

COMMONWEALTH OF MASSACHUSETTS



CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	605126-120185
P.V. =	\$8,964,000.00
PLANS	YES

FOR

**Federal Aid Project No. STP(BR-OFF)-003S(606)X
Bridge Replacement Br. No. W-05-015 (Steel)
Route 32 (Palmer Road) over the Ware River**

in the Town of

WARE

In accordance with the STANDARD SPECIFICATIONS
for HIGHWAYS and BRIDGES dated 2022

This Proposal to be opened and read:

TUESDAY, NOVEMBER 15, 2022 @ 2:00 P.M.

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DOCUMENT 00010

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DOCUMENT 00104

**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, NOVEMBER 15, 2022 at 2:00 P.M. **

WARE

Federal Aid Project No. STP(BR-OFF)-003S(606)X

Bridge Replacement Br. No. W-05-015 (Steel)

Route 32 (Palmer Road) over the Ware River

****Date Subject to Change**

PROJECT VALUE = \$8,964,000.00

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 \$772.50 per ton, Portland cement \$170.00 per ton, diesel fuel \$3.912 per gallon, and gasoline \$2.754 per gallon. 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: Jamey Tesler, Secretary and CEO, MassDOT
Jonathan L. Gulliver, Administrator, MassDOT Highway Division
SATURDAY, SEPTEMBER 10, 2022

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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.

- (d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request.
- (e) The office of inspector general, the commissioner of capital asset management and maintenance and any other awarding authority shall enforce the provisions of this section. The commissioner of capital asset management and maintenance may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.
- (f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

M.G.L. c. 30, § 390: Suspension, Delay, or Interruption or Failure to Act by Awarding Authority; Adjustment in Contract Price; Submission of Claims.

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

- (a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.
- (b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.

****<<<<<<<<<<<<<<<<<<<<<<<<<<>>>>>>>>>>>>>>>>****

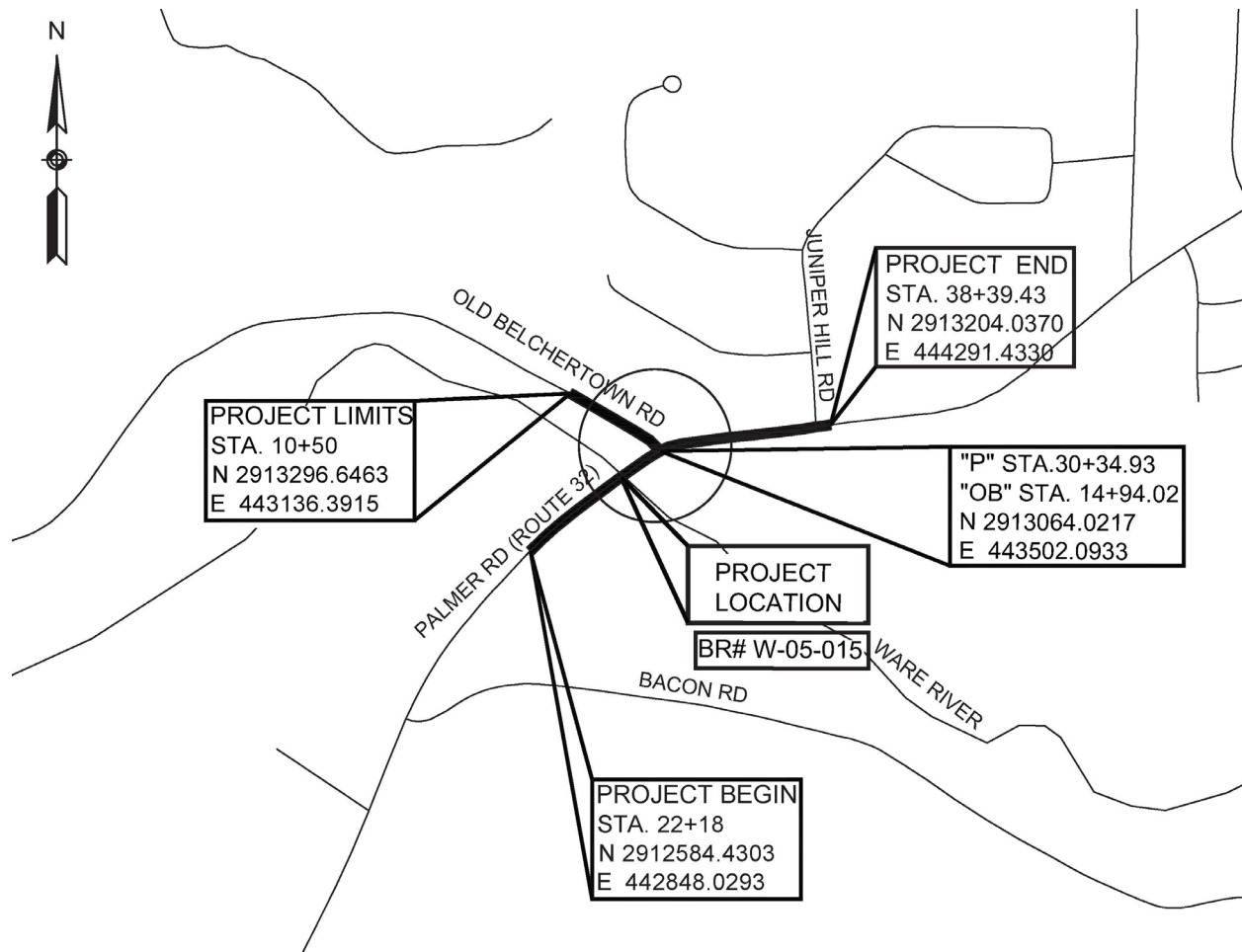
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DOCUMENT 00331

LOCUS MAP**WARE**

**Federal Aid Project No. STP(BR-OFF)-003S(606)X
Bridge Replacement Br. No. W-05-015 (Steel)
Route 32 (Palmer Road) over the 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: _____

DOCUMENT 00710
GENERAL CONTRACT PROVISIONS
Revised: 04/08/22

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2022, 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 00711

SUBSECTION M4.02.14

Precast Concrete Highway Units

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SUBSECTION M4.02.14 Precast Units

Replace this Subsection with the following :

SUBSECTION M4.02.14 Precast Concrete Highway Units

The following Precast Concrete Highway Units shall meet the materials and fabrication requirements specified herein:

- (a) Standard Temporary and Permanent Barriers
- (b) Box Culverts with spans less than or equal to 10 feet
- (c) Catch basins
- (d) Drainage Pipes
- (e) Pipe Flared Ends
- (f) Manholes
- (g) Handholes
- (h) Proprietary Retaining Wall Systems
- (i) Traffic Light Pole Bases
- (j) Luminaire Bases

Precast Concrete Highway Units shall be fabricated in conformance with the MassDOT Construction Standard Details, Traffic Standard Drawings for Traffic Signals and Highway Lighting, Overhead Signal Structure and Foundation Standard Drawings, and Standard Drawings for Signs and Supports. Circular vertical precast reinforced concrete manholes and structures used in sewer, drainage, and water works shall conform with the requirements of AASHTO M 199. The outside surface of the tapered or cone section of precast drainage structures shall be dried, cleaned, and coated with an RS-1-H coating meeting the requirements of AASHTO M 140.

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). 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. Plant.

Prior to the fabrication of Precast Concrete Highway Units, 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 Highway Unit(s) being fabricated
- (b) MassDOT Approval

C. Fabricator Quality Control.

Quality Control shall be performed by the Fabricator. The Fabricator shall maintain a Quality Control system to monitor, assess, and adjust placement and fabrication processes to ensure the fabricated Precast Concrete Highway Unit(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 inspection 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.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)**1. Personnel.**

The Fabricator shall provide adequate training for all QC personnel in accordance with the Fabricator's NPCA or PCI Certification. A sufficient amount of QC personnel shall be trained and certified to perform the tests as specified in M4.02.13, Part D. At a minimum, the Fabricator's Quality Control personnel shall maintain the following qualifications and certifications:

- (a) QC Manager with an active NETTCP Field Technician or ACI Concrete Field Testing Technician – Grade I certification or higher, and a minimum of six (6) months continuous experience in the manufacture of Precast Concrete Highway Products. The QC Manager shall be on site while the batch plant is producing and placing concrete for MassDOT projects.
- (b) Technicians/Inspectors with an active American Concrete Institute (ACI) Concrete Field Testing Technician – Grade I certification, or higher.

The Fabricator shall provide to the MassDOT Plant Inspector copies of the Fabricator's Quality Control Personnel required qualifications, as specified above.

2. 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. The moisture storage room or curing box shall be thermostatically controlled to maintain temperatures consistent with AASHTO T23. The laboratory 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.

3. 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 T152
- (b) Air Content Meter Volumetric Method: AASHTO T196 (Required for Lightweight Concrete)
- (c) Slump Cone: AASHTO T119
- (d) Cylinder Molds: AASHTO M205
- (e) Concrete Testing Machine: AASHTO T22
- (f) Screening Sieve: AASHTO T27, AASHTO T11
- (g) Curing Box: AASHTO T23
- (h) Spread Test Base Plate for Self-Consolidating Concrete (SCC): ASTM 1611
- (i) All other equipment prescribed by AASHTO and ASTM standards for the tests to be performed by the Fabricator as specified

4. Inspection.

Quality Control personnel shall monitor and inspect the fabrication of each Precast Concrete Highway Unit. 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.

5. Temperature Monitoring.

At a minimum, the Fabricator shall monitor, record, and report the temperatures of the form and ambient temperatures surrounding the concrete continuously, without interruption as specified below:

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

- (a) Prior to placement of concrete to verify the temperatures are greater than or equal to 50°F.
- (b) Immediately after placement to verify that the temperatures are greater than or equal to 50°F.
- (c) Throughout the entire duration of the curing cycle, at regular intervals not to exceed one hour until 70% Design Strength (f'_c) is attained.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest 2°F. The Fabricator shall verify all temperature requirements meet the specifications herein. Fabricator Quality Control concrete temperature monitoring records reporting the concrete temperature at the specified minimum frequency shall be provided to the MassDOT Inspector upon request.

6. Sampling and Testing.

At a minimum, the Fabricator shall perform random Quality Control sampling and testing for each Sublot of concrete produced 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 Subsection M4.02.13 and AASHTO R 60.

Table 1: Quality Control Sampling and Testing

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size ^(b)	Sublot Size ^(c)	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 in a year, per Mix Design	50 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	5% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°F				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	Stripping Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 70% 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.	≥ 100% f'_c at 28 days				

Notes:

- (a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
- (b) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
- (c) 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.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)**7. Certificate of Compliance.**

The Fabricator shall provide a Certificate of Compliance in accordance with Standard Specifications, Division I, Subsection 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.

8. 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 MassDOT Standard Shop Drawings
- (e) Fabricator Certificate of Compliance for each fabricated Precast Concrete Highway Unit
- (f) Admixture Manufacturer's Certification of Compliance and Technical Data Sheet for each approved Admixture
- (g) Completed QC Inspection Checklist for each fabricated Precast Concrete Highway Unit
- (h) Identification Number for each fabricated Precast Concrete Highway Unit
- (i) Time and date of casting of each fabricated Precast Concrete Highway Unit
- (j) Date of stripping the forms of each fabricated Precast Concrete Highway Unit
- (k) Batch Ticket Printout reporting the quantity of concrete produced for each batch of concrete produced
- (l) QC Test Report Forms for each subplot of concrete produced
- (m) Non-Conformance Reports (NCRs)
- (n) Documentation of Repairs (if applicable)

D. 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 Highway Unit 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 Highway Units shall be determined by MassDOT.

1. Inspection.

A MassDOT Inspector may be assigned to perform Acceptance activities during the fabrication of the Precast Concrete Highway Products, which includes the inspection of the materials, work procedures, and Precast Concrete Highway Units. When a MassDOT Inspector is assigned to the Fabricator's plant, 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 start date. The Fabricator shall perform 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.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

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 Highway Unit(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 Highway Unit(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.

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 in a year, per Mix Design	50 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	5% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°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.	≥ 100% f'_c at 28 days				
		56-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 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).

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

- (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.

MATERIALS**E. Materials.**

Materials shall meet the following specifications, where 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
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
Self-Consolidating Concrete (SCC)	M4.02.17
Slag	AASHTO M-302
High Performance Cement Concrete	M4.06.1
Reinforcing Bars	M8.01.0
Epoxy Coated Reinforcing Bars	M8.01.7
Asphalt Emulsions	M3.03.0

1. Cement Concrete Mix Design.

Cement concrete for Precast Concrete Highway Units shall meet the requirements of M4.02.0. When used, High Performance Cement Concrete shall meet the requirements of M4.06.1 and self-consolidating concrete (SCC) shall meet the requirements of M4.02.17. The cement concrete shall be composed of specified proportions by the mass of aggregates, cement, supplementary cementitious materials (SCMs), water, and QCML approved admixtures to form a homogenous composition. The particular quantities and uniform combination of materials and sources of supply to be used by the Fabricator on MassDOT Highway Construction contracts shall be reported on the MassDOT Cement Concrete Mix Design Sheet and submitted to MassDOT RMS 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.

Prior to the production and placement of the cement concrete for Precast Concrete Highway Units, the Fabricator's proposed mix design shall be approved by MassDOT RMS. Modifications made to the aggregate, cement, supplementary cementitious materials (SCMs), admixtures (including coloring agents), or formulation to previously approved mix designs during fabrication are prohibited. All new mix design formulations and modifications made to previously approved mix designs will require resubmission of the Cement Concrete Mix Design Sheet to MassDOT RMS for review and trial batch testing for the new mix design(s) by the Fabricator. 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:

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

- (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: 130% f'_c at 28 days Batch Mixed: 120% f'_c at 28 days	MassDOT
Alkali-Silica Reaction (ASR) ^(c)	ASTM C 1567	Per ASTM	M4.02.00	Quality Control
Resistance to Chloride Ion Penetration ^(d)	AASHTO T 358 ^(e)	28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	Resistivity $\geq 15 \text{ k}\Omega\text{-cm}$ at 28 days	MassDOT

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. Cylinders shall be haLaboratory 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) 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).
- (d) Resistance to Chloride Ion Penetration testing shall be performed only on proposed High Performance Cement Concrete mix designs. The 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.
- (e) The Wenner probe tip spacing "a" shall be 1.5.

CONSTRUCTION METHODS – PLANT FABRICATION

F. Shop Drawings.

Fabricator shop drawings for Precast Concrete Highway Units shall conform with the MassDOT Construction Standard Details, Traffic Standard Drawings for Traffic Signals and Highway Lighting, Overhead Signal Structure and Foundation Standard Drawings, and Standard Drawings for Signs and Supports. Circular vertical precast reinforced concrete manholes and structures used in sewer, drainage, and water works shall conform with the requirements of AASHTO M 199.

G. Tolerances.

Precast unit tolerances shall be as indicated on the plans, as specified in Subsection 901, or as indicated in the MassDOT Construction Standard Details, as appropriate.

H. Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the Precast Concrete Highway Units within specified tolerances to the shapes, lines and dimensions shown on the MassDOT Construction Standard Details. 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 minor nature, due to form work, stripping or handling, shall be cause for rejection, as defined in Repairs and Replacement, unless approved for repair through the NCR process. 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.

I. 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 a MassDOT approved mix design. 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.

J. 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. The Quality Control Inspector shall inspect and accept the placement of the reinforcing steel prior to the placement of concrete into the forms. When a MassDOT Inspector is assigned to perform Acceptance activities at the Fabricator's facility, 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.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)**K. 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.

L. Exposed Surfaces of Precast Concrete Highway Units.

As soon as conditions permit and 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.

M. Final Curing Methods.

All exposed concrete surfaces shall meet the requirements of the selected final curing method and maintain the required concrete temperature ranges throughout the duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all the specified conditions are met.

1. Water Spray Curing.

The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the water spray. After the concrete has sufficiently hardened, all exposed concrete surfaces shall remain moist with a continuous fine spray of water throughout the entire duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 4: Termination of Curing Cycle for Water Spray Curing*).

Table 4: Termination of Curing Cycle for Water Spray

Sustained Ambient Temperature	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ 70% f'_c

2. Saturated Covers for Curing.

The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the saturated burlap. After the concrete has sufficiently hardened, all exposed concrete surfaces shall be covered with water-saturated burlap throughout the entire duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 5: Termination of Curing Cycle for Saturated Cover Curing*).

Table 5: Termination of Curing Cycle for Saturated Covers

Sustained Ambient Temperature	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ 70% f'_c

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

3. Curing Covers.

Curing covers shall be Plastic Coated Fiber Blankets or Polyethylene Curing Covers. Proposed curing covers shall be submitted for approval to the Designer of Record with a copy to the MassDOT Research and Materials Section. The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the curing covers. After the concrete has sufficiently hardened, all exposed concrete surfaces shall be covered with curing covers throughout the entire duration of the final curing method cycle. The Fabricator shall ensure that the surface of the concrete remains wet until the covers are placed. If forms are removed from the Precast Concrete Highway Unit, curing covers shall be placed over the exposed concrete for the remainder of 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 (100% minimum relative humidity). Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 6: Termination of Curing Cycle for Curing Covers*).

Table 6: Termination of Curing Cycle for Curing Covers

Sustained Ambient Temperature	Compressive Strength
$50^{\circ}\text{F} \leq ^{\circ}\text{F} \leq 90^{\circ}\text{F}$	$\geq 70\% f'_c$

N. Stripping.

The Fabricator shall not strip forms or handle the Precast Concrete Highway Unit until Quality Control compressive strength cylinders attain a minimum compressive strength of 70% Design Strength (f'_c).

O. Handling and Storage of Precast Concrete Highway Units.

Precast Concrete Highway Units shall not be exposed to temperatures below 50°F until Quality Control compressive strength results have achieved 70% f'_c . Precast units 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 units shall be supported on the ground by means of continuous blocking.

Precast units shall be loaded on a trailer with continuous blocking. Shock-absorbing cushioning material shall be used at all bearing points during transportation of the precast units. Blocking shall be provided at all locations of tie-down straps. The precast units shall not be subject to damaging torsional or impact stresses.

P. Repairs and Replacement (not including Proprietary Retaining Wall Systems)

Where noted, defects shall be repaired according to the PCI Northeast Region Guidelines for Resolution of Non-Conformances in Precast Concrete Highway Units, Report Number PCINE-18-RNPCBE. Please note that reference to PCINE-18-RNPCBE is made for repair details only. In the case of conflict with this specification, this specification shall govern.

Any required repairs shall utilize materials listed on the MassDOT QCML. All repairs shall be completed at the expense of the Contractor.

Q. Repairs and Replacement for Proprietary Retaining Wall Systems.

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.

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:

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

- (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 3
- (b) cracks less than or equal to 0.006" wide

2. Category 2, Minor Defects.

Category 2 defects shall be repaired and documented. Non-conformance Reports are not required for this category. Documentation of the repair shall be submitted to the MassDOT District Engineer. Minor defects are defined as:

- (a) Spalls, honeycombing, surface voids that are less than 2 inches deep and have no dimension greater than 12 inches
- (b) Cracks greater than 0.006" and less than or equal to 0.060"
- (c) Broken corners without exposed reinforcing steel

Defects and cracks shall be repaired according to the Guidelines for Resolution of Non-Conformances in Precast Concrete Highway Units, Report Number PCINE-18-RNPCBE and this specification. All repairs shall be completed at the expense of the Contractor. Any required repairs shall utilize materials listed on the MassDOT QCML.

3. Category 3, Rejectable Defects.

Rejectable defects as determined by the MassDOT Inspector and MassDOT Resident Engineer will be rejected, unless the Fabricator receives MassDOT approval of a Non-Conformance Report. Some rejectable defects are defined as:

- (a) Surface defects on more than 5% of the surface area
- (b) Minor defects that in total make up more than 5% of the surface area of the unit
- (c) Concentrated area of defects consisting of four or more Category 2 Defects within a 4-square foot area.
- (d) Exposed reinforcing steel
- (e) 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
- (f) Cracks greater than 0.060" in width
- (g) Elements fabricated outside of the specified tolerances
- (h) Compressive strength that does not meet the specified Design Strength, f'_c

R. Loading.

Prior to the Fabricator loading the Precast Concrete Highway Unit 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 Concrete Highway Unit. 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.

S. Shipping.

Prior to shipment, the Fabricator shall perform the following actions and provide the required documentation to the MassDOT Plant Inspector:

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

- (a) Precast Concrete Highway Units 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 Highway Unit'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 and MassDOT Inspector and/or MassDOT RMS.

T. 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 Highway Unit'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 Highway Units upon receipt at the site. Precast Concrete Highway Units damaged during delivery shall be repaired or replaced at MassDOT's direction at no cost to MassDOT..

DOCUMENT 00713

Subsection 701
Cement Concrete Sidewalks, Pedestrian Curb Ramps, and Driveways
and
Guide to the Interim Subsection 701
Cement Concrete Sidewalk Specification

(March 31, 2022)

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SUBSECTION 701: CEMENT CONCRETE SIDEWALKS, PEDESTRIAN CURB RAMPS, AND DRIVEWAYS

Replace this Subsection with the following:

**INTERIM SUBSECTION 701: CEMENT CONCRETE SIDEWALKS,
PEDESTRIAN CURB RAMPS, AND DRIVEWAYS****DESCRIPTION****701.20: General**

This work shall consist of the construction of cement concrete sidewalks, pedestrian curb ramps, and driveways in accordance with the specifications and within the tolerances established on the plans.

MATERIALS**701.30: General**

Materials shall meet the requirements specified in the following Subsections of Division III, Materials except as noted herein:

Gravel Borrow, Type b.....	M1.03.0
Cement Concrete ($\geq 4,000$ psi).....	M4.02.00
Preformed Expansion Joint Filler.....	M9.14.0 ^[1]

^[1] Preformed expansion joint filler shall conform to Subsection M9.14.0 or ASTM D8139.

The following best practices may be incorporated into the cement concrete mix design at no additional cost to the Department as identified herein.

A. Combined Aggregate System.

The combined aggregate system for the mix design may be analyzed using the Tarantula Curve, Shilstone Chart, fineness modulus, and coarse aggregate content to enhance the properties of the concrete.

1. Tarantula Curve.

The combined aggregate system for the mix design may be analyzed using the Tarantula Curve to evaluate potential properties of the concrete, including workability, segregation, edge slumping, surface finishing, and cohesion.

Table 701.30-1: Tarantula Curve Particle Size Distribution

Sieve Opening	Percent by Mass Targets (%)		Percent by Mass Retained (%)		
	Passing	Retained			
1-1/2 in.	100	—	—	—	—
1 in.	92	8	0 – 16	—	—
3/4 in.	82	10	0 – 20	—	—
1/2 in.	69	13	4 – 20	—	—
3/8 in.	56	13	4 – 20	—	—
No. 4	43	13	4 – 20	—	—
No. 8	37	6	0 – 12	Coarse Sand 20 – 40	—
No. 16	31	6	0 – 12		—
No. 30	18	13	4 – 20		Fine Sand 24 – 34
No. 50	5	13	4 – 20	—	
No. 100	0	5	0 – 10	—	
No. 200	0	0	0 – 2	—	

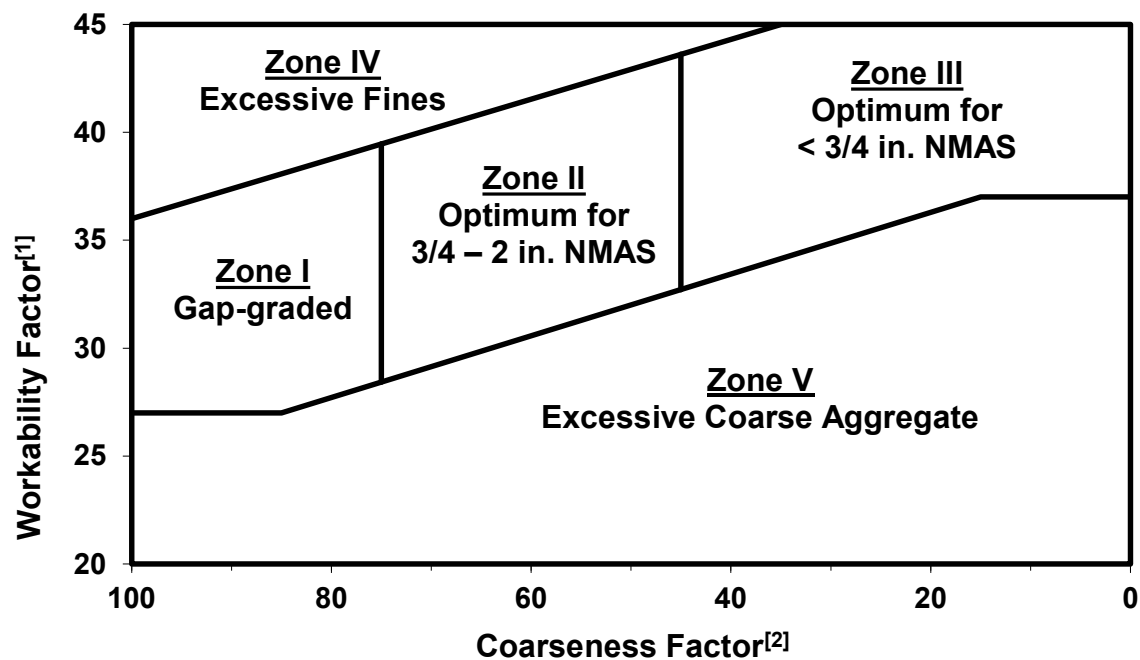
2. Shilstone Workability-Coarseness Chart.

The combined aggregate system for the mix design may be analyzed using the Shilstone Workability-Coarseness Chart, to evaluate potential properties of the concrete, including workability.

Table 701.30-2: Shilstone Workability-Coarseness

Zone	Property	Cause
Zone I	Gap-graded; High potential for segregation during placement and consolidation; Cracking, blistering, spalling, and scaling	Deficiency in intermediate particles; Non-cohesive
Zone II	Optimum mixture for nominal maximum aggregate size from 2 in. – 3/4 in.	Optimized workability factor and coarseness factor
Zone III	Optimum mixture for nominal maximum aggregate size < 3/4 in.	Optimized workability factor and coarseness factor
Zone IV	Sticky; High potential for segregation during consolidation and finishing; Variable strength, high shrinkage, cracking, curling, spalling, and scaling	Excessive fines
Zone V	Rocky; Lacking plasticity	Excessive amount of coarse and intermediate aggregate

Figure 701.30-1: Shilstone Workability-Coarseness Chart



^[1] The workability factor is determined by the equation $WF = W + (C - 564) / 38$, where WF = workability factor, W = percent passing No. 8 sieve and C = total cementitious materials content.

^[2] The coarseness factor is determined by the equation $CF = (Q/R) / 100$, where CF = coarseness factor, Q = cumulative percent retained on 3/8 in. sieve and R = cumulative percent retained on No. 8 sieve.

3. Fineness Modulus.

The combined aggregate system for the mix design may be analyzed using the fineness modulus, to evaluate potential properties of the concrete, including the fineness or coarseness of the mix design and estimating the design proportions of fine and coarse aggregates. The coarseness of the mix design increases as the fineness modulus increases. The fineness modulus is determined by calculating the total cumulative percentages by mass retained on each designated sieve and dividing by 100.

4. Coarse Aggregate Content.

The combined aggregate system for the mix design may be analyzed using the coarse aggregate content. The coarse aggregate content is determined by calculating the total cumulative percentages by mass retained on the No. 4 sieve.

B. Paste System.

The quality of the paste system is determined by the water-cementitious ratio, air content, cementitious materials, and chemical admixtures incorporated into the mix design.

1. Water-Cementitious Ratio.

The water-cementitious ratio for the mix design may be analyzed to evaluate potential properties of the concrete, including strength, concrete and reinforcement bonding, and resistance to freezing, thawing, de-icing, sulfate reaction, corrosion of steel reinforcement, drying shrinkage, cracking, and

volume change from wetting and drying. The water-cementitious ratio is determined by calculating the total water content by mass and dividing by the total cement and supplementary cementitious material (SCM) content by mass. The recommended water-cementitious ratio design target is identified in Table 701.30-3. The water-cementitious ratio shall be less than or equal to 0.45.

Table 701.30-3: Freezing, Thawing, and De-icing Resistance

Exposure Class	Severity	Condition	Water-Cementitious Ratio
			Requirement
F3	Very Severe	Exposed to freezing and thawing cycles and accumulation of snow, ice, and de-icing chemicals; Frequent exposure to water	≤ 0.45

2. Air Content.

The air content for the mix design may be analyzed to evaluate potential properties of the concrete, including strength and resistance to freezing, thawing, de-icing, and sulfate reaction. The recommended air content design targets are identified in Table 701.30-4.

Table 701.30-4: Freezing, Thawing, and De-icing Resistance

Exposure Class	Severity	Condition	Nominal Maximum Aggregate Size (in.)	Air Content Target Recommendation (%)
F3	Very Severe	Exposed to freezing and thawing cycles and accumulation of snow, ice, and de-icing chemicals; Frequent exposure to water	3/8	7.5
			1/2	7.0
			3/4	7.0
			1	6.5
			1 1/2	6.5

3. Cement and Supplementary Cementitious Materials Content.

The cement and supplementary cementitious materials content incorporated into the mix design shall promote quality properties of the cement concrete, including resistance to alkali silica reaction, freezing, thawing, de-icing, and sulfate reaction. Incorporation of supplementary cementitious materials (SCM) in cement concrete may affect workmanship properties, including workability, bleed rate, setting time, and other properties. Adequate adjustments in Contractor workmanship practices, including placement, finishing, curing, and other construction practices shall be required to account for these changes in properties and to prevent scaling due to freezing, thawing, and de-icing cycles. The cement and supplementary cementitious materials content shall meet the design criteria identified in Table 701.30-5.

Table 701.30-5: Alkali Silica Reaction and Freezing, Thawing, and De-icing Resistance^{[1][2]}

Exposure Class	Severity	Condition	Material	Replacement by Weight of Cement (%)
F3	Very Severe	Exposed to freezing and thawing cycles and accumulation of snow, ice, and de-icing chemicals; Frequent exposure to water	Low Alkali Cement ($\leq 0.60\%$ Alkalinity)	–
			Blended Hydraulic Cement ^[3]	–
			Fly Ash (Class F)	15 – 30
			Slag (Grade 100 or 120)	25 – 50
			Silica Fume	5 – 10
			Total SCM	≤ 50
			Total Fly Ash and Silica Fume	≤ 35

^[1] Acceptable replacement by weight of cement for alkali silica reaction resistance shall be determined by the alkali silica reaction resistance performance test results and the criteria identified in Table 701.73-1: Minimum Acceptance Sampling and Testing Requirements.

^[2] Test results meeting the alkali silica reaction resistance performance criteria of Table 701.30-6: Alternative Performance Evaluation to Alkali Silica Reaction Resistance Design Criteria may supersede the replacement by weight of cement design criteria.

^[3] SCMs in blended hydraulic cement shall meet the criteria identified for fly ash, slag, and silica fume.

Table 701.30-6: Alternative Performance Evaluation to Alkali Silica Reaction Resistance Design Criteria

Method	Quality Characteristic	Criteria
C295	Petrographic Examination for Potential Alkali Aggregate Reactive Constituents and Deleterious Materials in Aggregate ^[1]	–
	Optically Strained, Microfractured or Microcrystalline Quartz (%)	≤ 5.0
	Chert or Chalcedony (%)	≤ 3.0
	Trydimite or Cristobalite (%)	≤ 1.0
	Opal (%)	≤ 0.5
	Natural Volcanic Glass (%)	≤ 3.0
T 380	Alkali Silica Reaction Resistance: Expansion of Miniature Concrete Prisms at 56 days (%)	≤ 0.03 ^[2]

^[1] Examination of aggregate shall be performed and reported to identify and quantify potential alkali-aggregate reactive constituents and deleterious materials in aggregate, as defined in ASTM C294 Standard Descriptive Nomenclature for Constituents of Concrete Aggregates and ASTM C295 Standard Guide for Petrographic Examination of Aggregates for Concrete.

^[2] 56-day expansion results greater than 0.03 but less than or equal to 0.04 shall be considered non-reactive if the average two-week rate of expansion from day 56 to day 84 is less than or equal to 0.01%, otherwise, expansion results shall be considered reactive.

4. Chemical Admixtures.

Chemical admixtures may be incorporated into the mix design to enhance the properties of the concrete.

Table 701.30-7: Chemical Admixtures

Spec.	Type	Chemical Admixture	Properties
M 194	A	Water-Reducing	Increases Workability and Air Content; Decreases Water Demand (5 – 10%, 3 – 6 in. Slump)
	B	Retarding	Increases Initial and Final Setting Time, Air Content, Long-Term Strength; Offsetting of Accelerating Effect of Hot Weather; Decreases Early-Age Strength
	C	Accelerating	Increases Early-Age Strength; Decreases Initial and Final Setting Time
	D	Water-Reducing and Retarding	Type A and Type B Admixture Properties
	E	Water-Reducing and Accelerating	Type A and Type C Admixture Properties
	F	High Range Water-Reducing	Increases Workability (More Effective than Type A), Air Content, Early-Age Strength, and Ultimate Strength; Decreases Water Demand (12 – 40%, > 6 in. Slump) and Permeability
	G	High Range Water-Reducing and Retarding	Type F and Type B Admixture Properties
	S-SRA	Shrinkage Reducing	Increases Setting Time; Decreases Drying Shrinkage Cracking and Bleed Rate
	S-CRA	Crack Reducing	Decreases Cracking (More Effective than SRAs) and Crack Width
M 154	AEA	Air-Entraining	Increases Cohesion, Workability, Stabilization of Air Bubbles, Resistance to Freezing, Thawing, and De-icing, Resistance to Alkali-Reactive Environment, and Resistance to Sulfate Reaction
M 194 ^[1]	MRWRA	Mid Range Water-Reducing	Type A and Type F Admixture Properties; Increases Workability (Especially Concrete with SCMs); Decreases Water Demand (6 – 12 %, 5 – 8 in. Slump)
C1622	CWA	Cold Weather	Increases Hydration Rate; Decreases Freezing Point of Mixing Water

^[1] Mid range water-reducing admixtures (MRWRA) may meet either water-reducing (A) or high range water-reducing (F) admixture criteria.

5. Paste Content.

The paste content for the mix design may be optimized to enhance potential properties of the concrete, including workability, strength, permeability, and resistance to drying shrinkage and cracking and volume change from wetting and drying. The volume of paste should adequately fill the voids and provide sufficient separation between the aggregate particles to promote workability and effective bonding of particles.

Table 701.30-8: Paste Content

Mix Design Characteristic	Recommendation
Volume of Cement Concrete (cf) ^[1]	27
Paste Content (%) ^[2]	≤ 28 ^[3]
Paste Content to Aggregate Void Content Ratio ^[4]	1.25 – 1.75
Excess Volume of Paste for Workability (%) ^[5]	–

^[1] The volume of cement concrete is determined by the following equation, where W = Weight (lbs.), SG = Specific Gravity, D = Density (pcf), and V = Volume (cf).

$$\begin{aligned}
 V_{\text{CEMENT}} &= W_{\text{CEMENT}} / SG_{\text{CEMENT}} * D_{\text{WATER}} \\
 V_{\text{SCM}} &= W_{\text{SCM}} / SG_{\text{SCM}} * D_{\text{WATER}} \\
 V_{\text{ADMIXTURE}} &= V_{\text{ADMIXTURE in oz.}} / 957.5 \text{ oz. per cf} \\
 V_{\text{WATER}} &= V_{\text{WATER in gal.}} / 7.48 \text{ gal. per cf} \\
 V_{\text{COARSE}} &= W_{\text{COARSE}} / SG_{\text{COARSE}} * D_{\text{WATER}} \\
 V_{\text{FINE}} &= W_{\text{FINE}} / SG_{\text{FINE}} * D_{\text{WATER}} \\
 V_{\text{CONCRETE}} &= V_{\text{CEMENT}} + V_{\text{SCM}} + V_{\text{ADMIXTURE}} + V_{\text{WATER}} + V_{\text{COARSE}} + V_{\text{FINE}} + V_{\text{AIR}}
 \end{aligned}$$

^[2] The paste content by volume of cement concrete is determined by the following equation, where V = Volume (cf) and PC = Paste Content (%).

$$\begin{aligned}
 V_{\text{PASTE}} &= V_{\text{CEMENT}} + V_{\text{SCM}} + V_{\text{ADMIXTURE}} + V_{\text{WATER}} \\
 PC_{\text{CONCRETE}} &= V_{\text{PASTE}} / V_{\text{CONCRETE}}
 \end{aligned}$$

^[3] The cracking tendency of structural concrete is significantly reduced when the paste content by volume is less than or equal to 28 percent.

^[4] The paste content to aggregate void content ratio is determined by the following equation, where D = Density (pcf), SG = Specific Gravity, BD = Bulk Density (pcf), VC = Void Content (%), V = Volume (cf), AVC = Aggregate Void Content (%), PC = Paste Content (%), and R = Ratio. Workability increases as the paste content to aggregate void content ratio increases. Decreased paste content to aggregate void content ratios will result in decreased workability, where water-reducing admixtures provide no benefit.

$$\begin{aligned}
 VC_{\text{COARSE}} &= SG_{\text{COARSE}} * D_{\text{WATER}} - BD_{\text{COARSE}} / D_{\text{COARSE}} \\
 VC_{\text{FINE}} &= SG_{\text{FINE}} * D_{\text{WATER}} - BD_{\text{FINE}} / D_{\text{FINE}} \\
 VC_{\text{AGGREGATE}} &= [(V_{\text{COARSE}} / (V_{\text{COARSE}} + V_{\text{FINE}})) * VC_{\text{COARSE}} + (V_{\text{FINE}} / (V_{\text{COARSE}} + V_{\text{FINE}})) * VC_{\text{FINE}}] \\
 AVC_{\text{CONCRETE}} &= [VC_{\text{AGGREGATE}} * ((V_{\text{COARSE}} + V_{\text{FINE}}) / V_{\text{CONCRETE}})]
 \end{aligned}$$

$$R_{PC-AVC} = PC_{CONCRETE} / AVC_{CONCRETE}$$

^[5] The excess paste content for workability is determined by the following equation, where PC = Paste Content (%), AC = Air Content (%), AVC = Aggregate Void Content (%), and EPC = Excess Paste Content for Workability (%).

$$EPC_{CONCRETE} = PC_{CONCRETE} + AC_{CONCRETE} - AVC_{CONCRETE}$$

C. Initial Curing Materials.

The materials and procedures used for initial curing methods of cement concrete shall meet the Manufacturer's instructions and recommendations and the requirements specified herein.

Cement concrete with a low to negligible bleeding rate, exposure to highly evaporative environments, high content of silica fume, fine cement, or other fine cementitious material, low water to cementitious ratio, high air content, or water-reducing admixtures have an increased susceptibility to surface drying and plastic shrinkage between placement and finishing operations. Initial curing materials and procedures shall be applied immediately after the bleed water sheen has disappeared from the surface of the concrete or the concrete surface exhibits loss of moisture and surface drying, between placement and finishing operations. Initial curing materials shall not be worked into the surface in subsequent finishing operations.

1. Liquid-Applied Evaporation Reducers.

Liquid-applied evaporation reducers used for initial curing methods shall produce an effective monomolecular film over the bleed water layer, to reduce the rate of evaporation of the bleed water from the surface and plastic shrinkage when the evaporation rate equals or exceeds the bleeding rate.

D. Intermediate Curing Materials.

The materials and procedures used for intermediate curing methods of cement concrete shall meet the Manufacturer's instructions and recommendations and the requirements specified herein.

In instances where finishing operations have been completed prior to the concrete achieving final set and the concrete surface exhibits loss of moisture and surface drying, the following curing materials and procedures shall be applied immediately to the concrete surface prior to the application of final curing materials, to prevent the loss of moisture without damaging the concrete surface, until final set of the concrete has been achieved and final curing materials have been applied to the concrete surface.

- 701.30.C.1: Liquid-Applied Evaporation Reducers
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing
- 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing

E. Final Curing Materials.

The materials and procedures used for final curing methods of cement concrete shall meet the Manufacturer's instructions and recommendations and the requirements specified herein.

Curing water shall be free of deleterious impurities, causing staining and deterioration. The potential staining ability of curing water shall be evaluated by means of CRD-C401 (US Army Corps

of Engineers 1975) for instances where curing water quality is questioned. Curing water shall not exceed a temperature differential of more than 20°F from the internal concrete temperature, to prevent cracking due to temperature gradients causing strain that exceeds the strain capacity of concrete. Curing water shall remain above freezing temperatures throughout the duration of the curing cycle.

Final curing materials and procedures shall be applied to the concrete surface immediately after application of initial and intermediate curing materials, finishing operations, and final set of cement concrete, to prevent the loss of moisture and surface drying.

Materials used for final curing methods of cement concrete shall accommodate all exposed cement concrete surfaces with a continuous application of moisture throughout the entire duration of the final curing method cycle and provide controlled and gradual termination of the final curing method cycle.

Final curing materials applied to the concrete shall allow the concrete to mature sufficiently to achieve its designed and desired properties, including strength, volume stability, permeability, durability, and resistance to freezing, thawing, and de-icing cycles. Insufficient application of final curing materials results in decreased strength and durability of the top surface of concrete.

Protection to the concrete surface and curing materials shall be required in instances where adverse weather conditions are present, until curing operations can be initiated without damaging the surface of the concrete.

Final curing materials and procedures shall be applied to the concrete surface throughout the entire duration of the curing cycle and meet minimum sustained temperature, duration, and strength requirements, as specified in applicable Division II: Construction Details and herein. Controlled and gradual termination of the final curing method cycle shall begin only after all specified conditions are met, until the concrete gradually cools to within 20°F of the ambient temperature.

1. Saturated Covers.

Saturated covers used for final curing methods shall meet 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 cement concrete and cementitious materials. 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 cement concrete and cementitious materials. Saturated covers shall have sufficient thickness and proper positioning onto the surface to maximize moisture retention. Saturated covers shall contain a sufficient amount of moisture to prevent moisture loss from the surface of cement concrete and cementitious materials. Saturated covers shall have the ability to retain sufficient moisture from continuous watering so that a film of water remains on the surface of cement concrete and cementitious materials throughout the entire duration of the final curing method cycle. Saturated covers shall not absorb water from cement concrete and cementitious materials. Polyethylene film may be applied over the saturated cover to limit the amount of continuous watering required for sufficient moisture retainage. Saturated covers shall accommodate uniform and slow drying of cement concrete and cementitious materials surfaces immediately prior to removal.

2. Sheet Materials.

Sheet materials, including polyethylene film, white burlap-polyethylene sheeting, and reinforced paper, used for final curing methods shall meet ASTM C171 and the requirements specified 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 sheet materials shall be secured to maintain a moist environment.

a. Polyethylene Film.

Polyethylene film shall be clear, white, or black in color and consist of a single sheet manufactured from polyethylene resins, be free of visible defects, including tears, wrinkles, and discontinuity. The film shall prohibit mottling and uneven spots from appearing on the surface of concrete, due to variations in temperature, moisture content, or both. Application of additional curing water under the film or application of a polyethylene film bonded to absorbent fabric to the concrete surface may be required to prevent mottling and to retain and evenly distribute the moisture. Polyethylene film shall accommodate concrete surfaces with constant contact without damage. The film shall be sufficient in length to extend beyond the edges of the concrete surface. 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.

i. White Polyethylene Film.

White polyethylene film shall minimize heat gain caused by absorption of solar radiation and shall be exclusively used during warm weather applications.

ii. Clear and Black Polyethylene Films.

Clear and black polyethylene films shall inhibit absorption of solar radiation for cold weather applications.

b. White Burlap-Polyethylene Sheeting.

White burlap-polyethylene sheeting shall be securely bonded to the burlap so to avoid separation of the materials during handling and curing of the concrete.

c. Reinforced Impervious Paper.

Reinforced impervious paper shall be white in color, 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. Reinforced impervious paper shall be free of holes, tears, and pin holes from deterioration of the paper through repeated use. Reinforced impervious paper shall be treated to prevent tearing when wetted and dried. Reuse of reinforced impervious paper shall be permitted so long as it is able to retain moisture on the surface of concrete. The paper shall be discarded and prohibited from use when moisture is no longer retained in the material.

3. Liquid Membrane-Forming Compounds.

Compounds shall form a continuous, non-yellowing, and durable film with quality moisture-retention properties. Compounds shall maintain the relative humidity of the concrete surface

above 80% for seven days to sustain cement hydration. Compounds shall not affect the original color of the concrete surface. Compounds shall not degrade due to exposure to ultraviolet light from direct sunlight. Compounds shall meet the local and federal allowable Volatile Organic Compound (VOC) content limits.

White-pigmented compounds shall be used in instances where solar-heat gain is concern to the concrete surface. White-pigmented compounds shall be agitated in the container prior to application to prevent pigment from settling out resulting in non-uniform overage and ineffective curing.

Careful considerations shall be made by the Contractor 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. To diagnose and prevent this condition, the Contractor may 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. Under such conditions, the application of liquid membrane-forming compounds to the concrete surface shall be delayed to prevent bleed water from being sealed below the concrete surface, map cracking of the membrane films, reduction in moisture-retention capability, and the need for reapplication of the compound.

Prior to use, compounds shall be thoroughly mixed, stirred, and agitated per the Manufacturer's instructions and recommendations.

Compounds shall be applied continuously and uniformly to the surface of the concrete per the Manufacturer's instructions and recommendations. Compounds shall be applied immediately after the disappearance of the surface water sheen following final finishing. Applying of the compound immediately after final finishing and before all free water on the surface has evaporated will help prevent the formation of cracks. When using compounds to reduce moisture loss from formed surfaces, the exposed surface shall be wetted immediately after form removal and kept moist until the curing compound is applied. The concrete shall be allowed to reach a uniformly damp appearance with no free water on the surface, and then application of the compound shall begin at once. Delayed application will result in surface drying, absorption of the compound into the concrete, and no forming of a continuous membrane.

The concrete surface shall be damp when the compound is applied. Power-driven spray equipment shall be used for uniform application of compounds on large paving projects. Spray nozzles recommended by the compound Manufacturer and use of windshields shall be arranged by the Contractor to prevent wind-blown loss of compound and to ensure proper coverage application rates are achieved. The compound shall be applied by power sprayer, using appropriate wands and nozzles with pressures between 25 and 100 psi. The Contractor shall fill the power sprayer with curing compound from the Manufacturer's original container in the presence of the Engineer. Any dilution as recommended by the Manufacturer shall take place in the presence of the Engineer. For very small areas such as repairs, the compound shall be applied with a wide, soft-bristled brush or paint roller.

The Contractor shall verify the application rate and procedures are in accordance with the Manufacturer's instructions and recommendations. At least one uniform coat shall be applied at a rate of 150 to 200 ft²/gallon. On very deeply textured surfaces, the surface area to be treated shall be at least twice the surface area of the surface. In such cases, two separate applications may be needed, each at 200 ft²/gallon or greater if specified by the Manufacturer to achieve the desired

moisture retention rate, with the first being allowed to become tacky before the second is applied. If two coats are necessary to ensure complete coverage, for effective protection the second coat should be applied at right angles to the first. Complete coverage of the surface shall be attained due to the potential for formation of small pinholes in the membrane, which will result in loss of moisture from the concrete. Compounds shall not sag, run off peaks, or collect in grooves.

Compounds and procedures shall be compatible with concrete surfaces receiving subsequent applications or placements of concrete, overlays, coatings, paints, sealers, finishes or other toppings to ensure acceptable bonding to the concrete. Testing to establish compatibility among the curing compound, subsequent surface treatments, concrete moisture content and the actual finished surface texture of the concrete shall be conducted when compatibility is not known. The compound Manufacturer shall be consulted by the Contractor to determine the compatibility of the application. Compounds shall not be applied to concrete surfaces where bonding of subsequent applications or placements is incompatible or is of concern. The use of wax-based curing compounds shall be prohibited in instances where concrete surfaces are subject to additional toppings and vehicular, pedestrian, or other traffic. Deliberate removal of compounds in the presence of the Engineer and in accordance with Manufacturer's instructions and recommendations shall be conducted as an alternative to compatibility testing, incompatibility, or in instances where bonding is of concern. Bonding of subsequent materials may still be inhibited by the presence of the compound even after the moisture retention characteristics of the compound have diminished.

a. Liquid Membrane-Forming Compounds for Curing.

Liquid membrane-forming compounds for curing shall meet ASTM C309, the Manufacturer's instructions and recommendations, and the requirements specified herein.

Table 701.30-1: Types of Compounds for Curing

Type	Description
Type 1	Clear or translucent without dye
Type 1-D	Clear or translucent with fugitive dye
Type 2	White pigmented

Table 701.30-2: Composition Class of Compounds for Curing

Type	Description
Class A	Unrestricted composition, generally wax-based products
Class B	ASTM D883 resin-based products

b. Liquid Membrane-Forming Compounds for Curing and Sealing.

Liquid membrane-forming compounds for curing and sealing shall meet ASTM C 1315, the Manufacturer's instructions and recommendations, and the requirements specified herein.

In addition to moisture-retention capabilities compounds shall exhibit specific properties, including alkali resistance, acid resistance, adhesion-promoting quality, and resistance to degradation by ultraviolet light.

Table 701.30-3: Types of Compounds for Curing and Sealing

Type	Description
Type I	Clear or translucent
Type II	White pigmented

Table 701.30-4: Class of Compounds for Curing and Sealing

Type	Description
Class A	Non-yellowing

F. Protective Sealing Compounds.

Protective sealing compounds shall maintain valid listing on the Department Qualified Construction Materials List (QCML) and meet AASHTO M 224, NCHRP Report 244 and the requirements specified herein.

Protective sealing compounds shall sufficiently penetrate the concrete to seal the surface pores and fill the capillaries of the concrete by chemically reacting with the concrete and forming a hydrophobic layer. Protective sealing compounds shall limit the penetration of liquids, gases, and harmful substances into hardened concrete, including water, de-icing agents, and carbon dioxide to protect concrete from freezing, thawing, and de-icing cycles, corrosion of reinforcing steel, and acid attack. Protective sealing compounds shall limit the buildup of vapor pressure between the concrete and the applied sealer. Protective sealing compounds shall retard the penetration of harmful substances into hardened concrete. Protective sealing compounds shall maintain their protective properties during environmental exposure to freezing, thawing, and de-icing cycles. Protective sealing compounds shall not reduce the frictional properties of the concrete. Protective sealing compounds shall not affect the original color of the concrete surface if maintaining the original color is desired by the Department. Protective sealers shall meet the local and federal allowable Volatile Organic Compound (VOC) content limits.

Curing methods conforming to Department specifications shall be applied to the concrete prior to the application of protective sealers. Protective sealers shall not be applied to the concrete for a minimum of 28 days after placement and the surface shall be sufficiently prepared, clean, and dry for at least 24 hours with ambient temperatures exceeding 60°F. Protective sealers shall not be applied to concrete placed where freezing, thawing, and de-icing cycles are expected immediately after, due to the retainage of water in the concrete. Periodic re-application shall be required for protective penetrants requiring multiple applications and for concrete surfaces exhibiting wear to ensure long-term protection of the concrete surface.

G. Cold Weather Concreting Materials.

Cold weather concreting shall be defined as the procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather conditions, while exposed to air temperatures falling below, or expected to fall below 40°F.

The protection period shall be defined as the minimum duration required to prevent concrete from the negative effects of cold weather exposure. The protection period shall remain in place while

cold weather conditions exist. Controlled and gradual termination of the protection period shall be conducted only after 100% f'c is attained and all specified conditions are met.

The procedures, operations, materials, and equipment selected for cold weather concreting shall adequately maintain specified temperature ranges by addressing all variables, including ambient weather conditions, geometry of the structure, and mix design proportions. Concrete temperatures for cold weather concreting shall meet Table 701.30-5.

Table 701.30-5: Concrete Temperature Requirements for Cold Weather Concreting

Phase	Cold Weather Temperature (°F)	Concrete Temperature (°F)
Mixing	30-39	60-75
	0-30	65-80
	< 0	70-85
Placement	< 40	55-75
Protection Period	< 40	55-75
Termination of Protection Period – Allowable Rate of Decrease in 24 Hours	< 40	≤ 50

Cold weather concreting procedures, operations, materials, and equipment shall be developed and performed to prevent damage to concrete due to freezing at early ages, to ensure that the concrete develops the recommended strength for safe removal of forms, to maintain curing conditions that promote quality strength and durability development, to limit rapid temperature fluctuation, and to provide protection consistent with intended serviceability of the structure. The Contractor shall develop and submit to the Department for review and approval, cold weather concreting procedures for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather, including:

- Procedures for protecting the subgrade from frost and the accumulation of ice or snow on reinforcement or forms prior to placement
- Methods and requirements for cold weather protection and temperature control of constituent materials incorporated into the mix design
- Chemical admixtures incorporated into the mix design for cold weather protection and temperature control
- Methods and requirements for cold weather protection and temperature control during mixing, delivery, placement, finishing, curing, and protection period
- Curing methods to be used during and following the protection period
- Types of covering, insulation, heating, or enclosures to be provided
- Methods for verification of in-place strength
- Procedures for measuring and recording concrete temperatures
- Procedures for preventing drying during dry, windy conditions

All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

1. Insulating Materials.

Insulating materials used for cold weather concreting shall meet the requirements specified herein. The thermal resistance of the proposed insulation system shall be determined to meet the concrete temperature range requirements specified herein. Supplemental heat, including hydronic heating systems, shall be applied in instances where insulating materials cannot achieve the concrete temperature requirements.

2. Heaters.

Heaters used for cold weather concreting including direct fired, indirect fired, and hydronic heaters shall meet ANSI A10.10 carbon monoxide limits, safety regulations for ventilation, and the stability, operation, fueling, and maintenance of heaters and the requirements specified herein.

a. Direct Fired Heaters.

Direct fired heaters generate heat to an enclosed space through the combustion of fossil fuels, including oil, kerosene, propane, gasoline, and natural gas. Hot air comprised of carbon dioxide and carbon monoxide combustion products, is discharged into the enclosed space. Direct fired heaters shall be prohibited from heating the air directly surrounding the concrete surface due to calcium carbonate formation interfering with the hydration reaction, from the reaction between the carbon dioxide generated from the combustion of fossil fuels and the calcium hydroxide on the surface of freshly placed concrete, resulting in a soft, chalky, and nondurable concrete surface. Direct fired heaters shall only be used on concrete surfaces protected from fossil fuel combustion products.

b. Indirect Fired Heaters.

Indirect fired heaters generate heat to an enclosed space through the combustion of fossil fuels, including oil, kerosene, propane, gasoline, and natural gas. The carbon dioxide and carbon monoxide combustion products are expelled through venting, resulting in clean heated air discharged into the enclosed space. Indirect fired heaters are suitable for heating the air directly surrounding the concrete surface.

c. Hydronic Heaters.

Hydronic heaters generate heat to an enclosed space through the circulation of the heat-transfer fluid in a closed system of pipes or hoses. The heat-transfer fluid is comprised of a propylene glycol water solution and is heated through the combustion of fossil fuels, including diesel fuel and kerosene. The combustion of fossil fuel occurs outside of the enclosed space and does not expose the concrete surface to the deleterious effects of carbon dioxide.

After the concrete placement achieves final set, polyethylene film or other suitable material shall sufficiently serve as a vapor barrier. The heat-transfer hoses shall be placed on top of the vapor barrier and covered with insulating materials meeting 701.30.G.1. Hydronic heaters shall be used to thaw or preheat subgrades prior to concrete placement and provide supplementary heat to insulating materials. Hydronic heaters shall provide an even distribution of heat to prevent curling and cracking induced by temperature gradients within concrete.

3. Enclosures.

Enclosures shall be made of wood, canvas tarpaulins, polyethylene film, or prefabricated rigid plastic. Enclosures shall be airtight, block wind, prevent admittance of cold air, conserve heat, and withstand wind and snow loads. Enclosures shall provide adequate headroom for craftsmen and sufficient space between the concrete and the enclosure to permit free circulation of warm air. Supplementary heat shall be supplied to enclosures by hydronic heaters, live steam, hot forced air, or indirect fired combustion heaters. Icing along the perimeter of the enclosure shall be prevented when live steam is utilized. Heaters and ducts shall be positioned to prevent the hot, dry air from overheating or drying the concrete surface. Insulating materials meeting 701.30.G.1 shall be applied as a vapor barrier to the concrete surface immediate after final set is attained.

H. Hot Weather Concreting Materials.

Hot weather concreting shall be defined as the procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, bleed water evaporation, curing, and protection of concrete during hot weather conditions, while exposed to air temperatures exceeding, or expected to exceed 80°F; concrete temperatures approaching, or expected to approach 90°F; evaporation rates of surface water approaching, or expected to approach the bleeding rate of the concrete; high solar radiation; low relative humidity; and high wind speed.

The protection period shall be defined as the minimum duration required to prevent concrete from the negative effects of hot weather exposure, including the acceleration of rate of moisture loss and rate of cement hydration, difficulties in curing, increased concrete temperature, increased water demand, accelerated slump loss, increased rate of setting, increased tendency for plastic shrinkage and thermal cracking, increased potential for cold joints, and difficulties in controlling entrained air content. The protection period shall remain in place while hot weather conditions exist. Controlled and gradual termination of the protection period shall be conducted when conditions permit. The allowable rate of temperature decrease shall not exceed 5°F per hour and meet the allowable rate of temperature decrease specified in 701.30.G: Cold Weather Concreting Materials.

The procedures, operations, materials, and equipment selected for hot weather concreting shall adequately maintain specified temperature ranges and evaporation rates by addressing all variables, including ambient weather conditions, geometry of the structure, and mix design proportions. Initial materials meeting 701.30.C: Initial Curing Materials shall be applied to the concrete surface while the concrete and air temperatures, relative humidity of the air, and the wind speed have the capacity to evaporate free water from the fresh concrete surface at a rate that is equal to or greater than bleeding rate of the concrete. The evaporation rate of surface water shall be determined by the following equation:

$$E = (T_c^{2.5} - r * T_a^{2.5})(1 + 0.4V) \times 10^{-6}$$

where E = evaporation rate of water-covered surface (lb/ft²/hr), T_c = concrete temperature of the evaporating surface (°F), r = relative humidity of air surrounding the evaporating surface (%), T_a = temperature of the air surrounding the evaporative surface (°F), and V = average wind speed 20 inches above the evaporating surface. The air surrounding the evaporating surface shall be defined as the air approximately 4 to 6 feet above the evaporating surface on the windward side and shielded from the sun's rays.

Hot weather concreting procedures, operations, materials, and equipment shall be developed and performed to prevent damage to concrete and promote long-term durability. The Contractor shall develop and submit to the Department for review and approval, hot weather concreting procedures for the mixing, delivery, placement, finishing, curing, and protection of concrete during hot weather, including:

- Procedures for preparing the subgrade prior to placement
- Methods and requirements for hot weather protection and temperature control of constituent materials incorporated into the mix design
- Chemical admixtures incorporated into the mix design for hot weather protection and temperature control
- Methods and requirements for hot weather protection and temperature control during mixing, delivery, placement, finishing, curing, and protection period
- Initial curing methods to be used to reduce surface evaporation
- Curing methods to be used during and following the protection period
- Types of covering, insulation, cooling, or enclosures to be provided
- Evaporation rate and bleeding rate of concrete calculations
- Procedures for measuring and recording concrete temperatures
- Procedures for preventing drying during dry, windy conditions

All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

CONSTRUCTION METHODS

701.40: Pre-Placement

A. Excavation.

Excavation of the area shall be in accordance with the applicable portions of Subsection 120: Excavation.

B. Subgrade and Subbase.

The subgrade for the sidewalks and driveways shall be shaped parallel to the proposed surface of the sidewalks and driveways and thoroughly compacted. All depressions in the subgrade shall be filled with suitable material and again compacted until the surface is smooth and hard. Prior to the placement of the subbase, the Contractor shall inspect the prepared subgrade to ensure that it is in conformance with the required grade and cross-section. Subgrade shall be fine graded to meet the applicable requirements of Subsection 170: Grading.

After the subgrade has been prepared, a gravel subbase shall be placed upon it. After being compacted thoroughly, the subbase shall be at least 8 inches thick and parallel to the proposed surface of the sidewalk. Prior to the placement of the cement concrete, the Contractor shall inspect the prepared subbase material to ensure that it is in conformance with the required grade and cross-section. Subbase material that is not in accordance with the plans or specifications shall be reworked or replaced to meet the applicable requirements of Subsection 170: Grading before the start of cement concrete placement. When placing cement concrete, the compacted subbase shall not be frozen or have standing water.

C. Forms.

Side forms and transverse forms shall be smooth, free from warp, of sufficient strength to resist springing out of shape, of a depth to conform to the thickness of the proposed sidewalk or pedestrian curb ramp and of a type satisfactory to the Engineer.

All mortar or dirt from previously used forms shall be completely removed prior to use. The forms shall be well staked and thoroughly graded and set to the established lines with their upper edge conforming to the grade of the finished sidewalk or pedestrian curb ramp which shall have sufficient pitch to the roadside edge to provide for surface drainage.

All pedestrian curb ramp joints and transition sections which define grade changes shall be formed staked and checked for dimension, grade and slope conformance prior to placing cement concrete.

All forms shall be oiled before placing concrete.

701.41: Placement

The concrete shall be placed in alternate slabs 30 ft long except as otherwise ordered. The slabs shall be separated by transverse preformed expansion joint filler ½ in. thick.

Preformed expansion joint filler shall be placed adjacent to or around existing structures as directed.

Detectable warning panels conforming to the plans shall be securely incorporated into the work by means acceptable to the Engineer.

On the foundation as specified above, the concrete shall be placed in such quantity that after being thoroughly consolidated in place it shall be 4 in. deep. At driveways, the sidewalks shall be 6 in. deep.

In conveying the concrete from the place of mixing to the place of deposit, the operation shall be conducted in such a manner that no mortar will be lost, and the concrete shall be so handled that the concrete will be of uniform composition throughout, showing neither excess nor lack of mortar in any one place.

The surface of all concrete sidewalks shall be uniformly scored into block units of areas not more than 36 ft². The depth of the scoring shall be at least ½ in. deep and no more than ½ in. wide.

701.42: Initial Curing

In instances where the bleed water sheen has disappeared from the surface of the concrete or the concrete surface exhibits loss of moisture and surface drying between placement and finishing operations, the Contractor shall apply one of the following initial curing materials and procedures meeting 701.30.C: Initial Curing Materials until finishing operations occur.

- 701.30.C.1: Liquid-Applied Evaporation Reducers

Initial curing materials shall not be worked into the surface in subsequent finishing operations.

701.43: Finishing

The finishing of concrete surface shall be done by experienced and competent cement finishers. No finishing operation shall be performed while free water is present. Finishing operations shall be delayed until all bleed water and water sheen has left the surface and the concrete has started to stiffen. After water sheen has disappeared, edging operations, where required, shall be completed. After edging and joining operations, the surface shall be floated. Magnesium floats shall be used for all finishing operations. If necessary tooled joints and edges shall be rerun before and after floating to maintain uniformity. After floating, the surface shall be brushed by drawing a soft-bristled push broom with a long handle over the surface of the concrete to produce a nonslip surface.

701.44: Intermediate Curing

In instances where finishing operations have been completed prior to the concrete achieving final set and the concrete surface exhibits loss of moisture and surface drying, the Contractor shall apply one of the following intermediate curing materials and procedures meeting 701.30.D: Intermediate Curing Materials immediately to the concrete surface prior to the application of final curing materials, to prevent the loss of moisture without damaging the concrete surface, until final set of the concrete has been achieved and final curing materials have been applied to the concrete surface.

- 701.30.C.1: Liquid-Applied Evaporation Reducers
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing
- 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing

701.45: Final Curing

The Contractor shall apply one of the following final curing materials and procedures meeting 701.30.E: Final Curing Materials to the concrete surface immediately after application of initial and intermediate curing materials, finishing operations, and final set of cement concrete, to prevent the loss of moisture and surface drying.

- 701.30.E.1: Saturated Covers
- 701.30.E.2: Sheet Materials
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing
- 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing

The Contractor shall apply final curing materials and procedures to the concrete surface throughout the entire duration of the curing cycle and meet minimum sustained temperature, duration, and strength requirements, as specified in in Table 701.45-1. Controlled and gradual termination of the curing cycle shall begin after all specified conditions are met.

Table 701.45-1: Termination of Curing Cycle

Sustained Concrete Temperature	Final Curing Cycle Duration	Compressive Strength ^[1]
50°F ≤ °F ≤ 90°F	≥ Seven (7) days	≥ 70% f _c

^[1] Compressive strength cylinders for termination of curing cycle shall be cast and field cured with the same environmental conditions that the sidewalk is subjected to throughout the entire duration of the final curing cycle, per 701.73: Acceptance Sampling and Testing.

701.46: Protective Sealing

The Contractor shall apply sealing materials and procedures meeting 701.30.F: Protective Sealing Compounds only if one or more of the following final curing materials and procedures were applied:

- 701.30.E.1: Saturated Covers
- 701.30.E.2: Sheet Materials
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing

Protective sealing compounds shall not be applied to concrete surfaces applied with a final curing material and procedure meeting 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing.

701.47: Cold Weather Concreting

The Contractor shall conduct cold weather concreting procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete, while surfaces are exposed to air temperatures falling below, or expected to fall below 40°F in accordance with 701.30.G: Cold Weather Concreting Materials. All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

701.48: Hot Weather Concreting

The Contractor shall conduct hot weather concreting procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete, while surfaces are exposed to air temperatures exceeding, or expected to exceed 80°F; concrete temperatures approaching, or expected to approach 90°F; evaporation rates of surface water approaching, or expected to approach the bleeding rate of the concrete; high solar radiation; low relative humidity; and high wind speed in accordance with 701.30.H: Hot Weather Concreting Materials. All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production

CONTRACTOR QUALITY CONTROL**701.60: General**

The Contractor shall provide adequate Quality Control (QC) to ensure that all materials and workmanship conform with the specification requirements. The Contractor shall perform QC activities as outlined further below.

701.61: Contractor Quality Control Plan

The Contractor shall provide and maintain a Quality Control Plan (QC Plan). The QC Plan should sufficiently document the QC processes of all Contractor parties (i.e. Prime Contractor, Subcontractors, Producers) performing work required under this specification.

701.62: Production Personnel**A. Foreman.**

A foreman shall be present throughout the entire duration of the construction operation with at least one of the following personnel certifications.

- NRMCA Concrete Exterior Finisher Certification
- ACI Concrete Flatwork Technician and Flatwork Finisher

The foreman is responsible for the oversight of the construction operation per the requirements specified in Table 701.62-1.

Table 701.62-1: Minimum Foreman Activities

Operation	Foreman	Activity
Oversight	One (1)	Review and compare batch ticket quantities and sources to approved mix design
		Monitors conformance to AASHTO M 157 Standard Specification for Ready-Mixed Concrete
		Monitors conformance to Department specifications
		Monitors Production Personnel activities
		Verifies proper equipment is on hand prior to start of construction
		Monitors equipment, environmental conditions, materials, and workmanship
		Prohibits the use of prohibited equipment and practices
		Acknowledges sampling, testing, and inspection results

B. Operators.

Concrete sidewalk shall be constructed by sufficiently staffed, trained, experienced, and qualified equipment operators and craftsmen, who are presently involved in sidewalk construction, throughout the entire duration of the construction operation, per the requirements specified in Table 701.62-2.

Table 701.62-2: Minimum Operator Activities

Operation	Operators ^[1]	Activity
701.40: Pre-Placement	Two (2)	Apply sufficient base compaction
		Moisten sub-base, free of standing water
		Secure forms, straight and level
		Mark expansion locations
		Prohibited Practices: Placement on frozen sub-grade
701.41: Placement (Concrete Discharging)	Two (2)	Direct concrete trucks
		Handle chute discharge and truck movement
		Assist in preparing concrete for testing
		Direct trucks to washout area
		Provide general help
		Prohibited Practices: Adding constituent materials not in conformance with AASHTO M 157 or without Department consent
701.41: Placement	Two (2)	Localize placement to minimize moving material
		Level concrete in front of the screed
		Operate come-alongs or flat headed shovel to move concrete in form
		Consolidate concrete along form edge to avoid honeycombing
		Operate screed over top of forms in sawing action for surface leveling
		Operate magnesium bull float to push coarse aggregate below the surface and fill in the low spots or depressions
		Prohibited Practices: Toothed raking, dragging of internal vibrator, and internal vibrator to move concrete; steel troweling or floating
701.42: Initial Curing	Apply an initial curing material and procedure per 701.42	
	One (1)	701.30.C.1: Liquid-Applied Evaporation Reducers
701.43: Finishing	Two (2)	Permit bleed water to dissipate and concrete to set
		Operate a hose drag or squeegee to remove water from the surface
		Check surface for flatness, fill/cut as necessary
		Finish surface with magnesium float
		Apply pulled broom finish at proper time to acceptable texture
		Clean broom when excessive mortar adheres
		Remove excess water from broom before use
		Finish edges and joints
		Finish well formed, properly spaced joints to sufficient depth
		Prohibited Practices: Steel troweling or floating; adding water to the surface; excessive working of surface; pushing broom across surface

^[1] Recommended number of operators.

Table 701.62-2: Minimum Operator Activities (Continued)

Operation	Operators ^[1]	Activity
701.44: Intermediate Curing	If applicable, apply an intermediate curing material and procedure per 701.44	
	One (1)	701.30.C.1: Liquid-Applied Evaporation Reducers
	One (1)	701.30.E.3.a: Liquid Membrane-Forming Compounds
	One (1)	701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing
701.45: Final Curing	Apply a final curing material and procedure meeting 701.45	
	Four (4)	701.30.E.1: Saturated Covers
	Four (4)	701.30.E.2: Sheet Materials
	One (1)	701.30.E.3.a: Liquid Membrane-Forming Compounds
	One (1)	701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing
701.46: Protective Sealing	One (1)	If applicable, apply a protective sealing material and procedure per 701.46
701.47: Cold Weather Concreting	Four (4)	If applicable, apply cold weather concreting materials and procedures per 701.47 and the Department approved Contractor cold weather concreting plan
701.48: Hot Weather Concreting	Four (4)	If applicable, apply hot weather concreting materials and procedures per 701.48 and the Department approved Contractor hot weather concreting plan

^[1] Recommended number of operators.

701.63: Quality Control Inspection

Quality Control inspection shall be performed and reported on inspection report forms by qualified Quality Control Technicians, to confirm conformance to specifications and to visually inspect equipment, environmental conditions, materials, and workmanship. Quality Control Technicians shall obtain at least one of the following personnel certifications.

- NRMCA Concrete Exterior Finisher Certification
- ACI Concrete Flatwork Technician and Flatwork Finisher

Quality Control inspection report forms shall be completed by the Contractor and submitted to the Department for review.

DEPARTMENT ACCEPTANCE

701.70: General

Acceptance shall be performed by the Department, including consultants under direct contract with the Department independent of the Contractor, to evaluate the degree of compliance with contract requirements, to monitor each Contractor entity's Quality Control activities, to determine the

corresponding value for a given product, and to determine the acceptability of all material produced and placed.

701.71: Acceptance of Contractor Quality Control Plan

The Department will review the Contractor Quality Control Plan. Department approval shall be subject to conformance with the requirements specified herein.

701.72: Acceptance Inspection

Acceptance inspection will be performed and reported by qualified Department (or designee) Acceptance Technicians, to confirm conformance to specifications and to visually inspect equipment, environmental conditions, materials, and workmanship.

701.73: Acceptance Sampling and Testing

Acceptance sampling and testing will be performed and reported by qualified Department (or designee) Acceptance Technicians, to provide quality characteristic data used for Department Acceptance determination, per the requirements specified herein.

Table 701.73-1: Minimum Acceptance Sampling and Testing Requirements

Property	Method	Quality Characteristic	Sublot Size	Minimum Test Frequency	Point of Sampling	Criteria
Uniformity	T 119	Slump Allowable Tolerance (in.) ^[1]	100 cy	1 per Sublot	Point of Discharge	Target ± 1.5
Workability	T 119	Segregation Resistance ^[2]	100 cy	1 per Sublot	Point of Discharge	Pass
Thermal	T 309	Concrete Temperature (°F)	100 cy	1 per Sublot	Point of Discharge	50 – 90
Strength	T 22	Compressive Strength at 7 Days for Curing Termination (psi) ^[3]	100 cy	1 per Sublot	Point of Discharge	$\geq 70\% f'_c$
		Compressive Strength at 28 Days (psi) ^[3]	100 cy	1 per Sublot	Point of Discharge	$\geq 100\% f'_c$
		Compressive Strength at 56 Days (psi) ^{[3][4]}	100 cy	1 per Sublot	Point of Discharge	$\geq 100\% f'_c$
Durability	T 121 T 152 T 196	Freezing and Thawing Resistance: Air Content (%)	100 cy	1 per Sublot	Point of Discharge	5.5 – 8.5
	T 303 or C1567	Alkali Silica Reaction Resistance: Expansion at 14 Days (%)	–	1 per Annual Mix Design Submission Cycle	–	≤ 0.08

^[1] Test result and the Producer's mix design target shall be within the specified allowable tolerances. Slump shall be reported on the Producer's mix design batch ticket for each delivery.

^[2] Testing for segregation resistance shall be performed while the concrete is being discharged and during AASHTO T 119 Standard Method of Test for Slump of Hydraulic Cement Concrete. Visual signs of segregation include coarse particles advancing in front of or behind the fine particles and mortar and a tendency for coarse aggregate to separate from the mortar, particularly when the mixture is being consolidated.

^[3] Three (3) 4 x 8 in. compressive strength cylinders shall be cast and tested for each age per sublot.

^[4] Testing only required if compressive strength results at 28 days do not conform with specifications.

COMPENSATION

701.80: Method of Measurement

Cement Concrete Sidewalks, Pedestrian Curb Ramps, and Driveways will be measured in square yards.

Excavation will be measured by the cubic yard as specified in 120.80: Method of Measurement.

Gravel Borrow will be measured by the cubic yard as specified in 150.80: Method of Measurement.

Fine grading and compacting will be measured by the square yard as specified in 170.88: Method of Measurement.

701.81: Basis of Payment

Cement Concrete Sidewalk, Cement Concrete Pedestrian Curb Ramp, and Cement Concrete Driveway will be paid for at the contract unit price per square yard complete in place, including detectable warning panels and all incidental materials, labor, and equipment necessary to complete the work to the satisfaction of the Engineer.

Gravel will be paid for at the contract unit price per cubic yard under Item 151: Gravel Borrow.

Fine grading and compacting will be paid for at the contract unit price per square yard under Item 170: Fine Grading and Compacting – Subgrade Areas.

Excavation will be paid for at the contract unit price per cubic yard under the excavation items.

701.82: Payment Items

701.	Cement Concrete Sidewalk.....	Square Yard
701.1	Cement Concrete Sidewalk Driveways	Square Yard
701.2	Cement Concrete Pedestrian Curb Ramp	Square Yard

GUIDE TO THE INTERIM SUBSECTION 701 CEMENT CONCRETE SIDEWALK SPECIFICATION

MATERIALS ACTIVITIES

Section	Activity	
701.30.A	Combined Aggregate System	
701.30.A.1	The mix design's combined aggregate system should meet Table 701.30-1: Tarantula Curve Particle Size Distribution.	Recommendation
701.30.A.2	The mix design's combined aggregate system should meet Table 701.30-2 / Figure 701.30-1: Shilstone Workability-Coarseness.	Recommendation
701.30.A.3	The mix design's combined aggregate system should be analyzed using the Fineness Modulus.	Recommendation
701.30.A.4	The mix design's combined aggregate system should be analyzed using the Coarse Aggregate Content.	Recommendation
701.30.B	Paste System	
701.30.B.1	The mix design's Water-Cementitious Ratio should be ≤ 0.40 (Table 701.30-3: Freezing, Thawing, and De-icing Resistance).	Recommendation
701.30.B.1	The mix design's Water-Cementitious Ratio shall be ≤ 0.45 (Table 701.30-3: Freezing, Thawing, and De-icing Resistance).	Required
701.30.B.2	The mix design's Air Content should approach the recommended Air Content Targets identified in Table 701.30-4: Freezing, Thawing, and De-icing Resistance.	Recommendation
701.30.B.3	The mix design's Cement and Supplementary Cementitious Materials (SCM) Content shall meet Table 701.30-5: Alkali Silica Reaction and Freezing, Thawing, and De-icing Resistance requirements.	Requirement
701.30.B.3	Test results meeting Table 701.30-6: Alternative Performance Evaluation to Alkali Silica Reaction Resistance requirements may be used in lieu of the mix design requirements identified in Table 701.30-5: Alkali Silica Reaction and Freezing, Thawing, and De-icing Resistance requirements.	Optional
701.30.B.4	The mix design should incorporate Chemical Admixtures identified in Table 701.30-7: Chemical Admixtures to enhance the properties of the concrete.	Recommendation
701.30.B.5	The mix design's Paste Content should approach the recommended targets identified in Table 701.30-8: Paste Content.	Recommendation

701.73	Acceptance Sampling and Testing	
T 119	The Slump shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements (± 1.5 from Slump Target identified by the Concrete Producer on the Batch Ticket).	Requirement
T 119	The Segregation Resistance shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements.	Requirement
T 309	The Concrete Temperature shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements.	Requirement
T 22	The Compressive Strength (7, 28, and 56 days) shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements.	Requirement
T 121 T 152 T 196	The Air Content shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements (5.5 – 8.5%).	Requirement
T 303 or C1567	The resistance to Alkali Silica Reaction shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements (One per year for mix design verification).	Requirement

CONTRACTOR ACTIVITIES

Section	Activity	
701.40	Pre-Placement	
	The Contractor should have a minimum of two (2) Operators.	Recommendation
	The Contractor shall apply sufficient base compaction.	Requirement
	The Contractor shall moisten sub-base, free of standing water.	Requirement
	The Contractor shall secure forms, straight and level.	Requirement
	The Contractor shall mark expansion locations.	Requirement
	The Contractor shall be prohibited from performing the following practices: Placement on frozen sub-grade.	Requirement
701.41	Placement (Concrete Discharging)	
	The Contractor should have a minimum of two (2) Operators.	Recommendation
	The Contractor shall direct concrete trucks.	Requirement
	The Contractor shall handle chute discharge and truck movement.	Requirement
	The Contractor shall assist in preparing concrete for testing.	Requirement
	The Contractor shall direct trucks to washout area.	Requirement
	The Contractor shall provide general help.	Requirement

	The Contractor / Concrete Producer shall be prohibited from performing the following practices: Adding constituent materials not in conformance with AASHTO M 157 or without Department consent.	Requirement
701.41	Placement	
	The Contractor should have a minimum of two (2) Operators.	Recommendation
	The Contractor shall localize placement to minimize moving material.	Requirement
	The Contractor shall level concrete in front of the screed.	Requirement
	The Contractor shall operate come-alongs or flat headed shovel to move concrete in form.	Requirement
	The Contractor shall consolidate concrete along form edge to avoid honeycombing.	Requirement
	The Contractor shall operate screed over top of forms in sawing action for surface leveling.	Requirement
	The Contractor shall operate magnesium bull float to push coarse aggregate below the surface and fill in the low spots or depressions.	Requirement
	The Contractor shall be prohibited from performing the following practices: Toothed raking, dragging of internal vibrator, and internal vibrator to move concrete; steel troweling or floating.	Requirement
701.42	Initial Curing (When Applicable)	
	The Contractor should have a minimum of one (1) Operator.	Recommendation
	The Contractor shall apply 701.30.C.1: Liquid-Applied Evaporation Reducers when applicable.	Required when applicable
701.43	Finishing	
	The Contractor should have a minimum of two (2) Operators.	Recommendation
	The Contractor shall permit bleed water to dissipate and concrete to set.	Requirement
	The Contractor shall operate a hose drag or squeegee to remove water from the surface.	Requirement
	The Contractor shall check surface for flatness, fill/cut as necessary.	Requirement
	The Contractor shall finish surface with magnesium float.	Requirement
	The Contractor shall apply pulled broom finish at proper time to acceptable texture.	Requirement
	The Contractor shall clean broom when excessive mortar adheres.	Requirement
	The Contractor shall remove excess water from broom before use.	Requirement

	The Contractor shall finish edges and joints.	Requirement
	The Contractor shall finish well formed, properly spaced joints to sufficient depth.	Requirement
	The Contractor shall be prohibited from performing the following practices: Steel troweling or floating; adding water to the surface; excessive working of surface; pushing broom across surface.	Requirement
701.44	Intermediate Curing (When Applicable, Apply One of the Methods)	
	The Contractor should have a minimum of one (1) Operator.	Recommendation
	The Contractor shall apply 701.30.C.1: Liquid-Applied Evaporation Reducers when applicable and if selected.	Required when applicable
	The Contractor shall apply 701.30.E.3.a: Liquid Membrane-Forming Compounds when applicable and if selected.	Required when applicable
	The Contractor shall apply 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing when applicable and if selected.	Required when applicable
701.45	Final Curing (Apply One of the Methods)	
	The Contractor should meet the minimum number of operators identified in Table 701.62-2: Minimum Operator Activities.	Recommendation
	The Contractor shall apply 701.30.E.1: Saturated Covers if selected.	Requirement
	The Contractor shall apply 701.30.E.2: Sheet Materials if selected.	Requirement
	The Contractor shall apply 701.30.E.3.a: Liquid Membrane-Forming Compounds if selected.	Requirement
	The Contractor shall apply 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing if selected.	Requirement
701.46	Protective Sealing (If Required)	
	The Contractor should have a minimum of one (1) Operator.	Recommendation
	The Contractor shall apply 701.30.F: Protective Sealing Compounds at least 28 days after placement. Application of 701.30.F: Protective Sealing Compounds is NOT REQUIRED IF 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing was applied.	Required if 701.30.E.3.b Curing and Sealing Compound was Not Applied
701.47	Cold Weather Concreting (When Applicable)	
	The Contractor should have a minimum of four (4) Operators.	Recommendation
	The Contractor shall submit a Cold Weather Concreting Plan meeting 701.47.	Required when applicable

	The Contractor shall apply cold weather concreting materials and procedures meeting 701.47 and the Department approved Contractor cold weather concreting plan.	Required when applicable
701.48	Hot Weather Concreting (When Applicable)	
	The Contractor should have a minimum of four (4) Operators.	Recommendation
	The Contractor shall submit a Hot Weather Concreting Plan meeting 701.48.	Required when applicable
	The Contractor shall apply hot weather concreting materials and procedures meeting 701.47 and the Department approved Contractor hot weather concreting plan.	Required when applicable
701.61	Contractor Quality Control Plan	
	The Contractor shall prepare and submit a Quality Control Plan (QC Plan) to the Department for review.	Requirement
701.62	Production Personnel	
701.62.A	Foreman	
	The Contractor shall have a minimum of One (1) Foreman.	Requirement
	<p>A Foreman shall be present throughout the entire duration of the construction operation with at least one of the following personnel certifications.</p> <ul style="list-style-type: none"> • NRMCA Concrete Exterior Finisher Certification • ACI Concrete Flatwork Technician and Flatwork Finisher 	Requirement
	The Contractor's Foreman shall review and compare batch ticket quantities and sources to approved mix design.	Requirement
	The Contractor's Foreman shall monitor conformance to AASHTO M 157 Standard Specification for Ready-Mixed Concrete.	Requirement
	The Contractor's Foreman shall monitor conformance to Department specifications.	Requirement
	The Contractor's Foreman shall monitor Production Personnel activities.	Requirement
	The Contractor's Foreman shall verify that proper equipment is on hand prior to start of construction.	Requirement
	The Contractor's Foreman shall monitors equipment, environmental conditions, materials, and workmanship.	Requirement
	The Contractor's Foreman shall prohibit the use of prohibited equipment and practices.	Requirement
	The Contractor's Foreman shall acknowledge sampling, testing, and inspection results.	Requirement

701.62.B	Operators	
	Concrete sidewalk shall be constructed by sufficiently staffed, trained, experienced, and qualified equipment operators and craftsmen, who are presently involved in sidewalk construction, throughout the entire duration of the construction operation, per the requirements specified in Sections 701.40 to 701.48.	Requirement
701.63	Quality Control Inspection	
	<p>Quality Control inspection shall be performed and reported on inspection report forms by qualified Quality Control Technicians, to confirm conformance to specifications and to visually inspect equipment, environmental conditions, materials, and workmanship. Quality Control Technicians shall obtain at least one of the following personnel certifications.</p> <ul style="list-style-type: none">• NRMCA Concrete Exterior Finisher Certification• ACI Concrete Flatwork Technician and Flatwork Finisher <p>Quality Control inspection report forms shall be completed by the Contractor and submitted to the Department for review</p>	Requirement

DOCUMENT 00715



SUPPLEMENTAL SPECIFICATIONS

(English Units)

SEPTEMBER 30, 2022

The 2022 *Standard Specifications for Highways and Bridges* are amended by the following modifications, additions and deletions. This 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 1.00: DEFINITION OF TERMS

Subsection 1.03: Defined Terms

(page I.7- I.8) Delete the term Interim Supplemental Specifications.

(page I.9- I.10) Replace the definitions below with the following and add the definition for Standard Specifications.

Special ProvisionsThe special agreements and provisions prepared for proposed work on a specific project. The special provisions shall be included within the general term specifications and are part of the Contract

SpecificationsThe directions, provisions and requirements contained or referenced herein together with all written agreements made or to be made pertaining to the method and manner of performing the work, or the quantities and qualities of materials to be furnished under the Contract.

Standard SpecificationsThe Standard Specifications for Highways and Bridges issued by the Department.

Supplemental SpecificationsSpecifications issued by the Department which amend portions of the Standard Specifications.

SECTION 4.00: SCOPE OF WORK

Subsection 4.04 Changed Conditions

(page I.21) Replace the fourth, fifth sixth and seventh paragraphs with the following:

If the Contractor and the Department fail to agree on an equitable adjustment to be made under this Subsection, then the Contractor shall accept as full payment for the work in dispute an amount calculated using actual costs as provided in Subsection 9.03: Payment for Extra Work.

Subsection 4.06 Increased or Decreased Contract Quantities

(pages I.22 and I.23) Replace the sixth, seventh and eighth paragraphs with the following:

To assist the Engineer in the determination of an equitable adjustment for an overrun, the Contractor shall prepare a submission and accept as full payment for work or materials an amount for an equitable adjustment in the Contract Price calculated using actual costs as provided in Subsection 9.03: Payment for Extra Work.

SECTION 5.00: CONTROL OF WORK**Subsection 5.03 Permits and Licenses**

(page I.28) Replace the last two paragraphs with the following;

In the event the Engineer finds the materials or the finished product in which the materials are used or the work performed are not in reasonably close conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor. Materials or work that are found not to conform must not be made inaccessible prior to the resolution of the deficiencies.

Deviations from the approved plans and working drawings, that may be required by the need of construction, will be determined by the Engineer and authorized in writing.

Subsection 5.04: Order of Precedence

(page I.28) Delete line 2., d. Interim Supplemental Specifications and re-letter lines e. and f. to d. and e.

SECTION 7.00: LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC**Subsection 7.01 Permits and Licenses**

(page I.39) Delete subsection H. Cargo Preference Act – Use of United States Flagged Vessels

Subsection 7.03 Permits and Licenses

(page I.47) Add the following paragraph after the first paragraph:

For overweight vehicles in excess of 130,000 lbs., the Contractor shall provide a copy of each overweight vehicle permit to the Engineer prior to arrival or delivery of the vehicle to a project site. This requirement is for all Contractors, their subcontractors, equipment suppliers and material suppliers.

SECTION 8.00: PROSECUTION AND PROGRESS**Subsection 8.05: Claim for Delay or Suspension or the Work**

(page I.72) Replace the second paragraph of this subsection with the following:

Provided, however, that if in the judgement of the Engineer it is determined that the performance of all or any major portion of the work is suspended, delayed, or interrupted for an unreasonable period of time by an act of the Department in the administration of the Contract, or by the Department's failure to act as required by the Contract within the time specified in the Contract (or if no time is specified, within a reasonable time) and without the fault or negligence of the Contractor, an adjustment shall be made by the Department for any increase in the actual cost of performance of the Contract (excluding profit and overhead) necessarily caused by the period of such suspension, delay or interruption. No adjustment shall be made if the performance by the Contractor would have been prevented by other causes even if the work had not been so suspended, delayed, or interrupted by the department

(page I.72) Replace the fifth paragraph of this subsection with the following:

Any dispute concerning whether the delay or suspension is unreasonable or any other question of fact arising under this paragraph shall be determined by the Engineer, and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

Subsection 8.07 Character of Workers, Methods and Equipment

(page 1.73) Add the following paragraph after the second paragraph:

All electrical connections, splicing, grounding, resistance tests, service connections and circuit identification shall be done by a licensed electrician holding a Massachusetts journeyman electrician's license. The Contractor shall provide to the Engineer at least 10 days prior to each work assignment the names and license qualifications of electricians.

Subsection 8.13 Convenience Termination

(page 1.80) Replace B. For Construction Related Costs with the following:

Actual costs as provided in Subsection 9.03: Payment for Extra Work.

SECTION 9.00: MEASUREMENT AND PAYMENT**Subsection 9.03 Payment for Extra Work**

(page 1.84) Replace B. Payment for work or materials for which no price is contained in the contract with the following:

If the Engineer directs, the Contractor shall submit promptly in writing to the Engineer an offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of:

- (1) The estimated cost of direct labor, materials, and the use of equipment, plus 10 percent of this total for overhead;
- (2) Plus 13 percent of direct labor, for the actual costs of Federal Insurance Contribution Act (FICA), Federal Unemployment Tax Act (FUTA), State Unemployment Tax Act (SUTA) including workforce training and Massachusetts Employer Medical Assistance Contribution, Earned Sick Time (EST) Law (940 CMR 33.00), and Paid Family and Medical Leave (PFML) Act (458 CMR 2.00); or, as an alternative to the above 13 percent, the Contractor may elect to use actual rates for FICA, FUTA, SUTA, EST and PFML provided the actual rates are supported with verifiable documentation and shall be subject to review by Audit Operations;
- (3) Plus the actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;
- (4) Plus subcontractor or a Public or Private Utility costs;
- (5) Plus 10 percent of the total of (1), (2), (3) and (4);
- (6) Plus the estimated proportionate cost of surety bonds (The Contractor shall provide evidence of revised bonds according to Subsection 3.04).

Unless an agreed lump sum and/or unit price is obtained from above and is so stated in the Extra Work Order the Contractor shall accept as full payment for work or materials for which no price agreement is contained in the Contract an amount equal to the following:

- (1) The actual cost for direct labor, material (less value of salvage, if any) and use of equipment, plus 10 percent of this total for overhead;
- (2) Plus 13 percent of direct labor, for the actual costs of Federal Insurance Contribution Act (FICA), Federal Unemployment Tax Act (FUTA), State Unemployment Tax Act (SUTA), including workforce training and Massachusetts Employer Medical Assistance Contribution, Earned Sick Time (EST) Law (940 CMR 33.00), and Paid Family and Medical Leave (PFML) Act (458 CMR 2.00); or, as an alternative to the above 13 percent, the Contractor may elect to use actual rates for FICA, FUTA, SUTA, EST and PFML provided the actual rates are supported with verifiable documentation and shall be subject to review by Audit Operations;

- (3) Plus the actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;
- (4) Plus subcontractor or a Public or Private Utility costs;
- (5) Plus 10 percent of the total of (1), (2), (3) and (4);
- (6) Plus the estimated proportionate cost of surety bonds (The Contractor shall provide evidence of revised bonds according to Subsection 3.04).

Costs incurred for traffic police, railroad flagging and permits will be reimbursed without markup for overhead or profit.

The Subcontractor is bound by the same criteria for the determination of an equitable adjustment as the Contractor.

No separate payment will be made for general superintendence and the use of small tools, and manual equipment. The costs of general superintendence as well as use of small tools and manual equipment will be considered included in field and/or home office overhead. General superintendence is that next level above the working foreman.

The Contractor shall, when requested by the Engineer, furnish itemized statements of the cost of the work ordered and give the Engineer access to all accounts, bills and vouchers relating thereto, and unless the Contractor shall furnish such itemized statements, access to all accounts, bills and vouchers, the Contractor shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

DIVISION II CONSTRUCTION DETAILS

SUBSECTION 230: CULVERTS, STORM DRAINS, AND SEWER PIPES

Subsection 230.40 General

(page II.62) Replace this subsection with the following:

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Mortar for Pipe Joints	M4.02.15
Jointing Materials for Pipes	M5.01.0
Reinforced Concrete Pipe	M5.02.1
Reinforced Concrete Pipe. Flared Ends	M5.02.2
Corrugated Metal Pipe	M5.03.0
Metal End Sections	M5.03.6
Polymeric Precoated Corrugated Metal Pipe	M5.03.8
Corrugated Plastic Pipe	M5.03.10
Corrugated Plastic Flared Ends	M5.03.10
Corrugated Metal Pipe-Arch	M5.04.0
Structural Plate for Pipe and Pipe-Arch	M5.04.2
Smooth Steel Liner Helically Corrugated Shell Metal Pipe	M5.04.3
Ductile Iron Pipe	M5.05.3

Subsection 230.62 Pipe Joints

(page II.62) Replace this subsection with the following:

The joints of concrete pipe shall be formed by caulking a gasket of jute or oakum into the bell and then filling the remainder of the joint with cement mortar. The invert shall be kept smooth and free of any obstructions. In the case of concrete pipe, the surfaces to be joined shall be thoroughly cleaned and wetted with water before the joint is made. Corrugated metal pipe and corrugated plastic pipe shall be firmly joined with an approved coupling. The interior surfaces of abutting pipes shall form a smooth grade when pipe laying is completed.

Where watertight joints are required, concrete pipe shall be joined using flexible water tight rubber gaskets conforming to M5.01.0. The pipe ends shall be designed so that the gasket will be confined on all sides and will not support the weight of the pipe. Any alternative joint design must be pre-approved by the Engineer.

In designated areas, as directed, certain joints may be left open to allow for entrance of underground water into the pipeline.

Subsection 230.82 Payment Items

(page II.67) Replace this subsection with the following:

*230.	-Inch Corrugated Metal Pipe __ Gage	Foot
*230.7-	-Inch Corrugated Metal Pipe End Section	Each
*232.	__ x __ Inch ACCM Pipe-Arch __ Gage	Foot
*234.-	-Inch Drainage Pipe-Option	Foot
*238.	Ductile Iron Pipe	Foot
*239.	Structural Plate Pipe	Foot
*240.	Structural Plate Pipe-Arch, __ Gage	Foot
*241.-	-Inch Reinforced Concrete Pipe Class III	Foot
*242.-	-Inch Reinforced Concrete Pipe Flared End	Each
*243.-	-Inch Reinforced Concrete Pipe Class IV	Foot
*244.-	-Inch Reinforced Concrete Pipe Class V	Foot
*252.-	-Inch Corrugated Plastic Pipe	Foot
*252.1-	-Inch Corrugated Plastic Pipe Flared End	Each
*255.-	Polymeric Precoated Corrugated Metal Pipe	Foot

SUBSECTION 301: WATER SYSTEMS

Subsection 301.40 General

(page II.76) Replace this subsection with the following:

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Thrust Blocks	
Cement Concrete.....	M4.02.0
Jointing Materials for Pipes.....	M5.01.0
Water Pipe and Fittings	
Copper Tubing	M5.06.0
Ductile Iron Pipe and Fittings	M5.05.3
Insulation and Waterproof Jackets.....	M9.11.0
Cellular Glass.....	M9.11.1
Fiber Glass	M9.11.2
Expanded Polystyrene	M9.11.3
Urethane.....	M9.11.4
Waterproof Jackets.....	M9.11.5

SECTION 800: TRAFFIC CONTROL DEVICES

SUBSECTION 813: WIRING, GROUNDING AND SERVICE CONNECTIONS

Subsection 813.20 General

(page II.385) Delete the third paragraph.

Subsection 813.60 Wire and Cable

(page II.387) Under C. Splicing, delete the first paragraph.

SUBSECTION 815: TRAFFIC CONTROL SIGNALS

Subsection 815.20 General

(page II.394) Replace the 9th paragraph of this subsection with the following:

All work within the traffic control cabinet shall be done by an IMSA Certified Traffic Signal Level II Technician. The Contractor shall provide to the Engineer names and certification qualifications of all persons who will be working within the traffic control cabinet at least 10 days prior to the start of any traffic control cabinet work.

SUBSECTION 820: HIGHWAY LIGHTING

Subsection 820.20 General

(page II.406) Delete TRAFFIC CONTROL DEVICES at the top of the page and delete the 7th paragraph of the subsection.

SUBSECTION 840: SIGN SUPPORTS

Subsection 840.20 General

(page II.427) Replace the paragraph at the top of the page beginning with Before fabricating ... with the following:

Before fabricating the sign support structures, the Contractor shall submit erection plans and shop drawings for approval of the Engineer.

Shop drawings shall be in accordance with Subsection 960.60: Shop Drawings and Subsection 5.02: Plans and Detail Drawings and include span lengths, post heights, vertical and horizontal clearances, material specifications (grade and/or alloy), anchor bolt layout, and any other pertinent information. Provisions for cambering shall also be shown to ensure that horizontal cross beams will not deflect below the horizontal.

Erection procedures shall be in accordance with Subsection 960.61 Design, Fabrication and Erection.

SUBSECTION 850: TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS

Subsection 850.29 Temporary Barrier and Temporary Barrier Removed and Reset

(page II.432) Replace the first paragraph of this subsection with the following:

Temporary Barrier consists of furnishing, installing, maintaining and final removal of temporary barriers, including delineation, for traffic control or work zone protection in construction zones.

Subsection 850.30 Temporary Restrained Barrier and Temporary Restrained Barrier Removed and Reset

(page II.432) Delete this subsection.

Subsection 850.50 Temporary Restrained Barrier

(page II.435) Delete this subsection.

Subsection 850.70 Temporary Restrained Barrier and Temporary Restrained Barrier Removed and Reset

(page II.440) Delete this subsection.

Subsection 850.80 Method of Measurement

(page II.443) Delete the fifth paragraph up from the end of this subsection.

Subsection 850.81 Basis of Payment

(page II.445) Delete the 12th, 13th and 14th paragraph of this subsection.

SUBSECTION 860: REFLECTORIZED PAVEMENT MARKINGS

Subsection 860.40 General

(page II.447) Replace White Thermoplastic ReflectORIZED Pavement Markings ...M7.01.03 and Yellow Thermoplastic ReflectORIZED Pavement Markings ...M7.01.04 with the following:

Liquid Thermoplastic Striping Material..... M7.01.3

Subsection 860.62 Application of Markings

(page II.448) Replace Table 860.62-1 with the following:

Table 860.62-1: Pavement Marking Application Requirements

Material	Application Temperature	Line Thickness Above Roadway Surface	Glass Bead Application
M7.01.3	400°F to 425°F	125 to 188 mils	Drop-on 1 lb per 10 ft ²
M7.01.23	135°F to 150°F	15 mils	6 lb per gal
M7.01.24	135°F to 150°F	15 mils	6 lb per gal

DIVISION III MATERIALS SPECIFICATIONS

SECTION M4: CEMENT AND CEMENT CONCRETE MATERIALS

Subsection M4.02.02: Aggregates

(page III.50) Replace this Subsection with the following:

Aggregate shall exhibit acceptable quality characteristics and material properties, including particle size distribution, shape, surface texture, absorption, compressibility, effect on modulus of elasticity of concrete, moisture-related volume changes, coefficient of thermal expansion, wetting and drying, and resistance to abrasion, alkali aggregate reaction, and d-cracking, popouts, and sulfate attack due to freezing, thawing, and de-icing. Aggregate shall be sufficiently limited of potentially deleterious amounts of constituents that may negatively affect cement concrete performance, including workability, setting, hardening, aggregate-cement bond, strength, color, long-term durability, and other properties.

Aggregate sources with limited historical field and test data shall be subjected to ASTM C295 Petrographic Examination for Potential Alkali Aggregate Reactive Constituents and Deleterious Materials in Aggregate. Examinations and reporting shall be conducted by accredited independent laboratories. The Producer shall submit ASTM C295 examination reports to the Department for review.

A. Fine Aggregates

Fine aggregate shall meet AASHTO M 6 Standard Specification for Fine Aggregate for Hydraulic Cement Concrete.

B. Coarse Aggregates

Coarse aggregate shall meet AASHTO M 80 Standard Specification for Coarse Aggregate for Hydraulic Cement Concrete and AASHTO M 43 Sizes of Aggregate for Road and Bridge Construction.

Subsection M4.02.06: Proportioning

(page III.55) Replace B, 4. Air Content with the following:

4. Air Content.

The air void system shall contain a stabilized air bubble distribution and promote quality concrete properties, including enhanced workability, cohesion, strength, and resistance to freezing, thawing, de-icing, and sulfate reaction. Cement concrete shall meet the air content targets identified in Table M4.02.06-1. A tolerance of $\pm 1.5\%$ in the percentages will be allowed.

Table M4.02.06-1: Air Content Target

Nominal Maximum Aggregate Size (in.)	Reinforced Concrete (%) ^[1]	Non-Reinforced Concrete (%) ^[1]
3/8	7.5	7.5
1/2	7.0	7.0
3/4	6.0	7.0
1	6.0	6.5
1 1/2	5.5	6.5

^[1]A 1.0% reduction from the air content target is permitted for $f'_c \geq 5000$ psi.

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUIT

Subsection M5.01.0 Jointing Materials for Pipes

(page III.77) Add this new subsection:

- A. Jute or oakum furnished for use in pipe joints shall be of an accepted grade approved for common usage.
- B. Mortar shall conform to the requirements of M4.02.15: Cement Mortar.
- C. Rubber ring or plastic gaskets shall be of tough, flexible, chemical-resistant material, and of such size and shape as to ensure satisfactory pipe joints when incorporated in the work and shall conform to ASTM C443.
- D. Mechanical joints shall conform to the requirements of the ASA Specifications A21.11.
- E. The yarning material for cast iron bell-and-spigot pipe joints shall be sterilized braided hemp or untarred twisted jute, clean and dry and free from oil, grease, or any other deleterious matter.

Subsection M5.02.1 Reinforced Concrete Pipe

(page III.77) Replace this subsection with the following:

Reinforced concrete pipe shall conform to the requirements of AASHTO M 170 for the class of pipe specified in the contract documents.

- All pipe 24 in. in diameter or smaller shall be of the bell-and-spigot type.
- Pipes larger than 24 in. in diameter shall be tongue and groove or bell and spigot.

Subsection M5.02.2 Reinforced Concrete Pipe Flare Ends

(page III.77) Replace this subsection with the following:

Flared end sections shall be fabricated to comply with the current construction standard for this item. The method of fabrication and materials used shall conform to the requirements of AASHTO M 170, Class III, except that the three edge bearing tests shall not be required. The flare shall be of the same thickness and materials as the barrel and have steel reinforcement equaling or exceeding the amount shown on the table for AASHTO M 170, Class III, except that a double row of steel will not be required.

SECTION M7: PAINTS, PROTECTIVE COATINGS AND PAVEMENT MARKINGS

M7.00.0 General Requirements for Paints and Protective Coatings

(page III.92) Delete the second occurrence of M7.01: Pavement Markings in the last paragraph.

M7.01 Pavement Markings

(page III.92) Change the subsection number from M7.01 to M7.01.0. and delete M7.01.03 and M7.01.04.

M7.01.3 Liquid Thermoplastic Striping Material

(page III.93) Add this new subsection.

M7.01.3 Liquid Thermoplastic Striping Material

A. General.

This specification covers a reflectorized thermoplastic pavement striping material that is extruded onto the pavement in a molten state by mechanical means with the application of glass beads. When applied properly and at the designated thickness and width the stripe shall, upon cooling, be reflectorized and be able to resist deformation by traffic. The material shall be placed on bare pavement or existing thermoplastic markings.

1. Materials

Prequalified batches of acceptable thermoplastic materials are listed on the QCML.

All thermoplastic material shall meet the requirements of AASHTO M 249 and tested in accordance with AASHTO T 250 and the following:

- 1) Glass Beads (Pre-Mix) used in the manufacture of thermoplastic shall be uncoated and meet the requirements of AASHTO M 247, Type I and M7.01.07 and have a minimum of 80% true spheres.
- 2) The resin shall be alkyd or hydrocarbon and meet the requirements of table M7.01.3-1.

Table M7.01.3-1 Thermoplastic Resin Requirements

Properties	Hydrocarbon	Alkyd
% Binder, Minimum	22	20
Indentation Resistance @ 115°F, ASTM D7735	--	40-75 units (Type A)
Bond Strength, Minimum, psi	180	200

The material manufacturer shall have the option of formulating a hydrocarbon resin-based or an alkyd resin-based system. However, the physical and chemical properties contained in this specification shall apply regardless of the type of formulation used. The binder must consist of a mixture of resins, at least one of which is a solid at room temperature, and high boiling point plasticizers. At least one third of the binder composition of an alkyd-based system must be maleic-modified glycerol ester of rosin and must be no less than 8% of the entire material formulation. Material of either binder type upon heating to the application temperature shall not evolve fumes which are toxic, or injurious to persons or property. The pigment, beads and filler shall be well dispersed in the resin. The material shall be free from all skins, dirt, and foreign objects.

The thermoplastic pavement marking material may be supplied in block or granular form. Block material shall be packaged in suitable containers to which it will not adhere to during shipment or storage. The blocks shall be approximately 12" X 36" X 2". Granular material shall be packaged in bags that when introduced to the mix hopper of the application equipment, it will become part of the mix with no adverse effect to the performance of the thermoplastic material. The packages of either type shall weigh approximately 50 pounds. Each container label shall designate the color, manufacturer's name, batch number and date of manufacture. Each batch manufactured shall have its own separate number. The label shall warn the user that the material shall be heated in the range of 400-425°F during application.

B. Sampling and Testing

1. Sampling

Provide one bag of thermoplastic material for verification testing per batch. A batch is a unit of production that is consistent in appearance, formulation, proportions and can be identified by a unique number known as a Batch Number. Each batch shall consist of a minimum of 3,000 lbs. and a maximum of 44,000 lbs.

2. Testing

Tests on White and Yellow Thermoplastic Striping Material shall be reported by an Independent Testing Laboratory and performed in accordance with these Specifications and AASHTO M 249.

The Independent Test Results shall be for each batch and shall identify the material by manufacturer including name and address, batch number(s), date and place of manufacture and any other information that will assist in identifying the product. It shall also note the test method used for each test. The report shall include the date tested and shall be signed by a person responsible for authenticating the veracity of the test. Below the signature shall be the person's printed name and title.

Request for prequalification for each thermoplastic material batch shall be submitted to RMS, accompanied by:

- a) Certificate of Compliance stating that the material complies with AASHTO M 249, AASHTO T 250, this specification and all applicable MassDOT requirements.
- b) Independent Lab test results; and
- c) One bag of thermoplastic striping material per batch in sample bags meeting the specifications above for verification testing. The bag shall be sent to the attention of the Director of Research & Materials, MassDOT/Highway, 5 Macadam Road, Hopkinton, MA 01748.

SUBSECTION M8: METALS AND RELATED MATERIALS

Subsection M8.01.5 Anchor Bolts, Nuts and Washers

(page III.98) Replace this subsection with the following:

All bolts, nuts and washers, with the exception of those with weathering characteristics, shall be galvanized in accordance with AASHTO M 232M/M 232.

Used For Anchoring Bridge Railing Base Plates to Concrete

Bolts, nuts, and washers shall conform to the requirements of ASTM F1554 Grade 105.

Used For Anchoring Bridge Bearings to Concrete

Bolts, nuts, and washers shall conform to the requirements of ASTM F1554 Grade 105.

Used For Anchoring Signal Lighting and Sign Structures

Bolts, nuts, and washers shall conform to the applicable requirements of one of the following:

- AASHTO M 31 Type W Grade 60
- AASHTO M 314 Grade 36
- AASHTO M 314 Grade 55
- AASHTO M 314 Grade 105
- ASTM F1554 Grade 55
- ASTM F1554 Grade 105

Notes: (1) Nuts and washers for the above shall be suited to the approved bolts.

(2) Hooked smooth bars and anchor bolts shall not exceed 55 ksi.

High Strength Bolts

High strength bolts, where specified, shall conform to Subsection M8.04.3. A galvanized hexagon nut, leveling nut and flat washer shall be furnished with each bolt.

DOCUMENT 00719

(Revised October 12, 2022 – for all Federally Aided Projects)

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

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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 12 %
(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.

- (3) 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.
- (4) 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.
- (5) 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.

- (6) 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 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 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.
- 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.
- f. 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.
- g. 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.
- h. 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.
- i. 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.
- j. 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.
- k. 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.
- l. 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.

- (3) 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.
- (4) 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.
- (5) 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.
- (6) 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.
- (7) In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE firms.

m. 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)

DOCUMENT 00760

FHWA-1273 -- Revised July 5, 2022

**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. All laborers and mechanics employed or working upon the site of the work, 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 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.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. 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 shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). 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 classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall 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.(1) The contracting officer shall 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 shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore 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 utilized 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) 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 shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. 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.

(3) 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 shall 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.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall 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.

c. 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 shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. 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, 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.

2. Withholding (29 CFR 5.5)

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics,

including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, 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.

3. Payrolls and basic records (29 CFR 5.5)

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, 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 section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) 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 section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall 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. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or

subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed 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;

(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 of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) 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. 231.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, 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 may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees (29 CFR 5.5)

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed 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 Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State

Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall 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 the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall 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, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the

corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. 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 journeymen 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 shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 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 (29 CFR 5.5)

a. By entering into this contract, the contractor certifies that neither it (nor he or she) 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 section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

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 watchmen 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. 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 watchmen 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. 29 CFR 5.5.

* \$27 as of January 23, 2019 (See 84 FR 213-01, 218) 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.

The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this section. 29 CFR 5.5.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1 through 4 of this section. 29 CFR 5.5.

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 200.326.

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 200.326.

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.

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

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

(a) 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;

(b) 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

(c) 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)

2. 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.

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DOCUMENT 00811

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
ENGLISH AND METRIC UNITS
Revised: 06/04/2019

This provision applies to all projects using greater than 100 tons (91 megagrams) 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/2019-massdot-contract-price-adjustments> within two (2) business days 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. This method of period price determination was formerly called the New Asphalt Period Price Method. Separate website postings using both the New Asphalt Period Price Method and the Old Asphalt Period Price Method were discontinued after June 2013.

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 Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

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

October 20, 2022

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 in which MassDOT opened bids for the project. This date is used to select the Base Price Index.

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	\$0.78
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note below.)	\$1.09
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	\$1.09
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	\$1.15
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	\$1.21
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	\$1.13
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	\$1.21
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	\$1.13
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	\$1.25
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	\$1.15
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	\$1.25
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	\$1.15
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	\$1.34
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	\$1.41
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	\$2.15
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	\$1.25
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	\$1.15
18	ASTM A276 Type 316 Stainless Steel	\$6.41
19	ASTM A240 Type 316 Stainless Steel	\$6.41
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	\$2.21
21	ASTM A53 Grade B Structural Steel Pipe	\$1.42
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	\$1.42
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	\$1.12
24	ASTM 252, Grade 2 Permanent Steel Casing	\$1.12
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	\$1.20
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	\$2.11
27	ASTM A572 / A572M, Grade 50 Sheetpiling	\$2.11
28	ASTM A36/36M, Grade 50	\$1.21
29	ASTM A570, Grade 50	\$1.20
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	\$1.21
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	\$1.42
32	AREA 140 LB Rail and Track Accessories	\$0.71

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: 120185Project No. 605126Federal Aid No.: STP(BR-OFF)-003S(606)XLocation: WAREProject Description: Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the 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/consttag.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: _____

 (Print Name and Title)

Telephone Number: _____

Federal I.D. Number: _____

Estimated Start Date: _____

Estimated Completion Date: _____

Estimated Dollar Amount: _____

 (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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CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

Proposal No. 605126-120185

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

ROSALIN ACOSTA
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: MassDOT
Contract Number: 120185 **City/Town:** WARE
Description of Work: WARE
Federal Aid Project No. STP(BR-OFF)-003S(606)X
Bridge Replacement Br. No. W-05-015 (Steel)
Job Location: Route 32 (Palmer Road) over the 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>	12/01/2021	\$35.95	\$13.41	\$16.01	\$0.00	\$65.37
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.02	\$13.41	\$16.01	\$0.00	\$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.14	\$13.41	\$16.01	\$0.00	\$65.56
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</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 3 (BUILDING & SITE)</i>	06/01/2022	\$33.75	\$9.10	\$16.19	\$0.00	\$59.04
	12/01/2022	\$34.38	\$9.10	\$16.19	\$0.00	\$59.67
	06/01/2023	\$35.00	\$9.10	\$16.19	\$0.00	\$60.29
	12/01/2023	\$35.63	\$9.10	\$16.19	\$0.00	\$60.92
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$33.25	\$9.10	\$14.01	\$0.00	\$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	12/01/2020	\$34.29	\$12.80	\$8.95	\$0.00	\$56.04
ASPHALT RAKER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$32.75	\$9.10	\$14.01	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.74	\$12.47	\$14.50	\$0.00	\$65.71
	12/01/2022	\$39.62	\$12.47	\$14.50	\$0.00	\$66.59
	06/01/2023	\$40.57	\$12.47	\$14.50	\$0.00	\$67.54
	12/01/2023	\$41.52	\$12.47	\$14.50	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.74	\$12.47	\$14.50	\$0.00	\$65.71
	12/01/2022	\$39.62	\$12.47	\$14.50	\$0.00	\$66.59
	06/01/2023	\$40.57	\$12.47	\$14.50	\$0.00	\$67.54
	12/01/2023	\$41.52	\$12.47	\$14.50	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.21	\$12.47	\$14.50	\$0.00	\$65.18
	12/01/2022	\$39.09	\$12.47	\$14.50	\$0.00	\$66.06
	06/01/2023	\$40.04	\$12.47	\$14.50	\$0.00	\$67.01
	12/01/2023	\$40.99	\$12.47	\$14.50	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$33.75	\$9.10	\$16.19	\$0.00	\$59.04
	12/01/2022	\$34.38	\$9.10	\$16.19	\$0.00	\$59.67
	06/01/2023	\$35.00	\$9.10	\$16.19	\$0.00	\$60.29
	12/01/2023	\$35.63	\$9.10	\$16.19	\$0.00	\$60.92
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$33.25	\$9.10	\$14.01	\$0.00	\$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15

Apprentice - BOILERMAKER - Local 29**Effective Date -** 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
2	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
3	70	\$32.27	\$7.07	\$12.59	\$0.00	\$51.93
4	75	\$34.58	\$7.07	\$13.49	\$0.00	\$55.14
5	80	\$36.88	\$7.07	\$14.38	\$0.00	\$58.33
6	85	\$39.19	\$7.07	\$15.29	\$0.00	\$61.55
7	90	\$41.49	\$7.07	\$16.18	\$0.00	\$64.74
8	95	\$43.80	\$7.07	\$17.09	\$0.00	\$67.96

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

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)</i>	08/01/2022	\$47.56	\$11.49	\$20.37	\$0.00	\$79.42
	02/01/2023	\$48.76	\$11.49	\$20.37	\$0.00	\$80.62
	08/01/2023	\$50.81	\$11.49	\$20.37	\$0.00	\$82.67
	02/01/2024	\$52.06	\$11.49	\$20.37	\$0.00	\$83.92
	08/01/2024	\$53.31	\$11.49	\$20.37	\$0.00	\$85.17
	02/01/2025	\$54.61	\$11.49	\$20.37	\$0.00	\$86.47
	08/01/2025	\$56.76	\$11.49	\$20.37	\$0.00	\$88.62
	02/01/2026	\$58.11	\$11.49	\$20.37	\$0.00	\$89.97
	08/01/2026	\$60.31	\$11.49	\$20.37	\$0.00	\$92.17
	02/01/2027	\$61.71	\$11.49	\$20.37	\$0.00	\$93.57

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield						
Effective Date - 08/01/2022						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.78	\$11.49	\$20.37	\$0.00	\$55.64
2	60	\$28.54	\$11.49	\$20.37	\$0.00	\$60.40
3	70	\$33.29	\$11.49	\$20.37	\$0.00	\$65.15
4	80	\$38.05	\$11.49	\$20.37	\$0.00	\$69.91
5	90	\$42.80	\$11.49	\$20.37	\$0.00	\$74.66
Effective Date - 02/01/2023						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.38	\$11.49	\$20.37	\$0.00	\$56.24
2	60	\$29.26	\$11.49	\$20.37	\$0.00	\$61.12
3	70	\$34.13	\$11.49	\$20.37	\$0.00	\$65.99
4	80	\$39.01	\$11.49	\$20.37	\$0.00	\$70.87
5	90	\$43.88	\$11.49	\$20.37	\$0.00	\$75.74
Notes:						
Apprentice to Journeyworker Ratio:1:5						
BULLDOZER/POWER SHOVEL/TREE SHREDDER	06/01/2022	\$38.74	\$12.47	\$14.50	\$0.00	\$65.71
/CLAM SHELL OPERATING	12/01/2022	\$39.62	\$12.47	\$14.50	\$0.00	\$66.59
ENGINEERS LOCAL 98	06/01/2023	\$40.57	\$12.47	\$14.50	\$0.00	\$67.54
	12/01/2023	\$41.52	\$12.47	\$14.50	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN	12/01/2021	\$42.33	\$9.10	\$17.72	\$0.00	\$69.15
LABORERS - FOUNDATION AND MARINE						
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER	12/01/2021	\$41.18	\$9.10	\$17.72	\$0.00	\$68.00
LABORERS - FOUNDATION AND MARINE						
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN	12/01/2021	\$41.18	\$9.10	\$17.72	\$0.00	\$68.00
LABORERS - FOUNDATION AND MARINE						
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
CARPENTER	09/01/2022	\$39.82	\$7.16	\$18.15	\$0.00	\$65.13
CARPENTERS LOCAL 336 - HAMPDEN HAMPSHIRE FRANKLIN	03/01/2023	\$40.32	\$7.16	\$18.15	\$0.00	\$65.63

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - CARPENTER - Local 336 Hampden Hampshire Franklin**Effective Date - 09/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.91	\$7.16	\$1.38	\$0.00	\$28.45
2	60	\$23.89	\$7.16	\$1.38	\$0.00	\$32.43
3	70	\$27.87	\$7.16	\$13.95	\$0.00	\$48.98
4	75	\$29.87	\$7.16	\$13.95	\$0.00	\$50.98
5	80	\$31.86	\$7.16	\$15.35	\$0.00	\$54.37
6	80	\$31.86	\$7.16	\$15.35	\$0.00	\$54.37
7	90	\$35.84	\$7.16	\$16.75	\$0.00	\$59.75
8	90	\$35.84	\$7.16	\$16.75	\$0.00	\$59.75

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.16	\$7.16	\$1.38	\$0.00	\$28.70
2	60	\$24.19	\$7.16	\$1.38	\$0.00	\$32.73
3	70	\$28.22	\$7.16	\$13.95	\$0.00	\$49.33
4	75	\$30.24	\$7.16	\$13.95	\$0.00	\$51.35
5	80	\$32.26	\$7.16	\$15.35	\$0.00	\$54.77
6	80	\$32.26	\$7.16	\$15.35	\$0.00	\$54.77
7	90	\$36.29	\$7.16	\$16.75	\$0.00	\$60.20
8	90	\$36.29	\$7.16	\$16.75	\$0.00	\$60.20

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$26.70/ 3&4 \$43.29/ 5&6 \$50.73/ 7&8 \$56.17

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME	04/01/2022	\$23.66	\$7.21	\$4.80	\$0.00	\$35.67
CARPENTERS-ZONE 3 (Wood Frame)	04/01/2023	\$24.16	\$7.21	\$4.80	\$0.00	\$36.17

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - CARPENTER (Wood Frame) - Zone 3**Effective Date - 04/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.20	\$7.21	\$0.00	\$0.00	\$21.41
2	60	\$14.20	\$7.21	\$0.00	\$0.00	\$21.41
3	65	\$15.38	\$7.21	\$0.00	\$0.00	\$22.59
4	70	\$16.56	\$7.21	\$0.00	\$0.00	\$23.77
5	75	\$17.75	\$7.21	\$3.80	\$0.00	\$28.76
6	80	\$18.93	\$7.21	\$3.80	\$0.00	\$29.94
7	85	\$20.11	\$7.21	\$3.80	\$0.00	\$31.12
8	90	\$21.29	\$7.21	\$3.80	\$0.00	\$32.30

Effective Date - 04/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
2	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
3	65	\$15.70	\$7.21	\$0.00	\$0.00	\$22.91
4	70	\$16.91	\$7.21	\$0.00	\$0.00	\$24.12
5	75	\$18.12	\$7.21	\$3.80	\$0.00	\$29.13
6	80	\$19.33	\$7.21	\$3.80	\$0.00	\$30.34
7	85	\$20.54	\$7.21	\$3.80	\$0.00	\$31.55
8	90	\$21.74	\$7.21	\$3.80	\$0.00	\$32.75

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$17.86/ 3&4 \$20.22/ 5&6 \$27.57/ 7&8 \$29.94

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING	01/01/2020	\$41.94	\$12.70	\$17.64	\$0.62	\$72.90
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)						

Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.97	\$12.70	\$15.41	\$0.00	\$49.08
2	60	\$25.16	\$12.70	\$17.64	\$0.62	\$56.12
3	65	\$27.26	\$12.70	\$17.64	\$0.62	\$58.22
4	70	\$29.36	\$12.70	\$17.64	\$0.62	\$60.32
5	75	\$31.46	\$12.70	\$17.64	\$0.62	\$62.42
6	80	\$33.55	\$12.70	\$17.64	\$0.62	\$64.51
7	90	\$37.75	\$12.70	\$17.64	\$0.62	\$68.71

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 3 (BUILDING & SITE)</i>	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.21	\$12.47	\$14.50	\$0.00	\$65.18
	12/01/2022	\$39.09	\$12.47	\$14.50	\$0.00	\$66.06
	06/01/2023	\$40.04	\$12.47	\$14.50	\$0.00	\$67.01
	12/01/2023	\$40.99	\$12.47	\$14.50	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$42.24	\$12.47	\$14.50	\$0.00	\$69.21
	12/01/2022	\$43.12	\$12.47	\$14.50	\$0.00	\$70.09
	06/01/2023	\$44.07	\$12.47	\$14.50	\$0.00	\$71.04
	12/01/2023	\$45.02	\$12.47	\$14.50	\$0.00	\$71.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 3</i>	07/01/2022	\$54.86	\$8.65	\$23.05	\$0.00	\$86.56
	01/01/2023	\$56.06	\$8.65	\$23.05	\$0.00	\$87.76
	07/01/2023	\$57.26	\$8.65	\$23.05	\$0.00	\$88.96
	01/01/2024	\$58.46	\$8.65	\$23.05	\$0.00	\$90.16
	07/01/2024	\$59.66	\$8.65	\$23.05	\$0.00	\$91.36
	01/01/2025	\$60.86	\$8.65	\$23.05	\$0.00	\$92.56

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.43	\$8.65	\$0.00	\$0.00	\$36.08
2	55	\$30.17	\$8.65	\$6.27	\$0.00	\$45.09
3	60	\$32.92	\$8.65	\$6.84	\$0.00	\$48.41
4	65	\$35.66	\$8.65	\$7.41	\$0.00	\$51.72
5	70	\$38.40	\$8.65	\$19.63	\$0.00	\$66.68
6	75	\$41.15	\$8.65	\$20.20	\$0.00	\$70.00
7	80	\$43.89	\$8.65	\$20.77	\$0.00	\$73.31
8	90	\$49.37	\$8.65	\$21.91	\$0.00	\$79.93

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$8.65	\$0.00	\$0.00	\$36.68
2	55	\$30.83	\$8.65	\$6.27	\$0.00	\$45.75
3	60	\$33.64	\$8.65	\$6.84	\$0.00	\$49.13
4	65	\$36.44	\$8.65	\$7.41	\$0.00	\$52.50
5	70	\$39.24	\$8.65	\$19.63	\$0.00	\$67.52
6	75	\$42.05	\$8.65	\$20.20	\$0.00	\$70.90
7	80	\$44.85	\$8.65	\$20.77	\$0.00	\$74.27
8	90	\$50.45	\$8.65	\$21.91	\$0.00	\$81.01

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1**DEMO: ADZEMAN***LABORERS - ZONE 3 (BUILDING & SITE)*

06/01/2022	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
12/01/2022	\$43.33	\$9.10	\$17.57	\$0.00	\$70.00
06/01/2023	\$44.33	\$9.10	\$17.57	\$0.00	\$71.00
12/01/2023	\$45.58	\$9.10	\$17.57	\$0.00	\$72.25

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR*LABORERS - ZONE 3 (BUILDING & SITE)*

06/01/2022	\$43.33	\$9.10	\$17.57	\$0.00	\$70.00
12/01/2022	\$44.33	\$9.10	\$17.57	\$0.00	\$71.00
06/01/2023	\$45.33	\$9.10	\$17.57	\$0.00	\$72.00
12/01/2023	\$46.58	\$9.10	\$17.57	\$0.00	\$73.25

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS*LABORERS - ZONE 3 (BUILDING & SITE)*

06/01/2022	\$43.08	\$9.10	\$17.57	\$0.00	\$69.75
12/01/2022	\$44.08	\$9.10	\$17.57	\$0.00	\$70.75
06/01/2023	\$45.08	\$9.10	\$17.57	\$0.00	\$71.75
12/01/2023	\$46.33	\$9.10	\$17.57	\$0.00	\$73.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$43.33	\$9.10	\$17.57	\$0.00	\$70.00
	12/01/2022	\$44.33	\$9.10	\$17.57	\$0.00	\$71.00
	06/01/2023	\$45.33	\$9.10	\$17.57	\$0.00	\$72.00
	12/01/2023	\$46.58	\$9.10	\$17.57	\$0.00	\$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$43.08	\$9.10	\$17.57	\$0.00	\$69.75
	12/01/2022	\$44.08	\$9.10	\$17.57	\$0.00	\$70.75
	06/01/2023	\$45.08	\$9.10	\$17.57	\$0.00	\$71.75
	12/01/2023	\$46.33	\$9.10	\$17.57	\$0.00	\$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
	12/01/2022	\$43.33	\$9.10	\$17.57	\$0.00	\$70.00
	06/01/2023	\$44.33	\$9.10	\$17.57	\$0.00	\$71.00
	12/01/2023	\$45.58	\$9.10	\$17.57	\$0.00	\$72.25
For apprentice rates see "Apprentice- LABORER"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</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 3)</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 3)</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 3)</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 (Including Core Drilling) <i>ELECTRICIANS LOCAL 7</i>	07/03/2022	\$46.41	\$12.25	\$13.69	\$0.00	\$72.35
	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - ELECTRICIAN - Local 7**Effective Date - 07/03/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.56	\$7.35	\$0.56	\$0.00	\$26.47
2	45	\$20.88	\$7.35	\$0.63	\$0.00	\$28.86
3	50	\$23.21	\$12.25	\$7.20	\$0.00	\$42.66
4	55	\$25.53	\$12.25	\$7.27	\$0.00	\$45.05
5	65	\$30.17	\$12.25	\$9.14	\$0.00	\$51.56
6	70	\$32.49	\$12.25	\$10.37	\$0.00	\$55.11

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.80	\$7.50	\$0.56	\$0.00	\$26.86
2	45	\$21.15	\$7.50	\$0.63	\$0.00	\$29.28
3	50	\$23.51	\$12.50	\$7.26	\$0.00	\$43.27
4	55	\$25.86	\$12.50	\$7.33	\$0.00	\$45.69
5	65	\$30.56	\$12.50	\$9.27	\$0.00	\$52.33
6	70	\$32.91	\$12.50	\$10.54	\$0.00	\$55.95

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

01/01/2022

\$58.62

\$16.03

\$20.21

\$0.00

\$94.86

Apprentice - ELEVATOR CONSTRUCTOR - Local 41**Effective Date - 01/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.31	\$16.03	\$0.00	\$0.00	\$45.34
2	55	\$32.24	\$16.03	\$20.21	\$0.00	\$68.48
3	65	\$38.10	\$16.03	\$20.21	\$0.00	\$74.34
4	70	\$41.03	\$16.03	\$20.21	\$0.00	\$77.27
5	80	\$46.90	\$16.03	\$20.21	\$0.00	\$83.14

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER

ELEVATOR CONSTRUCTORS LOCAL 41

01/01/2022

\$41.03

\$16.03

\$20.21

\$0.00

\$77.27

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)

LABORERS - ZONE 3 (HEAVY & HIGHWAY)

12/01/2021

\$32.75

\$9.10

\$14.01

\$0.00

\$55.86

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 7</i>	07/03/2022	\$46.41	\$12.25	\$13.69	\$0.00	\$72.35
For apprentice rates see "Apprentice- ELECTRICIAN"	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS</i>	07/03/2022	\$46.41	\$12.25	\$13.69	\$0.00	\$72.35
<i>LOCAL 7</i>	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.21	\$12.47	\$14.50	\$0.00	\$65.18
	12/01/2022	\$39.09	\$12.47	\$14.50	\$0.00	\$66.06
	06/01/2023	\$40.04	\$12.47	\$14.50	\$0.00	\$67.01
	12/01/2023	\$40.99	\$12.47	\$14.50	\$0.00	\$67.96

Apprentice - OPERATING ENGINEERS - Local 98 Class 3**Effective Date -** 06/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.93	\$12.47	\$14.50	\$0.00	\$49.90
2	70	\$26.75	\$12.47	\$14.50	\$0.00	\$53.72
3	80	\$30.57	\$12.47	\$14.50	\$0.00	\$57.54
4	90	\$34.39	\$12.47	\$14.50	\$0.00	\$61.36

Effective Date - 12/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.45	\$12.47	\$14.50	\$0.00	\$50.42
2	70	\$27.36	\$12.47	\$14.50	\$0.00	\$54.33
3	80	\$31.27	\$12.47	\$14.50	\$0.00	\$58.24
4	90	\$35.18	\$12.47	\$14.50	\$0.00	\$62.15

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 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$24.50	\$9.10	\$14.01	\$0.00	\$47.61
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE III</i>	03/01/2022	\$39.22	\$7.16	\$18.15	\$0.00	\$64.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - FLOORCOVERER - Local 2168 Zone III						
Effective Date - 03/01/2022						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.61	\$7.16	\$1.40	\$0.00	\$28.17
2	55	\$21.57	\$7.16	\$1.40	\$0.00	\$30.13
3	60	\$23.53	\$7.16	\$13.95	\$0.00	\$44.64
4	65	\$25.49	\$7.16	\$13.95	\$0.00	\$46.60
5	70	\$27.45	\$7.16	\$15.35	\$0.00	\$49.96
6	75	\$29.42	\$7.16	\$15.35	\$0.00	\$51.93
7	80	\$31.38	\$7.16	\$16.75	\$0.00	\$55.29
8	85	\$33.34	\$7.16	\$16.75	\$0.00	\$57.25
Notes: Steps are 750 hrs. % After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps) Step 1&2 \$26.21/ 3&4 \$31.49/ 5&6 \$49.96/ 7&8 \$55.29						
Apprentice to Journeyworker Ratio:1:1						
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FORK LIFT	06/01/2022	\$38.43	\$12.47	\$14.50	\$0.00	\$65.40
OPERATING ENGINEERS LOCAL 98	12/01/2022	\$39.31	\$12.47	\$14.50	\$0.00	\$66.28
	06/01/2023	\$40.26	\$12.47	\$14.50	\$0.00	\$67.23
	12/01/2023	\$41.21	\$12.47	\$14.50	\$0.00	\$68.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
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GENERATORS/LIGHTING PLANTS	06/01/2022	\$34.98	\$12.47	\$14.50	\$0.00	\$61.95
OPERATING ENGINEERS LOCAL 98	12/01/2022	\$35.86	\$12.47	\$14.50	\$0.00	\$62.83
	06/01/2023	\$36.81	\$12.47	\$14.50	\$0.00	\$63.78
	12/01/2023	\$37.76	\$12.47	\$14.50	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
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GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	06/01/2020	\$39.18	\$10.80	\$10.45	\$0.00	\$60.43
GLAZIERS LOCAL 1333						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - GLAZIER - Local 1333						
Effective Date - 06/01/2020						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$32.19
2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$34.64
3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$37.74
4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$40.19
5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$43.34
6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$45.78
7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$55.53
8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57.98
Notes:						
Apprentice to Journeyworker Ratio:1:3						

GRADER/TRENCHING MACHINE/DERRICK <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.74	\$12.47	\$14.50	\$0.00	\$65.71
	12/01/2022	\$39.62	\$12.47	\$14.50	\$0.00	\$66.59
	06/01/2023	\$40.57	\$12.47	\$14.50	\$0.00	\$67.54
	12/01/2023	\$41.52	\$12.47	\$14.50	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2022	\$39.29	\$10.64	\$17.33	\$2.02	\$69.28
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i>	07/03/2022	\$46.41	\$12.25	\$13.69	\$0.00	\$72.35
	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2022	\$39.29	\$10.64	\$17.33	\$2.02	\$69.28
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>	09/17/2022	\$45.71	\$9.55	\$17.10	\$0.00	\$72.36
	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>	09/17/2022	\$45.71	\$9.55	\$17.10	\$0.00	\$72.36
	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$33.25	\$9.10	\$14.01	\$0.00	\$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	09/01/2022	\$44.05	\$13.80	\$17.14	\$0.00	\$74.99

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield						
Effective Date - 09/01/2022						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.03	\$13.80	\$12.42	\$0.00	\$48.25
2	60	\$26.43	\$13.80	\$13.36	\$0.00	\$53.59
3	70	\$30.84	\$13.80	\$14.31	\$0.00	\$58.95
4	80	\$35.24	\$13.80	\$15.25	\$0.00	\$64.29
Notes: Steps are 1 year						
Apprentice to Journeyworker Ratio:1:4						
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IRONWORKER/WELDER	09/16/2022	\$38.06	\$8.25	\$22.70	\$0.00	\$69.01
IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)	03/16/2023	\$38.91	\$8.25	\$22.70	\$0.00	\$69.86
	09/16/2023	\$39.81	\$8.25	\$22.70	\$0.00	\$70.76
	03/16/2024	\$40.66	\$8.25	\$22.70	\$0.00	\$71.61
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Apprentice - IRONWORKER - Local 7 Springfield						
Effective Date - 09/16/2022						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.84	\$8.25	\$22.70	\$0.00	\$53.79
2	70	\$26.64	\$8.25	\$22.70	\$0.00	\$57.59
3	75	\$28.55	\$8.25	\$22.70	\$0.00	\$59.50
4	80	\$30.45	\$8.25	\$22.70	\$0.00	\$61.40
5	85	\$32.35	\$8.25	\$22.70	\$0.00	\$63.30
6	90	\$34.25	\$8.25	\$22.70	\$0.00	\$65.20
Notes: Structural 1:6; Ornamental 1:4						
Apprentice to Journeyworker Ratio:						
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JACKHAMMER & PAVING BREAKER OPERATOR	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
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LABORER	06/01/2022	\$33.00	\$9.10	\$16.19	\$0.00	\$58.29
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2022	\$33.63	\$9.10	\$16.19	\$0.00	\$58.92
	06/01/2023	\$34.25	\$9.10	\$16.19	\$0.00	\$59.54
	12/01/2023	\$34.88	\$9.10	\$16.19	\$0.00	\$60.17

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - LABORER - Zone 3 Building & Site**Effective Date - 06/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.80	\$9.10	\$16.19	\$0.00	\$45.09
2	70	\$23.10	\$9.10	\$16.19	\$0.00	\$48.39
3	80	\$26.40	\$9.10	\$16.19	\$0.00	\$51.69
4	90	\$29.70	\$9.10	\$16.19	\$0.00	\$54.99

Effective Date - 12/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.18	\$9.10	\$16.19	\$0.00	\$45.47
2	70	\$23.54	\$9.10	\$16.19	\$0.00	\$48.83
3	80	\$26.90	\$9.10	\$16.19	\$0.00	\$52.19
4	90	\$30.27	\$9.10	\$16.19	\$0.00	\$55.56

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

LABORER (HEAVY & HIGHWAY)

LABORERS - ZONE 3 (HEAVY & HIGHWAY)

12/01/2021

\$32.58

\$9.10

\$13.93

\$0.00

\$55.61

Apprentice - LABORER (Heavy & Highway) - Zone 3**Effective Date - 12/01/2021**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.55	\$9.10	\$13.93	\$0.00	\$42.58
2	70	\$22.81	\$9.10	\$13.93	\$0.00	\$45.84
3	80	\$26.06	\$9.10	\$13.93	\$0.00	\$49.09
4	90	\$29.32	\$9.10	\$13.93	\$0.00	\$52.35

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

LABORER: CARPENTER TENDER

LABORERS - ZONE 3 (BUILDING & SITE)

06/01/2022

\$33.00

\$9.10

\$16.19

\$0.00

\$58.29

12/01/2022

\$33.63

\$9.10

\$16.19

\$0.00

\$58.92

06/01/2023

\$34.25

\$9.10

\$16.19

\$0.00

\$59.54

12/01/2023

\$34.88

\$9.10

\$16.19

\$0.00

\$60.17

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER

LABORERS - ZONE 3 (BUILDING & SITE)

06/01/2022

\$33.00

\$9.10

\$16.19

\$0.00

\$58.29

12/01/2022

\$33.63

\$9.10

\$16.19

\$0.00

\$58.92

06/01/2023

\$34.25

\$9.10

\$16.19

\$0.00

\$59.54

12/01/2023

\$34.88

\$9.10

\$16.19

\$0.00

\$60.17

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$32.85	\$9.10	\$16.44	\$0.00	\$58.39
	12/01/2022	\$33.48	\$9.10	\$16.44	\$0.00	\$59.02
	06/01/2023	\$34.10	\$9.10	\$16.44	\$0.00	\$59.64
	12/01/2023	\$34.73	\$9.10	\$16.44	\$0.00	\$60.27
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$34.00	\$9.10	\$16.19	\$0.00	\$59.29
	12/01/2022	\$34.63	\$9.10	\$16.19	\$0.00	\$59.92
	06/01/2023	\$35.25	\$9.10	\$16.19	\$0.00	\$60.54
	12/01/2023	\$35.88	\$9.10	\$16.19	\$0.00	\$61.17
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$32.75	\$9.10	\$14.01	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$33.00	\$9.10	\$16.19	\$0.00	\$58.29
	12/01/2022	\$33.63	\$9.10	\$16.19	\$0.00	\$58.92
	06/01/2023	\$34.25	\$9.10	\$16.19	\$0.00	\$59.54
	12/01/2023	\$34.88	\$9.10	\$16.19	\$0.00	\$60.17
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$33.00	\$9.10	\$16.19	\$0.00	\$58.29
	12/01/2022	\$33.63	\$9.10	\$16.19	\$0.00	\$58.92
	06/01/2023	\$34.25	\$9.10	\$16.19	\$0.00	\$59.54
	12/01/2023	\$34.88	\$9.10	\$16.19	\$0.00	\$60.17
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 3 (BUILDING & SITE)</i>	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$32.75	\$9.10	\$14.01	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE</i>	08/01/2022	\$38.77	\$11.49	\$19.53	\$0.00	\$69.79
	02/01/2023	\$39.73	\$11.49	\$19.53	\$0.00	\$70.75
	08/01/2023	\$41.37	\$11.49	\$19.53	\$0.00	\$72.39
	02/01/2024	\$42.37	\$11.49	\$19.53	\$0.00	\$73.39
	08/01/2024	\$44.05	\$11.49	\$19.53	\$0.00	\$75.07
	02/01/2025	\$45.90	\$11.49	\$19.53	\$0.00	\$76.92
	08/01/2025	\$46.81	\$11.49	\$19.53	\$0.00	\$77.83
	02/01/2026	\$47.89	\$11.49	\$19.53	\$0.00	\$78.91
	08/01/2026	\$49.65	\$11.49	\$19.53	\$0.00	\$80.67
	02/01/2027	\$50.77	\$11.49	\$19.53	\$0.00	\$81.79

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)**Effective Date - 08/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.39	\$11.49	\$19.53	\$0.00	\$50.41
2	60	\$23.26	\$11.49	\$19.53	\$0.00	\$54.28
3	70	\$27.14	\$11.49	\$19.53	\$0.00	\$58.16
4	80	\$31.02	\$11.49	\$19.53	\$0.00	\$62.04
5	90	\$34.89	\$11.49	\$19.53	\$0.00	\$65.91

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

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick

BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

MECH. SWEEPER OPERATOR (ON CONST. SITES)

OPERATING ENGINEERS LOCAL 98

06/01/2022	\$38.74	\$12.47	\$14.50	\$0.00	\$65.71
12/01/2022	\$39.62	\$12.47	\$14.50	\$0.00	\$66.59
06/01/2023	\$40.57	\$12.47	\$14.50	\$0.00	\$67.54
12/01/2023	\$41.52	\$12.47	\$14.50	\$0.00	\$68.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANIC/WELDER/BOOM TRUCK

OPERATING ENGINEERS LOCAL 98

06/01/2022	\$38.21	\$12.47	\$14.50	\$0.00	\$65.18
12/01/2022	\$39.09	\$12.47	\$14.50	\$0.00	\$66.06
06/01/2023	\$40.04	\$12.47	\$14.50	\$0.00	\$67.01
12/01/2023	\$40.99	\$12.47	\$14.50	\$0.00	\$67.96

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 3)

MILLWRIGHTS LOCAL 1121 - Zone 3

01/03/2022	\$38.91	\$8.58	\$21.57	\$0.00	\$69.06
01/02/2023	\$40.16	\$8.58	\$21.57	\$0.00	\$70.31

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - MILLWRIGHT - Local 1121 Zone 3**Effective Date -** 01/03/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.40	\$8.58	\$5.72	\$0.00	\$35.70
2	65	\$25.29	\$8.58	\$17.93	\$0.00	\$51.80
3	75	\$29.18	\$8.58	\$18.98	\$0.00	\$56.74
4	85	\$33.07	\$8.58	\$20.01	\$0.00	\$61.66

Effective Date - 01/02/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.09	\$8.58	\$5.72	\$0.00	\$36.39
2	65	\$26.10	\$8.58	\$17.93	\$0.00	\$52.61
3	75	\$30.12	\$8.58	\$18.98	\$0.00	\$57.68
4	85	\$34.14	\$8.58	\$20.01	\$0.00	\$62.73

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	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
OILER	06/01/2022	\$33.90	\$12.47	\$14.50	\$0.00	\$60.87
OPERATING ENGINEERS LOCAL 98	12/01/2022	\$34.78	\$12.47	\$14.50	\$0.00	\$61.75
	06/01/2023	\$35.73	\$12.47	\$14.50	\$0.00	\$62.70
	12/01/2023	\$36.68	\$12.47	\$14.50	\$0.00	\$63.65
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI	06/01/2022	\$31.92	\$12.47	\$14.50	\$0.00	\$58.89
OPERATING ENGINEERS LOCAL 98	12/01/2022	\$32.80	\$12.47	\$14.50	\$0.00	\$59.77
	06/01/2023	\$33.75	\$12.47	\$14.50	\$0.00	\$60.72
	12/01/2023	\$34.70	\$12.47	\$14.50	\$0.00	\$61.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS)	07/01/2022	\$54.86	\$8.65	\$23.05	\$0.00	\$86.56
PAINTERS LOCAL 35 - ZONE 3	01/01/2023	\$56.06	\$8.65	\$23.05	\$0.00	\$87.76
	07/01/2023	\$57.26	\$8.65	\$23.05	\$0.00	\$88.96
	01/01/2024	\$58.46	\$8.65	\$23.05	\$0.00	\$90.16
	07/01/2024	\$59.66	\$8.65	\$23.05	\$0.00	\$91.36
	01/01/2025	\$60.86	\$8.65	\$23.05	\$0.00	\$92.56

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.43	\$8.65	\$0.00	\$0.00	\$36.08
2	55	\$30.17	\$8.65	\$6.27	\$0.00	\$45.09
3	60	\$32.92	\$8.65	\$6.84	\$0.00	\$48.41
4	65	\$35.66	\$8.65	\$7.41	\$0.00	\$51.72
5	70	\$38.40	\$8.65	\$19.63	\$0.00	\$66.68
6	75	\$41.15	\$8.65	\$20.20	\$0.00	\$70.00
7	80	\$43.89	\$8.65	\$20.77	\$0.00	\$73.31
8	90	\$49.37	\$8.65	\$21.91	\$0.00	\$79.93

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$8.65	\$0.00	\$0.00	\$36.68
2	55	\$30.83	\$8.65	\$6.27	\$0.00	\$45.75
3	60	\$33.64	\$8.65	\$6.84	\$0.00	\$49.13
4	65	\$36.44	\$8.65	\$7.41	\$0.00	\$52.50
5	70	\$39.24	\$8.65	\$19.63	\$0.00	\$67.52
6	75	\$42.05	\$8.65	\$20.20	\$0.00	\$70.90
7	80	\$44.85	\$8.65	\$20.77	\$0.00	\$74.27
8	90	\$50.45	\$8.65	\$21.91	\$0.00	\$81.01

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *

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

NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 3*

07/01/2022	\$37.83	\$8.65	\$19.15	\$0.00	\$65.63
01/01/2023	\$38.93	\$8.65	\$19.15	\$0.00	\$66.73
07/01/2023	\$39.98	\$8.65	\$19.15	\$0.00	\$67.78
01/01/2024	\$41.08	\$8.65	\$19.15	\$0.00	\$68.88
07/01/2024	\$42.13	\$8.65	\$19.15	\$0.00	\$69.93
01/01/2025	\$43.23	\$8.65	\$19.15	\$0.00	\$71.03

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.92	\$8.65	\$0.00	\$0.00	\$27.57
2	55	\$20.81	\$8.65	\$4.13	\$0.00	\$33.59
3	60	\$22.70	\$8.65	\$4.50	\$0.00	\$35.85
4	65	\$24.59	\$8.65	\$4.88	\$0.00	\$38.12
5	70	\$26.48	\$8.65	\$16.90	\$0.00	\$52.03
6	75	\$28.37	\$8.65	\$17.28	\$0.00	\$54.30
7	80	\$30.26	\$8.65	\$17.65	\$0.00	\$56.56
8	90	\$34.05	\$8.65	\$18.40	\$0.00	\$61.10

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.47	\$8.65	\$0.00	\$0.00	\$28.12
2	55	\$21.41	\$8.65	\$4.13	\$0.00	\$34.19
3	60	\$23.36	\$8.65	\$4.50	\$0.00	\$36.51
4	65	\$25.30	\$8.65	\$4.88	\$0.00	\$38.83
5	70	\$27.25	\$8.65	\$16.90	\$0.00	\$52.80
6	75	\$29.20	\$8.65	\$17.28	\$0.00	\$55.13
7	80	\$31.14	\$8.65	\$17.65	\$0.00	\$57.44
8	90	\$35.04	\$8.65	\$18.40	\$0.00	\$62.09

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)

PAINTERS LOCAL 35 - ZONE 3

07/01/2022	\$35.15	\$8.65	\$19.15	\$0.00	\$62.95
01/01/2023	\$36.25	\$8.65	\$19.15	\$0.00	\$64.05
07/01/2023	\$37.30	\$8.65	\$19.15	\$0.00	\$65.10
01/01/2024	\$38.40	\$8.65	\$19.15	\$0.00	\$66.20
07/01/2024	\$39.45	\$8.65	\$19.15	\$0.00	\$67.25
01/01/2025	\$40.55	\$8.65	\$19.15	\$0.00	\$68.35

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.58	\$8.65	\$0.00	\$0.00	\$26.23
2	55	\$19.33	\$8.65	\$4.13	\$0.00	\$32.11
3	60	\$21.09	\$8.65	\$4.50	\$0.00	\$34.24
4	65	\$22.85	\$8.65	\$4.88	\$0.00	\$36.38
5	70	\$24.61	\$8.65	\$16.90	\$0.00	\$50.16
6	75	\$26.36	\$8.65	\$17.28	\$0.00	\$52.29
7	80	\$28.12	\$8.65	\$17.65	\$0.00	\$54.42
8	90	\$31.64	\$8.65	\$1,171.75	\$0.00	\$1,212.04

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.13	\$8.65	\$0.00	\$0.00	\$26.78
2	55	\$19.94	\$8.65	\$4.13	\$0.00	\$32.72
3	60	\$21.75	\$8.65	\$4.50	\$0.00	\$34.90
4	65	\$23.56	\$8.65	\$4.88	\$0.00	\$37.09
5	70	\$25.38	\$8.65	\$16.90	\$0.00	\$50.93
6	75	\$27.19	\$8.65	\$17.28	\$0.00	\$53.12
7	80	\$29.00	\$8.65	\$17.65	\$0.00	\$55.30
8	90	\$32.63	\$8.65	\$18.40	\$0.00	\$59.68

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *

* If 30% or more of surfaces to be painted are new construction,
NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 3*

07/01/2022	\$36.43	\$8.65	\$19.15	\$0.00	\$64.23
01/01/2023	\$37.53	\$8.65	\$19.15	\$0.00	\$65.33
07/01/2023	\$38.58	\$8.65	\$19.15	\$0.00	\$66.38
01/01/2024	\$39.68	\$8.65	\$19.15	\$0.00	\$67.48
07/01/2024	\$40.73	\$8.65	\$19.15	\$0.00	\$68.53
01/01/2025	\$41.83	\$8.65	\$19.15	\$0.00	\$69.63

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.22	\$8.65	\$0.00	\$0.00	\$26.87
2	55	\$20.04	\$8.65	\$4.13	\$0.00	\$32.82
3	60	\$21.86	\$8.65	\$4.50	\$0.00	\$35.01
4	65	\$23.68	\$8.65	\$4.88	\$0.00	\$37.21
5	70	\$25.50	\$8.65	\$16.90	\$0.00	\$51.05
6	75	\$27.32	\$8.65	\$17.28	\$0.00	\$53.25
7	80	\$29.14	\$8.65	\$17.65	\$0.00	\$55.44
8	90	\$32.79	\$8.65	\$18.40	\$0.00	\$59.84

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.77	\$8.65	\$0.00	\$0.00	\$27.42
2	55	\$20.64	\$8.65	\$4.13	\$0.00	\$33.42
3	60	\$22.52	\$8.65	\$4.50	\$0.00	\$35.67
4	65	\$24.39	\$8.65	\$4.88	\$0.00	\$37.92
5	70	\$26.27	\$8.65	\$16.90	\$0.00	\$51.82
6	75	\$28.15	\$8.65	\$17.28	\$0.00	\$54.08
7	80	\$30.02	\$8.65	\$17.65	\$0.00	\$56.32
8	90	\$33.78	\$8.65	\$18.40	\$0.00	\$60.83

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 3

07/01/2022	\$33.75	\$8.65	\$19.15	\$0.00	\$61.55
01/01/2023	\$34.85	\$8.65	\$19.15	\$0.00	\$62.65
07/01/2023	\$35.90	\$8.65	\$19.15	\$0.00	\$63.70
01/01/2024	\$37.00	\$8.65	\$19.15	\$0.00	\$64.80
07/01/2024	\$38.05	\$8.65	\$19.15	\$0.00	\$65.85
01/01/2025	\$39.15	\$8.65	\$19.15	\$0.00	\$66.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.88	\$8.65	\$0.00	\$0.00	\$25.53
2	55	\$18.56	\$8.65	\$4.13	\$0.00	\$31.34
3	60	\$20.25	\$8.65	\$4.50	\$0.00	\$33.40
4	65	\$21.94	\$8.65	\$4.88	\$0.00	\$35.47
5	70	\$23.63	\$8.65	\$16.90	\$0.00	\$49.18
6	75	\$25.31	\$8.65	\$17.28	\$0.00	\$51.24
7	80	\$27.00	\$8.65	\$17.65	\$0.00	\$53.30
8	90	\$30.38	\$8.65	\$18.40	\$0.00	\$57.43

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.43	\$8.65	\$0.00	\$0.00	\$26.08
2	55	\$19.17	\$8.65	\$4.13	\$0.00	\$31.95
3	60	\$20.91	\$8.65	\$4.50	\$0.00	\$34.06
4	65	\$22.65	\$8.65	\$4.88	\$0.00	\$36.18
5	70	\$24.40	\$8.65	\$16.90	\$0.00	\$49.95
6	75	\$26.14	\$8.65	\$17.28	\$0.00	\$52.07
7	80	\$27.88	\$8.65	\$17.65	\$0.00	\$54.18
8	90	\$31.37	\$8.65	\$18.40	\$0.00	\$58.42

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2021	\$32.50	\$9.10	\$14.01	\$0.00	\$55.61
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2020	\$43.53	\$9.40	\$23.12	\$0.00	\$76.05

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PILE DRIVER - Local 56 Zone 3						
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
<div> 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 </div>						
Apprentice to Journeyworker Ratio:1:5						
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PIPELAYER		06/01/2022	\$33.25	\$9.10	\$16.19	\$58.54
<i>LABORERS - ZONE 3 (BUILDING & SITE)</i>		12/01/2022	\$33.88	\$9.10	\$16.19	\$59.17
		06/01/2023	\$34.50	\$9.10	\$16.19	\$59.79
		12/01/2023	\$35.13	\$9.10	\$16.19	\$60.42
For apprentice rates see "Apprentice- LABORER"						
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PIPELAYER (HEAVY & HIGHWAY)		12/01/2021	\$32.75	\$9.10	\$14.01	\$55.86
<i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>						
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
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PLUMBER & PIPEFITTER		09/17/2022	\$45.71	\$9.55	\$17.10	\$72.36
<i>PLUMBERS & PIPEFITTERS LOCAL 104</i>		03/17/2023	\$46.96	\$9.55	\$17.10	\$73.61
		09/17/2023	\$47.96	\$9.55	\$17.10	\$74.61
		03/17/2024	\$49.21	\$9.55	\$17.10	\$75.86

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - PLUMBER/PIPEFITTER - Local 104**Effective Date - 09/17/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$20.57	\$9.55	\$10.10	\$0.00	\$40.22
2	50	\$22.86	\$9.55	\$10.10	\$0.00	\$42.51
3	55	\$25.14	\$9.55	\$10.10	\$0.00	\$44.79
4	60	\$27.43	\$9.55	\$10.10	\$0.00	\$47.08
5	65	\$29.71	\$9.55	\$10.10	\$0.00	\$49.36
6	70	\$32.00	\$9.55	\$10.10	\$0.00	\$51.65
7	75	\$34.28	\$9.55	\$10.10	\$0.00	\$53.93
8	80	\$36.57	\$9.55	\$10.10	\$0.00	\$56.22
9	80	\$36.57	\$9.55	\$17.10	\$0.00	\$63.22
10	80	\$36.57	\$9.55	\$17.10	\$0.00	\$63.22

Effective Date - 03/17/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.13	\$9.55	\$10.10	\$0.00	\$40.78
2	50	\$23.48	\$9.55	\$10.10	\$0.00	\$43.13
3	55	\$25.83	\$9.55	\$10.10	\$0.00	\$45.48
4	60	\$28.18	\$9.55	\$10.10	\$0.00	\$47.83
5	65	\$30.52	\$9.55	\$10.10	\$0.00	\$50.17
6	70	\$32.87	\$9.55	\$10.10	\$0.00	\$52.52
7	75	\$35.22	\$9.55	\$10.10	\$0.00	\$54.87
8	80	\$37.57	\$9.55	\$10.10	\$0.00	\$57.22
9	80	\$37.57	\$9.55	\$17.10	\$0.00	\$64.22
10	80	\$37.57	\$9.55	\$17.10	\$0.00	\$64.22

Notes: **1:1,2:5,3:9,4:12**Apprentice to Journeyworker Ratio:****

PNEUMATIC CONTROLS (TEMP.)	09/17/2022	\$45.71	\$9.55	\$17.10	\$0.00	\$72.36
PLUMBERS & PIPEFITTERS LOCAL 104	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86

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

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY)	12/01/2021	\$32.75	\$9.10	\$14.01	\$0.00	\$55.86
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LABORERS - ZONE 3 (HEAVY & HIGHWAY)

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

POWDERMAN & BLASTER	06/01/2022	\$34.00	\$9.10	\$16.19	\$0.00	\$59.29
LABORERS - ZONE 3 (BUILDING & SITE)	12/01/2022	\$34.63	\$9.10	\$16.19	\$0.00	\$59.92
	06/01/2023	\$35.25	\$9.10	\$16.19	\$0.00	\$60.54
	12/01/2023	\$35.88	\$9.10	\$16.19	\$0.00	\$61.17

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$33.50	\$9.10	\$14.01	\$0.00	\$56.61
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.74	\$12.47	\$14.50	\$0.00	\$65.71
	12/01/2022	\$39.62	\$12.47	\$14.50	\$0.00	\$66.59
	06/01/2023	\$40.57	\$12.47	\$14.50	\$0.00	\$67.54
	12/01/2023	\$41.52	\$12.47	\$14.50	\$0.00	\$68.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$38.21	\$12.47	\$14.50	\$0.00	\$65.18
	12/01/2022	\$39.09	\$12.47	\$14.50	\$0.00	\$66.06
	06/01/2023	\$40.04	\$12.47	\$14.50	\$0.00	\$67.01
	12/01/2023	\$40.99	\$12.47	\$14.50	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2020	\$22.44	\$11.07	\$6.50	\$0.00	\$40.01
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$37.60	\$12.47	\$14.50	\$0.00	\$64.57
	12/01/2022	\$38.48	\$12.47	\$14.50	\$0.00	\$65.45
	06/01/2023	\$39.43	\$12.47	\$14.50	\$0.00	\$66.40
	12/01/2023	\$40.38	\$12.47	\$14.50	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i>	07/01/2022	\$38.16	\$10.35	\$17.25	\$0.00	\$65.76
	07/01/2023	\$38.66	\$10.35	\$18.75	\$0.00	\$67.76
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofing Waterproofing &Roofing Dampproofing) <i>ROOFERS LOCAL 248</i>	07/01/2022	\$37.66	\$10.35	\$16.75	\$0.00	\$64.76
	07/01/2023	\$39.16	\$10.35	\$18.25	\$0.00	\$67.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - ROOFER - Local 248**Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.60	\$10.35	\$0.00	\$0.00	\$32.95
2	65	\$24.48	\$10.35	\$16.75	\$0.00	\$51.58
3	70	\$26.36	\$10.35	\$16.75	\$0.00	\$53.46
4	75	\$28.25	\$10.35	\$16.75	\$0.00	\$55.35
5	80	\$30.13	\$10.35	\$16.75	\$0.00	\$57.23
6	85	\$32.01	\$10.35	\$16.75	\$0.00	\$59.11
7	90	\$33.89	\$10.35	\$16.75	\$0.00	\$60.99
8	95	\$35.78	\$10.35	\$16.75	\$0.00	\$62.88

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.50	\$10.35	\$0.00	\$0.00	\$33.85
2	65	\$25.45	\$10.35	\$18.25	\$0.00	\$54.05
3	70	\$27.41	\$10.35	\$18.25	\$0.00	\$56.01
4	75	\$29.37	\$10.35	\$18.25	\$0.00	\$57.97
5	80	\$31.33	\$10.35	\$18.25	\$0.00	\$59.93
6	85	\$33.29	\$10.35	\$18.25	\$0.00	\$61.89
7	90	\$35.24	\$10.35	\$18.25	\$0.00	\$63.84
8	95	\$37.20	\$10.35	\$18.25	\$0.00	\$65.80

Notes:

Steps are 750 hrs.Roofer(Tear Off)1:1; Same as above

Apprentice to Journeyworker Ratio:1:3

ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 248	07/01/2022	\$38.16	\$10.35	\$17.25	\$0.00	\$65.76
	07/01/2023	\$38.66	\$10.35	\$18.75	\$0.00	\$67.76
For apprentice rates see "Apprentice- ROOFER"						
SCRAPER OPERATING ENGINEERS LOCAL 98	06/01/2022	\$38.21	\$12.47	\$14.50	\$0.00	\$65.18
	12/01/2022	\$39.09	\$12.47	\$14.50	\$0.00	\$66.06
	06/01/2023	\$40.04	\$12.47	\$14.50	\$0.00	\$67.01
	12/01/2023	\$40.99	\$12.47	\$14.50	\$0.00	\$67.96
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) OPERATING ENGINEERS LOCAL 98	06/01/2022	\$37.60	\$12.47	\$14.50	\$0.00	\$64.57
	12/01/2022	\$38.48	\$12.47	\$14.50	\$0.00	\$65.45
	06/01/2023	\$39.43	\$12.47	\$14.50	\$0.00	\$66.40
	12/01/2023	\$40.38	\$12.47	\$14.50	\$0.00	\$67.35
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM OPERATING ENGINEERS LOCAL 98	06/01/2022	\$34.98	\$12.47	\$14.50	\$0.00	\$61.95
	12/01/2022	\$35.86	\$12.47	\$14.50	\$0.00	\$62.83
	06/01/2023	\$36.81	\$12.47	\$14.50	\$0.00	\$63.78
	12/01/2023	\$37.76	\$12.47	\$14.50	\$0.00	\$64.73
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	01/01/2022	\$39.29	\$10.64	\$17.33	\$2.02	\$69.28

Apprentice - SHEET METAL WORKER - Local 63**Effective Date -** 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$17.68	\$4.79	\$4.67	\$0.81	\$27.95
2	50	\$19.65	\$5.32	\$5.19	\$0.90	\$31.06
3	55	\$21.61	\$5.85	\$9.33	\$1.10	\$37.89
4	60	\$23.57	\$6.38	\$9.33	\$1.18	\$40.46
5	65	\$25.54	\$6.92	\$9.33	\$1.25	\$43.04
6	70	\$27.50	\$7.45	\$9.33	\$1.33	\$45.61
7	75	\$29.47	\$7.98	\$9.33	\$1.40	\$48.18
8	80	\$31.43	\$8.51	\$16.29	\$1.69	\$57.92
9	85	\$33.40	\$9.04	\$16.29	\$1.76	\$60.49
10	90	\$35.36	\$9.58	\$16.29	\$1.84	\$63.07

Notes:**Apprentice to Journeyworker Ratio:1:3**

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	04/01/2021	\$43.14	\$10.55	\$16.41	\$0.00	\$70.10

Apprentice - SPRINKLER FITTER - Local 669**Effective Date -** 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.41	\$7.75	\$0.00	\$0.00	\$27.16
2	50	\$21.57	\$7.75	\$0.00	\$0.00	\$29.32
3	55	\$23.73	\$10.55	\$8.15	\$0.00	\$42.43
4	60	\$25.88	\$10.55	\$8.15	\$0.00	\$44.58
5	65	\$28.04	\$10.55	\$8.40	\$0.00	\$46.99
6	70	\$30.20	\$10.55	\$8.40	\$0.00	\$49.15
7	75	\$32.36	\$10.55	\$8.40	\$0.00	\$51.31
8	80	\$34.51	\$10.55	\$8.40	\$0.00	\$53.46
9	85	\$36.67	\$10.55	\$8.40	\$0.00	\$55.62
10	90	\$38.83	\$10.55	\$8.40	\$0.00	\$57.78

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN	07/03/2022	\$46.41	\$12.25	\$13.69	\$0.00	\$72.35
<i>ELECTRICIANS LOCAL 7</i>	01/01/2023	\$47.01	\$12.50	\$13.96	\$0.00	\$73.47

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 7**Effective Date - 07/03/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.56	\$7.35	\$0.56	\$0.00	\$26.47
2	45	\$20.88	\$7.35	\$0.63	\$0.00	\$28.86
3	50	\$23.21	\$12.25	\$7.20	\$0.00	\$42.66
4	55	\$25.53	\$12.25	\$7.27	\$0.00	\$45.05
5	65	\$30.17	\$12.25	\$9.14	\$0.00	\$51.56
6	70	\$32.49	\$12.25	\$10.37	\$0.00	\$55.11

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.80	\$7.35	\$0.56	\$0.00	\$26.71
2	45	\$21.15	\$7.35	\$0.63	\$0.00	\$29.13
3	50	\$23.51	\$12.25	\$7.20	\$0.00	\$42.96
4	55	\$25.86	\$12.25	\$7.27	\$0.00	\$45.38
5	65	\$30.56	\$12.25	\$9.14	\$0.00	\$51.95
6	70	\$32.91	\$12.25	\$10.37	\$0.00	\$55.53

Notes:

Steps are 800 hours

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS	08/01/2022	\$58.09	\$11.49	\$22.34	\$0.00	\$91.92
<i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE</i>	02/01/2023	\$59.29	\$11.49	\$22.34	\$0.00	\$93.12
	08/01/2023	\$61.34	\$11.49	\$22.34	\$0.00	\$95.17
	02/01/2024	\$62.59	\$11.49	\$22.34	\$0.00	\$96.42
	08/01/2024	\$64.69	\$11.49	\$22.34	\$0.00	\$98.52
	02/01/2025	\$65.99	\$11.49	\$22.34	\$0.00	\$99.82
	08/01/2025	\$68.14	\$11.49	\$22.34	\$0.00	\$101.97
	02/10/2026	\$69.49	\$11.49	\$22.34	\$0.00	\$103.32
	08/01/2026	\$71.69	\$11.49	\$22.34	\$0.00	\$105.52
	02/01/2027	\$73.09	\$11.49	\$22.34	\$0.00	\$106.92

Classification

Effective Date

Base Wage

Health

Pension

Supplemental
Unemployment

Total Rate

Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)**Effective Date - 08/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.05	\$11.49	\$22.34	\$0.00	\$62.88
2	60	\$34.85	\$11.49	\$22.34	\$0.00	\$68.68
3	70	\$40.66	\$11.49	\$22.34	\$0.00	\$74.49
4	80	\$46.47	\$11.49	\$22.34	\$0.00	\$80.30
5	90	\$52.28	\$11.49	\$22.34	\$0.00	\$86.11

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.65	\$11.49	\$22.34	\$0.00	\$63.48
2	60	\$35.57	\$11.49	\$22.34	\$0.00	\$69.40
3	70	\$41.50	\$11.49	\$22.34	\$0.00	\$75.33
4	80	\$47.43	\$11.49	\$22.34	\$0.00	\$81.26
5	90	\$53.36	\$11.49	\$22.34	\$0.00	\$87.19

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

TERRAZZO MECHANIC

BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

08/01/2022	\$59.17	\$11.49	\$22.31	\$0.00	\$92.97
02/01/2023	\$60.37	\$11.49	\$22.31	\$0.00	\$94.17
08/01/2023	\$62.42	\$11.49	\$22.31	\$0.00	\$96.22
02/01/2024	\$63.67	\$11.49	\$22.31	\$0.00	\$97.47
08/01/2024	\$65.77	\$11.49	\$22.31	\$0.00	\$99.57
02/01/2025	\$67.07	\$11.49	\$22.31	\$0.00	\$100.87
08/01/2025	\$69.22	\$11.49	\$22.31	\$0.00	\$103.02
02/01/2026	\$70.57	\$11.49	\$22.31	\$0.00	\$104.37
08/01/2026	\$72.77	\$11.49	\$22.31	\$0.00	\$106.57
02/01/2027	\$74.17	\$11.49	\$22.31	\$0.00	\$107.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)						
Effective Date - 08/01/2022						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.59	\$11.49	\$22.31	\$0.00	\$63.39
2	60	\$35.50	\$11.49	\$22.31	\$0.00	\$69.30
3	70	\$41.42	\$11.49	\$22.31	\$0.00	\$75.22
4	80	\$47.34	\$11.49	\$22.31	\$0.00	\$81.14
5	90	\$53.25	\$11.49	\$22.31	\$0.00	\$87.05
Effective Date - 02/01/2023						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.19	\$11.49	\$22.31	\$0.00	\$63.99
2	60	\$36.22	\$11.49	\$22.31	\$0.00	\$70.02
3	70	\$42.26	\$11.49	\$22.31	\$0.00	\$76.06
4	80	\$48.30	\$11.49	\$22.31	\$0.00	\$82.10
5	90	\$54.33	\$11.49	\$22.31	\$0.00	\$88.13
Notes:						
Apprentice to Journeyworker Ratio:1:5						
TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$42.58	\$9.10	\$17.72	\$0.00	\$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$41.30	\$9.10	\$17.72	\$0.00	\$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$41.18	\$9.10	\$17.72	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2022	\$37.60	\$12.47	\$14.50	\$0.00	\$64.57
	12/01/2022	\$38.48	\$12.47	\$14.50	\$0.00	\$65.45
	06/01/2023	\$39.43	\$12.47	\$14.50	\$0.00	\$66.40
	12/01/2023	\$40.38	\$12.47	\$14.50	\$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>	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2021	\$53.41	\$9.10	\$18.17	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2021	\$55.41	\$9.10	\$18.17	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2021	\$45.48	\$9.10	\$18.17	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2021	\$47.48	\$9.10	\$18.17	\$0.00	\$74.75

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
WAGON DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING & SITE)</i>						
	06/01/2022	\$33.25	\$9.10	\$16.19	\$0.00	\$58.54
	12/01/2022	\$33.88	\$9.10	\$16.19	\$0.00	\$59.17
	06/01/2023	\$34.50	\$9.10	\$16.19	\$0.00	\$59.79
	12/01/2023	\$35.13	\$9.10	\$16.19	\$0.00	\$60.42
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY & HIGHWAY)</i>	12/01/2021	\$32.75	\$9.10	\$14.01	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WATER METER INSTALLER <i>PLUMBERS & PIPEFITTERS LOCAL 104</i>						
	09/17/2022	\$45.71	\$9.55	\$17.10	\$0.00	\$72.36
	03/17/2023	\$46.96	\$9.55	\$17.10	\$0.00	\$73.61
	09/17/2023	\$47.96	\$9.55	\$17.10	\$0.00	\$74.61
	03/17/2024	\$49.21	\$9.55	\$17.10	\$0.00	\$75.86
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - West						
EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$44.67	\$8.00	\$12.55	\$0.00	\$65.22
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$30.58	\$8.00	\$5.48	\$0.00	\$44.06
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN / TRUCK DRIVER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$39.97	\$8.00	\$10.96	\$0.00	\$58.93
For apprentice rates see "Apprentice- LINEMAN"						
HEAVY EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$47.01	\$8.00	\$13.22	\$0.00	\$68.23
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$51.71	\$8.00	\$15.55	\$0.00	\$75.26

Apprentice - LINEMAN (Outside Electrical) - West Local 42

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$31.03	\$8.00	\$3.43	\$0.00	\$42.46
2	65	\$33.61	\$8.00	\$3.51	\$0.00	\$45.12
3	70	\$36.20	\$8.00	\$3.59	\$0.00	\$47.79
4	75	\$38.78	\$8.00	\$5.16	\$0.00	\$51.94
5	80	\$41.37	\$8.00	\$5.24	\$0.00	\$54.61
6	85	\$43.95	\$8.00	\$5.32	\$0.00	\$57.27
7	90	\$46.54	\$8.00	\$7.40	\$0.00	\$61.94

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TRACTOR-TRAILER DRIVER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$44.67	\$8.00	\$12.55	\$0.00	\$65.22

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.

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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 00875
TRAINEE SPECIAL PROVISIONS
Revised October, 2016

THE REQUIRED NUMBER OF TRAINEES TO BE TRAINED UNDER THIS CONTRACT WILL BE **3**

The contractor shall provide on-the job training aimed at developing full journeyworkers in the type of trade of job classification involved.

In the event that a contractor subcontracts a portion of the contract work, the General Contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeyworkers in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Massachusetts Department Of Transportation (MassDOT) for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyworker status is a primary objective of the Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority and women trainees (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that have been taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training.

No employee shall be trained under this Special Provision in any classification in which he or she has successfully completed a training course leading to journeyworker status or in which he or she has been employed as a journeyworker. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the finding in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Massachusetts Department Of Transportation and the Federal Highway Administration. The Massachusetts Department Of Transportation and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyworker status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typist or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc. where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Federal Highway Administration division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Reimbursement

Under these Training Special Provisions, reimbursement will be as follows:

The Contractor will only be reimbursed 80 cents for each hour of on the job training as specified in the approved Training Program.

The Contractor is advised and encouraged that it may train additional persons in excess of the number specified and will be reimbursed as stated above. Reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement.

If less than full training specified in the approved training programs is provided, payment to the contractor will be made at a rate of 80 cents for each hour of training completed under this contract. However, no payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyworker, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Training Special Provision.

Payment

Trainees will be paid:

1. Percentage (%) of the journeyworker's rate as provided in the existing programs approved by the Department of Labor or Transportation as of September 15, 1970.
2. For journeyworker programs submitted by the Contractor and approved by Massachusetts Department Of Transportation and the Federal Highway Administration at least 60 percent of the appropriate minimum journeyworker's rate specified in the contract for the first half of the training period, 75 percent for the third quarter if the training period, and 90 percent for the last quarter of the training period.
3. For skilled laborer programs, the minimum starting wage rate of unskilled laborer. At the conclusion of training, he or she will be paid the minimum wage rate of the Classification for programs submitted by the Contractor and approved by the Massachusetts Department Of Transportation and the Federal Highway Administration.
4. For the purposes of meeting the legal requirements of State Prevailing Wage Law, please be advised that no person may be paid the Apprentice wage rate as listed on a MA Prevailing Wage Rates schedule, unless that person and program is registered with the Department of Labor Standards/Division of Apprentice Standards (DLS/DAS). Any person or program not registered with DLS/DAS, regardless of whether or not they are registered with any other federal, state, local, or private entity must be paid the journeyworker's rate for the trade.

The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

Form FHWA-1409, Federal-aid Highway Construction Contracting Semi Annual Training Report, shall be submitted as per instructions on the Form.

*** 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: MA20220020 04/22/2022

Superseded General Decision Number: MA20210020

State: Massachusetts

Construction Type: Highway

County: Hampshire 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)(2)-(60).

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 \$15.00 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 2022.
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 \$11.25 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 2022.

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 <https://www.dol.gov/agencies/whd/government-contracts>.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022
2	04/22/2022

* ENGI0004-019 06/01/2021

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 48.73	29.25+A
GROUP 1.....	\$ 51.38	30.10
Group 2.....	\$ 48.23	29.25+A
GROUP 2.....	\$ 50.83	30.10

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: Broom/Sweeper; Crane; Gradall; Post Driver
(Guardrail/Fences)
Group 2: Bulldozer; Grader/Blade

ENGI0098-010 12/01/2016

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 33.68	23.96+A
Group 2.....	\$ 33.37	23.96+A
Group 4.....	\$ 32.54	23.96+A

Footnote:

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: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid
Loader; Loader

Group 2: Milling Machine; Paver (Asphalt, Aggregate, and
Concrete)

Group 4: Roller

* IRON0007-027 03/16/2022

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND STRUCTURAL).....	\$ 37.58	32.05

LABO0596-008 12/01/2021

	Rates	Fringes
LABORER (Traffic Control: Flagger).....	\$ 24.50	23.96

LABO0999-003 12/01/2021

	Rates	Fringes
LABORER		
Common or General.....	\$ 32.50	23.96
Landscape.....	\$ 32.50	23.96

PAIN0035-023 07/01/2019

	Rates	Fringes
PAINTER (Steel).....	\$ 50.66	30.90

SUMA2014-010 01/11/2017

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 40.64	20.80
CEMENT MASON/CONCRETE FINISHER....	\$ 52.13	20.89
ELECTRICIAN.....	\$ 47.13	13.41
IRONWORKER, REINFORCING.....	\$ 46.21	21.27
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 33.10	18.09
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 44.43	14.18
OPERATOR: Forklift.....	\$ 51.63	0.00
OPERATOR: Mechanic.....	\$ 48.14	17.02
OPERATOR: Piledriver.....	\$ 43.87	18.04
PAINTER: Spray (Linestriping)....	\$ 37.50	18.83
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper.....	\$ 43.73	15.06
TRUCK DRIVER: Concrete Truck....	\$ 33.69	15.79
TRUCK DRIVER: Dump Truck.....	\$ 30.00	18.18
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) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

DOCUMENT A00801

SPECIAL PROVISIONS**WARE****Federal Aid Project No. STP(BR-OFF)-003S(606)X
Bridge Replacement Br. No. W-05-015 (Steel)
Route 32 (Palmer Road) over the 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

Work under this Contract consists of replacing the existing State Route 32 (Palmer Road) bridge, MassDOT Bridge No. W-05-015 in the Town of Ware. The work includes complete replacement of the existing bridge, as well as reconstruction and realignment of Palmer Road with modifications of the roadway profile and right of way. The project includes, but is not limited to, pedestrian facilities, ADA ramps, and new striping in accordance with the Contract plans and documents.

Existing utility poles carrying overhead telephone, electric, and cable lines along Route 32 (Palmer Road) are to be relocated, and the existing 12-inch diameter water main on the bridge will be replaced with a new 12-inch water main. Temporary use of the existing 6-inch diameter water main will provide service during staged construction.

The existing 3-span bridge will be completely demolished and replaced with a two-span continuous steel girder bridge supported on integral abutments and a center pier, all on steel piles. The total length of structure is 167'-0" from the centerline of bearings of the west abutment to the centerline of bearings of the east abutment.

The contractor shall be responsible for maintenance and emergency repairs of any portion of the existing Bridge W-05-015 until the structure, or portion of structure relying on the repaired area(s) is no longer subject to traffic or construction loading or is demolished. All repair areas shall be maintained for as long as still in use and until authorized by the Engineer to be abandoned and/or demolished. MassDOT will identify the location/need for emergency repairs based on on-going regular inspection report findings and/or observations by the Resident Engineer.

The Contractor shall maintain safe public passage along the Ware River at the bridge site for the duration of the project unless it is determined that the contractor's demolition or construction activities pose an unavoidable conflict or a public safety issue.

SCOPE OF WORK (Continued)

All work under this Contract shall be done in conformance with the *2022 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 Massachusetts Amendments; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; *The American Standard for Nursery Stock*; the Plans and these Special Provisions.

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 is to be placed in the subject line.

SUBSECTION 7.05 INSURANCE REQUIREMENTS**B. Public Liability Insurance**

The insurance requirements set forth in this subsection 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.

Paragraph 4

Asbestos Liability Insurance shall be obtained for this project. The Contractor and the Massachusetts Department of Transportation shall be named as additional insureds.

COVID 19 GUIDELINES AND PROCEDURES

Per Subsection 5.09 – Inspection of the Work - the Contractor is required to provide assistance to the Engineer to make a complete and detailed inspection of the work. That assistance includes furnishing equipment to perform the inspection, therefore the Contractor will be required to provide CDC compliant Personal Protective Equipment (PPE) to Department personnel field staff. The CDC compliant PPE shall consist of face masks, gloves and eye protection.

All costs associated with compliance with this provision are considered to be incidental to the contract cost and therefore the Contractor will not be entitled to any additional compensation.

SECTION 7.00: LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC**Subsection 7.03: Permits and Licenses**

(page I.47) Replace Subsection 7.03 in its entirety with the following:

The Contractor shall procure all required permits and licenses, pay all charges, fees and taxes and shall give all notices necessary and incidental to the due and lawful prosecution of the work. The cost thereof shall be included in the prices bid for the various items listed in the Proposal. Copies of all required permits and licenses shall be filed with the Engineer prior to the beginning of work.

For overweight vehicles in excess of 130,000 lbs., the Contractor shall provide a copy of each overweight vehicle permit to the Engineer prior to arrival or delivery of the vehicle to a project site. This requirement is for all Contractors, their subcontractors, equipment suppliers and material suppliers.

The Contractor's attention is directed to the provisions of General Laws, Chapter 90, Section 9 as amended, in which it is provided that earth-moving motor vehicles which exceed certain dimensions or weight limits as specified in said Act, and which are used exclusively for building, repair and maintenance of highways, may be operated without registration for a distance not exceeding 300 yd on any way adjacent to any highway or toll road being constructed, relocated or improved provided a permit, authorizing such use, to be issued by the Commissioner of Public Works or by the Board or officer having charge of such way, has been procured by the Contractor.

MATERIAL OPTIONS

The Contractor shall inform the Engineer of his option prior to the installation of the material. Once the option is designated, all material for the option item(s) shall remain the same throughout the job.

<u>OPTIONS</u>		
<u>Item Number</u>	<u>Item Description</u>	<u>Unit</u>
234.12	12 Inch Drainage Pipe-Option	Foot
234.18	18 Inch Drainage Pipe-Option	Foot

Pipe Options
Reinforced Concrete Pipe
Corrugated Plastic (Polyethylene) Pipe
Corrugated Plastic (Polypropylene) Pipe

SUBSECTION 6.03: Delivery and Storage of Materials

Replace this Subsection with the following:

Materials and equipment shall be progressively delivered to or removed from the site so that there will be neither delay in the progress of the work nor an accumulation of materials that are not to be used or removed within a reasonable time. All materials shall be stored in pre-approved locations per the conditions of the property owner.

Delivered materials and materials originating from the site, shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located to facilitate their prompt inspection.

Approved portions of the State Highway Layout (SHLO) may be used for storage of project materials and for the placing of the Contractor's plant and equipment upon obtaining a state highway access permit. All storage sites shall be restored to their original condition by the Contractor. No additional compensation shall be given for the design, construction, preparation, or restoration of the storage site(s) or obtaining the access permit which may include but is not limited to a Traffic Management Plan (TMP), utilities, and lighting.

The application for a permit shall contain a locus map identifying the proposed location, a description of the specific activities and uses of the staging area, a TMP in accordance with section 7.10 depicting minimum setbacks from the roadway and any existing structures for stored materials and equipment and how equipment will safely access and exit the staging area.

Any additional space required must be provided by the Contractor at their expense. Municipal, private, or other state-owned property shall not be used for storage purposes without written permission of the owner or lessee, and copies of such written permission shall be furnished to the Engineer.

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.

BUY AMERICA PROVISIONS

The Buy America Provisions of Subsection 7.01 G. of the Standard Specifications shall apply to steel used for temporary support of excavation, including H piles, soldier piles, and sheeting when the steel is required to be left in place. Temporary steel shall remain in place when it falls within the influence zone of the soil supporting any structure or railroad tracks. The influence line is defined by a line extending out at 45° from the toe of structure being supported.

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.

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.

HOLIDAY WORK RESTRICTIONS (Continued)**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

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 8.02 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.

SUBSECTION 8.03: PROSECUTION OF WORK

The Contractor is reminded that, in bidding this work, the Contractor is obligated to meet the Contract Milestones and Durations (Time) and is obligated to plan the successful completion of Work, prior to submitting the bid.

Contractual Milestones:

This Contract contains the following Contractual Milestones that are to be included in the Contractor's Baseline Contract Progress Schedule submission. The Contractor shall identify the completion of the work pertaining to each Contractual Milestone through the inclusion of a Finish Milestone and hammock activities in the accepted baseline Contract Progress Schedule using the stated description.

MS#03 Full Beneficial Use: 1569 calendar days

The Contractor shall achieve Full Beneficial Use within 1569 calendar days from Notice to Proceed. Full Beneficial Use shall be defined as: 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.

MS#02 Substantial Completion: 1590 calendar days

The Contractor shall achieve Substantial Completion within 1590 calendar days from Notice to Proceed. Substantial Completion shall be defined as: 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 paper work, 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 have been received by the District Materials Lab.

MS#01 Contractor Field Completion: 1620 calendar days

The Contractor shall achieve Contractor Field Completion within 1620 calendar days from Notice to Proceed. Contractor Field Completion shall be defined as: All physical contract Work is complete including punch-list. The Contractor has fully de-mobilized from field operations.

The contractor shall be expected to complete the work included in phase 1A in a timeframe of 7 calendar days. Any work outside normal hours (including work on weekends) during this period shall be considered incidental to the project.

The contractor shall be expected to complete the work included in phase 1B in a timeframe of 7 calendar days. Any work outside normal hours (including work on weekends) during this period shall be considered incidental to the project.

Standard Work hour are between the times of 7:00 AM to 3:30 PM.

The contractor shall also provide, inclusive to the cost of the schedule for the project, a separate hourly schedule depicting the work to occur during phase 1A and phase 1B.

NORTHERN LONG-EARED BAT PROTECTION

The U.S. Fish and Wildlife Service (USFWS) has listed the northern long-eared bat (NLEB) as threatened 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 August 2-4, 2021, 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 2020 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 August 2, 2026. 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 A00871 USFWS NLAA). 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.

MUSSEL SURVEY AND RELOCATION

In accordance with the Conservation and Management Permit issued by the MA Natural Heritage and Endangered Species Program, a mussel survey and relocation plan must be completed by MassDOT's on-call mussel biologist prior to the work in water. The survey season begins in June of 2023, and as long as conditions are appropriate, the survey will be completed by MassDOT's biologist by the end of June 2023. Once the survey is complete, work in water can proceed. Any questions on this requirement can be directed to the Wildlife & Endangered Species Unit of MassDOT Environmental Services.

DEP – WATER QUALITY CERTIFICATION

This project is subject to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 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/he 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 (857) 368-2057. 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.

ARMY CORPS OF ENGINEERS PERMIT

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 the respective Application are to be considered 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 (857) 368-2057. If the Contractor wishes to obtain copies, s/he shall do so at his own expense. For a Self Verification (SV) Projects, 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 monitoring reports, etc.; 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.

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”.

**GENERAL REQUIREMENTS FOR DEMOLITION AND
WORK INVOLVING PAINTED STEEL** (Continued)**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.

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 30µg/m³.

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.

VALUE ENGINEERING CHANGE PROPOSAL

This Subsection defines the conditions and requirements which apply to Value Engineering Change Proposals (“VECPs”). The purpose of this provision is to encourage the Contractor to propose changes in certain project requirements that will maintain the project’s functional requirements at a savings in contract time, contract price, or both. The net savings obtained by using a VECP that meets the conditions and requirements set forth here will be shared by the Contractor and MassDOT.

VECP’s under this provision are to be initiated, developed and submitted to MassDOT by the Contractor. The VECP must show the contemplated changes to the Drawings, Specifications and other requirements in the Contract. When a VECP submitted pursuant to this section is fully accepted by MassDOT, the VECP will be implemented by the Contractor and paid using the current cost and resource loaded schedule. Contractor shall demonstrate that the VECP is equal to, or better than, the original design or material; that there is an interest in public safety within the VECP; that there is a life-cycle cost benefit; and/or that end users will benefit from the shortened schedule. VECPs shall be consistent with the MassHighway/MassDOT Standard Specifications for Highways and Bridges and other applicable reference documents and directives. Any proposed deviation from these documents will need to be clearly identified in the VECP Proposal Documents, and must be approved by MassDOT’s Chief Engineer before accepting this VECP.

- A. In order to be considered for MassDOT review each VECP shall:
1. Be clearly labeled pursuant to this Subsection;
 2. Yield a net savings at least two hundred and fifty thousand (250,000.00) Dollars and/or a net saving of contract completion duration of at least three (3) months;
 3. The proposed changes to contract items must:
 - a. maintain the specified items’ required functions (service life, reliability);
 - b. meet applicable safety regulations and codes;
 - c. material substitutions must be in accordance with DOT prequalified/preapproved products and must be tested in accordance with standard material specs/testing methods (and considering all relevant environmental, load, and other relevant factors);
 - d. show economy of operation, ease of maintenance, ease of construction, and necessary standardized features and appearance; and
 4. Shall not require an extension of Contract Time or Contract Milestones, with the exception of cases when there are anticipated significant cost saving.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

The thresholds above are considered to be a general guideline. MassDOT will consider VECPs outside of these thresholds if a significant benefit is demonstrated. Additionally, notwithstanding this VECP process, MassDOT will consider minor revisions in the form of a Contract Modification.

Further, any VECP submitted shall be in sufficient detail to clearly define the proposed change. The Contractor's failure to provide information of the type, detail and in a format to facilitate the MassDOT's review, may be grounds for rejection of the VECP. Additionally, the Contractor will not be entitled to any equitable adjustment or increased Time, due to any aspect of any of the proposed VECP including permitting, right of way, utility coordination or delayed responses by MassDOT. If, after the progression of the work associated with the executed Contract Modification for the VECP, any additional costs are realized by the Contractor or any of the sub-consultants, sub-contractors, or suppliers, the Contractor shall be obligated to pay for any and all costs.

B. The following initial items shall be provided by the Contractor for MassDOT's review. *Items 1-6 need to be submitted prior to the start of MassDOT's review of the VECP and item 7 is an important consideration for the pricing of the VECP and the timeline of the proposed VECP schedule.*

1. **VECP Description:** A description of the difference between the existing and the proposed Contract requirements, and the comparative advantages and disadvantages of each;
2. **VECP Change Listing:** A listing of the Contract requirements that will need to be changed, modified, or reviewed as well as the proposed Contract document changes in the Instructions to Bidders, Contract, Standard Specifications, General Requirements and Special Provisions required by the VECP.
3. **Construction Schedule Update:** Any changes in the Contract Time(s) or Contract Milestone(s), that will result from acceptance of the VECP, shall be accompanied by a contemporaneous schedule analysis (*i.e., the Contractor's baseline schedule submission, all past/required monthly schedule updates, a detailed assessment of all past delays, and a resource loaded Critical Path Method schedule as specified in Section 8.0 / Subsection 8.02 of this Contract*) of the projected Work that remains including the proposed VECP related schedule changes (*inclusive of the timeline to review accept the VECP and the timeline for implementing the design changes*) in the remaining work. This shall be submitted in the form of a Proposal Schedule until the VECP has been formally accepted. Note: All of this information is to be updated, recertified, and formally accepted by MassDOT before final acceptance of this this VECP is issued.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

4. ***Date for MassDOT's Acceptance:*** A statement that clearly justifies the date by which the VECP must be accepted to obtain the maximum price reduction, noting any effect upon the Contract Time(s) and/or Contract Milestone(s). This statement must include a narrative that demonstrates the most recent construction schedule has been utilized to justify that proposed acceptance date (*e.g. "in order to start to fabricate critical materials, authorization must be provided to work on the shop drawings by no later than [date]"*). The Contractor should allow for at least sixty (60) to ninety (90) days for acceptance by MassDOT once all of the VECP documentation has been provided. Acceptance shall mean that MassDOT has received a finalized and executed contract modification. However, this is a proposed Contract change.

The Contractor is fully obligated to progress the Work of the original Contract and MassDOT is not liable for any delays or costs that may occur in the review phase of any VECP proposal.

5. ***Cost and Savings Estimates:*** A detailed estimate of the anticipated net savings, calculated as follows:
- a. ***Original Scope:*** Isolate the cost of performing the original contract construction activities, in accordance with the original Contract Documents, as originally bid by the Contractor, that are anticipated to be superseded by the VECP. *This cost is to include any original contract scope that is anticipated to be altered or eliminated by the VECP such as, shop drawing preparation, inspection work, testing, maintenance of traffic, or any other original contract costs, that have yet to have been performed at the time of this VECP submission.*
 - b. ***New VECP Scope:*** Calculate the cost of performing the comparable construction activities associated with the VECP.
 - c. ***Contractor's Engineer & Inspection:*** Calculate the cost of engineering, inspection, and design work by the Contractor's Engineer/Designer. This should be a realistic estimate of the costs of any required engineering, design and review work by the Contractor's Engineer.
 - d. ***MassDOT's Costs:*** MassDOT's estimate of costs to perform engineering/design reviews, cost estimate reviews, schedule reviews, and any other administrative costs to review and recommend implementation of the proposed VECP. (*including all anticipated increased costs to MassDOT on other Contracts and all anticipated follow-on increased costs to MassDOT, if any*) as provided by MassDOT. MassDOT's estimated costs must be included the VECP calculation and will be provided by MassDOT in support of the VECP evaluation process.
 - e. ***Other Costs:*** Estimated costs associated with any revisions to other project related costs, such as Environmental Permits or Right of Way acquisitions, including other agency or municipality costs, as provided by MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)**Net Savings:**

The net savings to be split between MassDOT and the Contractor shall be calculated using the items above as follows: $a - (b+c+d+e) = \text{net savings}$

6. *The Contractor shall also provide:*

- a. A proposed Change Order, which explains and justifies any required Equitable Adjustment in the Contract Price.
- b. The Contractor's actual costs expended for developing the VECP as of the date of the VECP submission;

7. *Design Changes and Drawings:* The costs that are outlined above should be inclusive of the following design and engineering responsibilities.

- a. Design changes shall be prepared and stamped by the Contractor's professional designer and/or engineer. In addition, in the development of the VECP; the Contractor is responsible for anticipating and managing all aspects associated with any VECP design work that must be performed by a licensed Engineer.
- b. The Contractor's engineer must analyze and stamp all components of any aspect of the project that has been redesigned, changed, or altered as a result of this VECP.
- c. The Contractor's engineer shall provide all calculations and supporting design/engineering documentation that was utilized to develop the changes and stamped drawings. These will be used by MassDOT's Designer-of-Record to review the VECP changes. The Contractor is limited to selecting only those engineer's that have been pre-qualified by MassDOT's A&E Board.
- d. MassDOT's Designer-of-Record will review and respond to all completed design submissions related to this VECP within thirty (30) calendar days, unless determined to be a non-critical path item.
- e. MassDOT will be responsible for estimating and managing MassDOT's Designer-of-Record during the VECP review and implementation. Should any significant conflicts arise, between the Contractor's Engineer and MassDOT's Designer-of-Record, the DOT and the Contractor will work expeditiously to resolve the conflict. Should this type of conflict continue for greater than five (5) days, the Contractor is to bear all financial and time related impacts of such delay and must seek to resolve the design conflict, in an acceptable manner to MassDOT. The resolution of this conflict will be funded at the Contractor's expense – exclusive of the net saving that was agreed to at the execution of the contract modification for this VECP.
- f. The Contractor's Engineer may also be required to inspect the construction work. The Contractor is to include such anticipated inspection costs in the initial VECP.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

- g. MassDOT's Designer of Record will remain the Designer-of-Record for the entire Project. Any costs incurred in the use of MassDOT's Designer-of-Record by MassDOT or Contractor associated with the review of a VECP are to be included in the calculated net savings.
- C. Approval of the VECP shall not occur until a Contract Modification, incorporating the VECP, is issued by MassDOT and properly executed by the Contractor. MassDOT may accept or reject part or all of any VECP at any time prior to an executed Contract Modification for the applicable VECP. The decision of MassDOT, concerning acceptance or rejection of any VECP, shall be final and shall not be subject to dispute resolution.

It is expected that several weeks may go by before the final VECP documentation has been executed with a Contract Modification. Therefore, MassDOT intends to make certain that the initial cost estimate information has not changed before entering into a Contract Modification. As the VECP evaluation process is finalized, and prior to the signed Contract Modification for the VECP, the Contractor and MassDOT must re-certify the current status of the originally proposed cost and/or schedule savings.

Until a contract modification is issued and schedule and cost/savings re-certification is complete and accepted by MassDOT, the Contractor shall remain obligated to perform the Work in accordance with the terms and conditions of the original Contract Documents.

Upon completion of the work associated with the VECP, MassDOT may require verification that the VECP savings has been achieved.

- D. VECPs will be processed (distributed, reviewed, commented upon, accepted or rejected) expeditiously (pursuant to M.G.L. c. 30, § 39R); however, as this is an elective modification to the contract, MassDOT shall not be liable for any delay or cost in the review and acceptance of the VECP. During the review of the VECP, the Contractor remains obligated to progress the original Contract scope, and schedule, as planned; until a Contract Modification, accepting the Contractor re-certified VECP, has been executed by MassDOT.

The Contractor has the right to withdraw part, or all of any VECP, prior to acceptance by MassDOT. Such withdrawal shall be made in writing to the Engineer. The Contractor shall state the period of time, from the date of the initial VECP submittal, that the VECP shall remain valid and feasible. Revision of this validity and feasibility period shall be allowed only by mutual agreement of the Contractor and the Engineer in writing.

If the Contractor desires to withdraw the proposal prior to the expiration of this period for non-technical reason, MassDOT reserves the right to recover all actual costs that have been incurred to MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

If the Contractor withdraws the VEC Proposal, MassDOT reserves the right to proceed with the VECP or any portion of the VECP as a normal change and the Contractor waives any right it may have had to share in net savings thereunder.

For purposes of this provision, expiration of the time established by the Contractor for approval shall be considered as withdrawal by the Contractor if MassDOT requests an extension of that time and the Contractor does not provide a written extension.

- E. With regard to unknown conditions or sub-surface work, in general, the expectation is that the Contractor and MassDOT will strive to gain enough knowledge about the risks in order to provide a forward-priced Change Proposal. Therefore, any costs to fully evaluate the proposal, such as additional borings and/or test pits, must be considered in the cost evaluation of whether the VECP is worth pursuing. However, if it is impractical to gather conclusive exploratory information, before the VECP is executed, MassDOT may consider provisions in the VECP that clearly identifies the risk sharing (cost and time) related specifically to the unknown/sub-surface conditions. If these VECP provisions are acceptable to MassDOT they are to include supplemental language to provide a determination of the final savings/cost, and time impacts, no later than 45 days after the sub-surface work is completed. All other aspects of the VECP, unrelated to these Provisions, will be binding upon execution of the VECP.

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.

NOTICE TO OWNERS OF UTILITIES

(Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of public or private utilities, of his/her intention to commence operations affecting such utilities at least one week in advance of the start of such operations. The Contractor shall at the same time file a copy of said notice with the Engineer.

A list of public and private utilities can be found on the MassDOT website at:
<https://www.mass.gov/info-details/utility-contacts-by-district-and-municipality>

Select District 2,
Select the Town of **WARE** and then locate the utility.

NOTICE TO OWNERS OF UTILITIES (Continued)

Following are the names and addresses of the companies or agencies that may be affected, but the completeness of the list is not guaranteed:

<u>District Utility/Constructability Engineer</u> Paul Kelly (857) 368-2066 Paul.Kelly@dot.state.ma.us	<u>Ware DPW (Water & Sewer)</u> Gilbert St. George-Sorel 4 1/2 Church Street Ware, MA 01082 (413) 967-9620
<u>Verizon</u> Karen Mealey 385 Myles Standish Blvd. Taunton, MA 02780 (774) 409-3160 karen.m.mealey@verizon.com	<u>National Grid Electric</u> Sandra Annis 548 Haydenville Road Leeds, MA 01053 (413) 582-7424 sandra.annis@nationalgrid.com
<u>Comcast Cable Corporation</u> Wendy Brown P.O. Box 6505, 5 Omni Way Chelmsford, MA 01824 (978) 848-5163 Wendy_Brown@comcast.com	<u>Local Linx</u> Jason Wing 30 Elmview Circle Dover, NH 03820 (403) 538-4545 jason.wing@locallinx.com
<u>Ware Fire Department (Fire Alarm)</u> Chief Thomas Coulombe 200 West Street Ware, MA 01082 (413) 967-5901	<u>Pioneer Valley Transit Authority</u> Sandra Sheehan, PVTA Administrator (413) 732-6248 ext. 2216 ssheehan@pvta.com

NATIONAL GRID EMERGENCY TELEPHONE NUMBERS
ELECTRIC:

Outage/ Emergency: 1-800-465-1212

New Service: 1-800-375-7405

Customer Support: 1-800-322-3223

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.

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.

PROPRIETARY PRODUCTS

A letter discussing ‘Eagle model 1656, 55-gallon HDPE drum with plastic lever-lock cover’ as a proprietary specification pursuant to M.G.L. c. 30, § 39M(b) has been filed with MassDOT.

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 3.9 Million 18-kip (80-kn) ESALs.

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.

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.

SUBSECTION 8.14 (Continued)**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.

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.

SUBSECTION 8.14 (Continued)

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.

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.

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

ITEM 114.1**DEMOLITION OF SUPERSTRUCTURE OF
BRIDGE NO. W-05-015****LUMP SUM**

The work under this item shall conform to the relevant provisions of Subsection 112 of the Standard Specifications and the following:

The work under this Item includes demolition, removal, and the satisfactory legal disposal of the superstructure of Bridge No. W-05-015, including but not limited to the existing steel beams, diaphragms, and bearings; reinforced concrete deck, sidewalk, and safety curbs; bridge railings; wearing surface; all other non-hazardous materials above the existing bridge seats; and all other related superstructure elements during all construction stages and as shown on the Plans and/or as directed by the Engineer and to the satisfaction of the Engineer.

Demolition of the existing superstructure shall be completed in phases to accommodate the phased construction of the new bridge structure, as shown on the Plans.

CONSTRUCTION METHODS

The Contractor shall perform all work in such a manner as to maintain the safety of traffic and pedestrians in the vicinity of the job site during all construction stages. The Engineer may reject the use of any method or equipment that causes excessive vibration or damage to the existing or proposed structures.

The contractor is responsible for supporting, stabilizing, and bracing all partially demolished elements to remain during phased construction, as needed and as required by the Contractor's design to ensure required stability to support pedestrian and traffic loads on the bridge during construction.

Existing deck slab shall be vertically saw cut to create a clean edge along the limit of demolition in conformance with the construction stages.

Saw cutting of concrete related to this item and necessary to complete this work shall be considered incidental to this Item 114.1. The Contractor shall prevent damage to the existing reinforcing steel where saw cutting of concrete is required under this item. The Contractor shall thoroughly clean the interface at the existing concrete to remain of all debris and other materials of a corrosive nature.

Saw cutting of concrete related to Item 127.1 shall not be included as incidentals to this Item 114.1.

The Contractor shall take care not to damage the existing deck slab, reinforcing steel, steel beams, diaphragms, and any other part of the superstructure that is to remain and be used during phase construction. The Contractor shall limit equipment to be used and develop his means and methods such that the partial demolition and selective removal during phase construction do not extend beyond the removal limits shown on the Plans.

ITEM 114.1 (Continued)

During the prosecution of this work, the Engineer may reject use of any method or equipment which may cause undue vibration and/or potential damage to the portions of the existing structure that is identified to remain during demolition and/or phase construction operations. The use of explosives to accomplish any aspect of the demolition work will not be allowed. The Contractor is cautioned to use extreme care so as not to damage portions of the existing structure to remain. Any items damaged, or otherwise deemed unsuitable for continued use during phase construction as a result of the Contractor's operations, the items shall be repaired, braced, and/or replaced by the Contractor at the contractor's own expense, as directed by the Engineer and to the satisfaction of the Engineer at no cost to the Engineer.

The Contractor shall protect and/or relocate all utilities prior to any demolition and phase construction activities and as shown on the plans. The Contractor shall take necessary precautions to protect existing utilities from damage during his operations. Additionally, the Contractor shall temporarily support, remove and/or relocate existing utilities and coordinate with utility owners as necessary to complete the work as shown on the Plans.

Materials removed under Item 114.1, shall become the property of the Contractor and shall be removed from the job site and legally disposed of. The Contractor shall legally dispose of the demolition materials.

MassDOT does not guarantee or represent that the bridge materials will actually coincide with nay descriptions contained herein or represented on the Plans. The contractor shall satisfy himself by his own investigation and research regarding all conditions and materials affecting the work to be done. No other compensation, other than the lump sum price bid for this item, shall be made if the materials or work proves to be different from that inferred or described herein, or shown on any Plans.

SUBMITTALS

The Contractor shall design and submit a demolition plan to the Engineer for review and approval, indicating his proposed demolition procedures and methods to be used including but not limited to: design calculations, equipment, tools, devices, crane capacity and location, barge sizes and location, schedule of operations, methods of utility protection, methods of preventing any debris resulting from demolition, excavation or construction from falling into the river. The requirements for equipment and all procedures utilized shall be in conformance with the intent of the current edition of LRFD Specifications for Highways and Bridges by AASHTO.

The Contractor's submittal of demolition procedures and methods, including calculations and drawings, shall be designed and stamped by a Professional Structural Engineer licensed registered in the Commonwealth of Massachusetts certifying that all existing structural members have sufficient capacity to support the proposed construction loads, pedestrian and vehicular loads and traffic, and are suitably braced and supported throughout the demolition and phase construction operations. Work under this item may not commence until the Engineer has given written approval. Payment for the Contractor's design and submittal including contractor's engineering services shall be considered incidental to this item and no further compensation will be allowed.

ITEM 114.1 (Continued)**BASIS FOR PARTIAL PAYMENT**

Item 114.1 will be paid for at the Contract Lump Sum price for the demolition of the bridge superstructure, which price shall include full compensation for all labor, tools, equipment, materials, sawcutting, and incidental costs required to complete the work, including any required field survey, as described herein and as required by the Engineer.

The contractor will make his own investigation of the structure to be demolished including the materials that are part of, or may be stored in, the structure. No increase will be made to the bid price due to the nature of the materials involved in the demolition. All costs for permits, dump fees, taxes, special handling of hazardous materials, and all incidental costs required to complete the work shall be included in the bid price of the demolition item.

Within ten (10) days after the notice to proceed of the Contract, the Contractor shall submit, in duplicate, for the review and approval of the Engineer, a schedule of the Demolition of Superstructure of Bridge No. W-05-015.

The cost of labor and materials for any item not listed but required to complete the work shall be considered incidental to Item 114.1 without additional compensation.

Payment shall be made based upon the following percentages: 10% upon approval of design, 40% upon completion of Phases 1A/1B to the satisfaction and approval of the Engineer, and 50% upon completion of Phases 2A/2B, as required and approval by the Engineer.

ITEM 127.1**REINFORCED CONCRETE EXCAVATION****CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsections 112, 120, 140, and 950 of the Standard Specifications and the following:

The work under this item includes the reinforced concrete excavation and removal, except for portions designated to remain, of the following substructure elements of the existing Route 32 (Palmer Road) bridge over Ware River, Bridge No. W-05-015 during all construction stages and as shown on the Plans and/or as directed by the Engineer:

- 1) Existing reinforced concrete abutments and wingwalls, including the entirety of all stems and footings.
- 2) Existing reinforced concrete piers, including complete and/or partial demolition of stems and pile caps, as required. All existing piers shall be demolished to a depth of 3'-0" below the river bed, as shown on the Plans. The portions of the existing piers at depths greater than 3'-0" below the river bed shall remain in place.

Demolition of the existing abutments and piers shall be completed in phases to accommodate the phased construction of the new bridge structure, as shown on the Plans.

CONSTRUCTION METHODS

The Contractor shall perform all work in such a manner as to maintain the safety of traffic and pedestrians in the vicinity of the job site during all construction stages. The Engineer may reject the use of any method or equipment that causes excessive vibration or damage to the existing or proposed structures.

The contractor is responsible for supporting, stabilizing, and bracing all partially demolished elements to remain during phased construction, as needed and as required by the Contractor's design to ensure required stability to support pedestrian and traffic loads on the bridge during construction.

Existing abutments and piers shall be vertically saw cut to create a clean edge along the limit of demolition. Saw cutting of concrete related to this item and necessary to complete this work as indicated on the Plans and/or as directed by the Engineer, including but not limited to the existing reinforced concrete abutments, wingwalls, and piers shall be considered incidental to this Item 127.1.

The Contractor shall prevent damage to the existing reinforcing steel where saw cutting of concrete is required under this item. The Contractor shall thoroughly clean the interface at the existing concrete to remain, or to remain to be used during phase construction, of all debris and other materials of a corrosive nature.

ITEM 127.1 (Continued)

The Contractor shall take care not to damage any part of the substructure that is to remain and/or used during phase construction. The Contractor shall limit equipment to be used and develop his means and methods such that the partial demolition and selective removal during phase construction do not extend beyond the removal limits shown on the Plans.

During the prosecution of this work, the Engineer may reject use of any method or equipment which may cause undue vibration and/or potential damage to the portions of the existing structure that is identified to remain during demolition and/or phase construction operations. The Contractor is cautioned to use extreme care so as not to damage portions of the existing structure to remain. Any items damaged, or otherwise deemed unsuitable for continued use during phase construction as a result of the Contractor's operations, the items shall be repaired, braced, and/or replaced by the Contractor at the contractor's own expense, as directed by the Engineer and to the satisfaction of the Engineer at no cost to the Engineer.

The Contractor shall protect and/or relocate all utilities prior to any demolition and phase construction activities and as shown on the plans. The Contractor shall take necessary precautions to protect existing utilities from damage during his operations. Additionally, the Contractor shall temporarily support, remove and/or relocate existing utilities and coordinate with utility owners as necessary to complete the work as shown on the Plans.

SUBMITTALS

The Contractor shall design and submit a plan to the Engineer for review and approval, indicating his proposed procedures and methods to be used including but not limited to: design calculations, equipment, tools, devices, crane capacity and location, barge sizes and location, schedule of operations, methods of utility protection, methods of preventing any debris resulting from demolition, excavation or construction from falling into the river. The requirements for equipment and all procedures utilized shall be in conformance with the intent of the Standard Specifications for Highways and Bridges by AASHTO.

The Contractor's submittal of reinforced concrete excavation, procedures, and methods, including calculations and drawings, shall be designed and stamped by a Professional Structural Engineer licensed registered in the Commonwealth of Massachusetts certifying that all existing structural members have sufficient capacity to support the proposed construction loads, pedestrian and vehicular loads and traffic, and are suitably braced and supported throughout the reinforced concrete excavation, demolition and phase construction operations. Work under this item may not commence until the Engineer has given written approval. Payment for the Contractor's design and submittal including contractor's engineering services shall be considered incidental to this item and no further compensation will be allowed.

ITEM 127.1 (Continued)**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 127.1 will be measured and paid for at the Contract unit price per Cubic Yard, which price bid shall include full compensation for all labor, tools, equipment, materials, sawcutting, proper disposal of excavated materials, and incidental costs required to complete the work as described herein and as required by the Engineer.

Demolition of the existing superstructure of the Route 32 (Palmer Road) bridge (Bridge No. W-05-015), including demolition of the existing steel beams and bearings; reinforced concrete deck, sidewalk, and safety curbs; bridge railings; wearing surface; and all other non-hazardous materials above the existing bridge seats shall be paid for under the Lump Sum Price for Item 114.1, Demolition of Superstructure of Bridge No. W-05-015.

ITEM 127.4 **REINFORCED CONCRETE DECK EXCAVATION** **SQUARE YARD**
(FULL DEPTH)**ITEM 127.41** **REINFORCED CONCRETE DECK EXCAVATION** **CUBIC YARD**
(PARTIAL DEPTH)

The work under these Items shall conform to the relevant provisions of Subsections 120 and 482 of the Standard Specifications and the following:

The work under these Items shall consist of full and/or partial depth removal and satisfactory disposal of all disintegrated or otherwise unsatisfactory reinforced concrete from the bridge deck.

The intent of these items is for repair of the existing bridge deck on the portion of the bridge designated to carry traffic for the Phase 1 demolition/construction. The repairs shall be undertaken and completed by the Contractor and accepted by the Engineer prior to shifting all traffic to that portion of the structure for Phase 1. Additional repairs may be designated by the Engineer at any time during the project until the portion of the structure relying on the repaired area(s) is no longer subject to traffic or construction loading or is demolished. All repair areas shall be maintained for as long as still in use and until authorized by the Engineer to abandon and/or demolish.

The MassDOT Resident Engineer will identify the need, location, and extents for deck repairs under these items and direct the Contractor in the performance of the repairs.

Traffic Control and protection shall conform to MassDOT and MUTCD standards and as directed by the Engineer.

Special lifting equipment may be required to place shielding for the assigned bridge repair work. Any equipment necessary to erect forms shall be incidental to the relevant items: 127.4, and 127.41.

Prior to excavation, the Contractor shall cover all drainage structures that may be affected by the work. The structures shall remain covered until the new concrete has set and the area has been cleaned.

The Contractor shall take all precautions necessary not to damage that portion of the deck, including reinforcing steel, which is to remain. This includes determining the concrete cover to the steel bars at the edge of each patch prior to excavating concrete.

The edges of all areas where concrete is removed under Items 127.4, and 127.41 shall be cut to neat lines by saw cutting or by methods approved by the Engineer, to a depth of 1 inch, and all costs in connection with such work shall be incidental to the pertinent item. Patch areas shall be made rectangular in shape [as much as possible], with horizontal and vertical edges and square corners.

ITEMS 127.4 and 127.41 (Continued)

In case the reinforcing bars are exposed, the minimum depth of all cement concrete areas to be excavated shall be one (1) inch below the bottom of the top layer of longitudinal reinforcing steel throughout the entire excavated area. No concrete shall be placed until approval of the Engineer is given.

Surface preparation and concrete removal equipment shall be of the following types:

Pneumatic and Power-Driven Chipping Hammers: In no event shall any pneumatic or power hammer weighing in excess of twenty-five (25) pounds be used for the removal of concrete. The Contractor will be restricted to fifteen (15) pound chipping hammers when work involves removing concrete from below any reinforcing bar.

Abrasive Blasting Equipment: Abrasive blasting equipment shall be capable of removing rust and old concrete from exposed reinforcing steel when deemed necessary by the Engineer.

During the prosecution of this work, the Engineer may reject the use of any method or equipment which causes undue vibration or possible damage to the structure or any part thereof.

Bobcats/Skid Steers will be allowed only to collect debris from the deck surface and will not be allowed to remove concrete from the patch area. All concrete debris shall be removed by hand or by using hand tools. The smaller pieces may be blown out using an oil free compressed air after first being wetted with water to control airborne particulates.

Also, included under these Items are all costs in connection with the cleaning, cutting, and bending of the existing reinforcing steel designated to be retained in the proposed construction. Any existing reinforcing steel damaged or otherwise made unsatisfactory for continued use as a result of the Contractor's operations shall be replaced at the Contractor's expense. All reinforcing steel with active rusting encountered in the excavation shall be thoroughly cleaned by abrasive blasting and coated with a zinc-rich primer conforming to MassDOT Spec. No. M7.04.11 or as directed by the Engineer. Any reinforcing steel that is unsuitable for further use through no fault of the Contractor shall be replaced. All reinforcing steel that is loose shall be tied tightly together using wire ties. Ties are required at every other intersection of transverse and longitudinal reinforcing.

Temporary Protective Shielding must be used on bridges over the waterway during full depth excavation and when, in the opinion of the Engineer, there is the possibility of dislodging concrete from the bottom of the deck.

Immediately before placement of new concrete, the exposed area to be patched shall be free of foreign materials. These materials shall be removed by abrasive blasting and by use of oil free compressed air. No grease, dust, rust, or laitance will be allowed to remain on reinforcing steel and exposed concrete surfaces.

ITEMS 127.4 and 127.41 (Continued)

The Contractor shall take all measures necessary to protect pedestrians, vehicular traffic, and the waterway below from the construction operations. No debris, tools, or incidental equipment of any kind will be permitted to fall into areas where vehicular or pedestrian traffic exists. Any material that accidentally falls into such areas shall be removed immediately.

All excavated materials shall become the property of the Contractor and shall be removed from the job site.

METHOD OF MEASUREMENT

Items 127.41 will be measured for payment by the Cubic Yard, complete in place.

Item 127.4 will be measured for payment by the Square Yard, complete in place.

BASIS OF PAYMENT

Item 127.41 will be paid at the Contract unit price per Cubic Yard.

Item 127.4 will be paid at the Contract unit price per Square Yard.

The quantity paid for these Items shall be the actual area or volume excavated to be removed and properly disposed according to all city, town, State and Federal rules, regulations, and requirements and as required by the Engineer.

Items 127.4 and 127.41 will compensate the contractor for excavation performed on the bridge deck (full depth or partial).

Payment for Reinforcing Steel shall be made per the Unit Bid Price for sub-item 910.1 within item 995.01

Payment for Temporary Protective Shielding shall be made and included under Item 994.01.

The cost for the removal of hot mix asphalt and any membrane waterproofing above the area of reinforced concrete excavation shall be made under Item 129.6.

The Contract unit prices shall include all labor, tools, and equipment, all saw cutting and incidental costs required to complete the work as required by the Engineer.

ITEM 129.6**BRIDGE PAVEMENT EXCAVATION****SQUARE YARD**

The work under this Item shall conform to the relevant provisions of Subsection 120 of the Standard Specifications and the following:

The work under this Item shall consist of the removal and satisfactory disposal of the existing hot mix asphalt pavement and membrane waterproofing to the top of the existing bridge deck as required by the Engineer as required to facilitate concrete deck excavation and repairs under Items 127.4, 127.41 and 909.5

The edges of all areas where existing asphalt is removed under this Item shall be sawcut to a depth of 1 inch, and all costs in connection with such work shall be considered as incidental to this Item.

The Contractor should be required to submit to the Engineer for approval the type of machine that will be used. Any damage to the deck shall be repaired at the Contractor's own expense.

METHOD OF MEASUREMENT

Item 129.6 will be measured for payment by the Square Yard of actual area of the existing HMA pavement excavated, removed, and properly disposed.

BASIS OF PAYMENT

Item 129.6 will be paid at the Contract unit price per Square Yard of the actual area of the existing HMA pavement excavated, removed, and properly disposed as required by the Engineer. The Contract price shall include all labor, tools, equipment, sawcutting, and incidental costs required to complete the work as required by the Engineer.

ITEM 153. **CONTROLLED DENSITY FILL - EXCAVATABLE** **CUBIC YARD**

The work performed under this item shall include placing anti-seepage collars on pipes in proximity to the proposed infiltration basin as noted on the Plans.

MATERIALS

Controlled density fill – excavatable shall conform to Section M4.08.0, category 2E of the Standard Specifications.

METHOD OF MEASUREMENT

Controlled density fill – excavatable will be measured for payment by the Cubic Yard, complete in place.

BASIS OF PAYMENT

Controlled density fill – excavatable will be paid for at the Contract Unit Price per Cubic Yard, which price shall include the costs of all labor, tools, materials, equipment, and incidental costs required to complete the work.

ITEM 156.01 **CRUSHED STONE FOR INTEGRAL ABUTMENTS** **TON**

The work under this Item shall conform to the relevant provisions of Subsections 150 of the Standard Specifications and the following:

The work shall include placing crushed stone at the integral abutments to the limits shown on the Plans.

MATERIALS

The crushed stone shall conform to Section M2.01.6 of the Standard Specifications.

METHOD OF MEASUREMENT

Crushed stone for integral abutments will be measured for payment by the Ton, complete in place.

BASIS OF PAYMENT

Crushed stone for integral abutments will be paid for at the Contract Unit Price per Ton, which price shall include the costs of all labor, tools, materials, equipment, and incidental costs required to complete the work.

ITEM 156.5**CRUSHED STONE FOR FILTER BLANKET****CUBIC YARD**

The work under this Item shall conform to the relevant provisions of Subsections 150 of the Standard Specifications and the following:

The work shall include placing crushed stone below the riprap aprons at both abutments and at the center pier to the limits shown on the Plans.

MATERIALS

The crushed stone, between 3/8" and 1 1/2" in size, shall conform to Section M2.01.0 of the Standard Specifications.

METHOD OF MEASUREMENT

Crushed stone for filter blanket will be measured for payment by the Cubic Yard, complete in place.

BASIS OF PAYMENT

Crushed stone for filter blanket will be paid for at the Contract Unit Price per Cubic Yard, which price shall include the costs of all labor, tools, materials, equipment, and incidental costs required to complete the work.

ITEM 157.1**GABIONS****CUBIC YARD**

Under this item the Contractor shall furnish, assemble, and fill with stones galvanized coated steel wire mesh baskets of approved sizes. The sizes shall be as specified on the plans, manufactured in accordance with these specifications and placed in accordance with the lines, grades and dimensions as shown on the plans or as required by the engineer. The assembly and erection of gabions shall be conducted in accordance with the manufacturer's instructions and in accordance with ASTM A975-97.

Gabion Fabrication:

Gabions shall be manufactured in such a manner that their sides, ends, lids and diaphragm(s) can be assembled to form rectangular units of specified dimensions.

Gabions shall be of a single unit construction. The front, base, back and lid shall be woven into a single unit. The ends and diaphragm(s) shall be factory connected to the base.

All perimeter edges of the mesh forming the gabion shall be securely selvedge so that the joints obtained have at least the same strength as the wire mesh itself.

MATERIALS**Gabions:**

1. Mesh: Mesh openings shall be hexagonal in shape, mesh type 8 x 10 with a nominal width opening of approximately 2 inches. All dimensions are subject to a tolerance limit of 5% of the manufacturer's specified sizes.
2. Mesh Joints: All joints shall be flexible and double twisted to prevent unraveling.
3. Galvanizing: All steel wire used shall be zinc coated (galvanized) in accordance with ASTM A641, Class III soft temper coating. The adhesion of zinc coating shall be such that when the wire is wrapped six turns around a mandrel having four times the diameter of the wire, it does not flake or crack when rubbing it with the bare fingers in accordance with ASTM A641.
Wire: All wire used for the manufacture of gabions and the lacing wire shall have maximum tensile strength of 75,000 psi in accordance with ASTM A641. The nominal diameter of the steel wire mesh shall be 0.120 in. after zinc coating and an overall nominal diameter of 0.153 in.
4. Elongation shall not be less than 12%, in accordance with ASTM A370-97a and the test must be carried out on a sample at least 12 in. long.
5. Selvedge Wire: The nominal diameter of the selvedge wire, running through all the edges (perimeter wire), shall be 0.153 in. after zinc coating.
6. Lacing Wire: The nominal diameter of the wire, necessary for assembling and lacing the gabion units, shall be 0.087 in. after zinc coating.
7. Geotextile Fabrics: Geotextile fabric used to wrap rock-filled wire baskets.
8. Stone: Gabion units shall be filled with stone conforming to the requirements of Subsection M2.01.0. and shall be uniformly blended according to the grading requirements for the respective stone sizes shown in the following table.

ITEM 157.1 (Continued)TABULATION OF STONE SIZES
PASSING SQUARE OPENING SIEVE BY WEIGHT

Square Opening Sieve	% Passing by Weight
8"	100
7"	90-100
6"	24-50
5"	0-15
4"	0-5

CONSTRUCTION

1. Assembling: Single gabion shall be removed from the bundle, unfolded flat on the ground and all kinks and bends flattened.

The gabion units shall then be assembled individually, by erecting the sides (front and back), ends and diaphragm(s) ensuring that all creases are in the correct position and the tops of all sides are level.

The four corners of the gabion unit shall be laced first, followed by the edges of internal diaphragm(s) to the sides.

2. Lacing Procedure: The assembled gabion unit shall be carried on the job site and placed in the proper location. For structural integrity, all adjoining empty gabions shall be laced along the perimeter of their contact surfaces in order to obtain a monolithic structure. Once the gabion units are laced together they shall be stretched to effective alignment. This operation shall be carried out after several empty gabion units have been positioned. The first gabion in the line shall be partially filled to provide the necessary anchorage.

While under tension, the gabion joints shall be carefully controlled against any possible unraveling.

3. Filling: Gabion units shall be filled with stone. Gabions may be filled by construction equipment suitable for this purpose. Care shall be taken when placing fill material to assure that the sheathing on PVC coated gabions will not be broken or damaged.

Gabions shall be filled in three layers, one foot at a time. Two bracing-connecting wires shall be placed between each layer in all cells along each face of the gabion structure cell. All bracing connecting wires shall be looped around two mesh openings and the wire terminals shall be securely twisted to prevent their loosening.

The cells in any row shall be filled in stages so that local deformation may be avoided. That is, at no time shall any cell be filled to a depth exceeding one foot more than the adjoining cell.

ITEM 157.1 (Continued)

Along all exposed gabion faces, the outer layer of stone shall be carefully placed and packed by hand, in order to ensure proper alignment and a neat, compact, square appearance.

The last layer of stone shall be leveled with the top of the gabion to allow proper closing of the lid and provide an even surface for the next course.

The Contractor shall place backfill along the gabion walls simultaneously with the gabion filling operation.

All packed stone filled gabions experiencing bulging, kinks, untied lacing wires, untied bracing connecting wires and/or broken wires shall not be used by the Contractor in the final erection of the gabion wall and the Contractor shall not be compensated for unaccepted gabion units.

4. Lid Closing: The lids shall be stretched tight over the stone fill, using crow bars or lid closing tools, until the lid touches the perimeter edges of the front and end panels.

The lid shall be then tightly laced along all edges, ends and diaphragm(s) in the same manner as described above for assemblies.

5. Cutting and Folding Mesh: Where shown on the drawings or otherwise directed by the Engineer, the gabion mesh shall be cut, folded and wired together to suit existing site conditions. The mesh must be cleanly cut and the surplus mesh cut out completely, or folded back and neatly wired to an adjacent gabion face. The cut edges of the mesh shall be securely laced together with lacing wire to the manner described above for assembling.

The assembling, installation, filling and lid closing of the reshaped gabions shall be carried out as specified in 1 through 4 above.

METHOD OF MEASUREMENT

Gabions will be measured for payment by the CUBIC YARD complete in place.

BASIS OF PAYMENT

Gabions will be paid for at the Contract unit price per CUBIC YARD; which price shall be full payment for all materials, equipment, labor, hauling, stockpiling, placing of stone, gabion manufacturer requirements.

ITEM 180.01 ENVIRONMENTAL HEALTH AND SAFETY PROGRAM LUMP SUM

The work shall consist of ensuring the health and safety of the Contractor's employees and subcontracting personnel, the Engineer, their representatives, the environment, and public welfare from any on-site chemical contamination present in air, soil, water and sediment.

The Contractor shall prepare and implement a site-specific Environmental Health and Safety Plan (EHASP) which has been approved and stamped by a Certified Industrial Hygienist (CIH) and includes the preparer's name and work experience. The EHASP shall include appropriate components required by OSHA Standard 29 CFR 1910.120(b) and the Massachusetts Contingency plan (MCP) 310 CMR 40.0018 and must comply with all applicable state and federal laws, regulations, standards and guidelines, and provide a degree of protection and training appropriate for implementation on the project. The EHASP shall be a dynamic document with provision for change to reflect new information, new practices or procedures, changing site environmental conditions or other situations which may affect site workers and the public. The EHASP shall be developed and implemented independently from the standard construction HASP required to work on all MassDOT construction projects.

Health and safety procedures provided by the Contractor shall comply with all the appropriate regulations that address employee working conditions, including but not limited to standards established by OSHA and National Institute for Occupational Safety and Health (NIOSH). Equipment used for the purpose of health and safety shall be approved by and meet pertinent standards and specifications of the appropriate regulatory agencies.

A copy of the most up-to-date version of the EHASP shall be maintained on-site at all times by the Contractor. The on-site copy shall contain the signature of the Engineer and each on-site employee of the MassDOT, Contractor, and Subcontractors involved with on-site activities. The employee's signature on the EHASP shall be deemed prima facie evidence that the employee has read and understands the plan. Updated copies of signature sheets shall be submitted to the Engineer.

The EHASP shall specify a Contractor Site Safety and Health Officer responsible for implementation of the EHASP and to oversee all construction activities, including handling, storage, sampling and transport, which require contact with or exposure to potentially hazardous materials.

The level of protection, required to ensure the health and safety of on-site personnel will be stipulated in the EHASP. The Site Safety and Health Officer shall implement the EHASP based on changing site and weather conditions, type of operation or activity, chemical compounds identified on-site, concentration of the chemicals, air monitoring data, physical state of the hazardous materials, potential duration of exposure to hazardous materials, dexterity required to perform work, decontamination procedures, necessary personnel and type of equipment to be utilized.

ITEM 180.01 (Continued)

During implementation of the EHASP, a daily log shall be kept by the Site Safety and Health Officer and a copy shall be provided weekly to the Engineer. This log shall be used to record a description of the weather conditions, levels of personal protection being employed, screening data and any other information relevant to on-site environmental safety conditions. The Site Safety and Health Officer shall sign and date the daily log.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Preparation and implementation of the Environmental Health and Safety Program, including the monitoring, protection and storage of all contaminated materials, as well as subsequent modifications to the EHASP, will be measured and paid for at the Lump Sum Bid Price.

Payment of 50% of the Environmental Health and Safety Program contract price will be made upon the initial acceptance of the EHASP by the Engineer. Payment of the remaining 50% of the Environmental Health and Safety Program contract price will be made upon completion of the work. The bid price shall include preparation and implementation of the EHASP as well as the cost for its enforcement by the Site Safety and Health Officer along with any necessary revisions and updates. The work of implementing the Environmental Health and Safety Program includes work involving, but not limited to, the monitoring, protection, and storage of all contaminated materials.

ITEM 180.02**PERSONAL PROTECTION LEVEL C UPGRADE****HOURLY**

The work shall consist of providing appropriate personal protective equipment (PPE) for all personnel in an area either containing or suspected of containing a hazardous environment.

Contingencies for upgrading the level of protection for on-site workers will be identified in the EHASP and the Contractor shall have the capability to implement the personal protection upgrade in a timely manner. The protective equipment and its use shall be in compliance with the EHASP and all appropriate regulations and/or standards for employee working conditions.

Personal Protection Level C Upgrade will be measured and paid only upon upgrade to Level C and will be at the Contract unit price, per Hour, per worker, required in Level C personal protection. No payment will be made to the Contractor to provide Level D PPE.

ITEM 182.1**INSPECTION AND TESTING FOR ASBESTOS****LUMP SUM**

The work shall include the inspecting and testing of all materials suspected of containing asbestos. When any demolition is required to enable the inspection and testing of the suspected material it will be considered incidental to this Item and the Contractor must perform all asbestos handling and testing in accordance with the regulations stated below.

Dust suppression in the form of light water sprays, foams, dust suppressants and calcium chloride will be implemented as required to control dusting during any disturbance of asbestos suspected material. Alternatively, intrusive activities may be reduced or curtailed under high wind or heavy rain conditions, which in the opinion of the Health and Safety Plan (HASP) may pose a safety hazard to the workers.

The Contractor shall employ the services of a Massachusetts licensed "Asbestos Inspector" to inspect the material to determine whether or not "ITEM 182.2 REMOVAL OF ASBESTOS" is required. Should the asbestos inspector determine laboratory testing is required, a state certified laboratory shall be used to perform all necessary tests.

REGULATIONS

U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA) including but not limited to:

- 29 CFR 1910 Section 1001 and 29 CFR 1926 Section 58 Occupational exposure to Asbestos, Tremolite, Anthophyllite and Actinolite, Final Rule
- 29 CFR 1910 Section 134 Respiration Protection
- 29 CFR 1926 Construction Industry
- 29 CFR 1910 Section 2 Access to Employee Exposure and Medical Records
- 29 CFR 1910 Section 1200 Hazard Communication
- 29 CFR 1910 Section 145 Specifications for Accident Prevention Signs and Tags

U.S. Environmental Protection Agency, (EPA) including but not limited to:

- 40 CFR 762, CPTS 62044, FRL 2843-9, Federal Register Vol. 50 no.134, July 12, 1985 p.28530 - 28540 Asbestos Abatement Projects Rule
- 40 CFR 61 Subpart A Regulation for Asbestos
- 40 CFR 61 Subpart M (Revised Subpart B) National Emission Standard for Asbestos

U.S. Department of Transportation 49 CFR 172 and 173

Massachusetts Department of Labor Standards Regulations, (DLS) including but not limited to:

- 454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

ITEM 182.1 (Continued)

Massachusetts Department of Environmental Protection (DEP) including but not limited to (supplementing subsection 7.01):

310 CMR 7.00, Section 7.09 Odor and Dust, Section 7.10 Noise,
Section 7.15 Air Pollution Control Regulations
310 CMR 18.00 and 19.00 Solid Waste Regulations

Massachusetts Division of Industrial Safety 45 CMR 10.00

Local Requirements including but not limited to those of Health Departments, Fire Departments and Inspection Services Departments

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

Measurement and payment will be at the Contract unit price per Lump Sum for ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS as specified above including all materials, tools, equipment and labor to complete the inspecting and testing of the asbestos suspected material.

All costs in the connection with the protection of general public, private property, and all costs associated with the proper inspecting and testing of the material shall be included in the price and no additional compensation will be allowed.

ITEM 182.2**REMOVAL OF ASBESTOS****FOOT**

The work shall include the removal and satisfactory disposal of existing asbestos. The Contractor's attention is directed to the fact that existing asbestos shall be inspected and tested prior to removal, to determine if special removal and disposal is required. The Contractor shall follow all the rules and regulations stated in "ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS". If asbestos is present, the Contractor shall follow all the rules and regulations stated in the section "REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS", under this item. The Contractor should notify and coordinate his/her efforts with the proper utility accordingly.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

This section specifies the requirements for the handling and removal of asbestos containing material. The Contractor must perform all asbestos handling and removal work in accordance with these specifications and the following additional requirements.

U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA) including but not limited to:

29 CFR 1910 Section 1001 and 29 CFR 1926 Section 58
Occupational exposure to Asbestos, Tremolite,
Anthophyllite and Actinolite, Final Rule
29 CFR 1910 Section 134 Respiration Protection
29 CFR 1926 Construction Industry
29 CFR 1910 Section 2 Access to Employee Exposure
and Medical Records
29 CFR 1910 Section 1200 Hazard Communication
29 CFR 1910 Section 145 Specifications for Accident
Prevention Signs and Tags

U.S. Environmental Protection Agency, (EPA) including but not limited to:

40 CFR 762, CPTS 62044, FRL 2843-9, Federal Register Vol. 50 no.134,
July 12, 1985 p.28530 - 28540 Asbestos Abatement Projects Rule
40 CFR 61 Subpart A Regulation for Asbestos
40 CFR 61 Subpart M (Revised Subpart B) National Emission
Standard for Asbestos

U.S. Department of Transportation 49 CFR 172 and 173

Massachusetts Department of Labor Standards, (DLS) including but not limited to:

454 CMR 28.00 Removal, Containment and
Encapsulation of Asbestos

ITEM 182.2 (Continued)

Massachusetts Department of Environmental Protection (DEP) including but not limited to (supplementing subsection 7.01):

310 CMR 7.00, Section 7.09 Odor and Dust, Section 7.10 Noise, Section 7.15 Air
Pollution Control Regulations
310 CMR 18.00 and 19.00 Solid Waste Regulations

Massachusetts Division of Industrial Safety 45 CMR 10.00

Local Requirements including but not limited to those of Health Departments, Fire Departments and Inspection Services Departments

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

All asbestos material shall be removed and properly disposed of by a contractor or subcontractor with a current Massachusetts Abatement Contractors License issued by the Department of Labor Standards. Work shall be supervised by a competent person as required by OSHA in 29 CFR 1926 to ensure regulatory compliance. This person must have completed a course at an EPA Training Center or equivalent course in asbestos abatement procedures, have had a minimum of four years on-the-job training and meet any additional requirements set forth in 29 CFR 1926 for a Competent Person. This person must also be certified by the Commonwealth as an Asbestos Supervisor and Asbestos Project Designer as required by 454 CMR 28.00.

Asbestos removal work shall be coordinated with all other work under the contract and shall be completed prior to performing any activities which could disturb the asbestos material or produce airborne asbestos fibers.

Dust suppression in the form of light water sprays, foams, dust suppressants and calcium chloride will be implemented as required to control dusting during trenching and excavation. Alternatively, intrusive activities may be reduced or curtailed under high wind or heavy rain conditions, which in the opinion of the Health and Safety Plan (HASP) may pose a safety hazard to the workers.

NOTIFICATION AND PERMITS

The Contractor shall prepare a formal pre-notification form at least ten (10) days prior to the start of asbestos removal work. This form must be submitted to the appropriate Regional Office of the Massachusetts Department of Environmental Protection and to the U.S. Environmental Protection Agency Region I Air and Hazardous Material Division. A copy of the submitted forms must be provided to the Engineer and kept at the work site.

Prior to starting any work, the Contractor shall also obtain any required asbestos removal permit(s) from the city/town. A copy of the permit(s) must be provided to the Engineer and posted at the work site.

ITEM 182.2 (Continued)

The Contractor shall also obtain and pay all other applicable asbestos waste transportation and disposal permits, licenses and fees.

STANDARD OPERATING PROCEDURES

The standard operating procedure shall ensure the following:

1. Proper site security including posting of warning signs and restricting access to prevent unauthorized entry into the work spaces.
2. Proper protective clothing and respiratory protection prior to entering the work spaces.
3. Safe work practices including provisions for communications; exclusion of eating, drinking, smoking, or use of procedures or equipment that would in any way reduce the effectiveness of respiratory protection or other engineering controls.
4. Proper exit practices from the work space through the showering and decontamination facilities.
5. Removing asbestos containing material in ways that minimize release of fibers.
6. Packing, labeling, loading, transporting and disposing of contaminated material in a way that minimizes or prevents exposure and contamination.
7. Emergency evacuation of personnel, for medical or safety (fire and smoke) so that exposure will be minimized.
8. Safety from accidents in the work space, especially from electrical shocks, slippery surfaces and entanglements in loose hoses and equipment.
9. Provisions for effective supervision and OSHA - specified personnel air monitoring for exposure during work.

REQUIRED SUBMITTALS

The Contractor shall submit to the Engineer the following listed items at least ten (10) calendar days prior to the start of asbestos work. No asbestos removal work activities shall commence until these items are reviewed by the Engineer, unless otherwise waived. Submittals shall be clearly labeled and in sufficient detail to enable the Engineer to form an opinion as to its conformity to the specifications.

ITEM 182.2 (Continued)

1. Name, experience and DLS certification of proposed Supervisors and Foreman responsible for asbestos work.
2. Summary of workforce by disciplines and a notarized statement documenting that all proposed workers, by name, have received all required medical exams and have been properly trained and certified for asbestos removal work, respirator use and appropriate Massachusetts DLS, EPA and OSHA standards.
3. Notarized statement that workers are physically fit and able to wear and use the type of respiratory protection proposed for the project. Notarized certification signed by an officer of the abatement contracting firm that exposure measurements, medical surveillance and worker training records are being kept in conformance with 29 CFR 1926.
4. Written plan of action and standard operating procedures (HASP) to include: location and layout of decontamination areas; sequencing of asbestos work; detailed schedule of work activities by date and interface with other project activities which affect work performance; methods used to assure safety and security; worker protection and exposure monitoring; contingency and emergency evacuation procedures; detailed description of methods to be employed to control pollution; waste handling procedures.
5. Written respiratory protection program specifying level of protection intended for each operation required by the project and details of daily inspection and maintenance elements.
6. Copies of the U.S. EPA, State and local asbestos removal pre-notification forms. If applicable, lists and copies of all permits, licenses, or manifests which will be applied for and used.
7. Name, location and applicable approval certificates for primary and secondary landfill for disposal of asbestos-containing or asbestos contaminated waste. Name, address and licenses number(s) of hauler permitted to transport waste. (Submit copies of completed manifests upon disposal).

The Contractor must provide copies of daily inspection and record logs upon request of the Engineer, at any time during project. This information will include but is not limited to work area entry data, respirator inspections and maintenance, HEPA-exhaust inspections and maintenance and other work applicable activities or reports of accidents or unusual events.

ITEM 182.2 (Continued)

METHOD OF MEASUREMENT:

ITEM 182.2 will be measured by the FOOT for the complete removal and disposal of the asbestos containing material.

BASIS OF PAYMENT:

Payment will be at the Contract unit price per FOOT for ITEM 182.2 REMOVAL OF ASBESTOS, as specified above including all materials, tools, equipment and labor necessary to complete the work specified above.

All costs in connection with the protection of the general public, private property and all costs associated with the proper disposal of the material removed shall be included in the price and no additional compensation will be allowed.

ITEM 184.1**DISPOSAL OF TREATED WOOD PRODUCTS****TON**

Work under this item shall include the transportation and disposal of all treated existing wood product as directed by the Engineer.

The timber components of the existing structure are suspected to be treated with creosote, pentachlorophenol and/or CCA. This item shall include all costs for sampling, laboratory testing, loading, transportation and disposal of the treated wood. The Contractor is required to submit disposal manifests to the Engineer prior to the completion of the project. All aspects of this Item are to be completed in accordance with state and federal regulations.

COMPENSATION

Measurement and payment will be by the weight, in Tons, of treated timber transported and accepted at a licensed facility. The work shall be considered full compensation for all labor, tools, equipment, materials, testing, loading, transportation, approvals, and permits required for the completion of the work.

ITEM 221.1**FRAME AND COVER - SECURED****EACH**

The work under this Item shall conform to the relevant provisions of Subsections 201, 220 of the Standard Specifications and the following:

The work to be done under this Item consists of the furnishing and delivering Frame and Cover – Secured to the site as shown on the Plans, and as directed by the Engineer.

Frame and Cover - Secured assemblies shall consist of covers and frames that conform to the nominal size, weight, material and load-carrying requirements in MassDOT Construction Standard Details E 202.6.0, E 202.7.0 and E 202.8.0, and are on the relevant MassDOT Qualified Construction Materials list. Some dimensions of secured manhole covers and frames may vary slightly from those shown on the standard details to account for necessary fastening components. The Contractor shall submit shop drawings of all drainage castings for approval prior to ordering.

Covers and frames shall be held securely together by bolting to threaded holes in the frame or to nuts or tumbler devices secured by the frame, by use of hooks attached to the cover or by any other means approved by MassDOT, to prevent being dislodged under traffic loading. Gaskets and other sealing devices will not be allowed.

METHOD OF MEASUREMENT

Item 221.1 will be measured per EACH Frame and Cover – Secured furnished and delivered to the site.

BASIS OF PAYMENT

Item 221.1 will be paid for at the Contract unit price EACH Frame and Cover – Secured furnished and delivered.

ITEM 234.08**8 INCH DRAINAGE PIPE - OPTION****FOOT**

The work to be done under this Item shall conform to the relevant provisions of Subsection 230 of the Standard Specifications.

MATERIALS

8 inch drainage pipe – option shall meet material requirements of Subsection 230.40 for the option selected.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

8 inch drainage pipe – option will be measured and paid for at the Contract unit price per Foot, per Subsections 230.80 and 230.81 respectively for the option selected.

ITEM 315.06 6 INCH WATER MAIN REMOVED AND STACKED FOOT

The work under this Item shall include the removal and disposal of the existing 6-inch waterline within the limits shown on the plans or directed by the Engineer, to be saved or discarded as determined by the Town of Ware. Any pipe determined to be saved is the property of the Town and shall be loaded onto DPW trucks for removal and storage.

MATERIALS

Special consideration should be taken while removing existing waterline. Asbestos materials may be present, and caution should be taken during removal.

METHOD OF MEASUREMENT

6 INCH WATER MAIN REMOVED AND STACKED will be measured for payment by the Foot.

BASIS OF PAYMENT

6 INCH WATER MAIN REMOVED AND STACKED 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.

Asbestos materials, if present, then it will be covered and paid for under respective bid Items 182.1 and 182.2.

ITEM 315.12 **12 INCH WATER MAIN REMOVED AND STACKED** **FOOT**

The work to be done under this Item shall include the removal and disposal of the existing 12-inch waterline within the limits shown on the plans or directed by the Engineer, to be saved or discarded as determined by the Town of Ware. Any pipe determined to be saved is the property of the Town and shall be loaded onto DPW trucks for removal and storage.

MATERIALS

Special consideration should be taken while removing existing waterline. Asbestos materials may be present, and caution should be taken during removal.

METHOD OF MEASUREMENT

12 INCH WATER MAIN REMOVED AND STACKED will be measured for payment by the Foot.

BASIS OF PAYMENT

12 INCH WATER MAIN REMOVED AND STACKED 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.

Asbestos materials, if present, then it will be covered and paid for under respective bid Items 182.1 and 182.2.

ITEM 336.2 1-INCH CTS PLASTIC WATER SERVICE LINE FOOT

The work under this Item shall conform to the relevant provisions of Section 300 of the Standard Specifications and the following:

This work consists of furnishing and installing new polyethylene water service connections as indicated on the Contract Drawings, as specified in these Specifications and as required by the Engineer.

MATERIALS

Piping for buried water services shall be Copper Tube Size (CTS) Polyethylene shall have a working pressure rating of 200 P.S.I. and shall conform to AWWA C901, ASTM D3350 and ASTM D2737. Iron Pipe Size (IPS) Polyethylene shall have a working pressure of 160 P.S.I. and shall conform to AWWA C901, ASTM D3350 and ASTM D2239.

CONSTRUCTION METHODS

The new service piping shall be installed as shown on the Contract Drawings. The fittings for a new service shall include a corporation stop and a curb stop with extension service box. Stainless steel inserts within the PE tubing shall be used at all compression connections.

Work done beyond the described limits shall be at the Contractor's own expense and responsibility. Curbs and driveway that are damaged through negligence on the Contractor's part shall be replaced at the Contractor's expense.

Minimum cover over the water service connections shall be 5' (five feet).

METHOD OF MEASUREMENT

Items 336.2 will be measured for payment by the Foot of plastic water pipe installed under the relevant provisions for water pipe of Subsection 301.80.

BASIS OF PAYMENT

Items 336.2 will be paid for at the Contract unit price per Foot under the relevant provisions for water pipe of Subsection 301.81. This price shall include fittings required to connect to existing or new water main and curb stops.

ITEM 355.06 6 INCH GATE AND GATE BOX REMOVED AND STACKED EACH

The work to be done under this Item shall include the removal and disposal of the existing 6 INCH waterline gate boxes within the limits shown on the plans or directed by the Engineer, to be saved or discarded as determined by the Town of Ware. Any boxes determined to be saved is the property of the Town and shall be loaded onto DPW trucks for removal and storage.

MATERIALS

Special consideration should be taken while removing existing gate boxes. Asbestos materials may be present, and caution should be taken during removal.

METHOD OF MEASUREMENT

6 INCH GATE BOX REMOVED AND STACKED will be measured for payment by the Each.

BASIS OF PAYMENT

6 INCH GATE BOX REMOVED AND STACKED will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Asbestos materials, if present, then it will be covered and paid for under respective bid Items 182.1 and 182.2.

ITEM 355.12 12 INCH GATE AND GATE BOX REMOVED AND STACKED EACH

The work to be done under this Item shall include the removal and disposal of the existing 12 INCH waterline gate boxes within the limits shown on the plans or directed by the Engineer, to be saved or discarded as determined by the Town of Ware. Any boxes determined to be saved is the property of the Town and shall be loaded onto DPW trucks for removal and storage.

MATERIALS

Special consideration should be taken while removing existing gate boxes. Asbestos materials may be present, and caution should be taken during removal.

METHOD OF MEASUREMENT

12 INCH GATE BOX REMOVED AND STACKED will be measured for payment by the Each.

BASIS OF PAYMENT

12 INCH GATE BOX REMOVED AND STACKED will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Asbestos materials, if present, then it will be covered and paid for under respective bid Items 182.1 and 182.2.

ITEM 376.3**HYDRANT – REMOVED AND STACKED****EACH**

The work to be done under this Item shall include the removal of the existing Hydrants within the limits shown on the plans or directed by the Engineer, to be saved or discarded as determined by the Town of Ware. Any hydrants determined to be saved is the property of the Town and shall be loaded onto DPW trucks for removal and storage.

MATERIALS

Special consideration should be taken while removing existing hydrants. Asbestos materials may be present, and caution should be taken during removal.

METHOD OF MEASUREMENT

HYDRANT REMOVED AND STACKED will be measured for payment by the Each.

BASIS OF PAYMENT

HYDRANT REMOVED AND STACKED will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Asbestos materials, if present, then it will be covered and paid for under respective bid Items 182.1 and 182.2.

ITEM 381.2**SERVICE BOX REMOVED AND STACKED****EACH**

The work to be done under this Item shall include the removal and disposal of the existing service boxes within the limits shown on the plans or directed by the Engineer, to be saved or discarded as determined by the Town of Ware. Any boxes determined to be saved is the property of the Town and shall be loaded onto DPW trucks for removal and storage.

MATERIALS

Special consideration should be taken while removing existing hydrants. Asbestos materials may be present, and caution should be taken during removal.

METHOD OF MEASUREMENT

SERVICE BOX REMOVED AND STACKED will be measured for payment by the Each.

BASIS OF PAYMENT

SERVICE BOX REMOVED AND STACKED will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

Asbestos materials, if present, then it will be covered and paid for under respective bid Items 182.1 and 182.2.

ITEM 628.26**MODIFIED TRANSITION TO BRIDGE RAIL****LUMP SUM**

The work under this Item shall conform to the relevant provisions of Subsection 601 of the Standard Specifications, as detailed and specified on the plans, and the following:

The work shall include furnishing and installing the Modified Transition to Bridge Rail to the limits shown on the Plans and/or as directed by the Engineer.

SUBMITTALS

The Contractor shall submit shop drawings showing the layout and for all components in the system.

MATERIALS

Drums are Eagle Model 1656, 55-gallon HDPE with plastic lever-lock cover and shall be filled with 715 (\pm 15) lbs. of sand.

BASIS OF PAYMENT

Item 628.26 Modified Transition to Bridge Rail will be paid for at the Lump Sum Contract Unit Price, which price shall include all labor, materials, equipment, Thrie Beam Terminal connector at the precast concrete bridge transition to the limits (including Post No. 1) shown on the plans, and incidental costs required to complete the work.

ITEM 657.**TEMPORARY FENCE****FOOT**

Fencing shall conform to the relevant provisions of Subsection 644 of the Standard Specifications and the following:

The work under this item shall include furnishing, installing, maintaining, removing, resetting, and final removal of temporary 72-inch chain-link fence and gates in the location indicated on the plan and/or as directed by the Engineer. The fence shall be used to close off the construction area from adjacent private properties whose use conflicts with the construction activities.

MATERIALS

The Contractor will be responsible for providing the Engineer with an acceptable method for the installation of the Temporary Fence that will provide for the pedestrian and worker safety and security for which it is intended.

All posts, including end, corner, and intermediate brace posts, and all gates and gate posts, shall be included in the linear foot cost. All fencing height shall be 72-inches (minimum). Materials need not be new, but shall be in good condition, shall not be deteriorated, nor in a condition which in any way may jeopardize the safety and security purposes intended. Posts for temporary fence shall be set in ground without concrete bases unless determined to be unstable or unsecure by the Engineer. All materials shall meet the approval of the Engineer. The Contractor shall be responsible for maintenance of the Temporary Fence and for assuming that the work area remains secure and is inaccessible to the general public at all times. It may be necessary to remove sections of Temporary Fence at times during construction. Any removing and resetting of Temporary Fence by the Contractor to facilitate his construction operations shall be done at no additional cost to the Department. Fence fabric shall be placed on the top face of the post away from the work area. A top tension wire, rather than a pipe top rail, shall be used. The top edge of the fabric shall be finished with a "knuckled" selvage. The Temporary Fence shall not be removed until the construction is completed, or until directed by the Engineer.

METHOD OF MEASUREMENT

Item 657. will be measured for payment by the Foot, complete in place.

BASIS OF PAYMENT

item 657. will be paid for at the Contract unit price per Foot, which price shall include all equipment, materials, labor, and all incidental costs required to complete the work as described herein.

The Contract price shall also include the replacement and/or restoration of fence damaged due to the construction, and/or accidents, vandalism or in any other manner.

The cost of removal and proper disposal of any existing chain-link fence as directed by the Engineer shall be considered incidental to this Item

ITEM 697.1**SILT SACK****EACH**

Work under this item shall conform to the relevant provisions of Subsections 227 and 670 of the Standard Specifications and the following:

The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

CONSTRUCTION

Silt sacks shall be installed in retained existing and proposed catch basins and drop inlets within the project limits and as required by the Resident Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and disposed of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

When emptying the silt sack, the contractor shall take all due care to prevent sediment from entering the structure. Any silt or other debris found in the drainage system at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the insert be deposited on site and used in construction.

All curb openings shall be blocked to prevent stormwater from bypassing the device.

All debris accumulated in silt sacks shall be handled and disposed of as specified in Section 227 of the Standard Specifications

COMPENSATION

Silt sacks will be measured and paid at the Contract unit price per each, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for removal and disposal of the sediment from the insert, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 697.2**FLOATING SILT FENCE****FOOT**

The work under this item shall consist of furnishing and erecting floating silt fence (turbidity barrier) to act as a silt barrier for work within the waterway and as required by the Engineer. The floating silt fence shall be installed prior to commencing any work in or near the water.

The Contractor shall maintain the floating silt fence in satisfactory working order until removed, including any necessary replacements of damaged or deteriorated sections, at no additional compensation. The floating silt fence shall be maintained until all work within and adjacent to the waterway has been completed. Sediment deposited into the area enclosed by the floating silt fence shall be removed and lawfully disposed prior to relocating or removal of the floating silt fence barrier(s).

Installation procedures may be varied to comply with manufacturers recommended procedures with the approval of the Engineer. If required, the Contractor shall submit alternate installation and/or staging procedures for approval.

MATERIALS

Floating Silt Fence barrier shall consist of a nylon reinforced PVC fabric siltation curtain with solid plastic foam flotation members enclosed in a top pocket, tension link in floatation section and a ballast chain enclosed in bottom pocket and meet the following property specifications:

Draft: 3 feet to 10 feet. Contractor shall field verify draft requirements.

Floatation Element: Minimum 6-inch diameter closed cell solid plastic foam logs with 17 lbs. per ft. buoyancy.

Floatation Fabric: Shall be impermeable 22 oz. nylon reinforced PVC having 450 psi tensile strength.

Tension Cables: 1/4-inch cable enclosed in top portion of the floatation section. It shall secure to each end of connector of the curtain sections. Cable system shall be tamperproof.

Ballast: 5/16-inch or heavier, galvanized steel chain enclosed in bottom pocket of the entire length of floating silt fence.

Connectors: Aluminum or galvanized steel universal connectors on each end of floatation section. Below the connectors, the skirts shall be joined by 5/8-inch polypropylene rope ties between the grommets on the two skirts. The ballast chains can be shackled.

Steel Posts: Minimum 4-inch diameter galvanized fence post or other manufacturer approved supporting device approved by the engineer, with a minimum length of 10 feet.

Length: 50 feet per section.

ITEM 697.2 (Continued)

METHOD OF MEASUREMENT

Item 697.2 will be measured for payment by the Foot, complete installation, removing and resetting, and final removal of floating silt fence.

BASIS OF PAYMENT

Item 697.2 will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment, tools and incidental costs required to complete installation, removing and resetting, and final removal.

No separate payment will be made for removal and disposal of built-up silt or debris deposited or accumulated into the enclosed area or at the bottom of the floating silt fence, but all costs in connection therewith shall be included in the contract unit price bid.

ITEM 698.3**GEOTEXTILE FABRIC FOR SEPARATION****SQUARE YARD**

The work under this Item shall conform to the relevant provisions of Section 600 of the Standard Specifications and the following:

The work shall include furnishing and installing geotextile fabrics and impermeable liners to the limits shown on the Plans and/or as directed by the Engineer.

SUBMITTALS

The Contractor shall provide the Engineer a certificate stating the name of the geotextile manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.

MATERIALS

Geotextile Fabric for Separation shall be placed under the modified rockfill and pavement milling mulch as shown on the plans and as directed by the Engineer. The geotextile fabric shall conform to the requirements of AASHTO-M-288, Table 5, Class 1 from Table 1 and Section M9.50.00 of the Standard Specifications. Material shall be selected from the MassDOT Qualified Construction Materials List.

CONSTRUCTION

At locations of fabric installation, the subgrade shall first be graded and compacted. All rocks, vegetation, and other obstructions shall be removed before placement of fabric. The fabric shall be installed and fastened in place in conformance with the manufacturers recommendations.

Geotextile fabric shall be rolled out flat and tight with no folds and not dragged into place. Adjacent strips of geotextile should overlap at least 2 feet. The geotextile should be secured in place at the overlaps with steel pins at least 18 inches long and spaced at 2 feet on center. The pins should be fitted with washers at least 1.5 inches in diameter.

No backfill material shall be dropped onto the geotextile from a height exceeding 3 feet.

METHOD OF MEASUREMENT

Geotextile fabric for separation will be measured for payment by the Square Yard installed complete in place. The area of geotextile used for overlapping shall not be included for measurement.

BASIS OF PAYMENT

Geotextile fabric for separation and geotextile fabric for permanent erosion control will be paid for at the Contract unit prices per Square Yard, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 698.4**GEOTEXTILE FABRIC FOR PERMANENT
EROSION CONTROL****SQUARE YARD**

The work under this item shall conform to the requirements of Section M9.50.0 of the Standard Specifications and the following:

The work shall include furnishing and placing geotextile fabrics for permanent erosion control prior to placing crushed stone beneath riprap and modified rock fill as shown on the plans and as required by the Engineer.

MATERIAL

The geotextile fabric used shall be selected from the MassDOT Qualified Construction Materials List for the appropriate application.

CONSTRUCTION METHODS

Before placing the fabric, grade the area smooth and remove all stones, roots, sticks, or other matter that might prevent the fabric from completely contacting the soil. Place the fabric loosely and lay it parallel to the direction of water movement. The Engineer may require pinning or stapling to hold the geotextile fabric in place. Join separate pieces of fabric by overlapping or sewing. Overlap the fabric in the joints at least 24 inches in the direction of flow. If using sewn seams, ensure that all seams develop a tensile strength equal to or greater than 60 percent of the specified grab tensile strength of the fabric, unless specified otherwise.

After placing, do not expose the fabric longer than 48 hours before covering. Construction equipment shall not be allowed directly on the fabric. Cover damaged areas with a patch of fabric that overlaps 3 feet in all directions.

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.

No separate payment will be made for sewing and the 24 inch overlapping, but all costs in connection therewith shall be included in the contract unit price bid.

ITEM 715.1**MAIL BOX REMOVED AND RESET****EACH**

This work consists of the removing and resetting present mail boxes in accordance with these specifications and in close conformity with the lines and grades established by the Engineer.

MATERIAL

Material shall meet the requirements specified on the plans.

CONSTRUCTION METHODS

The mail boxes indicated shall be removed together with the posts, and the post holes filled with suitable material and properly tamped.

The Contractor shall carefully remove mailboxes and posts, exercising care to not damage boxes or posts, and be responsible to replace boxes or posts damaged by removal/resetting.

If necessary during the construction the mail boxes shall be set in temporary locations directed, so that they are easily accessible to the mail carrier.

The present mail boxes and posts shall be set in their final locations as directed by the engineer.

METHOD OF MEASUREMENT

Item 715.1 will be measured for payment by the Each mail box removed and reset, complete in place.

BASIS OF PAYMENT

Item 715.1 will be paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, setting the boxes in temporary locations, Post hole filling materials with compaction, and all incidental costs prrequired to complete the work.

Rock excavation, if required, will be paid for at the contract unit price per cubic yard under the Item 144. Class B Rock Excavation.

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 | - 600 x 600 dpi capability |
| - LCD touch panel display | - 30 pages per minute print speed (color), |
| - 50 page reversing automatic document feeder | - 4 Paper Trays Standard
(RADF) (not including the bypass tray) |
| - Reduction/enlargement capability | - Automatic duplexing |
| - Ability to copy and print 11" x 17" paper size | - Finisher with staple functions |
| - email and network pc connectivity | - Standard Ethernet. Print Controller |
| - Microsoft and Apple compatibility | - Scan documents to PDF, PC and USB |
| - ability to overwrite latent images on hard drive | - 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 755.99**STREAMBED RESTORATION****LUMP SUM**

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 and B).

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 on-site oversight 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 Tim Dexter (MassDOT Wetlands & Wildlife Unit Supervisor, 857-368-8794 / timothy.dexter@state.ma.us) to set up a meeting with MassDOT's Geomorphologist, Contractor, and Resident Engineer. At this meeting, the Geomorphologist will provide an overview of the restoration work and will discuss the Contractor's anticipated means, methods, and schedule.

Process Approval:

In lieu of a mockup, the Contractor shall schedule an additional 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.

MATERIAL

The top 2 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 cobble native river bed. The following gradation shall be used as a guide.

ITEM 755.99 (Continued)

Stream Bed Material Gradation

Stone Size (mm)	Stone Size (inches)	Particle*	% Finer
1,024	40	Medium boulder	100
256	10	Very large cobble	85
64	2.5	Very coarse gravel	45
0.5	0.02	Coarse sand	10

*(Wentworth, 1992)

The streambed material shall be approved by the Resident Engineer and Geomorphologist prior to use.

Related Items

Crushed Stone. Shall conform to the requirements of Item 156.5 Crushed Stone For Filter Blanket and shall be paid for under that item.

Riprap Stone shall conform to the requirements of Item 983.11 and shall be paid for under that item.

CONSTRUCTIONChannel

The streambed material shall be reinstalled over riprap (Item 983.11), as depicted on the plans, to a thickness between 1.0 and 3.5 feet based on the plans. 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 and riparian habitat. Fish passage must be maintained. The streambed materials shall be installed during normal low water conditions behind cofferdams or turbidity curtains 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 or turbidity curtains in such a way as to slowly wet the stream to minimize the initial sediment pulse. Every attempt shall be made to minimize the downstream movement of sediment.

ITEM 755.99 (Continued)

The final streambed shall maintain the general configuration of the existing streambed bedform and there shall be minimal to no 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 Downstream of Bridge

ITEM 755.99 (Continued)



Figure B: Existing Streambed Material Upstream of Bridge

ITEM 756. NPDES STORM WATER POLLUTION PREVENTION PLAN LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the EPA for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. The Contractor shall be fully responsible for compliance with the most recently issued CGP and any subsequent revisions. Should a fine or penalty be assessed against it, or MassDOT, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a fourteen (14) day review period commencing from the date on which EPA enters the Notice into their database. Based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

The CGP also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The Plan will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. The contractor shall prepare the SWPPP and update it as necessary. The Contractor shall submit the Plan to the Engineer for approval at least four (4) weeks prior to any site activities. It is the responsibility of the Contractor to comply with the CGP conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to the project and to include in the SWPPP the methods and means necessary to comply with applicable conditions of said permits.

ITEM 756. (Continued)

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, regulations, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

Included in the CGP conditions is the requirement for inspection of all erosion controls and site conditions on a weekly basis as well as after each incidence of rainfall exceeding 0.25 inches in twenty-four hours. For multi-day storms, EPA requires that an inspection must be performed during or after the first day of the event and after the end of the event. The CGP requires that inspections be performed by a qualified individual as outlined in the CGP. MassDOT requires proof of completion of a 4 hour minimum sedimentation and erosion control training class current to the latest CGP. This individual can be, but not limited to, someone that is either a certified inspector, certified professional, or certified storm water inspector. The documentation shall be included as an appendix in the SWPPP. The inspector's qualifications shall be submitted to the Engineer for approval prior to beginning any work. This individual shall be on-site during construction to perform these inspections. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. The Standard Specifications require adequate erosion control for the duration of the Contract. All control measures must be properly selected, installed, and maintained in accordance with manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or is no longer adequate, it is the responsibility of the Contractor to replace or modify the control for site conditions at no additional cost to the Department. Contractor must maintain all control measures and other protective measures in effective operating condition and shall consider replacement of erosion controls for each construction season.

This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, and preparation of monthly reports. In addition, any erosion controls beyond those specified in bid items which are selected by the Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this item.

ITEM 756. (Continued)

The CGP provides specific requirements for temporary and final stabilization. This shall be incorporated into the project schedule. The permit defines specific deadline requirements for Initial Stabilization (“immediately”, i.e., no later than the end of the next work day following the day when earth-disturbing activities have temporarily or permanently ceased) and for Complete Stabilization Activities (no later than 14 calendar days after the initiation of stabilization). Stabilization criteria for vegetative and non-vegetative measures are provided in the CGP.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etc. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer’s Final Estimate. The permittee shall use EPA’s website to prepare and submit the NOT.

COMPENSATION

Payment for all work under this Item shall be made at the contract unit price, lump sum, which shall include all work detailed above, including Plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees.

Payment of fifty (50) % of the contract price shall be made upon acceptance of the NPDES Stormwater Pollution Prevention plan. Payment of forty (40) % of the contract price shall be made in equal installments over the expected duration of stormwater pollution prevention measures. Payment of the final ten (10) % of the contract price shall be paid upon satisfactory submissions of a Notice of termination (NOT) when final stabilization has been achieved.

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.

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:

Avena sativa (Grain Oats): 1 January to 31 July

Cecale cereale (Grain Rye): 1 August to 31 December

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Annual Cover Crop for Native Seeding will be measured for payment by the Pound of seed, complete in place.

Annual Cover Crop for Native Seeding 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.

ITEM 765.553**WETLAND – RIPARIAN SEEDING****SQUARE YARD**

The work under this item shall conform to the relevant provisions of Subsection 765 of the Standard Specifications and the following:

The work shall consist of planting and establishing 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.

Seeding shall be done within 48 hours of placement of loam and final grading. Mulch for seed shall be Compost Topdressing or hydromulch as specified below, and shall be incidental to this item.

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%.

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.

ITEM 765.553 (Continued)

- 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
- 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.

MATERIALS**Seed**

Riparian Seed mix shall be as follows. Substitutions must be approved by MassDOT Landscape Design. Contact george.batchelor@dot.state.ma.us.

ITEM 765.553 (Continued)

	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
Grass			
	Andropogon gerardii 'Niagara'	Big Bluestem 'Niagara'	12.00%
	Schizachyrium scoparium 'Camper'	Little Blue Stem 'Camper'	12.00%
	Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	11.80%
	Sorghastrum nutans NY Eco	Indiangrass NY Ecotype	10.20%
	Elymus virginicus	Virginia Wild Rye	10.00%
	Elymus riparius	Riverbank Wild Rye	10.00%
	Carex vulpinoidea	Fox Sedge	5.00%
	Panicum rigidulum	Redtop Panicgrass	5.00%
	Panicum virgatum	Switchgrass	5.00%
	Juncus effuses	Soft Rush	2.00%
	Agrostis perennans	Upland Bentgrass	2.00%
			<hr/> 85.00%
Herb/Forb			
	Chamaecrista fasciculata	Partridge Pea	3.00%
	Asclepias incarnata	Swamp Milkweed	2.20%
	Verbena hastata	Blue Vervain	2.00%
	Heliopsis helianthoides	Ox-Eye Sunflower	2.00%
	Monarda fistulosa	Wild Bergamot	1.00%
	Senna hebecarpa	Wild Senna	1.00%
	Vernonia noveboracensis	New York Ironweed	1.00%
	Aster umbellatus	Flat Topped White Aster	0.50%
	Aster prenanthoides	Zig Zag Aster	0.50%
	Aster puniceus	Aster – Swamp	0.50%
	Aster novae-angliae	New England Aster	0.50%
	Eupatorium maculatum	Joe-pye Weed	0.50%
	Eupatorium perfoliatum	Boneset	0.30%
			<hr/> 15.00%
			<hr/> 100.00%

Seeding Rate:

Species ecotype shall be as native to New England region as possible. Apply this mix at 30 lbs PLS/acre

ITEM 765.553 (Continued)**Fertilizer**

No fertilizers shall be applied.

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.

Mulch

Mulch for seeding and topdressing shall be incidental to this item. Mulch shall be:

- Compost Mulch meeting the material and submittal requirements of Item 751.72,
OR
- Hydromulch per the manufacturer's recommendation. Mulch for hydroseeding shall be wood fiber only.

Photo Documentation

Contractor shall submit photo documentation to the Engineer and Landscape Design Section. Each photo shall be date stamped. Photos shall be submitted after the following stages of construction:

- Soil preparation
- Seed and hydromulch/compost topdressing
- Germination
- Grass establishment after one full growing season (growing season is June-September)

CONSTRUCTION**Surface Preparation**

Soil preparation and seeding shall occur only when the bed is in a friable condition, not muddy or hard. 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 smooth and even finish corresponding to the required grades.

When seeding over existing or compacted soil, surface will be prepared by raking or tracking to a depth of 2 inches prior to seeding and prior to Compost Topdressing (when applicable).

Surface preparation shall be approved by the Engineer prior to seeding.

ITEM 765.553 (Continued)**Seeding over Various Substrates**

Loam: Seeding shall occur within 48 hours of site preparation to prevent loss of topsoil. Seeding shall be hydroseeding or broadcast as specified below.

Compost Topdressing: Compost Topdressing shall be applied as specified under that item. Seed should be broadcast at the same time as compost application to ensure a thin cover of compost over seed. *When seeding is done after application of Compost Topsoil the rate shall be increased by 50% and area shall be hydromulched.*

Compost Mulch over Modified Rock: Compost Mulch shall be applied as specified under that item and shall be such that only the voids in the rock are filled so that seed has an organic substrate for germination. Seed shall be broadcast after compost application. No hydromulch is required.

SEEDING

Hand broadcast method shall be used for all areas smaller than half an acre or when specified on the plans.

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 Jute mesh 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.

ITEM 765.553 (Continued)**Seeding over Various Substrates**

Seeding shall occur within 72 hours of top soil placement to prevent loss of topsoil. Seeding for areas less than half an acre and when specified shall be hand broadcast followed by hydromulching as specified below. Large areas may be hydroseeded as specified below.

Jute Mesh: If used, Jute mesh 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.

Compost Mulch over Modified Rock: Compost Mulch and seed shall be applied as specified under that item. No hydromulch is required.

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 Jute mesh in which case it shall be as specified above under seeding with Jute mesh application.

Hydroseeding and Hydromulching

Hydromulching shall be per the manufacturer's directions and as follows.

A 2-step process shall be used. 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.

ITEM 765.553 (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.

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.

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 as required 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.

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.

ITEM 765.553 (Continued)**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.

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.

A warm-season grass mix with perennials will not have uniform growth. A uniform stand of grass may indicate use of an incorrect mix.

ITEM 765.553 (Continued)**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

Item 765.553 will be measured for payment by the Square Yard, complete in place.

BASIS OF PAYMENT

Item 765.553 will be paid at the Contract unit price per 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, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Surface preparation shall be compensated for under Item 751. And 751.1. If used, Jute mesh shall be compensated under the respective item.

Schedule of payment shall be as follows:

50% upon Conditional Acceptance

50% upon Final Acceptance of Establishment

ITEM 765.553 (Continued)***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 jute mesh):

_____ **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.*

ITEM 765.553 (Continued)**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 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. Photo-biodegradable fabric shall not be used.

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, sedimentation fence shall be used in addition to compost filter tubes and straw bales and shall be compensated under that 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. If necessary to accommodate field conditions and to maximize effectiveness, barrier locations may be shifted with approval from the Engineer. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

ITEM 767.121 (Continued)**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.

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.

ITEM 767.121 (Continued)

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.

Sedimentation Fence

Materials and Installation shall be per Section 670.40 and 670.60 of the Standard Specifications and the following:

Sedimentation 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 Section 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 (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

ITEM 767.121 (Continued)**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 sedimentation 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:

- 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 grass mix).
- Sedimentation 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.

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 consist of furnishing and installing jute mesh fabric to prevent soil erosion. Jute mesh shall be placed over all areas of exposed soil at locations that has a slope of 2:1 or greater, 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, reseeding of trenched and disturbed areas, and all incidental costs required to complete the work.

ITEM 816.81 TEMPORARY TRAFFIC CONTROL SIGNAL**LUMP SUM****Scope of Temporary Traffic Control Signal Work**

The work to be done under this item relates to the installation, removal and resetting prior to subsequent construction phases, and complete removal (when the bridge construction is complete), of a temporary traffic control signal complete with temporary mast arms, signal heads, controller, controller cabinet, mounting assemblies, equipment grounding and bonding, ground rods, and all other equipment, materials and incidental costs necessary to furnish, install and program a complete and functioning traffic signal as specified and as shown in the Plans and these Special Provisions or as directed by the Engineer. All traffic control equipment shall be on the most recent MassDOT Qualified Traffic Control Equipment List.

All work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the 2009 Manual on Uniform Traffic Control Devices (MUTCD), as amended, and the following technical provisions.

The Contractor shall fill out and submit for review and approval, a copy of the temporary traffic control signal permit along with a sketch of the proposed location including all components of the proposed temporary traffic control system for each stage of construction at least two (2) weeks in advance of the proposed work.

Documentation Requirements for Performing Traffic Work

Before beginning ANY traffic signal work, the individual, work crew or contracting organization performing any portion of the traffic signal construction shall demonstrate to the Engineer personal possession at all times in the field of all of the latest versions of the following documents:

- Massachusetts Standard Specifications for Highways and Bridges
- Supplemental Specifications to the Standard Specifications
- Standard Special Provisions for incorporation into Construction Projects
- 2009 MUTCD, with latest revisions and amendments
- Standard Drawings for Traffic Signals and Highway Lighting
- Standard Drawings for Signs and Supports
- All contract drawings showing traffic signal details or traffic signal design
- All contract special provisions

ITEM 816.81 (Continued)**Requirements for Intersection Controller**

The controller unit may be NEMA TS-1 or TS-2 Standard. The controller shall be capable of providing all necessary intersection control functions. Signal indications shall be LED. Signal mast arm supports shall be portable systems. The system shall be powered via either live AC voltage or solar, as indicated on the plans. MassDOT will not own the signal control equipment after the construction is complete. The Contractor will own, operate and maintain this temporary signal during the entire construction period. If the Engineer determines that this temporary signal is no longer needed, the Contractor shall remove the signal as directed. No extra compensation is allowed for the signal removal.

Within thirty days following execution of the Contract, the Contractor shall submit shop drawings for signal supports, a list of equipment, and manufacturer's equipment specifications to the Engineer in accordance with the relevant provisions of Section 815 of the Standard Specifications.

The Contractor shall not commence work until approval of the shop drawings and the manufacturer's data has been received in writing from the Engineer. Approval of these drawings shall be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

The Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

Electrical Power Source Connection

For systems powered by live AC voltage, the Contractor shall coordinate with the appropriate utility company to provide power for the temporary traffic control signal via overhead electrical connections, as shown on the plans. The Contractor will pay for the power costs.

Testing of Grounding System

The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer in accordance with the Standard Specifications.

Signal Heads

Signal heads mounted on mast arm shafts shall be rigidly attached to the shaft.

3 Inch Electrical Conduit Type NM – Plastic (UL)

Three-inch non-metallic conduit shall be furnished and installed in accordance with the plans or as required by the Engineer, and shall conform to current NEMA standards. All Type NM conduit shall be Schedule 80 PVC, conforming to Section M5 of the Standard Specifications.

ITEM 816.81 (Continued)**Video Traffic Detection System**

The video detection system shall use equipment preapproved by MassDOT, and consist of video cameras as shown on the plans, isolation amplifiers for video cabling, an automatic control unit (ACU), and a pointing device. The system shall include software that detects vehicles in multiple lanes using only the video image. Detection zones shall be defined using only a video menu and a pointing device to place the zones on a video image. Up to 144 detection zones shall be available.

Removal and Resetting of Signal Equipment

After the temporary signal equipment is first put in place as shown in the Plans, and prior to each subsequent construction phase where signal control is required, the Contractor shall remove and reset the temporary signal equipment to new locations as shown on the Plans. The cost of such relocation at each phase shall be included under Item 816.81, and no additional compensation for such relocation shall be provided.

BASIS OF PAYMENT

Item 816.81 Temporary Traffic Control Signal will be paid for at the Contract Lump Sum price bid, which price shall include all labor, material, equipment and incidental costs required to install the temporary signal equipment, complete and operating as specified, remove and reset said equipment as shown on the Plans or as required by the Engineer, and remove said equipment upon completion of bridge construction.

ITEM 823.72**HIGHWAY LIGHTING ARM AND LUMINAIRE
REMOVED AND RESET****EACH**

The work under this item shall conform to the relevant provisions of Subsection 820 of the Standard Specifications and the following:

The work under this item shall consist of dismantling and removing the existing highway luminaires and arms from the existing utility poles and resetting them onto the relocated utility poles, as shown on the plans.

The Contractor shall exercise extreme care in the dismantling, removal, transporting, storage, and resetting of the existing luminaires and arms. Any equipment damaged during construction operations, shall be replaced in kind at the Contractor's expense.

Work shall be in accordance with the latest edition of the National Electrical Code, Massachusetts Electrical Code, local codes and as directed by the Engineer. All work shall be performed by an experienced licensed electrician licensed in the Commonwealth of Massachusetts.

The Contractor shall coordinate with the Lighting fixture owner (Town of Ware), and National Grid the Pole Joint Owner and power service provider to request a Disconnect/Reconnect for each fixture and pay all fees. Please note this may take some time (expect up to 90 days). Please also note that this work is in the Duration of the Pole Relocations and if not completed, could delay the pole relocations.

REMOVE

Work shall include disconnection of the lighting fixtures from the utility company provided lighting circuit on the overhead utility poles. After disconnection and removal of fixtures, a pigtail tap off the lighting circuit shall be left in place to allow for connection of new lighting fixtures.

If the Engineer or Town determines that an existing lighting arm and luminaire is not suitable to be reset, but the Town would still like to retain and store it, the work shall also include dismantling, removing and stacking of the arm and luminaire. The Contractor shall notify the Ware Department of Public Works and verify if the Town would like to have the arm and luminaire. If the Town elects to have the arm and luminaire, the Contractor shall arrange a time to deliver and stack the arm and luminaire at the Ware Department of Public Works yard. If the Town decides to abandon part or all of the arm and luminaire, said materials shall become the property of the Contractor and shall be legally disposed of.

If the existing lighting is deemed to be unsuitable for resetting as described above, a new fixture shall be provided by the Town for installation by the Contractor

ITEM 823.72 (Continued)**RESET**

For fixtures being reset in a new location, a tap of the existing lighting circuit for the new light location shall be arranged with the utility company.

METHOD OF MEASUREMENT

Item 823.72 Highway Lighting Arm and Luminaire Removed and Reset will be measured for payment by the Each, complete in place .

BASIS OF PAYMENT

Item 823.72 Highway Lighting Arm and Luminaire Removed and Reset will be paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, dismantling, removing, transporting, cutting and capping of existing conduits if required, coordination with the Town of Ware DPW, the removing and stacking of arms or luminaires, the disposal of unsuitable or abandoned materials, and all incidental costs necessary to complete the work.

No separate payment will be made for dismantling, removing, transporting, cutting and capping of existing conduits, if necessary, coordination with the Town of Ware, the removing and stacking of arms or luminaires or the disposal of unsuitable or abandoned materials, but all costs in connection therewith shall be included in the unit price bid.

If the existing Lighting arm or luminaires are unsuitable for resetting the Contractor will stack the old one and pick up a new one from the Town as incidental to this work.

ITEM 852.12**TEMPORARY PEDESTRIAN RAMP****EACH**

Work under this item shall consist of installing a system to transition pedestrians from the roadway to the sidewalk where temporary ramp locations are required.

Elements of the system may include plastic barricade, temporary curb ramps and associated modifications and appurtenances and signage. The guidance system is to prevent pedestrians from entering the work area, protect pedestrians from vehicles entering a shoulder area temporarily designated for pedestrian use around the work site, and prevent pedestrians from leaving the temporary path and entering the vehicle lane.

Prior to deploying the Temporary Pedestrian Ramp, the Contractor shall prepare a sketch plan of the system for the work site showing the ramp system and the locations of the ramps. This will be reviewed and approved by the Engineer prior to its set up. Any material that is damaged during the deployed period and throughout the project shall be replaced at the direction of the Engineer at no additional cost.

Layout must meet the requirements of the ADA and the Massachusetts AAB as well as the rules and regulations for traffic control devices and the 2009 Manual on Uniform Traffic Control Devices (MUTCD). All material which is used adjacent to traffic must meet the requirements of NCHRP350 or MASH. Dimensions and ramp details shall adhere to the details contained within the contract documents.

The Contractor shall not block or obstruct the temporary pedestrian ramp by their operations. They shall not remove or relocate the pedestrian ramps to obtain access to the work, or otherwise compromise the integrity of the ramp.

METHOD OF MEASUREMENT

Temporary Pedestrian Ramp will be measured for payment by the Each.

BASIS OF PAYMENT

Temporary Pedestrian Ramp will be paid for at the Contract unit price per Each, which price shall include all required materials, labor, equipment, and incidental costs required to complete the work.

This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition

ITEM 853.21 **TEMPORARY BARRIER REMOVED AND RESET** **FOOT**

Work under this item shall conform to the relevant provisions of Section 850 of the Standard Specifications and shall consist of removing, transporting and resetting temporary barrier systems and limited deflection temporary barrier systems from alignments established along the roadway to new alignments in accordance with the details shown on the plans, as required by the construction and staged construction operations and as required by the Engineer for the channelization of traffic and/or work zone protection.

The work shall also include furnishing and installing all hardware and associated materials per the details and/or manufacturer's specifications. The work shall also include necessary patches and repairs caused by the temporary barrier system to damaged pavement surfaces or any adjacent longitudinal barrier once the system has been removed.

Temporary barrier systems and limited deflection temporary barrier systems shall be removed from existing locations and reset in accordance to the construction methods stated in the respective barrier items.

Damage to the pavement surface or adjacent permanent barriers caused by removing or resetting temporary barrier shall be repaired as directed by the Engineer at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 853.21 will be measured and paid by the Foot, in place which shall provide full compensation for removing, relocating, resetting, realigning, and transporting maintaining the temporary barrier system and/or limited deflection temporary barrier system. The Contractor will be paid for this item each time the barrier is relocated either to a new work zone, to off-season storage, or back to the project from storage. The Contractor will not be separately compensated for any work necessary to maintain or re-align units or replace damaged units. No payment will be made for removing and resetting barriers for the purpose of gaining access to the construction work zone. No payment will be made for removing, relocating and resetting any barriers moved for the convenience of the Contractor.

For temporary barrier systems that require anchorage systems, the cost of furnishing, installing and removing the anchorage and hardware and the restoration of pavement surfaces or adjacent permanent barrier systems to facilitate anchorage shall be considered incidental to the cost of this Item.

ITEM 853.33 TEMPORARY BARRIER – LIMITED DEFLECTION (TL-3) FOOT

Work under this Item shall consist of furnishing, installing, maintaining, and final removal of limited deflection TL-3 temporary barrier systems for channelization of traffic and/or work zone protection. Limited deflection temporary barrier systems shall have a maximum dynamic deflection of 24 inches or less and shall be used in areas where the available clear area behind the barrier system is 24 inches or less. All barrier on the bridge, as well as any barrier off the bridge, shall have zero (0") deflection at the base.

MATERIALS

The following limited deflection temporary barrier systems are acceptable for use:

1. BarrierGuard 800; Highway Care International.
http://www.highwaycareint.com/product_info/44/barrierguard800
2. J-J Hooks F-Shape Temporary Concrete Barrier; Easi-Set Industries. <http://jjhooks.com/>
3. ZoneGuard; Hill & Smith, Inc. <http://www.hillandsmith.com/zoneguard/>
4. Texas DOT X-Bolt F-Shaped Concrete Safety Barrier.

The Contractor may submit alternate materials to the Engineer for approval if the limited deflection temporary barrier system meets the following criteria:

1. The system has been tested by an independent laboratory that is accredited by FHWA to crash test roadside hardware;
2. The system meets the minimum requirements of the AASHTO Manual on Assessing Safety Hardware (MASH) at Test Level (TL) 3 or higher; and
3. The system has a federal-aid eligibility letter from FHWA.

Copies of the testing results and the federal-aid eligibility letter shall be submitted and approved by the Engineer prior to procurement of an alternate temporary barrier system.

The Contractor shall supply shop drawings to confirm the available clear area behind the barrier equals or exceeds the maximum dynamic deflection of MASH Test 3-11 during testing procedures taken at an independent laboratory that is accredited by FHWA to crash test roadside hardware.

Delineators shall be installed on all limited deflection temporary barrier systems in conformance with the relevant provisions of Section 850.69 and shall be incidental to the temporary barrier systems.

ITEM 853.33 (Continued)

Temporary impact attenuators that are listed on the Qualified Traffic Control Equipment List shall be used whenever a blunt end of the limited deflection temporary barrier system is facing traffic within the clear zone unless it is protected by a second barrier system or secured to a separate barrier system or bridge railing by a method approved by the manufacturer.

The side of the temporary barrier that faces traffic shall include delineators in accordance with Section 850.69 Temporary Barrier and Temporary Barrier Removed and Reset.

CONSTRUCTION METHODS

Limited deflection temporary barrier systems shall be placed in line with the drawings. Installation shall be per the manufacturer's specifications, details, and the approved shop drawings.

The Contractor shall not place any breaks in the limited deflection temporary barrier system that will result in sections that are shorter than the stated minimum length-of-need (LON) under MASH Test 3-11. Exceptions shall be allowed for gate systems or changeable length segments placed over expansion joints if those barrier segment types have been tested and meet the minimum requirements of MASH Test 3-11 with the adjoining limited deflection barrier system.

Within the LON section, limited deflection temporary barrier systems shall only be placed on paved surfaces unless otherwise tested and certified under MASH TL-3 for those conditions.

Damage to the pavement surface caused by the limited deflection temporary barrier during installation, while in service, and/or during removal shall be repaired as directed by the Engineer at the Contractor's expense.

Limited deflection temporary barrier systems that require anchorage systems shall conform with the relevant provisions of Section 850.70.

METHOD OF MEASUREMENT

Item 853.33 will be measured in place by the Foot as actually installed, complete in place and accepted.

BASIS OF PAYMENT

Payment for work under this Item will be made at the Contract price per foot for limited deflection temporary barrier installed in place, including all incidental items. This price shall include the cost of furnishing, installing, maintaining and final removal of all limited deflection temporary barrier systems.

For limited deflection temporary barrier systems that require anchorage systems, the cost of furnishing and installing the anchorage and hardware and the restoration of pavement surfaces or adjacent permanent barrier systems to facilitate anchorage shall be considered incidental to the cost of the Item.

Payment for limited deflection temporary barrier removed and reset will be made under Item 853.21.

ITEM 859.1**REFLECTORIZED DRUMS WITH SEQUENTIAL
FLASHING WARNING LIGHTS****DAY**

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.

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 required by the Engineer.

ITEM 864.35**SLOTTED PAVEMENT MARKER TWO-WAY
YELLOW/YELLOW****EACH**

The work to be done under this item shall consist of furnishing and installing two-way yellow/yellow slotted pavement markers in accordance with the construction plans, the relevant provisions of Traffic Standard TR.6.5 “Typical Pavement Markings for Conventional Roadways” and the following:

Install two-way yellow/yellow markers at 40-foot intervals on either side of the yellow centerline(s). Refer to Traffic Standard TR.6.5.

MATERIALS

Acceptable products to be used as reflectorized pavement markers shall be listed on MassDOT’s Quality Construction Materials List (QCML).

CONSTRUCTION METHODS

Only motorized vehicles with specialized grinding equipment intended for these purposes shall be used to grind out the slots for the recessed pavement markers. No manually-propelled or walk behind carts will be allowed. Equipment that does not produce slots that remain in true alignment with the striping centerline shall be replaced with satisfactory equipment as required by the Engineer.

The work shall include cutting the tapered pavement slot to the dimensions shown on the typical detail for the one-way or two-way markers issued with Engineering Directive E-05-003, application of the manufacturer’s recommended epoxy adhesive, and placing the reflectorized pavement marker in the proper position within the slot so that the reflective face is visible and perpendicular to oncoming traffic and so that the top of the marker is set $1/8 \pm$ inch below the top of the adjacent pavement.

Surface preparation and installation shall be strictly in accordance with the manufacturer’s instructions.

Pavement markers shall not be placed on pavement surfaces that show evidence of cracking, checking, spalling or failure of underlying base material.

If during the laying out process, it is determined that the marker would be installed at a point with one of the aforementioned surface defects or at a pavement construction joint, then the marker shall be relocated a distance not to exceed 10% of the typical marker spacing. If the marker cannot be located within this 10% margin then this marker shall be deleted.

The minimum pavement surface temperature at the time of application shall be that recommended by the epoxy manufacturer. No markers shall be installed if the pavement surface or precut slots are wet.

ITEM 864.35 (Continued)

The marker shall be protected against traffic until the adhesive has hardened. The following table may be used as a guideline.

Ambient Air Temp (°F)	Minimum Period Protected From Traffic (Minutes)
100	15
90	20
80	25
70	30
60	35
50*	46

*No installation will be made at a lower temperature than 50°F unless the epoxy manufacturer can guarantee his product will harden sufficiently at this lower temperature to withstand traffic in 45 minutes.

METHOD OF MEASUREMENT

Item 864.35 will be measured for payment by the Each.

BASIS OF PAYMENT

Item 864.35 will be paid for at the Contract unit bid price per Each, which price shall include all materials, equipment, and incidental costs required to complete the work in place.

<u>ITEM 868.206</u>	<u>6 INCH WET REFLECTIVE RECESSED WHITE LINE</u>	<u>FOOT</u>
	<u>(POLYUREA)</u>	
<u>ITEM 868.212</u>	<u>12 INCH WET REFLECTIVE RECESSED WHITE LINE</u>	<u>FOOT</u>
	<u>(POLYUREA)</u>	
<u>ITEM 869.206</u>	<u>6 INCH WET REFLECTIVE RECESSED YELLOW LINE</u>	<u>FOOT</u>
	<u>(POLYUREA)</u>	

Work to be completed under these items shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

Work shall consist of grooving a slot in the pavement surface and the furnishing and installation of wet reflective polyurea pavement markings.

MATERIALS

Wet reflective polyurea pavement markings shall consist of a liquid binder, first drop beads or elements to provide dry and wet retroreflectivity, and second drop glass beads to improve the durability of the pavement marking, reduce track-free times, and provide supplementary dry retroreflectivity.

The Contractor shall use one of the following binders and first drop beads or elements, or approved equivalents:

1. 3M™ Liquid Pavement Marking Series 5000 with 3M™ All Weather Series 90 elements;
2. Epoplex GLOMARC® 90 with Potters VISIMAX® Glass Bead System; or
3. SWARCO MFUA-12 with SWARCO MEGALUX-BEADS®.

Combination of other binder and first drop bead or element series may only be used at the approval of the Engineer.

Second drop beads shall be manufactured from glass of a composition that is highly resistant to traffic wear and to the effects of weathering. If coating is required to meet the performance requirements, the second drop beads shall be coated to ensure satisfactory embedment and adhesion. Second drop beads retained on a No. 40 U.S. Standard Mesh Sieve shall have a minimum crush strength of 30 lbs. when tested in accordance with ASTM D1213.

Second drop beads shall have a minimum refractive index of 1.51 when tested in accordance with AASHTO M247.

Second drop beads passing the No. 30 sieve shall have a minimum of 75 percent true spheres when tested in accordance with ASTM D1155. All second drop beads retained on the No. 20 and No. 30 sieves shall have a minimum of 80 percent true spheres as determined by ASTM D1155.

ITEMS 868.206, 868.212 and 869.206 (Continued)

Second drop beads shall meet the following gradation requirements when tested in accordance with ASTM D1214:

U.S. Standard Sieve No.	Percent Retained
20	3-10
30	15-35
50	45-75
70	0-10
Pan	0-5

CONSTRUCTION METHODS**Installation of Groove**

Prior to cutting out the grooves for all recessed lines, the Contractor shall use a chalk line or other suitable method to layout the proposed pavement markings on the surface course so that the Engineer can inspect the locations. Once the Engineer has inspected and approved the proposed striping layout, the grooves for the proposed pavement markings may be cut. No pavement grooving shall be done without the prior approval of the Engineer.

Groove position shall be a minimum of 4 inches from the edge of the pavement marking to any longitudinal pavement joints. The groove shall not be installed on bridge joints, on drainage structures, or in other areas identified by the Engineer. The groove shall not be installed continuously for intermittent pavement markings, but only where markings are to be applied.

The use of gang stacked diamond cutting blades to grind a smooth square slot is required for producing all grooves. The spacers between blade cuts shall be such that there will be less than a 10 mil rise in the finished groove between the blades. The acceptability of the surface texture will be determined by the Engineer.

The diamond grinder shall have an articulating head so that the slots are installed correctly on grades and super elevated sections.

Grooves that are ground deeper or wider than the specified allowable limits shall be repaired per the direction of the Engineer at no additional cost. Grooves that are ground too shallow, too narrow, or with unacceptable rises between blade cuts shall be reground to the correct size, depth, and surface finish at no additional cost. Slots ground out of alignment shall be patched using an approved method and materials.

ITEMS 868.206, 868.212 and 869.206 (Continued)

Grooves shall be 1 inch \pm ¼ inch wider than the pavement marking material. Groove depth shall be 100 mils \pm 5 mils, unless otherwise approved by the Engineer. Depth shall be consistent across the full width of the groove. Depth plates shall be provided by the Contractor to the Engineer to assure that desired groove depth is achieved.

Grooves shall be clean, dry and free of laitance, oil, dirt, grease, paint or other foreign contaminants. Shrouds and a vacuum apparatus shall be included as part of the grinder to remove larger pieces of pavement that are ground out. If water is used to clean the groove or the grooving process takes place during rainfall, a minimum of 24 hours of dry time is required prior to the placement of pavement markings.

After the depth, width, length, and surface condition has been approved by the Engineer, an air lance shall be used to remove fine particles from the groove. Air compressors shall initially be blown out away from the application area to prevent compressor condensation build-up from entering the groove. The Contractor shall prevent traffic from traversing the grooves and re-clean grooves, as necessary, prior to application of pavement markings at no additional cost to the Department.

All grooves must be given final approval by the Engineer prior to the placement of pavement markings.

Installation of Wet Reflective Polyurea

Installation of wet reflective polyurea pavement markings shall conform to the Manufacturer's specifications and the following:

Application rate for binder and all beads and elements shall consider final pavement surface composition and smoothness in advance of application to ensure proper wet film thickness and embedment of all beads and elements. The Contractor shall provide the Engineer with documentation from the Manufacturer with all recommended application rates (and conformance to initial dry and wet reflectivity requirements) in advance of any pavement marking installation.

The minimum uniform wet thickness for the polyurea binder shall be 25-30 mils. The line thickness shall be met across at least the middle ⅔ of the pavement marking width. Depth plates shall be provided by the Contractor to the Engineer to assure that desired thickness is achieved.

The finished white color shall be free from tint, with good opacity and visibility under both daylight and artificial light. The finished yellow color shall be defined by Federal Test Standard 595 - Color Chip Number 13538, using Federal Test Standard 141 (Method 4252). The finished lines shall be uniform in color and have clean, well-defined edges.

First and second drop beads and/or elements shall be applied in a manner that does not induce rolling or bouncing, to ensure that exposed portions of beads are free of binder material. Beads and elements should be embedded in the binder to a depth of approximately 50% of their diameter.

ITEMS 868.206, 868.212 and 869.206 (Continued)

Drop rate for first drop bead or element shall be per the Manufacturer's specifications.

Drop rate for second drop glass bead shall be 6.4-10.2 lbs. per gallon.

Newly installed pavement markings shall be protected from tracking during the setting period per Subsection 860.63.

Incidental to the cost of these items, the Contractor shall measure the average retroreflectance of the pavement markings, and report the results to the Engineer. The Contractor shall take retroreflectance measurements between 7 and 14 days from date of application. Contractor shall perform retroreflectance readings per the measurement and sampling procedures contained in ASTM D7585 (Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments) using the Referee Evaluation Protocol found in section 6.4. The following tests shall be performed during the measurement and sampling process:

- ASTM E1710 (Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer); and
- ASTM E2177 (Standard Test Method for Measuring the Coefficient of Retroreflected Luminance (RL) of Pavement Markings in a Standard Condition of Wetness).

The average initial retroreflectance readings shall exceed the following minimum values:

	*White Markings	*Yellow Markings
ASTM E1710 (Dry)	475 mcd/lux/m2	375 mcd/lux/m2
ASTM E2177 (Wet Recovery)	375 mcd/lux/m2	300 mcd/lux/m2

*Observation Angle = 1.05°, Entrance Angle = 88.8°

Pavement markings with measured average initial retroreflectance readings that do not meet the specified minimum values using the procedures outlined in subsection 6.4.5 of ASTM D7585 shall be removed by a method approved by the Engineer and reapplied at no additional cost.

Pavement Marking Asset Management

Upon completion of the pavement marking installation, the following data shall be tabulated by the Contractor:

1. Retroreflectance readings, including date(s), time(s), and location(s) where readings took place;
2. Liquid binder type(s) and application rate;
3. Reflective element type and drop rate;
4. Date of groove installation;
5. Lot, batch number, or any other material identifiers and manufacturing information;
6. Date and time of final liquid marking installation;
7. Highway location (including direction) of installation;

ITEMS 868.206, 868.212 and 869.206 (Continued)

8. Air and pavement temperature during application;
9. Measured material application thickness, depth of groove; and
10. Any other pertinent information that may assist MassDOT with Quality Control.

Results for all readings shall be provided within 10 business days of testing to the Engineer, with a second copy sent to:

State Traffic Engineer
Attention: Pavement Marking Installation & Testing
10 Park Plaza, Room 7210
Boston, MA 02116

The cost to prepare and submit this data shall be considered incidental to the cost of the items.

METHOD OF MEASUREMENT

Wet reflective polyurea pavement markings are to be paid for on the actual length of lines applied.

BASIS OF PAYMENT

Wet reflective polyurea pavement markings will be paid for at the Contract unit price under each item of the contract based on the measurements as determined by the Engineer. The contract prices shall include all material, labor, and equipment required or incidental to the satisfactory completion of the work.

ITEM 874.2**TRAFFIC SIGN REMOVED AND RESET****EACH**

Work under this item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following:

CONSTRUCTION METHODS

The Contractor shall, at new locations, carefully remove and reset all existing signs, attachment hardware and sign support posts not included under other sign items as shown on the drawings and as required by the Engineer.

Signs, attachment hardware, and sign support posts shall be satisfactorily stored and protected until the time that they are reset in the proposed work.

Signs, attachment hardware, and sign supports determined to be unsuitable for re-use by the Engineer shall be replaced with new materials.

Signs, attachment hardware, and sign support posts lost, damaged or otherwise made unsuitable for reuse while being removed, transported, stored, or reset shall be replaced with new materials. This work shall be incidental to the relevant item.

New attachment hardware shall be furnished and installed as necessary to replace any missing or unusable existing hardware.

METHOD OF MEASUREMENT

Item 874.2 will be measured for payment by the Each traffic sign removed and reset.

BASIS OF PAYMENT

Item 874.2 will be paid for at the Contract unit bid price per Each, which price shall include all materials, equipment, and incidental costs required to complete the work in place.

ITEM 874.4**TRAFFIC SIGN REMOVED AND STACKED****EACH**

The work under this item shall conform to the relevant provisions of Section 850 of the Standard Specifications, amended or supplemented as follows:

The work to be done under this item shall consist of the dismantling, removing, and stacking of all existing regulatory and warning signs and their supports as noted on the plans and/or as directed by the Engineer. Work under this item also includes excavation of the existing foundations for regulatory and warning signs. At the Engineer's discretion, if the existing foundation will not interfere with new construction, it may be removed to a depth of 12 inches below the existing ground. The hole shall be backfilled with gravel and compacted, and the existing surfaces restored or replaced in kind.

Unless otherwise directed by the Engineer, the existing signs shall not be removed until the new replacement signs and structures are ready for installation.

Existing signs shall be removed and delivered to MassDOT District 2 as required by the Engineer.

METHOD OF MEASUREMENT

Item 874.4 will be measured for payment by the Each existing sign (and support, unless otherwise noted on the plans) actually removed and stacked.

BASIS OF PAYMENT

Item 874.4 will be paid for at the Contract unit price per Each sign to be removed and stacked at the locations shown on the Plan or as directed by the Engineer, which price shall include all removals and stacking regardless of the number of existing sign panels and supports at each installation.

The contract unit price shall constitute full compensation for dismantling, removing and stacking 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.

ITEM 909.5**RAPID SETTING CONCRETE****CUBIC YARD**

The work under this Item shall conform to the relevant provisions of Subsection 901 of the Standard Specifications and the following:

The work under this Item shall consist of furnishing and placing rapid setting cementitious material that is suitable to repair concrete and pavement surfaces on bridges, as required by the Engineer.

The intent of these items is for repair of the existing bridge deck on the portion of the bridge designated to carry traffic for the Phase 1 demolition/construction. The repairs shall be undertaken and completed by the Contractor and accepted by the Engineer prior to shifting all traffic to that portion of the structure for Phase 1. Additional repairs may be designated by the Engineer at any time during the project until the portion of the structure relying on the repaired area(s) is no longer subject to traffic or construction loading or is demolished. All repair areas shall be maintained for as long as still in use and until authorized by the Engineer to abandon and/or demolish.

The MassDOT Resident Engineer will identify the need, location, and extents for deck repairs under these items and direct the Contractor in the performance of the repairs.

Traffic Control and protection shall conform to MassDOT and MUTCD standards and as directed by the Engineer.

The rapid setting cementitious product shall be qualified rapid set material that shall have completed testing through AASHTO's National Transportation Program (NTPEP) and is included on the MassDOT Qualified Construction Material List.

The rapid setting cementitious material shall be expanded with aggregate for placements that are two (2) inches or more in depth and must be formulated to develop a minimum compressive strength of 2000 psi within two (2) hours.

The product shall be expanded using clean non-reactive aggregates from a MassDOT approved source according to a formulation acceptable to the manufacturer. Submit certified test reports showing the aggregate is non-reactive. Aggregate specified, labeled, and furnished by the rapid set patching material manufacturer may be used with approval of the Engineer. The mixing process for expanding the rapid setting patching material shall be performed per the Manufacturer's recommendations.

The Contractor will be required to cast twelve (12) cylinders from trial batch for compressive strength testing, in accordance with AASHTO T 161. The trial batch production shall use the same materials and processes as those to be used to produce the rapid setting patching material for the contract.

ITEM 909.5 (Continued)

Trial batching shall be conducted in the presence of the Engineer. The concrete cylinders shall be cast by a certified technician for testing at an independent laboratory approved by MassDOT. Acceptance shall be based on the average compressive strength of three (3) cylinder breaks. The cylinders shall be tested at two (2) hours and seven (7) days. The minimum average compressive strength of the specimens (including 20% overdesign requirement) shall be 2400 psi at two (2) hours and 5000 psi at seven (7) days. Two sets of three (3) cylinders shall be reserved for quality assurance testing by MassDOT Research and Material Section. The contractor shall coordinate delivery of the concrete cylinders to a MassDOT facility so that they may be tested for compressive strength at two hours. No cylinders shall be handled or transported until they have cured for a minimum of 1 hour.

Retesting through trial batching will be required if the rapid setting cementitious product, aggregate source, or the process to produce the patching material changes.

The Contractor shall give the Engineer a 10-day minimum advance notification of trial batch production.

Construction Method

The surface to receive the rapid setting repair material shall be properly prepared and free from frost, ice, mud, water, grease, dirt, and any other materials that will hamper the bond.

Prior to placing the rapid setting repair material, the patch area shall be flushed with clean, potable water to remove all dust and then blasted with oil free compressed air to remove all standing water.

The ambient temperature must be 35°F and rising for placement of the rapid set repair material. Placement of this material, when the temperature is below 35°F, will require the following:

1. Heating the mixing water.
2. Heating the aggregate.
3. Using warm cement.
4. Pre-heating the excavated area to be patched using a method approved by the Engineer.
5. Protecting the mixture from freezing after placement (using a method approved by the Engineer) until after hydration takes place.

If approved by the Engineer, gypsum-based concrete may be used on exposed concrete deck repairs when ambient, surface, and adjacent concrete temperatures are 35°F and falling. This product should not be used below 32°F without taking additional steps to ensure proper curing.

NOTE: Gypsum-based concrete shall NOT BE USED when it will be covered by a hot mix asphalt product.

ITEM 909.5 (Continued)

The rapid setting repair material shall be cured and protected until the minimum compressive strength is achieved.

The Contractor shall be required to mix and place the cement by using an eight (8) cubic foot minimum rubber-blade mobile mixer. Two (2) mixers will be required to be on site, of which one mixer can be used as a back-up. Sufficient mixing and placing equipment shall be provided on the construction site by the Contractor to ensure that a breakdown of equipment will not cause significant delays in completing the scheduled work in the shift.

Approval by the Engineer for all formwork shall be required prior to placement of any concrete.

The Engineer may require the Contractor to vibrate and/or power screed the patched area.

Payment for such equipment shall be considered incidental to this Item.

Rapid setting concrete placements shall be completed no later than 2:00 AM for nighttime operations so that the required compressive strength of 2000 psi is attained before the area is opened to traffic no later than 5:00 A.M.

Formwork shall be maintained and remain in place a minimum of seventy-two (72) hours after placement.

All formwork placed under this contract must be removed no later than forty-five (45) days after it was initially placed. Failure to remove formwork within forty-five (45) days may result in its removal by others, with the associated costs being assessed to the Contractor.

METHOD OF MEASUREMENT

Item 909.5 will be measured for payment by the Cubic Yard of rapid setting concrete, furnished and installed, complete in place.

BASIS OF PAYMENT

Item 909.5 will be paid at the Contract unit price per Cubic Yard of concrete installed, complete in place. This price shall include all labor, materials, tools, equipment, and any incidental costs required to complete the work as required by the Engineer, including installation and subsequent removal of all formwork. Any required trial batching and acceptance testing, including the cost associated with hiring certified technician, shall also be incidental to this Item.

Where formwork is placed for a full depth repair, payment will be made at 70% of the measured volume, the remaining 30% will be made upon the removal of the formwork.

<u>ITEM 942.124</u>	<u>STEEL PILE HP 12 X 84</u>	<u>FOOT</u>
<u>ITEM 944.124</u>	<u>STEEL PILE SPLICE HP 12 X 84</u>	<u>EACH</u>
<u>ITEM 948.02</u>	<u>DRILLING FOR PILE OBSTRUCTIONS</u>	<u>FOOT</u>
<u>ITEM 948.41</u>	<u>DYNAMIC LOAD TEST BY CONTRACTOR</u>	<u>EACH</u>

The work under these Items shall conform to the relevant provisions of Subsection 940 of the Standard Specifications, and the following:

Prior to any pile driving operations, the Contractor shall submit for the review and approval of the Engineer a schedule of the proposed methods and equipment for all related installation procedures. The Contractor shall include in their submittal under this Item all pertinent details of the necessary procedures to pre-drill (if any obstructions are encountered) and maintain the diameter of the holes and to fill the holes with Crushed Stone after driving.

The Contractor shall have a Professional Engineer licensed in the Commonwealth of Massachusetts perform and submit to the Engineer for review and approval, a Wave Equation Analysis. The Wave Equation Analysis shall demonstrate to the Engineer that the selected pile-driving hammer is capable of installing the pile to practical refusal (ten blows to produce a total penetration of 1/2 inch) without overstress. The Wave Equation Analysis shall take into account the proposed equipment, the pile properties, and soil characteristics.

Static load testing will not be required. Dynamic testing shall be performed by the Contractor for two piles at each integral abutment and two piles at the pier. Each dynamic test shall include a CAPWAP analysis.

No splices shall be permitted within the top 20 feet of any pile. Splices may be permitted, with the prior written approval of the Engineer, if the proposed splice location is more than 20 feet from the bottom of the abutment pile cap. Welds shall be inspected using ultrasonic testing in accordance with the Bridge Welding Code, ANSI/AASHTO/AWS D1.5. Welds shall be considered to be in tension. Technicians performing the testing shall meet the requirements for ultrasonic testing listed in Section 960.61 of the MassDOT Standard Specifications under the heading "Nondestructive Testing". The Contractor shall submit shop drawings showing the type of prequalified splice weld(s) and procedures that would be used if required, regardless of whether or not the Contractor anticipates splices to be used. Prequalified weld and procedures shall conform to the Bridge Welding Code, ANSI/AASHTO/AWS D1.5 and all Interim Revisions published by AASHTO as of bid opening date.

The selected pile hammer shall be an approved power hammer of the single acting, double acting, differential acting type, or closed end or open-end diesel hammer. Vibratory, gravity (drop) and sonic hammers shall not be permitted.

ITEMS 942.124, 944.124, 948.02 and 948.41 (Continued)

At the integral abutments and pier the accuracy of driving shall be superseded by the following:

- A. Prior to driving any pile, the Contractor shall set up appropriate templates to locate each pile to within 1 inch of its location as shown on the Plans. Piles shall be installed so that their weak axis is parallel to the centerline of the abutment. The pile shall be surveyed after being set in the template to verify that it is plumb. During driving, each pile shall be monitored to verify that it remains plumb and within location tolerance. The driving shall be stopped at appropriate intervals in order to check the proper axial alignment and location of the pile. Driving shall not be resumed without the approval of the Engineer. Pulling laterally on piles and/or heat treating of piles to correct misalignment shall not be allowed. Each pile shall be installed so that its horizontal alignment at cutoff elevation is within the tolerances shown on the Plans.
- B. If any pile after driving is beyond the specified tolerances shown on the Plans, the Contractor shall extract the misaligned pile in its entirety, and shall drive a replacement pile to satisfy the tolerances specified in these Special Provisions. All of such corrective work shall be done without extra compensation for that pile which is being pulled. Pulling laterally on piles and/or heat treating of piles to correct misalignment shall not be allowed. After each pile is in place, the Engineer will inspect the pile for any damage due to driving such as twisting, buckling, and loss of section. If such damage exists, in the judgement of the Engineer, the pile shall be removed and replaced in its entirety without additional compensation.

Drilling for Pile Obstructions (Item 948.02) shall be used if needed to drill through obstructions where obstructions are encountered during pile driving. The primary purpose of such obstruction removal is to allow piles to be installed without pile damage and within alignment tolerances. Pre-drilling will only be permitted below the level of the bottom of the crushed stone and must be approved in writing by the Engineer. Projected area of auger shall not exceed 75% of the projected area of the pile.

The Contractor shall keep a record, independent of any which may be made by the Engineer, of all pertinent field data relative to the installation of each pile. This record shall be available for the Engineer's inspection, being transmitted to him/her as he/she may direct. As a minimum, this record shall include for each pile:

- 1. Date and time of installation;
- 2. Kind and size of hammer, the pressure and speed at which operated;
- 3. Depth of obstruction, if encountered, and predrilling performed.
- 4. Total penetration to the closest 2 inches, shown by point elevation and cutoff elevation;
- 5. Blows for the entire pile depth and blows per the last 4 inches of penetration; and
- 6. Pertinent notes as to any unusual behavior of a pile.

ITEMS 942.124, 944.124, 948.02 and 948.41 (Continued)**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 942.124: The method of measurement and basis of payment for this item will be based upon the Contract unit bid price per Foot, and upon the relevant provisions of Section 940. The contract unit price shall be considered full compensation for all labor and materials required, including, but not limited to, driving the piles, splicing and welding, performing wave equation analyses, backfilling with crushed stone (M2.01.6) in and around any pre-drilled hole for the abutment piles, and keeping pile driving records.

Payment for crushed stone at the base of the concrete integral abutments as shown on the Plans is separate from the crushed stone for any drilled holes stated above, and shall be paid for under Item 156.01 Crushed Stone for Integral Abutments.

Item 944.124: The method of measurement and basis of payment for this item of steel pile splice shall be based upon the Contract unit bid price per Each, and upon the relevant provisions of Section 940. The contract unit price shall be considered full compensation for all labor and materials required, including splicing and welding.

Item 948.02: Drilling for Pile Obstructions shall be measured and paid at the Contract per Foot bid price, which price and shall include full compensation for labor to drill or pre-drill from the ground surface through the obstruction. Payment for mobilization of the labor, equipment, tools and equipment furnished shall be incidental to Item 948.02.

Item 948.41: The method of measurement and basis of payment for this Item shall be based upon the Contract unit bid price per Each, and upon the relevant provisions of Section 940. The contract unit price shall be considered full compensation for all labor and materials required, including, but not limited to, preparing for and performing the dynamic load tests.

ITEM 950.11**TEMPORARY SUPPORT OF EXCAVATION****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 Contractor shall design, furnish, install, maintain and remove Temporary Support of Excavation, as required based upon the actual site conditions, for the maintenance of pedestrian and vehicular traffic, excavation for and demolition of the existing structure, excavation, and construction of proposed abutments and wingwalls, during all construction stages of the proposed bridge structure No. W-05-015 including wingwalls and utilities as necessary, to complete the work as shown on the Plans and to the satisfaction of the Engineer. The Temporary Support of Excavation system designed by the Contractor, may be detailed and designed to remain in place instead of removal at no additional cost to the Engineer.

The Temporary Support of Excavation systems shall be designed by the Contractor and shall provide sufficient space to allow for the installation of the temporary traffic barrier system and the required lane widths specified during stage construction, as shown on the Plans. The contractor's installation shall ensure that no impact from deflected barrier is transferred to the excavation support unless design of support specifically shows system capable of resisting impact load of vehicle.

The Temporary Support of Excavation, shall be designed for, but is not limited to:

- All necessary Temporary Support of Excavation to support excavations, demolitions, and construction work located outside the river's area as necessary for the work of the abutments, wingwalls, and riprap at locations shown on the plans. Temporary Support of Excavation as shown on the plans is conceptual and schematic. The actual locations and extents of excavation support shall be determined by the contractor's design of the system.
- The contractor's design of the Temporary Support of Excavation system shall account for existing groundwater and shall include the contractor's design for dewatering as necessary to complete the work.
- The Temporary Support of Excavation system shall be removed in its entirety unless the contractor's design details it to remain in place, as submitted to the Engineer for prior review and approval.

The Temporary Support of Excavation systems may consist of sheet piling with or without bracings or tiebacks, or any other system that minimizes impact to the river and wetlands.

The excavation support systems shall be capable of supporting all loads applied during all stages of construction. The Temporary Support of Excavation located adjacent to and supporting traffic shall extend longitudinally such that the maximum longitudinal slope of the excavated surface does not exceed 1 (vertical) to 2 (horizontal). The Temporary Support of Excavation be configured such that they will serve their intended purpose during all stages of construction without the need for reinstallation or major modifications.

ITEM 950.11 (Continued)

All material used for the temporary excavation support systems shall be sound and free from strength impairing defects. Steel sheeting (if used) shall conform to the applicable requirements of Section 950.

The Contractor shall design and submit to the Engineer for approval Temporary Support of Excavation that are designed to carry all of the applicable AASHTO loads, including, but not limited to, earth pressure and surcharge due to HS25 truck loading and temporary barriers.

The contractor's design of the Temporary Support of Excavation shall be prepared, designed, and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. Prior to any excavation, the Engineer must approve complete detailed drawings and complete calculations for the Temporary Support of Excavation in writing. Payment for the Contractor's design and submittal including contractor's engineering services shall be considered incidental to this item and no further compensation will be allowed.

The Contractor is responsible for determining all geotechnical criteria associated with the Temporary Support of Excavation including, but not limited to, lateral earth pressures. Additional lateral earth pressures due to surcharges caused by equipment operation and/or material storage near the top of the excavation shall be considered and incorporated into the designs. The minimum design live load is HS25 loading, but in no case shall this surcharge be less than 250 lb/ft².

The Contractor shall take into account subsurface conditions such as, but not limited to, ground water elevations, surface elevation, and existing foundations. The Contractor shall accurately locate all utility lines and structures to ensure that the proposed Temporary Support of Excavation systems will not interfere with any existing utilities and structures.

The Contractor shall always keep the surface clean of debris and shall make the surface thoroughly clean at the end of the work. The Contractor shall be responsible for any settlement or damage to curbing, structures, utilities, or roadway, which may occur because of his work.

Excavation for the Temporary Support of Excavation shall be made and paid for under Item 140, Bridge Excavation.

The Contractor shall submit to the Engineer for approval a short-term traffic management plan required for the installation of the temporary excavation support for each separate location. The plan submitted shall be sufficiently detailed so that the Contractor's method of dealing with operations shall be clearly stated. No construction work shall be allowed before the Engineer approves this traffic management plan. Payment for the Contractor's design and submittal including contractor's engineering services shall be considered incidental to this item and no further compensation will be allowed.

ITEM 950.11 (Continued)**BASIS OF PAYMENT**

Temporary Support of Excavation will be paid at the Contract Lump Sum bid price, which price shall include full compensation for the Contractor's design and plans; all material, labor, tools and equipment furnished; and installation, maintenance, and removal of all Temporary Support of Excavation systems necessary for the proper completion of the work specified, as approved and in a satisfactory manner to the Engineer, regardless of the type of the approved Contractor system.

In addition to the locations indicated on the Plans, other locations may require excavation supported by Temporary Support of Excavation. If the Contractor elects to install such excavation support, it will be considered incidental work necessary for the satisfactory completion of the various other Items of work, without any additional measurement or payment made under this Item. No direct payment will be made for any excavation support not indicated on the Plans or in these Special Provisions to be specifically utilized for demolition or construction of the bridge.

1. The first payment will be made at fifty percent (50%) of the contract Lump Sum bid price of this Item and will be paid upon completion of the excavation support installation of Stage 1A/1B, to the satisfaction and approval of the Engineer.
2. The second payment will be made at thirty percent (30%) of the contract Lump Sum bid price of this Item and will be paid upon completion of the excavation support installation of Stage 2A/2B, to the satisfaction and approval of the Engineer.
3. The final payment will be made for the remaining twenty percent (20%) of the contract Lump Sum bid price for this Item and will be paid upon completion of all work for this Item, including complete removal and satisfactory disposal of the excavation support from the project.

ITEM 983.11**MODIFIED RIPRAP****TON**

The work under this Item shall conform to the relevant provisions of Subsection 983 of the Standard Specifications, the material requirements outlined in Section M2.02.0, and the following:

The Contractor shall furnish and place new riprap stones or remove and re-lay existing riprap stones, if any, along the proposed pier, abutment, and wingwall walls. Riprap shall consist of scour and slope protection at the locations shown on the Plans and/or as directed by the Engineer.

This work shall consist of installing new or reused angular stones, hand placed, to provide bank protection where damage may be caused by water conditions, as shown on the plans. Riprap shall be placed along the pier, abutment and wingwall walls and shall extended a distance not less than shown on the plans down the bank slope in all directions away from the bridge structures and towards the river. Riprap shall extend a sufficient distance beyond the ends shown on the plans to stabilize the slopes and provide protection during flood events.

Proposed riprap stones shall be placed along the lines, thicknesses, and grades shown on the Plans.

All riprap shall be placed in such a manner as to allow access to the underside of bridge abutments, and wingwalls for inspection purposes. Services, voids, and other hazards that may cause bodily harm are to be avoided by careful placement of the riprap stone.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Modified Riprap furnished and placed and/or removed and re-laid will be measured and paid for at the Contract Unit Price bid per TON for stone complete in place, which price shall include all labor, materials, equipment and all incidental costs required to complete the work.

Crushed Stone shall be paid for under Item 156.5 Crushed Stone For Filter Fabric.

Geotextile fabric shall be paid for under Item 698.3 Geotextile Fabric For Separation.

ITEM 988.01**SEDIMENT FOREBAY PAVING****SQUARE FOOT**

The work under this item shall conform to the relevant provisions of Subsections 501 and 983 of the Standard Specifications and the following:

The purpose of this item is to provide a level protective surface over a compacted gravel borrow foundation to facilitate in maintenance of the pretreatment sedimentation forebay.

The work shall include the construction to the line and grade of a level sedimentation forebay protective bottom surface conforming to the minimum size and dimensions shown on the Contract Drawings and the following:

Each piece of granite curb or edging shall have a minimum length of eighteen (18) inches, minimum width of four (4) inches and minimum depth of four (4) inches. Granite curb or edging shall be placed in an offset tile pattern with one (1) inch spacing on all sides. Material may either be new or existing curb or edging designated to be discarded as shown on the plans within the Project limits of work.

Reused curbing shall include removal, temporary storage and protection, cutting, removal and disposal of all foreign matter and installation.

Curb layout pattern shall be pre-approved by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Measurement for Sediment Forebay Paving will be by the square foot of curbing installed and accepted as specified on the Contract Drawings.

Payment will be by the Contract bid price per square foot and shall include compensation for all labor, equipment and materials required to complete the specified work.

Excavation when required to construct the sediment forebay paving will be paid for by the cubic yard under Item 120. Earth Excavation.

Gravel borrow will be paid for separately by the cubic yard under Item 151.

ITEM 990.11**TEMPORARY COFFERDAM – STRUCTURE**
NO. W-05-015**LUMP SUM**

The work under this Item shall conform to the relevant provisions of Subsection 140 of the Standard Specifications, special provisions of Item 991.11 Temporary Control of Water – Structure No. W-05-015, and the following:

The Contractor shall design, furnish, install, maintain, and remove temporary cofferdams as necessary for the excavation and construction work of the proposed pier at the proposed bridge replacement of the Route 32 (Palmer Road) Bridge over Ware River, Bridge No. W-05-015, during all construction stages and as shown on the Plans and/or as directed by the Engineer. The Temporary cofferdam system designed by the Contractor, may be detailed and designed to remain in place instead of removal at no additional cost to the Engineer. The cofferdam system shall be designed for:

- 1) Excavation and construction for the proposed reinforced concrete pier, cap, stem and pile cap on steel H-piles, including the installation of proposed riprap for the pier.
- 2) Excavation and construction of suggested tremie concrete seal at the bottom of the cofferdam to control water as necessary to construct the proposed pier.

Cofferdam systems shall be designed by the Contractor and shall provide sufficient space for excavation and construction of the proposed bridge pier, as shown on the Plans.

The Contractor's design of the temporary cofferdam systems shall be prepared, designed, and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. Prior to installation, the Engineer must approve complete detailed drawings and complete calculations for the temporary cofferdam systems in writing. Payment for the Contractor's design and submittal, including Contractor's engineering services shall be considered incidental to this item and no further compensation will be allowed.

The Contractor shall design the system per the hydraulic data shown in the table "Temporary Water Control Design Data" on Bridge Sheet 2 of 42, in addition to all relevant geotechnical and structural loads. Ice loads shall be considered if the cofferdam is to remain in place during winter conditions.

The Contractor's design shall account for all construction stages and include dimensions of each cofferdam to be installed around existing and proposed sections of bridge, accounting for sections of existing or new bridge to remain in place during adjacent demolition and construction. Cofferdams installed against new construction shall not damage or adversely impact any elements of the new bridge.

ITEM 990.11 (Continued)

All elements of the cofferdams shall be completely removed at the conclusion of substructure demolition and new construction. Portions of cofferdams will need to be removed prior to the completion of substructure demolition and new construction due to the staged construction. Any sheet piling to be left in place will require advance approval of the Engineer, and shall be cut off to an elevation specified by the Engineer.

BASIS OF PAYMENT

Temporary Cofferdam will be paid at the Contract Lump Sum bid price, which price shall include full compensation for the Contractor's design and plans; all material, labor, tools and equipment furnished; and installation, maintenance, dewatering and removal and/or relocation of all temporary cofferdam systems necessary for the proper completion of the work specified, as approved and in a satisfactory manner to the Engineer, regardless of the type of the approved Contractor system.

1. The first payment will be made at fifty percent (50%) of the contract Lump Sum bid price of this Item and will be paid upon completion of the cofferdam installation of Stage 1A/1B, to the satisfaction and approval of the Engineer.
2. The second payment will be made at thirty percent (30%) of the contract Lump Sum bid price of this Item and will be paid upon completion of the cofferdam installation of Stage 2A/2B, to the satisfaction and approval of the Engineer.
3. The final payment will be made for the remaining twenty percent (20%) of the contract Lump Sum bid price for this Item and will be paid upon completion of all work for this Item, including complete removal and satisfactory disposal of the cofferdam systems from the project.

ITEM 991.11 **TEMPORARY CONTROL OF WATER - STRUCTURE** **LUMP SUM**
NO. W-05-015

The work under this item shall conform to the relevant provisions of Subsection 140 of the Standard Specification and the following:

The work to be performed under this Item shall include all sheeting, pumping, sandbagging, earth and other measures as needed to support excavation and water controls in the river to construct the dry abutments, wingwalls, and riprap in the dry. Water shall be discharged as specified in the environmental permits obtained for this project and in compliance with the NPDES permit program. No direct discharge shall be allowed into the Ware River during the dewatering operations. The Contractor shall be responsible for restoration of site following completion of the dewatering operations.

Temporary control of water shall be designed by the Contractor to support excavation, demolition and construction activities including dewatering as needed for all work in the river for:

- 1) Demolition of the existing bridge Piers, including complete and/or partial demolition of stem and pile caps to a depth of 3'-0" below the river bed, as shown on the Plans. Any portions of the existing piers at depths greater than 3'-0" below the river bed shall remain in place.
- 2) Excavation for and construction of the proposed abutments and riprap at the face of abutments and the sides of the abutments and wingwalls, as shown on the plans.

The work shall include all equipment, labor, materials, pumping, and other measures necessary for water control devices required for the control of water for substructure concrete work and for other work that may be required to complete the construction of proposed Bridge No. W-05-015 (C89), and for control of water necessary to accomplish the work as shown on the plans, as directed by the Engineer, and as specified herein.

This item does not include the design, furnishment, installation, maintenance, or removal of temporary cofferdam, which is included and paid for in Item 990.11: Temporary Cofferdam – Structure No. W-05-015.

Dewatering shall be conducted to ensure that all construction of the proposed bridge is performed in the dry. For demolition purposes, dewatering shall be conducted on an as needed basis as determined by the Contractor's plan for control of water.

It is the responsibility of the Contractor to determine the need and extent of excavation support and dewatering that are required, and to submit methods and materials he/she proposes to use for the Engineer's review and approval.

ITEM 991.11 (Continued)

The Contractor shall follow the guidelines of this specification for which dewatering is to be accomplished. However, except for payment, all work shall conform to the relevant requirements of Section 140, and to the allowed dewatering methods listed herein:

The Contractor shall submit complete working drawings and computation of his or her proposed excavation support and dewatering systems with supporting data, as necessary, to the Engineer for approval, in accordance with Subsection 5.02 and the Special Provisions. These drawings shall be accompanied by design calculations. Both shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The Contractor shall make his or her own evaluation of existing conditions and water flow, and of the effects of his or her proposed temporary works and construction methods, and shall provide in his or her design for all loads and construction conditions necessary to permit demolition and construction of the specified structure while maintaining public safety and protecting complete work and all third party property from damage resulting from construction operations.

Measures to control the discharge of pollutants into water resource areas shall include, but not be limited to the following:

- Rigorous management of construction operations involving potentially hazardous materials, such as refueling and maintenance of construction equipment.
- Formulation of contingency plans to control accidental spillage from potentially hazardous materials.
- Siting of construction laydown and staging areas outside of the riverfront inner riparian area and Wetlands buffer zones, and locating construction staging on relatively flat ground.
- Scheduling of work within the resource areas to avoid periods of high flood (e.g., spring floods) and inclement weather.
- Installation and continuous maintenance of compost filter tube fences to prevent sediment migration into adjacent downstream resource areas. Placement of erosion controls shall be as shown on the plans, as specified herein, or as directed by the Engineer to accomplish maximum control of project related sediment mobilization. Additional erosion control measures shall be employed as necessary to prevent erosion and sedimentation of the streambed. These measures shall be maintained for the duration of the contract.
- All discharge resulting from dewatering activities shall be directed to temporary construction tanks for sedimentation/retention provided as necessary to control turbidity. At no time shall said discharge be directly released into adjacent resource areas.

ITEM 991.11 (Continued)

The Contractor shall provide temporary sheeting, water barriers, filtering fabrics, silt fencing, sedimentation/retention basins, and/or other effective procedures or structures together with all labor, materials, and equipment necessary for controlling water in, under, and around the bridge. Such work shall be subject to the approval of the Engineer, but such approval will not relieve the Contractor of responsibility for the adequacy of construction, maintenance, operation, and safety of the water control system.

Also included shall be all necessary permits that may be required in performing the work under this item.

Upon completion of the work, temporary sheeting, water barriers, and any other water control devices or constructions shall be removed from the site.

BASIS OF PAYMENT

Compensation for the work to be done under this item shall be at the Contract Lump Sum price, which price shall be considered full compensation for all labor, tools, equipment, materials, installation, maintenance, and removal of any temporary water barriers such as, sheeting, or other diverting systems or material, filter fences, sedimentation/retention basins, and all incidental costs required to complete the work under this item as described herein and as required by the Engineer.

Payment shall be made based upon the following percentages: 10% upon approval of design, 70% upon complete installation, and 20% upon removal.

ITEM 994.01 **TEMPORARY PROTECTIVE SHIELDING**
BRIDGE NO. W-05-015**LUMP SUM**

The work under this item consists of the Contractor designing, furnishing, installing, maintaining, removing, and disposing of a protective shielding system on and under the Route 32 (Palmer Road) bridge over Ware River, Bridge No. W-05-015.

The shielding shall protect vehicular traffic, pedestrians, personnel on the bridge and beneath the bridge, and the Ware River, from damage, injury, falling or flying debris, or any tools or incidental equipment during existing deck repairs, demolition, excavation, debris removal, and construction activities including phased construction.

The Contractor is responsible for preventing any debris or items of any kind from falling into the river below, nor into the resource areas within the vicinity of the river. Any material that accidentally falls into the river or vicinity shall be removed immediately.

The Contractor's design of the temporary protective shielding shall be prepared, designed, and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts and shall be submitted to the Engineer for review and approval. Payment for the Contractor's design and submittal, including contractor's engineering services, shall be considered incidental to this item and no further compensation will be allowed.

The Contractor shall be required to shield the entire structure over the Ware River, including as many partial setups, adjustments or removal as necessary to accommodate all stages of work.

The shielding shall conform to the following:

1. Shielding shall be designed such that impacts on the river, wetlands, and resources areas during installation and removal will be minimal.
2. Shielding shall be in place prior to start of demolition and excavation, during concrete excavation for demolition of the existing structure, and until the end of construction activities requiring such shielding, as directed by the Engineer.
3. Shielding shall extend a sufficient distance both vertically and horizontally above and beyond the fasciae and the full width and length of the bridge underside. Vertical shielding along the work area shall extend to heights of no less than 9-feet and shall be dimensioned in the Contractor's design submittal.
4. Shielding shall have all spaces along the perimeter and at the seams sealed to prevent dust and debris from escaping and falling into the river below.

ITEM 994.01 (Continued)

5. Shielding shall be designed to safely withstand all loads that it will be subjected to. The design shall be in accordance with the latest edition of AASHTO LRFD Bridge Design Specifications and LRFD Bridge Construction Specifications. The Contractor's design shall also include a complete description of proposed equipment and construction methods.
6. Shielding shall be installed or removed only upon approval of the Engineer.

No debris shall be swung over vehicular or pedestrian traffic on the bridge.

If the Contractor's operations damage to any existing portions of the bridge that have been selected to be remain in place during phased construction, the Contractor shall repair such damage at his expense.

The Contractor is responsible for control of bridge traffic necessary to perform this shielding work and it shall be considered incidental to this Item.

BASIS OF PAYMENT

Compensation for the work to be done under this item shall be at the Contract Lump Sum price, which price shall be considered full compensation for all incidentals, labor, tools, equipment, materials, installation, maintenance, removal and legal disposal of all temporary systems, including as many partial setups, adjustments or removals as required to accommodate all stages of work as required to complete the work as described herein and as required by the Engineer.

Payment shall be made based upon the following percentages: 10% upon approval of design, 4% upon completion of existing deck repairs, 40% upon completion of and Phases 1A/1B to the satisfaction and approval of the Engineer, and 46% upon completion of Phases 2A/2B including removal of the shielding system, to the satisfaction and approval of the Engineer.

ITEM 995.01 BRIDGE STRUCTURE, BRIDGE NO. W-05-015**LUMP SUM**

The work under this Item shall conform to the relevant 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:

- Concrete Abutments and Pier, Concrete Wingwalls, Concrete Roadway Deck Slab, Concrete Sidewalks, Concrete Approach Slabs, and Precast Concrete Guardrail Transitions
- Steel Reinforcement for Structures - Epoxy Coated
- Mechanical Reinforcing Bar Splicers – Epoxy Coated
- Shear Connectors
- Laminated Elastomeric Bearings W/O Anchor Bolts, at Pier
- Rubber Cotton-Duck Erection Pads, at Abutments (incidental to this Item 995.01)
- Structural Steel – Coated
- Membrane Waterproofing for Bridge Decks (Spray Applied)
- Bituminous Damp-Proofing
- Asphaltic Bridge Joints
- Metal Bridge Railing, Type S3-TL4

The work does not include any items listed separately in the proposal. 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.

4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE**5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE****4000 PSI, 3/4 IN., 585 HP CEMENT CONCRETE**

The work under these headings shall conform to the applicable provisions of Section 901 of the Standard Specifications with the following additions:

4000 PSI, 1.5 INCH, 565 Cement Concrete shall be used to construct the integral abutments and wingwalls below the bridge seat construction joint, pier pile cap, approach slabs, and at those areas designated by the Engineer and/or as designated on the Plans.

5000 PSI, 3/4 INCH, 685 HP Cement Concrete shall be used to construct the sidewalk, integral wingwall coping above the construction joint at top of the deck, highway guardrail transition base and top, and at those areas designated by the Engineer and/or as designated on the Plans.

ITEM 995.01 (Continued)

4000 PSI, 3/4 IN., 585 HP Cement Concrete shall be used to construct the bridge deck, integral abutments and wingwalls above the bridge seat construction joint, pier stem, keeper blocks, and at those areas designated by the Engineer and/or as designated on the Plans.

Shall conform to all material requirements contained in Subsection M4.06.1 of the Supplemental Specifications, with the exception of cementitious content, which shall be limited to a maximum of 585 pounds per cubic yard.

Waterstops, preformed filler, joint sealer, paraffin and all other materials (complete in place) at expansion and construction joints and all other work considered as incidental to the work involved in furnishing and placing concrete and not covered in the schedule for partial payments, or for which payment is not provided elsewhere in the contract, shall be considered as included in the unit price per Cubic Yard of concrete as stated by the Contractor and approved by the Engineer in the "Basis for Partial Payments."

All concrete shall be placed in the dry.

PRECAST PRECAST HIGHWAY GUARDRAIL TRANSITIONS**General.**

The work under this Heading consists of fabricating, transporting and installing Precast Highway Guardrail Transitions (top and base) 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.

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.

ITEM 995.01 (Continued)**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:

- (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.

ITEM 995.01 (Continued)**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:

- (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.

ITEM 995.01 (Continued)

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.

ITEM 995.01 (Continued)

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	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				
	AASHTO T 23	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.

ITEM 995.01 (Continued)

- (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.

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 sublot 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.

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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 Cement Concrete	M4.06.1
Self-Consolidating Concrete (SCC)	M4.02.17
Controlled Density Fill – Non-Excavatable	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)**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.

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.

ITEM 995.01 (Continued)

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.

ITEM 995.01 (Continued)**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:

- (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.

ITEM 995.01 (Continued)

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 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.

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.

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 Procedure 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:

ITEM 995.01 (Continued)**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.

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.

ITEM 995.01 (Continued)**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.

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.

ITEM 995.01 (Continued)**STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED
MECHANICAL REINFORCING BAR SPLICERS**

The work under this heading shall conform to the relevant provisions of Section 901 of the Standard Specifications and the material requirements outlined in Sections:

M8.01.7 for steel reinforcement for structures - epoxy coated.

M8.01.9 for mechanical reinforcing bar splicers – epoxy coated.

All mechanical reinforcing bar splicers shall be selected from the Qualified Construction Materials List.

The work shall include furnishing and installing mechanical reinforcing bar splicers at construction joints as shown on the plans, and at the Contractor's option as a substitute for continuous reinforcing bars passing through construction joints as shown on the plans.

Mechanical reinforcing bar splicers shall be epoxy coated and shall satisfy the concrete cover shown on the Plans.

**STRUCTURAL STEEL – COATED STEEL
SHEAR CONNECTORS**

The work under this heading shall conform to the applicable provisions of Sections 901 and 960 of the Standard Specifications and the material requirements outlined in the following Sections:

Structural Steel – Coated: Grade AASHTO M270 Grade 36 (sole plates), shall meet the material requirements in Section M8.05.0, and as shown on the contract plans.

Grade AASHTO M270 Grade 50, shall meet the material requirements in Section M8.05.0, and as shown on the contract plans.

Stud Shear Connectors shall meet the requirements in Section M8.04.1.

THERMAL SPRAYED COATING (METALIZING) FOOTSHOP APPLIED**PURPOSE**

This section provides the requirements for shop performed surface preparation; the application of a thermal spray coating (TSC/metalizing); 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.

ITEM 995.01 (Continued)**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.

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.

ITEM 995.01 (Continued)

***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.

ITEM 995.01 (Continued)**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.

PERSONNEL QUALIFICATION

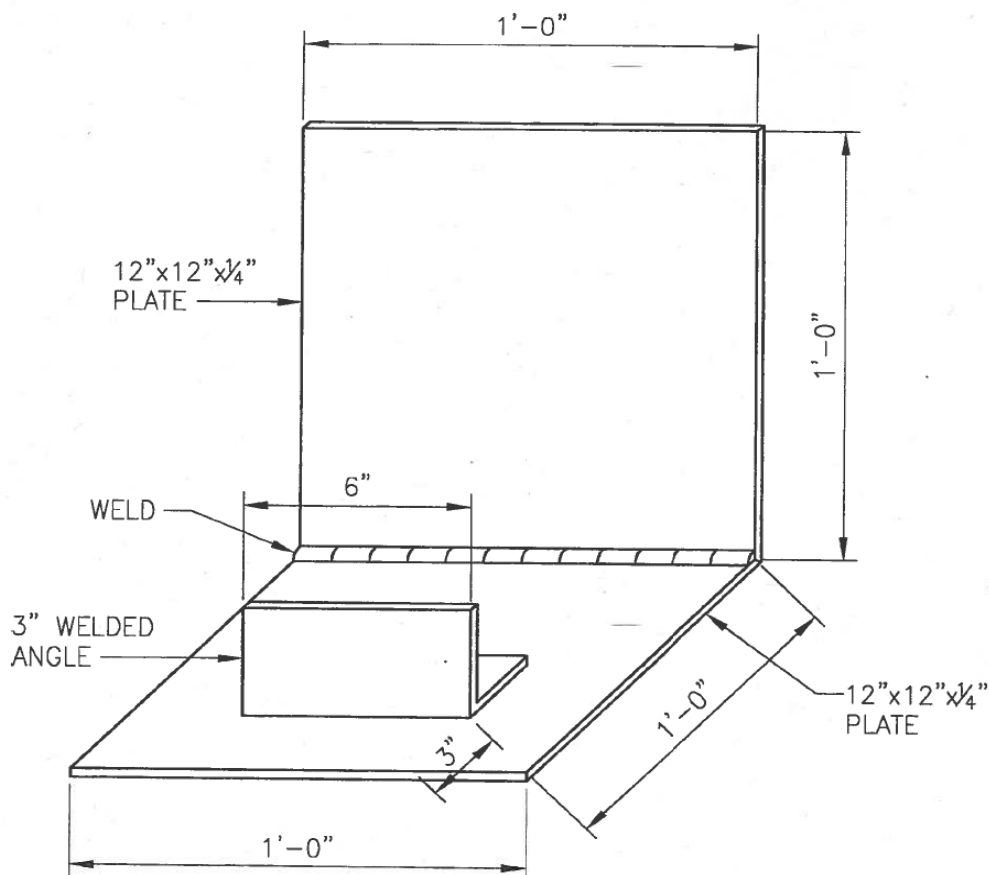
The applicators of the thermally applied material shall be individually qualified to apply the TSC as follows:

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 on the next page 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.

ITEM 995.01 (Continued)**TSC AND COATING APPLICATION****Storage, Testing and Sampling**

The Contractor shall provide protection from the elements and ensure that the paint is not subjected to temperatures outside the manufacturer's recommended extremes.

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.

ITEM 995.01 (Continued)**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.

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.

ITEM 995.01 (Continued)**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.

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.

ITEM 995.01 (Continued)**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.
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.

ITEM 995.01 (Continued)**LAMINATED ELASTOMERIC BEARING W/O ANCHOR BOLTS (>200)**Description Of Work

The work to be performed under this item shall conform to the relevant provisions of Section M9.14.5 and the following:

Submittals

The Contractor shall submit to the Engineer for approval the following documents:

1. Prior to fabrication:
 - a. Written notification in accordance with M9.14.5
 - b. Shop drawings for approval in accordance with Section 5.02 of MassDOT's Supplemental Specifications to the Standard Specifications for Highways and Bridges.
 - i. Fabrication shall not begin until the Contractor receives written approval from the Department that the submitted shop drawings have been received.
2. Upon delivery of the bearing pads:
 - a. A Certificate of Compliance certifying that the elastomeric bearing pads meet the requirements of the contract specifications.
 - i. A Mill certificate and certificate of compliance for the steel laminates shall accompany the bearing pads.
 - b. Independent testing results as required below.
 - c. Additional elastomeric bearing pads for MassDOT Acceptance testing as required below.

Materials

Elastomer: The elastomeric compound shall be composed of 100% low temperature Grade 3 virgin crystallization resistant polychloroprene (neoprene).

Steel Laminates: The steel laminates shall meet the requirements of AASHTO M 251.

Internal Load Plates: The internal load plates shall conform to AASHTO M 270 Grade 36 or Grade 50.

Fabricators

The National Transportation Product Evaluation Program (NTPEP) shall find the bearing pad fabrication plant to be in compliance with the Elastomeric Bridge Bearing Pad Technical Committee Work Plan. Approved fabricators are listed on the MassDOT QCML.

Fabrication

Bearing pads shall be fabricated in conformance with the "Method B" design method outlined in the AASHTO LRFD Bridge Design Specifications.

ITEM 995.01 (Continued)

The bearing dimensions, including elastomer thickness and edge cover, number and thickness of steel reinforcing laminates, dimensions of load plates (if any), and the design shear modulus of the elastomer shall be as shown on the Plans.

The tolerances on the overall dimensions for the bearings shall be according to Table 2 of AASHTO M 251, except that the tolerance on the overall vertical dimension shall be limited to -0, +1/8" regardless of the design thickness.

Sampling

Sampling of bearing pads for testing shall be random and performed on a lot basis. Lots shall be divided into sublots of 10 bearings. Acceptance samples shall be independently tested as outlined below. For Verification samples taken by the Engineer at the project, the sampling rate shall be one randomly selected full size bearing pad of each size and type in accordance with Subsection M9.14.5. A lot shall be defined as the smallest number of bearings determined by the following criteria:

1. A lot shall not exceed a single contract quantity.
2. A lot shall consist of bearings of the same size and configuration.
3. A lot shall consist of bearings produced in a continuous manner from the same batch of elastomer and cured under the same conditions.

All pads required for testing purposes in accordance with Subsection M9.14.5 of the Standard Specifications shall be considered as incidental to this item. The quantities listed in the Schedule of Basis for Partial Payment only include the number of bearings required for construction and do not include the additional bearings required for conformance and destructive testing as outlined herein.

Independent Testing

Independent testing shall be performed by a nationally recognized testing laboratory approved by the Engineer which shall provide certified test results. Each Lot of bearings as defined above shall be randomly sampled and tested at the frequency specified under Section 8.5 of AASHTO M 251. The minimum testing shall be in conformance with Sections 8 and 9 of M 251 as specified below:

1. Materials shall meet Section 4 of M 251.
2. Dimensions per Section 8.4 of M 251.
3. Elastomer per Section 8.6 of M 251.
4. Compressive Strain at maximum dead and live load (service) per Section 8.8.1 of M 251.
 - a. The compressive deflection of each bearing shall not exceed 10% of the design effective rubber thickness at a compressive load equal to the maximum design load.

Short Duration Compression Test per Section 8.8.2 of M 251.

ITEM 995.01 (Continued)

5. Shear Modulus of the Elastomer per Section 8.9.1 of M 251.
 - a. The shear modulus shall be between 0.136 and 0.184 ksi.
6. Tensile Strength, Ultimate Elongation per ASTM D412.
7. Shear Bond Strength per ASTM D429.
8. Heat Resistance per ASTM D573.
9. Compression Set per ASTM D395.
10. Low Temperature Brittleness per ASTM D746 for Elastomer Grades 3.

Packaging, Handling, And Storage

The bearing pads shall be packaged, handled and stored in accordance with Section 18.1.3 of the AASHTO LRFD Bridge Construction Specifications. On the top of each completed bearing it shall be clearly identified and marked in accordance with M 251 Section 7. In addition, a 1/32" deep direction arrow shall be inscribed into the bearing which will allow the bearing to be aligned with the up-station direction. All marks shall be permanent and be visible after the bearing is installed.

Installation

The bearing pads and bridge seat bearing areas shall conform to Section 901.65A(3).

Acceptance

Requirements for providing notification to the Department prior to the start of bearing pad production as well as the provisions for random sampling of the bearings by the Department at the job site for additional destructive testing shall be in accordance with M9.14.5 and this specification. The Department shall use the results of the Independent testing as well as their own testing in the Acceptance of the bearing pads.

ITEM 995.01 (Continued)**MEMBRANE WATERPROOFING FOR CONCRETE BRIDGE DECKS (SPRAY APPLIED)**

The work under this Item shall conform to the relevant provisions of Subsection 965 of the Standard Specifications and the following:

The material shall conform to Section M9.08.1 Spray-Applied Waterproofing Membrane, of the Standard Specifications.

BASIS OF PAYMENT

Item 995.01 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

SCHEDULE OF BASIS FOR PARTIAL PAYMENT

Within ten (10) days after the date of 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. W-05-015 (C89). 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.

The schedule on the proposal form applies only to Bridge Structure No. W-05-015 (C89). 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.

ITEM 995.01 (Continued)**Item 995.01 Bridge Structure, Bridge No. W-05-015 (C89)**

<u>SUB-ITEM</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
629.11	PRECAST HIGHWAY GUARDRAIL TRANSITIONS (TOP AND BASE)	4	EA		
901.	4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE	315	CY		
904.3	5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE	105	CY		
904.4	4000 PSI, 3/4 INCH, 585 HP CEMENT CONCRETE	500	CY		
910.1	STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED	130000	LB		
910.4	MECHANICAL REINFORCING BAR SPLICER	80	EA		
911.1	SHEAR CONNECTORS	6020	EA		
922.5	LAMINATED ELASTOMERIC BEARING W/O ANCHOR BOLTS >200	9	EA		
960.1	STRUCTURAL STEEL – COATED STEEL	6000	LB		
965.	MEMBRANE WATERPROOFING FOR BRIDGE DECKS (SPRAY APPLIED)	5850	SF		
970.	DAMP-PROOFING	375	SY		
971.	ASPHALTIC BRIDGE JOINT SYSTEM	115	FT		
975.1	METAL BRIDGE RAILING (3 RAIL), STEEL (TYPE S3-TL4)	384	FT		

Total Cost of Item 995.01 = _____

END OF DOCUMENT

DOCUMENT A00802

DETAIL SHEETS

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**THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
10 PARK PLAZA, BOSTON MA**

-PRELIMINARY ESTIMATE OF QUANTITIES – DETAIL SHEET

CITY/TOWN: Ware **Road** Route 32 (Palmer Road) over the Ware River

Station 10+50 to 14+68 **Class:** Bridge Replacement Project - Bridge W-05-015

DATE August 2022

Earth Excavation	5,440	CY	Class B Rock Excavation	140	CY
Class A Rock Excavation	50	CY	Ordinary Borrow	1,270	CY
Class B Trench Excavation	50	CY	Gravel Borrow	2,001	CY

PAVEMENT NOTES

FULL DEPTH CONSTRUCTION

AREA = 5,364 SY

SURFACE: 1.75" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P)

INTERMEDIATE: 2.25" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0) **BASE:**

4" SUPERPAVE BASE COURSE - 37.5 (SBC-37.5)

SUB-BASE: 4" DENSE GRADED CRUSHED STONE OVER

8" GRAVEL BORROW TYPE B OVER PROOF ROLLED SUBGRADE

FULL DEPTH PAVEMENT - PAVEMENT LESS THAN 6' WIDE

AREA = 324 SY

SURFACE: 1.75" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P)

INTERMEDIATE: 2.25" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0)

BASE: 8" CEMENT CONCRETE BASE OVER

SUB-BASE: 8" GRAVEL BORROW TYPE B

PAVEMENT NOTES (Continued)**MILLING & PAVEMENT OVERLAY****AREA = 1,219 SY**

SURFACE: 1.75" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P)
MATERIAL
PLACED IN ONE COURSE

MILLING: 1.75" PAVEMENT FINE MILLING VARIABLE DEPTH TO MEET
PROPOSED GRADING PAVEMENT OVERLAY SHALL MEETING
EXISTING PAVEMENT AT A SQUARE BUTT JOINT

HOT MIX ASPHALT DRIVEWAY**AREA = 458 SY**

SURFACE: 1.5" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER 2.5"
SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5)

SUB-BASE: REMOVE EXISTING ASPHALT PAVEMENT, 8" GRAVEL BORROW

CEMENT CONCRETE SIDEWALK**AREA = 680 SY**

SURFACE: 4" CEMENT CONCRETE OVER

SUB-BASE: 8" GRAVEL BORROW

CEMENT CONCRETE DRIVEWAY**AREA = 190 SY**

SURFACE: 4" CEMENT CONCRETE OVER

SUB-BASE: 8" GRAVEL BORROW

CEMENT CONCRETE PEDESTRIAN CURB RAMP**AREA = 60 SY**

SURFACE: 4" CEMENT CONCRETE OVER

SUB-BASE: 8" GRAVEL BORROW

LOAM FOR ROADSIDES**AREA = 3,985 SY**

SURFACE: 4" LOAM BORROW SEEDED

LOAM FOR LAWNS**AREA = 475 SY**

SURFACE: 4" LOAM BORROW SEEDED

ITEM 101. **CLEARING AND GRUBBING**

In general, the limits of clearing and grubbing shall be 5 feet beyond the limit of proposed slope work.

ITEM 121 **CLASS A ROCK EXCAVATION**

This item is to be used in the event that existing rock encountered cannot be removed without blasting or the use of rippers.

ITEM 127.4 **REINFORCED CONCRETE DECK EXCAVATION (FULL DEPTH)**

Contingency for deck repairs as directed by the engineer.

ITEM 129.6 **BRIDGE PAVEMENT EXCAVATION**

Excavation of existing pavement for purposes of preemptive repairs of existing bridge deck primarily of Phase 1.

ITEM 142. **CLASS B TRENCH EXCAVATION**

This item is to be used for excavation associated with the installation for proposed water main, sewer and drainage.

ITEM 144. **CLASS B ROCK EXCAVATION**

This item is to be used if rock is encountered during excavation for proposed water main, sewer and drainage and the proposed bridge.

ITEM 146. **DRAINAGE STRUCTURE REMOVED**

This item is to be used for removing existing drainage structures in the event that the proposed structure can't be installed in the same location of the existing structure.

ITEM 150. **ORDINARY BORROW**

This item is to be used as backfill between existing grade and gravel borrow.

ITEM 151. **GRAVEL BORROW**

This item is to be used as shown on the pavement notes and at proposed trenches in mill and overlay areas.

ITEM 153. **CONTROLLED DENSITY FILL - EXCAVATABLE**

This item shall include placing anti-seepage collars on pipes in proximity to the proposed infiltration basin.

ITEM 184.1 **DISPOSAL OF TREATED WOOD PRODUCTS**

This item is to be used as a contingency for treated wood material located near the bridge.

ITEM 201. **CATCH BASIN**

<u>Palmer Rd Station</u>	<u>Offset</u>
22+87	R
24+67	R
26+50	R
30+83	L
30+80	R
30+82	L
33+00	R
33+08	L
35+10	L
35+10	R
36+58	L

ITEM 202. **MANHOLE**

<u>Palmer Rd Station</u>	<u>Offset</u>
30+80	-
31+26	R
33+00	-
35+10	R

ITEM 202.2 **MANHOLE (9 TO 14 FOOT DEPTH)**

<u>Palmer Rd Station</u>	<u>Offset</u>
30+61	L

<u>Old Belchertown Rd Station</u>	<u>Offset</u>
14+04	R

ITEM 204. **GUTTER INLET**

<u>Palmer Rd Station</u>	<u>Offset</u>
22+87	L

ITEM 208. **DROP INLET, TYPE C**

<u>Old Belchertown</u>	<u>Offset</u>
12+36	L
14+32	L

ITEM 220. **DRAINAGE STRUCTURE ADJUSTED**

<u>Palmer Rd Station</u>	<u>Offset</u>
23+00	-
25+03	L
26+47	L

ITEM 221.1 **FRAME AND COVER SECURED**

This item is to be used for proposed manholes.

ITEM 222.1 **FRAME AND GRATE - MASSDOT CASCADE TYPE**

This item is to be used with proposed catch basins and gutter inlets within State Right-of Way.

ITEM 222.2 **FRAME AND GRATE – MASSDOT DROP INLET**

This item is to be used with proposed drop inlets within State Right-of Way.

ITEM 223.2 **FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED**

This item is to be used for discarding existing catch basin frames and grates.

ITEM 227.3 **REMOVAL OF DRAINAGE STRUCTURE SEDIMENT**

This item is to be used for cleaning existing structures to which proposed drainage discharges.

ITEM 227.31 **REMOVAL OF DRAINAGE PIPE SEDIMENT**

This item is to be used for to remove sediment in pipes over which a proposed structure is built, or to which a proposed pipe directly connects.

ITEM 234.08 **8 INCH DRAINAGE PIPE - OPTION**

Palmer Rd Station

Sta 31+14 LT to Sta 31+27 RT

ITEM 234.12 **12 INCH DRAINAGE PIPE - OPTION**

Palmer Rd Station

Sta 22+49 LT to Sta 23+00

Sta 22+87 RT to Sta 23+00

Sta 30+83 LT to Sta 30+80

Sta 30+80 RT to Sta 30+80

Sta 30+80 to Sta 33+00

Sta 33+03 LT to Sta 33+00

Sta 33+00 RT to Sta 33+00

Sta 35+10 LT to Sta 35+10

Sta 35+10 RT To Sta 35+10

Old Belchertown Station

Sta 14+04 RT to 30+80 LT (Palmer) Sta 12+35 LT to Sta 12+34 LT

Sta 14+53 LT to Sta 14+81 LT

ITEM 234.18 **18 INCH DRAINAGE PIPE - OPTION**

Old Belchertown Station

Sta 14+31 LT to Sta 14+04 RT

ITEM 258 **STONE FOR PIPE ENDS**

This item shall be placed in front of and around the drainage pipe end at the infiltration basin to ensure protection of the pipe end and the embankment.

ITEM 302.06 **6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)**Palmer Rd Station

Sta 27+30 LT to Sta 27+56 RT

Sta 27+56 RT to Sta 27+57 RT

ITEM 302.08 **8 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)**Old Belchertown Rd

Sta 13+56 RT to Sta 13+76 RT

Sta 13+76 LT to Sta 14+23

Sta 14+23 to Sta 14+44 LT

Sta 14+44 LT to Sta 30+33 RT (Palmer)

ITEM 302.12 **12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)**Palmer Rd Station

Sta 27+22 RT to Sta 27+57 RT

Sta 27+57 RT to Sta 30+33 RT

Sta 30+33 RT to Sta 31+60 RT

ITEM 315.06 **6 INCH WATER MAIN REMOVED AND STACKED**Palmer Rd Station

Sta 27+30 LT to Sta 29+80 LT

ITEM 315.12 **12 INCH WATER MAIN REMOVED AND STACKED**Palmer Rd Station

Sta 27+30 LT to Sta 29+80 LT

ITEM 336.2 **1 - INCH CTS PLASTIC WATER SERVICE LINE**Palmer Rd Station Sta 33+00 LT

Sta 34+50 LT

Sta 35+00 RT

Sta 36+00 LT

Sta 36+50 RT

ITEM 349.06 **6 INCH GATE VALVE**

Palmer Rd Station Sta
13+57 LT

ITEM 350.06 **6 INCH GATE AND GATE BOX**

Palmer Rd Station Sta
27+57 RT

ITEM 350.08 **8 INCH GATE AND GATE BOX**

Palmer Rd Station
Sta 30+34 RT

Old Belchertown Road
Sta 13+58 RT

ITEM 350.12 **12 INCH GATE AND GATE BOX**

Palmer Rd Station Sta 27+24.74 RT
Sta 27+66.02 RT
Sta 30+28.22 RT
Sta 30+39.12 RT
Sta 31+75.06 RT

355.06 **6 INCH GATE BOX REMOVED AND STACKED**

<u>Palmer Rd Station</u>	<u>Offset</u>
Sta 29+80	38.95 LT
Sta 33+02	15.02 LT

<u>Old Belchertown Rd Station</u>	<u>Offset</u>
Sta 14+45	4.02 RT

ITEM 355.12 **12 INCH GATE AND GATE BOX REMOVED AND STACKED**

<u>Palmer Rd Station</u>	<u>Offset</u>
Sta 28+07	14.53 RT
Sta 30+22	8.00 LT

ITEM 373.12 **12 INCH WATER PIPE INSULATION**

Palmer Rd Station
Sta 27+22 RT to Sta 27+57 RT
Sta 27+57 RT to Sta 30+33 RT
Sta 30+33 RT to Sta 31+60 RT

ITEM 376 **HYDRANT**

<u>Old Belchertown Station</u>	<u>Offset</u>
Sta 13+57.41	18.06 LT

ITEM 376.3 **HYDRANT REMOVED AND STACKED**

<u>Old Belchertown Station</u>	<u>Offset</u>
Sta 13+57.52	11.76 LT

ITEM 381.2 **SERVICE BOX REMOVED AND STACKED**

This item is to be used if existing service boxes are unsuitable for re-use.

ITEM 384. **CURB STOP**

This item is to be used if existing curb stops are unsuitable for re-use.

ITEM 451 **HMA FOR PATCHING**

This item is to be used for temporary full depth widening for staged construction and to repair any distressed pavement after milling operations

ITEM 472 **TEMPORARY ASPHALT PATCHING**

This item is to be used for providing temporary abutter access, temporary sidewalks, temporary pedestrian curb ramps, and temporary driveways.

ITEM 504**GRANITE CURB TYPE VA4 - STRAIGHT**

<u>Palmer Rd</u>	<u>Offset</u>
Sta. 22+18 to Sta. 28+14	RT
Sta. 22+18 to Sta. 27+98	LT
Sta. 29+88 to Sta. 36+64	RT
Sta. 29+75 to Sta. 36+59.92	LT

<u>Old Belchertown Rd</u>	
Sta. 13+57.85 to Sta. 14+65	RT
Sta. 13+27 to Sta. 14+65	LT

These locations include existing curb that is to be removed, relocated, reset, and curbs that have a radius >100'

ITEM 504.1**GRANITE CURB TYPE VA4 - CURVED**

Palmer Rd
Sta 13+99 RT to Sta 14+16 RT
Sta 14+52 Rt to Sta 14+78 RT
Sta 13+99 LT to Sta 14+35 LT
Sta 14+35 LT to Sta 14+79 LT

These locations include pedestrian curb ramp curved transition curbs.

ITEM 509**GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS
- STRAIGHT**

<u>Palmer Rd</u>	<u>Offset</u>
Sta. 30+04	RT
Sta. 36+30	RT
Sta. 36+30	LT

<u>Old Belchertown Rd</u>	
Sta. 13+36	RT

**ITEM 509.1
- CURVED****GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS**

<u>Palmer Rd</u>	<u>Offset</u>
Sta. 29+86	LT
Sta. 36+30	LT

ITEM 514 **GRANITE CURB INLET - STRAIGHT**

This item is to be used in the event that existing granite curb inlets are unsuitable for re-use.

ITEM 516 **GRANITE CURB CORNER TYPE A****Palmer Rd**

Sta 24+44.5 LT

Sta 24+63.4 LT

Sta 32+83.7 LT

Sta 33+03.4 LT

Sta 33+42.7 LT

Sta 34+64.6 LT

Old Belchertown Rd

Sta 13+28.8 LT

ITEM 594 **CURB REMOVED AND DISCARDED**

This item is to be used in the event that existing granite curb inlets are unsuitable for re-use.

ITEM 630.2 **HIGHWAY GUARD REMOVED AND DISCARDED****Palmer Rd**

Sta 26+83 LT to Sta 27+82 LT

Sta 29+45 LT to Sta 13+67 RT (Old Belchertown)

Sta 26+23 RT to Sta 30+90 RT

Sta 30+92 RT to Sta 33+06 RT

Sta 14+00 LT (Old Belchertown) to Sta 32+72 LT

ITEM 657 **TEMPORARY FENCE**

This item is to be used to secure the bridge work area.

ITEM 697.1 **SILT SACK**

This item is to be used in on all proposed and existing catch basin grates within the project limits.

ITEM 697.2 **FLOATING SILT FENCE**

This item is to be used on the Ware river as a sediment control barrier during bridge construction.

ITEM 710.4 **BOUND - PLAIN GRANITE**

This item is to be used as a contingency for layout alteration.

ITEM 711 **BOUND REMOVED AND RESET**

This item is to be used as a contingency for layout alteration.

ITEM 712 **BOUND REMOVED AND STACKED**

This item is to be used as a contingency for layout alteration

ITEM 715.1 **MAIL BOX REMOVED AND RESET**

<u>Palmer Rd</u>	Offset
Sta 33+31	17.4 LT
Sta 33+34	18.9 LT
Sta 33+78	18.2 RT
Sta 33+76	18.2 RT
Sta 34+98	19.3 RT
Sta 36+87	21.1 RT

<u>Old Belchertown Rd</u>	
Sta 11+08	8.88 RT
Sta 12+37	21.5 RT
Sta 13+14	29.1 RT

ITEM 765 **SEEDING**

This item is to be placed with compost topsoil on all disturbed areas within the project limits.

ITEM 767.121 **SEDIMENT CONTROL BARRIER**

Palmer Rd
Sta 25+67 RT to Sta 28+50 RT
Sta 26+37 LT to Sta 27+95 LT
Sta 29+78 RT to Sta 33+00 RT

Old Belchertown Rd
Sta 12+96 RT to Sta 29+13 LT (Palmer)
Sta 13+27 LT to Sta 32+93 LT (Palmer)

ITEM 823.72**HIGHWAY LIGHTING ARM AND LUMINARE REMOVED AND RESET**

Palmer Rd
23+16, 22.8 LT
27+42, 29.4 RT
29+84, 5.5 RT
32+89, 20.9 RT

ITEM 824.50**FLASHING WARNING BEACON REMOVED AND RESET**

Palmer Rd
26+11 RT

ITEM 874.2**TRAFFIC SIGN REMOVED AND RESET**

Type
Ware River Sign

Station
Sta 27+23 RT

ITEM 909.5**RAPID SETTING CONCRETE**

Contingency for deck repairs as directed by the engineer

ITEM 988.01**SEDIMENT FOREBAY PAVING**

This item shall provide a level of protective surface over a compacted gravel borrow foundation to facilitate in maintenance of pretreatment sedimentation forebay.

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DOCUMENT A00808

PROJECT UTILITY COORDINATION FORM

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CONTACTS AND GENERAL UTILITY INFORMATION

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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-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (for 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.

Suggested Sequence of Relocation (Based on Consultant proposed construction staging)

PUC FORM - CONTINUED

Is 'enabling' (prep) work, by the Contractor, necessary prior to the start of the first series of utility relocations:	Yes	No
	X	
Has any of the Utility work been identified to work concurrently	Yes	No
	X	

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RESPONSIBLE PARTY	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work				Access Restraint & Limitations of Operations Notes	
			Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site operations on-site (While Utility's No Contractor physical construction on-site)	Contractor Concurrent Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
C = Contractor U = Utility Co.	Enabling' work by the Contractor - _____ The Contractor completes tree clearing and provides access for utility companies to temporarily relocate utilities downstream of the Bridge Structure.							
C = Co	UTILITY OPERATIONS - Utility Co. NGRID							
Task 1	u NGRID sets temporary and permanent utility poles	20	X				Y	
	u NGRID frames, poles, sets anchor, replaces conductors, install and guying.	20	X				Y	
	Sub-Total	40						
	UTILITY OPERATIONS - Utility Co. Comcast							
Task 3	u Comcast transfers cable	2	X		X		Y	
	Sub-Total	2						
	UTILITY OPERATIONS - Utility Co. Verizon							
Task 4	u Verizon transfers cable	39	X		X		Y	
	u Removes abandoned poles	2		X			NO	
	Sub-Total	41						
	Enabling' work by the Contractor - _____ The Contractor completes bridge replacement and restores site.							
C = Co	UTILITY OPERATIONS - Utility Co. NGRID							
Task 1	u NGRID sets permanent utility poles.	8	X		X		Y	
	u NGRID frames, poles, sets anchor, replaces conductors and guying.	10	X		X		Y	
	Sub-Total	18						
	UTILITY OPERATIONS - Utility Co. Comcast							
Task 3	u Comcast transfers cable to permanent utility poles	2	X		X		Y	
	Sub-Total	2						
	UTILITY OPERATIONS - Utility Co. Verizon							
Task 4	u Verizon transfers cable	59	X		X		Y	
	u removes abandoned poles	1		X			NO	
	Sub-Total	60						
	Total	163						
1	Unless otherwise specified in the MassDOT Construction Contract, or unless specifically noted within this PUC Form, these durations (herein) are based upon the Contractor providing <i>unimpeded access</i> to the Utility company to perform Utility relocations (see Note 5 - Access).							
2	"Concurrent Utilities" operations noted herein, are to signify those Utility Company operations that can be worked concurrently (e.g. Utility A and Utility B work on-site together) - MassDOT and the Contractor are to prepare NTPs to Utilities accordingly.							
3	"Potential Access Restraints" noted within this PUC Form are for planning purposes. See MassDOT Contract for Contractual Access Restraints (refer to Subsections 8.02, 8.03, and/or 8.06 for Design Bid Build Contracts and Volume II Section 9 for Design Build Contracts).							

RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities										Access Restraint & Limitations of Operations Notes							
C = Contractor	U = Utility Co.	Estimated Duration (Work Days) by Utilities										Concurrent / Exclusive Utility Work		Access Restraint & Limitations of Operations Notes					
(Lead time not included)														Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Should an AR be considered for the Contractor ?	
				Exclusive Utility on site		Concurrent Utilities		Contractor Off-Site		Contractor Concurrent		Potential Access Restraint (Yes/No)		Reason/Note (optional)					
		Utility working with no other Utilities in vicinity		Utility working with other Utilities on site		No Contractor physical construction operations on-site (while Utility is Contractor and Utility are working on-site - but NOT in the same vicinity													
4		Utility non-work periods - For planning purposes, the durations above contain some non work days (contingency) for New England conditions (precipitation, high temperatures, low temperatures, snow, ice). Gas line work however, typically has a seasonal restriction and can NOT be installed from 15-November to 15-March. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-March. The Contractor shall (and the CTD plan) reflect this calendar restriction within the schedule (unless otherwise note).																	
5		Access - Unless otherwise noted in the Contract, and in addition to the 'enabling' notes above, the Contractor must provide safe and unimpeded access (for trucks, lifts, cranes, etc.) to the Utilities, to allow for the proposed relocation(s) - including but not limited to snow removal, clearing and grubbing, guard rail removal, barrier removal, tree removal, and grading.																	
6		For all MassDOT construction contracts issued after January 2014, the new Utility Coordination/documentation specification is required. This is Section 8.14 in Design-Bid-Build Contracts (see Design-Build index reference for applicable section #).																	
7		Prior to starting any and all enabling work for Utilities, the Contractor is to plan in advance with submittals and approved durations.																	
8		* Potential District Initiated Early Utility Relocation - if noted herein, the District reserves the right to initiate early utility relocation in advance of the Contract NTP. In submitting a bid price and in the development/basis of the Baseline Schedule, the Contractor shall not plan the Work with the potential benefit of any form of early utility relocation.' As a requirement of the Baseline submission, unless otherwise noted in this Specification, the earliest that the first Utility company is to receive the 30 days advance notification to mobilize to the site, will be 7 calendar days after the pre-construction meeting and never sooner than 7 days after the Contract NTP.																	
9																			

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WORK ZONE SAFETY

Temporary Traffic Control

*Typical Details and
Massachusetts Guidelines
for MassDOT, Municipalities,
Utilities, and Contractors*

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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.

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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.



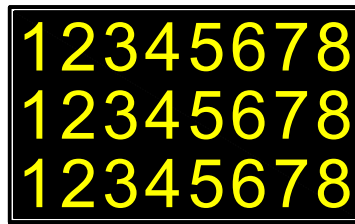
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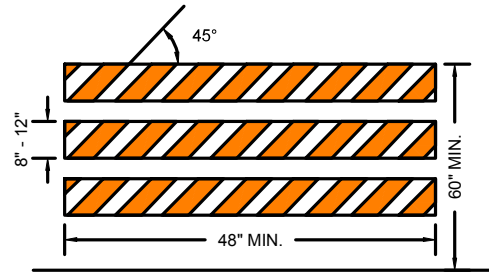
FIGURE 1
TYPICAL TRAFFIC CONTROL DEVICES
NOT TO SCALE



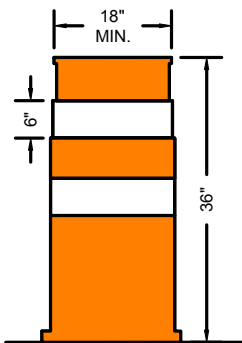
SIGN



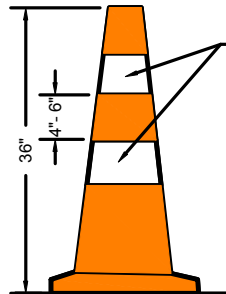
**PORTABLE CHANGEABLE
MESSAGE SIGN (PCMS)**



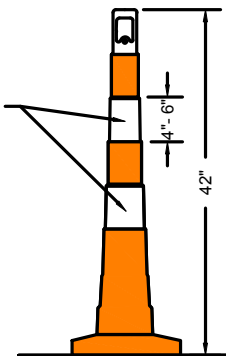
TYPE III BARRICADE



DRUM

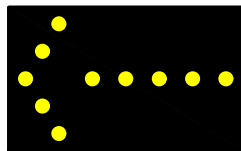


RETROFLECTIVE
BANDS

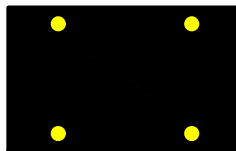


CONES

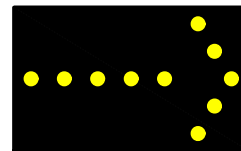
Cones may be used for all daytime operations. For night work, drums should be used to form the taper(s) and cones can be used along the tangent section of the work setup.



LEFT

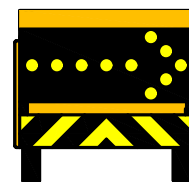


CAUTION



RIGHT

ARROW BOARD (WITH MODE)



TRUCK MOUNTED ATTENUATORS

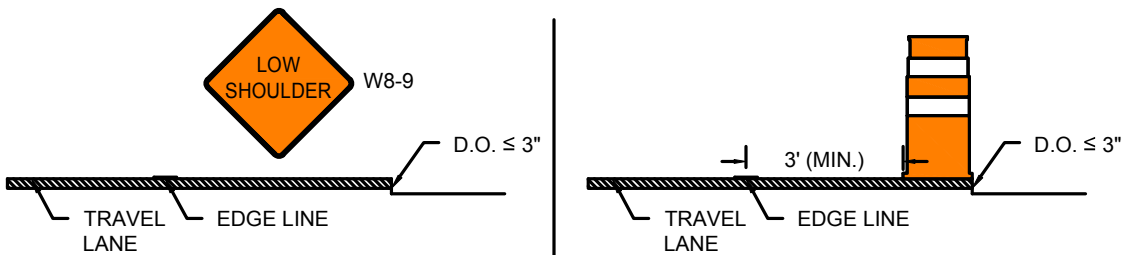
Truck Mounted Attenuators (TMA) shall be positioned between the start of the work area and the end of the designated buffer zone. The TMAs are to be positioned in each temporarily closed lane. This includes shoulders (≥ 8 feet) whether combined with a travel lane closure or being closed alone. These 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

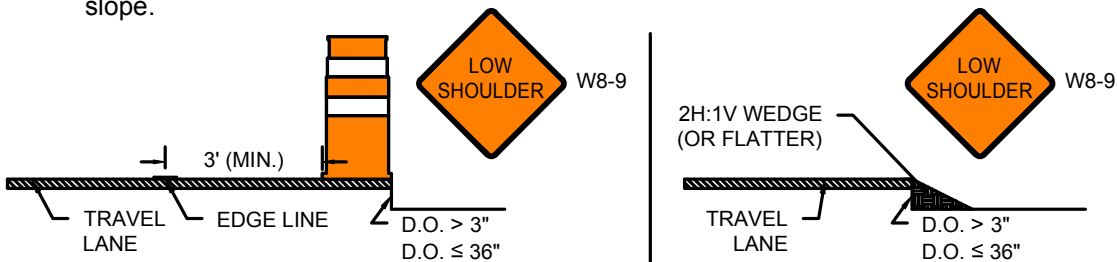
Note that this guidance is adopted from the Roadside Design Guide, 4th Edition.

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.

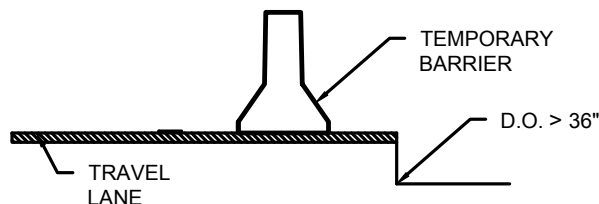
- Shoulder drop-offs 3" or less adjacent to a shoulder or active travel lane should be mitigated by:
 - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment; or
 - ✓ The placement of drums on the traffic side of the drop-off.



- 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.





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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

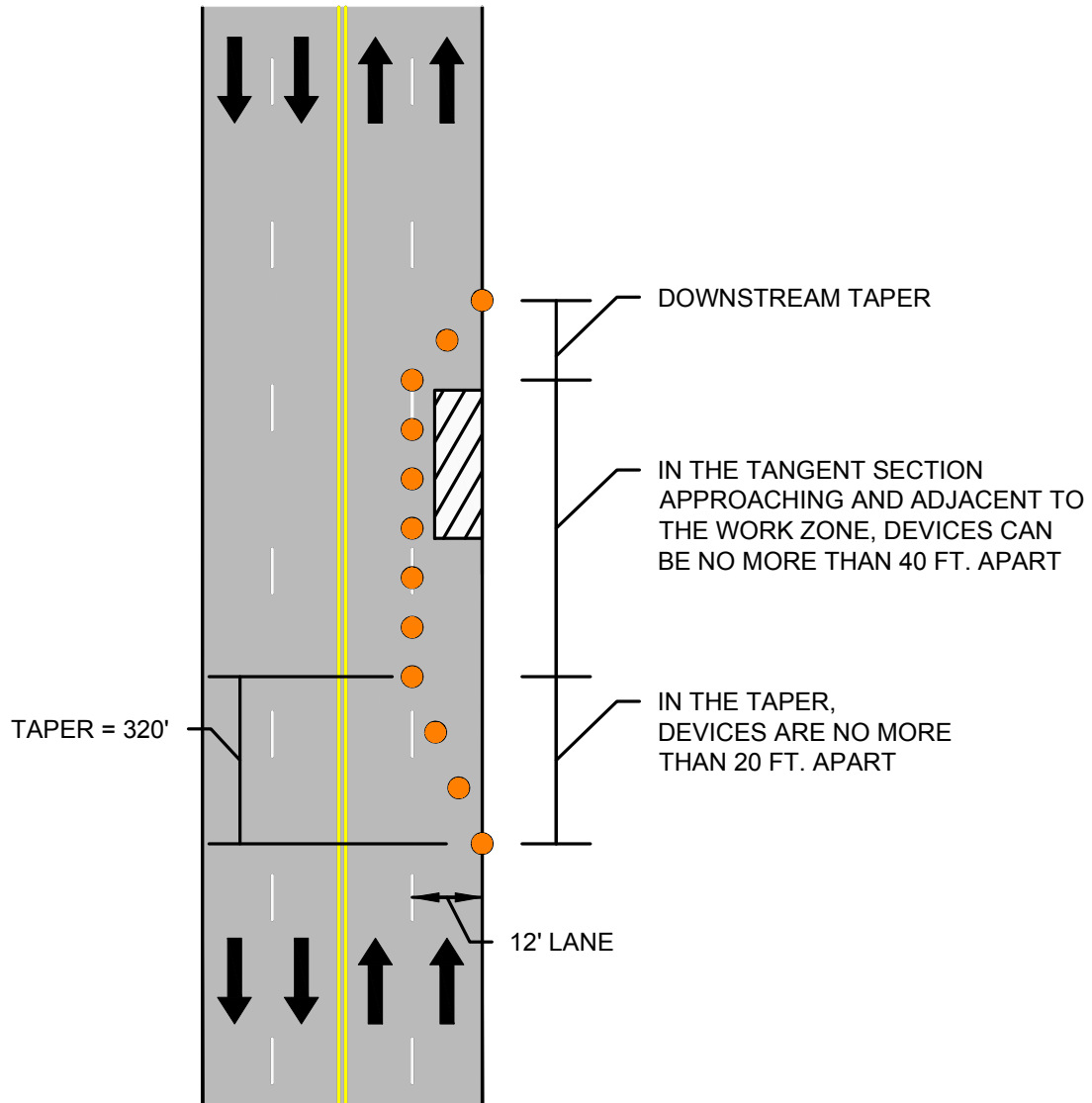


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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Work Zone Safety
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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.

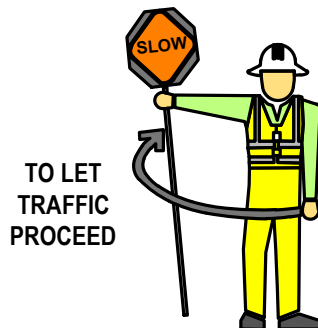


Properly Trained Flaggers

- 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

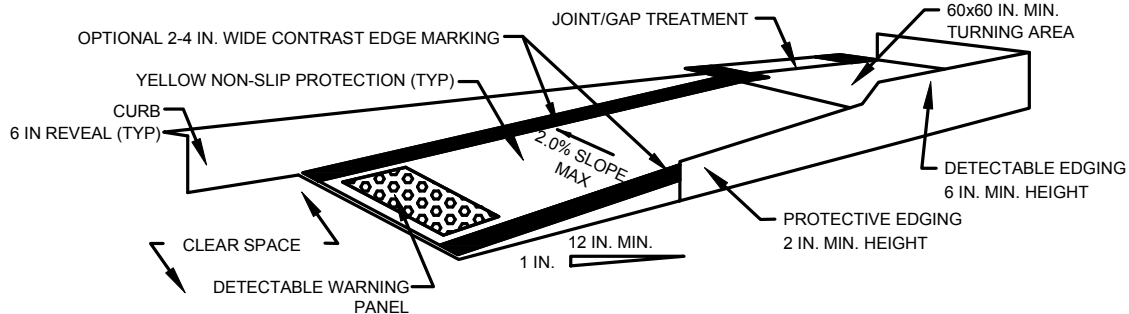
- Always use warning signs.
- Allow for reaction distance from signs.
- Remove signs if no longer necessary or not flagging.
- Use free hand in up-and-down motion to help slow traffic.



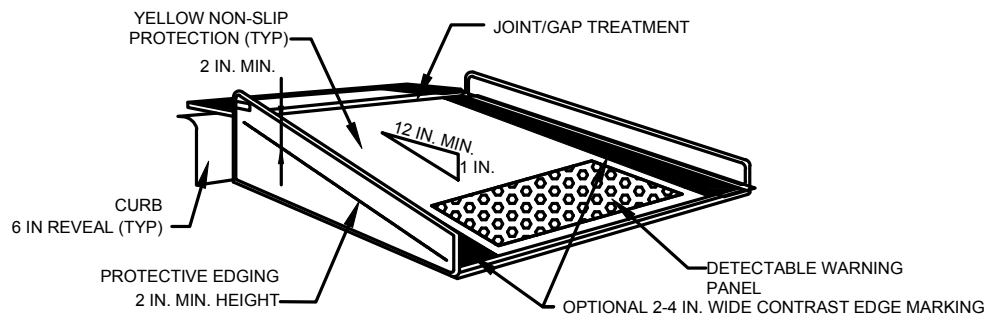
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FIGURE 4
TYPICAL PEDESTRIAN DEVICES
(1 OF 2)
NOT TO SCALE



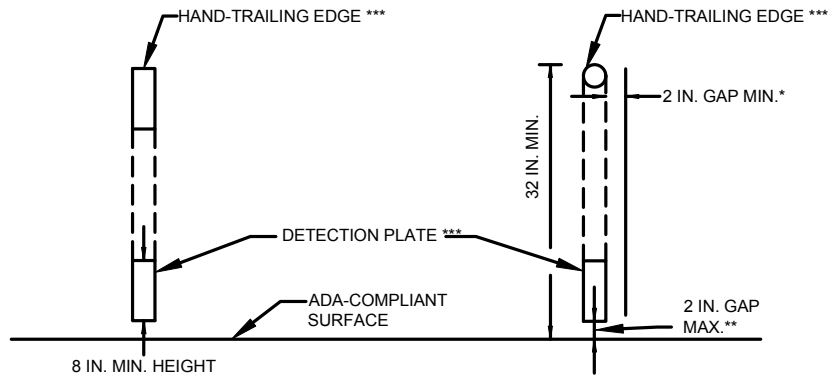
TEMPORARY CURB RAMP-PARALLEL TO CURB



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

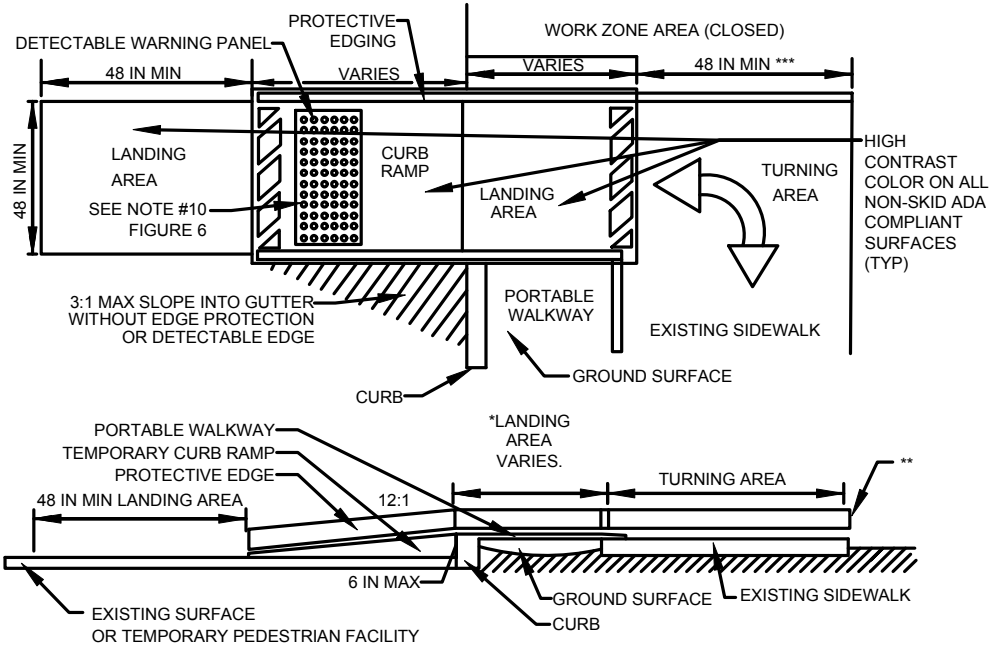
1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE, AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING 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.



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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

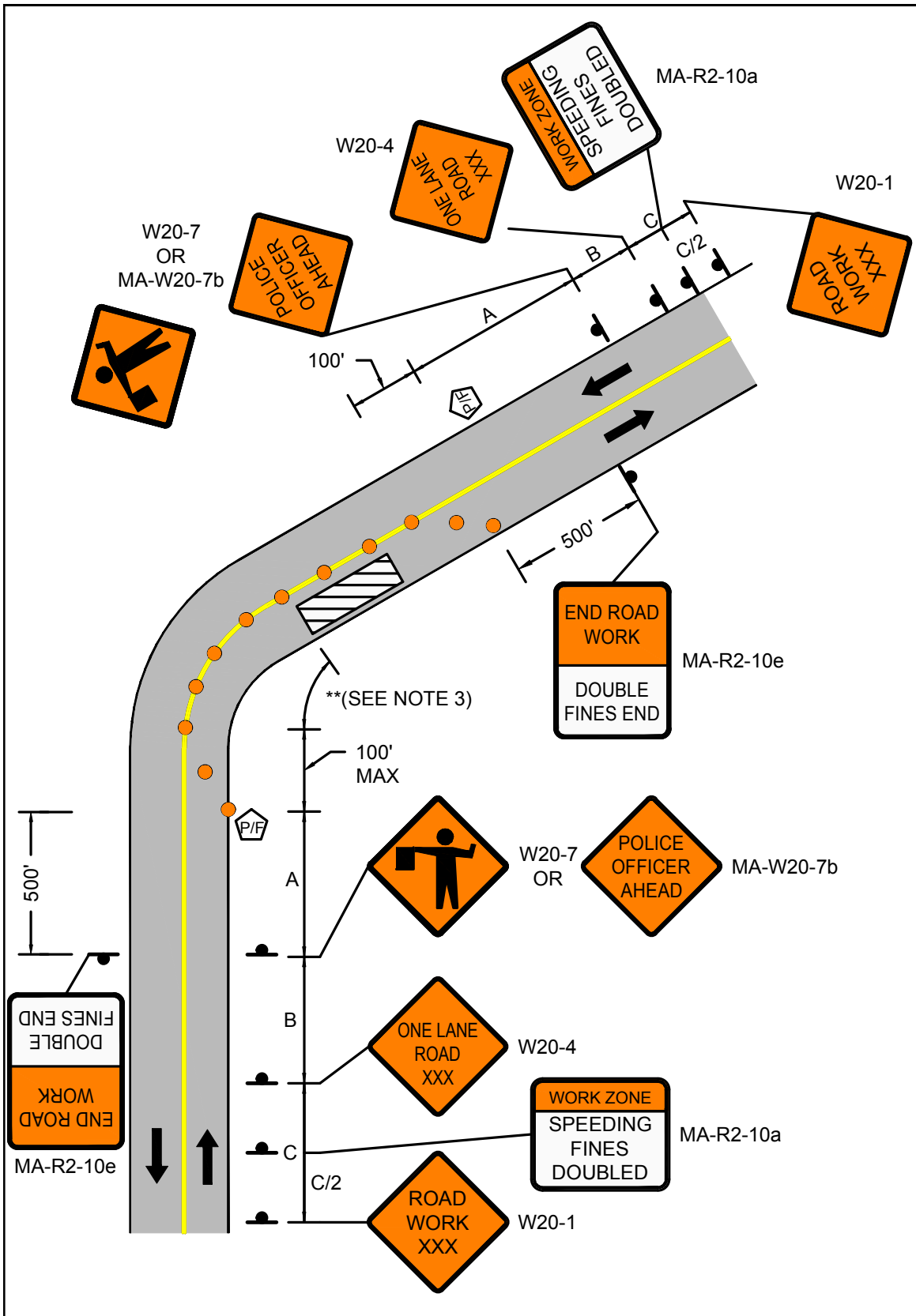


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

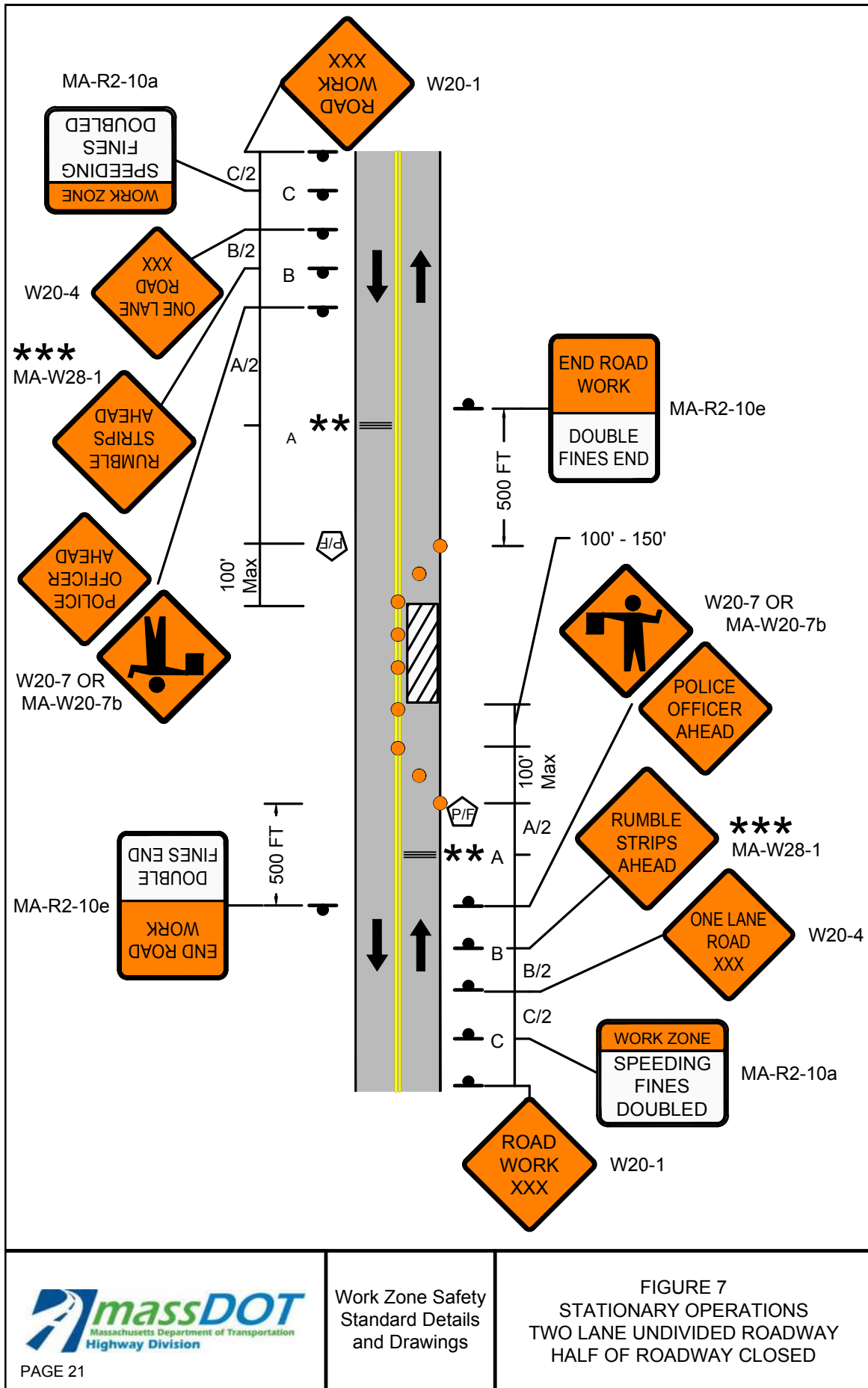
NOTES

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





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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.

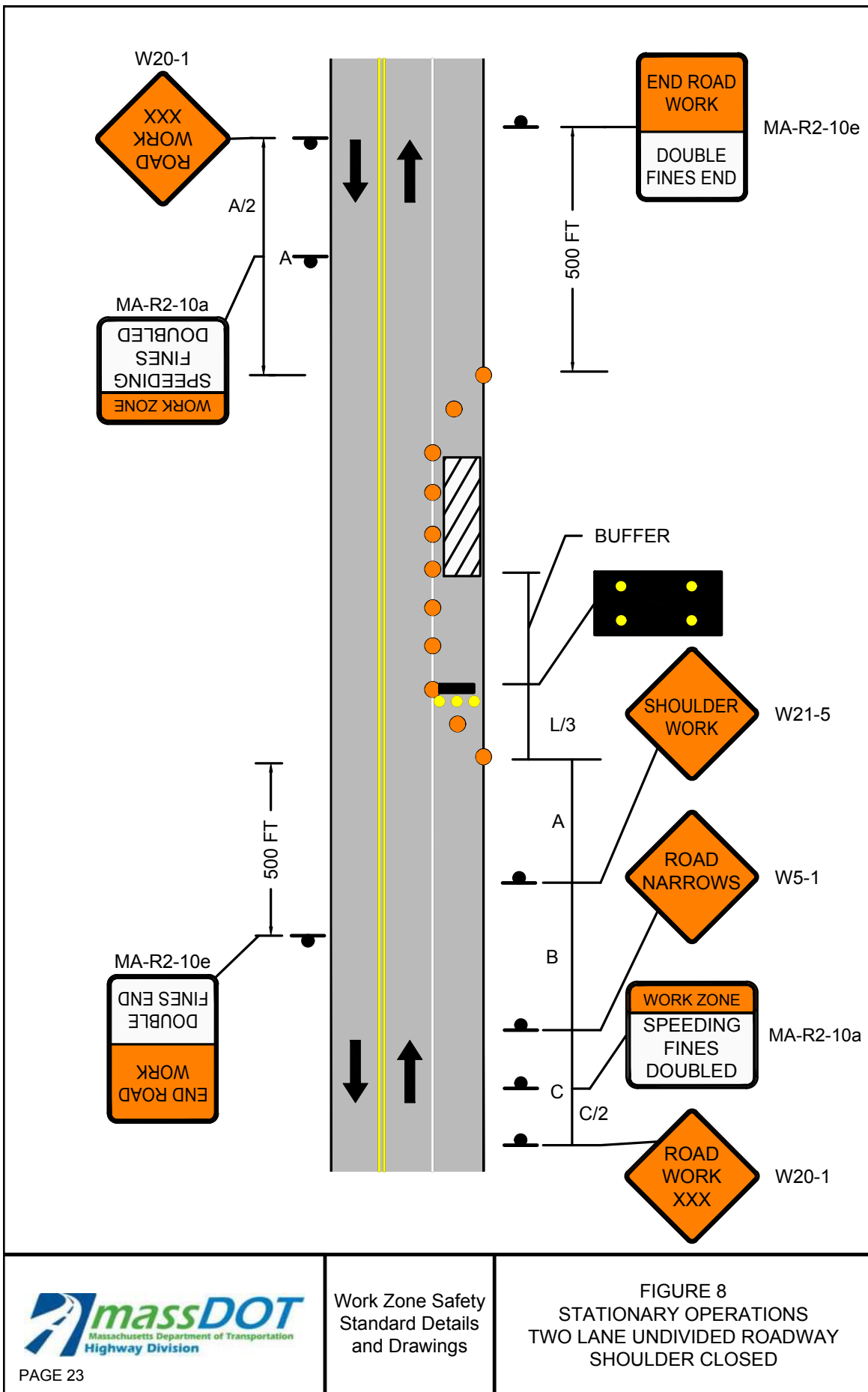
NOTES

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





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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

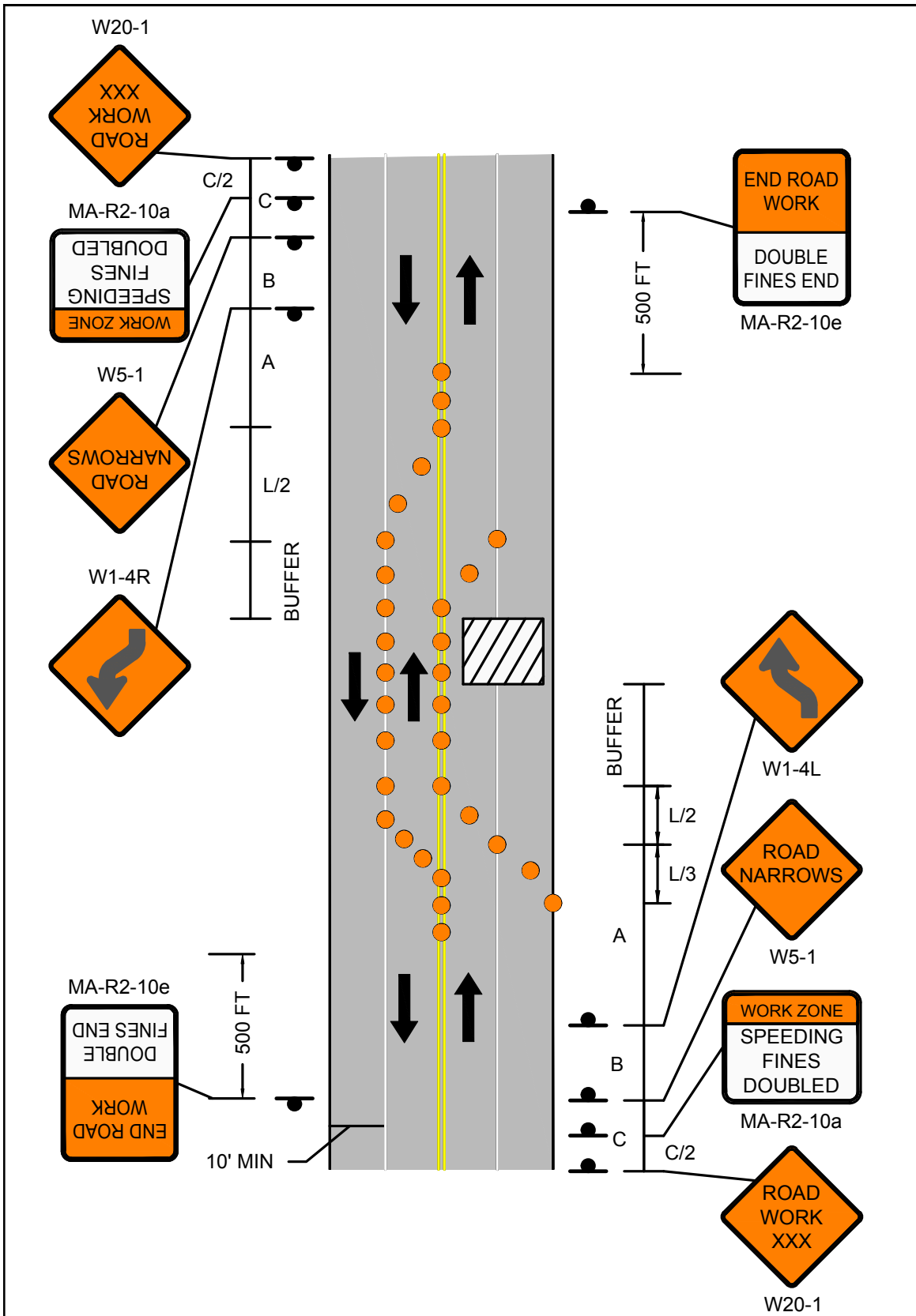


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

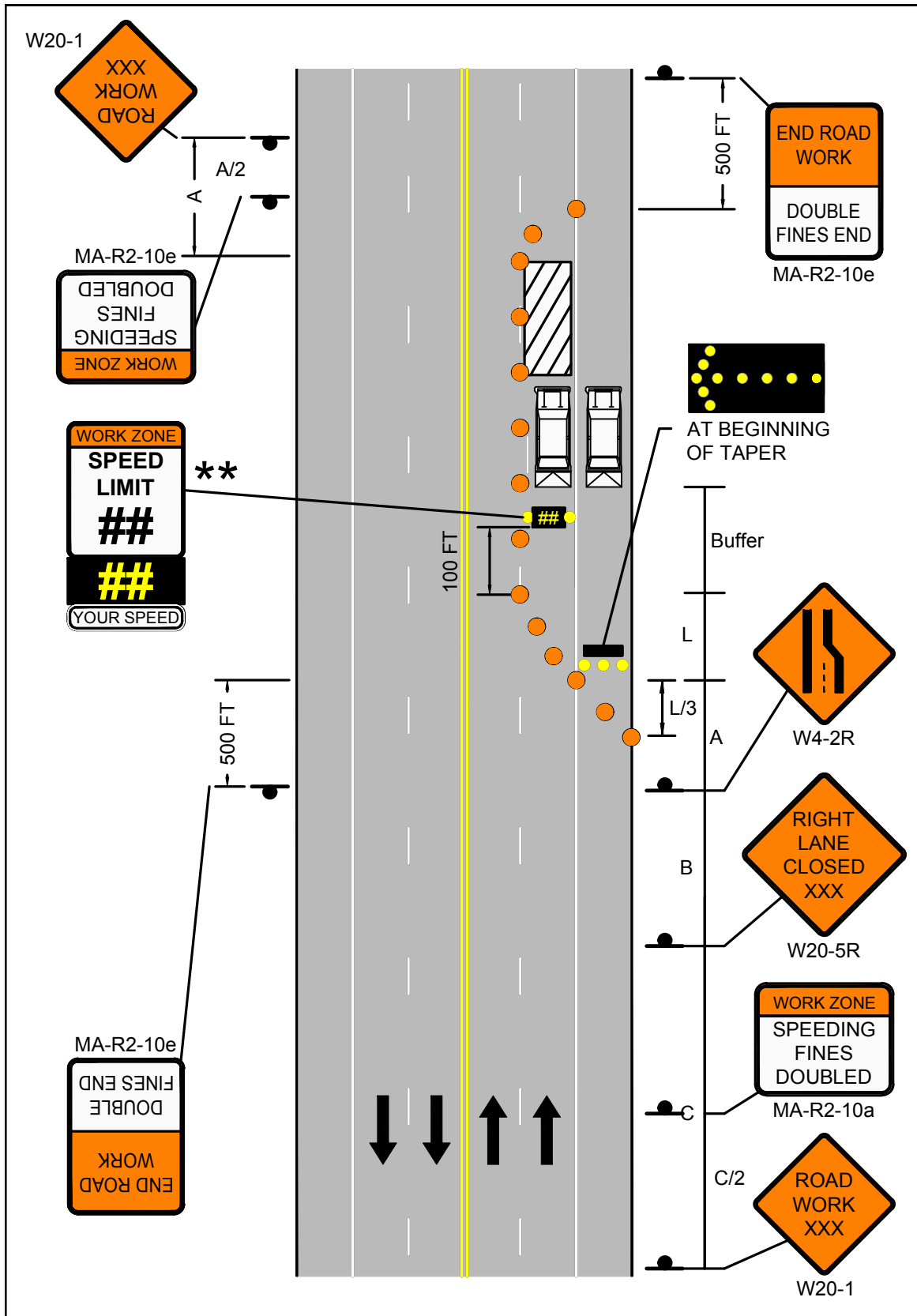


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

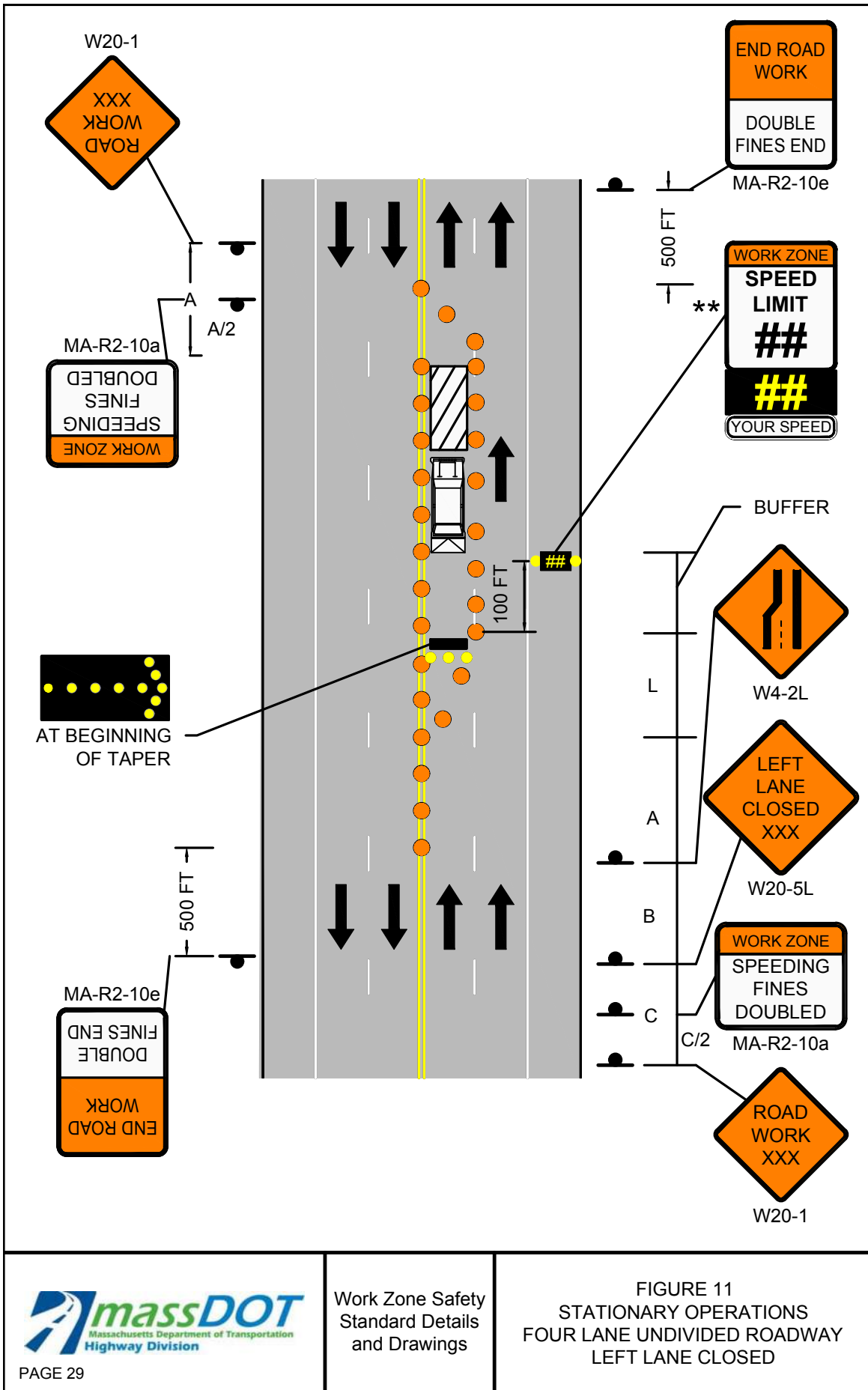


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

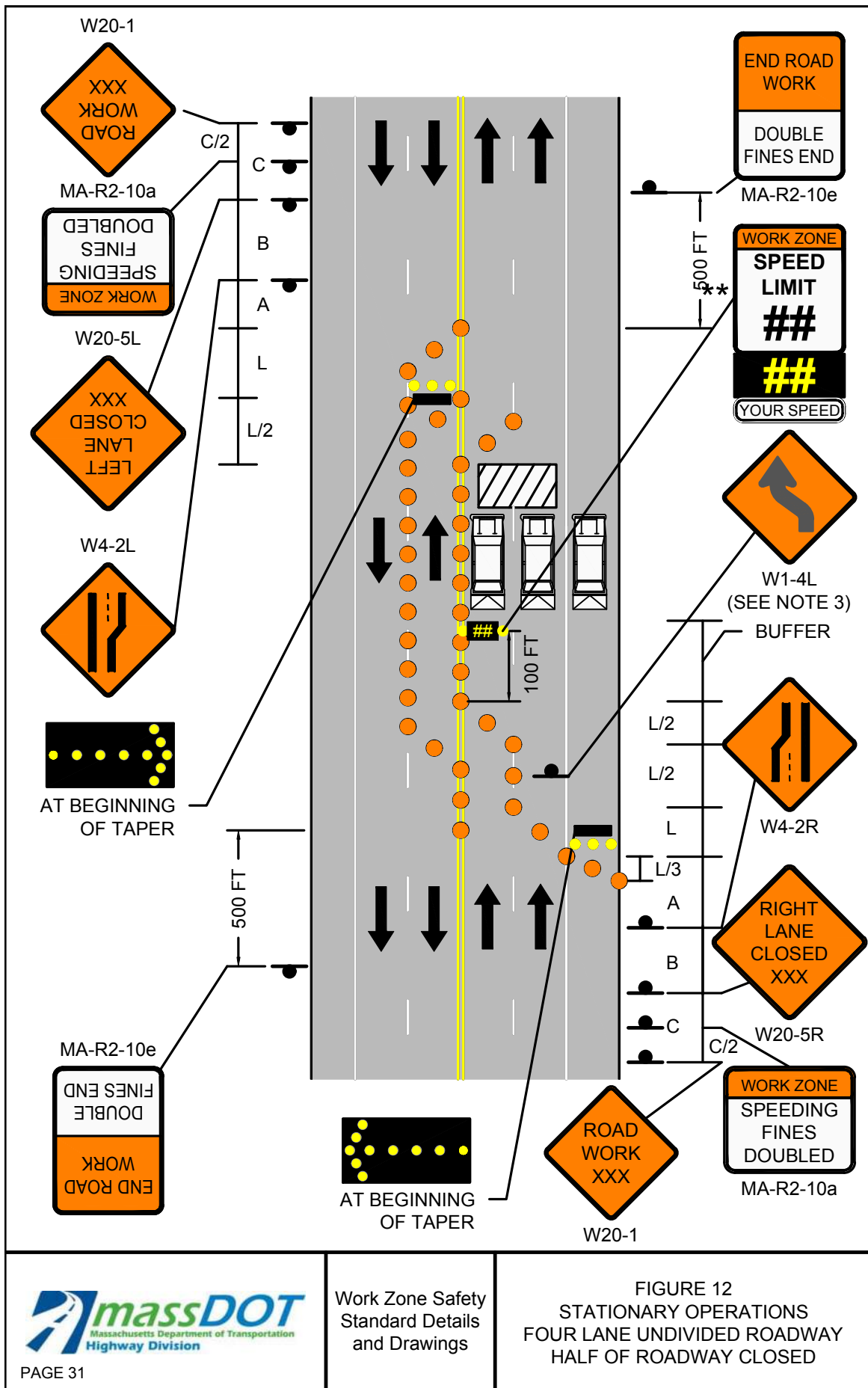


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

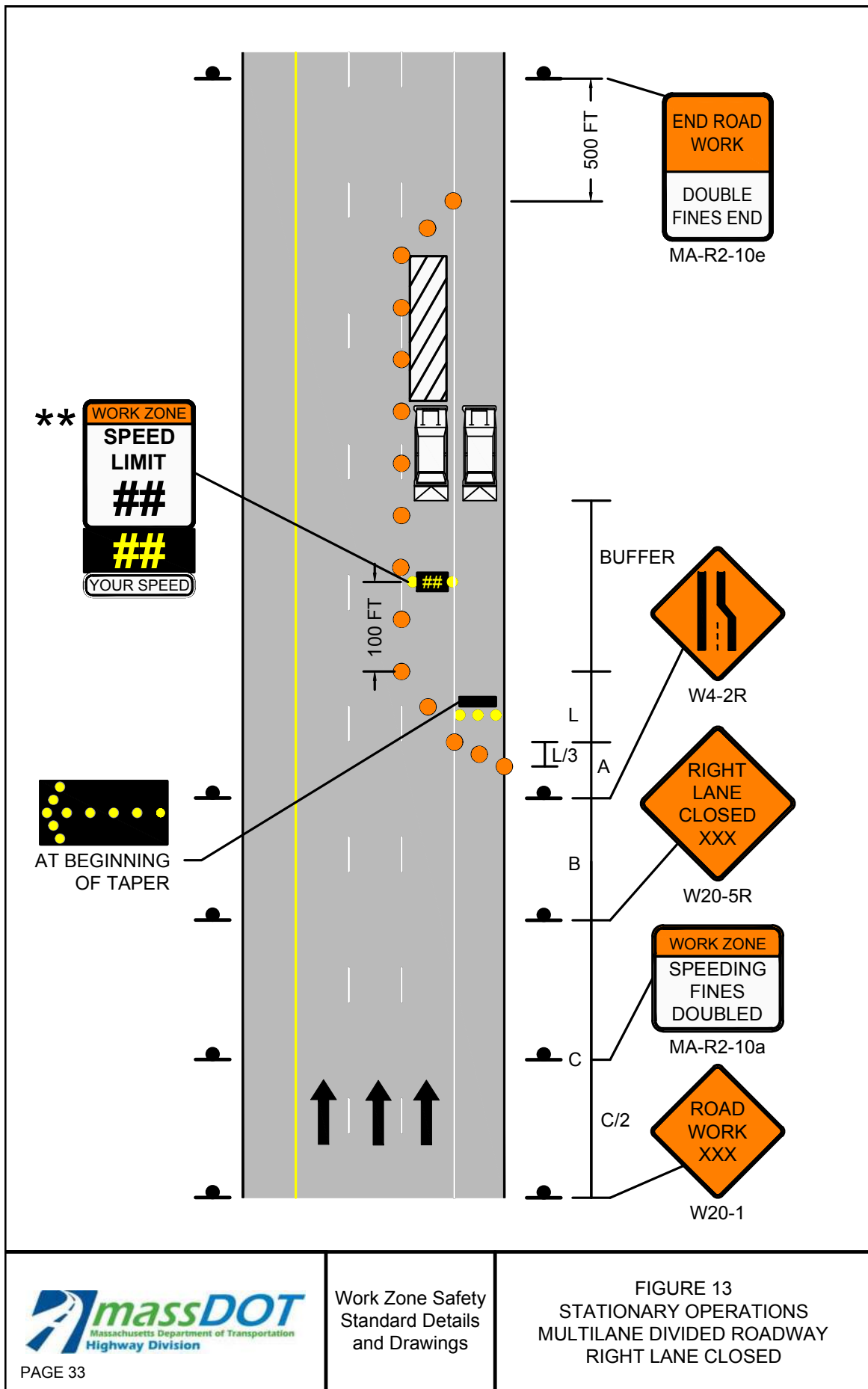
NOTES

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





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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

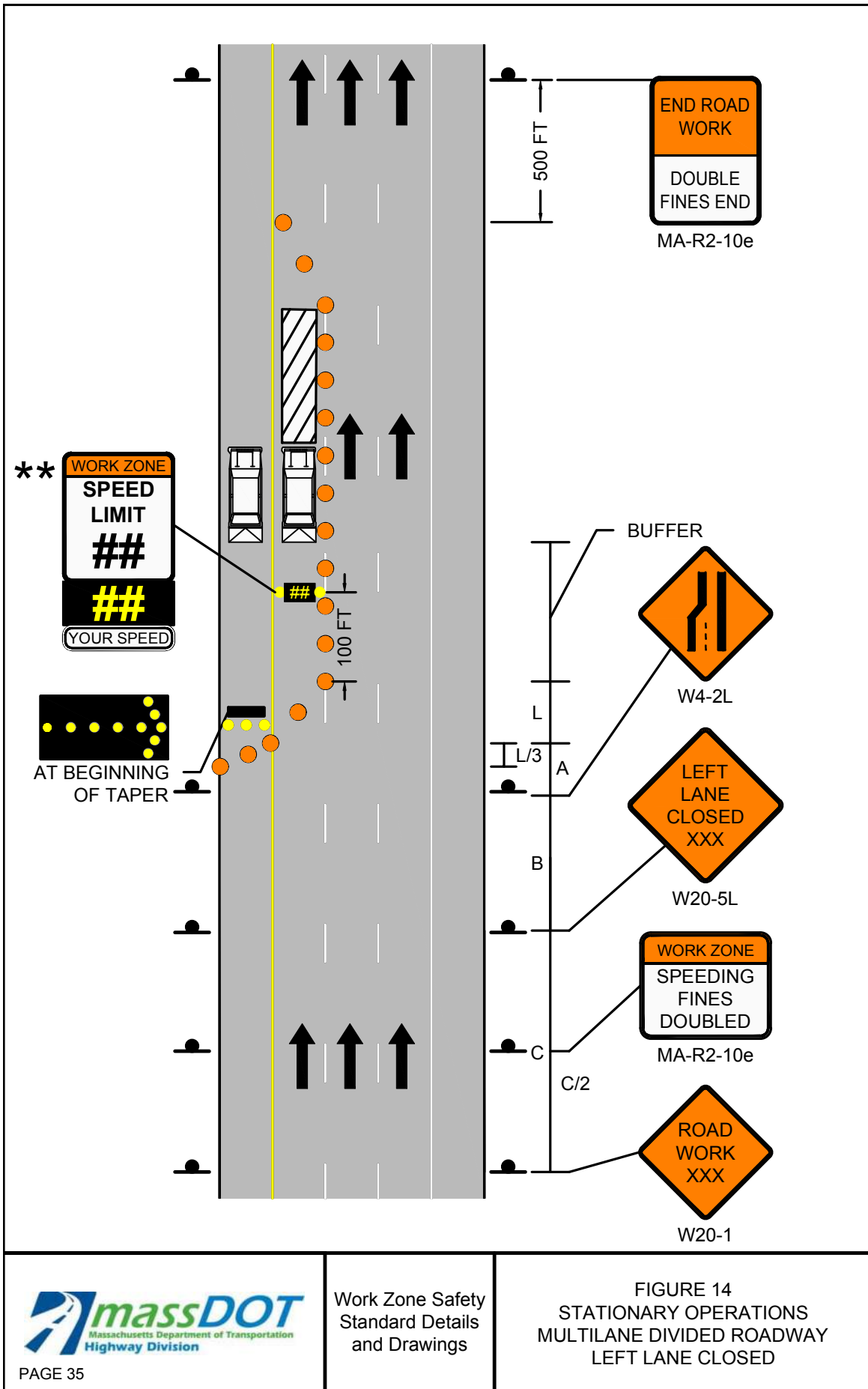


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

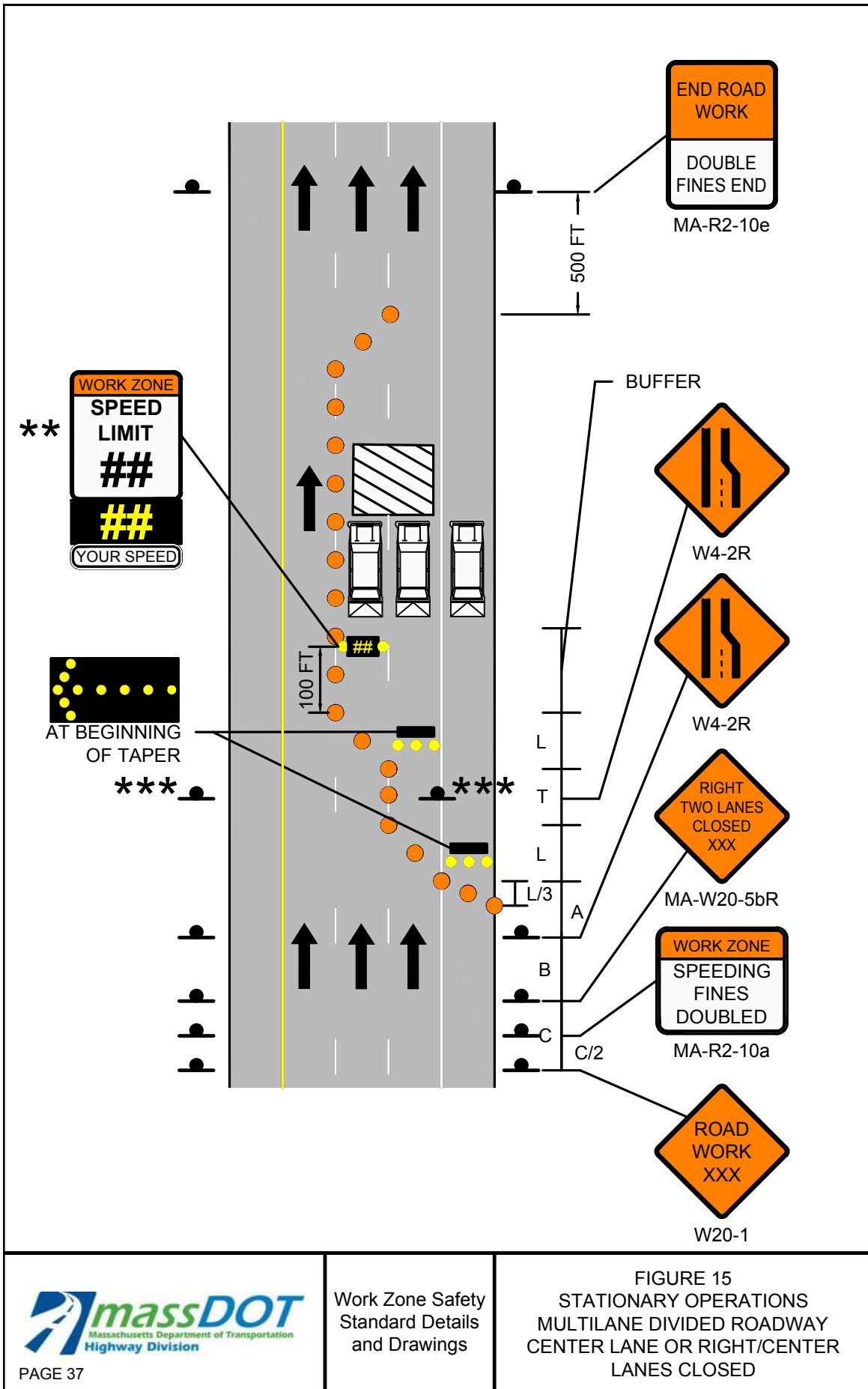


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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Work Zone Safety
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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

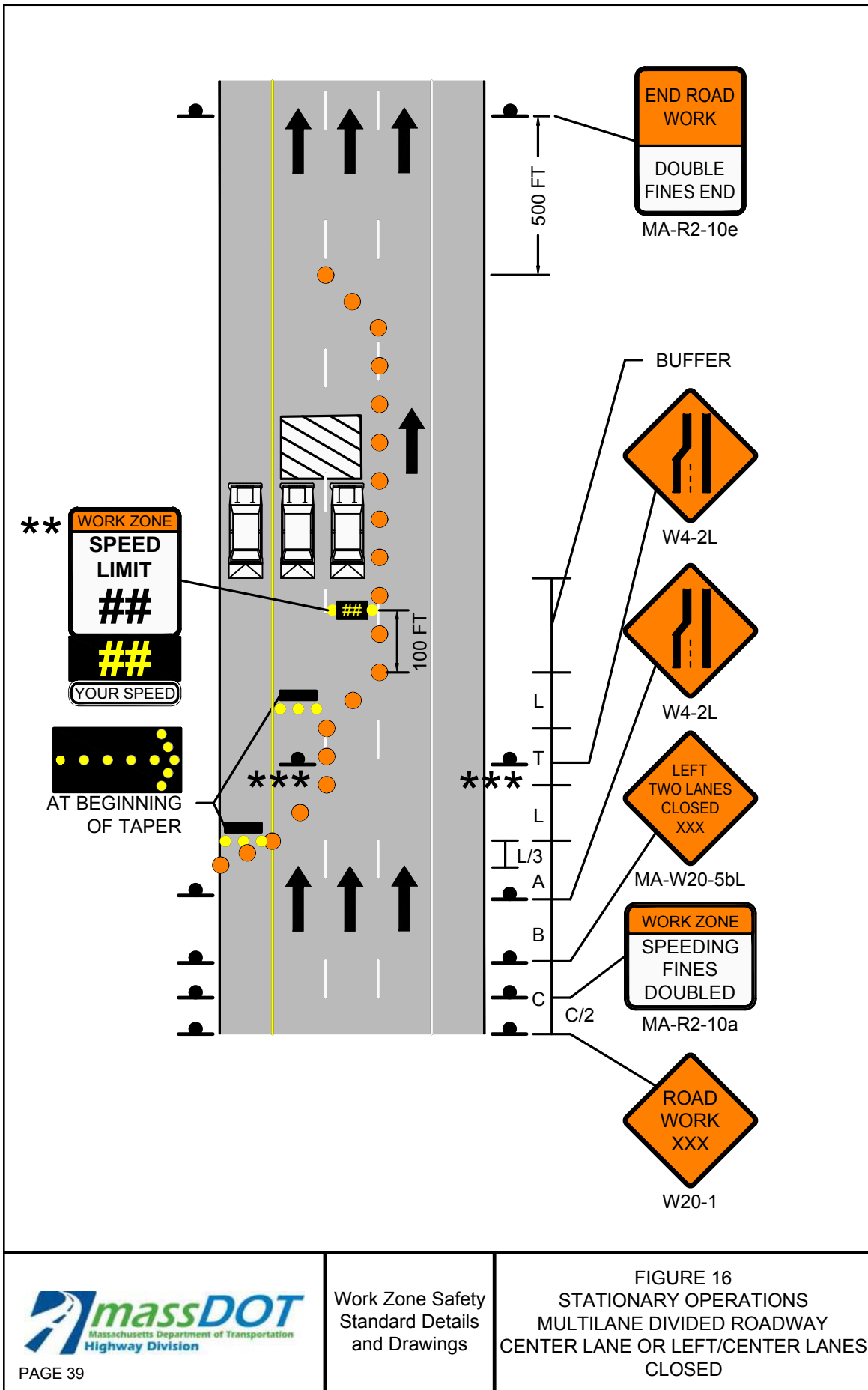


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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Work Zone Safety
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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

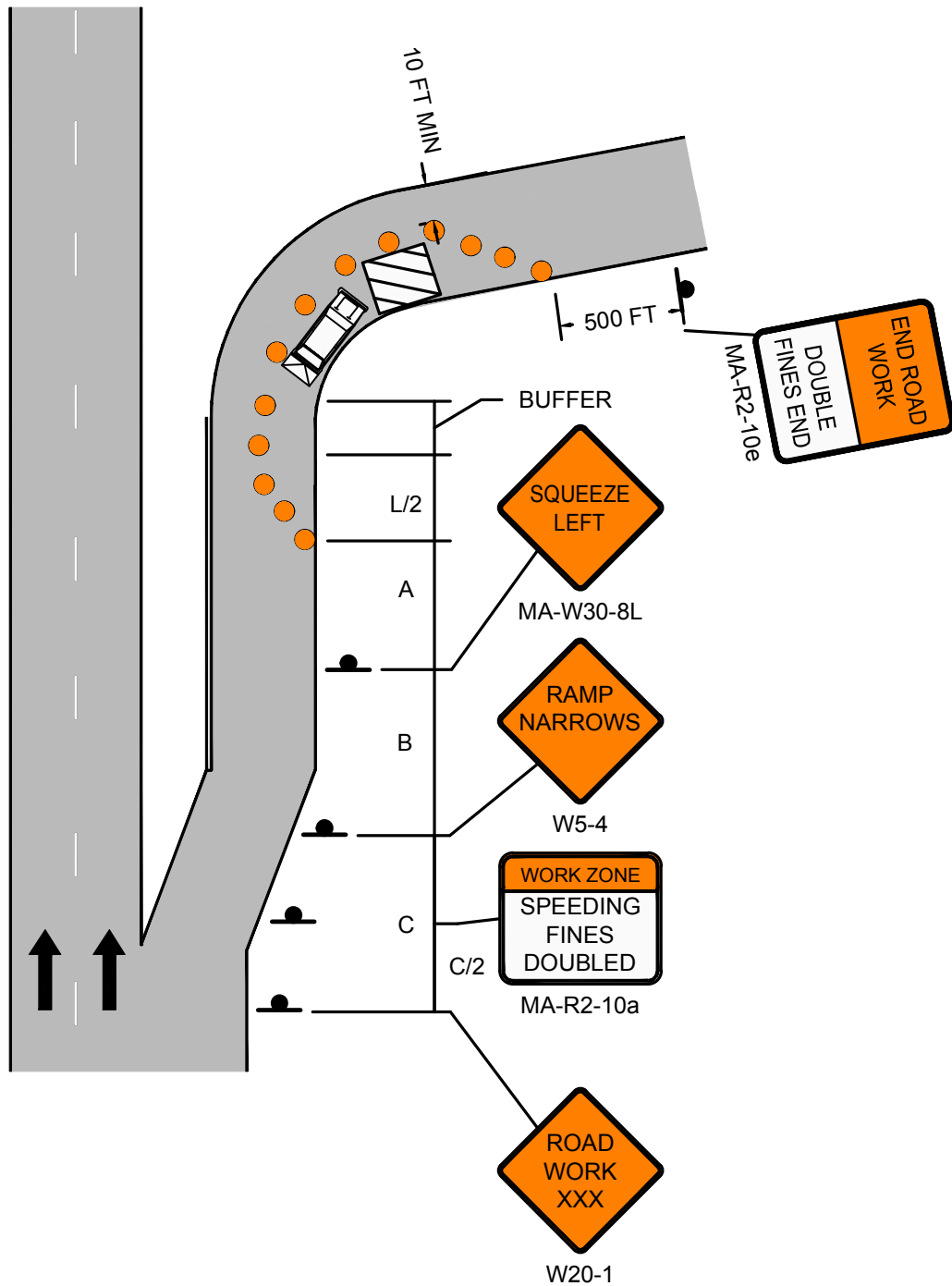


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

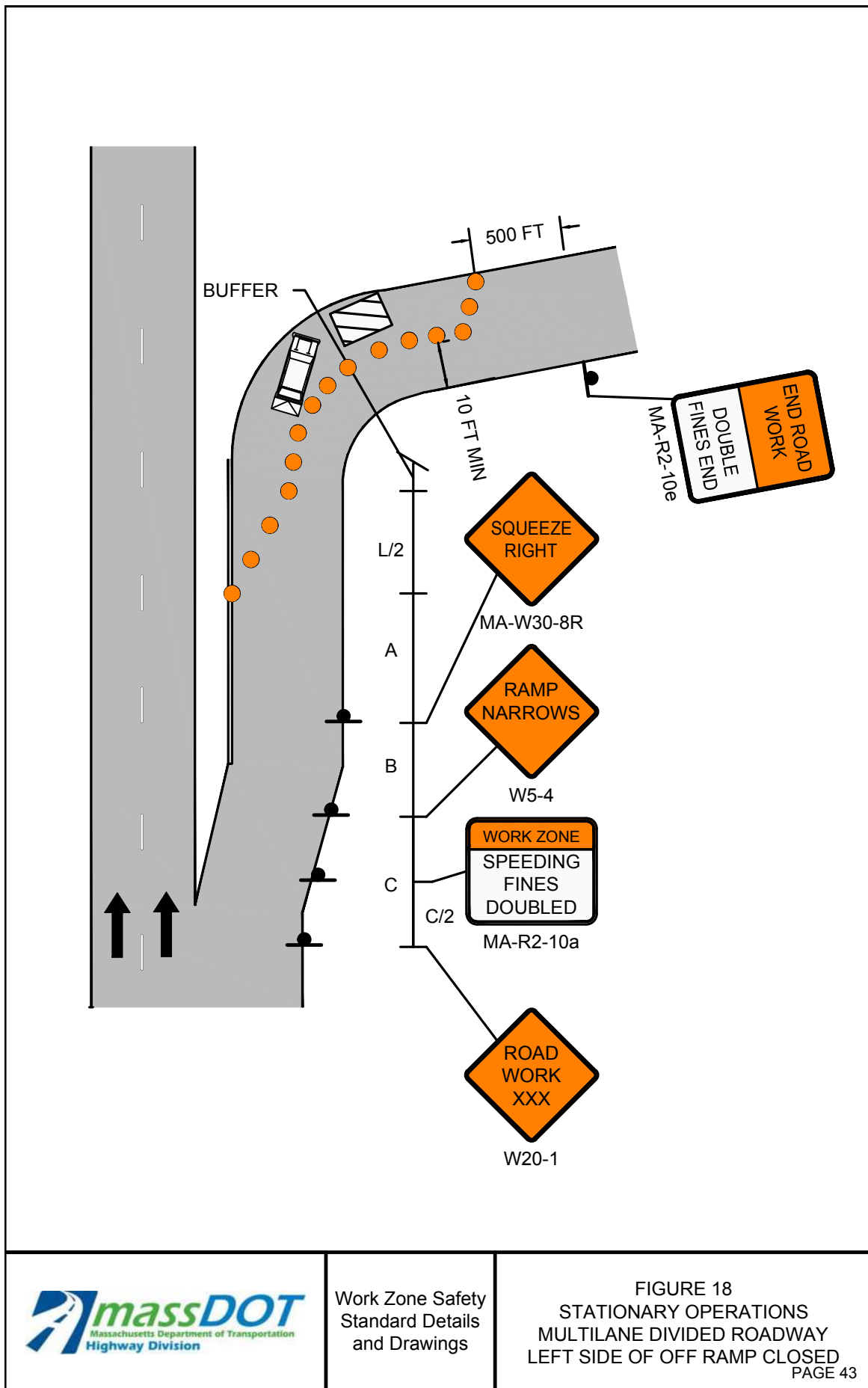


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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Work Zone Safety
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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

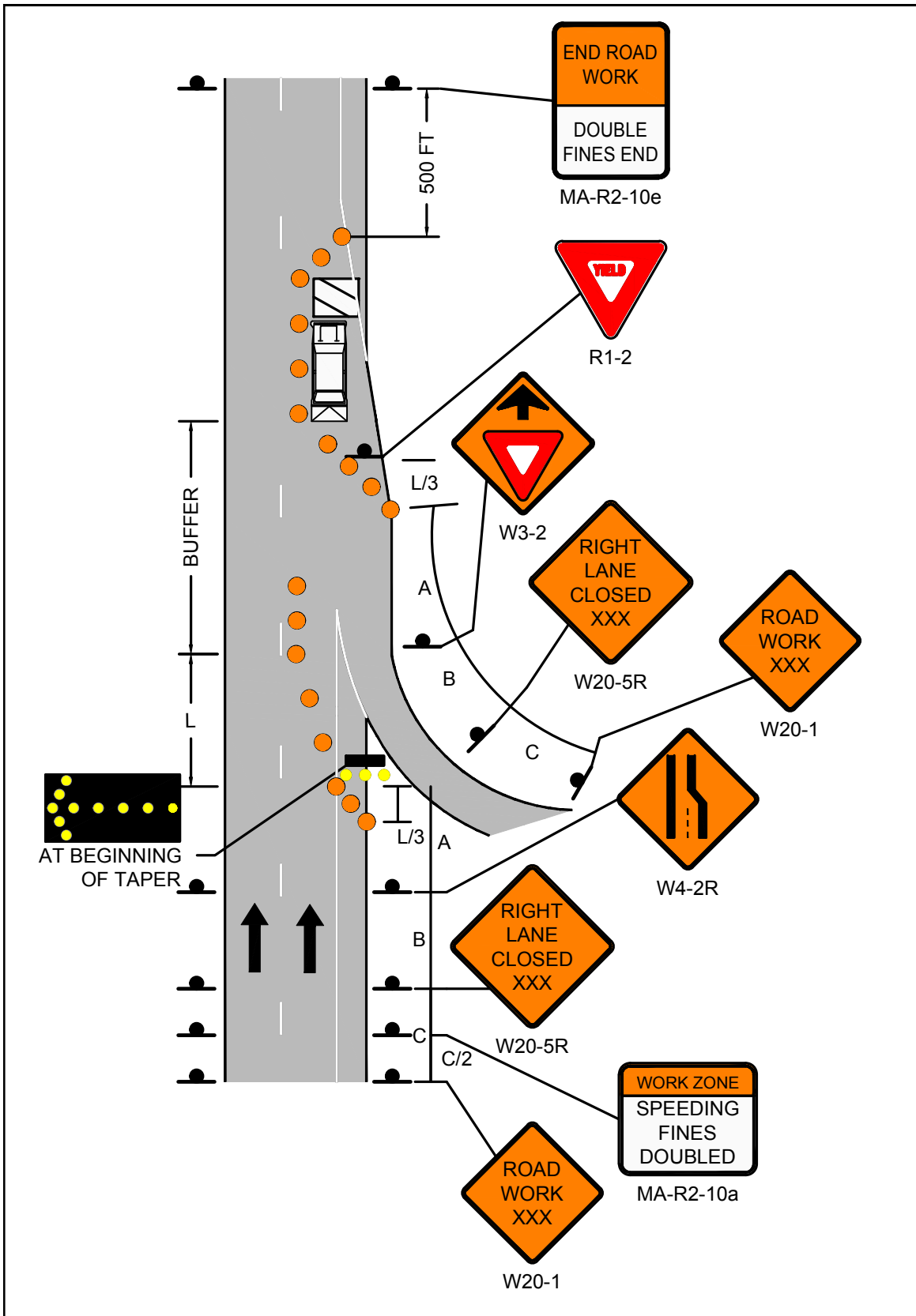


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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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

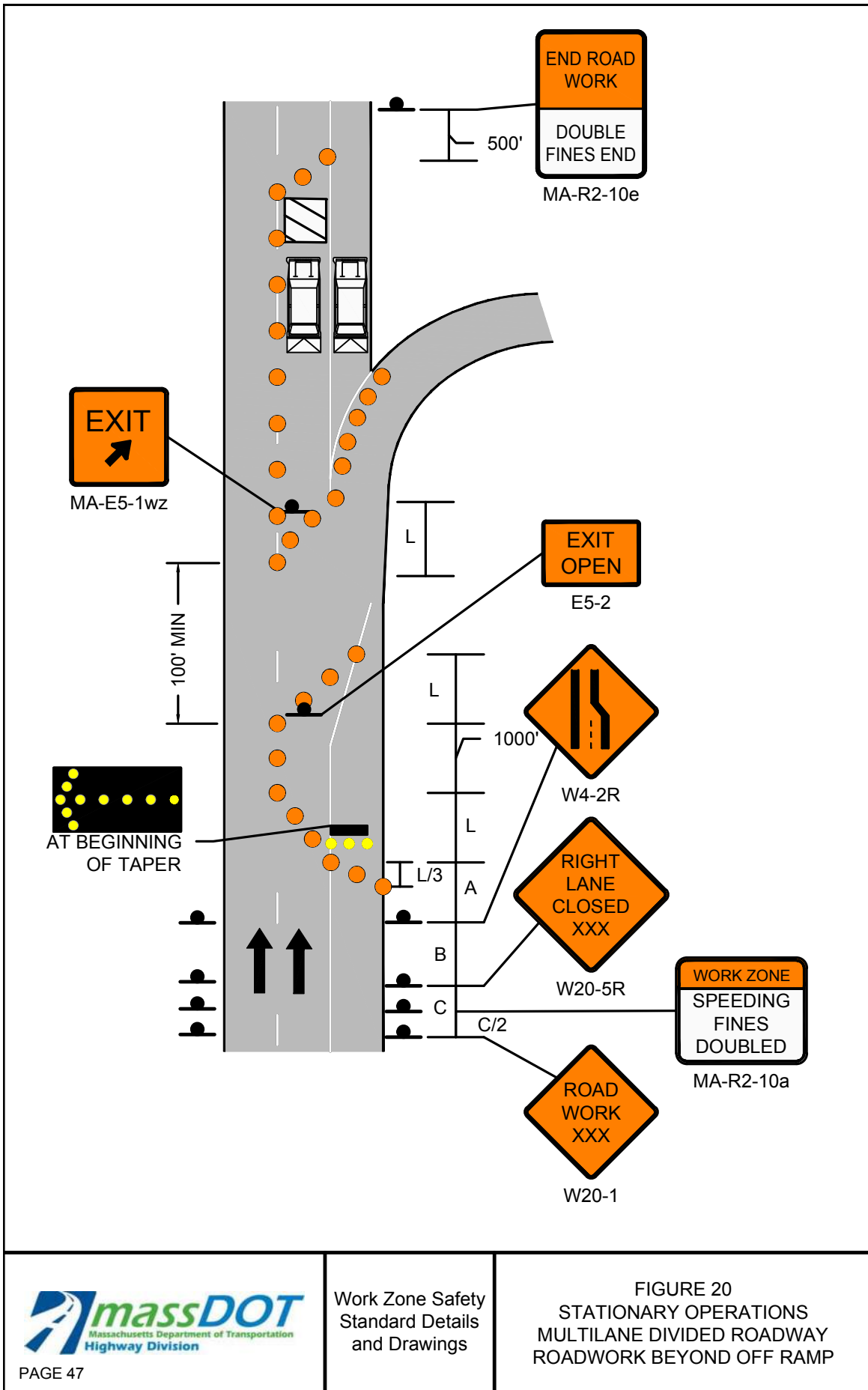


TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE





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Work Zone Safety
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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

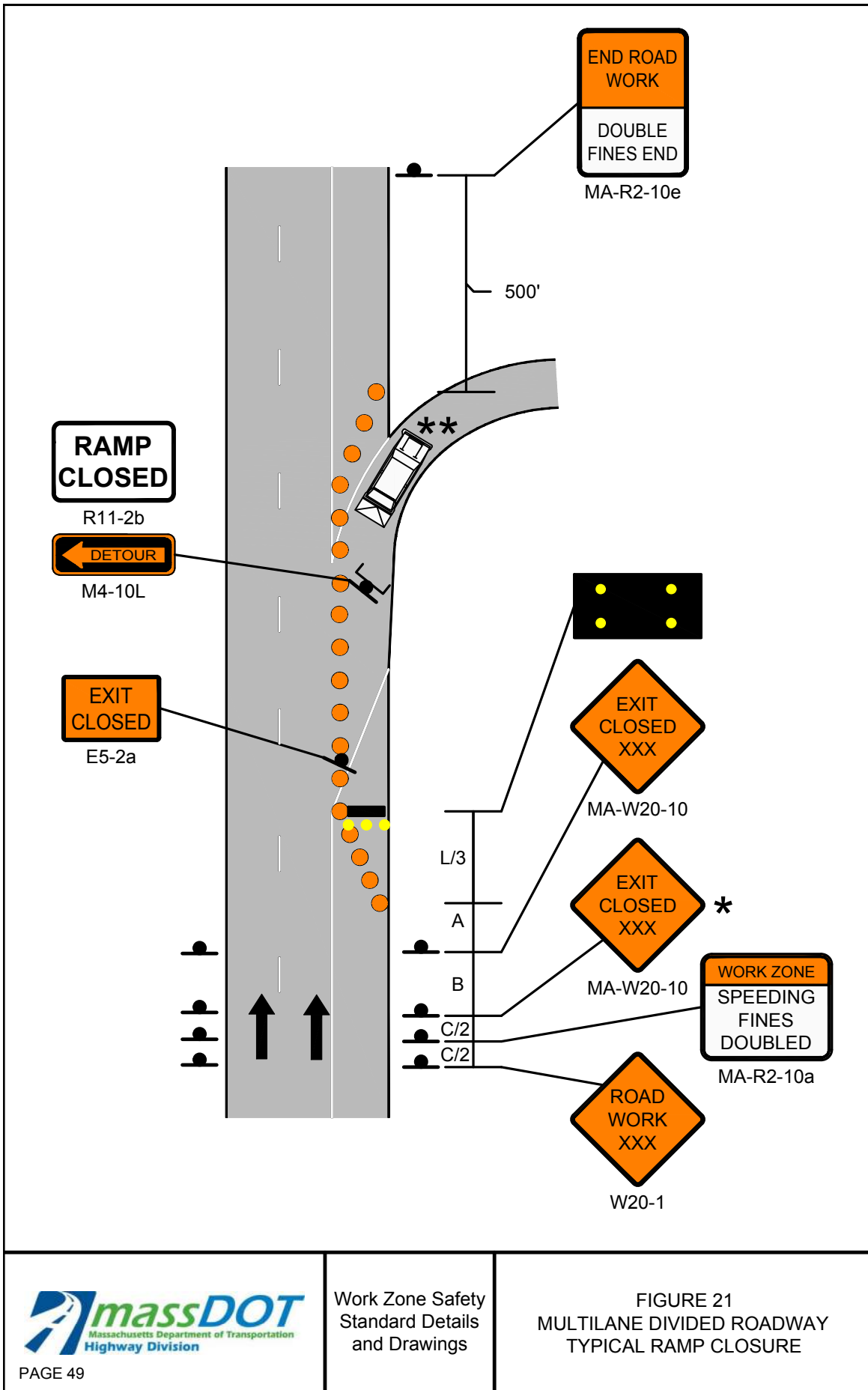
NOTES

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





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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

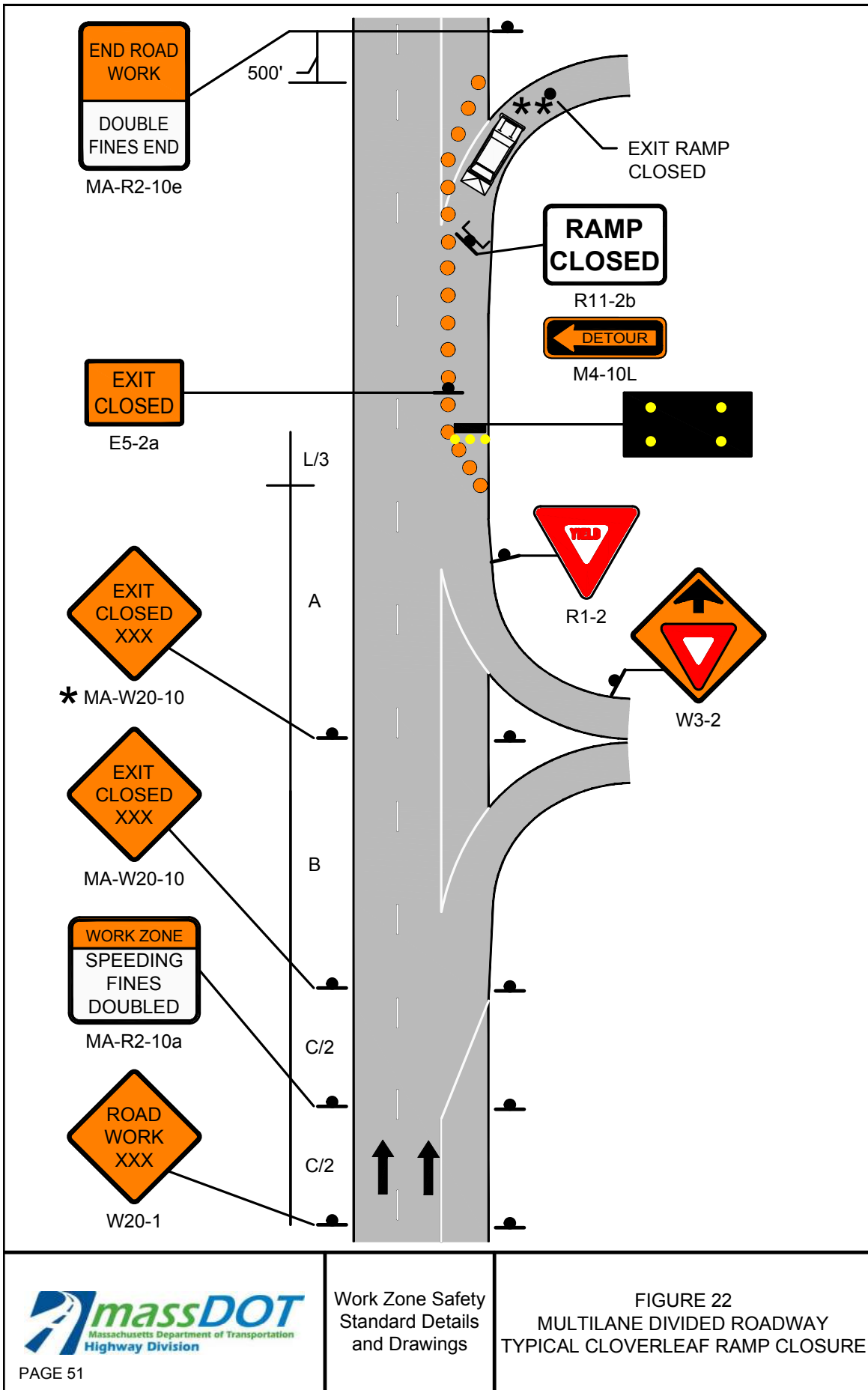
NOTES

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





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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

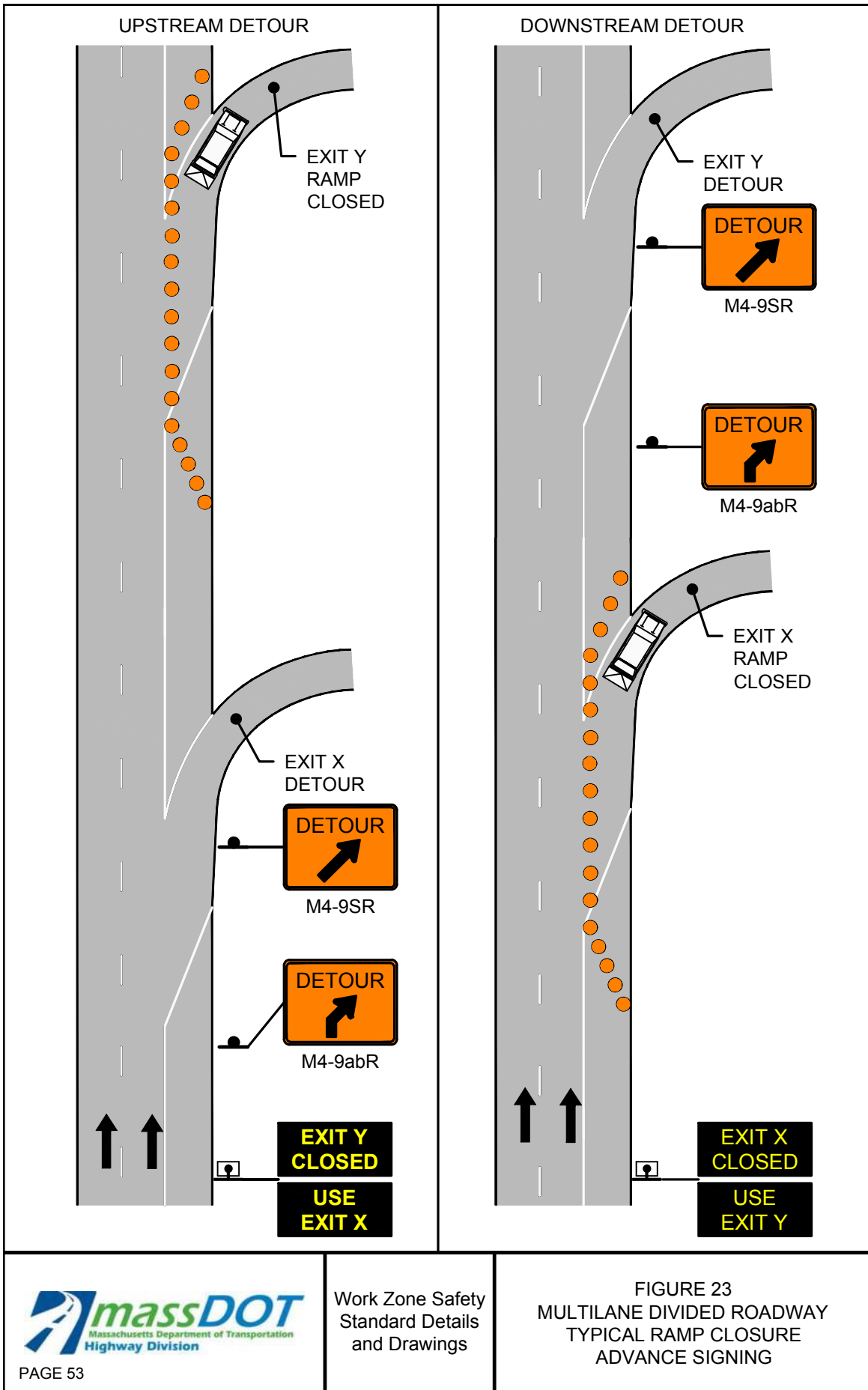


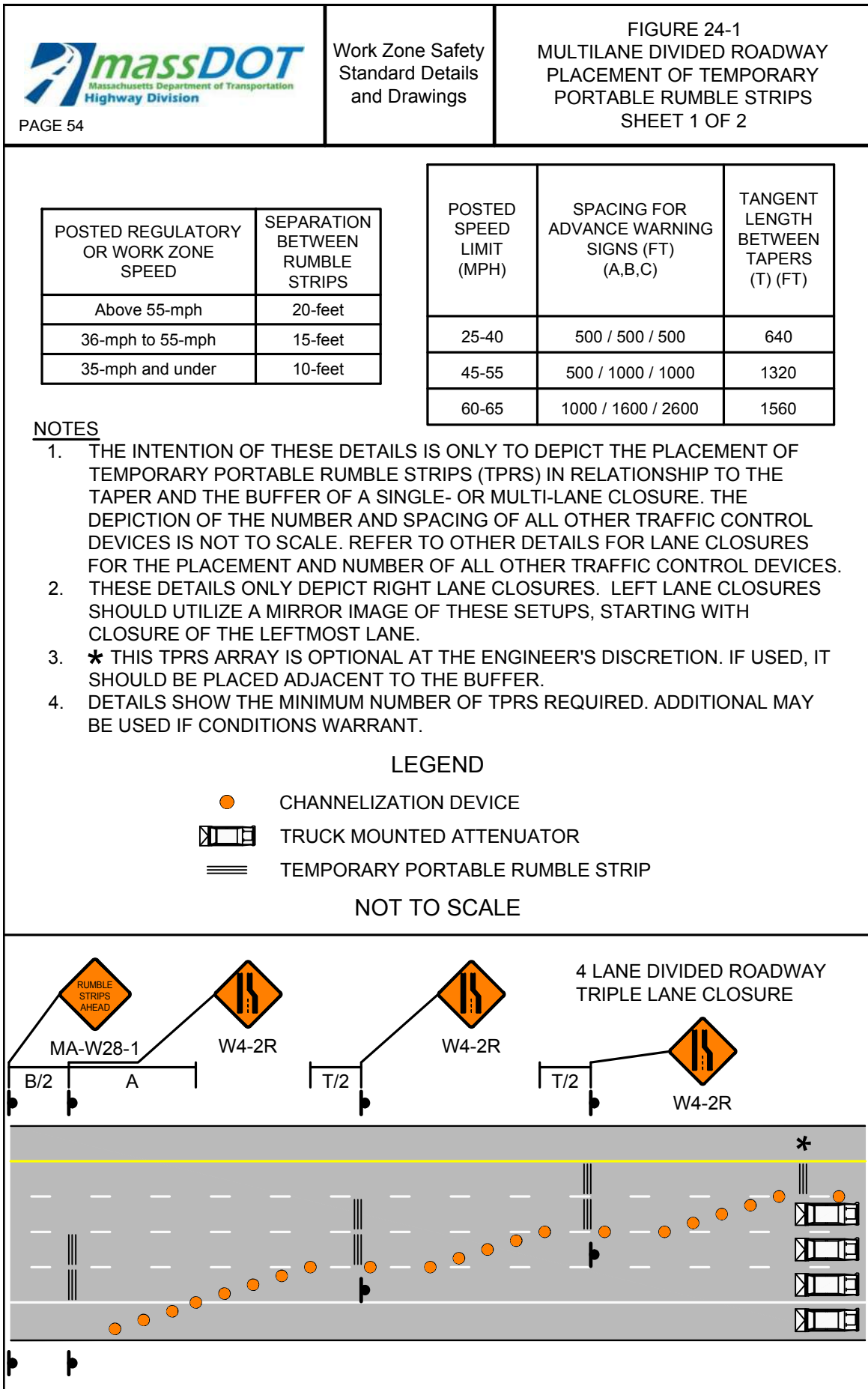
TEMPORARY PORTABLE RUMBLE STRIP

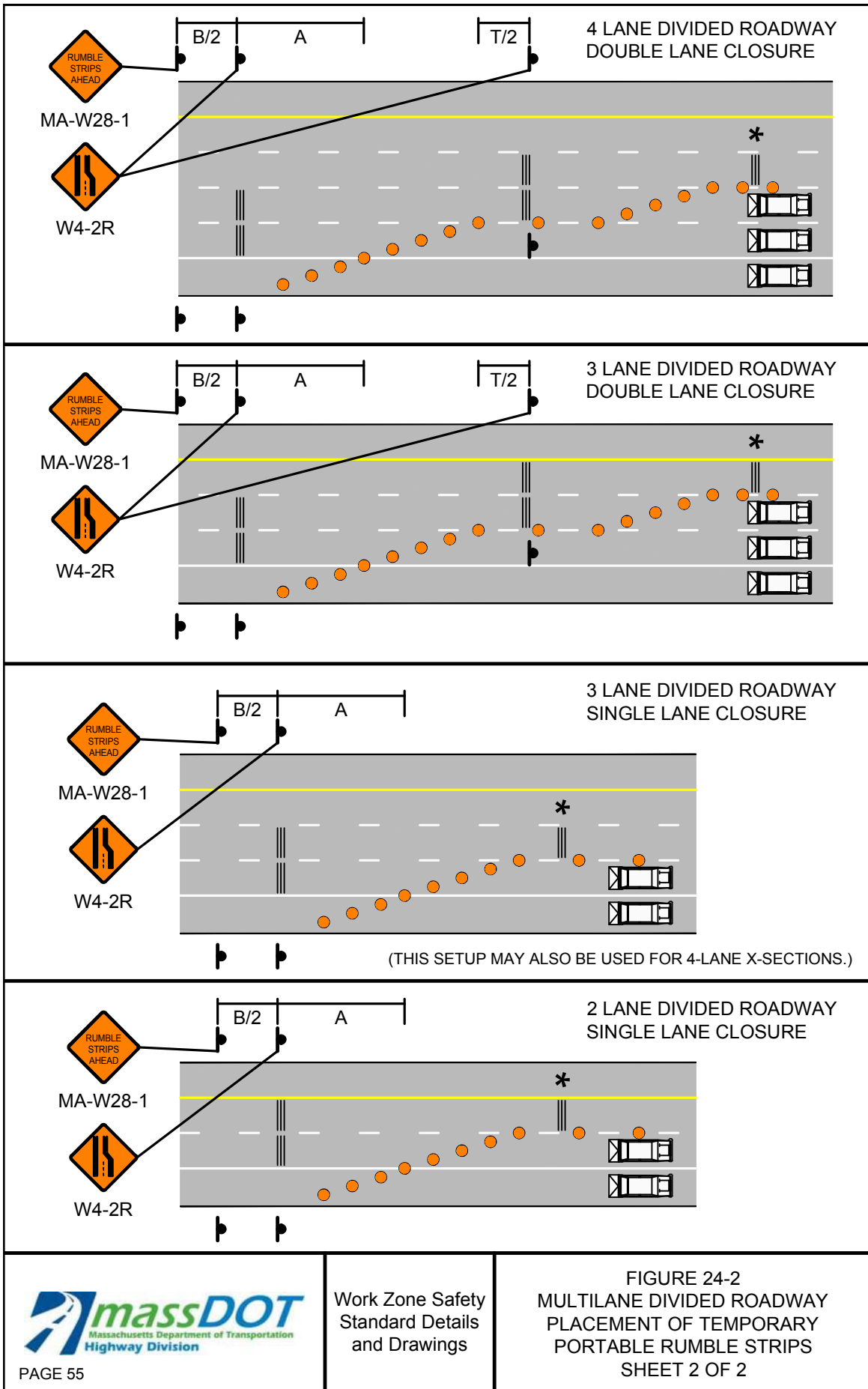



TYPE III BARRICADE

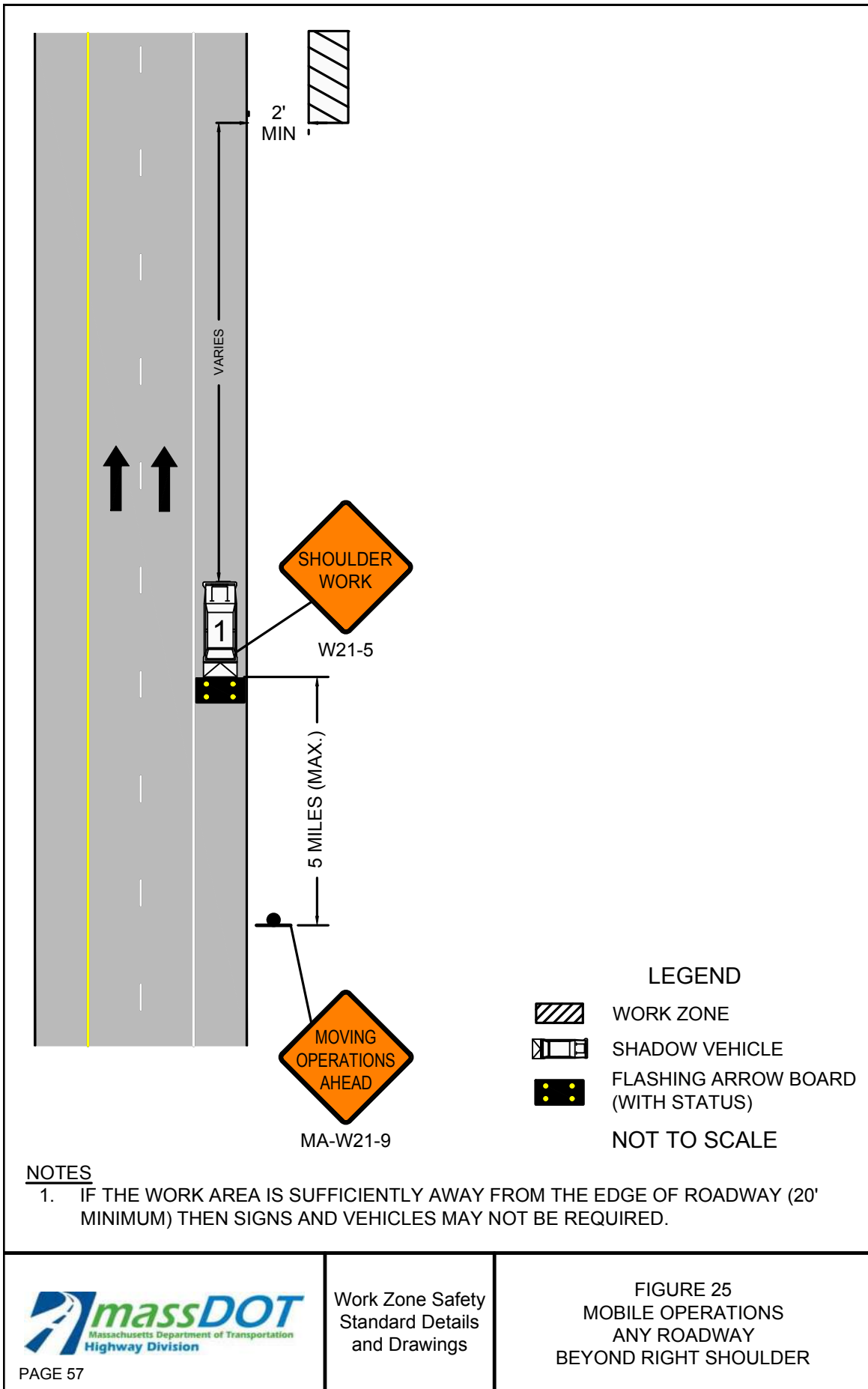
NOT TO SCALE







 <p>PAGE 56</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>NOTES FOR MOBILE OPERATIONS</p>
<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. 		

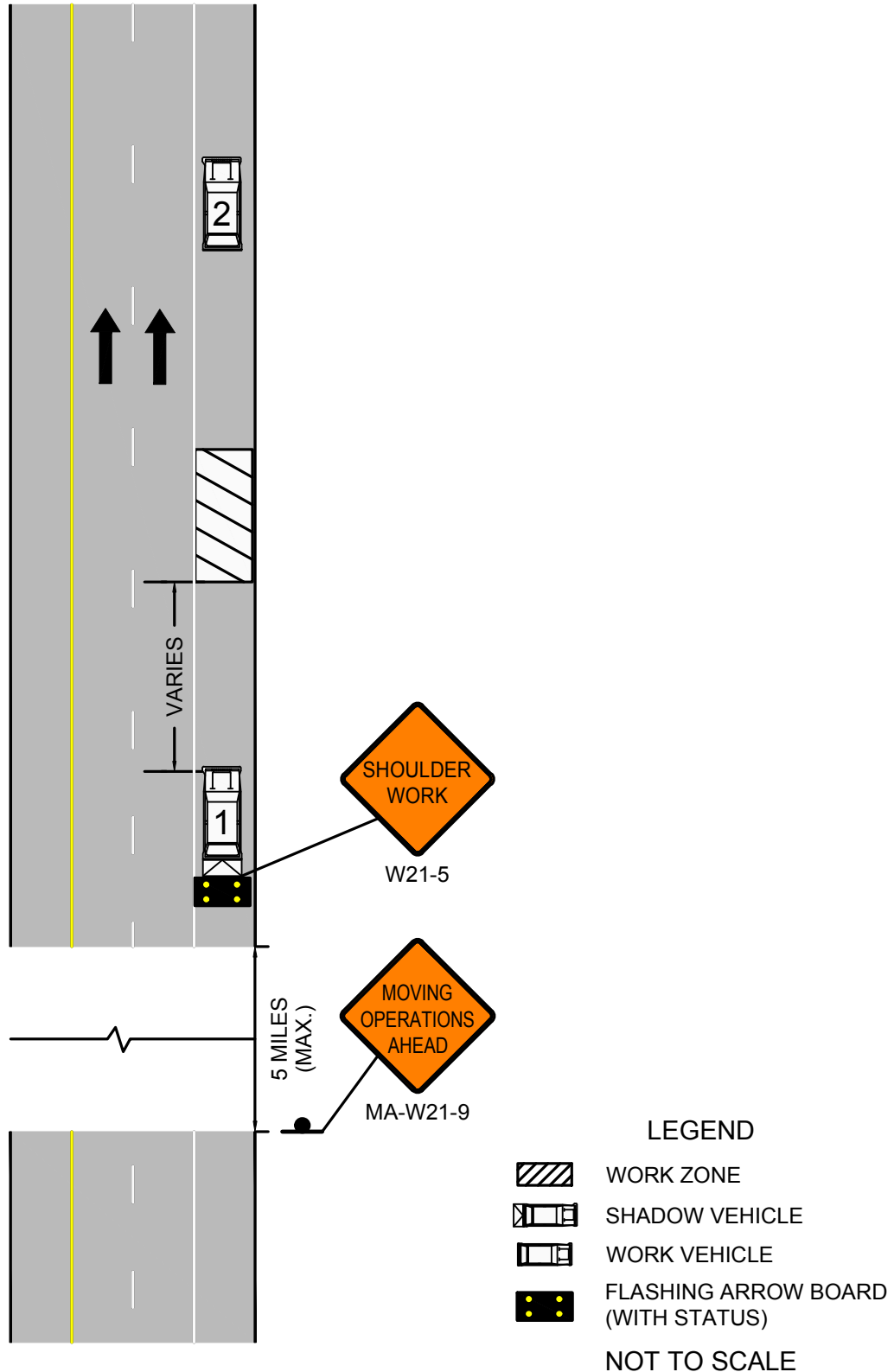


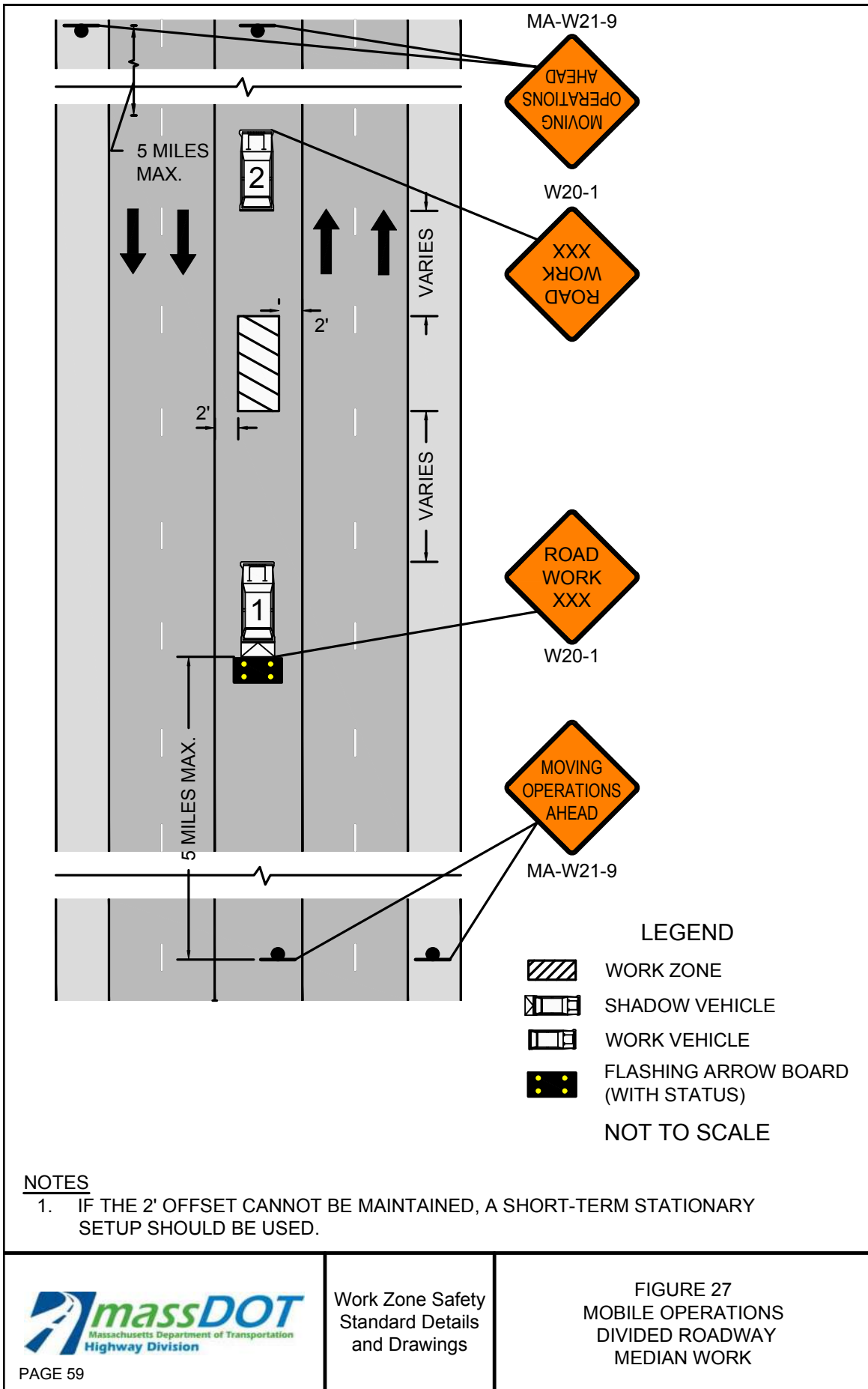


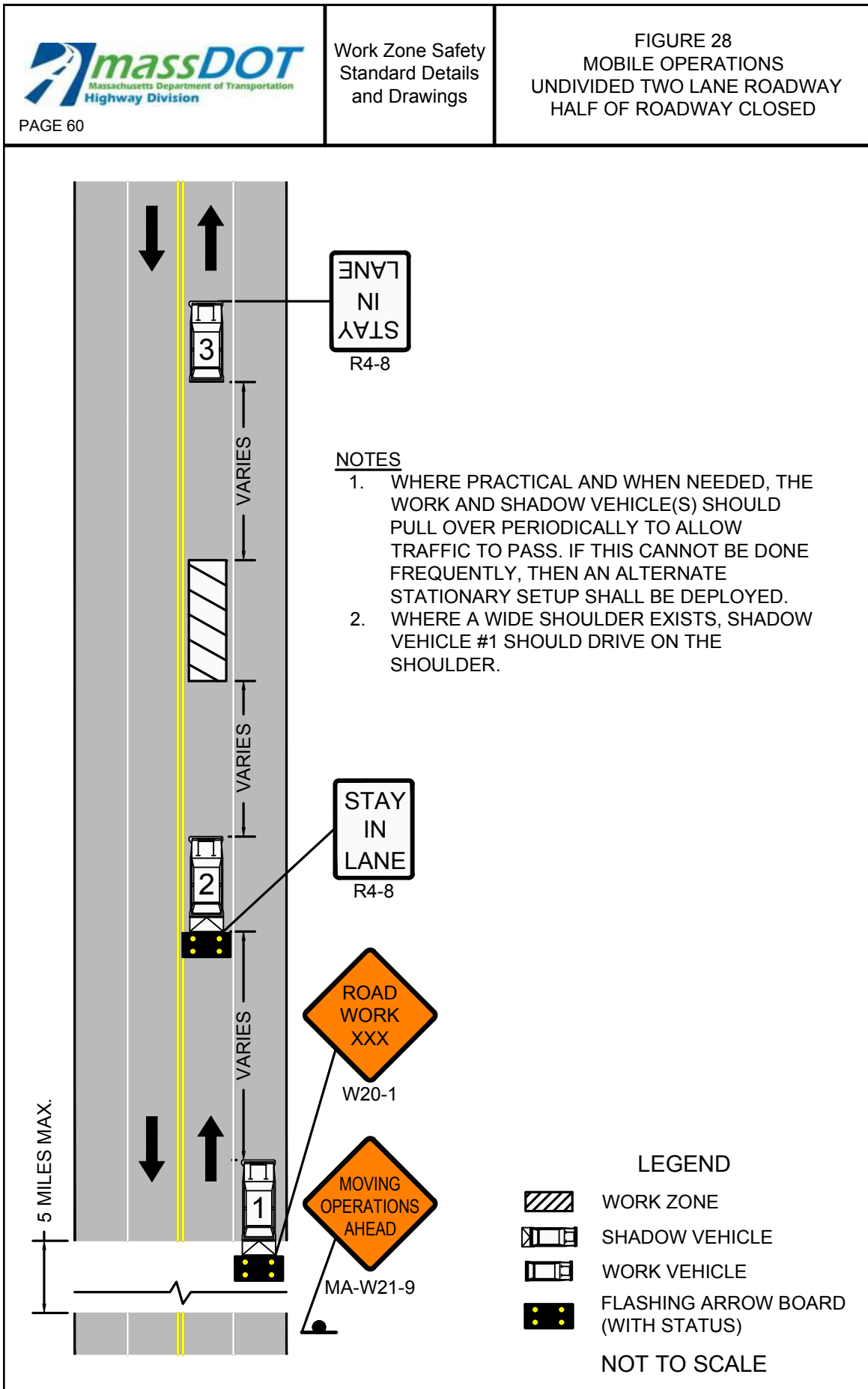
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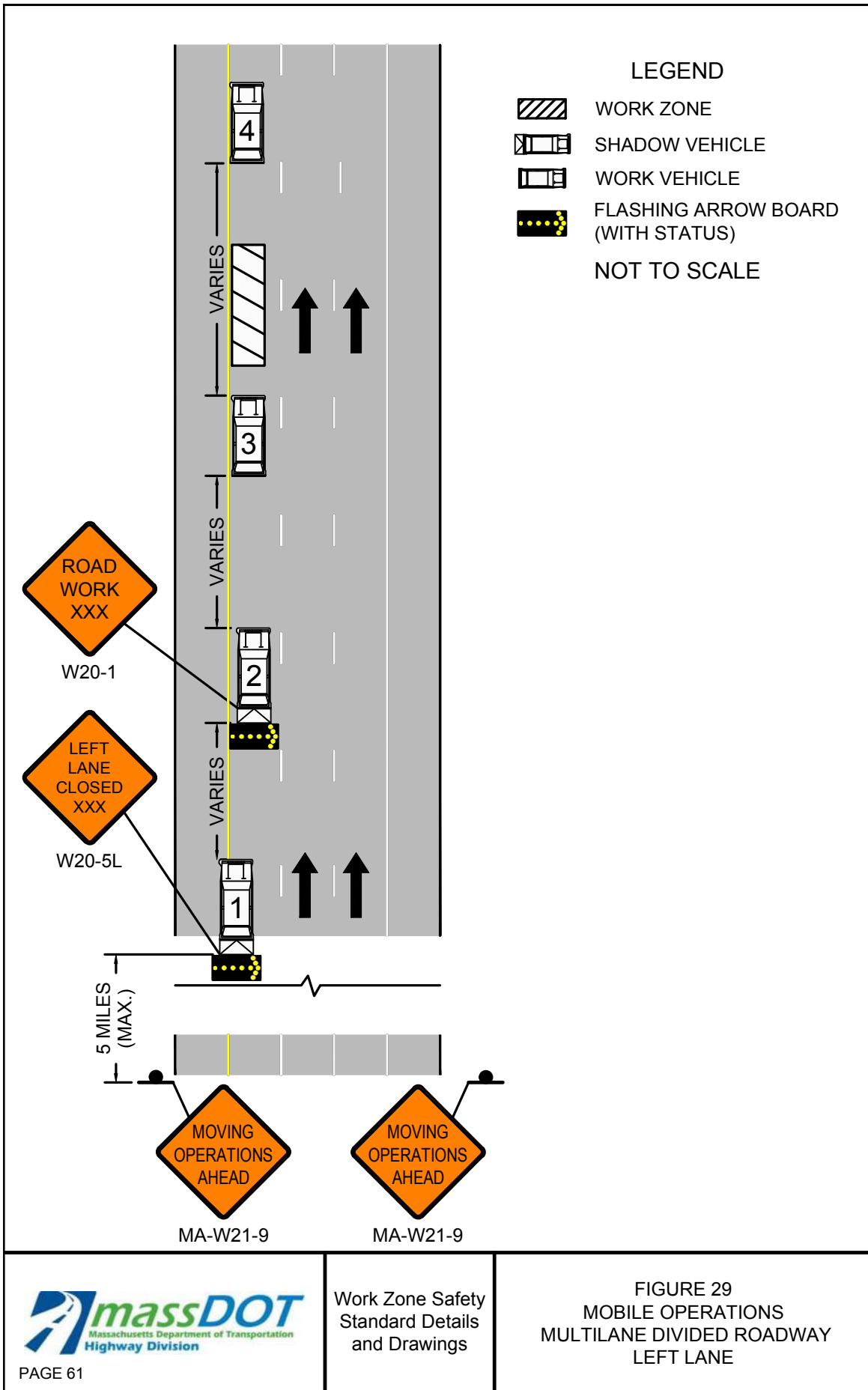
Work Zone Safety
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FIGURE 26
MOBILE OPERATIONS
ANY ROADWAY SHOULDER







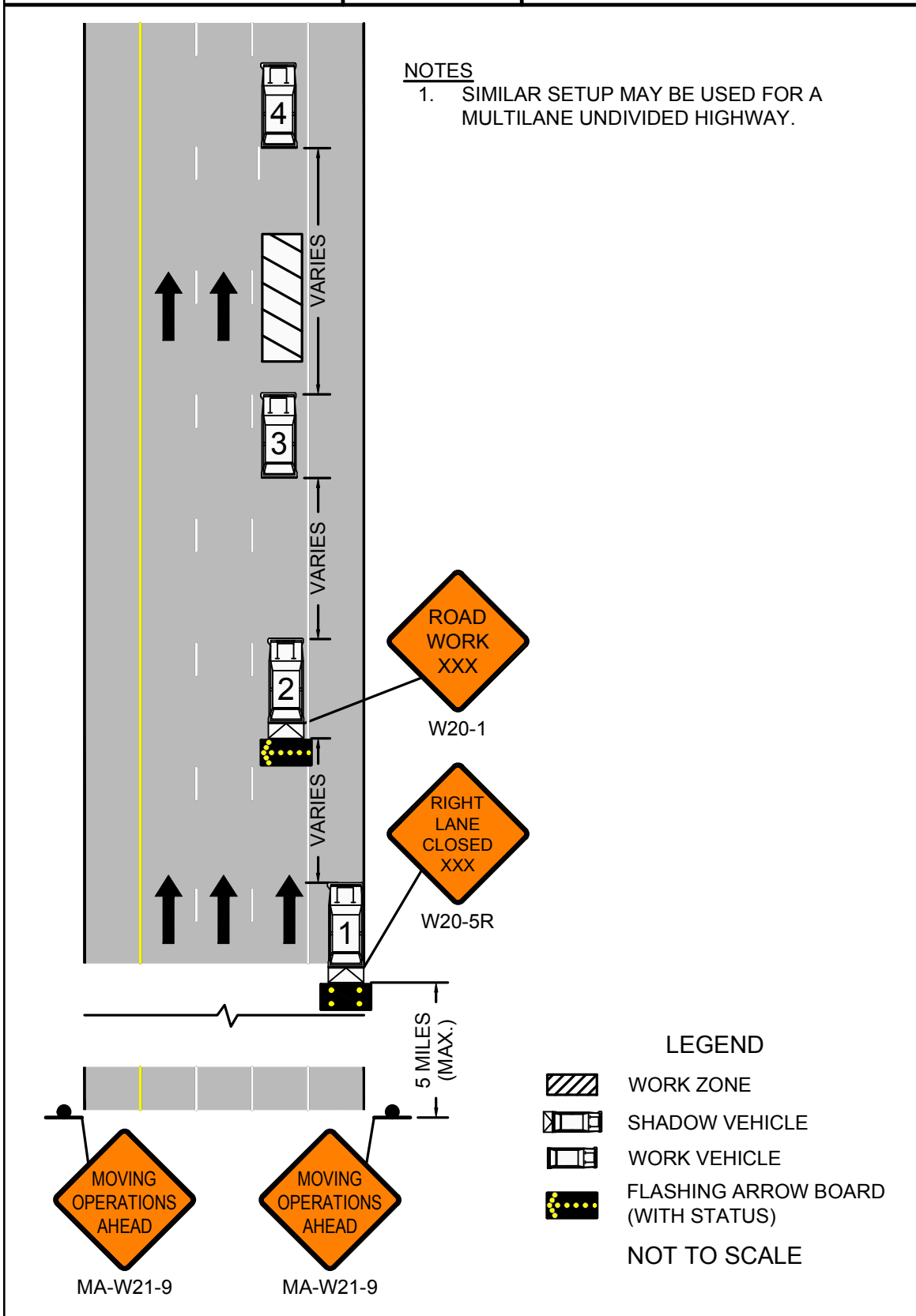


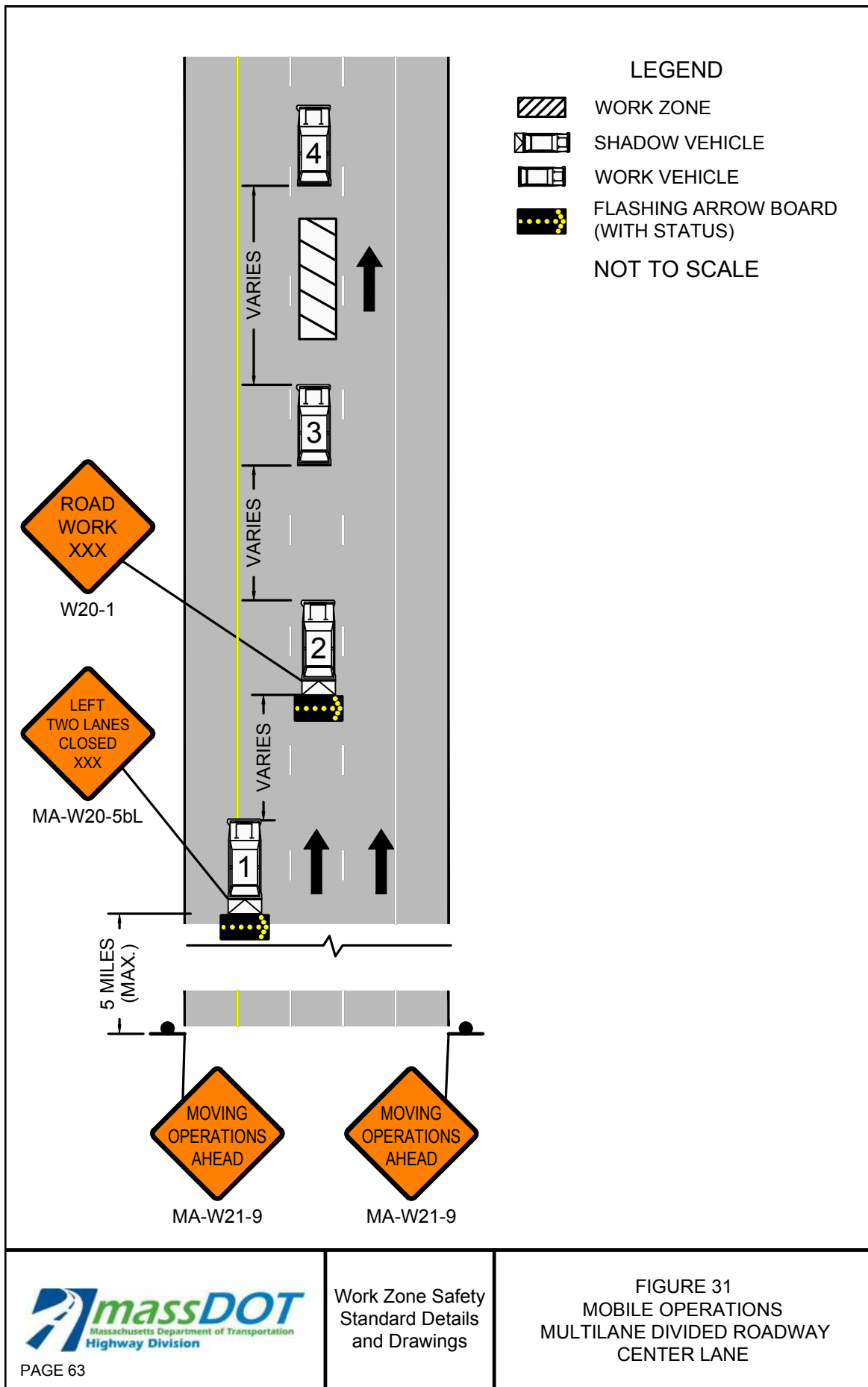


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FIGURE 30
MOBILE OPERATIONS
MULTILANE DIVIDED ROADWAY
RIGHT LANE



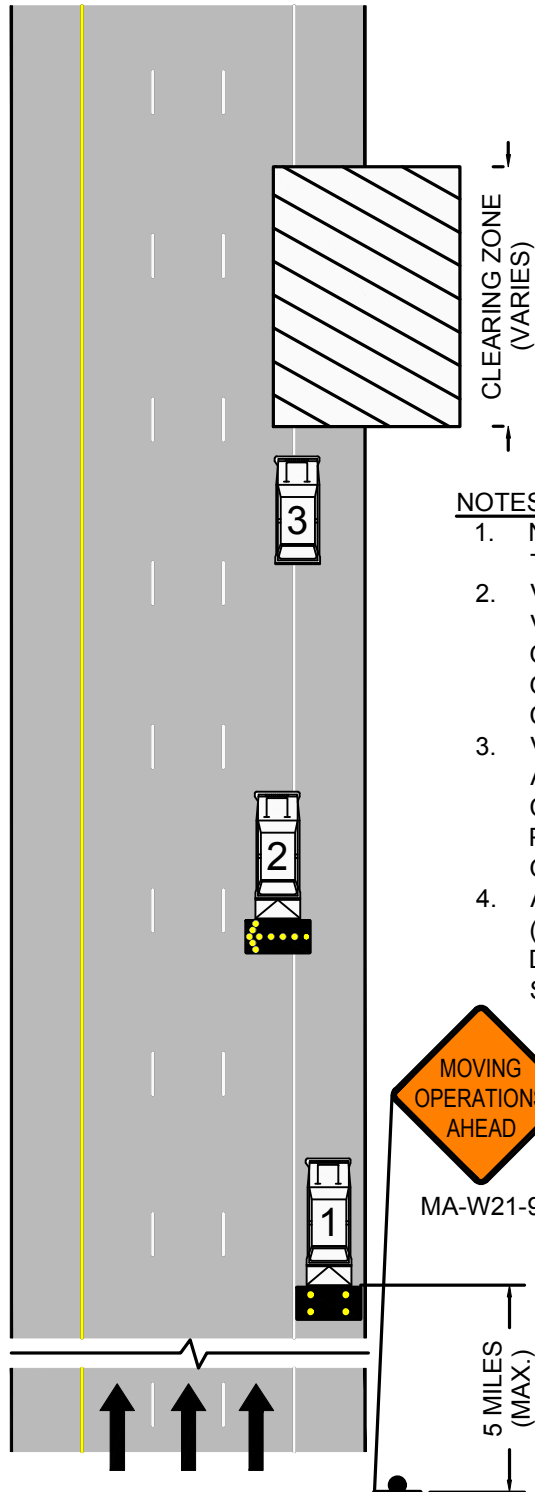




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FIGURE 32
MOBILE OPERATIONS
POST-STORM CLEANUP OPERATION



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

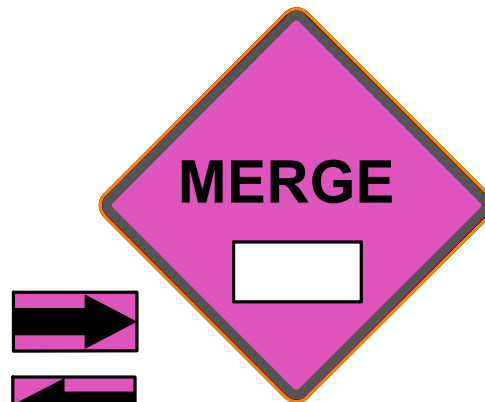
Notes for Traffic Emergency or Incident Operations

- 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








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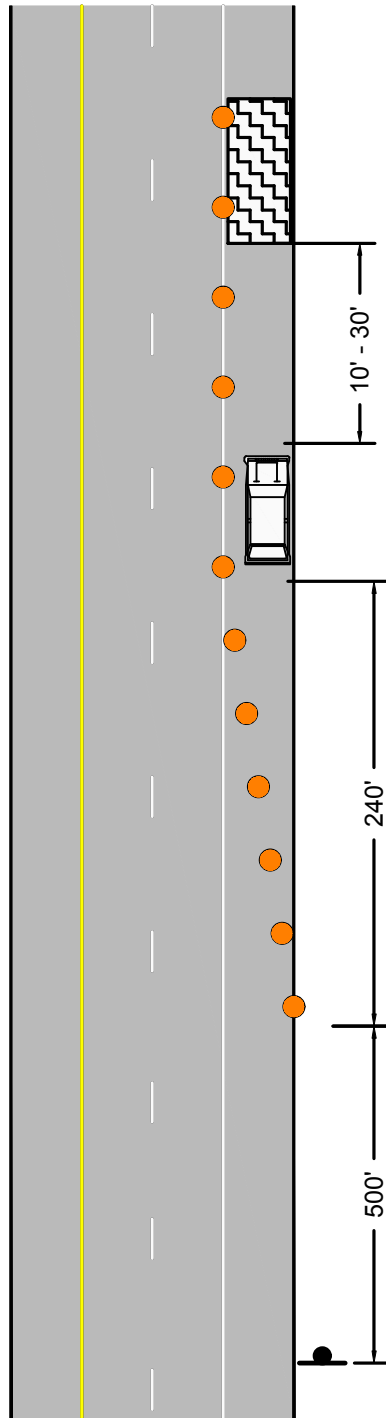
Work Zone Safety
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FIGURE 33
EMERGENCY RESPONSE
ANY ROADWAY
SHOULDER ENCROACHMENT

LEGEND

-  EMERGENCY AREA
-  CHANNELIZATION DEVICE
-  EMERGENCY RESPONSE VEHICLE

NOT TO SCALE



ORDER OF RESPONSE ACTIVITIES

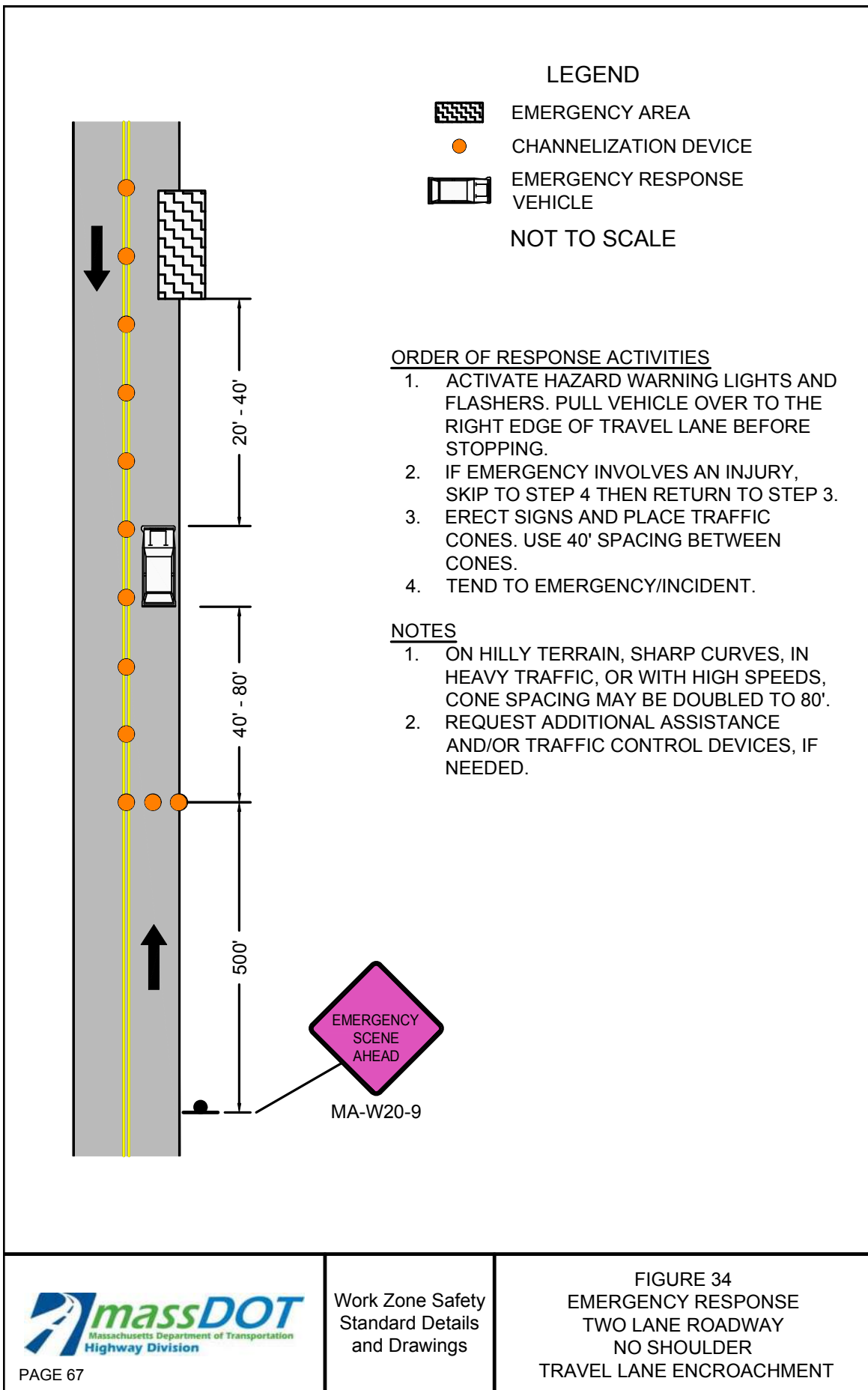
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE RIGHT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

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





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FIGURE 35
EMERGENCY RESPONSE
TWO LANE ROADWAY
TRAVERSABLE SHOULDER
SINGLE LANE ENCROACHMENT

LEGEND



EMERGENCY AREA

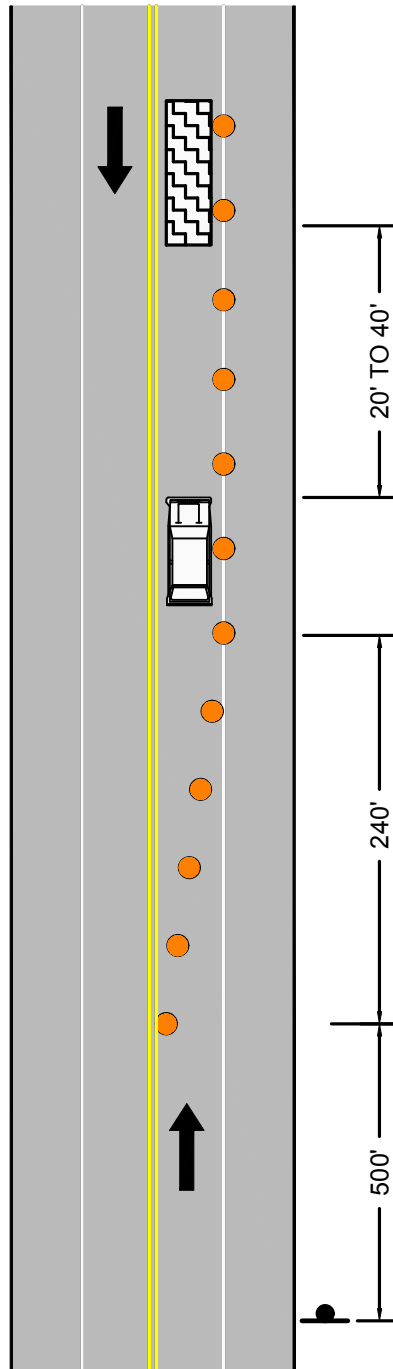


CHANNELIZATION DEVICE



EMERGENCY RESPONSE
VEHICLE

NOT TO SCALE

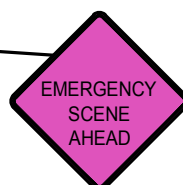


ORDER OF RESPONSE ACTIVITIES

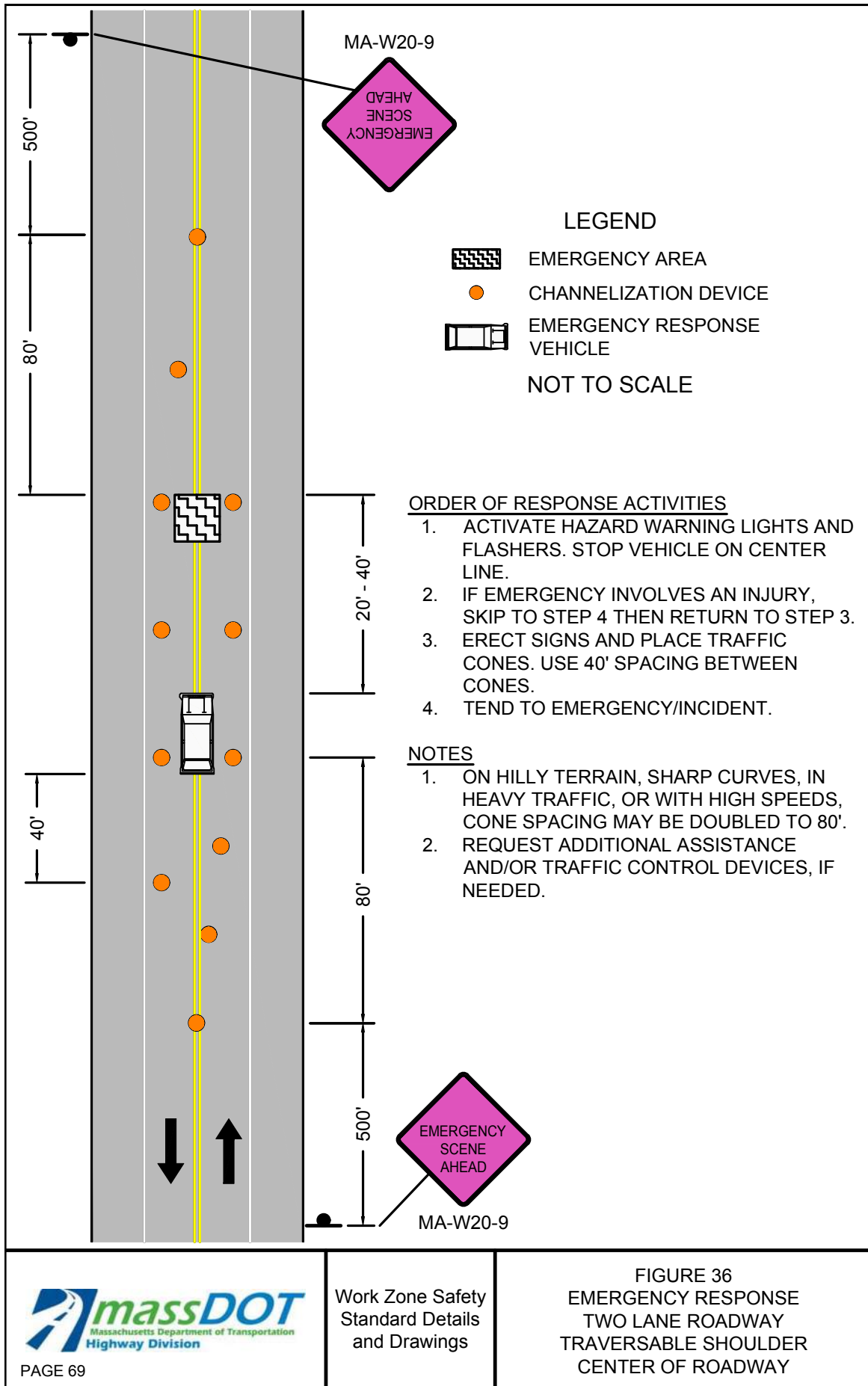
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE LEFT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

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

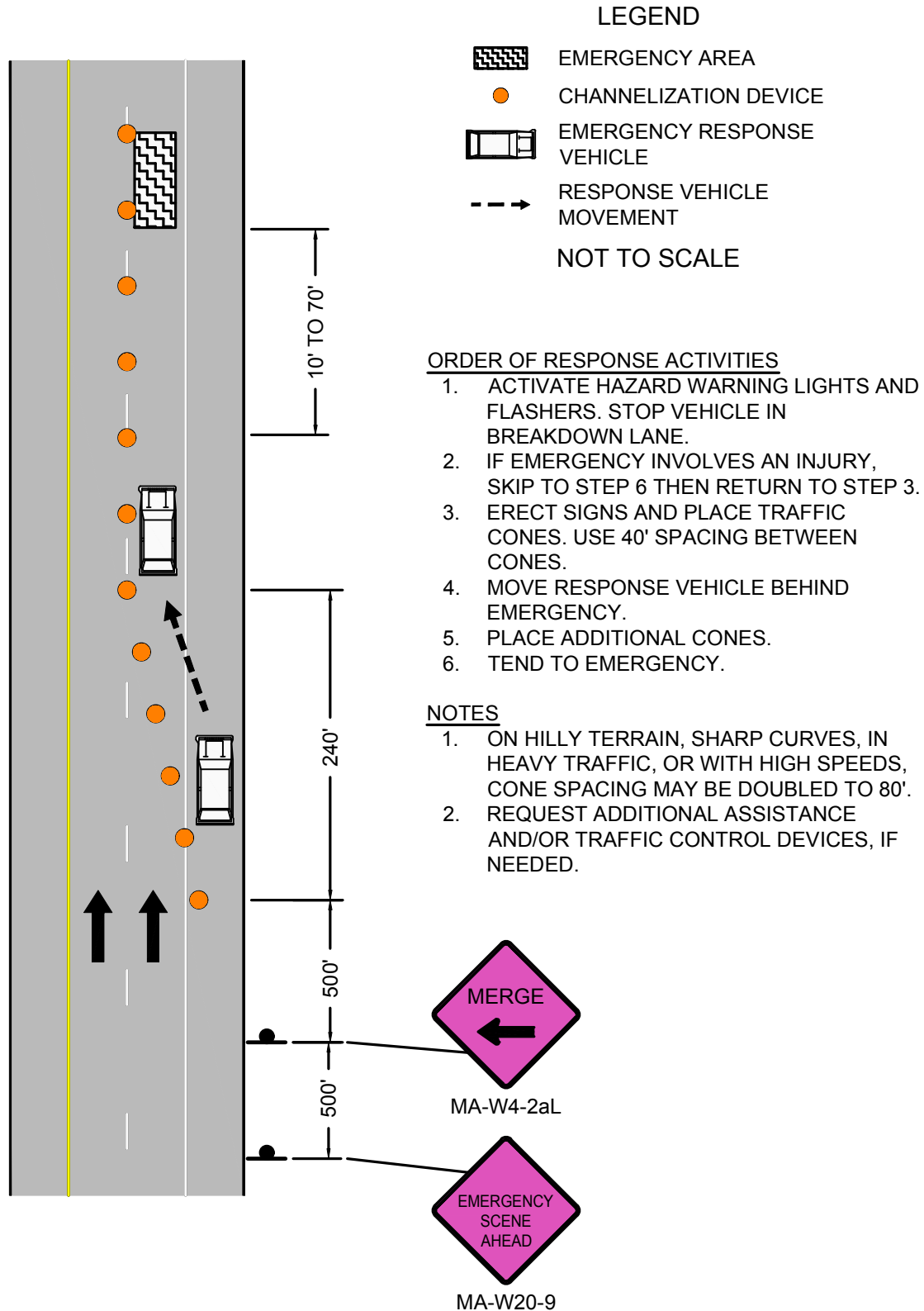


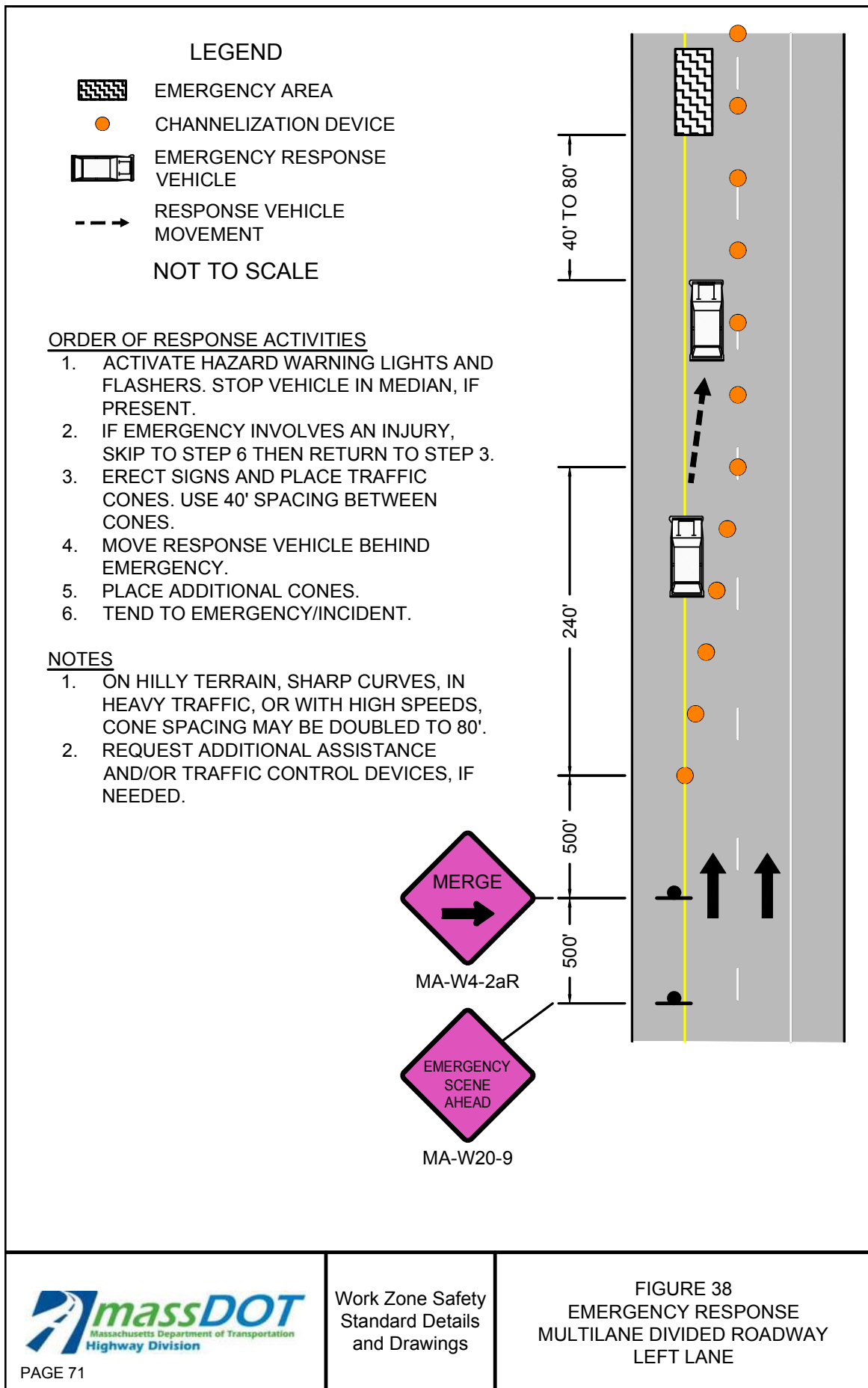


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Standard Details
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FIGURE 37
EMERGENCY RESPONSE
MULTILANE DIVIDED ROADWAY
RIGHT LANE



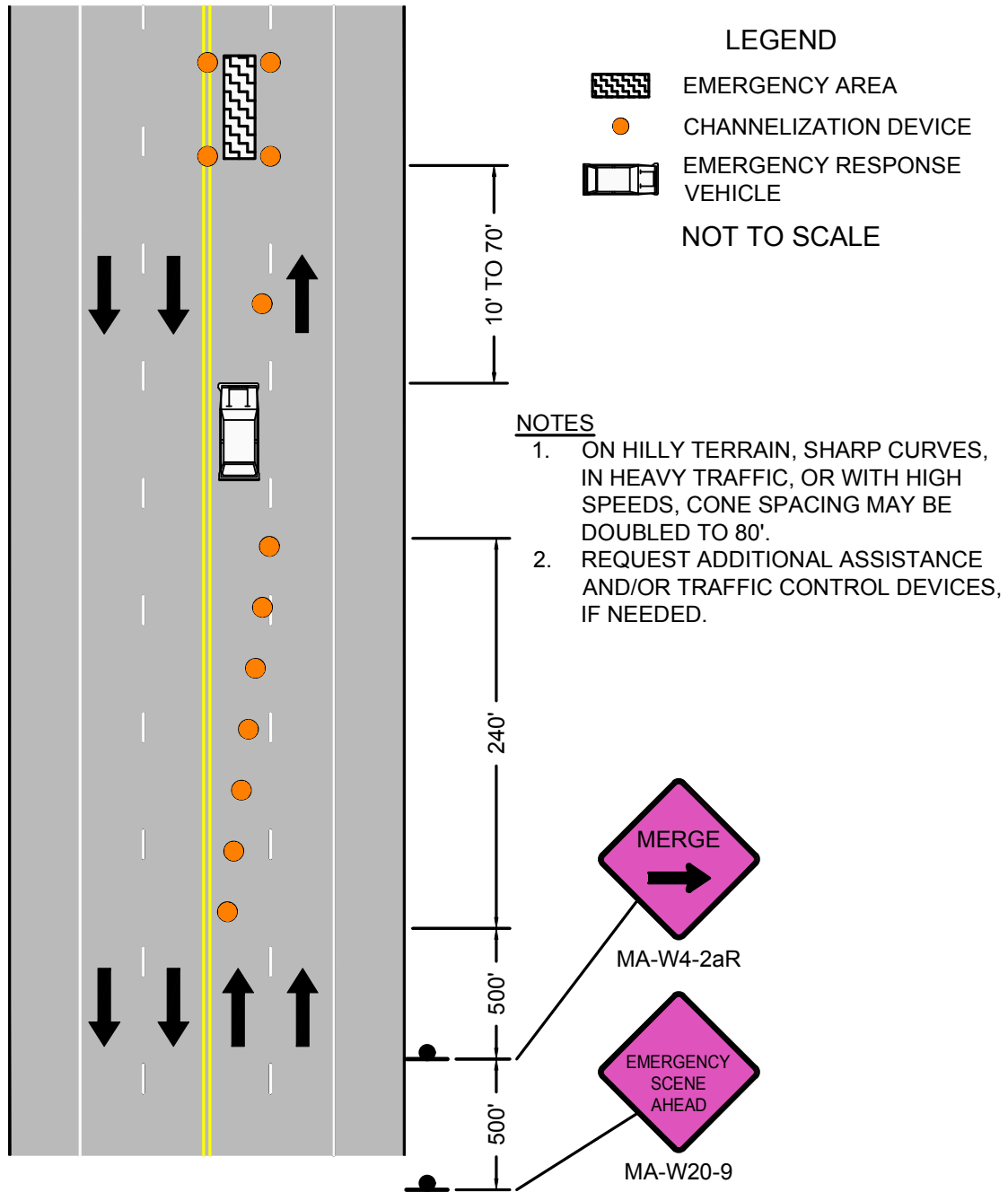


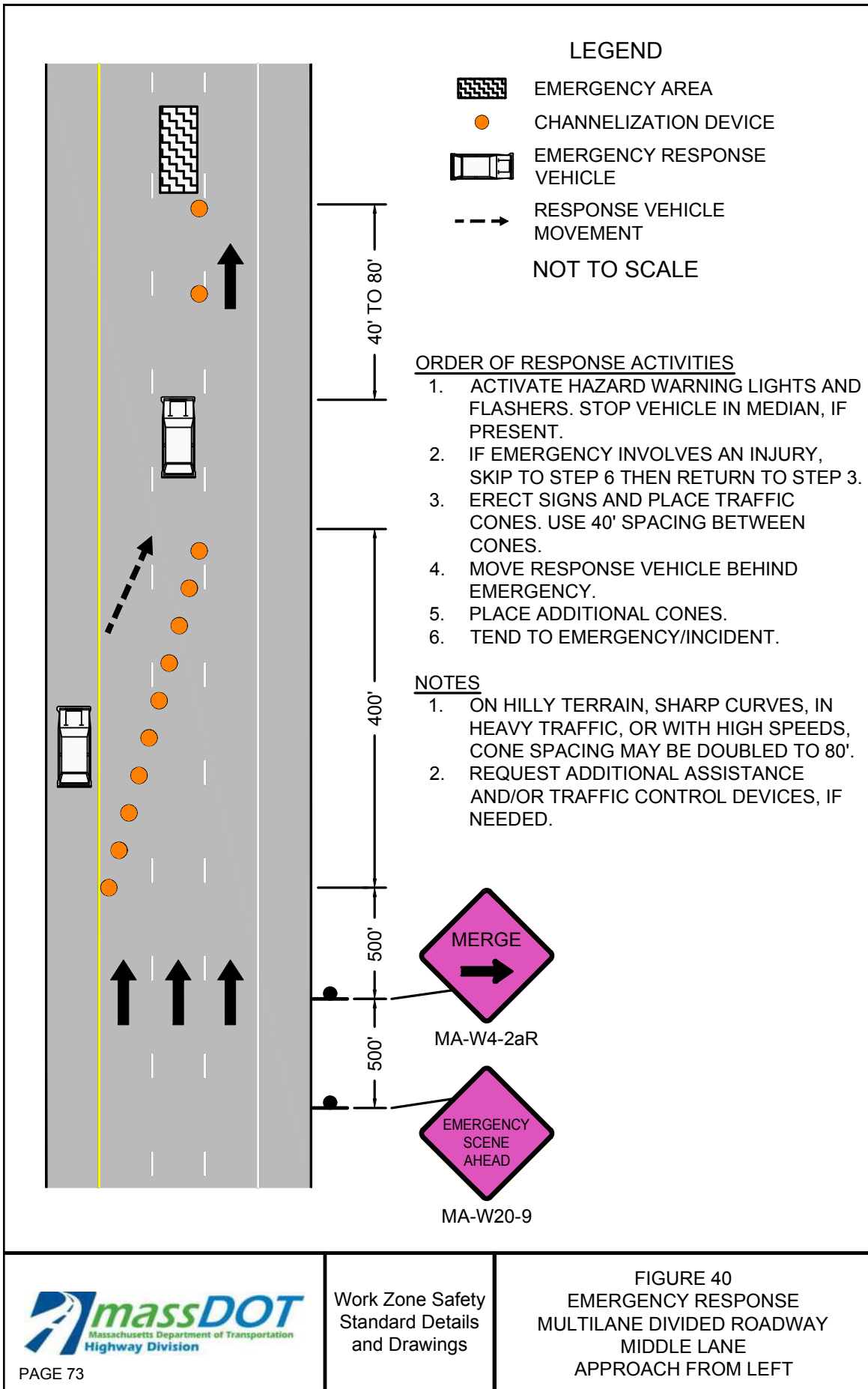


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FIGURE 39
EMERGENCY RESPONSE
MULTILANE UNDIVIDED
ROADWAY
LEFT LANE



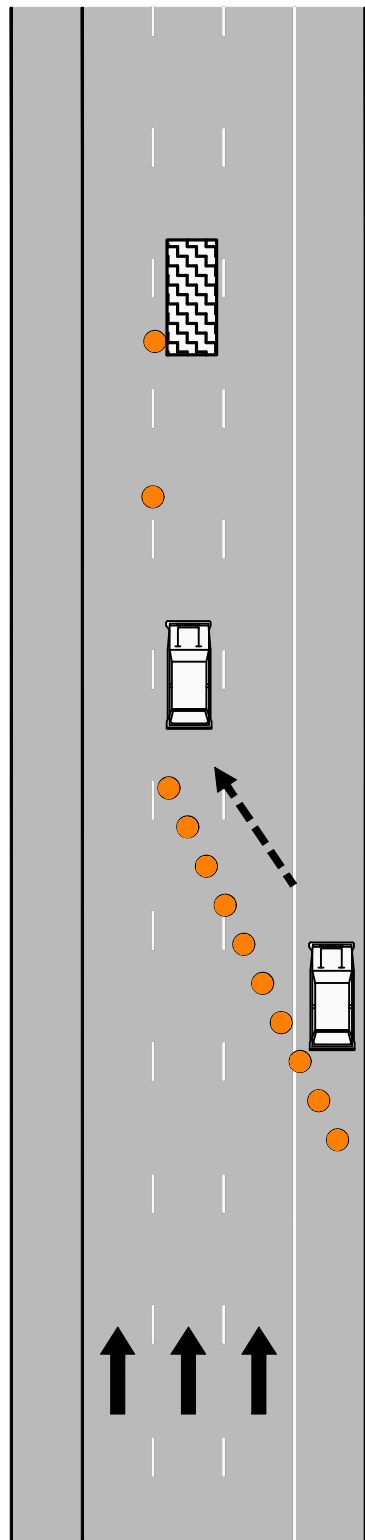








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FIGURE 41
EMERGENCY RESPONSE
MULTILANE DIVIDED ROADWAY
MIDDLE LANE
APPROACH FROM RIGHT



LEGEND

-  EMERGENCY AREA
-  CHANNELIZATION DEVICE
-  EMERGENCY RESPONSE VEHICLE
-  RESPONSE VEHICLE MOVEMENT

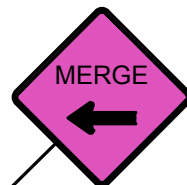
NOT TO SCALE

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

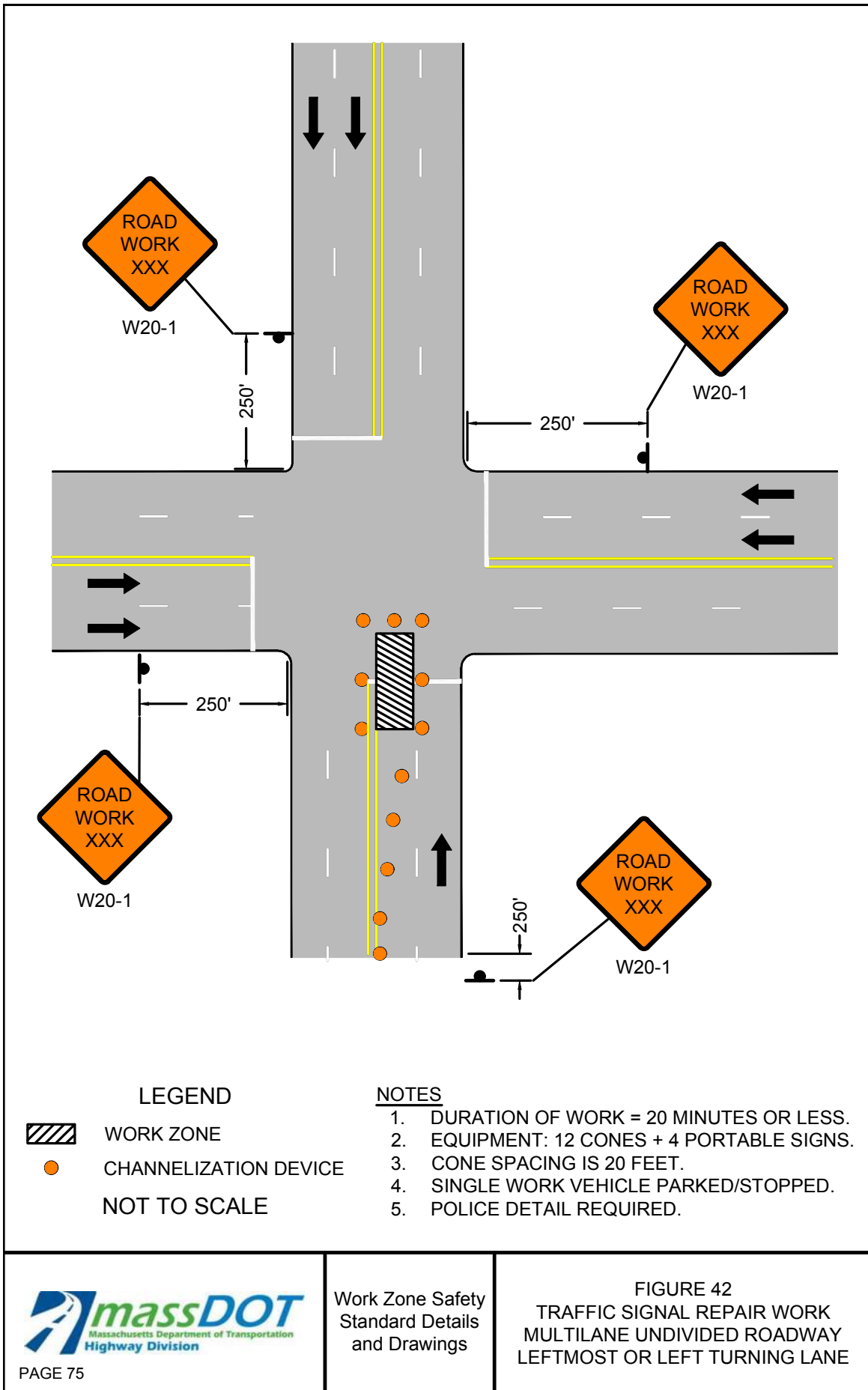
1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



MA-W4-2aL



MA-W20-9

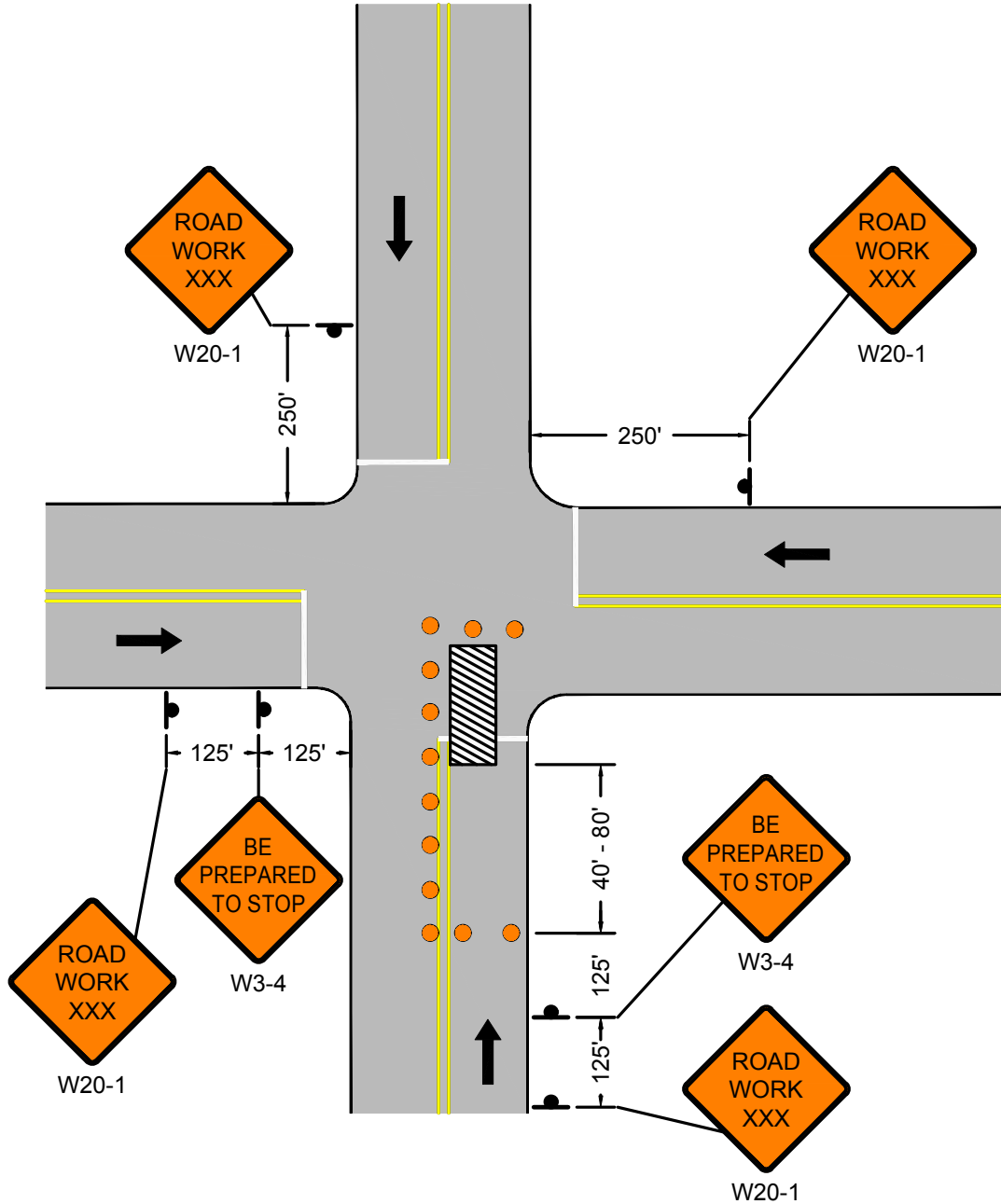




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FIGURE 43
TRAFFIC SIGNAL REPAIR WORK
TWO LANE UNDIVIDED ROADWAY
ONE LEG OF INTERSECTION



LEGEND



WORK ZONE

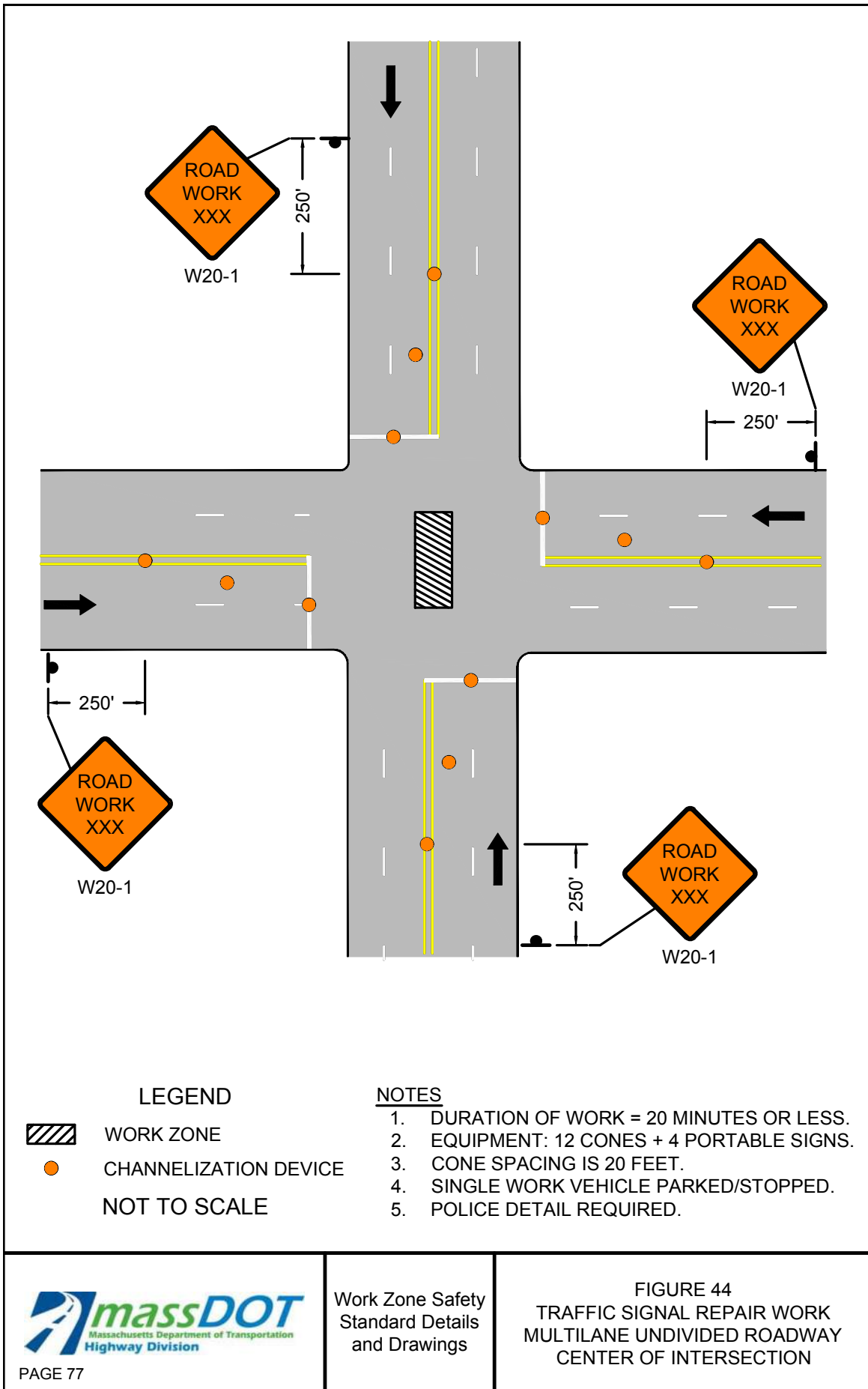


CHANNELIZATION DEVICE

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.

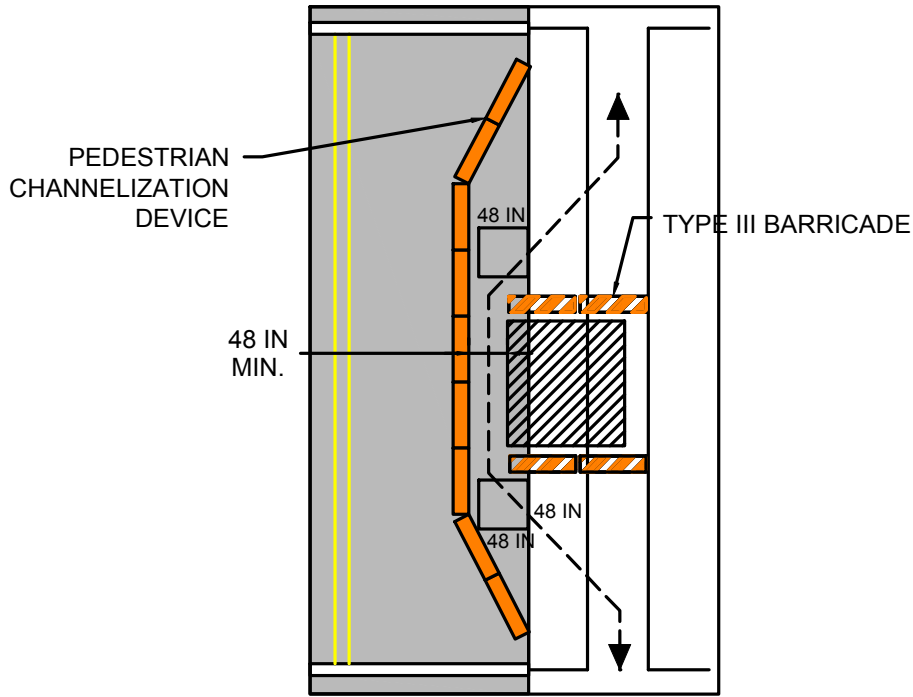




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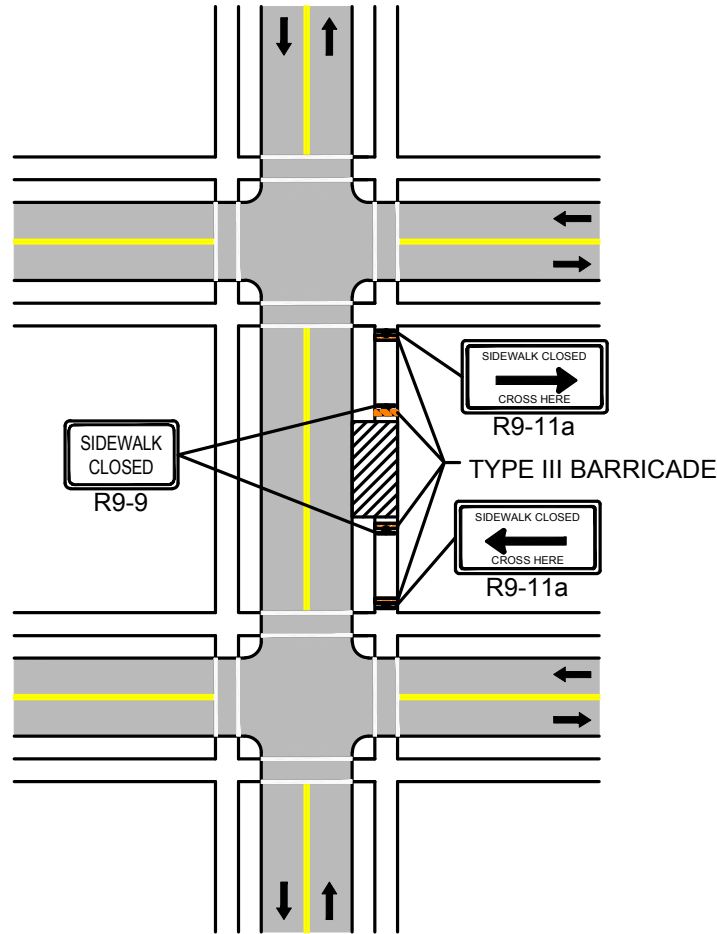
Work Zone Safety
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FIGURE 45
PEDESTRIAN BYPASS



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.



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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.

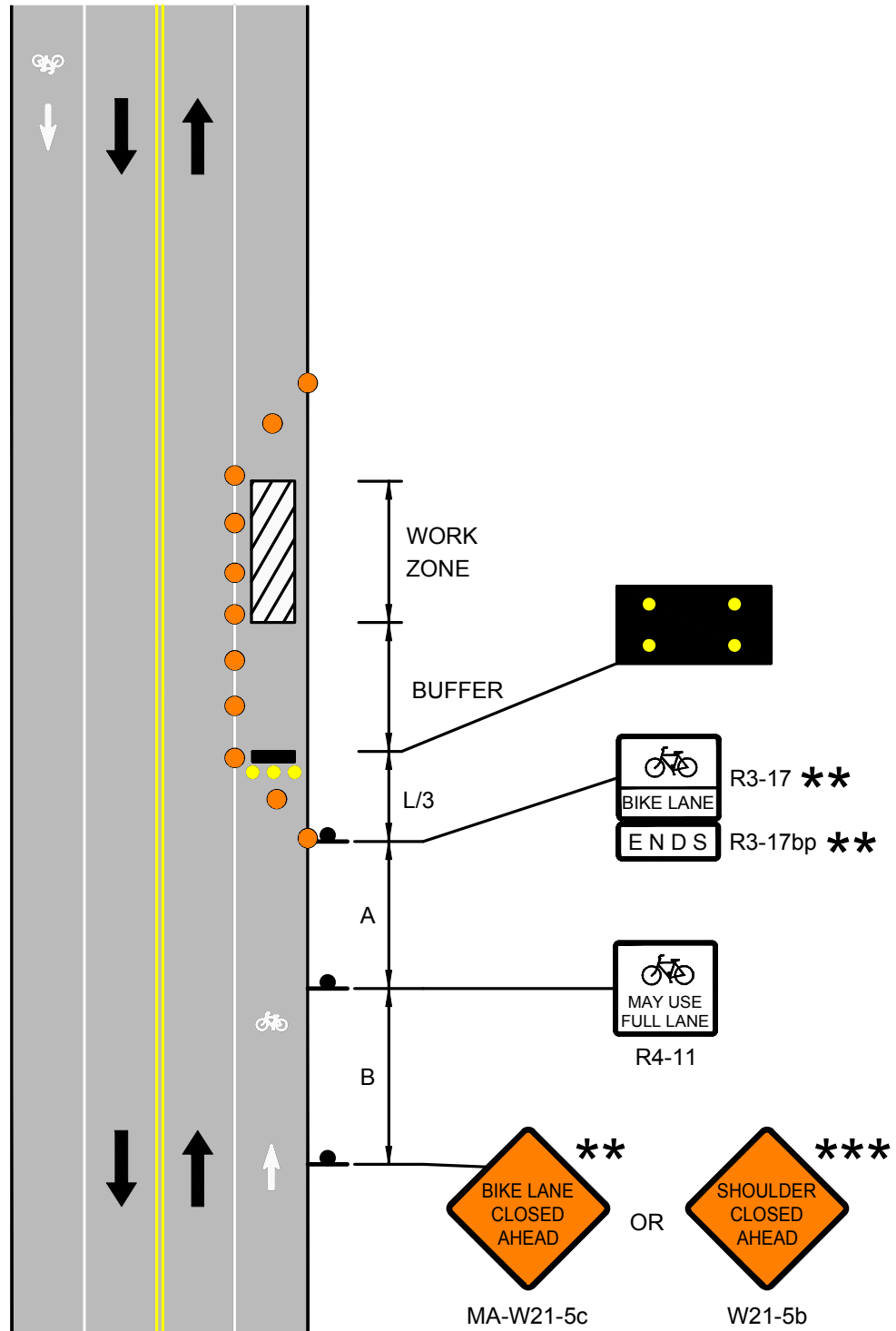
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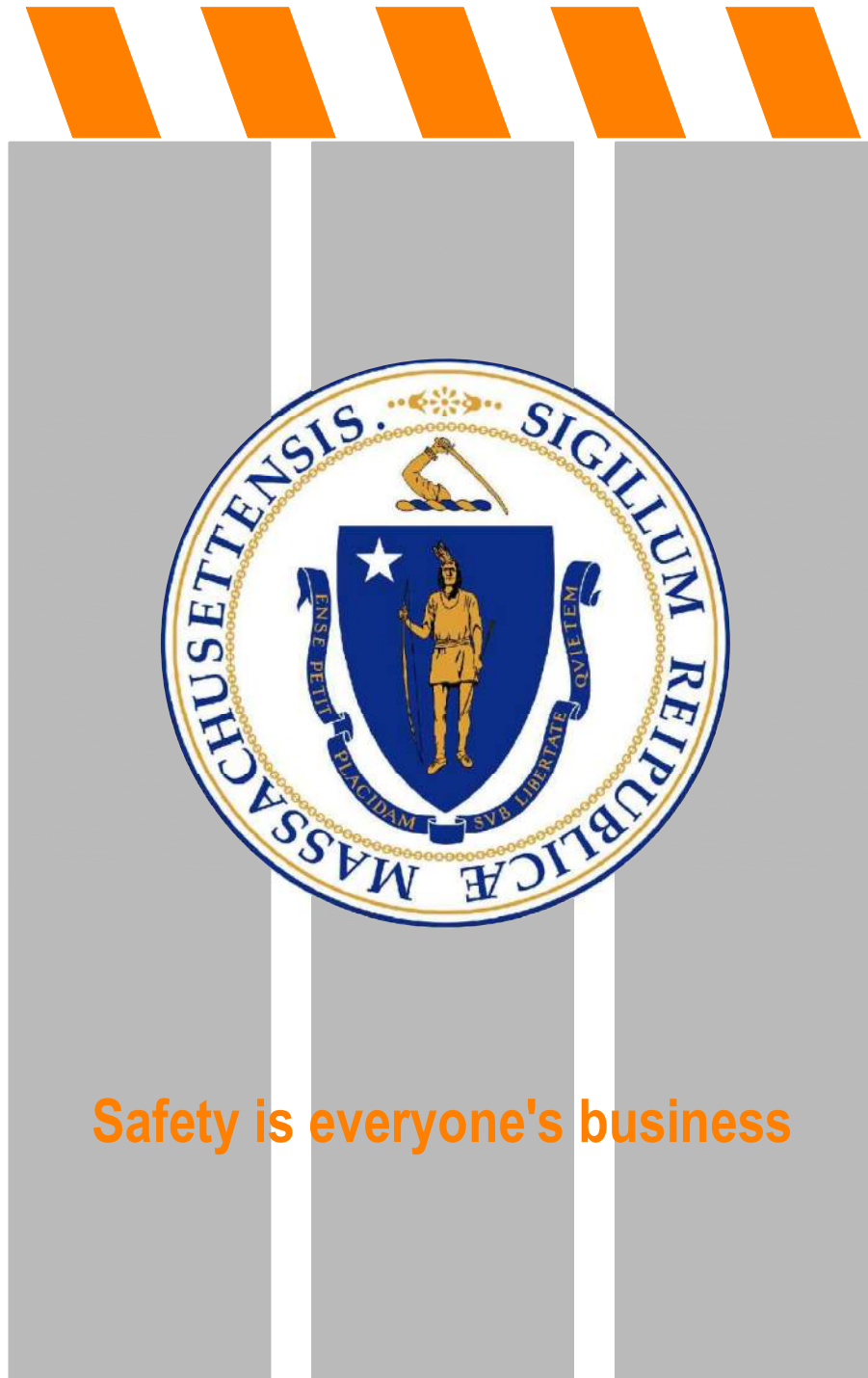
1. DETAIL SHALL BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS. SIGNING SHOWN ONLY FOR BIKE TRAFFIC. FOLLOW ALL OTHER RELEVANT DETAILS FOR TTC DEVICES FOR VEHICULAR TRAFFIC.
2. ** SIGN SHALL BE USED ONLY IF THERE IS A MARKED BIKE LANE.
3. *** SIGN SHALL BE USED ONLY IF THERE IS NO MARKED 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: WAREProject File Number: 605126Contract Number: 120185Project Description: Bridge Replacement, W-05-015, Route 32 (Palmer Road) over the 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 A00829

**ARMY CORPS OF ENGINEERS
And
Water Quality Certification

Joint Application**

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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, Secretary & CEO



May 26, 2022

Heidi Davis
Massachusetts Department of Environmental Protection
Wetlands Program
1 Winter Street
Boston, MA 02108

RE: 401 Water Quality Certification Applications
Route 32 (Palmer Road) over Ware River
Ware, Massachusetts
MassDOT Project No. 605126
Transmittal #s X288429 (dredge), X288430 (fill)

Dear Ms. Davis,

The Massachusetts Department of Transportation (MassDOT) Highway Division is submitting the attached Water Quality Certification application for the replacement of Bridge W-05-015 (C89) carrying Route 32 (Palmer Road) over the Ware River in the Town of Ware. Accompanying the application are several attachments describing the proposed work for the bridge replacement in detail. This material has been prepared in accordance with the Massachusetts General Permit, Clean Water Act (Section 401/404), and the regulations at 314 CMR 9.00. A prefiling meeting request was submitted on April 27, 2022 by email to your office. This project is being permitted under the MassDOT Bridge Exemption.

This project is anticipated to permanently impact 5,204 sf of Land Under Water, which includes streambed restoration over the riprap, and temporarily impact 9,340 sf of Land Under Water to construct the new bridge and footing. Dredging will occur for installation of new pier, during the removal of existing piers, and installation of rip-rap. Dredging impact to the riverbed is approximately 1,015 cubic yards and excavation of concrete is approximately 42 cubic yards.

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.

If you have any questions regarding the submission, or if you require additional information please contact me at 978-429-1772 or at Melissia.Lenker@state.ma.us.

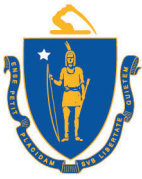
Sincerely,

A handwritten signature in blue ink that reads "Melissa Lenker".

Melissa Lenker
Wetlands Permitting Coordinator
MassDOT

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

cc: Tyler Lewis, MassDEP
Dan Vasconcelos, ACOE
Dave Paulson, MADFW
Ware Conservation Commission
Hema Bhatt, PM, MassDOT



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, Secretary & CEO



May 26, 2022

Daniel Vasconcelos
Regulatory Division
U.S Army Corps of Engineers, New England District
696 Virginia Road
Concord, MA 01742

RE : Section 404 Preconstruction Notification (PCN) Application
Route 32 (Palmer Road) over Ware River
Ware, Massachusetts
MassDOT Project No. 605126

Dear Mr. Vasconcelos,

The Massachusetts Department of Transportation (MassDOT) Highway Division is submitting the attached application for PCN authorization under the Massachusetts General Permit for the replacement of Bridge W-05-015 (C89) carrying Route 32 (Palmer Road) over the Ware River in the Town of Ware. Accompanying the application are several attachments describing the proposed work for the bridge replacement in detail. This material has been prepared in accordance with the Massachusetts General Permit #10, Clean Water Act (Section 401/404), and the regulations at 314 CMR 9.00.

This project will permanently impact 5,204 sf of Waters of the US, which includes streambed restoration over the riprap, and temporarily impact 9,340 sf of Waters of the US to construct the new bridge and footing.

If you have any questions regarding the submission, or if you require additional information, please contact me at 978-429-1772 or at Melissia.Lenker@state.ma.us.

Sincerely,

A handwritten signature in blue ink that reads "Melissa Lenker".

Melissa Lenker
Wetlands Permitting Coordinator
MassDOT

cc: Tyler Lewis, MassDEP
Heidi Davis, MADEP
Dave Paulson, MADFW
Hema Bhatt, PM, MassDOT

**BRIDGE REPLACEMENT
BRIDGE NO. Bridge W-05-015 (C89)
ROUTE 32 (PALMER ROAD) OVER WARE RIVER
PRE-CONSTRUCTION NOTIFICATION & WATER QUALITY
CERTIFICATE
WARE, MASSACHUSETTS
MASSDOT PROJECT NO. 605126**

MAY 2022

PREPARED FOR:

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PREPARED BY:



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SECTION 9 – ENVIRONMENTAL PERMITTING PLANS

SECTION 10 – SEDIMENT SIEVE ANALYSIS

SECTION 11 – SPECIFICATIONS

SECTION 1

PUBLIC NOTICE

Public Notice

Massachusetts Department of Environmental Protection
Division of Wetlands and Waterways
1 Winter Street
Boston, MA 02108

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 W-05-015 carrying Route 32 (Palmer Road) over the Ware River in the Town of Ware by the Massachusetts Department of Transportation – Highway Division, 10 Park Plaza, Room 7360, Boston, MA 02116. The project includes bridge replacement and roadway reconstruction with sidewalk replacement and drainage improvements. Additional information may be obtained from the Massachusetts Department of Transportation – Highway Division at the above address, Attention Melissa Lenker or by emailing melissa.lenker@state.ma.us. Written comments should be sent to Heidi Davis, MassDEP Wetlands Program, 1 Winter Street, Boston, MA 02108 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.

SECTION 2

WATER QUALITY CERTIFICATION FORMS

ACOE APPLICATION



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

X288429

Transmittal Number #

BRP WW 07, 08 Dredging

401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
Dredging or Disposal of Dredged Material

A. Applicant Information

1. For which permit category are you applying?

☐ BRP WW 07

☒ BRP WW 08

2. Applicant:

Massachusetts Department of Transportation - Highway Division

Name

10 Park Plaza - Room 7360

Street Address

Boston

City

02116

Zip Code

MA

State

Melissa Lenker

Contact person

978-429-1772, Melissa.Lenker@state.ma.us

Telephone Number (work)

Telephone Number (home)

3. Authorized Agent:

McMahon Associates

Name

350 Myles Standish Boulevard

Street Address

Taunton

City

02780

Zip Code

MA

State

Stephanie MacDonald

Contact person

508-823-2245

Telephone Number (work)

Telephone Number (home)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



B. Project Information

1. Project Location:

Route 32 (Palmer Road)

Street Address

Ware River

Nearest or Adjacent Waterbody

Ware

City

2. Project Name (if any):

Ware - Bridge Replacement, W-05-15 Route 32 (Palmer Rd) Over Ware River



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 07, 08 Dredging

X288429

Transmittal Number #

401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
Dredging or Disposal of Dredged Material

B. Project Information (cont.)

3. 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

Date of Publication

4. Identify the loss, or alteration, in square feet of each type of resource area (see Application instructions for additional information.):

a. Land under water: 5,204 SF (permanent) 9,339 SF (temporary)
square feet

b. Other Resources: _____
square feet

5. Does this project require a license from the Federal Energy Regulatory Commission?

☐ Yes ☒ No If yes, see Application Instructions for additional information needed.

6. Is the project categorically subject to MEPA? If yes, has final action been taken?

☐ Yes ☒ No ☐ Yes ☐ No

If yes, please include copy of MEPA certificate.

7. 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.

C. Description of Proposed Dredging Site

1. a. Describe in general the proposed project or activity, including the purpose and intended use of the project, and the duration of the work within any waterbody:

The project purpose is to replace a structurally deficient bridge and improve safety of a bridge on the National Highway System that is part of an emergency evacuation route; therefore the bridge is considered critical or essential. The existing bridge superstructure and substructure will be replaced. In addition, there will be roadway reconstruction, drainage improvements, replacement of existing sidewalks, guardrail improvements, and intersection improvements at Old Belchertown Road. The vertical alignment of the bridge will be adjusted approximately 8 to 10 inches across the bridge and tie back into the existing grade at the end of the project limits. A crest curve will be constructed across the bridge satisfying all minimum requirements for crest curvature per MassDOT Project Design and Development Guide (PDDG). The estimated duration of work within the River will be 18 months.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 07, 08 Dredging

X288429

Transmittal Number #

401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
Dredging or Disposal of Dredged Material

C. Description of Proposed Dredging Site (cont.)

- | | |
|--|---------------------------------|
| b. Date activity is to commence: | <u>October 2022</u> |
| c. What is the expected frequency of maintenance dredging of this project? | <u>None - one time activity</u> |

2. Attach plan(s) of the proposed project as follows:

- ☒ Include a copy of the appropriate portion from the USGS quadrangle map for this project site. Include the identification number and name of the USGS quad map.

Plan view.

The plan view of the proposed activity should show the following:

- | | |
|---|---|
| <input type="checkbox"/> Existing shorelines. | <input checked="" type="checkbox"/> Ebb and flood in tidal waters and direction of flow in rivers. |
| <input checked="" type="checkbox"/> North arrow. | <input checked="" type="checkbox"/> Graphic and numerical scale. |
| <input type="checkbox"/> Mean high and low water lines if the proposed activity is located in tidal areas. | <input checked="" type="checkbox"/> Ordinary high water line for inland water. |
| <input checked="" type="checkbox"/> Water depths around the project. | <input checked="" type="checkbox"/> Principal dimensions of the structure or work and extent of encroachment beyond the applicable high water line. |
| <input checked="" type="checkbox"/> Seaward distance from an existing permanent fixed structure or object. | <input type="checkbox"/> Harbor lines, if established and known. |
| <input type="checkbox"/> Distance between proposed activity and navigation channel, where applicable. | <input checked="" type="checkbox"/> Location of any vegetated wetlands or wetland resource areas. |
| <input checked="" type="checkbox"/> Location of structures, if any, in navigable waters immediately adjacent to the proposed activity | <input type="checkbox"/> Proximity to any designated Areas of Critical Environmental Concern. |

Elevation and/or Section View.

The elevation and/or section view of the proposed project should show the following:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Same water elevations as the plan view. | <input checked="" type="checkbox"/> Depth at waterward face of proposed work. Show dredging grade. |
| <input checked="" type="checkbox"/> Graph and numerical scale. | <input checked="" type="checkbox"/> Cross-section of excavation including approximate side slopes. |

3. a. What are the length, width, depth and volume of the proposed project?

Length:

Proposed Pier - 81.5', Proposed Riprap - 230',
Removal of Existing Piers - 93'

Width:

Proposed Pier - 16', Proposed Riprap - 10'
Removal of Existing Piers - 4'

Depth:

Proposed Pier - 6', Proposed Riprap - 8.5',
Removal of Existing Piers - 3'

Volume:

Proposed Pier - 290cy, Proposed Riprap - 725
CY, Removal of Existing Piers - 42 cy



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 07, 08 Dredging

X288429

Transmittal Number #

401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
 Dredging or Disposal of Dredged Material

C. Description of Proposed Dredging Site (cont.)

b. Is the proposed project considered:

i. a new project,

☒ Yes ☐ No

ii. maintenance of an existing project?

☐ Yes ☒ No

iii. when was the project last dredged?

N/A

Date

N/A

Permit/License Name and Number

c. Describe in complete detail the physical dredging operation including descriptions of the type of dredge equipment, i.e., hopper dredge, hydraulic dredge, etc., the type of transportation to be used from the dredge site to the disposal site, the method of release of the dredged material into the disposal site, and the name of the contractor if other than the applicant.

The excavation/dredging will remove the two existing piers down to 3' below the riverbed, and to excavate for construction of the proposed center pier pile cap and pier wall, and to excavate for the installation of riprap for scour protection. For all locations, there will be contractor-designed cofferdam sheeting for control of water. It is anticipated that work platforms will be used for work within the River. The material will be disposed of off-site at an upland disposal area in accordance with applicable waste disposal laws. There will be no disposal within Ware River or other wetlands or waterbodies. This project will be bid; therefore, the contractor is to be determined.

d. Describe all measures designed to avoid and minimize adverse impacts of the project on aquatic life and the aquatic ecosystem. Where impacts cannot be avoided or minimized, what mitigation measures are proposed? (See Application Instructions.)

See attached sheet.

4. Historical Parameters:

To the best of your knowledge, does the proposed project are have any past history of:

a. chemical or oil spills of discharge?

☐ Yes

☒ No

b. Upstream or on-site industrial or municipal discharge within 1,000 feet of the proposed project?

☐ Yes

☒ No

c. chronic pollutant loading from port or harbor use and/or other sources of pollutants? (eg. CSO or POTW discharges)

☐ Yes

☒ No



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

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401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
 Dredging or Disposal of Dredged Material

C. Description of Proposed Dredging Site (cont.)

If yes to any questions in Item C-4, provide as much historical information as you have, including dates, amounts, concentrations, etc. of such spills or discharge. Attach additional sheets if necessary.

N/A

D. Description of Material to be Dredged

1. Grain Size Analysis:

See application for sampling and analysis requirements.

Percentage of total by weight passing

87%

No. 4 Sieve

79%

No. 10 Sieve

49%

No. 40 Sieve

29%

No. 60 Sieve

5.1%

No. 200 Sieve

2. Chemical Analysis of Sediment:

See application instructions for sampling and analysis requirements. List constituents in mg/kg (ppm) dry weight unless otherwise indicated.

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required per instructions

TPH (total petroleum hydrocarbons)

N/A - not required per instructions

volatile solids (percent)

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required less than 10% passing 200 sieve & no history of contaminants

N/A - not required per instructions

EPH (extractable petroleum hydrocarbons)

N/A - not required per instructions

water (percent)



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 07, 08 Dredging

X288429

Transmittal Number #

401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
 Dredging or Disposal of Dredged Material

E. Description of the Disposal Site for Dredged Material

1. For ocean disposal sites:

- a. Location of proposed disposal site and its physical boundaries.

Not Applicable

- b. Has the site been designated by the state of E.P.A. as a dredge disposal site?

☐ Yes

☐ No

If no, give a description of the characteristics of the proposed disposal site and an explanation as to why no currently designated site is feasible for this project.

- c. Is the anticipated disposal site located within a designated ocean sanctuary as established by federal law or G.L.c. 132A, sec. 13?

☐ Yes

☐ No

If yes, which sanctuary?

2. For disposal sites or dewatering sites on land (landward of mean high water), see instructions

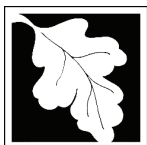
- a. Location of proposed disposal and dewatering sites and physical boundaries.

- b. Indicate drainage characteristics of dewatering and disposal sites from the results of test pits, borings, and percolation tests as applicable.

Material excavated from the river will be stockpiled on site with erosion and sedimentation controls (underlaid and covered), which will then be transported to an offsite location. Material will be disposed of in accordance with MassDEP Interim Policy #COMM-94-007. A sedimentation basin will be required. It is anticipated that the temporary sedimentation basin will be located upland adjacent to river and Palmer Road and/or Old Belchertown Road and will discharge into the Ware River.

- c. How long are the dewatering and disposal sites estimated to be in use from this project? From future projects?

It is estimated that the dewatering sites will be in use for approximately 18 months. After this project is completed, the dewatering sites will be returned to pre-construction conditions to the maximum extent practicable. It is not anticipated that future projects will use the dewatering site. The disposal site will be an offsite location.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 07, 08 Dredging

X288429

Transmittal Number #

401 Water Quality Certification – Projects Proposing More Than 100 Cubic Yards
Dredging or Disposal of Dredged Material

E. Description of the Disposal Site for Dredged Material (cont.)

- d. Include plans for effluent control at the dewatering and disposal sites.
- 3. For proposed dewatering of dredged sediment on a barge, provide plans for adequate containment

F. Certification

Application is hereby made for Water Quality Certification concerning the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

May 26, 2022

Date

Signature of Applicant or Authorized Agent

The application must be signed by the applicant; however, it may be signed by a duly authorized agent (named in Item 2) if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application.



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

X288430

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

Melissa Lenker

Contact Person

Telephone (home)

978-429-1772, Melissa.Lenker@state.ma.us
(work)

3. Authorized Agent

McMahon Associates

Name

350 Myles Standish Boulevard

Address

Taunton

City/Town

MA

State

02780

Zip Code

Stephanie MacDonald

Contact Person

Telephone (home)

508-823-2245
(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

X288430

Transmittal Number #

B. Project Information

1. Project Location:

Route 32 (Palmer Road)

Address

Ware

MA

01082

City/Town

State

Zip Code

Ware River

Nearest or Adjacent Waterbody

2. Project Name (if any):

Ware - Bridge Replacement, W-05-15 Route 32 (Palmer Rd) Over Ware River

3. a. Describe project purpose:

The project purpose is to replace a structurally deficient bridge that is on an emergency evacuation route. The replacement bridge will be constructed to meet current bridge width and load standards.

b. Is the project

☒ water-dependent

☐ non water-dependent

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 project involves replacement of an existing bridge superstructure and substructure, roadway reconstruction, drainage improvements, sidewalk replacement, guardrail improvements and intersection improvements at Old Belchertown Road. Vertical alignment of bridge adjusted 8-10 in.

N/A - Footprint Bridge Exemption

b. Notice of Intent File number (if any):

5. Identify the loss in square feet of each type of resource area (see Application Instructions for additional information.):

a. Bordering vegetated wetland:

square feet

b. Isolated vegetated wetland:

square feet

c. Land under water:

5,204 SF (permanent) 9,340 SF (temporary)
square feet

d. Total cumulative loss of a. + b. + c.:

5,204 SF (permanent) 9,340 SF (temporary)
square feet

e. Salt marsh:

square feet



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

X288430

Transmittal Number #

B. Project information (cont.)

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

Date of Publication

- b. Is this project a subdivision or any part of a subdivision? ☐ Yes ☒ No

- c. Is the project categorically subject to MEPA? ☐ Yes ☒ No

If yes, has final action been taken? ☐ Yes ☐ No

If yes, please include copy of MEPA certificate.

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."

Melissa Lenker

Applicant's Signature

Melissa Lenker

Print name

Stephanie MacDonald

Agent's Signature

Stephanie MacDonald

Print Name

5/23/2022

Date

Print Form

Save As

U.S. Army Corps of Engineers (USACE)
APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
 33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved -
OMB No. 0710-0003
Expires: 02-28-2022

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at . Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website:

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Melissa Middle - Last - Lenker Company - Massachusetts Dept. of Transportation - Hwy Div E-mail Address - Melissa.Lenker@dot.state.ma.us	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Stephanie Middle - Last - MacDonald Company - McMahon Associates, Inc. E-mail Address - smacdonald@mcmahonassociates.com
6. APPLICANT'S ADDRESS: Address- 10 Park Plaza - Room 7360 City - Boston State - MA Zip - 02116 Country -USA	9. AGENT'S ADDRESS: Address- 350 Myles Standish Blvd, Suite 103 City - Taunton State - MA Zip - 02780 Country -USA
7. APPLICANT'S PHONE NOs. w/AREA CODE a. Residence b. Business c. Fax N/A 978-429-1772	10. AGENTS PHONE NOs. w/AREA CODE a. Residence b. Business c. Fax N/A 508-823-2245 508-823-2246

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Stephanie MacDonald to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Melissa Lenker
 SIGNATURE OF APPLICANT

5/26/2022
 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) WARE- Bridge Replacement W-05-015, Route 32 (Palmer Road Over the Ware River)	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Ware River	14. PROJECT STREET ADDRESS (if applicable) Address 388 Palmer Road (Approximate)
15. LOCATION OF PROJECT Latitude: °N 42° 14' 19.8" Longitude: °W 72° 17' 08.9"	City - Ware State- MA Zip- 01082
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Ware Section - Township - Range -	

17. DIRECTIONS TO THE SITE

From I-90 East, take exit 8 to Route 32 (Thorndike Street). Turn left onto Route 32 (Thorndike Street) and stay on Route 32 for 5.6 miles to destination.

18. Nature of Activity (Description of project, include all features)

The applicant proposes a bridge replacement project with associated roadway reconstruction and realignment, drainage improvements, and the replacement of existing sidewalks. The superstructure and substructure of the bridge will be replaced. Pile installation and pier construction will occur within the Ware River. The existing two piers will be removed to three feet below the riverbed and replaced with one pier. The project will widen the bridge, but will not increase the number of travel lanes. The project is considered a footprint bridge project. The alignment of the roadway will be adjusted to satisfy Federal Highway Administration (FHWA) design criteria for the National Highway System (NHS) non-freeway roadways. The roadway profile will be raised to accommodate the design flood elevation of the Ware River. Guardrail will be installed on both sides of the roadway to provide errant vehicle protection. The smaller of two existing water mains will be removed. This material has been prepared in accordance with the Massachusetts General Permit #10. Please see attached project narrative for additional information on the scope of work at this bridge and the summary of impacts to the environmental resource area.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The Route 32 Bridge belongs to the National Highway System (NHS) and is part of an emergency evacuation route, classifying the structure as critical, or essential. The purpose of this project is to replace the structurally deficient bridge. Based on the latest bridge inspection report (2014) the deck is rated 3-Serious; the superstructure is rated 6-Satisfactory and the substructure is rated 6-Satisfactory. The purpose of the work proposed for this project is to improve the overall condition of the bridge for all users. The existing structure was constructed in 1937; the concrete that comprises the bridge abutments and pier walls is not reinforced. The bridge requires replacement to meet current load and capacity standards. Reconstruction would also improve the lifecycle of the structure. Additionally, the associated roadway alignment over the Ware River does not meet current MassDOT standards and the existing guardrail does not meet current crash test standards. Safety concerns have been raised over the sight distance at the Old Belchertown Road intersection as well.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

The project requires excavation of material to remove two existing piers down to 3' below the riverbed, excavate for construction of center pier pile cap and pier wall, replace the abutments, provide scour protection. The excavation/dredging is expected to use excavator/mechanical means located on the existing roadways, proposed access roadways, or work platforms. All excavated material will be disposed of off-site at an upland disposal area in accordance with applicable waste disposal laws. There will be no disposal within the Ware River, or other wetlands or waterbodies.

The project may require fill material to provide adequate scour protection. The material will be trucked to the project site. If needed, the material will be stockpiled at an upland location with appropriate erosion controls.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Proposed Concrete Pier & Rip-rap - 290	Proposed Abutment Scour Rip-rap - 725	Removal of existing concrete piers - 42

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 0.33 (14,543sf [5,204 sf permanent & 9,340 sf temporary])
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

An alternatives analysis was performed and the selected option for complete replacement of the bridge is the option that will improve the condition of the bridge and road for all users and will meet current load standards and federal bridge requirements. The sequence of construction demonstrates that the project will minimize disturbance to the wetlands and the project will not have a significant water quality impact. The project will incorporate erosion and sediment control, and stormwater measures to minimize runoff into the river. In addition, the project will incorporate measures to minimize sedimentation and turbidity during construction of piers, abutments, and dewatering.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See attached list.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
MassDEP	Water Quality Cert	X288430	TBD	Pending	
MassDEP	Dredging	X288429	TBD	Pending	
MassWildlife-NHEM	MESA	TBD	TBD	Pending	

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Melissa Lenker
SIGNATURE OF APPLICANT

5/26/2022
DATE

Stephen Malpena
SIGNATURE OF AGENT

2022-05-23
DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Item 25 Attachment - Abutters				
Owner Name	Parcel ID	Street Address	Mailing Address	
Julian J Knapp Marcella C Knapp	5-0-2	375 Palmer Road		
Ware on Earth Realty	9-0-171	388 Palmer Road		
Walulak Genevieve C Heir	9-0-1	Old Belchertown Road	c/o Walulak John, 59 Main Street #23-2, Dennis, MA 02638	
Ware Town of	9-0-170	Palmer Road	126 Main Street, Ware, MA 01082	

SECTION 3

WATER QUALITY CERTIFICATION &
PCN PROJECT NARRATIVE

Ware Bridge Replacement Project
Route 32 (Palmer Road) Over Ware Bridge
Ware, Massachusetts

Bridge No. W-05-015 (C89)
Water Quality Certification &
PCN Project Narrative

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Ware Bridge Replacement Project
Route 32 (Palmer Road) Over Ware Bridge
Ware, Massachusetts

Bridge No. W-05-015 (C89)
Water Quality Certification &
PCN Project Narrative

1. Introduction

The Massachusetts Department of Transportation Highway Division (MassDOT) with funding assistance from the Federal Highway Administration (FHWA), proposes to replace Bridge W-05-015 (C89) carrying Route 32 (Palmer Road) over the Ware River in Ware, Massachusetts. The bridge has been classified as structurally deficient and has weight restrictions. The purpose of the project is to replace the structurally deficient bridge to meet current bridge standards. Based on the Preliminary Structures report, the deck is in severe condition whereas the other bridge components have minor deficiencies. The replacement of the bridge will require work within the Ware River. As such, the project will require a Section 401 WQC Dredge and Fill Permit, as well as a Preconstruction Notification from the US Army Corps of Engineers. The project is Bridge Exempt under the Massachusetts Transportation Bond Bill as it will be essentially the same alignment and functional equivalent. MassDOT will also file a Project Review Checklist in accordance with the Massachusetts Endangered Species Act (MESA) with NHESP concurrently with the submittal of this Water Quality Certificate application, due to the presence of rare mussels within the river.

The Route 32 (Palmer Road) over Ware River Bridge replacement is being undertaken to eliminate the structural issues and improve safety as it is on the National Highway System and is part of an emergency evacuation route; therefore, the bridge is considered critical or essential. The new bridge will improve safety along the route of travel for both pedestrians and vehicles. It will be the responsibility of the contractor to develop an overall project summary and timing of the bridge construction.

The project involves the replacement of an existing bridge superstructure and substructures. In addition to the bridge replacement, it involves roadway reconstruction and realignment, drainage improvements, replacement of existing sidewalks, guardrail improvements, and intersection improvements at Old Belchertown Road. The replacement bridge vertical alignment will be adjusted approximately 8 to 10 inches across the bridge and tie back into the existing grade at the end of the project limits. There will also be a slight horizontal realignment on the eastern portion of the bridge to accommodate safety and sight distance at Old Belchertown Road. In addition, a crest curve will be constructed across the bridge, satisfying all minimum requirements for crest curvature per MassDOT Project Design and Development Guide (PDDG).

This project narrative summarizes the purpose of the project and further discusses the existing conditions, proposed improvements, potential environmental impacts, mitigation measures, and an alternatives analysis for the Bridge.

Ware Bridge Replacement Project
Route 32 (Palmer Road) Over Ware Bridge
Ware, Massachusetts

Bridge No. W-05-015 (C89)
Water Quality Certification &
PCN Project Narrative

2. Existing Conditions

Water Body

The Ware River originates in the Town of Hubbardston and flows southwesterly from its source. The river crosses northwest under the subject bridge. The Ware River's drainage area at the bridge crossing site is estimated to be 198 square miles and is part of the Chicopee Watershed. The observed water elevation is 376.2' North American Vertical Datum of 1988 (NAVD88) as observed in October 2017. In addition, the bankfull width of the river at the bridge is approximately 117 feet.

The Ware River is federally regulated as "Waters of the United States" and its corresponding segment ID, obtained from MassGIS, is MA36-06. The water body is impaired due to fecal coliform pathogens. Currently, no written Total Maximum Daily Loads (TMDLs) have been recorded by EPA for the water body.

There are two small areas of vegetated wetlands adjacent to the Palmer Road Bridge footings. There is also a small area of freshwater marsh containing herbaceous vegetation in the northwest quadrant and the southwest quadrant. Recreational activities allowed include, but are not limited to, shoreline fishing, walking trails, and biking on allowed trails only. Direct water contact activities, such as swimming, are strictly prohibited by regulations.

Bridge

The bridge, located on Route 32 (Palmer Road), was originally built in 1937 and has not been reconstructed. The local/memorial name of the bridge is Three Mile Bridge. It is 154 feet long and is owned by MassDOT. The bridge has been classified as structurally deficient by FHWA. The asphaltic wearing surface curb to curb width of the bridge is approximately 30'-0" with useable travel ways of 11'-0". The approximate out-to-out width is 40'-0". The 11'-0" travel ways carry one westbound and one eastbound vehicular travel lane. A sidewalk exists along the south side of the bridge. The sidewalk was originally constructed having a raised concrete curb separating the travel way and the raised sidewalk but has since been removed leaving an available sidewalk width of 6'-6". The bridge railing consists of four steel pipe rails with steel posts and safety chain-link panels between the rails. The railing elements do not meet current crash standards and the curbing and sidewalk have horizontal cracking and scattered spalls with and without exposed rebars.

The superstructure is a continuous 3-span continuous steel girder bridge with a reinforced concrete deck. There are stone, slope embankments at both the west and east ends of the bridge under the shorter spans, 1 and 3. The concrete abutments are constructed further away from the

Ware Bridge Replacement Project
Route 32 (Palmer Road) Over Ware Bridge
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river having the footings above the bottom of the river. Span 2 is the center, longer span over river with both piers 1 and 2 in the river having the bottom of the footings under water. The pier footings are supported on timber pile deep foundations. The routine inspection report dated September 9, 2020, indicates scour, settlement, and rip-rap at the piers is rated 7 (Good).

Overhead wires are located on the southern side of the bridge, approximately 9-feet away from the southern face. One utility pole labelled "UPL 129-124" is located at the southwestern side of the bridge and a second labelled "UPL 128" is located on the southeastern side of the bridge. The subsurface utilities consist of one 12-inch water main underneath the sidewalk on the southern side of the bridge and one 6-inch water main carried along the northern side of the bridge. As part of this project the Town of Ware indicated the 6-inch water main can be taken out of commission.

The approach guardrails consist of W-beam rails with steel posts and steel spacers with dents and scrapes. The southwest and northeast approach guardrails have buried ends. The northwest and southwest approach guardrails have terminal ends. The bridge rail has areas of minor surface rust and random anchor bolts that are not fully tightened. Several sections of chain-link panels are damaged along both bridge walls. The outside face of the north concrete rail base has scattered full-height vertical hairline cracks with and without leaching efflorescence.

The bridge has been classified as severely deficient, based on the most recent FHWA National Bridge Inspection Standards (NBIS) inspection report (2020). According to the inspection report the rating is as follows:

- 26 ton for H20 (2 axle)
- 27 ton for Type 3 (3 axle)
- 31 ton for Type 3s2 (5 axle)

According to signs, the bridge is currently posted as follows:

- 20 ton for H20 (2 axle)
- 25 ton for type 3 (3 axle)
- 34 ton for Type 3s2 (5 axle)

Based on the latest bridge inspection report (2020) the deck is rated 3-Serious; the superstructure is rated 6-Satisfactory and substructure is rated 6-Satisfactory. The concrete deck has multiple areas of severe concrete spalling with main reinforcing steel exposed and actively corroding. The substructure including the wingwalls, abutments, and piers are in satisfactory condition with minor deterioration and appear to not be reinforced. The backwalls have some spalls and efflorescence staining with vertical hairline cracks. The wingwalls also have a few

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scattered hairline cracks with leaching efflorescence and some scaled areas. The piers have hairline mapcracking with leaching efflorescence around spalled areas.

The bridge does not meet current Load and Resistance Factor Design (LRFD) Standards while the associated roadway alignment over the Ware River does not meet current MassDOT standards. Additionally, safety concerns have been raised over the sight distance of Old Belchertown Road intersection that is located northeast of the bridge. Due to multiple standards not being met, for both the federal and state, associated with the bridge and roadway it was concluded the bridge and associated roadway are in need of replacement.

Route 32 (Palmer Road) carries two-way vehicular traffic and is classified as an urban principal arterial. The present day average daily traffic (ADT) is approximately 10,300 vehicles per day. The roadway runs east and west crossing over the Ware River which flows south to north. In addition, this route is identified as an emergency evacuation route and is therefore considered critical or essential.

Land Use

Land use in the project area includes forested land directly abutting the Ware River. Residential land uses occur along Route 32 to the east and west of the bridge.

Drainage

The bridge carries scuppers along the southern edge and one on the southwest corner of the bridge. The stormwater from the bridge deck flows into the scuppers and enters the Ware River untreated. The stormwater from the southwest bridge approach is collected by a catch basin on the southside of the roadway approximately 150 feet from the bridge deck. This stormwater enters an existing drainage system that discharges to the Ware River north of the bridge. The northeast approach roadway drainage is collected by a catch basin at the northeast quadrant of Old Belchertown and Route 32 (Palmer Road) and discharges untreated stormwater to the Ware River at a concrete headwall on the bridge slope.

Environmental Constraints

Impaired Waterbody Status

The Ware River is federally regulated as “Waters of the United States” and its corresponding segment ID, obtained from MassGIS, is MA36-06. The water body is impaired due to fecal coliform pathogens. Currently, no written Total Maximum Daily Loads (TMDLs) have been recorded by EPA for the water body.

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Flood Zone Classification

According to the most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) on Community-Panel Number 2501720021B, effective date 8/17/1981, the project area is within the 100-year floodplain, Zone AE. Refer to Section 8 Figure 3 – FEMA Flood Zones.

Area of Critical Environmental Concern (ACEC)

The project area is not located within an Area of Critical Environmental Concern.

Outstanding Resource Water (ORW)

The project area is not located within an Outstanding Resource Water.

Cold Water Fishery

The Ware River is not classified as a Cold Water Fishery.

Rare Species

The project area is located within the Estimated Habitat of Rare Wetlands Wildlife and Priority Habitat (PH 1183/EH885) associated with the Ware River as determined by reference to the most recently available data from the Massachusetts Division of Fisheries and Wildlife (MADFW) – Natural Heritage and Endangered Species Program (NHESP) as provided by MassGIS. The Ware River provides habitat for mussels including the Brook Floater (*Alasmidonta varicosa* – state-listed Endangered), the Creeper (*Strophitus undulata* – state-listed Special Concern), and the Triangle Floater (*Alasmidonta undulata* – no state status). MassDOT Environmental Services is coordinating with the Massachusetts Department of Fish and Wildlife -Natural Heritage and Endangered Species Program (NHESP) regarding MESA compliance for the rare mussels located on site. A survey and relocation plan was undertaken in the fall of 2021. MassDOT will file a Project Review Checklist with NHESP concurrently with the submittal of this Water Quality Certificate application for determination of whether this work is considered a take, and, if necessary, what steps and actions will be required for mitigation or restoration. Proposed mitigation measures include an additional mussel survey and relocation prior to construction, and restoration of the riverbed following construction and installation of scour protection.

MassDOT Environmental submitted the Section 7 consultation for the Northern Long-eared Bat to the US Fish and Wildlife Service (USFWS) on behalf of the Army Corps on April 1, 2021. 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

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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 15 miles southeast of the project site in Sturbridge, MA. Based on this information the proposed project is not located within habitat that would support the NLEB; therefore, it can be assumed that this project will not result in any impacts to the NLEB. See attached iPaC Resources Determination in Section 6 USFW Coordination.

3. Proposed Conditions

The new bridge will consist of a two-span continuous steel girder with conventional cast in place composite concrete slab deck superstructure, with integral abutments and a center wall pier. The proposed bridge will have a 167-foot chord length. Both abutments and pier will be supported on steel H-pile foundation. On the new bridge, the lane, shoulder, and sidewalk widths will be slightly adjusted as required for the NHS roadways which includes a 48'-9" wide structure to accommodate a total roadway width of 34'-0" curb to curb. The S3-TL4 bridge railing will be provided on both sides of the bridge. The two existing piers are to be removed to three feet below the riverbed. The removal and installation of the bridge piers will be completed once the contractor-designed cofferdam sheeting is installed for control of water. The use of a backhoe, dragline or similar equipment is expected to be used. A barge is expected to aid in providing access to the bridge for excavation and mechanical means. The barge will be supported on spuds in the riverbed, as needed, for stabilization.

Two 11'-0" vehicular lanes with 6'-0" shoulders on each side and 6'-0" wide sidewalks on the north and south sides of the bridge are proposed. Roadway surface conditions and drainage and utility lines will also be improved as part of the project. Existing drainage patterns will remain. Drainage structures and associated piping will be added to the two existing drainage systems within the project area. Stormwater within the systems will discharge to a deep sump catch basin prior to discharging into the Ware River. The proposed drainage systems will contain deep sump catch basins to provide stormwater treatment to help minimize the amount of untreated stormwater entering the Ware River. The new bridge will not have scuppers but stormwater will be collected in catch basins located to the east of the bridge. The new bridge will have new clearances over the Ware River due to the roadway superelevation transition at the northeast; the exterior girder will be the controlling location for the vertical clearance change.

4. Anticipated Construction Sequence

Maintenance of Traffic

The schedule is phased, and construction is based on seasonal constraints of winter shutdown period restrictions for certain activities. This project will consist of 2 stage construction. The first stage will consist of demolition of 16'-6" of the southern section of the bridge and construction of 20'-4½" of new southern section of the proposed bridge. During this stage the northern side of the bridge will consist of an 11'-0" lane for alternating or one-way traffic and a 5'-0" wide pedestrian walkway separated from the roadway by anchored barriers. Stage 2 construction will consist of the construction of the remaining 25'-4 5/8" of bridge deck. During stage 2, the southern side of the bridge will carry a 10'-0" lane with alternating or one-way traffic and a 6'-0" sidewalk. Traffic management plans will include work zone setups, and detour routes. The majority of the construction activities are expected to be completed with the one lane alternating traffic scenario described above, there may be instances when a full bridge closure is required. When the full bridge closure is in place, vehicles will need to be detoured to area roadways in order to access Route 32 (Palmer Road) to the north and south of the bridge. Two separate detour routes were developed: one for passenger vehicles and one for heavy vehicles. Passenger vehicles will be expected to access approximately 5.3-mile detour route from Route 32 via Old Belchertown Road to the north and River Street in Palmer to the south. Heavy vehicles will be expected to utilize a 11-mile detour route, which would start/end at the intersections of Main Street at Vernon Street and Route 32 (Ware Street) at River Street in Palmer.

Anticipated Construction Sequence

See plans entitled Staged Construction for detailed anticipated general construction sequence for Route 32 (Palmer Road).

The summary of the anticipated construction sequence for water control and channel work construction stages is as follows:

Stage 1A:

- A. Install traffic management signage.
- B. Install soil erosion and sedimentation control.
- C. Clear vegetation and remove trees as required.
- D. Grade for construction and installation of access ramps to the river and install sedimentation basins.
- E. Relocate overhead utilities and install proposed north utility poles and remove existing south utility poles.

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- F. Connect existing 6" temporary water line crossing the north side of the existing bridge to the existing 12" water main on the south side of the bridge.
- G. Install Phase 1A traffic control and divert all traffic to a single 11' one way altering lane on the north side of the bridge while maintaining a 5' pedestrian walkway.
- H. Position Phase 1A related work platforms in the river below the bridge and install temporary protective shielding.
- I. Demolish Phase 1A south portion of the existing bridge deck and superstructure.
- J. Install cofferdams to allow for pier removal in the dry.
- K. Install turbidity barriers and install support of excavation.
- L. Demolish the southern portion of the existing pier stems to a depth of 3' below the riverbed.
- M. Brace the northern sections of the abutments to remain. Excavate behind the existing abutments and demolish the southern sections of the abutments and fill voids in accordance with the specification.

Stage 1B:

- A. Drive piles for abutments, excavate trenches at the top of the piles and fill with crushed stone. Construct abutment pile caps.
- B. Excavate slopes in front of southern portions of the abutments and install geotextile fabric, crushed stone and riprap. Backfill the abutments.
- C. Restore riverbed and slope along the riverbanks on top of the riprap
- D. Remove the cofferdams and repair the riverbed material. Remove turbidity barriers.
- E. Install turbidity barrier around proposed pier cofferdam. Install cofferdam and drive piles.
- F. Construct the concrete pier pile cap and stem wall
- G. Install pier riprap between the pile cap and cofferdam and restore the riverbed. Remove cofferdam and repair riverbed before removing turbidity barrier.
- H. Install erection pads on the girder pedestals and erect steel girders G1 through G4. Connect all end and interior diaphragms and utility supports.
- I. Construct the remaining sections of the concrete integral abutments and approach slab shelves.
- J. Install 12" water line in the utility bay.
- K. Attach shear studs to the tops of the girders.
- L. Construct the cast-in-place composite deck slab.
- M. Backfill behind integral abutments and construct the southern portion of the approach slabs.
- N. Construct the south sidewalk and install the S3-TL4 Bridge railing after the sidewalk has cured.
- O. Install the membrane waterproofing and bridge superpave protective course.

Stage 2A:

- A. Complete the southern portion of the realigned roadway construction of State Route 32 (Palmer Road) and the realignment of the Old Belchertown Road Intersection
- B. Grade and install Access ramps to the river on the north side of State Route 32 (Palmer Road) and install the sedimentation basin.
- C. Connect, disinfect, test and activate the 12" water line on the southern portion of the bridge.
- D. Reset traffic control barriers to move one way traffic across the bridge to the completed southern portion.
- E. Reposition the work platforms to the norther portion of the existing bridge.
- F. Demolish the phase 2A north portion of the existing bridge deck and superstructure.
- G. Install turbidity barriers around the limits of the proposed riprap cofferdams and support of excavation along newly constructed portions of southern abutments.
- H. Demolish remaining portions of the existing pier stems inside the cofferdams to 3' below the riverbed.
- I. Brace the newly constructed southern sections of the abutments. Demolish remaining sections of the existing abutments and fill voids.

Stage 2B:

- A. Install turbidity barriers around limits of proposed riprap cofferdams.
- B. Drive the remaining abutment piles and trenches at the top of the piles. Construct the remaining north portion of the abutment pile caps and the girder pedestals with embedded anchors. The closure pour for the abutments shall be completed after the abutments have fully cured and prior to the placement of the riprap and backfill.
- C. Excavate the slopes in front of the northern portions of the abutments and install geotextile fabric, crushed stone, and riprap. Backfill the abutments.
- D. Restore the riverbed and slope along the riverbank on top of the riprap.
- E. Remove the abutment riprap cofferdams and repair the riverbed material before removing the turbidity barriers.
- F. Install turbidity barrier around the limits of the proposed pier cofferdam and install the cofferdam
- G. Construct the remaining concrete pier pile cap and stem wall.
- H. Install the pier riprap between the pile cap and cofferdam and restore the riverbed on top of the riprap and the pile cap.
- I. Install the erection pads on the girder pedestals and erect steel girders G5 through G9. Connect all end and interior diaphragms.
- J. Construct the remaining sections of the concrete integral abutments and approach slab shelves.
- K. Attach the shear studs to the tops of the girders.
- L. Construct the cast-in-place composite deck slab. The deck closure pour shall be poured after the deck concrete has fully cured.

- M. Backfill behind the integral abutments and construct the northern portions of the approach slabs
- N. Construct the north sidewalk and install the S3-TL4 bridge railing after the sidewalk has cured.
- O. Install the membrane waterproofing and bridge superpave protective course.
- P. Remove all work platforms from the river and restore the riverbed material as required.
- Q. Demolish and regrade the sediment basin(s).
- R. Complete all approach roadway construction.
- S. Complete final pavement of all bridge and roadway surfaces. Add traffic markings.
- T. Remove the river access ramps.
- U. Loam and seed.
- V. Remove soil erosion and sedimentation controls.

5. Wetland Resources and Impacts

Wetland Resources

A field inspection was conducted on September 21, 2017, by Rimmer Environmental Consulting to determine the location and extent of wetland resources within the project area. (See Section 7 Wetlands Report) Wetland resources within the project area consist of, vegetated wetland, Land Under Water bodies (the areas below Ordinary High Water), and the site is located within the Priority Habitat and Estimated Habitat of Rare Wildlife. The boundary of OHW was determined based upon water marks on the bridge abutments, evidence of scouring and undercut banks, point bars and changes in vegetation from primarily aquatic to primarily terrestrial. The banks are steep and rocky and contain small trees and brush above the active bank. Wetland flags for the OHW on the northside and southside of the bridge were also located.

There are two very small areas of wetland vegetation adjacent to the existing west pier. In the northwest quadrant is a triangle shaped area below the OHW containing herbaceous vegetation, including reed canary grass (*Phalaris arundinacea*), pink smartweed (*Polygonum pensylvanicum*), purple loosestrife (*Lythrum salicaria*), wild mint (*Mentha sp.*) and manna grass (*Glyceria canadensis*). On the south quadrant below the OHW is a small area also of freshwater marsh including some aquatic vegetation, including water plantain (*Alisma triviale*). The adjacent upland area includes honeysuckle (*Lonicera tatarica*) and some thinly vegetated portions of rock rip-rap adjacent to the bridge abutment.

Wetland scientists from Epsilon Associates reestablished OHW and vegetated wetland flags within the project area on October 11, 2021. Epsilon confirmed that the wetland delineation was

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accurate and had not changed since the previous delineation completed in 2017. (See photo in Section 4)

This resource includes the lateral extent of flooding which occurs from overtopping of streams during storm events up to and including the 100-year storm, or storm of record. The flood plain elevation currently is 386' National Geodetic Vertical Datum of 1929 (NGVD29) approximately 160' north of Palmer Road and 387' NGVD29 approximately 100' south of Palmer Road. The design flood elevation for the two-span continuous steel girder with conventional cast in place is approximately 384.4' NAVD88.

Sediment Analysis

Soil borings were collected from around and below the bridge using the following drilling equipment, GT8 Geotech Drill with 3" and 4.25" O.D., Mobile B-57 with 5" O.D., and ATV with 4" O.D. Results from the borings collected showed the sediments are suitable for disposal at an in-state lined landfill. Sediment disposal shall be managed in accordance with Massachusetts Department of Environmental Protection (MassDEP) Interim Policy # COMM-94-007 Sampling, Analysis, Handling and Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills. Since the representative samples collected contain less than 10% passing the No. 200 sieve and there is no history of contaminants a sediment analysis for chemical constituents is not required. The sediment analysis can be found in Section 10.

Wetland Impacts

Temporary impacts to Land Under Water (the area below OHW) are from the proposed use of cofferdams and footings for work platforms. Cofferdams will be used to help control water for pier removal, scour protection and new pier installation. Work platforms will be used for access to the bridge during demolition and construction, as needed. The temporary area of disturbances to Land Under Water as depicted on the plans provides the maximum extent anticipated. The temporary Land Under Water impact area, controlled by the potential work platform surface area, is anticipated to be a maximum of 9,340 square feet (sf) of temporary impacts. Permanent impacts to Land Under Water (the area below OHW) from the new concrete pier, fill around existing piers, scour protection, and restoration of the existing riverbed are approximately 5,204 sf of permanent impacts. Restoration of the streambed will be implemented in accordance with Streambed Restoration, Specification Item 755.99 (See Attachment 6).

Dredging within the Ware River will occur for installation of new pier, during the removal of existing piers to three feet below riverbed and for installation of rip-rap. The dredging impact to the riverbed is approximately 1,015 cubic yards (cy) and excavation of concrete is approximately 42 cubic yards. Filling within the Ware River will consist of concrete pier

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installation with adjacent rip-rap for scour protection, rip-rap scour protection for the abutments, and restoration of the riverbed on top of riprap areas. The rip-rap scour protection for the abutments is within the area of the existing piers to be removed. The impacts from the proposed pier installation including the rip-rap scour around the pier are approximately 290 cy. The impacts from the rip-rap scour protection for the abutments are approximately 725 cy. The intent is to reuse existing materials for the restoration of the existing riverbed and slope on top of riprap and pile cap for the new pier.

Permanent impacts to bank include approximately 260 linear feet of riprap apron (approximately 125 linear feet on west abutment and 130 on east abutment) and approximately 30 linear feet of temporary impacts due to potential platform location and river access ramps (approximately 10 lf on west abutment and 20 lf on east abutment).

Roadway work includes areas of full depth construction, areas of micromilling and overlay, installation of concrete sidewalks, areas of hot mix asphalt driveway reconstruction, areas of clearing and grubbing, and areas of regrading to match existing grades.

Resource Area Impacts				
Environmental Impact	West Abutment	East Abutment	Pier	Total
Temporary Land Under Water / below Ordinary High Water (OHW) due to Work Platform Supports (SF)	-	-	-	9,339
Permanent Land Under Water / below OHW due to Riprap (SF)	498	318	1,304	2,120
Permanent Land Under Water / below OHW due to Excavation/Dredging (SF)	1,561	1,459	64	3,084
Total Permanent Land Under Water/below OHW Impacts	2,059	1,777	1,368	5,204
Temporary Bank Impact (LF)	8.6	21.3	-	29.9
Permanent Bank Impact (LF)	125.2	131.4	-	256.6

The riverbed will be restored, and disturbed areas of bank and adjacent riparian upland will be vegetated. See specifications included in Section 11 for the two items, Streambed Restoration and Wetland Riparian Seeding. Upland areas adjacent to the river that are disturbed during construction will be seeded with the wetland riparian seeding mix.

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Riprap Scour Protection Impacts

The project design strived to minimize the temporary and permanent impacts to the river caused by the riprap scour protection needed for the bridge replacement.

MassDOT wanted to implement draft updates to the MassDOT LRFD Bridge Manual, based on FHWA guidelines, for the design of the riprap. However, using the draft design guidelines would have resulted in riprap covering almost half the width of the river in front of each abutment, which was deemed excessive and unfeasible to construct on such a large river with a fragile ecosystem that supports endangered species of river mussels. Therefore, the existing MassDOT LRFD Bridge Manual details were used for the riprap aprons at the abutments, with the dimensions provided in MassDOT's Hydraulic Study Report. While still considerable, with the 5-foot-thick riprap apron extending 22-feet from the abutment faces downslope into the river and 25-feet upstream and downstream from the sides of the abutments, the riprap apron could not be reduced any further. Please note, ST 32 (Palmer Road) is classified as Rural Minor Arterial Road and from LRFD Bridge Manual Table 1.3.4-1, the Countermeasure flood frequency is 0.5% (200-year flood event) with peak flow of 15,705 cubic feet per second and velocity of 9.65 ft/second. Also, the design steepened the slope of riprap in front of the abutments from what is specified in the MassDOT LRFD Bridge Manual to allow for burying the riprap under water with room to cover it with restored riverbed material. The project design also modified the pier pile cap design to allow for minimal riprap, which reduced the riprap at the pier by almost half in width and more than half in thickness. It should be noted that impacts at the proposed pier are unavoidable because of the required construction of the pile cap and pier stem, and that the impacts have been reduced as much as possible.

The proposed riprap cannot be reduced any further while adhering to the MassDOT design requirements and standards.

6. Sedimentation Control

This project will incorporate sedimentation controls and stormwater measures to minimize runoff into the river. Temporary cofferdam sheeting is proposed to minimize siltation and turbidity when the existing pier sections are being removed and the new pier and rip-rap are being installed along with dewatering. The project will require scour protection/ fill material in the Ware River or associated wetland areas to aid in preventing future erosion. The contractor will design temporary river access ramps for use during construction. Sedimentation controls will border the ramps and the areas will be restored to their pre-existing conditions once construction has been completed.

Sedimentation controls will consist of compost filter tubes or equivalent for earth slope areas and silt sack or similar catch basin inlet filter bags. Controls will be removed following the

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completion of work. The Contractor will be required to inspect the river bottom and remove any demolition debris or other construction related materials.

7. Stream Crossing Standards

The following are the eight Stream Crossing Standards this project is to adhere to per the USACE.

- i. Design and construct the crossing in accordance with the United States Forest Service (USFS) stream simulation manual.
(Meets)

The bridge replacement project is anticipated to comply with the conditions of USFS stream simulation manual. Based on the manual, the goal of stream simulation is to construct a road crossing with a structure that is comparable to the natural channel so aquatic animals will not be impeded by the road crossing. The bridge replacement project will add a layer of riprap protection to the banks and will also add a new center pier. The project will restore the existing riverbed on top of the riprap and pile caps. The project will allow full aquatic organism passage by maintaining unrestricted movement within the Ware River. The addition of a new center pier and riprap within LUW around the abutments and center pier is anticipated to minimally affect the movement for fish and other aquatic organisms and may support movement corridors for some of the species. The continuity of the river, including river water depths, turbulence, velocities, and flow patterns will remain unchanged. The natural stream channel will be preserved with minimal disruption to the streambed.

- ii. Span streams or size culverts or pipe arches such that they are at least 1.2 times bankfull width of the reference reach. Spans are strongly preferred as they avoid or minimize disruption to the streambed and avoid entire streambed reconstruction and maintenance inside culverts or pipe arches (see v, vi & viii below), which may be difficult in smaller structures. In many cases bankfull width is not necessarily interchangeable with the elevation of OHW.
(Does Not Meet)

A span is proposed for the Ware River. The existing bankfull width is 117' and the proposed bankfull width is 120'. Total bridge span is 167 feet, greater than the 1.2 times bankfull width. However, a center pier is proposed providing approximately 83 feet of clear span on each side. The center pier option was agreed upon as the preferred

alternative as the new pier would be constructed without interference from the existing piers resulting in being more cost effective and less coordination time for construction.

- iii. Embed culverts or pipe arches below the grade of the streambed. This is not required when ledge/bedrock prevents embedment, in which case spans are required. The following depths are required to prevent streambed washout, and ensure compliance and long-term success:

- a. ≥ 2 feet for box culverts and pipe arches, or
- b. ≥ 2 feet and at least 25% for round pipe culverts

(Not Applicable)

Since the stream is being spanned, this condition is not applicable.

- iv. Match the culvert gradient (slope) with the anticipated stream channel profile that will form after the channel readjusts to post-crossing-replacement conditions.

(Not Applicable)

Since the stream is being spanned, this condition is not applicable.

- v. Construct crossings with a natural bottom substrate within the structure matching the characteristics of the substrate in the natural stream channel and the banks (mobility, slope, stability, confinement, grain and rock size) at the time of construction and over time as the structure has had the opportunity to pass substantial high flow events.

(Meets)

Since the stream is being spanned, the natural bottom will match existing natural channel condition. In locations with rip rap scour protection, streambed restoration is proposed.

- vi. Construct crossings with appropriate 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 at the time of construction and over time. In order to provide appropriate water depths and velocities at a variety of flows and especially low flows, it is usually necessary to reconstruct the streambed (sometimes including a low flow channel), or replicate or preserve the natural channel within the structure. Otherwise, the width of the structure needed to accommodate higher flows will create conditions that are too shallow at low flows. The grain and rock size, and arrangement of streambed materials within the structure should be in accordance with (v) above. Flows could go subsurface within the structure if only large material is used without smaller material filling the voids.

(Meets)

Since the stream is being spanned, the streambed characteristics including water depths and velocities will match existing conditions.

- vii. Openness >0.82 feet (0.25 meters). Openness is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units (e.g. feet). For a box culvert, openness = (height x width)/length. For crossing structures with multiple cells or barrels, openness is calculated separately for each cell or barrel. At least one cell or barrel must meet the appropriate openness standard. The embedded portion of a culvert is not included in the calculation of cross-sectional area for determining openness. Openness >0.82 feet is recommended to make the structure more likely to pass small, riverine wildlife such as turtles, mink, muskrat and otter that may tend to avoid structures that appear too constricted. This openness standard is too small to accommodate large wildlife such as deer, bear, and moose. Structures that meet this openness standard are much more likely than traditional culverts to pass flood flows and woody debris that would otherwise obstruct water passage. It is likely that most structures that meet all the other general standards will also meet this openness standard. However, for some very long structures it may be impractical or impossible to meet this standard.

(Meets)

Openness ratio of bridge is 11.77; meeting the openness requirement, as 11.77 feet >0.82 feet. Openness = (height x width)/length. Height (from OHW to bottom of bridge girder) is 11.25 feet. Width (east side of west abutment to west side of center pier) is 51.00 feet. Length of the bridge (north to south) is 48.75 feet.

- viii. Construct banks on each side of the stream inside the crossing that match the horizontal profile of the existing stream and banks outside the crossing. To prevent failure, all constructed banks should have a height to width ratio of no greater than 1:1.5 (vertical:horizontal) unless the stream is naturally incised. Tie the banks into the up and downstream banks and configure them to be stable during expected high flows. Use materials that match the up and downstream banks (avoid the use of angular riprap and armored slopes).

(Meets)

Banks will be reconstructed on each side of the Ware River upon completion of construction. The existing riverbed and slopes will be restored with loam and seed on top of the riprapped slope above the OHW.

8. Dewatering

Dewatering is anticipated during the pier and abutment installation and during the removal of existing piers to three feet below riverbed. Dewatering will be required for the rip-rap installation. It is anticipated that multiple sedimentation basins will be required. It is anticipated that the temporary sedimentation basins will be located upland adjacent to the river and Palmer Road and/or Old Belchertown Road and will discharge into the Ware River. Ultimately, the means, methods, and locations of dewatering will be up to the contractor.

9. Stormwater Management

Stormwater flows will generally match existing drainage patterns. However, the existing bridge contains scuppers and the new bridge will not, therefore the untreated stormwater discharging directly to the Ware River will now be conveyed to deep sump catch basin prior to discharging into the Ware River. The additional impervious area associated with the widening of the vehicular bridge will be captured by a proposed catch basin.

During construction, the existing catch basins and bridge scuppers will be protected from silt and debris through the use of a silt sack or similar catch basin inlet filter bag.

Due to site constraints, there is no available space to install a best management practice for treatment of fecal coliform. The project will replace existing catch basins with deep sump catch basins and add additional deep sump catch basins throughout the project. A total of seven deep sump catch basins will be installed. The right of way is limited within the project area with steep slopes outside the roadway or abutting land uses (residential) which limits the feasibility of using the area adjacent to the roadway as an infiltration swale. The project does not contain MassDOT or municipally owned parking lots, rest areas, or other similar areas. There is a small area available where Old Belchertown Road will be realigned. However, the proximity to a private property along Ware River limits the use of this area.

Stormwater Management Standards

The proposed redevelopment project has been designed to comply with the MassDEP Stormwater Management Standards (the Standards), outlined in 310 CMR 10.05(6)(k), to the maximum extent practicable. The purpose of re-alignment of the Old Belchertown Road intersection is to correct a substandard intersection and is therefore considered maintenance and improvement of existing roadways, which requires meeting the stormwater standards to the maximum extent practicable, as well as improving existing conditions. The project's conformance with these standards is described below.

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Standard 1: No New Untreated Discharges

No new stormwater conveyances 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. No new stormwater outfalls are proposed for the Project. Existing headwall outfalls have remained untouched, one of which will be abandoned in place. Existing bridge scupper outfalls have been eliminated and stormwater from the bridge will flow to the east or west based on grading of the bridge and roadway to a closed drainage system with deep sump catch basins that will provide stormwater quality treatment where none currently exist. The treatment provided by the deep sump catch basins is an improvement to the existing water quality runoff from the Project Area. In addition, existing outfalls will be retrofitted with improved scour protection through the use of rip-rap at the outfalls.

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. This project is a bridge replacement project and an intersection safety improvement project.

The project increases post-development peak runoff rates for the 2-year, 10-year, and 100-year 24-hour design storm events based on NOAA Atlas 14 precipitation data for Ware, Massachusetts as shown in Table 1.

Table 1 Rainfall Depths (in) & Rainfall Intensities (in/hr)

Design Storm Event	Rainfall Depth (in)	Rainfall Intensity (in/hr)
2-year	3.04	3.38
10-year	4.83	4.83
100-year	7.70	7.15

Three existing headwalls all outlet to the Ware River within 100' of each other. Since the receiving waterbody is the Ware River, it has been selected as the design point for the Project. Table 2 provides a summary of peak rates for the design point under existing and proposed conditions. The project will increase impervious cover by 0.31 acre from 1.4 acres to 1.71 acres. Using the rational method with a C value of 0.90 for impervious area, the peak discharge rates are as follows:

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Table 2 Peak Discharge Rates (cfs)

Design Point	Existing			Proposed		
	2-year	10-year	100-year	2-year	10-year	100-year
DP-EX-Ware River	4.25	6.07	8.99	5.21	7.45	11.02

The project proposes roadway widening of approximately 5 feet for less than half mile. Due to space constraints within the limited Right of Way, the proximity to the Ware River, and the topography within the project area, the stormwater management design does not include a stormwater control measure to reduce peak runoff rates. Based on the Flood Insurance Study for Town of Ware, Massachusetts, the peak discharges for the Ware River at the Gibbs Crossing gaging station is 4,310 cubic feet per second (cfs) for the 10-year storm and 12,720 cfs for the 100-year storm. The project increases the peak flow in the Ware River by 0.032% in the 10-year storm and 0.016% in the 100-year storm. This minor increase in peak flow to the Ware River is likely to not cause downstream flooding.

Standard 3: Recharge

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures, including environmentally sensitive site design, low impact development techniques, stormwater best 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 type. 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. This project is a bridge replacement project and intersection redevelopment project proposed to improve safety at the intersection of Palmer Road (Route 32) at Old Belchertown Road. The roadway project area provides very limited space for stormwater recharge measures for the increase of 0.31 acres of impervious area. Leaching catch basins were not a viable option because introducing water underneath the roadway has the potential to compromise its structural integrity. Table 3 provides the required recharge volume for the Project.

Table 3 Required Recharge Volume for Project

	HSG A	HSG B	HSG C	HSG D	Total
Existing Impervious (sq. ft.)		61,000			
Proposed Impervious (sq. ft.)		74,500			
Net Impervious Area (sq. ft.)		13,500			

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	HSG A	HSG B	HSG C	HSG D	Total
Target depth, F (in)	0.60	0.35	0.25	0.10	-
Required Recharge Volume, ReV (cf)		394			394

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:

Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained.

Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook.

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 project is required to provide 80% TSS removal and the water quality volume is calculated using the one half-inch rule. The Project discharges to the Ware River, which is a Category 5 impaired waterbody without a TMDL. MassDOT focuses on implementing mitigation measures for discharges within a Category 5 watershed.

However, because of the lack of space and the urbanized character within the project limit, further treatment for water quality cannot be achieved. The project proposes replacing existing catch basins with new catch basins with deep sumps and hoods. The project proposes to remove the existing bridge scuppers that discharged untreated stormwater directly into the Ware River. The proposed design directs the stormwater from the bridge to the catch basins with deep sumps and hoods providing water quality where none exist. The catch basins with deep sumps and hoods provide 25% TSS removal. Table 4 shows the treatment potential for the Design Point as part of the bridge replacement.

Table 4 Required Water Quality Volume (WQV) at Design Point for Standard 4

Design Point	WQV for New IA (cf)	WQV for Existing IA (cf)	Total WQV (cf)
DP- EX-Ware River	3,104	2,541	
Total	3,104	2,541	563

For MassDOT facilities, Long-Term Pollution Prevention Plans (LTPPPs) are implemented at a programmatic level through MassDOT's highway operation and maintenance program by district.

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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 LHPPLs 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: Redevelopment Projects

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 is the redevelopment of an existing bridge and roadways/intersection. The Project meets Standard 1 (for existing discharges, no new discharges proposed), and Standards 2, 3, 4, 5, and 6 to the maximum extent practicable. The project improves existing conditions by providing water quality treatment with the use of deep sump catch basins within the site

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constrained roadway where none currently exists. Additionally, bridge scuppers have been removed from the bridge design preventing untreated stormwater discharge from entering the Ware River directly. Stormwater, instead, will be directed via sheet flow to the east and west sides of the bridge where it will enter deep sump catch basins prior to discharging to the Ware River.

Standard 8: Erosion and Sediment Control

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 sediment barrier consisting of silt fence and compost filter tubes and stormwater inlet protection consisting of silt sacks. Within the river, cofferdams are proposed to control water for installation of riprap and new pier and demolition of existing pier stem. The chosen contractor will be responsible for Stormwater Pollution Prevention Plan. An Erosion and Sediment Control Plan is included within the Project Plans found in Section 9.

Standard 9: Operation and Maintenance Plan

A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

MassDOT O&M plans are implemented on a programmatic level by each MassDOT district. Each MassDOT district office is responsible for providing operation and maintenance for the MassDOT stormwater management systems within their respective jurisdictions.

The O&M Plan for the Project is as follows:

All new and existing components of the drainage system within the project area are the responsibility of MassDOT. MassDOT shall track inspections and corresponding maintenance needs and activities through its asset management system. For the most up-to-date inspection and maintenance procedures refer to MassDOT's O&M Programmatic Plan. The following summarizes the actions that shall be taken:

1. Catch basins shall be inspected at an interval that maintains the functionality of the catch basin (sumps shall always be less than 50% full). Catch basin inspections and catch basin cleanings will generally occur simultaneously. MassDOT shall record sediment depth

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and status of condition for catch basins. Inspections shall include observations of erosion, settling, root intrusion, depth of sediment/debris, sources of excess sediment and trash, causes of unwanted flow patterns and corrective measures to prevent further issues. Maintenance shall include removal and proper disposal of trash, sediment, debris, and root intrusions.

2. Street sweeping shall be performed as part of the regular maintenance schedule for MassDOT. Accumulated materials (e.g. sediment, trash, leaf litter, debris) shall be removed and properly disposed of. At a minimum, street sweeping shall occur annually.

Standard 10: 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.

10. Presence or Absence of Other Environmental Constraints

Section 106 Review – Massachusetts Historical

According to MACRIS data, the bridge is not on the National Register of Historic Place and there are no historic resources within the proximity of the bridge. Section 106 SHPO/THPO coordination documents are included as an attachment to this application in Section 5.

11. Alternatives Analysis

An alternatives analysis for Route 32 (Palmer Road) over Ware River Bridge was performed to prove that no other location, replacement technique, or design is suitable for the project at a similar cost. The project purpose is to replace the bridge on Route 32 (Palmer Road) that crosses over the Ware River. There are no other locations which would meet this project purpose.

Alternative 1

Alternative 1 includes the installation of a two-span continuous steel girder with conventional cast in place composite concrete slab deck superstructure with integral abutments and a center wall pier. The two-span structure costs less than the three-span structures due to lower

substructure cost. The steel girders can be designed for material efficiency as spacing and weight are less limited therefore reducing cost. The new pier would be constructed without interference from the existing piers. This option also allows the use of integral abutment options and “floating bridge” concept. Some disadvantages of this alternative include the pier location at the middle of the river has the lowest ground elevation, and potentially increased life cycle cost involved with girder metalizing system.

Alternative 2

Alternative 2 includes the installation of a two-span simply supported non-continuous precast concrete beams with a composite deck. This two-span structure has a low life cycle cost and would be less likely to deteriorate compared to the steel alternates. No girder installation will be needed which will reduce the time of the installation. Some disadvantages of this two-span structure is that the weight of the concrete girders is much greater than steel girders, does not satisfy the 2-foot freeboard requirement, and does not allow the use of integral abutment substructure due to discontinuous simple spans.

Alternative 3

Alternative 3 includes the installation of a three-span continuous steel girder with composite concrete deck. The lower weight of the superstructure allows for economical design of the substructure. The steel girder can be designed for material efficiency as the space and weight will be less limited therefore reducing the cost. The 2-foot freeboard requirement is satisfied, and it allows for the integral abutment options and “floating bridge” concept. Unlike alternative 1 this alternative will have one more pier which will ultimately increase the overall cost, as well as impacts to the river. The new piers will be constructed close to the existing piers which may cause the new piles to conflict with the existing piles. If removing of the existing piles needs to be completed that will cause additional coordination in stage construction and more time would need to be used.

Alternative 4

Alternative 4 is the no build option in which no improvements are made to the existing project area. Due to the existing bridge being part of an emergency evacuation route, is classified as structurally deficient, has weight restrictions and has deck that is severe condition, the bridge will need to be replaced. The no build alternative has been dismissed.

Preferred Alternative

Alternative 1 was selected as the Preferred Alternative as it best met the engineering requirements for the bridge replacement and resulting in the least impacts to Land Under Water. While Alternative 2 had similar impacts to Land Under Water from the proposed pier placement, it was not the preferred engineering solution. Alternative 3 would have resulted in more impact to Land Under Water due to the need for an additional pier. Alternative 4 did not satisfy the need to replace the existing bridge.

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12.Specifications to be Included in Contract

The contract will include provisions for staged construction and demolition of the bridge, a sedimentation basin/control for the dewatering system, erosion and sedimentation control, turbidity control, and asbestos removal, planting seed mix, mussel survey/transplant protocol, vegetation survey/transplant protocol, streambed/bank restoration, rip-rap apron/slope treatments, and geotextile fabrics. Specifications to be included in the Contract, see Section 11.

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ATTACHMENTS FOR PERMIT APPLICATIONS

- | | |
|---|------------------------|
| 1. Photos | provided in Section 4 |
| 2. Figures | provided in Section 8 |
| 3. Environmental Permitting Plans | provided in Section 9 |
| 4. USFWS Coordination/Section 7 Review Consultation | provided in Section 6 |
| 5. SHPO/THPO/Section 106 Review Documents | provided in Section 5 |
| 6. Specifications | provided in Section 11 |

SECTION 4

PHOTOS



Aerial image of the project intersection.



This is the general context of Route 32 (Palmer Road) over Ware River. This picture illustrates the Northbound approach of Palmer Road over Ware River.



This is the general context of intersection of Route 32 (Palmer Road) and Old Belchertown Road. This picture illustrates the Southbound approach of Palmer Road over Ware River.



This is the general context of the Ware River upstream from the Palmer Road Bridge.



This is the general context of the Ware River downstream from the Palmer Road Bridge.



This is the general context of the northwest quadrant (far bank) and the southwest quadrant (close bank) of the Palmer Road Bridge over the Ware River.



This is the general context of the northwest quadrant of the Palmer Road Bridge over the Ware River. In addition, there is stream gauge for USGS 01173500 Ware River at Gibbs Crossing, MA and the location can also be found at <https://waterdata.usgs.gov/usa/nwis/uv?01173500> .



This is the general context of the southwest quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the southwest quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the northeast quadrant (near bank) and the southeast context (far bank) of the Palmer Road Bridge over the Ware River.



This is the general context of the northeast quadrant of the Palmer Road Bridge over the Ware River.



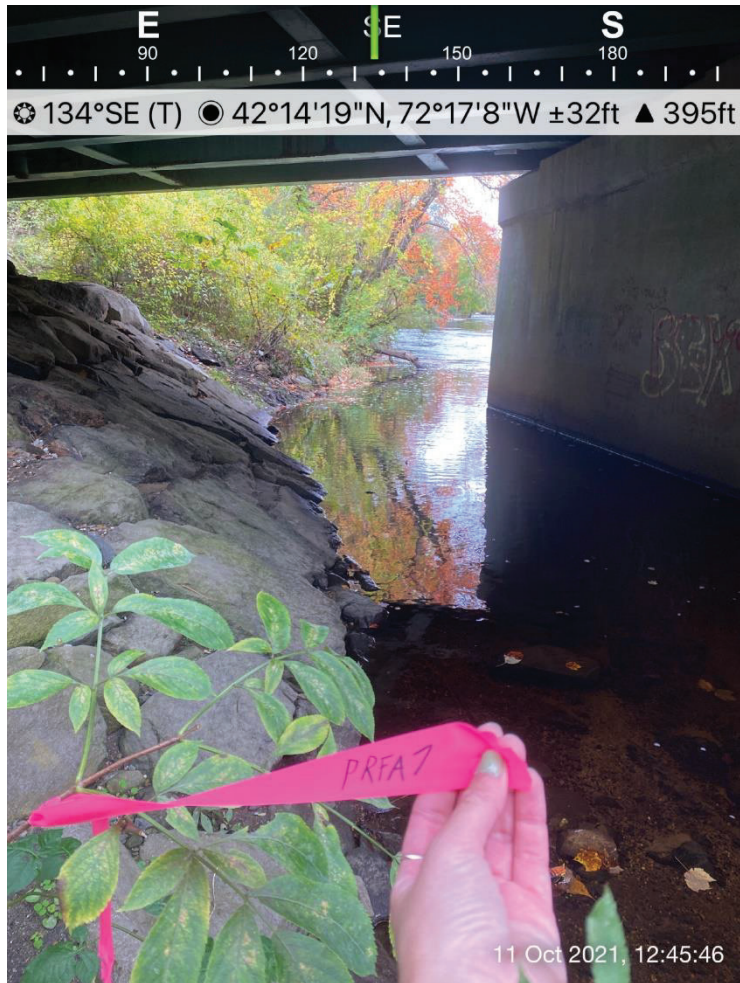
This is the general context of the southeast quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the piers supporting the Palmer Road Bridge over the Ware River.



This is the general context of a bridge scupper on the Palmer Road Bridge over the Ware River.



2021 field verification of wetland boundary



Photo 5:

Streambed 5 ft from right bank 130 ft downstream of bridge.
Streambed composition: 80% cobble, 10% gravel, 10% sand.



Photo 6:

Streambed 5 ft from right bank 130 ft downstream of bridge adjacent to photo 5 location.
Streambed composition: 40% boulder, 25% cobble, 25% gravel, 10% sand.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 9: Point bar 220 ft downstream from bridge viewed from river right.



Photo 10: Streambed 5 ft from right bank 220 ft downstream of bridge.
Streambed composition: 70% cobble, 10% gravel, 20% sand.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 11: View of bridge standing 5 ft from right bank 300 ft downstream of bridge.



Photo 12: Streambed 5 ft from right bank 300 ft downstream of bridge.
Streambed composition: 20% cobble, 50% gravel, 30% sand.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 13: View of bridge standing 5 ft from right bank 350 ft upstream of bridge.



Photo 14: Streambed 5 ft from right bank 350 ft upstream of bridge.
Streambed composition: 20% cobble, 60% gravel, 15% sand, 15% silt.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 15:

Streambed 5 ft from right bank 350 ft upstream of bridge adjacent to photo 14 location. Streambed composition: 20% boulder, 30% cobble, 30% gravel, 15% sand, 5% silt.



Photo 16:

View of bridge standing 5 ft from right bank 400 ft upstream of bridge.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 17:

Streambed 5 ft from right bank 400 ft upstream of bridge at depositional feature. Streambed composition: 10% gravel, 50% sand, 40% silt.



Photo 18:

Looking upstream standing 5 ft from right bank 400 ft upstream of bridge.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 21: View of bridge standing 5 ft from right bank 540 ft upstream of bridge.



Photo 22: Streambed 5 ft from right bank 540 ft upstream of bridge.
Streambed composition: 10% boulder, 40% cobble, 30% gravel, 20% sand.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



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Streambed 5 ft from right bank 130 ft downstream of bridge.
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	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



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	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



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	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



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	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 15:

Streambed 5 ft from right bank 350 ft upstream of bridge adjacent to photo 14 location. Streambed composition: 20% boulder, 30% cobble, 30% gravel, 15% sand, 5% silt.



Photo 16:

View of bridge standing 5 ft from right bank 400 ft upstream of bridge.


	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 17:

Streambed 5 ft from right bank 400 ft upstream of bridge at depositional feature. Streambed composition: 10% gravel, 50% sand, 40% silt.



Photo 18:

Looking upstream standing 5 ft from right bank 400 ft upstream of bridge.



	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015



Photo 21: View of bridge standing 5 ft from right bank 540 ft upstream of bridge.



Photo 22: Streambed 5 ft from right bank 540 ft upstream of bridge.
Streambed composition: 10% boulder, 40% cobble, 30% gravel, 20% sand.

	Ware River and Route 32 (Palmer Road) Bridge
SITE PHOTOGRAPHS April 9, 2021	Project 605126: Ware- Bridge Replacement, W-05-015

SECTION 5

SHPO, THPO, & BUAR COORDINATION

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RC. 68681

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 W-05-015 (MassDOT 605126)
Location /Address: Route 32 (Palmer Road) over Ware River
City/Town: Ware
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).

Agency NameType of License or funding (specify)

MassDOT

State funding

Army Corps of Engineers

Section 404 of the Clean Water Act

Date

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.



9/24/20

Linda Santoro
Preservation Planner
Massachusetts Historical Commission

Project Description (narrative):

MassDOT proposes to replace Bridge W-05-015, which carries State Route 32 (Palmer Road) in Ware over the Ware River. This bridge, constructed in 1936, consists of a three-span steel stringer superstructure supported on reinforced concrete piers and abutments. The project area includes the bridge structure itself and roadway approaches approximately 400' to the west of the bridge, and 900' to the east. In addition to proposed bridge replacement, this project will improve the horizontal and vertical roadway alignment to the east of the bridge along Palmer Road, and improve the intersection of Old Belchertown Road with Palmer Road, located adjacent to the eastern end of the bridge.

Proposed work includes replacement of the bridge with a wider structure on a slightly altered alignment. The proposed superstructure will consist of a two-span steel stringer structure with composite reinforced concrete deck, carrying two 12'-wide travel lanes with 8'-wide shoulders, and a single 6'-wide sidewalk on the southerly side. The proposed substructure will consist of reinforced concrete integral abutments on H-pile footings, and a single precast concrete pier on H-pile footings. Painted three-rail steel S3-TL4 railings are proposed. The western end of the proposed bridge structure will be situated at the same location as existing, while the eastern abutment will be shifted 20' toward the south. Construction will be phased, with a single travel lane carrying alternating traffic and a 5'-wide walkway for pedestrians maintained and remain open during construction.

In addition to replacement of Bridge W-05-015, the roadway east of the bridge will be realigned in order to eliminate an unsafe curve present near the intersection of Route 32 and Old Belchertown Road. Old Belchertown Road will also be realigned to provide a safer T-intersection. The maximum extent of this alignment shift along Route 32 will be about 70' southerly from the existing edge of pavement, including roadway embankment fill and slope grading; the maximum shift along Old Belchertown Road will be about

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APPENDIX A (continued)

40' easterly from the existing edge of pavement, including slope grading. The roadway elevation along the eastern bridge approach will be raised in order to eliminate a vertical sag in the vicinity of between Sta. 30+00 to 34+00 along Route 32, and from Sta. 12+50 to 14+00 along Old Belchertown Road. The maximum fill added above the existing roadway elevation will be 18", with associated slope fill and grading beyond the edge of pavement.

Project work will also include full-depth pavement construction with standard roadway box widening; construction of new concrete sidewalk along the southerly side of the roadway within the project limits; utility relocation, including relocation of poles and overhead wires, and buried water line; clearing and grubbing of trees and brush within the roadway layout, and areas impacted by roadway realignment; side slope grading and fill placement; installation of catch basins and other buried drainage structures beneath the roadway; resetting existing granite curbing, replacement of existing pavement markings and signage upgrades, , installation of temporary erosion and sedimentation controls, and other related work. |

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

Bridge W-05-015 will be removed and replaced. Kurt Jergensen, MassDOT Historic Bridge Specialist, reviewed the bridge and determined that it is not eligible for listing in the National Register of Historic Places. It is a typical early 20th century steel stringer bridge with minimal architectural character and standard engineering details and does not contribute to any historic district. |

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).

Bridge W-05-015 will be removed and replaced with a wider structure on a slightly altered alignment. The bridge will be replaced with a precast concrete deck beam bridge on reinforced concrete abutments, about nine feet wider than the existing structure. The western abutment will be situated at the same location as existing, while the eastern abutment will be shifted 20' toward the south. |

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 State and National Registers of Historic Places revealed no listed historic districts or properties located within or adjacent to the project area. Review of the Inventory of Historic and Archaeological Assets of the Commonwealth revealed no inventoried areas or properties within or adjacent to the project area.

A review of the MHC archaeological base maps revealed no recorded pre-Contact or historic archaeological sites in the vicinity of the project area. Although undisturbed areas near the Ware River and its tributaries are sensitive for pre-Contact archaeological resources, it is the opinion of the MassDOT Archaeologist that the project's direct area of potential effect has low sensitivity based on past bridge, roadway, and utility construction. The western approach for the proposed bridge will be constructed on the same alignment. The eastern approach for the proposed bridge will be shifted approximately 40' toward the south into the southeast quadrant. The southeast quadrant contains an existing water easement with a buried 12" water main and an access driveway. Soil borings indicate the southeast quadrant consists of topsoil over loose and poorly graded sand and gravel layers. These deep alluvial deposits are indicative of major flooding episodes. The proposed eastern approach near Station 30+00 RT will be supported on approximately 12' of fill, with graded slopes extending 30' out from the proposed roadway edge. This fill embankment will elevate the roadway to meet the new bridge. Old Belchertown Road will be shifted approximately 20' easterly in order to create a safer T-intersection with Route 32 (Palmer Road) in the northwest bridge quadrant. The roadway will be shifted into graded lawn area that also contains a drainage easement, overhead wires and utility poles, and a buried water line. The 1938 aerial photo reveals visible ground clearing and disturbance in the northeast and northwest bridge quadrants. The area was further disturbed by modern residential development and utility construction present today. |

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APPENDIX A (continued)

What is the total acreage of the project area?

Woodland <2 acresWetland acresFloodplain <2 acresOpen Space acresDeveloped <2 acres

Productive Resources:

Agriculture acresForestry acresMining/Extraction acresTotal Project Acreage <4 acres

What is the acreage of the proposed new construction?

<2 acres

What is the present land use of the project area?

The bridge is located in a less developed area on the western edge of suburban-type sprawl extending out from Ware Center. The bridge is immediately surrounded by wooded land, with a now-abandoned garden center business about 400 feet to the southwest, an abandoned railroad corridor to the southeast, and 1960s/70s residential development along Old Belchertown Road and off to the east. The majority of proposed project work will take place within the existing bridge and roadway footprint.

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:

Kurt Jergensen

Date:

September
11, 2020

Name:

Kurt Jergensen

Address:

10 Park Plaza

City/Town/Zip:

Boston, MA 02116

Telephone:

857-368-8802

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

From: [Shrimpton, Jeffrey P. \(DOT\)](#)
To: [Bettina Washington](#)
Cc: [Harwood, Jameson \(DOT\)](#)
Bcc: [Jergensen, Kurt E. \(DOT\)](#)
Subject: Ware, Replacement of Bridge W-05-015 (605126)
Date: Tuesday, September 15, 2020 1:47:00 PM
Attachments: [PNF 605126.pdf](#)
[Locus map 605126.pdf](#)
[25% Plans 605126.pdf](#)
[1938 aerial photo.pdf](#)

Hello Ms. Washington,

Enclosed please find a Project Notification Form (PNF) and other documentation for the above-noted project, which will be supported with state funds. The project requires a federal permit from the U. S. Army Corps of Engineers (USACE). MassDOT, therefore, is submitting the enclosed project information to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the USACE. Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Patricia Leavenworth, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood. You also may submit comments or questions by email to Jameson.Harwood@state.ma.us.

Jeffrey Shrimpton
Cultural Resources Supervisor
Massachusetts Department of Transportation
10 Park Plaza, Suite 4260
Boston, MA 02116
(857) 368-8824 Cell phone (978) 325-2094
Jeffrey.shrimpton@state.ma.us

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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 W-05-015 (MassDOT 605126)
Location /Address: Route 32 (Palmer Road) over Ware River
City/Town: Ware
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>
MassDOT	State funding
Army Corps of Engineers	Section 404 of the Clean Water Act

Project Description (narrative):

MassDOT proposes to replace Bridge W-05-015, which carries State Route 32 (Palmer Road) in Ware over the Ware River. This bridge, constructed in 1936, consists of a three-span steel stringer superstructure supported on reinforced concrete piers and abutments. The project area includes the bridge structure itself and roadway approaches approximately 400' to the west of the bridge, and 900' to the east. In addition to proposed bridge replacement, this project will improve the horizontal and vertical roadway alignment to the east of the bridge along Palmer Road, and improve the intersection of Old Belchertown Road with Palmer Road, located adjacent to the eastern end of the bridge.

Proposed work includes replacement of the bridge with a wider structure on a slightly altered alignment. The proposed superstructure will consist of a two-span steel stringer structure with composite reinforced concrete deck, carrying two 12'-wide travel lanes with 8'-wide shoulders, and a single 6'-wide sidewalk on the southerly side. The proposed substructure will consist of reinforced concrete integral abutments on H-pile footings, and a single precast concrete pier on H-pile footings. Painted three-rail steel S3-TL4 railings are proposed. The western end of the proposed bridge structure will be situated at the same location as existing, while the eastern abutment will be shifted 20' toward the south. Construction will be phased, with a single travel lane carrying alternating traffic and a 5'-wide walkway for pedestrians maintained and remain open during construction.

In addition to replacement of Bridge W-05-015, the roadway east of the bridge will be realigned in order to eliminate an unsafe curve present near the intersection of Route 32 and Old Belchertown Road. Old Belchertown Road will also be realigned to provide a safer T-intersection. The maximum extend of this alignment shift along Route 32 will be about 70' southerly from the existing edge of pavement, including roadway embankment fill and slope grading; the maximum shift along Old Belchertown Road will be about

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH**APPENDIX A (continued)**

40' easterly from the existing edge of pavement, including slope grading. The roadway elevation along the eastern bridge approach will be raised in order to eliminate a vertical sag in the vicinity of between Sta. 30+00 to 34+00 along Route 32, and from Sta. 12+50 to 14+00 along Old Belchertown Road. The maximum fill added above the existing roadway elevation will be 18", with associated slope fill and grading beyond the edge of pavement.

Project work will also include full-depth pavement construction with standard roadway box widening; construction of new concrete sidewalk along the southerly side of the roadway within the project limits; utility relocation, including relocation of poles and overhead wires, and buried water line; clearing and grubbing of trees and brush within the roadway layout, and areas impacted by roadway realignment; side slope grading and fill placement; installation of catch basins and other buried drainage structures beneath the roadway; resetting existing granite curbing, replacement of existing pavement markings and signage upgrades, , installation of temporary erosion and sedimentation controls, and other related work.]

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

[Bridge W-05-015 will be removed and replaced. Kurt Jergensen, MassDOT Historic Bridge Specialist, reviewed the bridge and determined that it is not eligible for listing in the National Register of Historic Places. It is a typical early 20th century steel stringer bridge with minimal architectural character and standard engineering details and does not contribute to any historic district.]

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).

[Bridge W-05-015 will be removed and replaced with a wider structure on a slightly altered alignment. The bridge will be replaced with a precast concrete deck beam bridge on reinforced concrete abutments, about nine feet wider than the existing structure. The western abutment will be situated at the same location as existing, while the eastern abutment will be shifted 20' toward the south.]

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 State and National Registers of Historic Places revealed no listed historic districts or properties located within or adjacent to the project area. Review of the Inventory of Historic and Archaeological Assets of the Commonwealth revealed no inventoried areas or properties within or adjacent to the project area.

A review of the MHC archaeological base maps revealed no recorded pre-Contact or historic archaeological sites in the vicinity of the project area. Although undisturbed areas near the Ware River and its tributaries are sensitive for pre-Contact archaeological resources, it is the opinion of the MassDOT Archaeologist that the project's direct area of potential effect has low sensitivity based on past bridge, roadway, and utility construction. The western approach for the proposed bridge will be constructed on the same alignment. The eastern approach for the proposed bridge will be shifted approximately 40' toward the south into the southeast quadrant. The southeast quadrant contains an existing water easement with a buried 12" water main and an access driveway. Soil borings indicate the southeast quadrant consists of topsoil over loose and poorly graded sand and gravel layers. These deep alluvial deposits are indicative of major flooding episodes. The proposed eastern approach near Station 30+00 RT will be supported on approximately 12' of fill, with graded slopes extending 30' out from the proposed roadway edge. This fill embankment will elevate the roadway to meet the new bridge. Old Belchertown Road will be shifted approximately 20' easterly in order to create a safer T-intersection with Route 32 (Palmer Road) in the northwest bridge quadrant. The roadway will be shifted into graded lawn area that also contains a drainage easement, overhead wires and utility poles, and a buried water line. The 1938 aerial photo reveals visible ground clearing and disturbance in the northeast and northwest bridge quadrants. The area was further disturbed by modern residential development and utility construction present today.]]

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APPENDIX A (continued)

What is the total acreage of the project area?

Woodland	<u><2</u>	acres	Productive Resources:		
Wetland	<u> </u>	acres	Agriculture	<u> </u>	acres
Floodplain	<u><2</u>	acres	Forestry	<u> </u>	acres
Open Space	<u> </u>	acres	Mining/Extraction	<u> </u>	acres
Developed	<u><2</u>	acres	Total Project Acreage	<u><4</u>	acres

[]

What is the acreage of the proposed new construction?

<2 acres

[]

What is the present land use of the project area?

[The bridge is located in a less developed area on the western edge of suburban-type sprawl extending out from Ware Center. The bridge is immediately surrounded by wooded land, with a now-abandoned garden center business about 400 feet to the southwest, an abandoned railroad corridor to the southeast, and 1960s/70s residential development along Old Belchertown Road and off to the east. The majority of proposed project work will take place within the existing bridge and roadway footprint.]

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:

Kurt Jergensen

Date:

September 11, 2020

Name:

Kurt Jergensen

Address:

10 Park Plaza

City/Town/Zip:

Boston, MA 02116

Telephone:

857-368-8802

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

[]

A00829 - 85

From: [Shrimpton, Jeffrey P. \(DOT\)](#)
To: [Robinson, David S \(EEA\)](#)
Cc: [Harwood, Jameson \(DOT\)](#)
Bcc: [Jergensen, Kurt E. \(DOT\)](#)
Subject: Ware, Replacement of Bridge W-05-015 (605126)
Date: Tuesday, September 15, 2020 1:47:00 PM
Attachments: [PNF 605126.pdf](#)
[Locus map 605126.pdf](#)
[25% Plans 605126.pdf](#)
[1938 aerial photo.pdf](#)

Hello David,

Enclosed please find a Project Notification Form (PNF) and other documentation for the above-noted project, which will be supported with state funds. The project requires a federal permit from the U. S. Army Corps of Engineers (USACE). MassDOT, therefore, is submitting the enclosed project information to the Board of Underwater Archaeological Resources to meet the Section 106 consultation requirements of the USACE. Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Patricia Leavenworth, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood. You also may submit comments or questions by email to Jameson.Harwood@state.ma.us.

Jeffrey Shrimpton
Cultural Resources Supervisor
Massachusetts Department of Transportation
10 Park Plaza, Suite 4260
Boston, MA 02116
~~(857) 368-8824~~ Cell phone (978) 325-2094
Jeffrey.shrimpton@state.ma.us

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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 W-05-015 (MassDOT 605126)
Location /Address: Route 32 (Palmer Road) over Ware River
City/Town: Ware
Project Proponent
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Address: 10 Park Plaza
City/Town/Zip/Telephone: Boston, MA 02116 / T: 207-590-4999

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<u>Agency Name</u>	<u>Type of License or funding (specify)</u>
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950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH**APPENDIX A (continued)**

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APPENDIX A (continued)

What is the total acreage of the project area?

Woodland	<u><2</u>	acres	Productive Resources:		
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Floodplain	<u><2</u>	acres	Forestry	<u> </u>	acres
Open Space	<u> </u>	acres	Mining/Extraction	<u> </u>	acres
Developed	<u><2</u>	acres	Total Project Acreage	<u><4</u>	acres

[]

What is the acreage of the proposed new construction?

<2 acres

[]

What is the present land use of the project area?

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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:

Kurt Jergensen

Date:

September 11, 2020

Name:

Kurt Jergensen

Address:

10 Park Plaza

City/Town/Zip:

Boston, MA 02116

Telephone:

857-368-8802

REGULATORY AUTHORITY

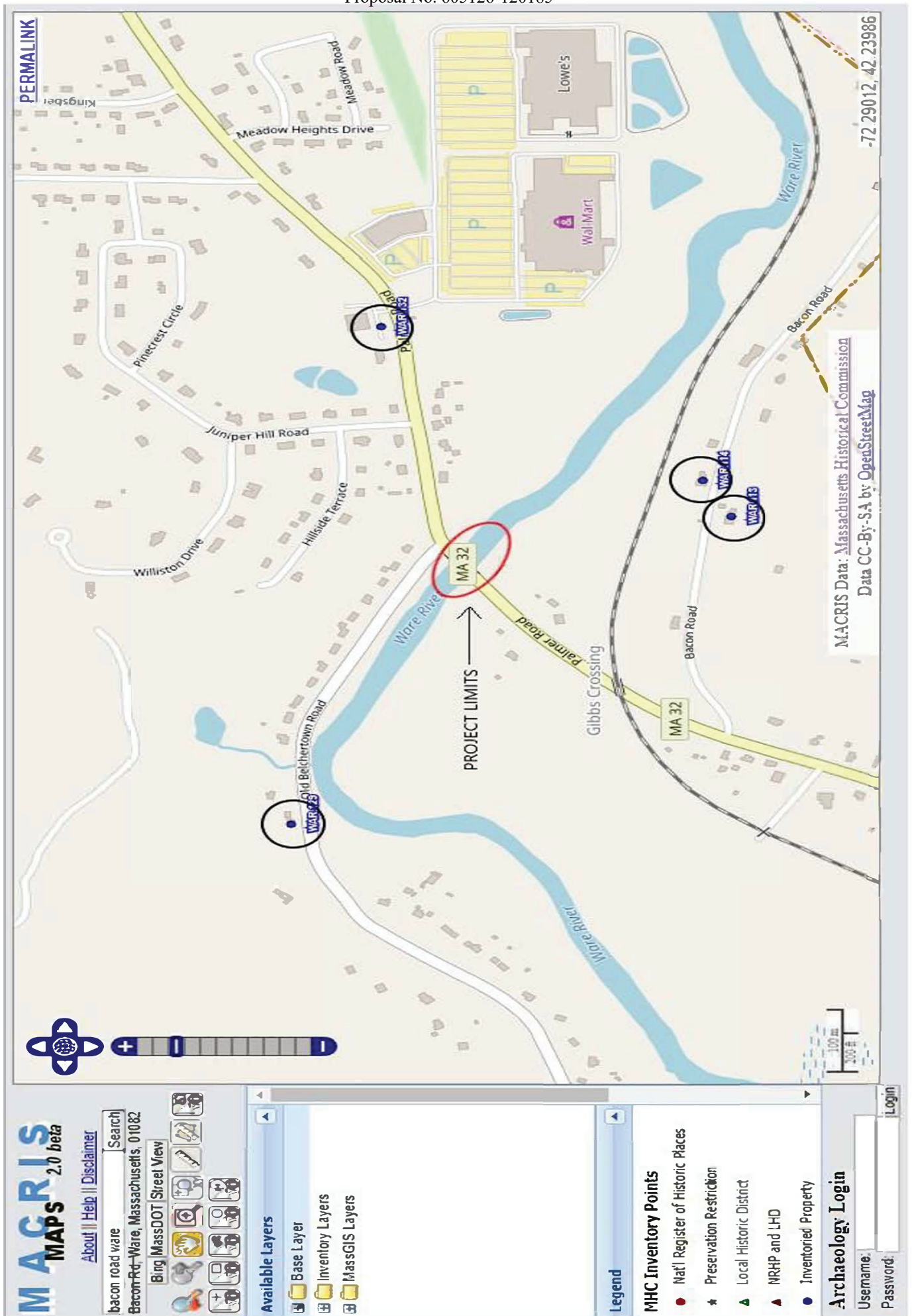
950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

7/1/93

950 CMR - 276

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A00829 - 90



Massachusetts Cultural Resource Information System

MACRIS

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For more information about this page and how to use it, [click here](#).

Inventory No: WAR.114 
Historic Name: Gibbs, Lucas House
Common Name:
Address: Bacon Rd
City/Town: Ware
Village/Neighborhood: Gibbs Crossing
Local No:
Year Constructed: C 1840
Architect(s):
Architectural Style(s): Greek Revival; No style
Use(s): Agricultural; Single Family Dwelling House
Significance: Agriculture; Architecture
Area(s):
Designation(s):
Building Material(s): Roof: Asphalt Shingle
 Wall: Asbestos Shingle



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For more information about this page and how to use it, [click here](#).

Inventory No: WAR.113 
Historic Name: Dunbar, S. House
Common Name:
Address: Bacon Rd
City/Town: Ware
Village/Neighborhood: Gibbs Crossing
Local No:
Year Constructed: C 1817
Architect(s):
Architectural Style(s): Federal; No style
Use(s): Agricultural; Single Family Dwelling House
Significance: Agriculture; Architecture
Area(s):
Designation(s):
Building Material(s): Roof: Asphalt Shingle
 Wall: Wood Clapboard



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Inventory No:	WAR.132 
Historic Name:	Andrews, Willard G. House
Common Name:	
Address:	Palmer Rd Route 32
City/Town:	Ware
Village/Neighborhood:	Ware
Local No:	
Year Constructed:	C 1850
Architect(s):	
Architectural Style(s):	Greek Revival
Use(s):	Agricultural; Single Family Dwelling House
Significance:	Agriculture; Architecture
Area(s):	
Designation(s):	
Building Material(s):	Roof: Asphalt Shingle Wall: Wood Clapboard Foundation: Granite



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For more information about this page and how to use it, [click here](#).

Inventory No:	WAR.129 
Historic Name:	Lamberton, Alfred House
Common Name:	
Address:	Old Belchertown Rd
City/Town:	Ware
Village/Neighborhood:	Ware
Local No:	
Year Constructed:	C 1840
Architect(s):	
Architectural Style(s):	Greek Revival
Use(s):	Agricultural; Single Family Dwelling House
Significance:	Agriculture; Architecture
Area(s):	
Designation(s):	
Building Material(s):	Roof: Asphalt Shingle Wall: Wood Clapboard



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SECTION 6

USFWS COORDINATION



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
<http://www.fws.gov/newengland>



In Reply Refer To:

June 26, 2020

Consultation Code: 05E1NE00-2020-SLI-3073

Event Code: 05E1NE00-2020-E-09368

Project Name: Palmer Rd (Rte 32) Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-3073

Event Code: 05E1NE00-2020-E-09368

Project Name: Palmer Rd (Rte 32) Bridge Replacement

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Proposed full bridge replacement of the Palmer Rd bridge over the Ware River in Ware, MA. Other proposed work includes roadway and sidewalk reconstruction, modified horizontal and vertical roadway alignments, and drainage improvements.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.23918575445078N72.28454269184367W>



Counties: Hampshire, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

SECTION 7

WETLANDS REPORT



Wetland Resource Evaluation
Route 21 (Palmer Road) over Ware River
Ware, MA
October 17, 2017

Project Location

The project site includes the Route 32 (Palmer Road) Bridge over the Ware River in Ware, Massachusetts, including the area extending 100 feet from the bridge itself. The project location is indicated in Figure 1 below.

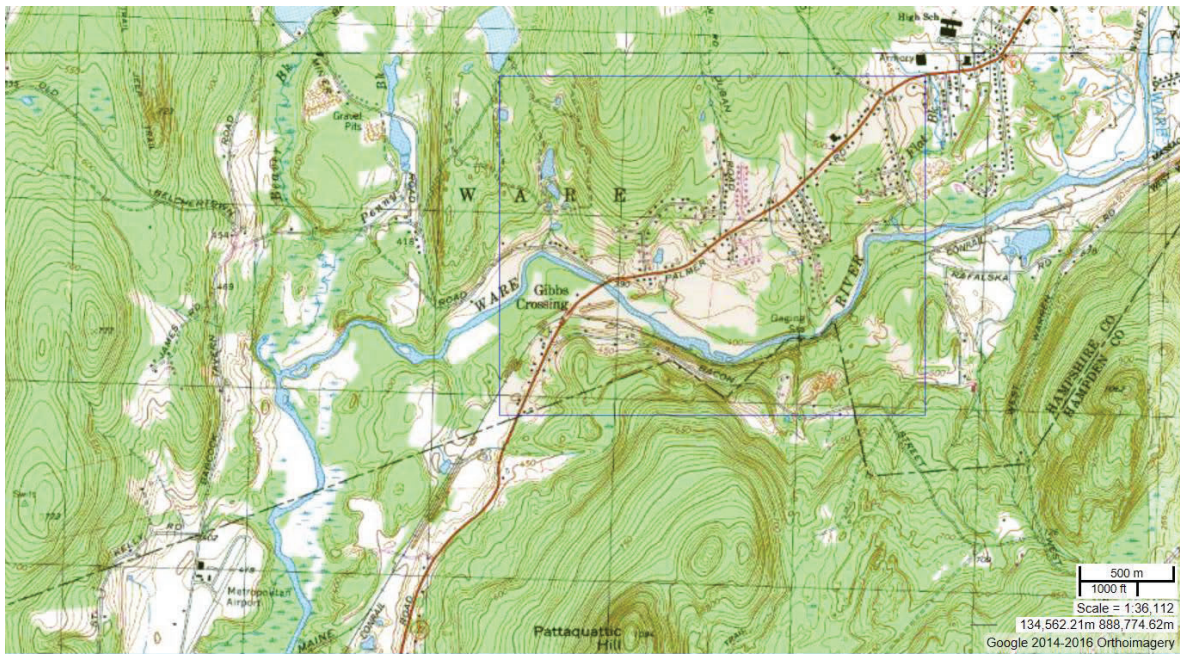


Fig. 1: USGS Topographic Quadrangle - Site Locus

Delineation Methods

Rimmer Environmental Consulting (REC) conducted a field inspection on September 21, 2017 to determine the location and extent of wetland resources subject to jurisdiction under the Mass. Wetlands Protection Act (MGL Ch. 131 s. 40) and Section 404 of the Federal Clean Water Act within the project area. Wetland resources were delineated in accordance with the procedures described in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and the Army Corps of Engineers Wetlands Delineation Manual. Numbered sequences of flags were placed in the field to delineate the boundary between wetland and upland resources. The presence of 50% wetland vegetation as well as

other indicators of wetland hydrology including hydric soils were used to identify wetland resources. The following wetland resources are present:

Riverfront Area:

The Ware River is perennially flowing and is therefore subject to the Riverfront Regulations of the Mass. Wetlands Protection Act contained within 310 CMR 10.58. A 200-foot Riverfront Area extends horizontally landward from the limits of Mean Annual High Water (MAHW). The boundary of MAHW was determined based upon observation of water marks on the bridge abutments, evidence of scouring and undercut banks, point bars and changes in vegetation from primarily aquatic to primarily terrestrial. The banks are steep and rocky and generally contain small trees and brush above the active bank. The area immediately adjacent to and under the bridge abutments contains sloped rock riprap. Wetland flags RFA1-RFA6 and RFA7-RFA12 delineate MAHW on the north side of the bridge and flags RFA 7.1-RFA7.6 and RFAA1.1-A1.6 represent MAHW on the south side of the bridge. Water levels at the time of observation were slightly below estimated MAHW.

Bordering Vegetated Wetland:

There are two very small areas of wetland vegetation adjacent to the bridge footings. In the northwest quadrant, between flags A1 and RFA2 is a triangle shaped area below MAHW containing herbaceous vegetation, including reed canary grass (*Phalaris arundinacea*), pink smartweed (*Polygonum pennsylvanicum*), purple loosestrife (*Lythrum salicaria*), wild mint (*Mentha sp.*) and manna grass (*Glyceria canadensis*). The adjacent upland area is the rock riprap embankment under and adjacent to the bridge.

On the southwest quadrant, adjacent to flags FFA 1.1 and RFA 1.2 and also below MAHW is a similarly small area of freshwater marsh, with similar vegetation, but also including some aquatic vegetation, including water plaintain (*Alisma trivale*). The adjacent upland area contains honeysuckle (*Lonicera tatarica*) and some thinly vegetated portions of the rock riprap adjacent to the bridge abutment.

Bordering Land Subject to Flooding:

This resource is regulated under the Mass. Wetlands Protection Act and includes the lateral extent of flooding which occurs from overtopping of streams during storm events up to and including the 100-year storm, or storm of record, whichever is greater. The limits of BLSF are determined based on reference to FEMA flood maps of the area. FEMA has not provided mapping of this section of the Water River so the limits of BLSF could not be determined.

Other Resources

The project site is located within Priority Habitat and Estimated Habitat of Rare Wetlands Wildlife as determined by reference to data provided by the Mass. Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program available on MassGIS (see Figure 2 below). Prior notification and consultation with the NHESP is required prior to any construction proposed within this area.

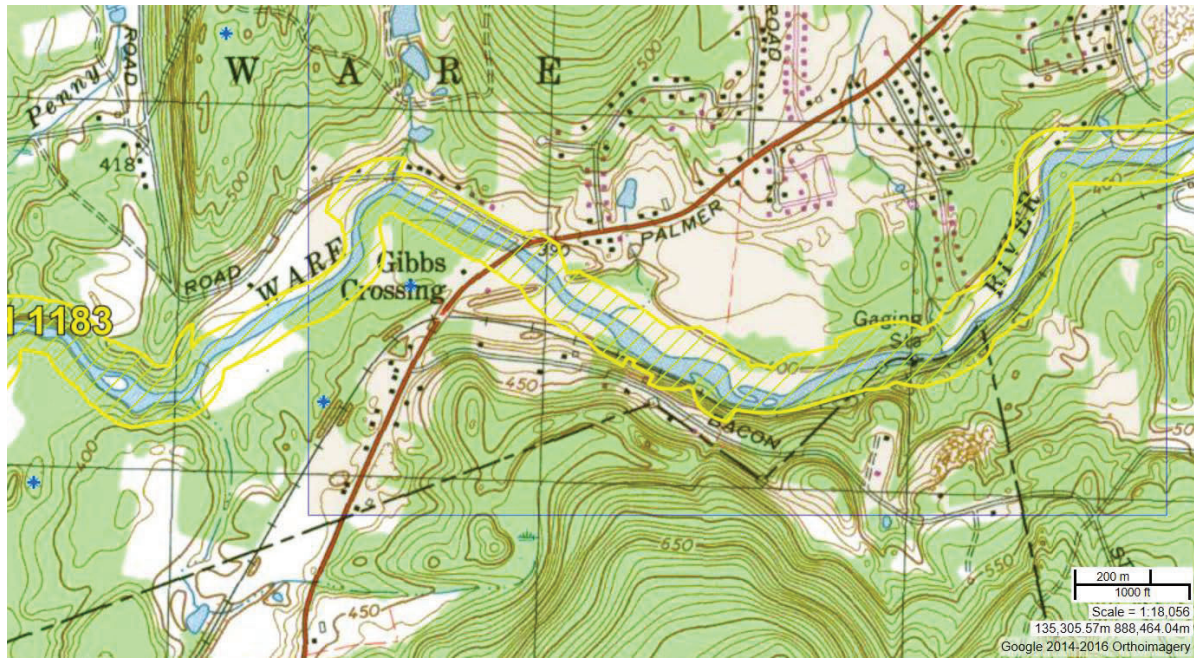


Fig 2: NHESP Priority Habitat Mapping

SECTION 8

FIGURES

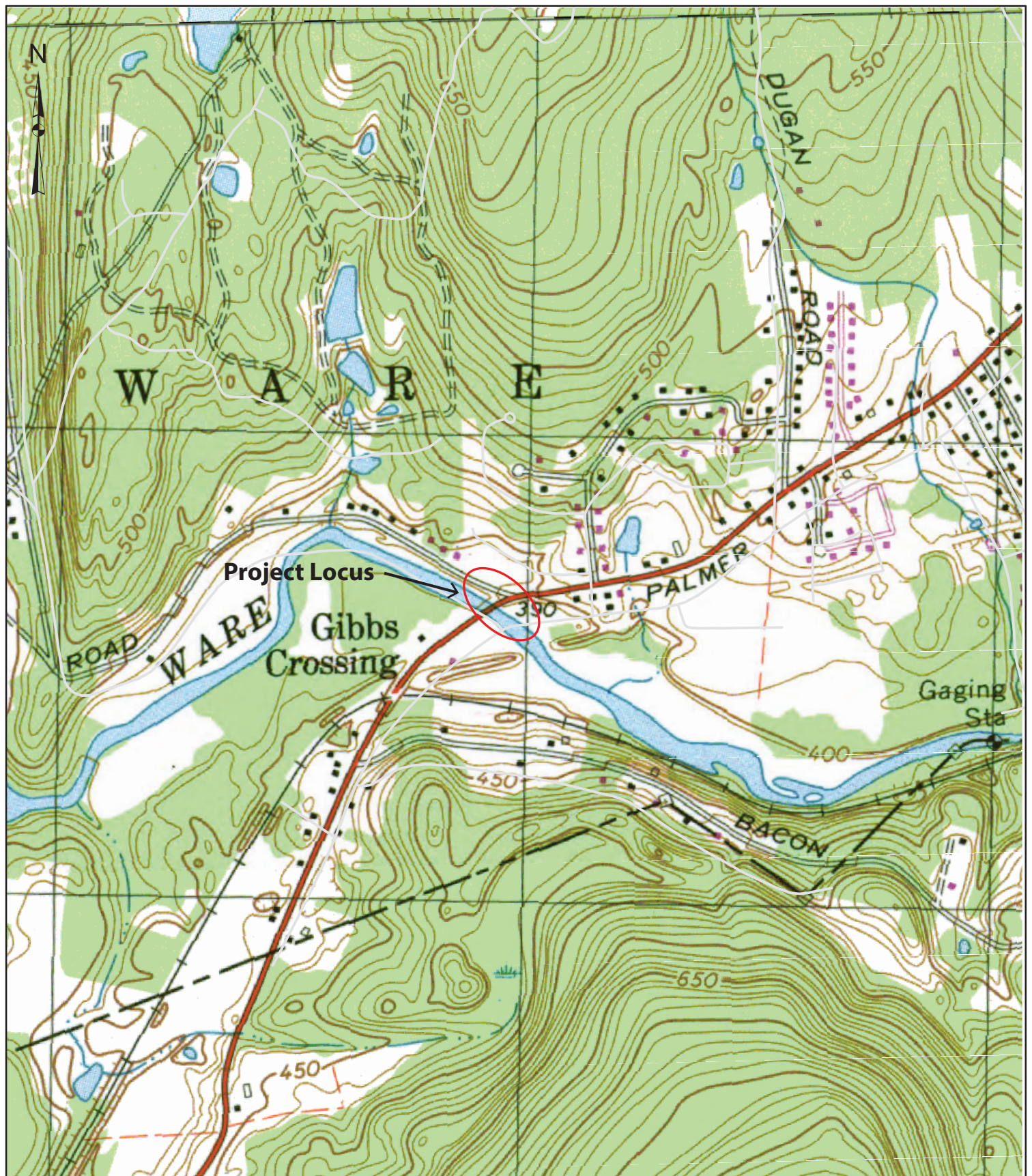


Figure 1
Project Locus
Route 32 over Ware River
(Bridge # W-05-015)
Ware, Massachusetts

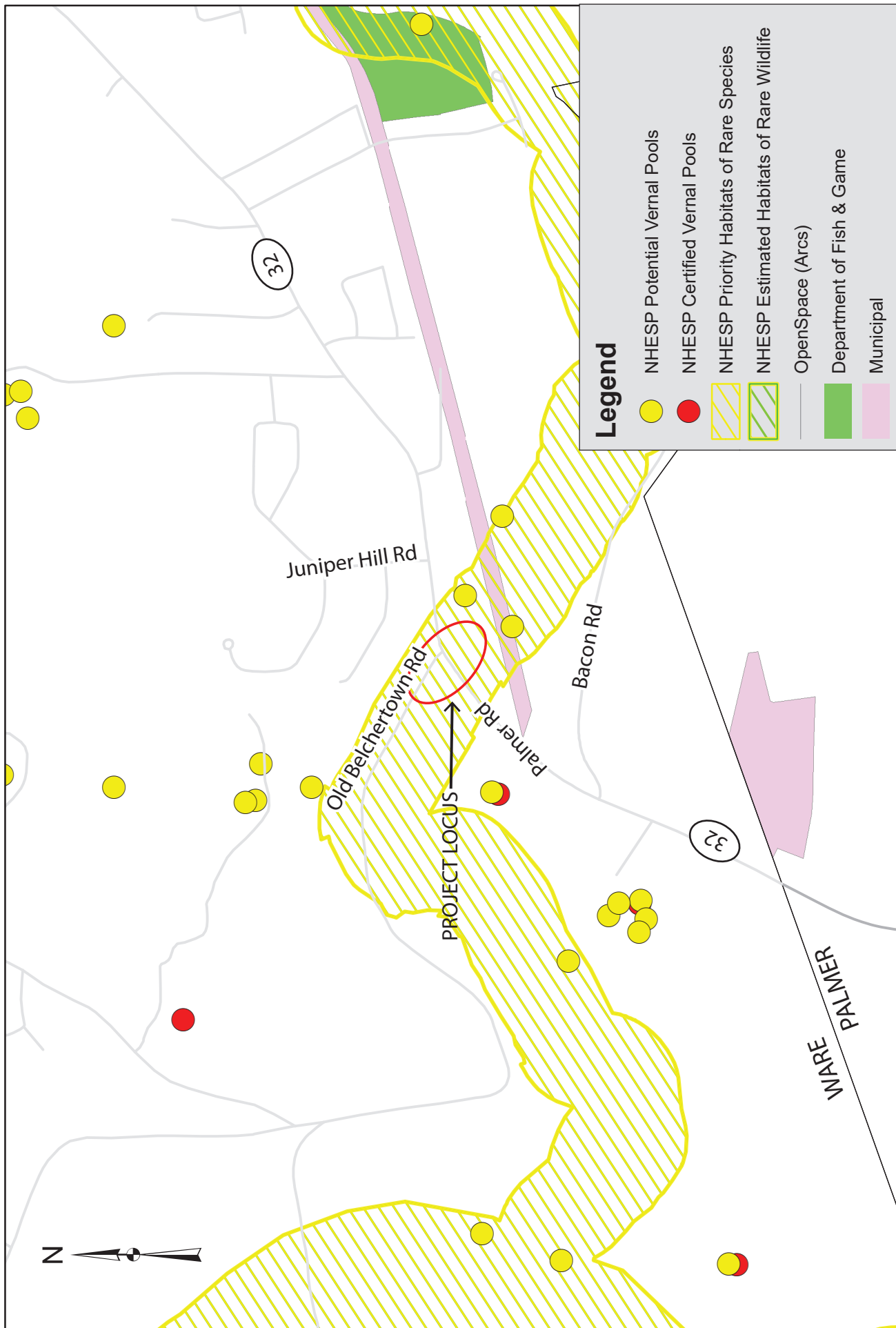


Figure 2
Environmental Constraints
Route 32 Bridge
Ware, Massachusetts



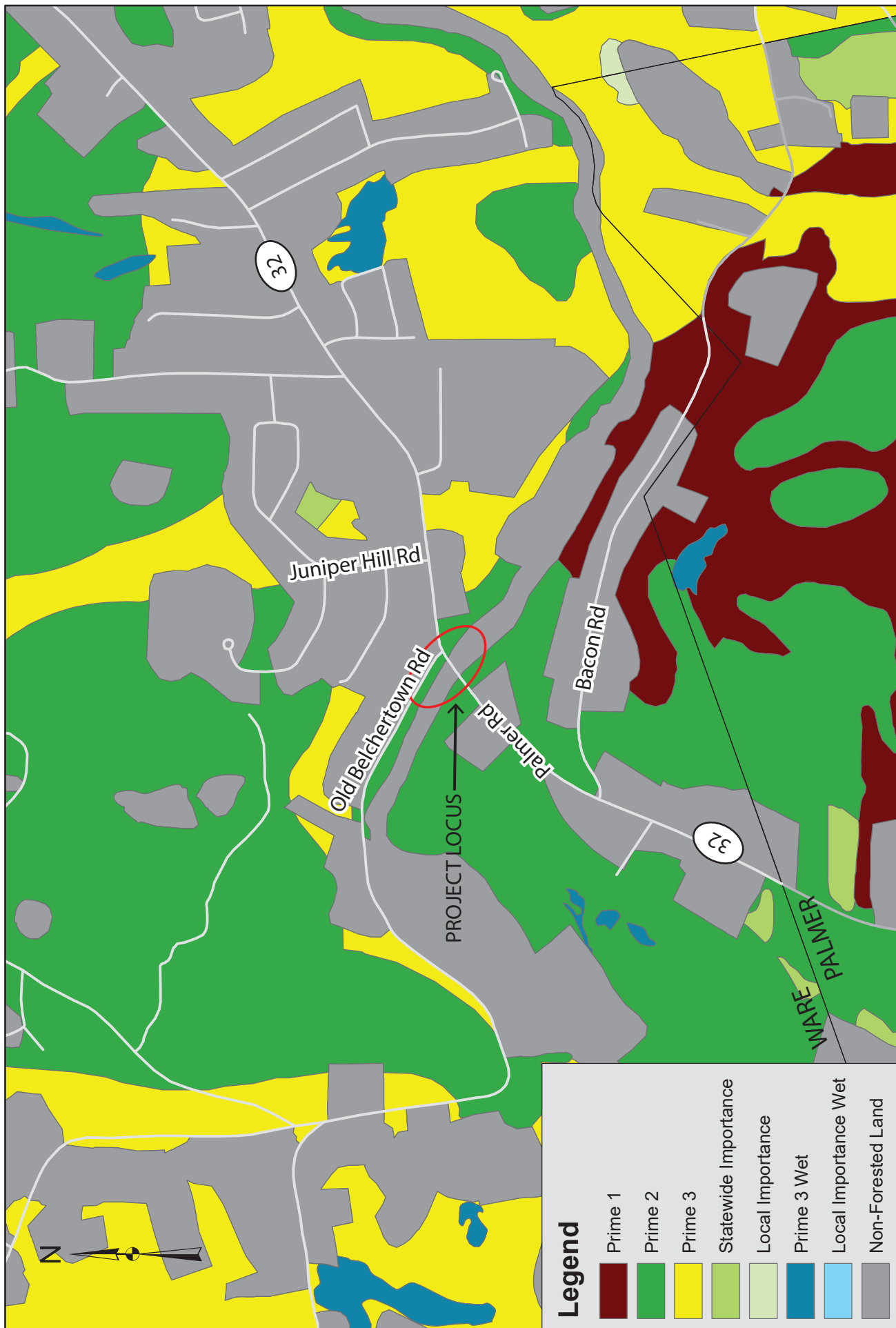
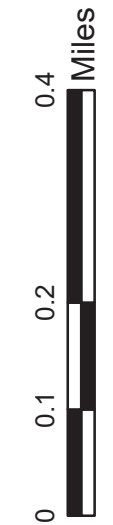


Figure 4
Prime Forest Land
Route 32 Bridge
Ware, Massachusetts



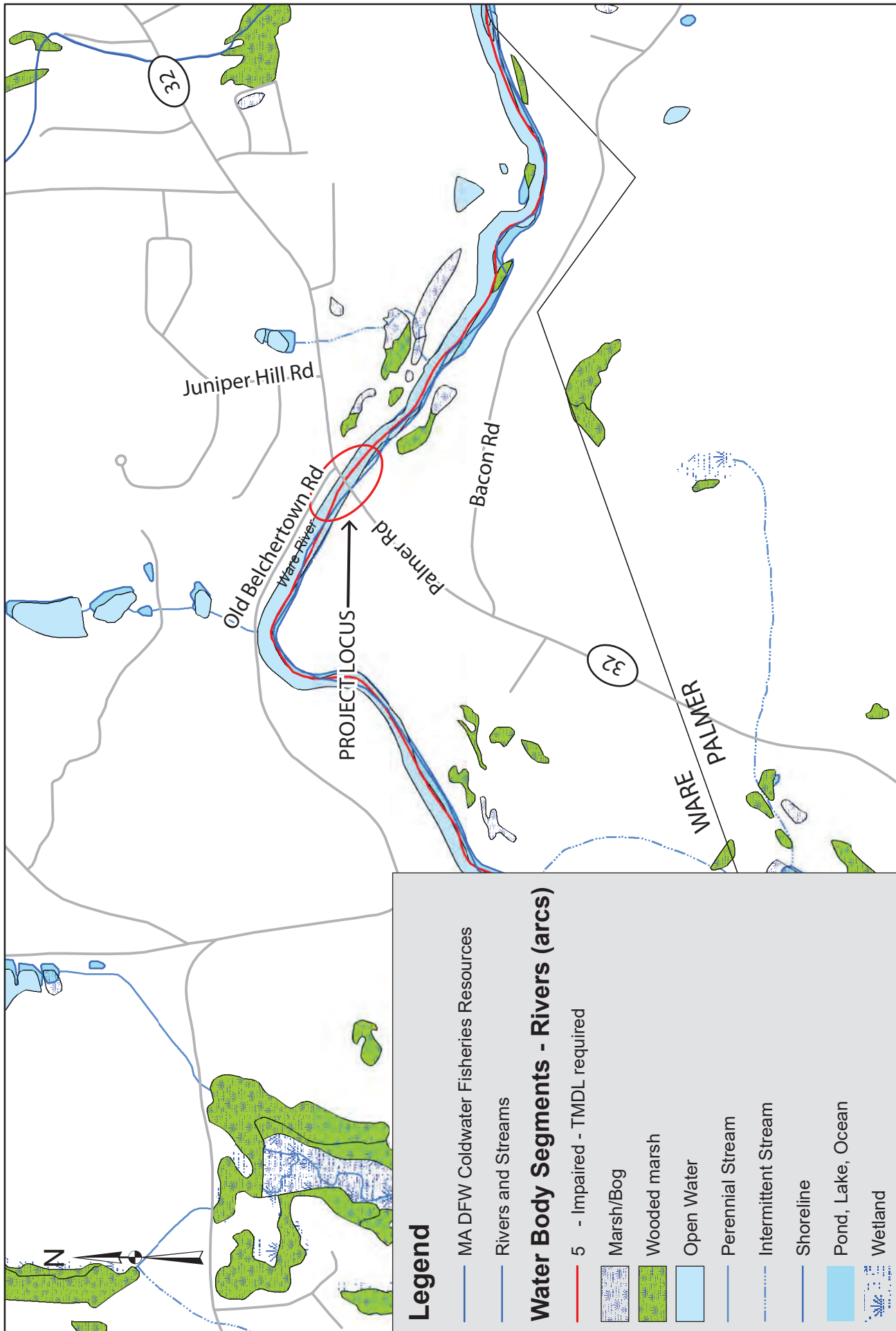
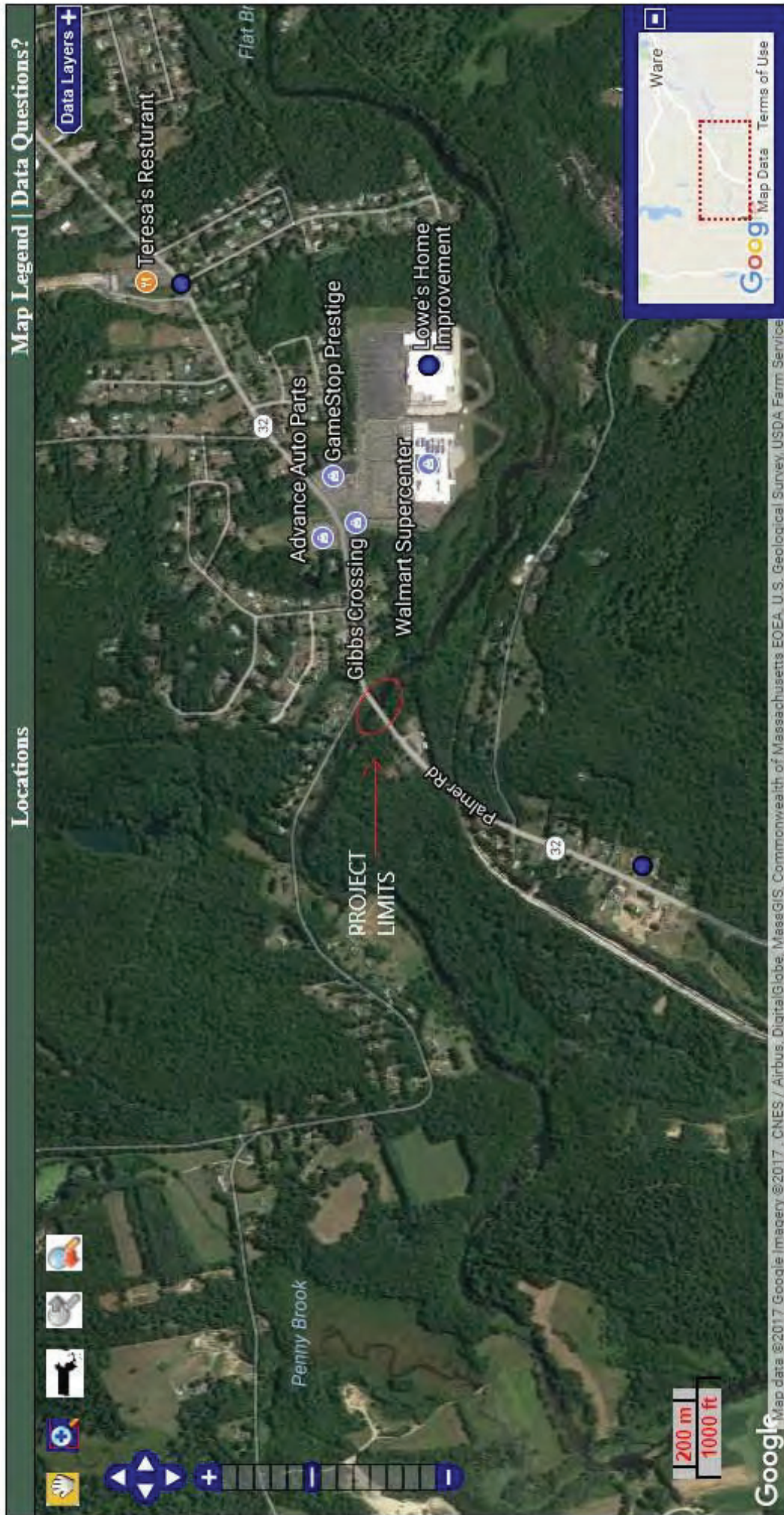


Figure 5
Water Resources
Route 32 Bridge
Ware, Massachusetts





SECTION 9

ENVIRONMENTAL PERMITTING PLANS

WARE PALMER ROAD (ROUTE 32) OVER WARE RIVER			
DATE	FED. APPROVAL NO.	DATE	REVISION
05/05/2022	-	05/05/2022	1
05/05/2022	-	05/05/2022	2
05/05/2022	-	05/05/2022	3
05/05/2022	-	05/05/2022	4
05/05/2022	-	05/05/2022	5
05/05/2022	-	05/05/2022	6
05/05/2022	-	05/05/2022	7
05/05/2022	-	05/05/2022	8
05/05/2022	-	05/05/2022	9
05/05/2022	-	05/05/2022	10
05/05/2022	-	05/05/2022	11
05/05/2022	-	05/05/2022	12
05/05/2022	-	05/05/2022	13
05/05/2022	-	05/05/2022	14
05/05/2022	-	05/05/2022	15
05/05/2022	-	05/05/2022	16
05/05/2022	-	05/05/2022	17
05/05/2022	-	05/05/2022	18
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05/05/2022	-	05/05/2022	20
05/05/2022	-	05/05/2022	21

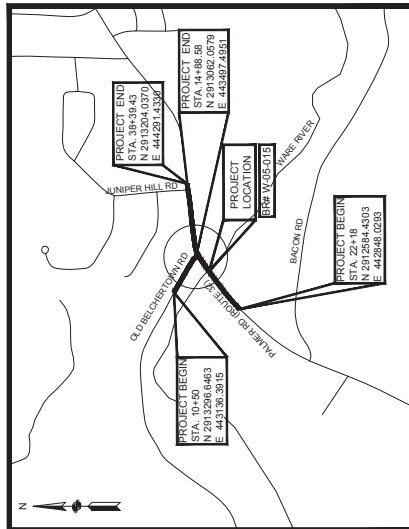
TITLE SHEET

PERMITTING PLANS FOR
ROUTE 32 (PALMER ROAD) OVER WARE RIVER
(BRIDGE NO. W-05-015)
IN THE TOWN OF
WARE
HAMPSHIRE COUNTY
FEDERAL AID PROJECT NO.

ENVIRONMENTAL PERMITTING PLANS

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND INDEX
2	KEY PLAN, PROFILE, AND LOGIC MAP
3	GENERAL NOTES AND ESTIMATED QUANTITIES
4-8	CONSTRUCTION PLANS
9	PROFILE - PALMER ROAD (ROUTE 32)
10	RIPRAP PLAN AND ELEVATION
11	CHANNEL APPROACH SECTIONS
12	PAVEMENT CONSTRUCTION SECTIONS
13-20	STAGE CONSTRUCTION PLANS
21	ENVIRONMENTAL IMPACT PLAN



DATE	DESCRIPTION	REV
05/05/2022	100% PERMITTING SUBMISSION	1
05/05/2022	100% PERMITTING SUBMISSION	2
05/05/2022	100% PERMITTING SUBMISSION	3
05/05/2022	100% PERMITTING SUBMISSION	4
05/05/2022	100% PERMITTING SUBMISSION	5
05/05/2022	100% PERMITTING SUBMISSION	6
05/05/2022	100% PERMITTING SUBMISSION	7
05/05/2022	100% PERMITTING SUBMISSION	8
05/05/2022	100% PERMITTING SUBMISSION	9
05/05/2022	100% PERMITTING SUBMISSION	10
05/05/2022	100% PERMITTING SUBMISSION	11
05/05/2022	100% PERMITTING SUBMISSION	12
05/05/2022	100% PERMITTING SUBMISSION	13
05/05/2022	100% PERMITTING SUBMISSION	14
05/05/2022	100% PERMITTING SUBMISSION	15
05/05/2022	100% PERMITTING SUBMISSION	16
05/05/2022	100% PERMITTING SUBMISSION	17
05/05/2022	100% PERMITTING SUBMISSION	18
05/05/2022	100% PERMITTING SUBMISSION	19
05/05/2022	100% PERMITTING SUBMISSION	20
05/05/2022	100% PERMITTING SUBMISSION	21



RECOMMENDED FOR APPROVAL

CHIEF ENGINEER

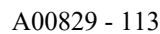
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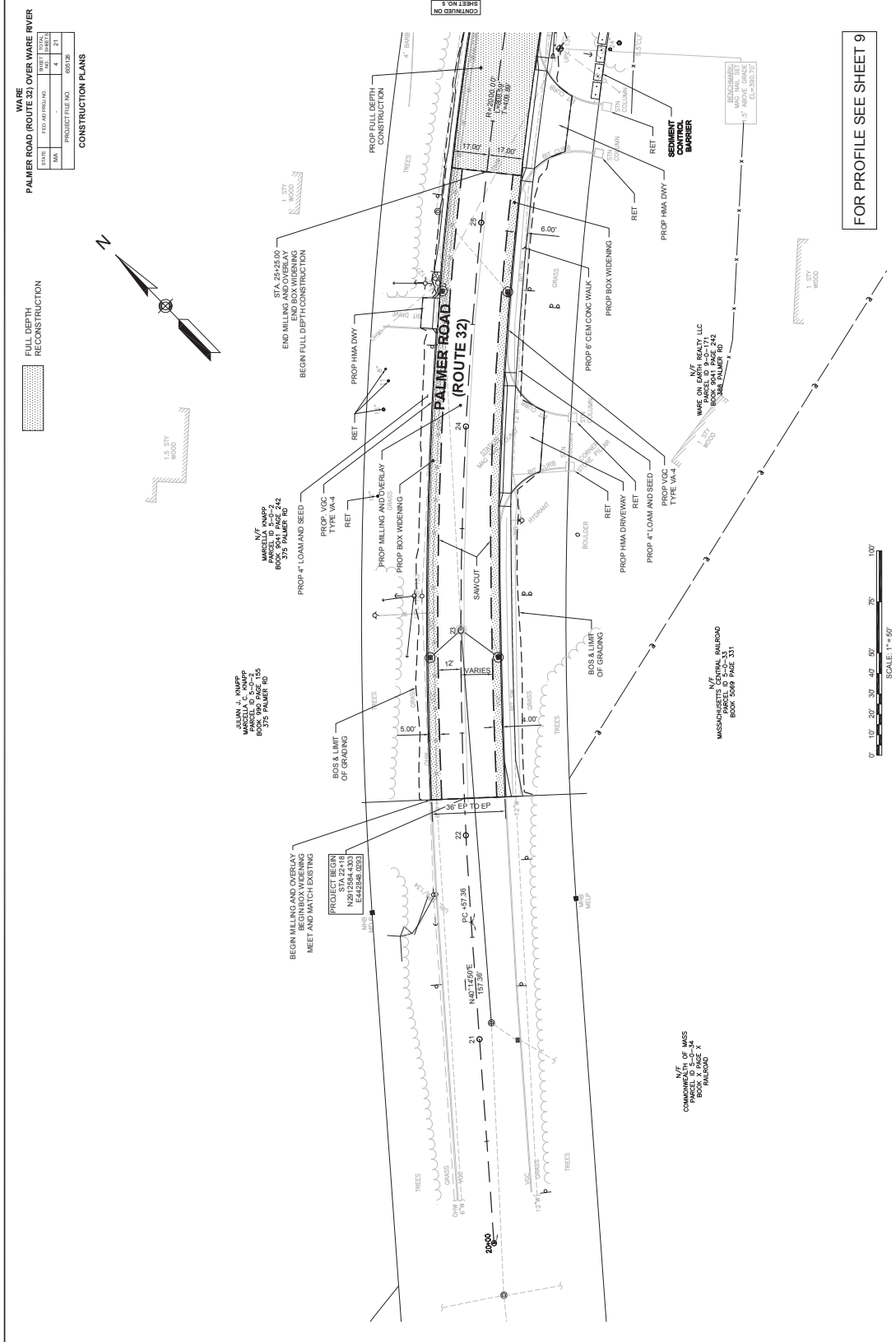
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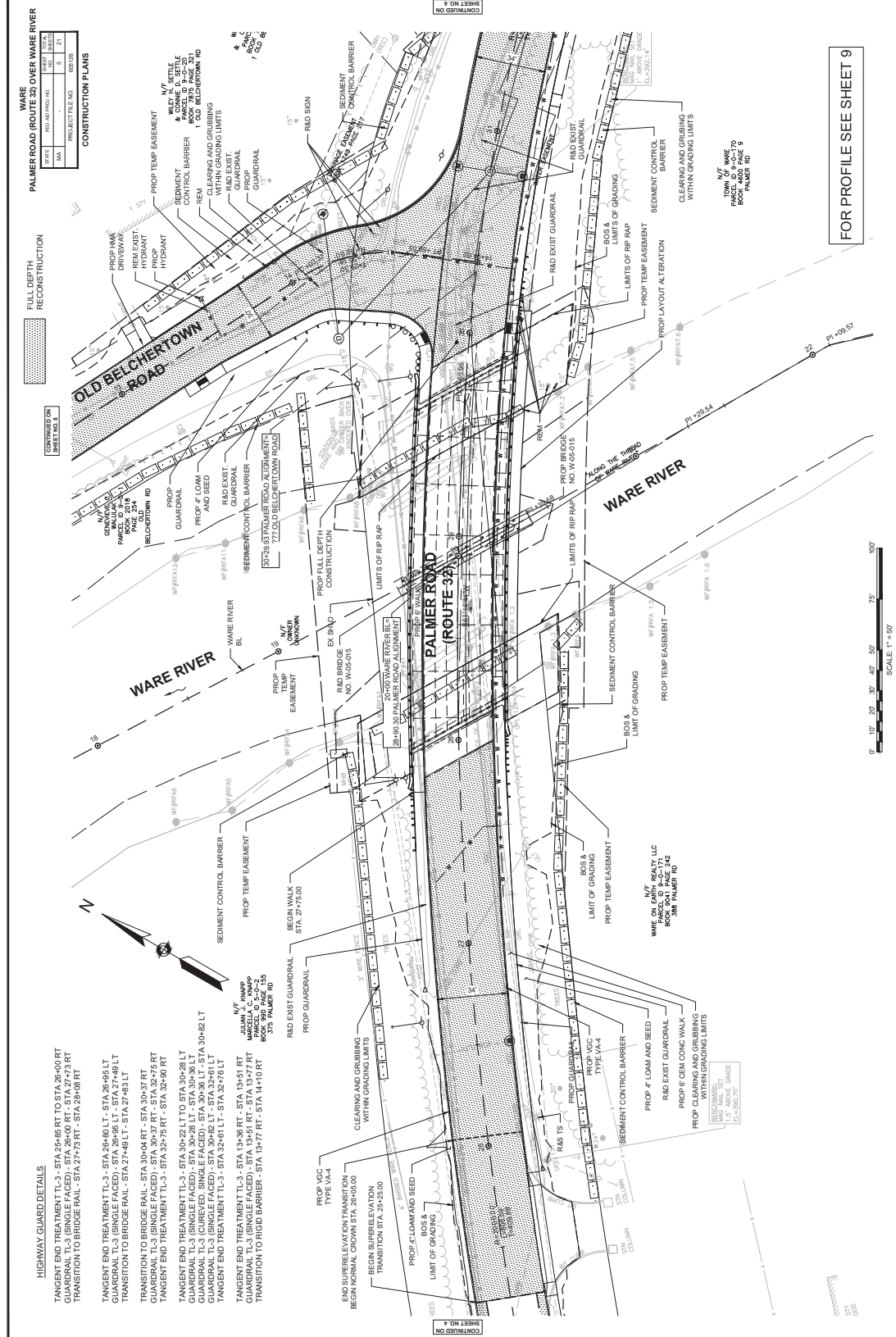
HIGHWAY ADMINISTRATOR

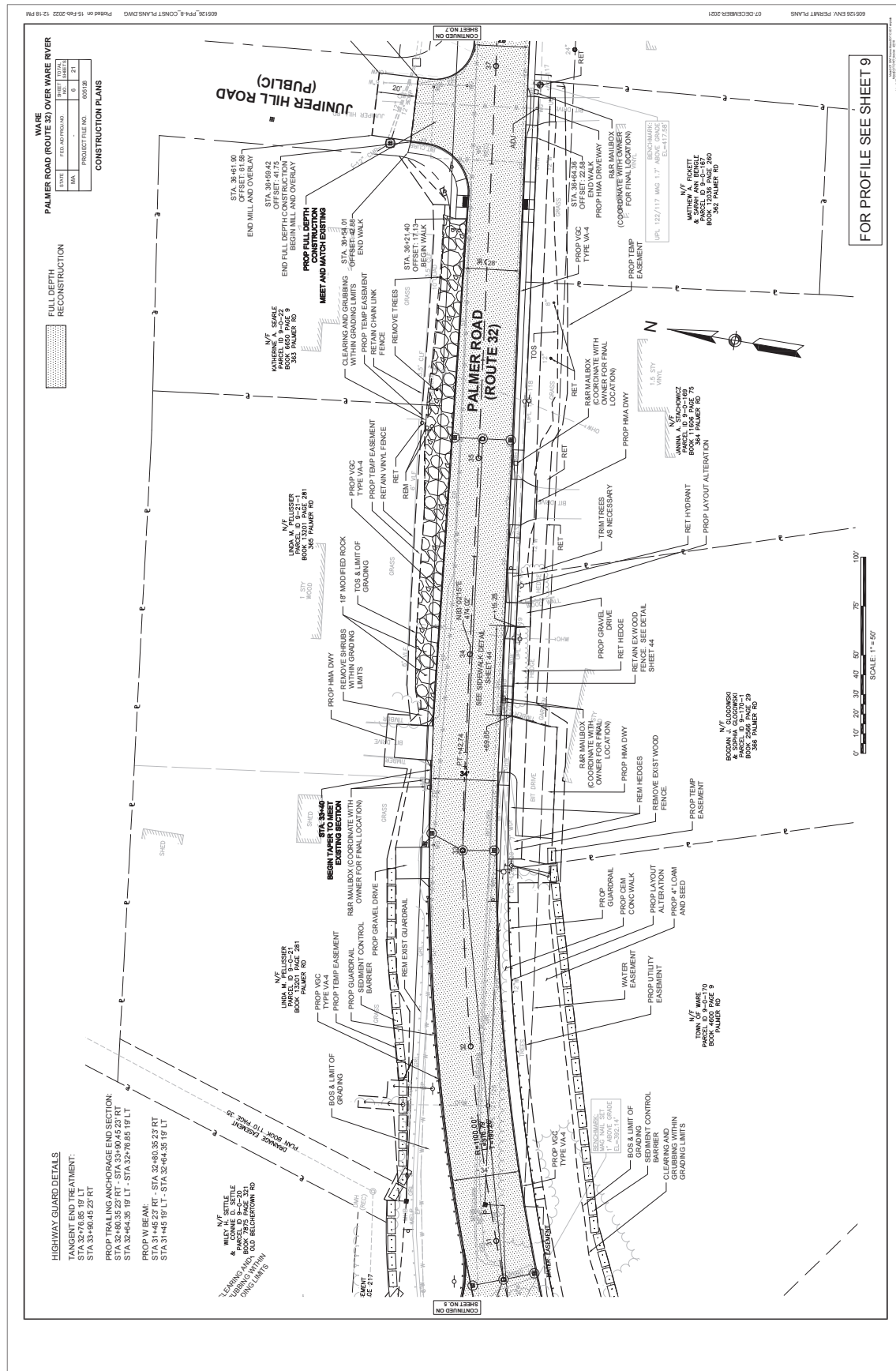
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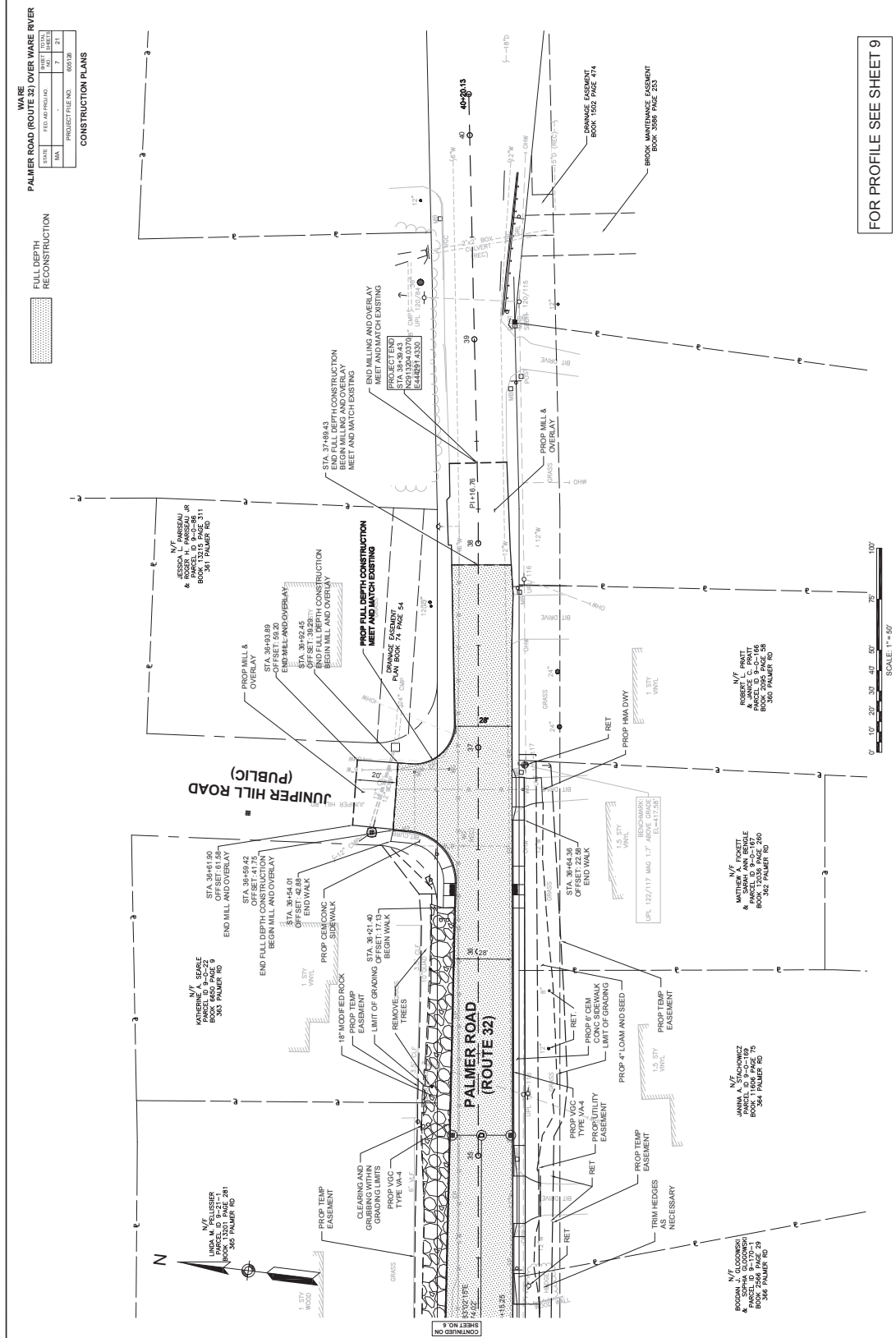


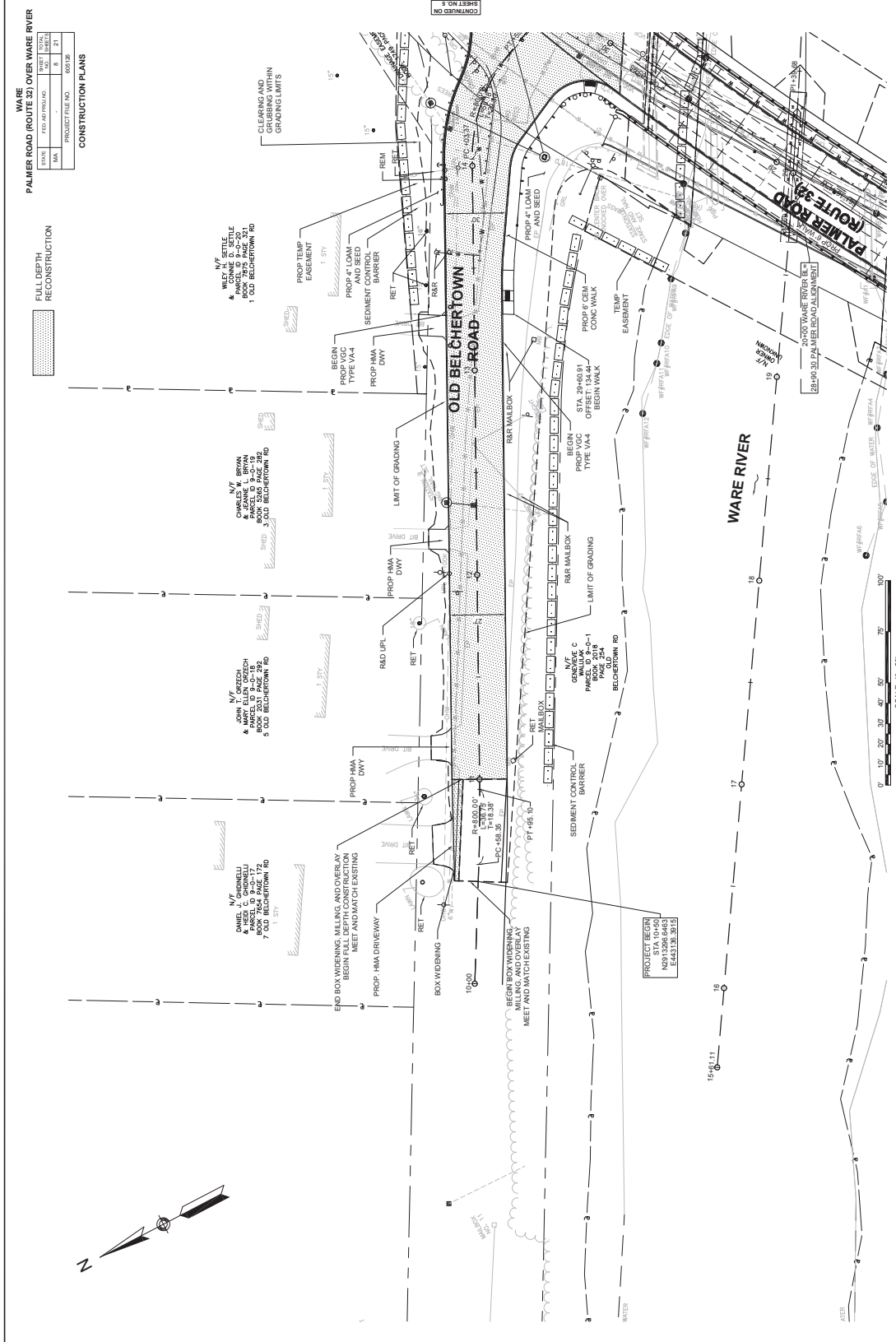


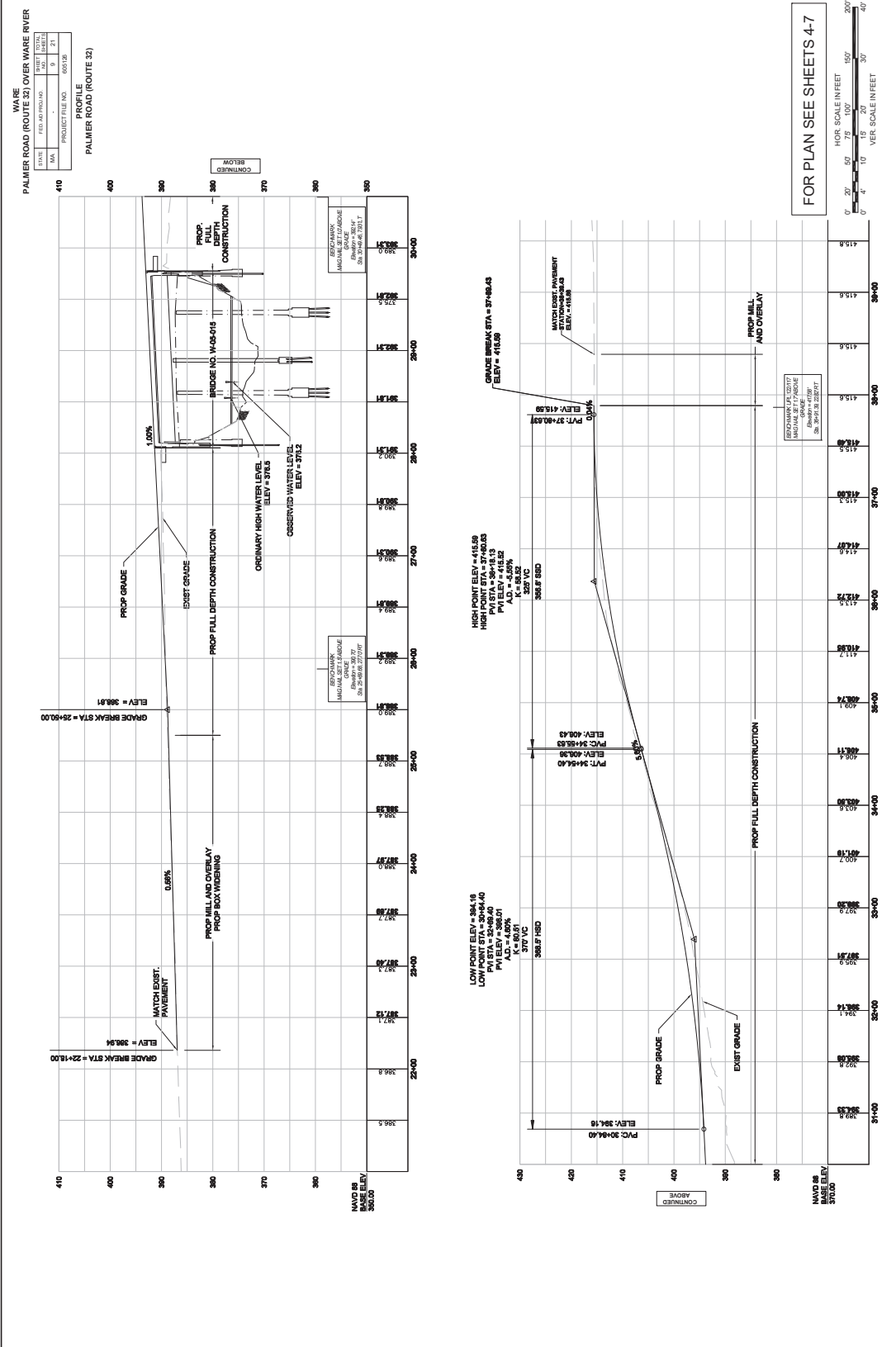


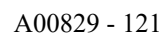


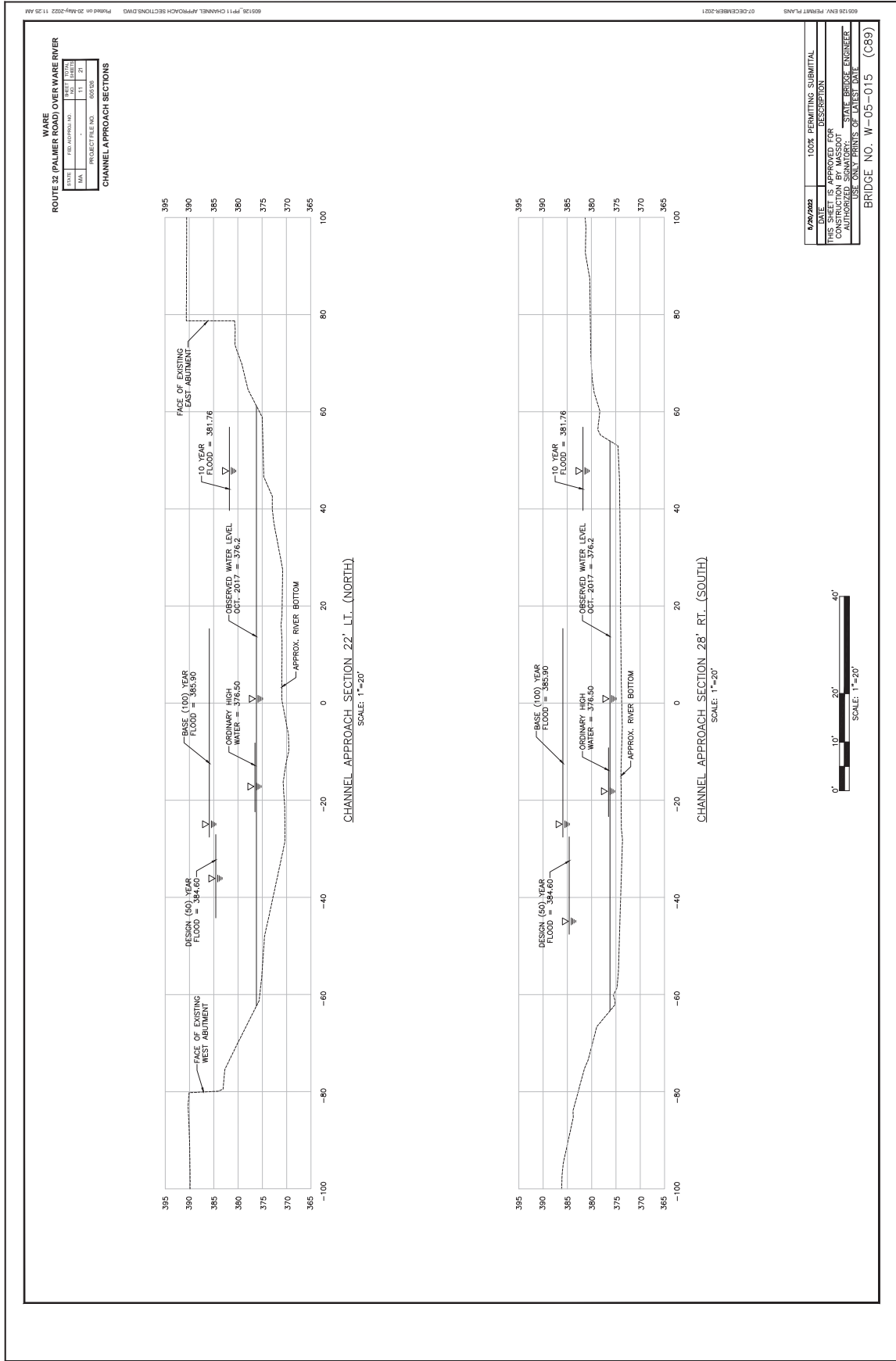


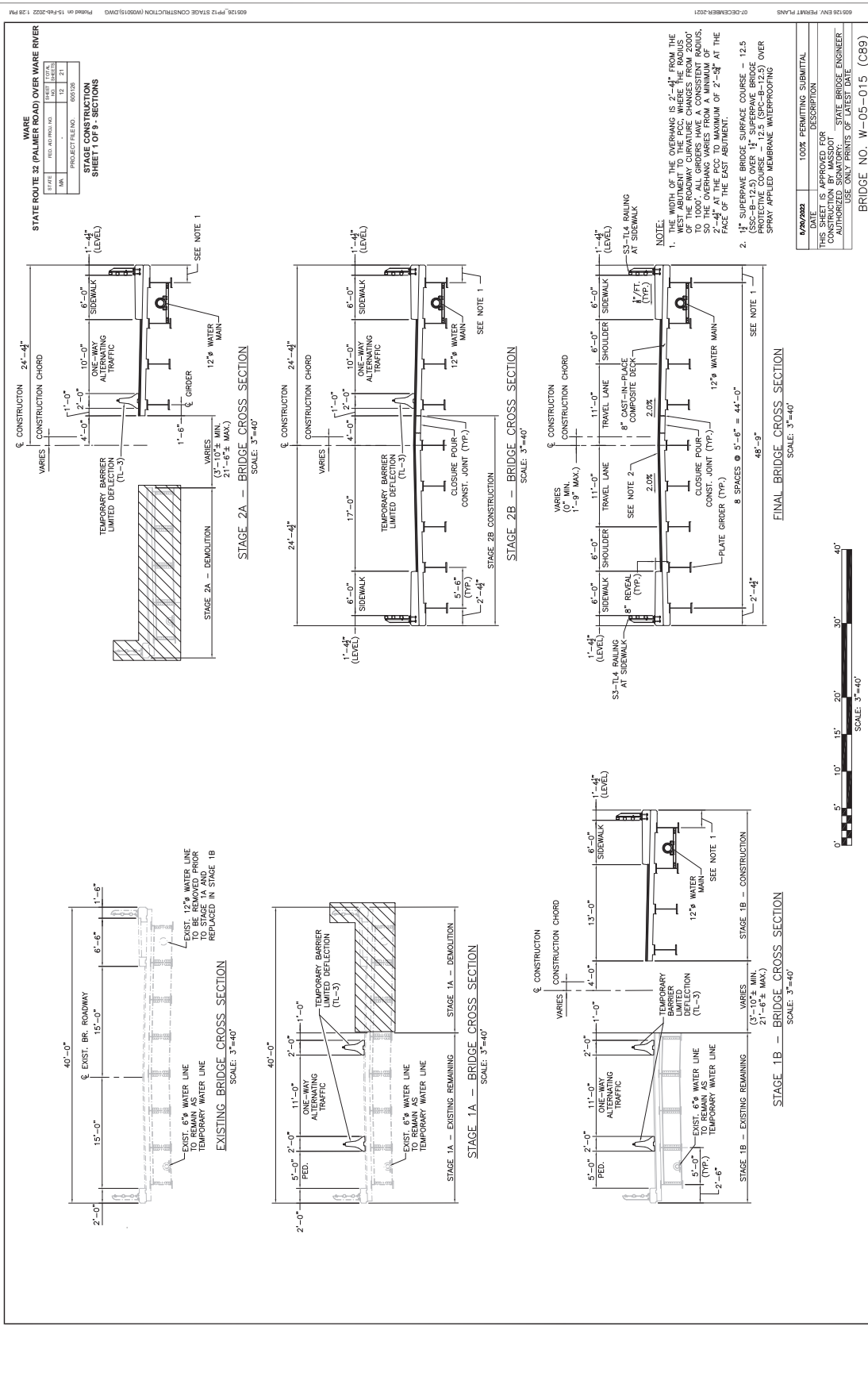














STAGE 1A

OFFICIALS

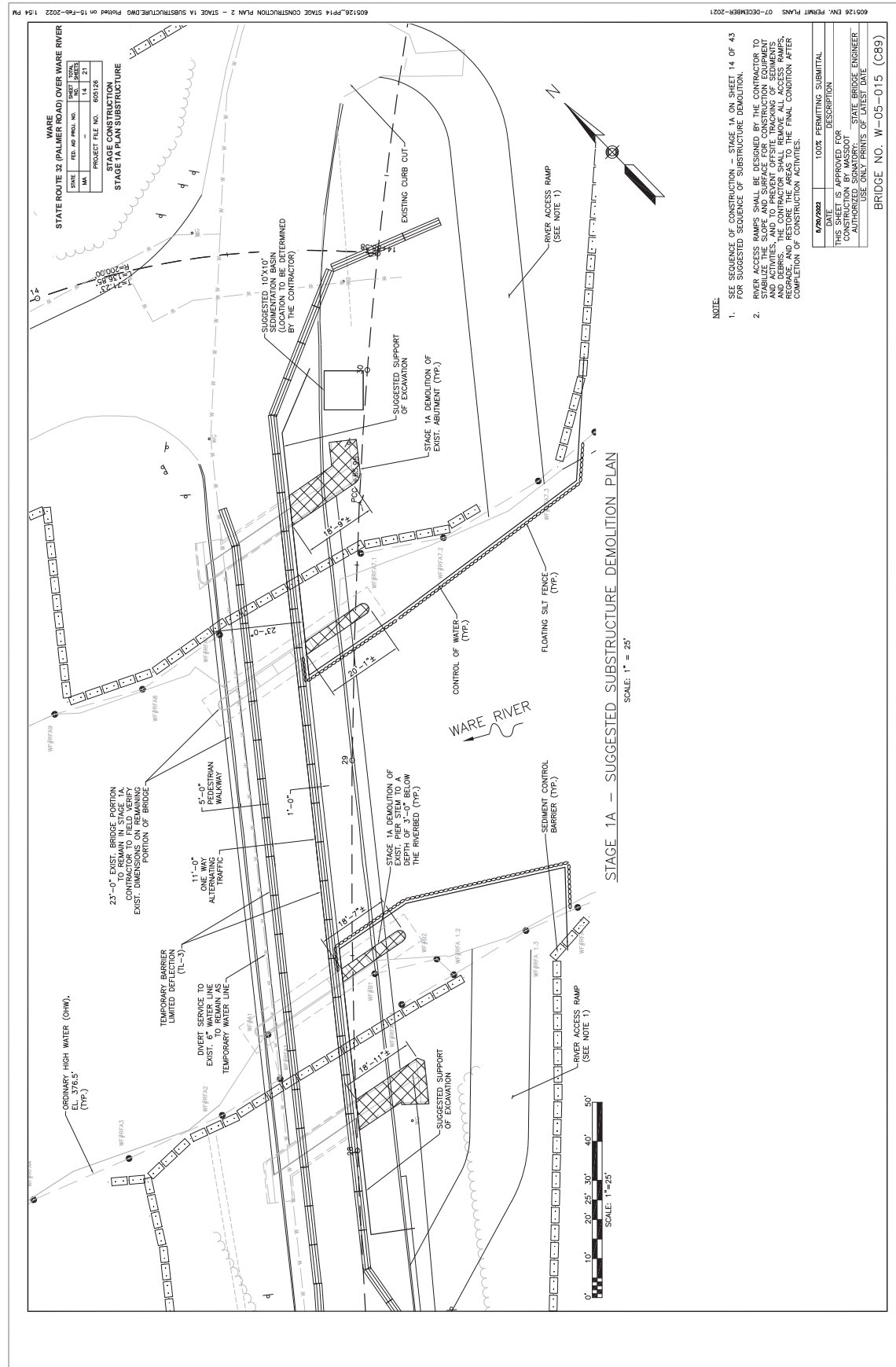
- # POSITION PHASE 1A RELATED WORK PLATFORMS IN THE WARE RIVER BELOW THE BRIDGE AND INSTALL

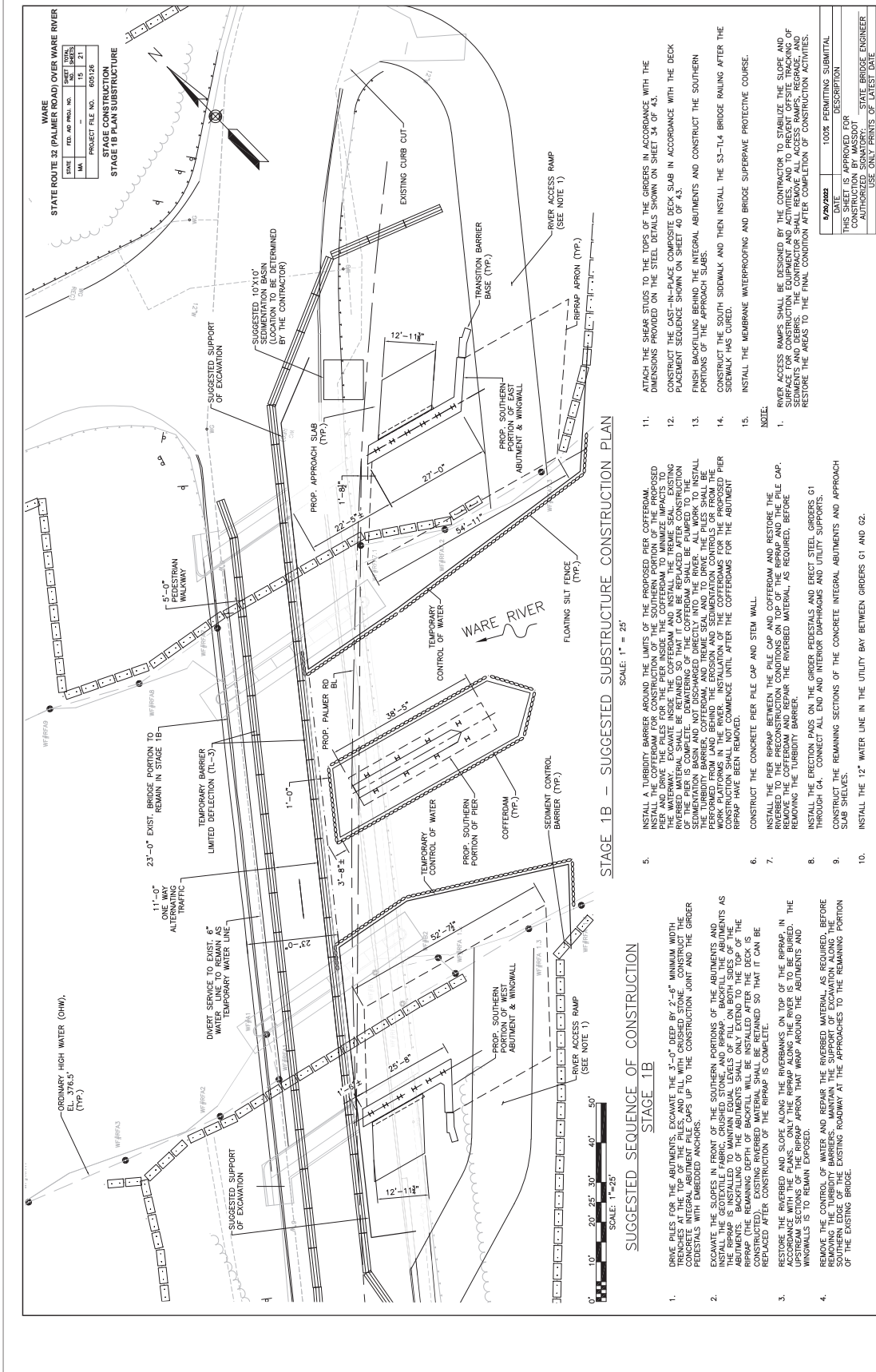
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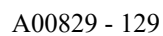
THIS SHEET IS APPROVED FOR
CONSTRUCTION BY MASSDOT
AUTHORIZED SIGNATORY: _____
STATE BRIDGE ENGINEER
LESS ONLY: PRINTS OF LATEST DATE

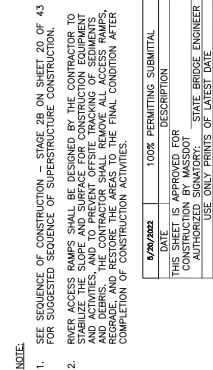
BRIDGE NO. W-05-015 (C89)

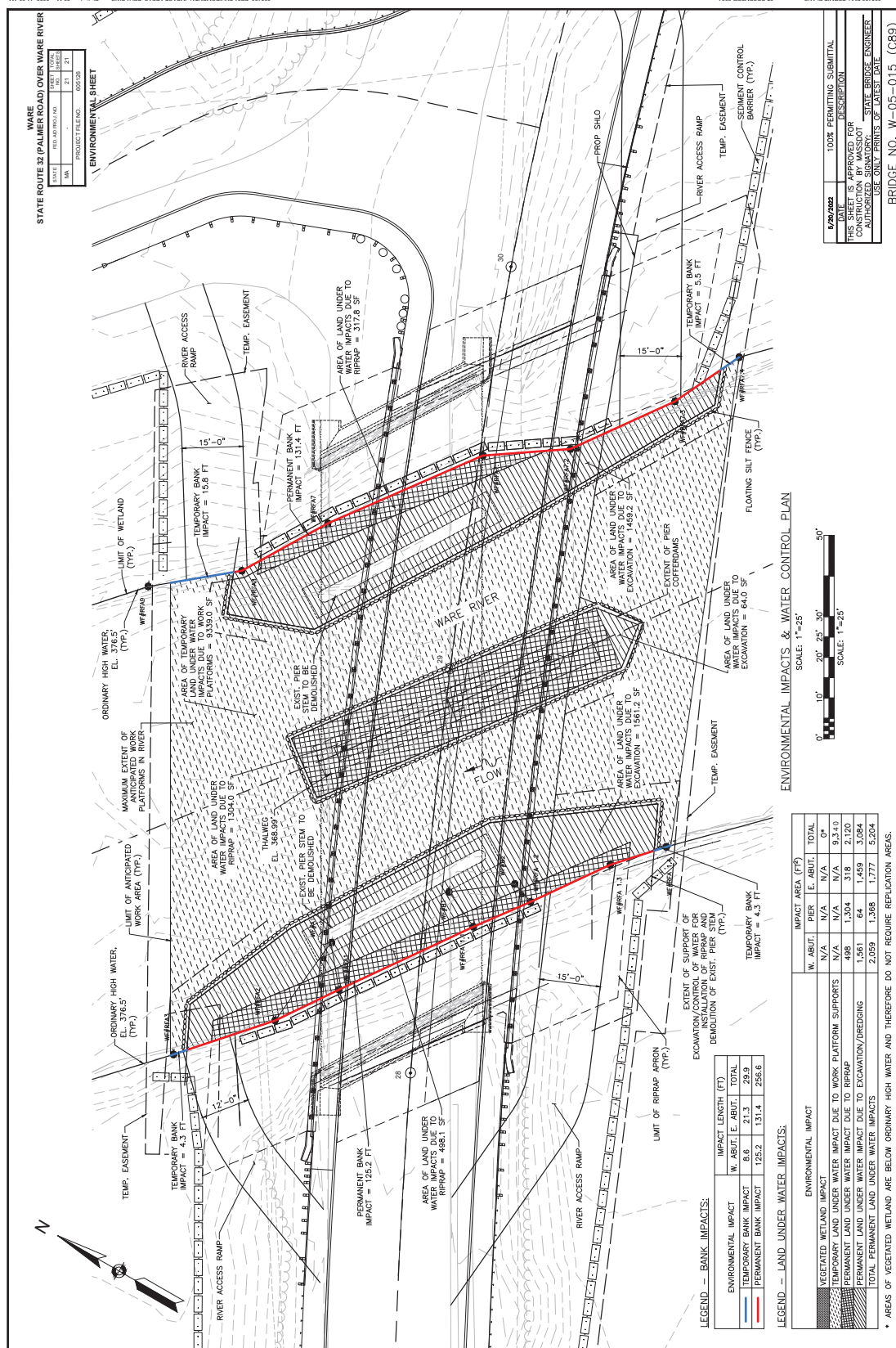












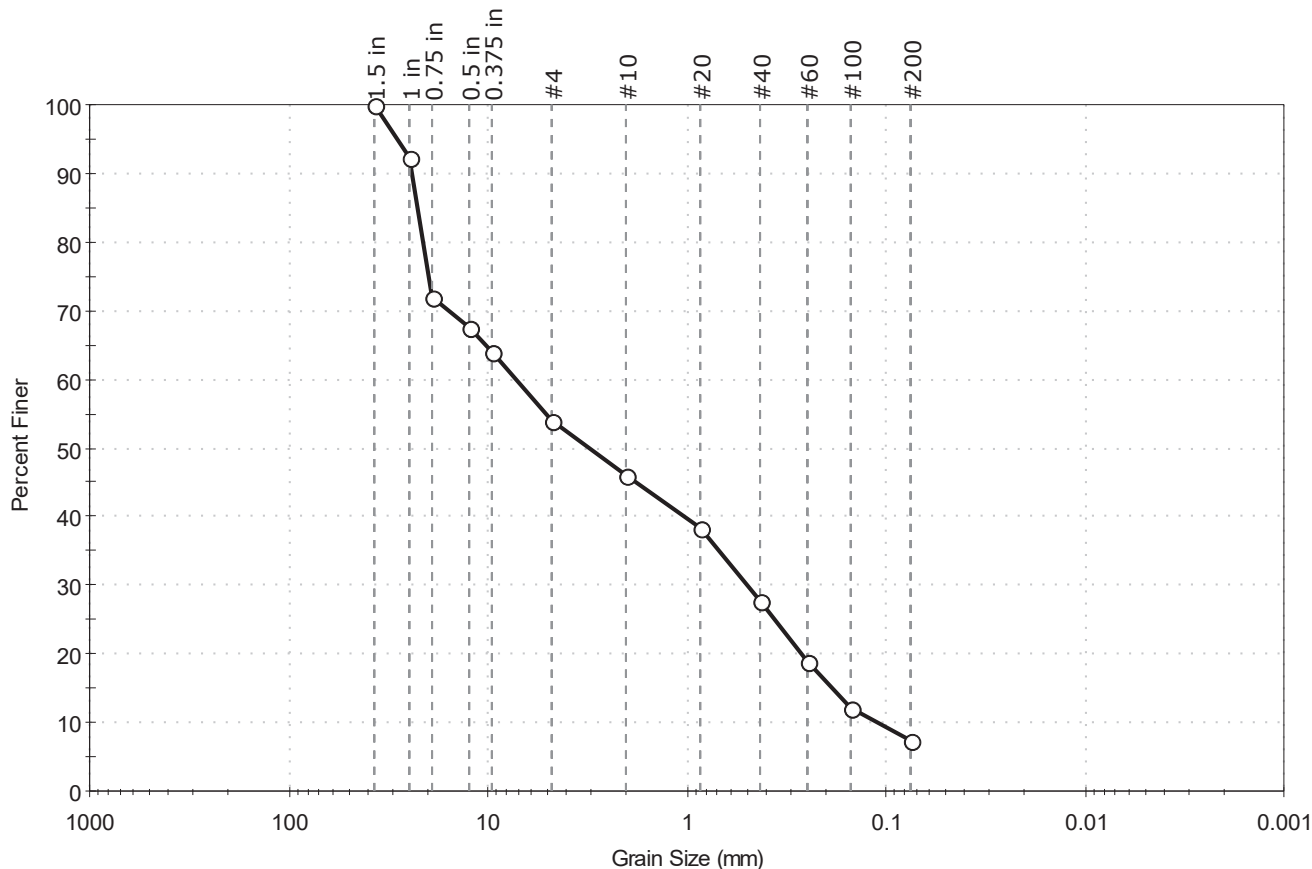
SECTION 10

SEDIMENT SIEVE ANALYSIS



Client:	Kleinfelder, Inc.	Project No:	GTX-307793
Project:	Ware Bridge		
Location:	Ware, MA		
Boring ID:	BB-1	Sample Type:	jar
Sample ID:	S-3	Test Date:	03/12/18
Depth :	4-6 ft	Test Id:	445741
Test Comment:	---		
Visual Description:	Moist, olive gray sand with silt and gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	45.9	46.6	7.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	92		
0.75 in	19.00	72		
0.5 in	12.50	67		
0.375 in	9.50	64		
#4	4.75	54		
#10	2.00	46		
#20	0.85	38		
#40	0.42	28		
#60	0.25	19		
#100	0.15	12		
#200	0.075	7.5		

Coefficients

D ₈₅ = 22.6537 mm	D ₃₀ = 0.4910 mm
D ₆₀ = 7.1739 mm	D ₁₅ = 0.1864 mm
D ₅₀ = 3.0750 mm	D ₁₀ = 0.1083 mm
C _u = 66.241	C _c = 0.310

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

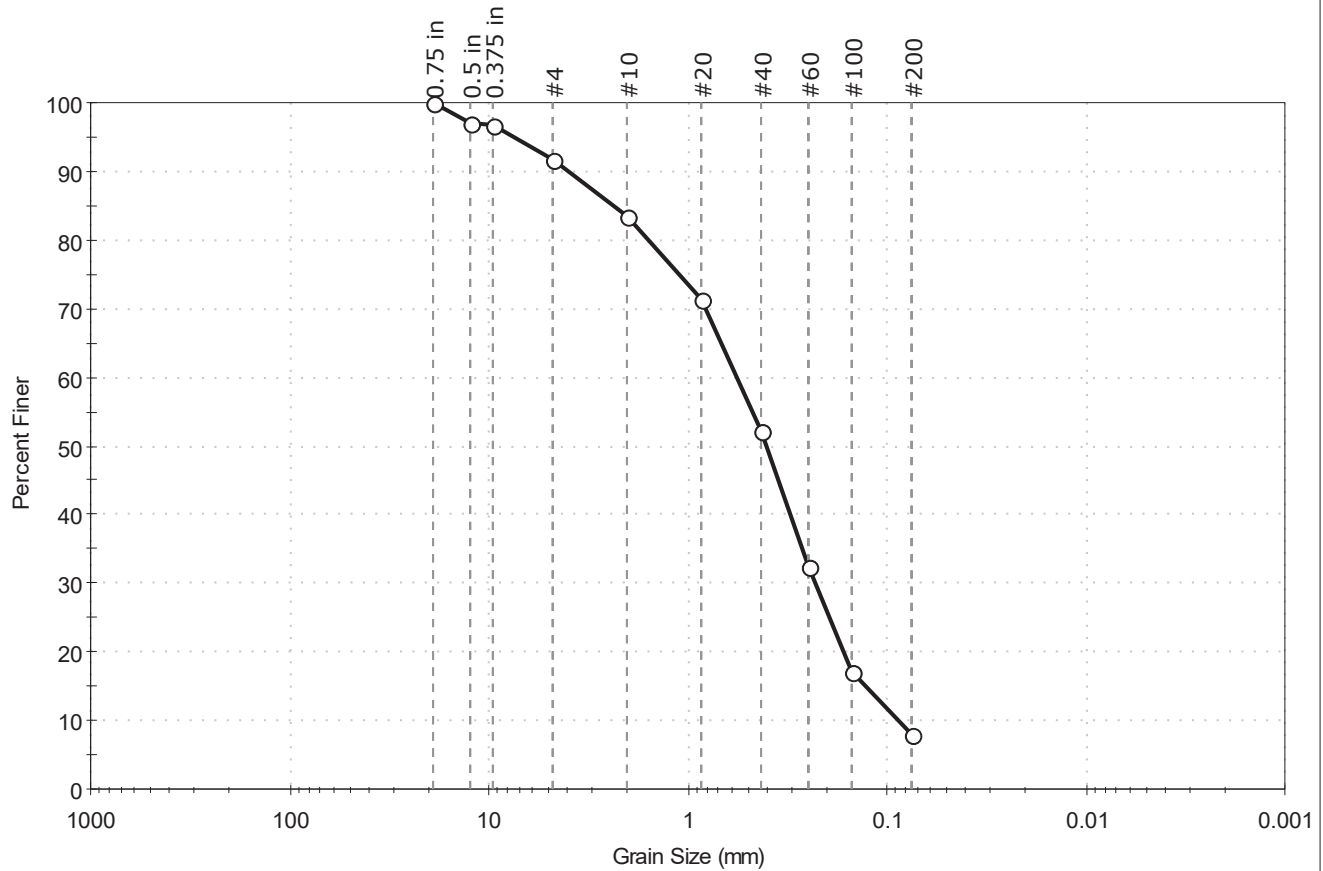
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Kleinfelder, Inc.	Project No:	GTX-307793
Project:	Ware Bridge		
Location:	Ware, MA		
Boring ID:	BB-1	Sample Type:	jar
Sample ID:	S-13	Test Date:	03/12/18
Depth :	39-41 ft	Test Id:	445742
Test Comment:	---		
Visual Description:	Moist, olive sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	8.2	83.7	8.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	97		
#4	4.75	92		
#10	2.00	83		
#20	0.85	72		
#40	0.42	52		
#60	0.25	33		
#100	0.15	17		
#200	0.075	8.1		

Coefficients

D ₈₅ = 2.3671 mm	D ₃₀ = 0.2295 mm
D ₆₀ = 0.5625 mm	D ₁₅ = 0.1265 mm
D ₅₀ = 0.4007 mm	D ₁₀ = 0.0867 mm
C _u = 6.488	C _c = 1.080

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

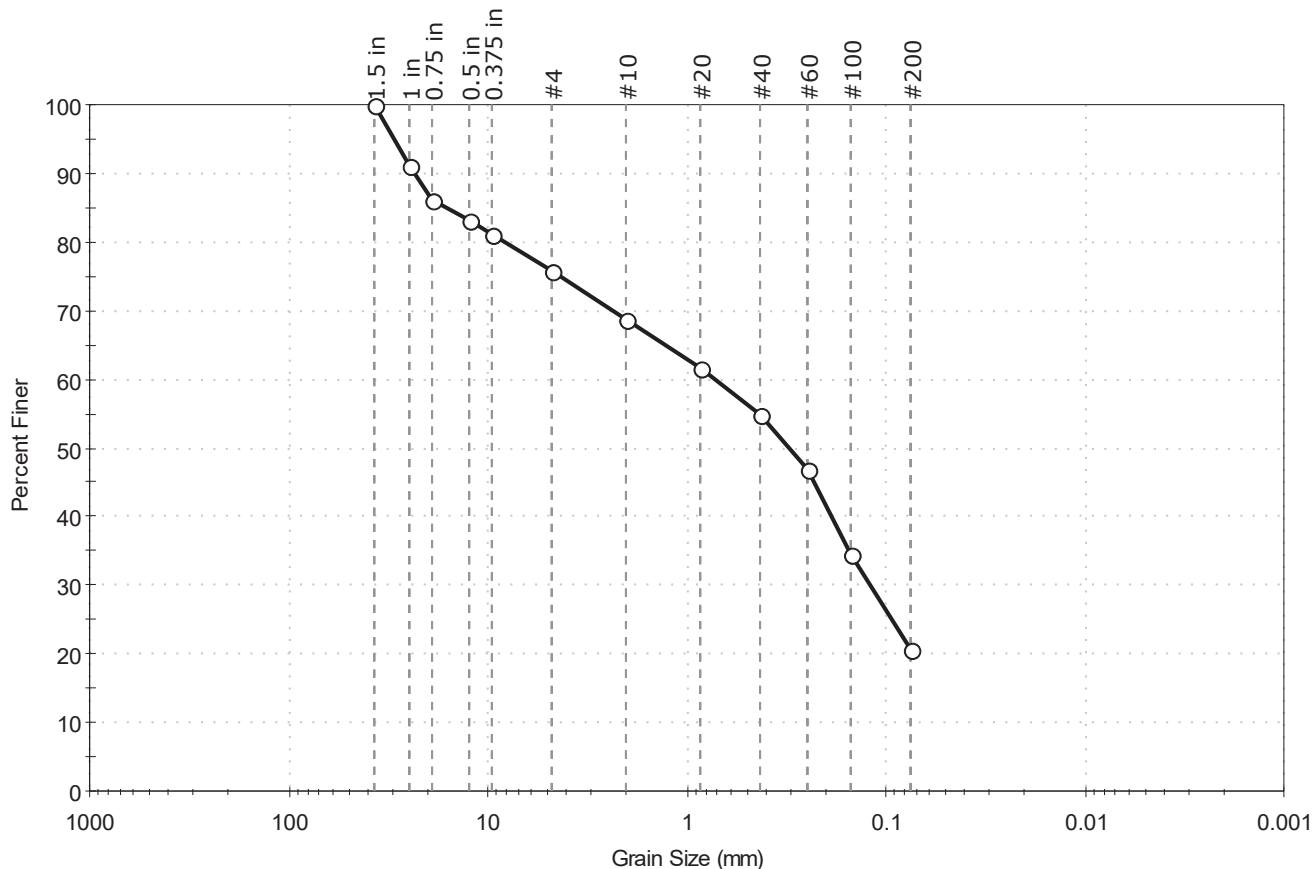
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Kleinfelder, Inc.	Project No:	GTX-307793
Project:	Ware Bridge		
Location:	Ware, MA		
Boring ID:	BB-2	Sample Type:	jar
Sample ID:	S-4	Test Date:	03/12/18
Depth :	6-8 ft	Test Id:	445743
Test Comment:	---		
Visual Description:	Moist, brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	24.3	55.2	20.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	91		
0.75 in	19.00	86		
0.5 in	12.50	83		
0.375 in	9.50	81		
#4	4.75	76		
#10	2.00	69		
#20	0.85	62		
#40	0.42	55		
#60	0.25	47		
#100	0.15	35		
#200	0.075	21		

Coefficients

D ₈₅ = 16.2031 mm	D ₃₀ = 0.1200 mm
D ₆₀ = 0.7163 mm	D ₁₅ = N/A
D ₅₀ = 0.3075 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

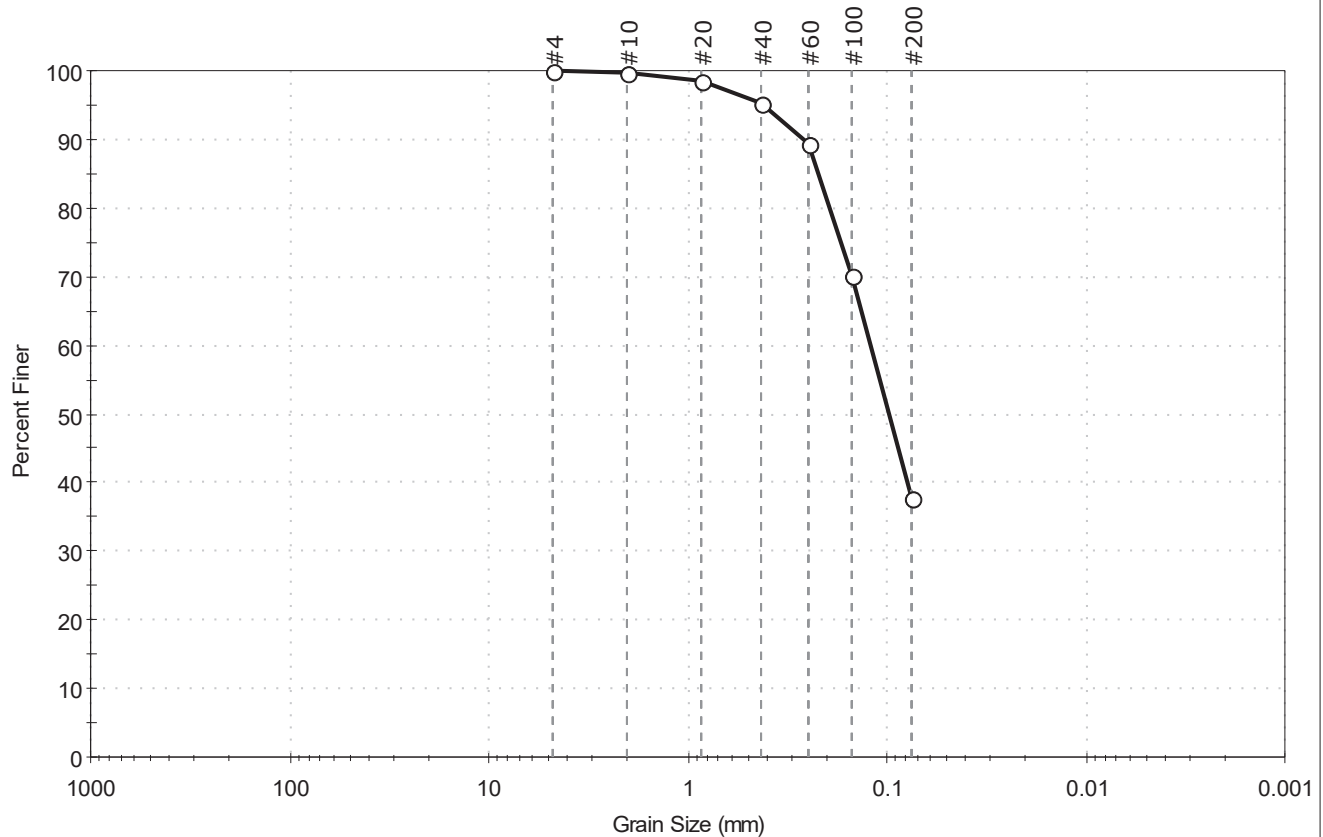
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Kleinfelder, Inc.	Project No:	GTX-307793
Project:	Ware Bridge		
Location:	Ware, MA		
Boring ID:	BB-2	Sample Type:	jar
Sample ID:	S-10	Test Date:	03/12/18
Depth :	24-26 ft	Test Id:	445744
Test Comment:	---		
Visual Description:	Moist, dark gray silty sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	62.4	37.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	95		
#60	0.25	89		
#100	0.15	70		
#200	0.075	38		

Coefficients

D ₈₅ = 0.2226 mm	D ₃₀ = N/A
D ₆₀ = 0.1209 mm	D ₁₅ = N/A
D ₅₀ = 0.0977 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Client:	Kleinfelder, Inc.				
Project:	Ware Bridge				
Location:	Ware, MA			Project No:	GTX-307793
Boring ID:	BB-2	Sample Type:	jar	Tested By:	cam
Sample ID:	S-5	Test Date:	03/12/18	Checked By:	emm
Depth :	9-11 ft	Test Id:	445745		
Test Comment:	---				
Visual Description:	Moist, dark reddish brown sandy silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	S-5	BB-2	9-11 ft	28	n/a	n/a	n/a	n/a	

Dry Strength: MEDIUM

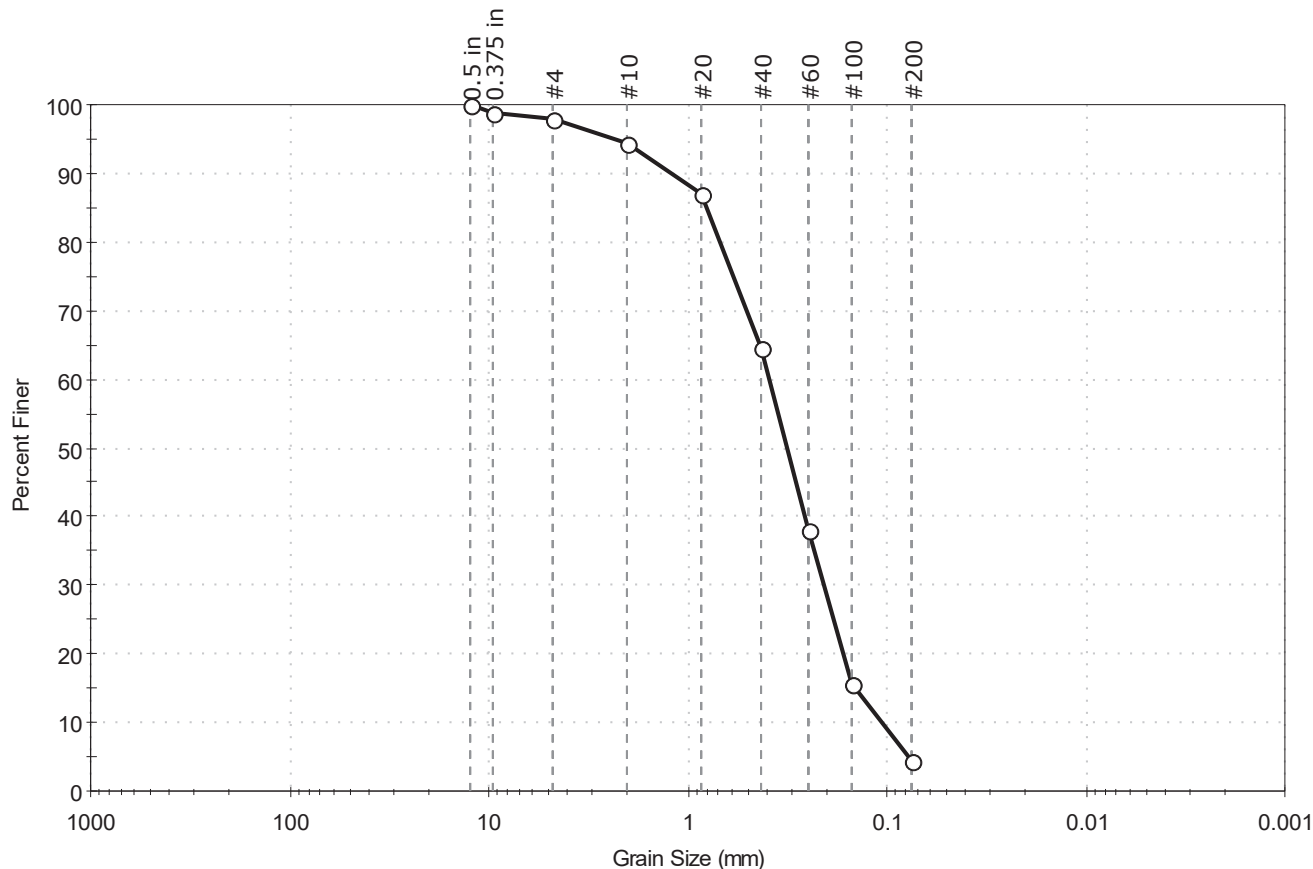
Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-101	Sample Type:	jar
Sample ID:	S-8	Test Date:	06/25/19
Depth :	29-31	Test Id:	510085
Test Comment:	---	Tested By:	ckg
Visual Description:	Moist, olive sand	Checked By:	jsc
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	2.1	93.4	4.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	98		
#10	2.00	94		
#20	0.85	87		
#40	0.42	65		
#60	0.25	38		
#100	0.15	16		
#200	0.075	4.5		

Coefficients

D ₈₅ = 0.8014 mm	D ₃₀ = 0.2082 mm
D ₆₀ = 0.3877 mm	D ₁₅ = 0.1450 mm
D ₅₀ = 0.3174 mm	D ₁₀ = 0.1060 mm
C _u = 3.658	C _c = 1.055

Classification

ASTM Poorly graded SAND (SP)

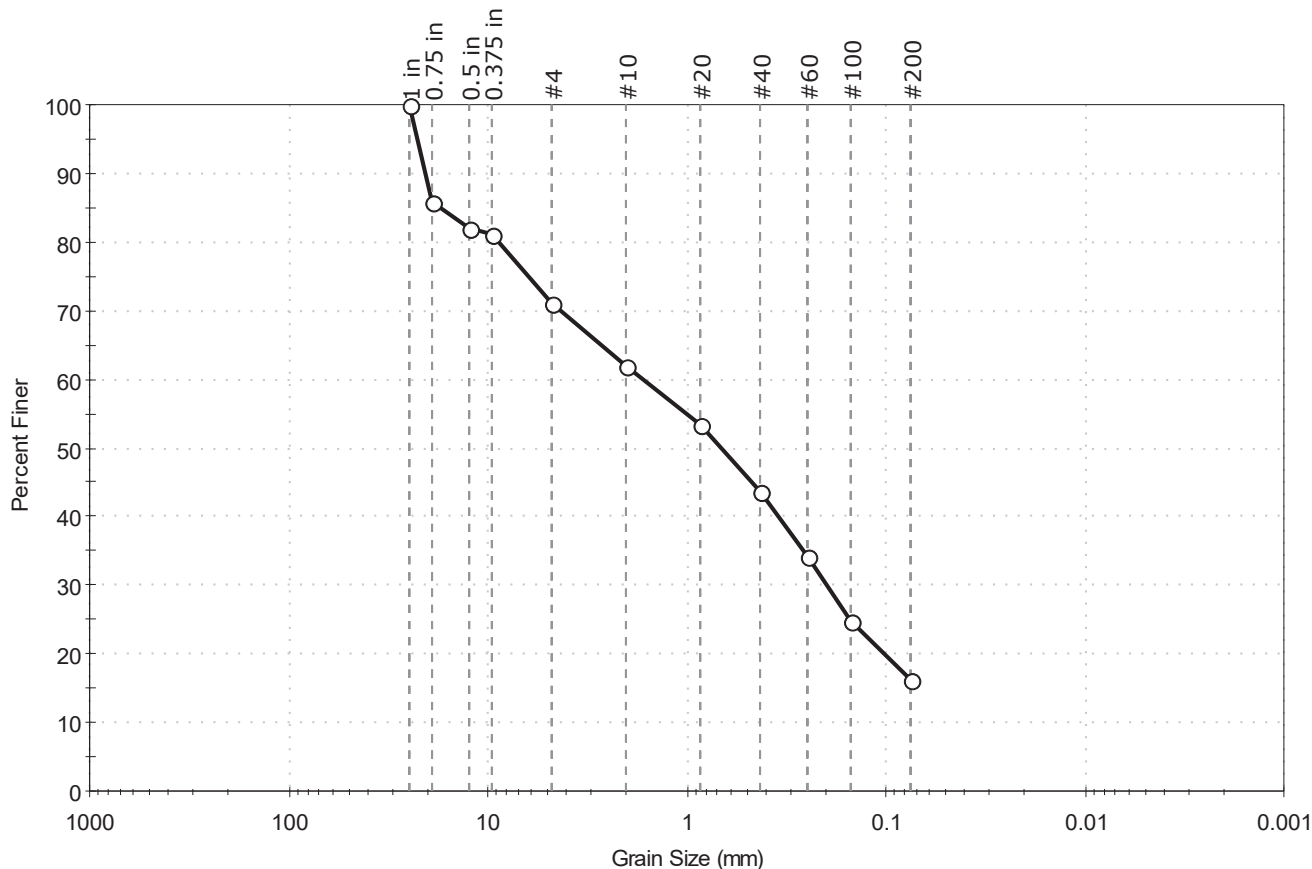
AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : **ROUNDED**
 Sand/Gravel Hardness : **HARD**

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-101	Sample Type:	jar
Sample ID:	S-12	Test Date:	06/25/19
Depth :	50-52	Test Id:	510086
Test Comment:	---		
Visual Description:	Moist, dark olive silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	28.9	55.0	16.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	86		
0.5 in	12.50	82		
0.375 in	9.50	81		
#4	4.75	71		
#10	2.00	62		
#20	0.85	53		
#40	0.42	44		
#60	0.25	34		
#100	0.15	25		
#200	0.075	16		

Coefficients

D ₈₅ = 17.1188 mm	D ₃₀ = 0.1995 mm
D ₆₀ = 1.6362 mm	D ₁₅ = N/A
D ₅₀ = 0.6738 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

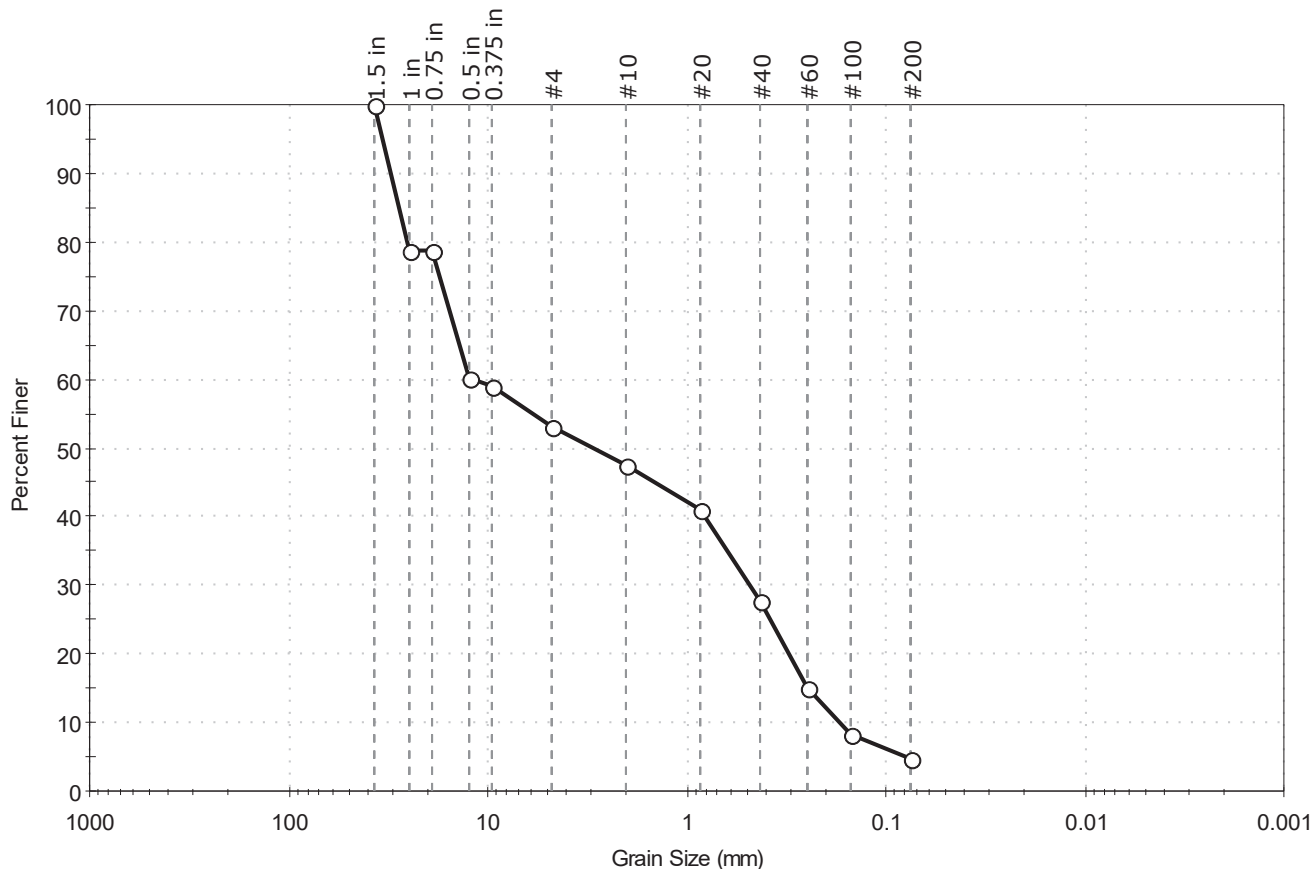
AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-102	Sample Type:	jar
Sample ID:	S-7	Test Date:	06/25/19
Depth :	20-22	Test Id:	510088
Test Comment:	---		
Visual Description:	Moist, dark yellowish brown sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	46.9	48.3	4.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	79		
0.75 in	19.00	79		
0.5 in	12.50	60		
0.375 in	9.50	59		
#4	4.75	53		
#10	2.00	47		
#20	0.85	41		
#40	0.42	28		
#60	0.25	15		
#100	0.15	8		
#200	0.075	4.8		

Coefficients

D ₈₅ = 28.1744 mm	D ₃₀ = 0.4801 mm
D ₆₀ = 12.0888 mm	D ₁₅ = 0.2494 mm
D ₅₀ = 2.9696 mm	D ₁₀ = 0.1719 mm
C _u = 70.325	C _c = 0.111

Classification

ASTM Poorly graded SAND with Gravel (SP)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

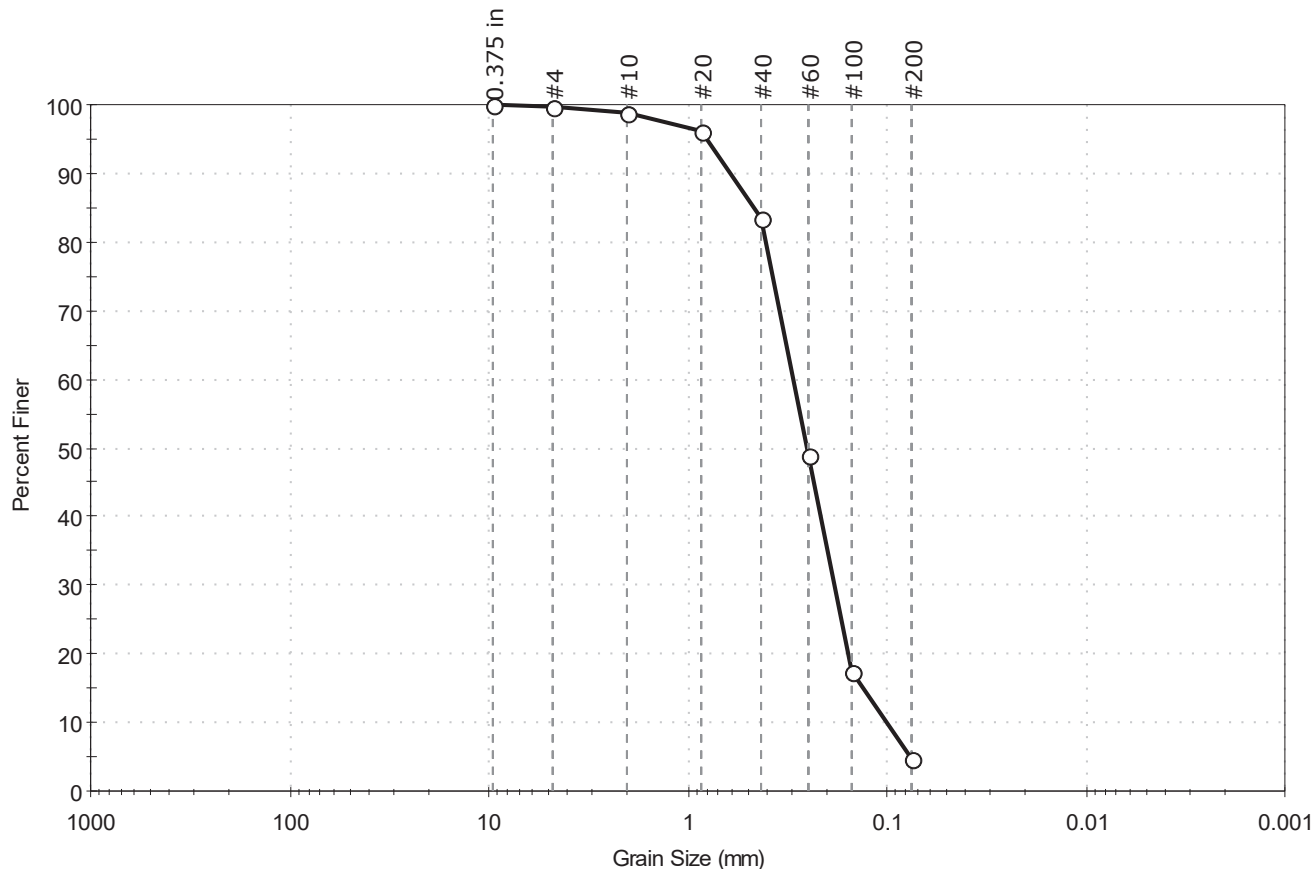
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-102	Sample Type:	jar
Sample ID:	S-10	Test Date:	06/25/19
Depth :	35-37	Test Id:	510087
Test Comment:	---	Tested By:	ckg
Visual Description:	Moist, olive sand	Checked By:	jsc
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.2	95.1	4.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#20	0.85	96		
#40	0.42	83		
#60	0.25	49		
#100	0.15	17		
#200	0.075	4.7		

Coefficients

D ₈₅ = 0.4629 mm	D ₃₀ = 0.1841 mm
D ₆₀ = 0.2964 mm	D ₁₅ = 0.1319 mm
D ₅₀ = 0.2542 mm	D ₁₀ = 0.1003 mm
C _u = 2.955	C _c = 1.140

Classification

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

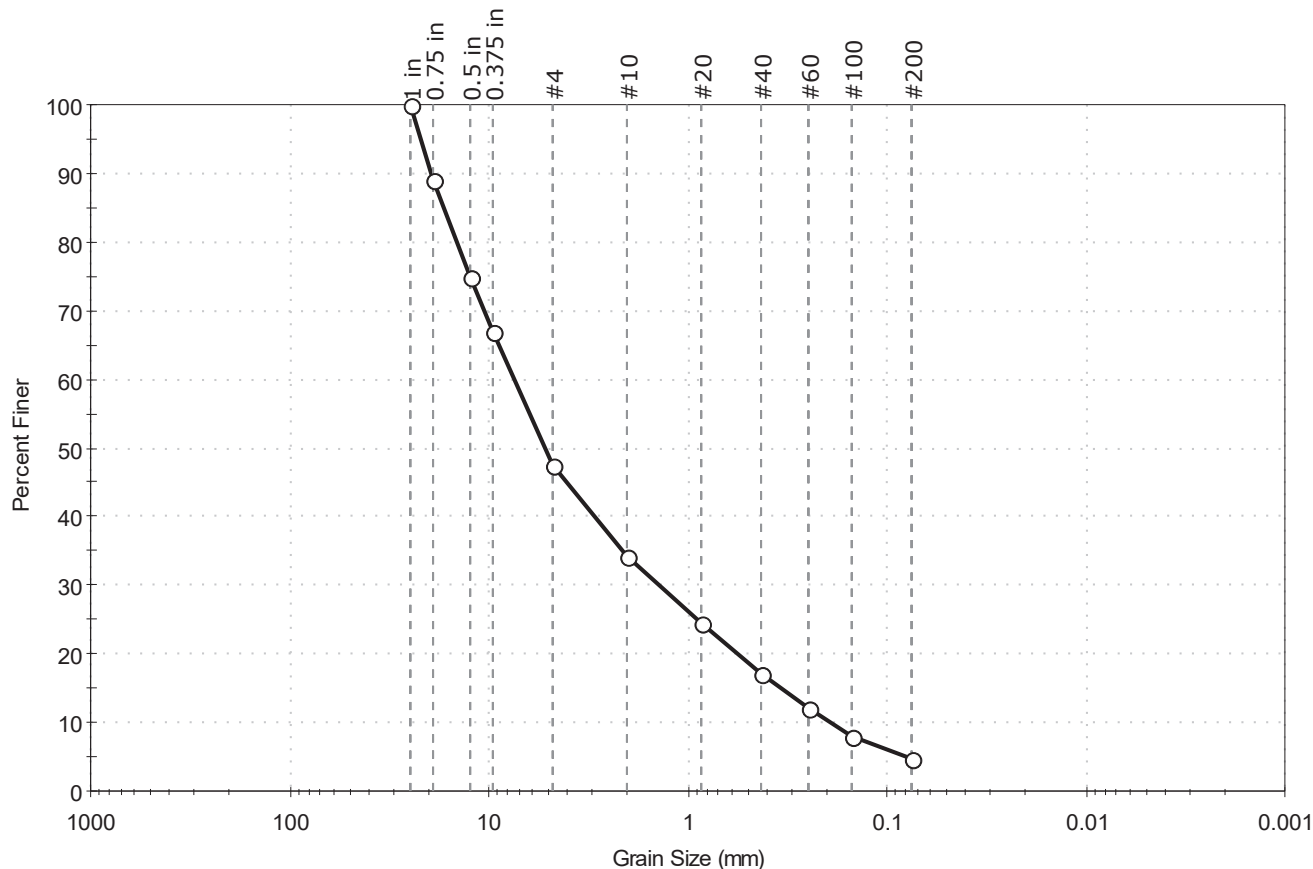
Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-103	Sample Type:	jar
Sample ID:	S-1	Test Date:	06/25/19
Depth :	23.4-25.4	Test Id:	510089
Test Comment:	---		
Visual Description:	Moist, olive brown gravel with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	52.5	42.9	4.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	89		
0.5 in	12.50	75		
0.375 in	9.50	67		
#4	4.75	48		
#10	2.00	34		
#20	0.85	25		
#40	0.42	17		
#60	0.25	12		
#100	0.15	8		
#200	0.075	4.6		

Coefficients

D ₈₅ = 16.8241 mm	D ₃₀ = 1.3744 mm
D ₆₀ = 7.4147 mm	D ₁₅ = 0.3394 mm
D ₅₀ = 5.1805 mm	D ₁₀ = 0.1937 mm
C _u = 38.279	C _c = 1.315

Classification

ASTM Well-graded GRAVEL with Sand (GW)

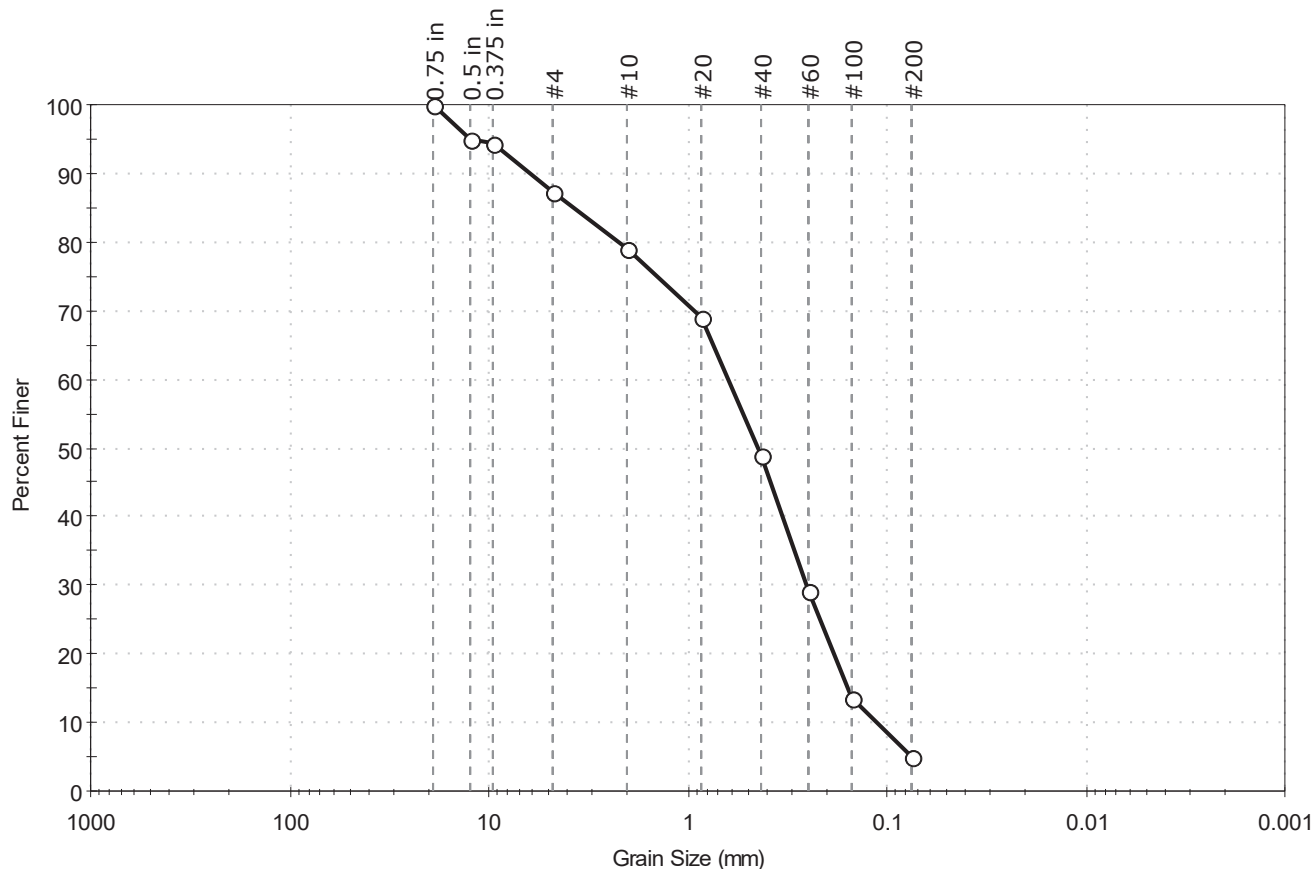
AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-103	Sample Type:	jar
Sample ID:	S-3	Test Date:	06/25/19
Depth :	35-37	Test Id:	510090
Test Comment:	---		
Visual Description:	Moist, yellowish brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	12.8	82.1	5.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	94		
#4	4.75	87		
#10	2.00	79		
#20	0.85	69		
#40	0.42	49		
#60	0.25	29		
#100	0.15	14		
#200	0.075	5.1		

Coefficients

D ₈₅ = 3.7492 mm	D ₃₀ = 0.2551 mm
D ₆₀ = 0.6218 mm	D ₁₅ = 0.1573 mm
D ₅₀ = 0.4384 mm	D ₁₀ = 0.1120 mm
C _u = 5.552	C _c = 0.934

Classification

ASTM N/A

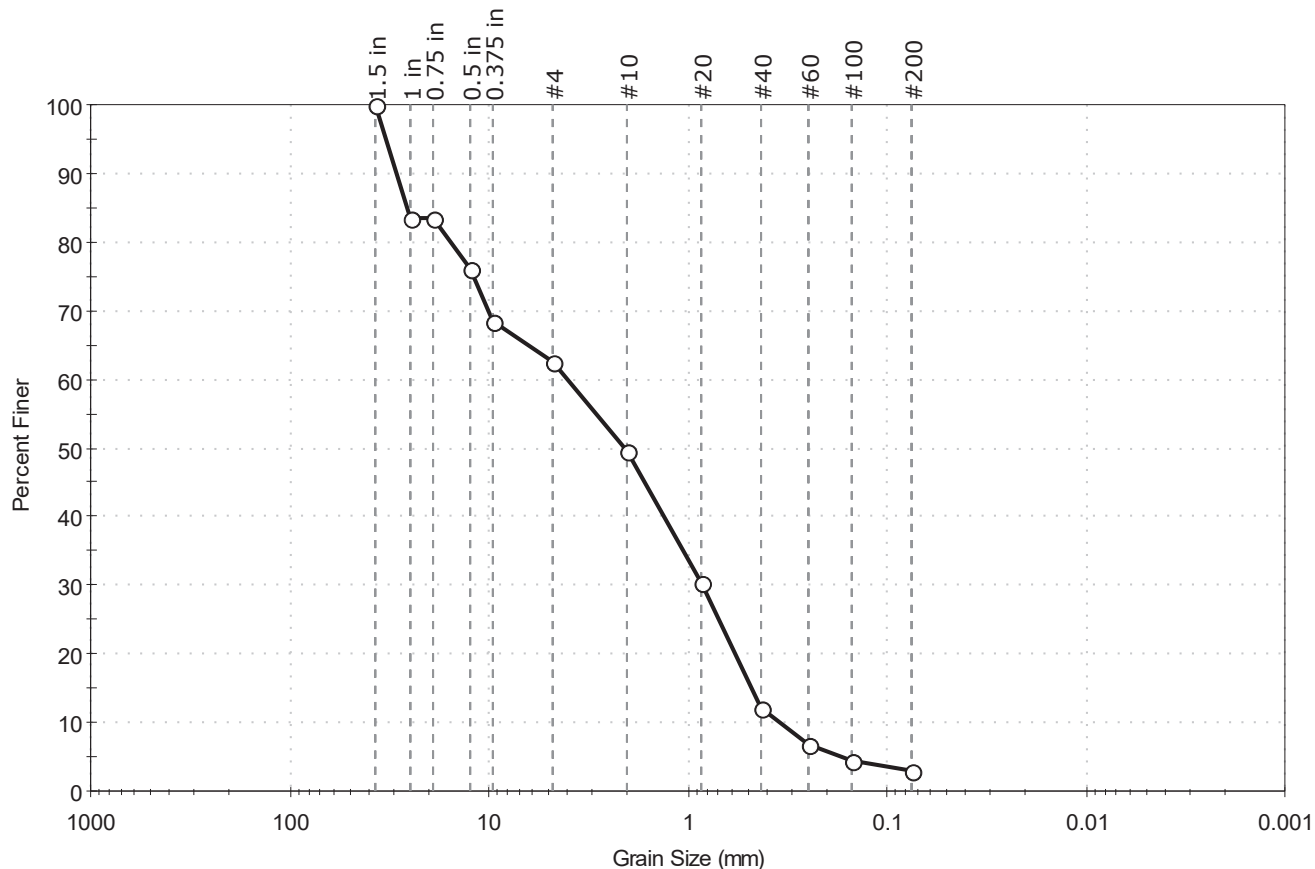
AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-104	Sample Type:	jar
Sample ID:	S-1	Test Date:	06/25/19
Depth :	21.8-23.8	Test Id:	510091
Test Comment:	---		
Visual Description:	Moist, olive brown sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	37.4	59.6	3.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	84		
0.75 in	19.00	84		
0.5 in	12.50	76		
0.375 in	9.50	68		
#4	4.75	63		
#10	2.00	49		
#20	0.85	30		
#40	0.42	12		
#60	0.25	7		
#100	0.15	4		
#200	0.075	3.0		

Coefficients

D ₈₅ = 25.9011 mm	D ₃₀ = 0.8396 mm
D ₆₀ = 3.9931 mm	D ₁₅ = 0.4733 mm
D ₅₀ = 2.0698 mm	D ₁₀ = 0.3430 mm
C _u = 11.642	C _c = 0.515

Classification

ASTM Poorly graded SAND with Gravel (SP)

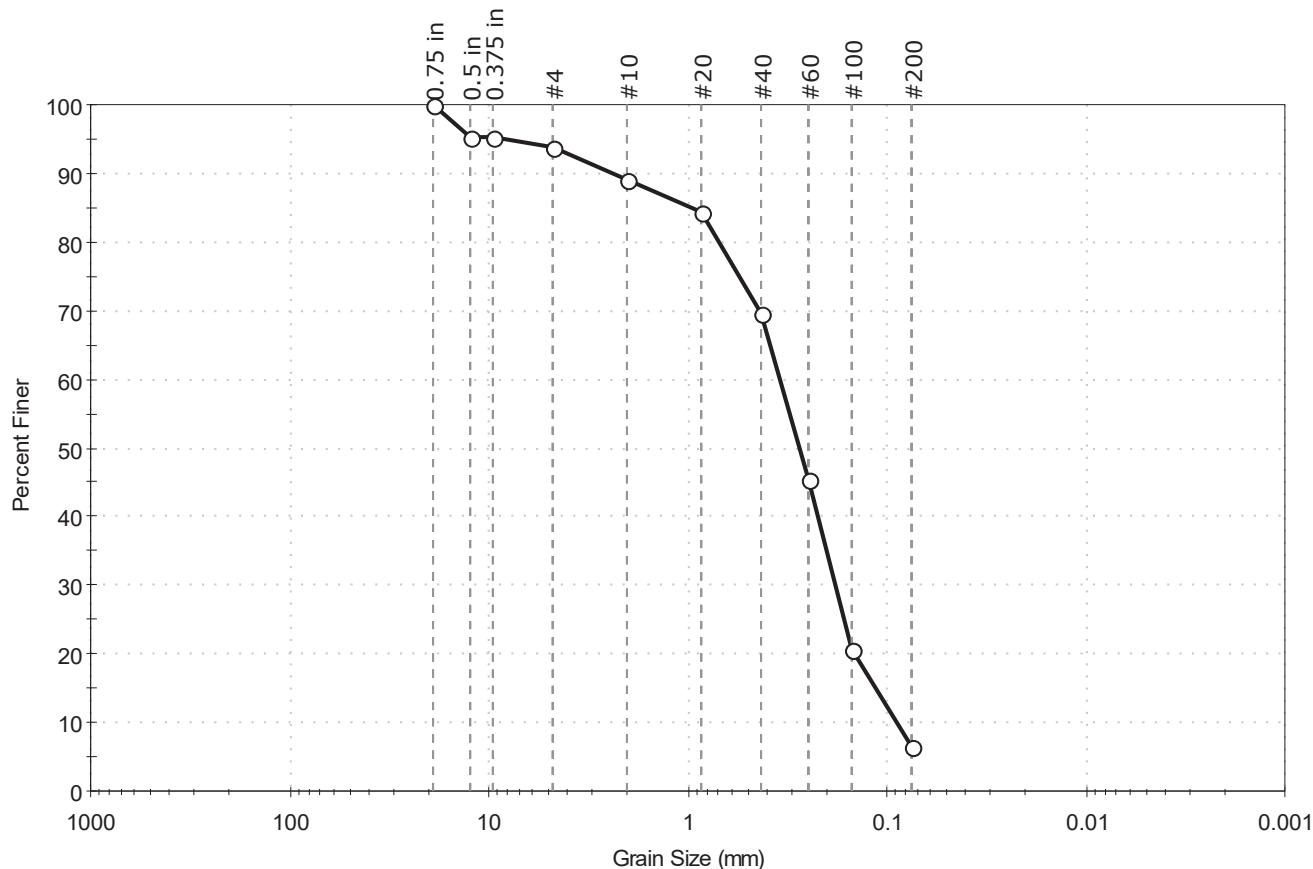
AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-104	Sample Type:	jar
Sample ID:	S-3	Test Date:	06/25/19
Depth :	34-36	Test Id:	510092
Test Comment:	---		
Visual Description:	Moist, olive brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	6.3	87.1	6.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	95		
#4	4.75	94		
#10	2.00	89		
#20	0.85	84		
#40	0.42	70		
#60	0.25	45		
#100	0.15	21		
#200	0.075	6.6		

Coefficients

D ₈₅ = 0.9561 mm	D ₃₀ = 0.1822 mm
D ₆₀ = 0.3441 mm	D ₁₅ = 0.1138 mm
D ₅₀ = 0.2766 mm	D ₁₀ = 0.0887 mm
C _u = 3.879	C _c = 1.088

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.		
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA	Project No:	GTX-310168
Boring ID:	BB-102	Sample Type:	cylinder
Sample ID:	C-1	Test Date:	06/24/19
Depth :	63.5-64.2	Test Id:	510093
Test Comment:	---		
Visual Description:	See photograph(s)		
Sample Comment:	---		

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
BB-102	C-1	63.50-63.85	178	20439	1	No	2,*

- Notes: Density determined on core samples by measuring dimensions and weight and then calculating.
- All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
- The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
- Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure (See attached photographs)
- 1: Best effort end preparation. See Tolerance report for details.
 - 2: The as-received core did not meet the ASTM side straightness tolerance due to irregularities in the sample as cored.
 - 3: Specimen L/D < 2.
 - 4: The as-received core did not meet the ASTM minimum diameter tolerance of 1.875 inches.
 - 5: Specimen diameter is less than 10 times maximum particle size.
 - 6: Specimen diameter is less than 6 times maximum particle size.

*Because the indicated tested specimens did not meet the ASTM D4543 standard tolerances, the results reported here may differ from those for a test specimen within tolerances.



Client:	Kleinfelder, Inc.	Test Date:	6/21/2019
Project Name:	Rte 32 (Palmer Rd) over Ware River	Tested By:	crnh
Project Location:	Ware, MA	Checked By:	jsc
GTX #:	310168		
Boring ID:	BB-102		
Sample ID:	C-1		
Depth:	63.50-63.85 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
1		2		Average		Maximum gap between side of core and reference surface plate: Is the maximum gap ≤ 0.02 in.?	
Specimen Length, in:	4.19	4.19	4.19	4.19	4.19	NO	
Specimen Diameter, in:	1.97	1.97	1.97	1.97	1.97		
Specimen Mass, g:	596.44						
Bulk Density, lb/ft ³ :	178						
Length to Diameter Ratio:	2.1						
END FLATNESS AND PARALLELISM (Procedure FP1)							
END 1		-0.875		-0.750		Straightness Tolerance Met?	
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	NO
Diameter 2, in (rotated 90°)	-0.00050	-0.00050	-0.00020	-0.00020	-0.00020	0.00040	
END 2		-0.875		-0.625		Difference between max and min readings, in:	
Diameter 1, in	0.00010	0.00000	0.00000	0.00000	0.00000	0.00020	90° = 0.00110
Diameter 2, in (rotated 90°)	-0.00090	-0.00080	-0.00080	-0.00080	-0.00080	0.00020	90° = 0.00110
						Maximum difference must be ≤ 0.0020 in. Difference = ± 0.00055	
						Flatness Tolerance Met? YES	
DIAMETER 1				DIAMETER 2			
End 1: Slope of Best Fit Line Angle of Best Fit Line:				End 1: Slope of Best Fit Line Angle of Best Fit Line:			
End 2: Slope of Best Fit Line Angle of Best Fit Line:				End 2: Slope of Best Fit Line Angle of Best Fit Line:			
Maximum Angular Difference:				Maximum Angular Difference:			
Parallelism Tolerance Met? Spherically Seated				Parallelism Tolerance Met? Spherically Seated			
YES				YES			
DIAMETER 1				DIAMETER 2			
End 1: Slope of Best Fit Line Angle of Best Fit Line:				End 1: Slope of Best Fit Line Angle of Best Fit Line:			
End 2: Slope of Best Fit Line Angle of Best Fit Line:				End 2: Slope of Best Fit Line Angle of Best Fit Line:			
Maximum Angular Difference:				Maximum Angular Difference:			
Parallelism Tolerance Met? Spherically Seated				Parallelism Tolerance Met? Spherically Seated			
YES				YES			
Maximum angle of departure must be $\leq 0.25^\circ$							
Perpendicularity Tolerance Met? YES							
END 2							
Diameter 1, in		0.00050		1.970		Perpendicularity Tolerance Met?	
Diameter 2, in (rotated 90°)		0.00110		1.970		YES	



Client:	Kleinfelder, Inc.
Project Name:	Rte 32 (Palmer Rd) over Ware River
Project Location:	Ware, MA
GTX #:	310168
Test Date:	6/24/2019
Tested By:	cmh
Checked By:	jsc
Boring ID:	BB-102
Sample ID:	C-1
Depth, ft:	63.50-63.85

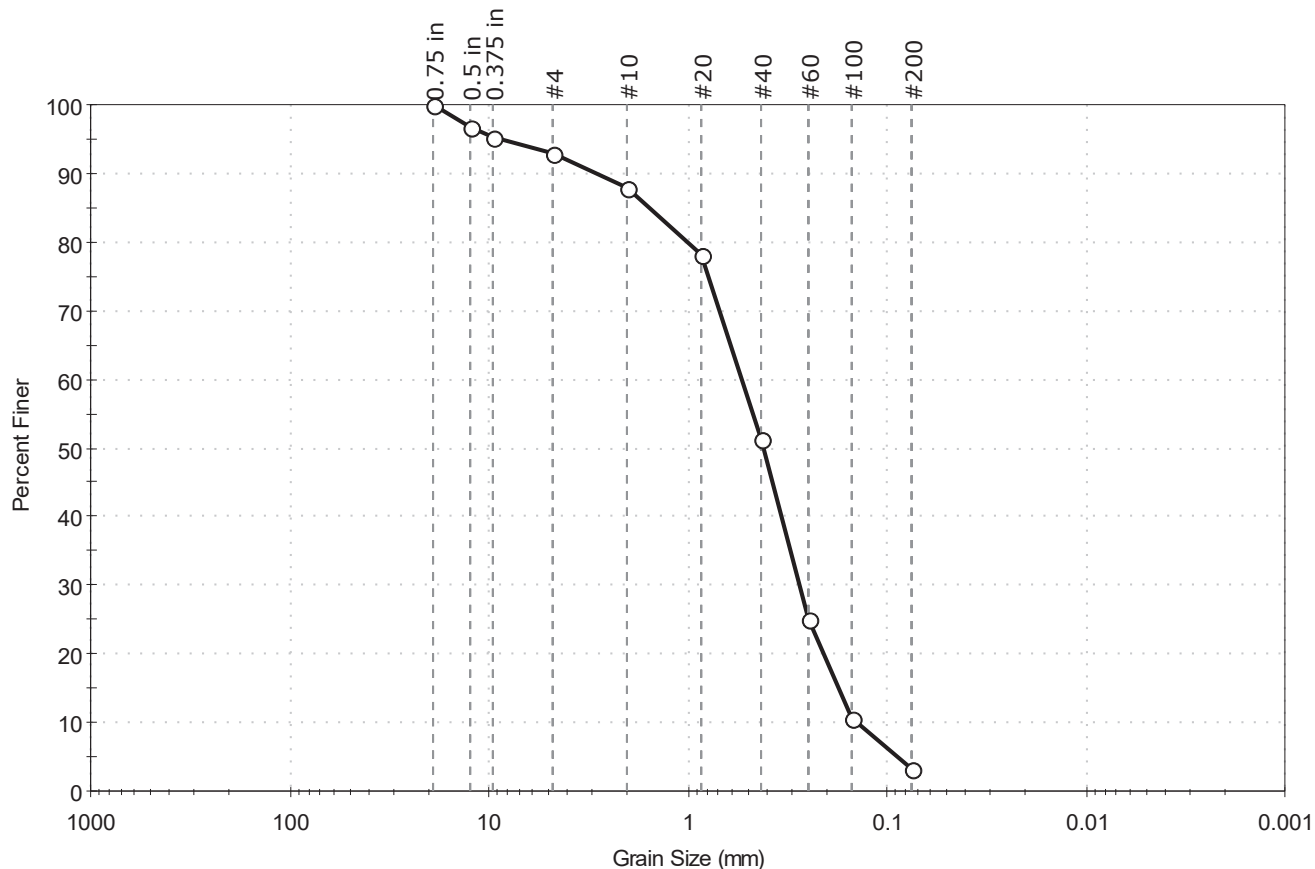
No Photo Available



After break

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	B-201	Sample Type:	jar
Sample ID:	S10	Test Date:	01/10/20
Depth :	34-36 ft	Test Id:	537206
Test Comment:	---		
Visual Description:	Moist, light olive brown sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	6.9	89.9	3.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	95		
#4	4.75	93		
#10	2.00	88		
#20	0.85	78		
#40	0.42	51		
#60	0.25	25		
#100	0.15	11		
#200	0.075	3.2		

Coefficients

D ₈₅ = 1.5331 mm	D ₃₀ = 0.2761 mm
D ₆₀ = 0.5311 mm	D ₁₅ = 0.1751 mm
D ₅₀ = 0.4138 mm	D ₁₀ = 0.1416 mm
C _u = 3.751	C _c = 1.014

Classification

ASTM Poorly graded SAND (SP)

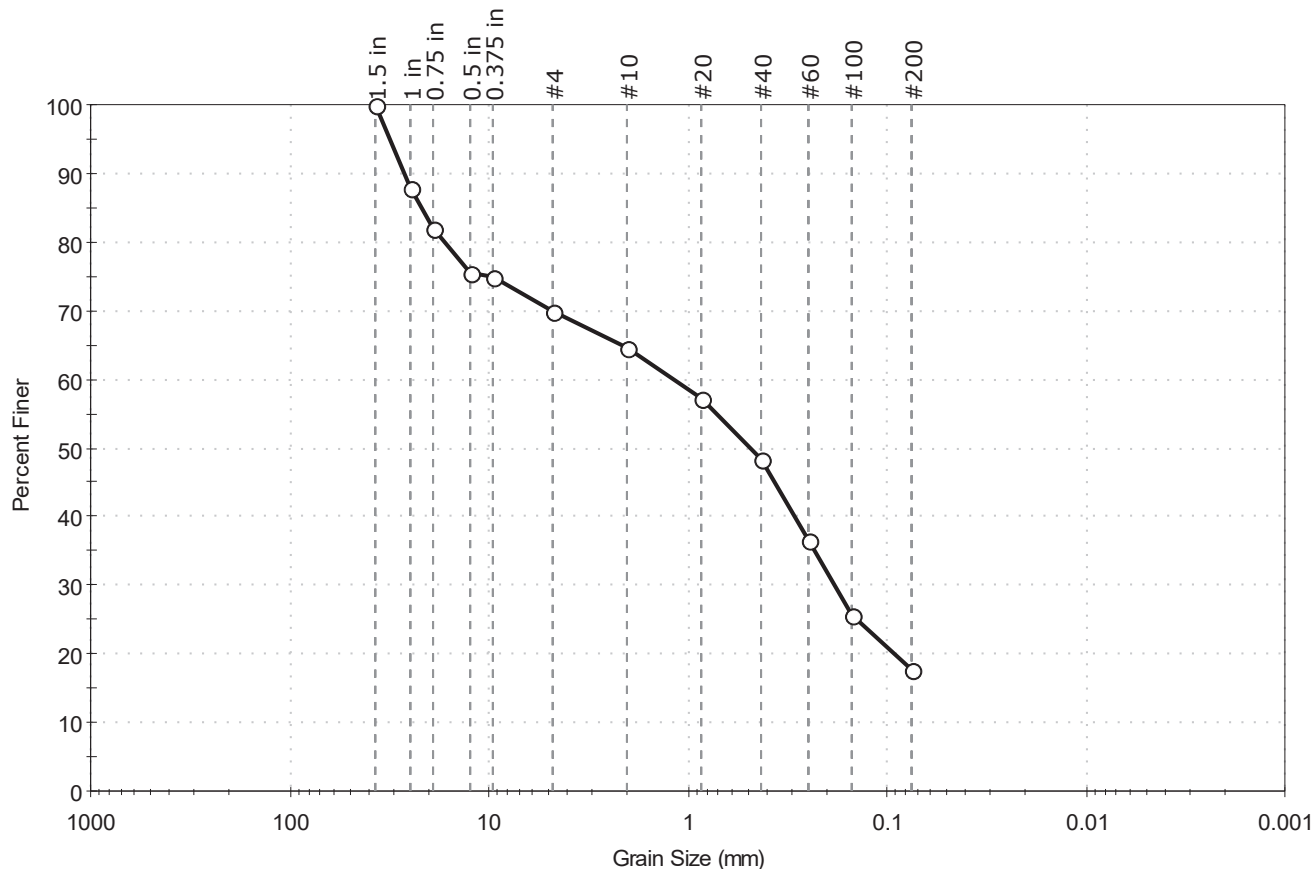
AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : **ROUNDED**
 Sand/Gravel Hardness : **HARD**

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	B-201	Sample Type:	jar
Sample ID:	S14	Test Date:	01/10/20
Depth :	53.5-54.5 ft	Test Id:	537207
Test Comment:	---	Tested By:	ckg
Visual Description:	Moist, dark gray silty sand with gravel	Checked By:	jsc
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	30.0	52.3	17.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	88		
0.75 in	19.00	82		
0.5 in	12.50	75		
0.375 in	9.50	75		
#4	4.75	70		
#10	2.00	65		
#20	0.85	58		
#40	0.42	48		
#60	0.25	37		
#100	0.15	26		
#200	0.075	18		

Coefficients

D ₈₅ = 21.8340 mm	D ₃₀ = 0.1827 mm
D ₆₀ = 1.1646 mm	D ₁₅ = N/A
D ₅₀ = 0.4830 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

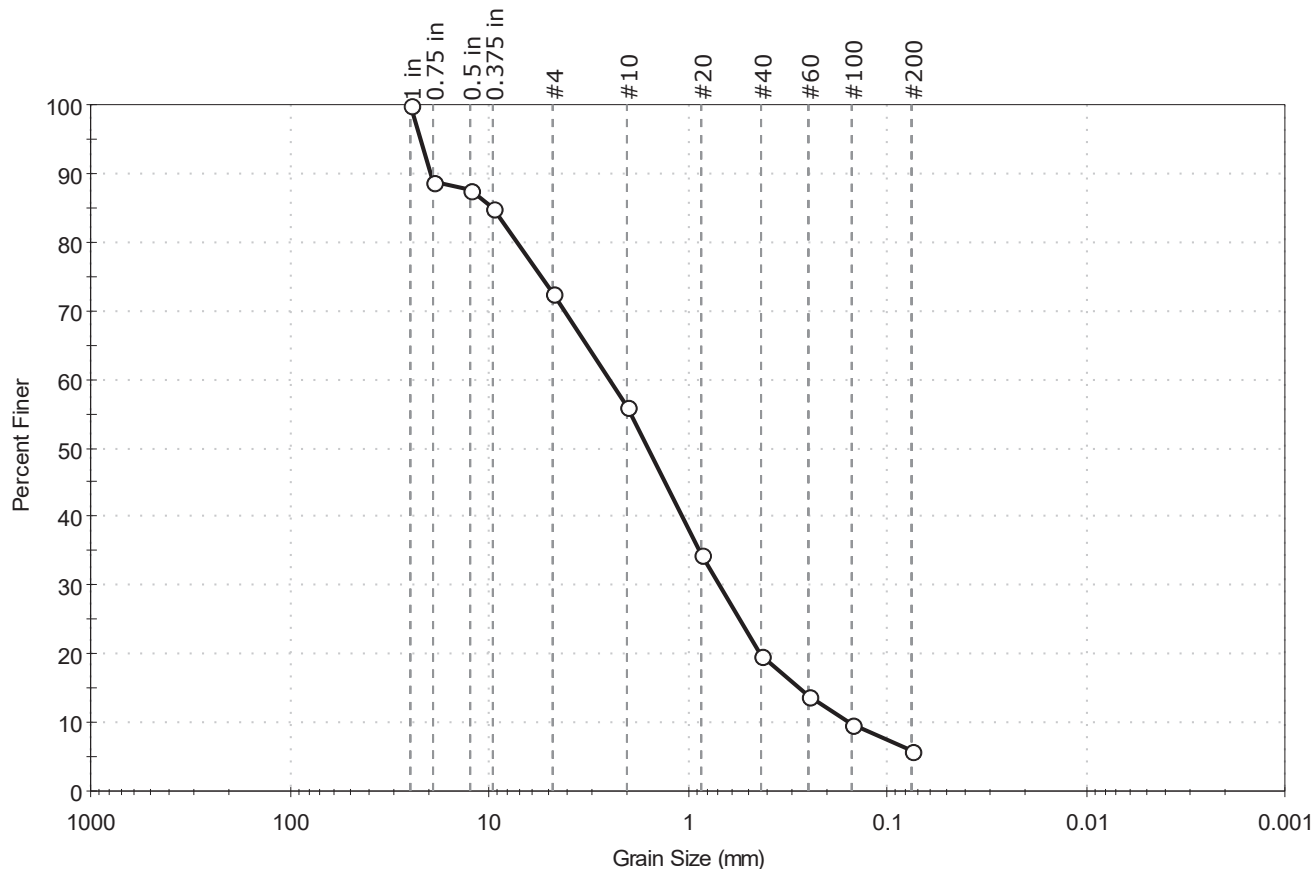
AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	B-202	Sample Type:	jar
Sample ID:	S5	Test Date:	01/10/20
Depth :	8-10 ft	Test Id:	537208
Test Comment:	---	Tested By:	ckg
Visual Description:	Moist, dark gray sand with silt and gravel	Checked By:	jsc
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	27.4	66.7	5.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	89		
0.5 in	12.50	88		
0.375 in	9.50	85		
#4	4.75	73		
#10	2.00	56		
#20	0.85	35		
#40	0.42	20		
#60	0.25	14		
#100	0.15	10		
#200	0.075	5.9		

Coefficients

D ₈₅ = 9.5223 mm	D ₃₀ = 0.6839 mm
D ₆₀ = 2.4629 mm	D ₁₅ = 0.2763 mm
D ₅₀ = 1.5732 mm	D ₁₀ = 0.1564 mm
C _u = 15.747	C _c = 1.214

Classification

ASTM N/A

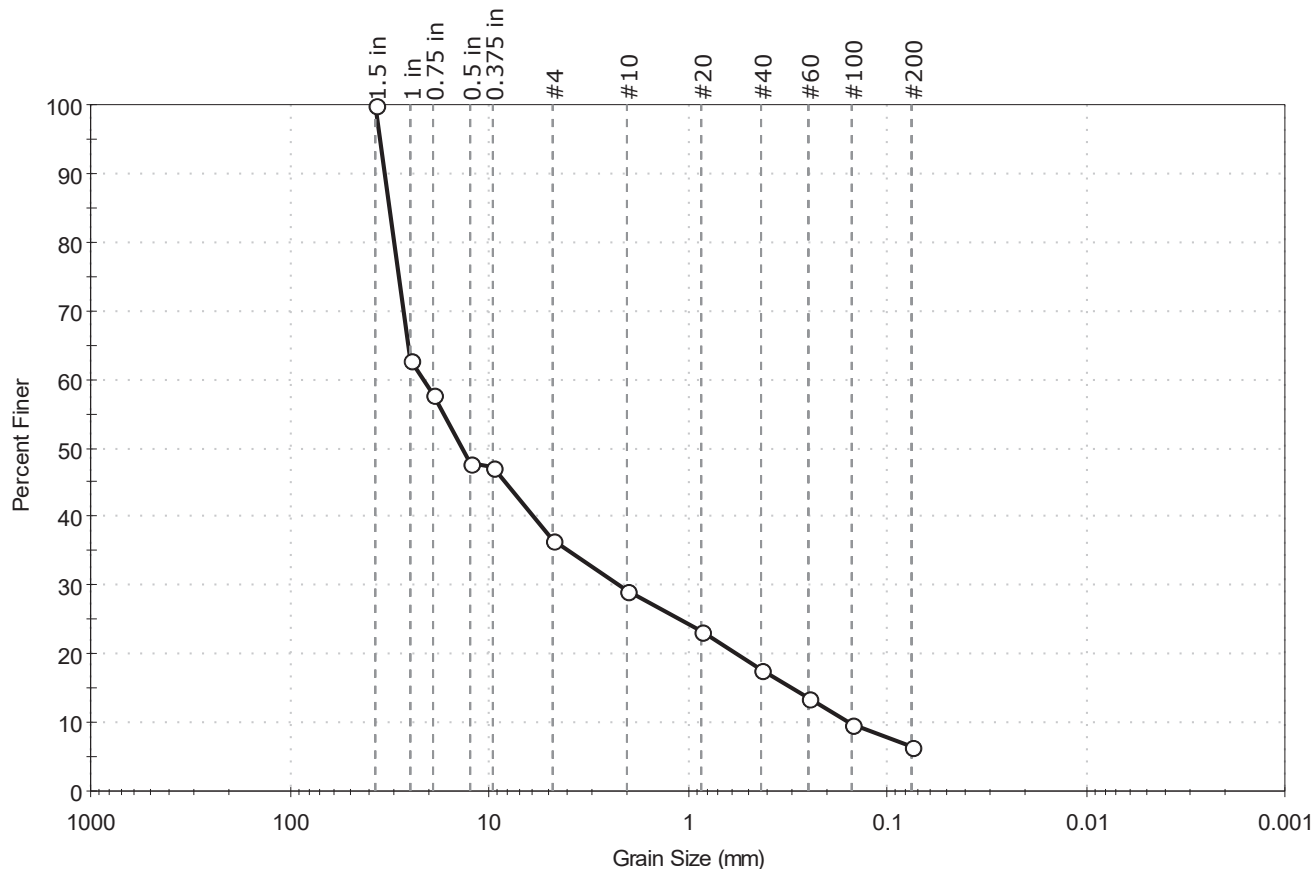
AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : **ROUNDED**
 Sand/Gravel Hardness : **HARD**

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	B-202	Sample Type:	jar
Sample ID:	S8-B	Test Date:	01/10/20
Depth :	24-26 ft	Test Id:	537209
Test Comment:	---		
Visual Description:	Moist, dark yellowish brown gravel with silt and sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	63.4	30.2	6.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	63		
0.75 in	19.00	58		
0.5 in	12.50	48		
0.375 in	9.50	47		
#4	4.75	37		
#10	2.00	29		
#20	0.85	23		
#40	0.42	18		
#60	0.25	13		
#100	0.15	10		
#200	0.075	6.4		

Coefficients

D ₈₅ = 31.8391 mm	D ₃₀ = 2.1954 mm
D ₆₀ = 21.3255 mm	D ₁₅ = 0.3034 mm
D ₅₀ = 13.7251 mm	D ₁₀ = 0.1541 mm
C _u = 138.387	C _c = 1.467

Classification

ASTM N/A

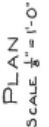
AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

S.T.N

- Samples taken on 6/25/18
- Samples taken on 10/12/18



- 1.) Locations and dimensions are approximate.
- 2.) Samples obtained using hand augers and post-hole digger
- 3.) Maximum sample depth is approximately 1 ft.



Client:	Kleinfelder, Inc.		
Project:	Ware River Bridge		
Location:	Ware, MA		Project No: GTX-308410
Boring ID: ---	Sample Type: ---	Tested By: jbr	
Sample ID: ---	Test Date: 10/22/18	Checked By: emm	
Depth : ---	Test Id: 477950		

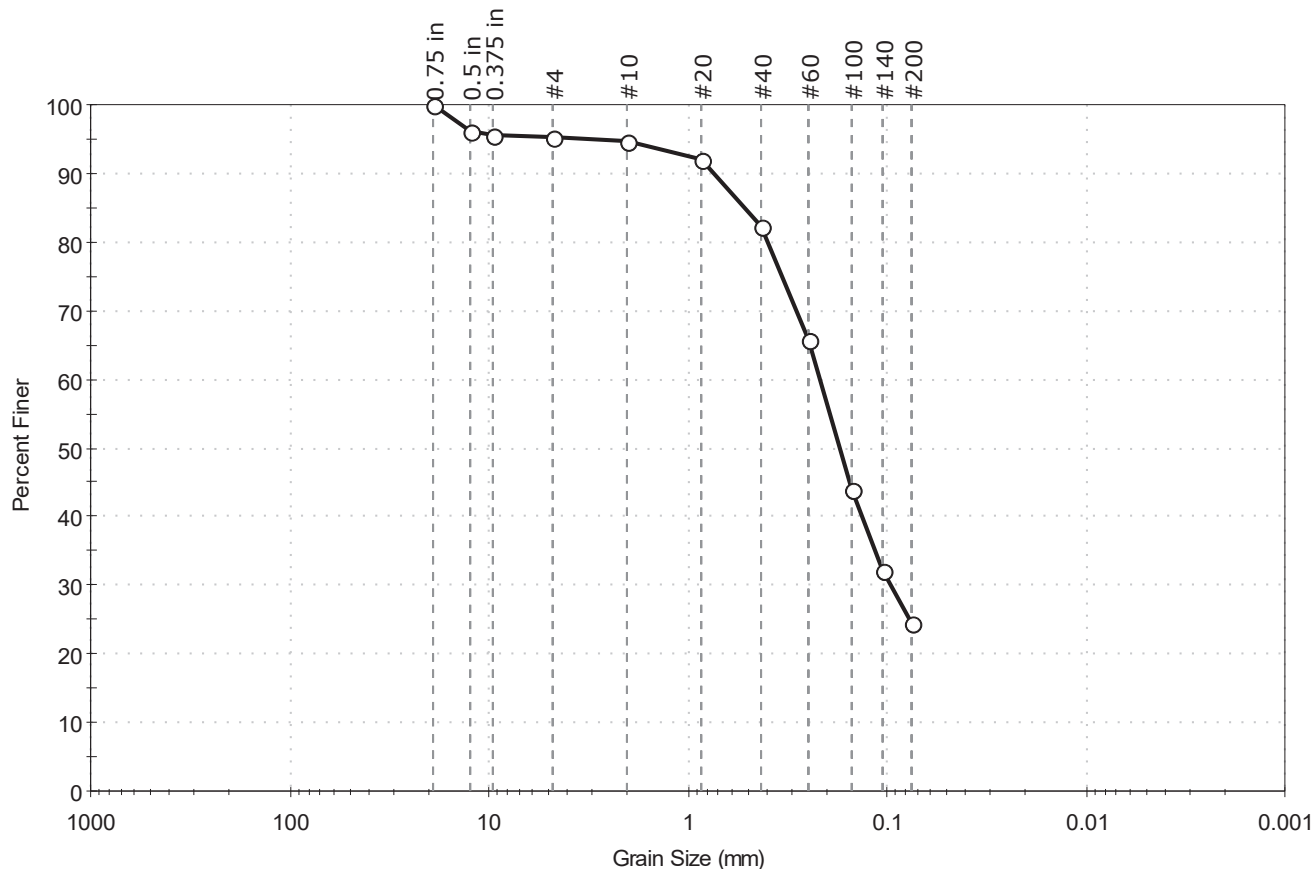
Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
East Bank	HA- E-Bank (2)	0-1	Moist, very dark brown silty sand	19.2
West Bank	HA- W-Bank	0-1	Moist, very dark brown silty sand	67.2

Notes: Temperature of Drying : 110° Celsius

Client:	Kleinfelder, Inc.	Project No:	GTX-308410
Project:	Ware River Bridge		
Location:	Ware, MA		
Boring ID:	East Bank	Sample Type:	bag
Sample ID:	HA-E-Bank (2)	Test Date:	10/22/18
Depth :	0-1	Test Id:	477946
Test Comment:	---	Tested By:	jbr
Visual Description:	Moist, very dark brown silty sand	Checked By:	emm
Sample Comment:	---		

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	4.8	70.8	24.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	96		
0.375 in	9.50	96		
#4	4.75	95		
#10	2.00	95		
#20	0.85	92		
#40	0.42	82		
#60	0.25	66		
#100	0.15	44		
#140	0.11	32		
#200	0.075	24		

Coefficients

D ₈₅ = 0.5128 mm	D ₃₀ = 0.0960 mm
D ₆₀ = 0.2181 mm	D ₁₅ = N/A
D ₅₀ = 0.1726 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM Silty SAND (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---

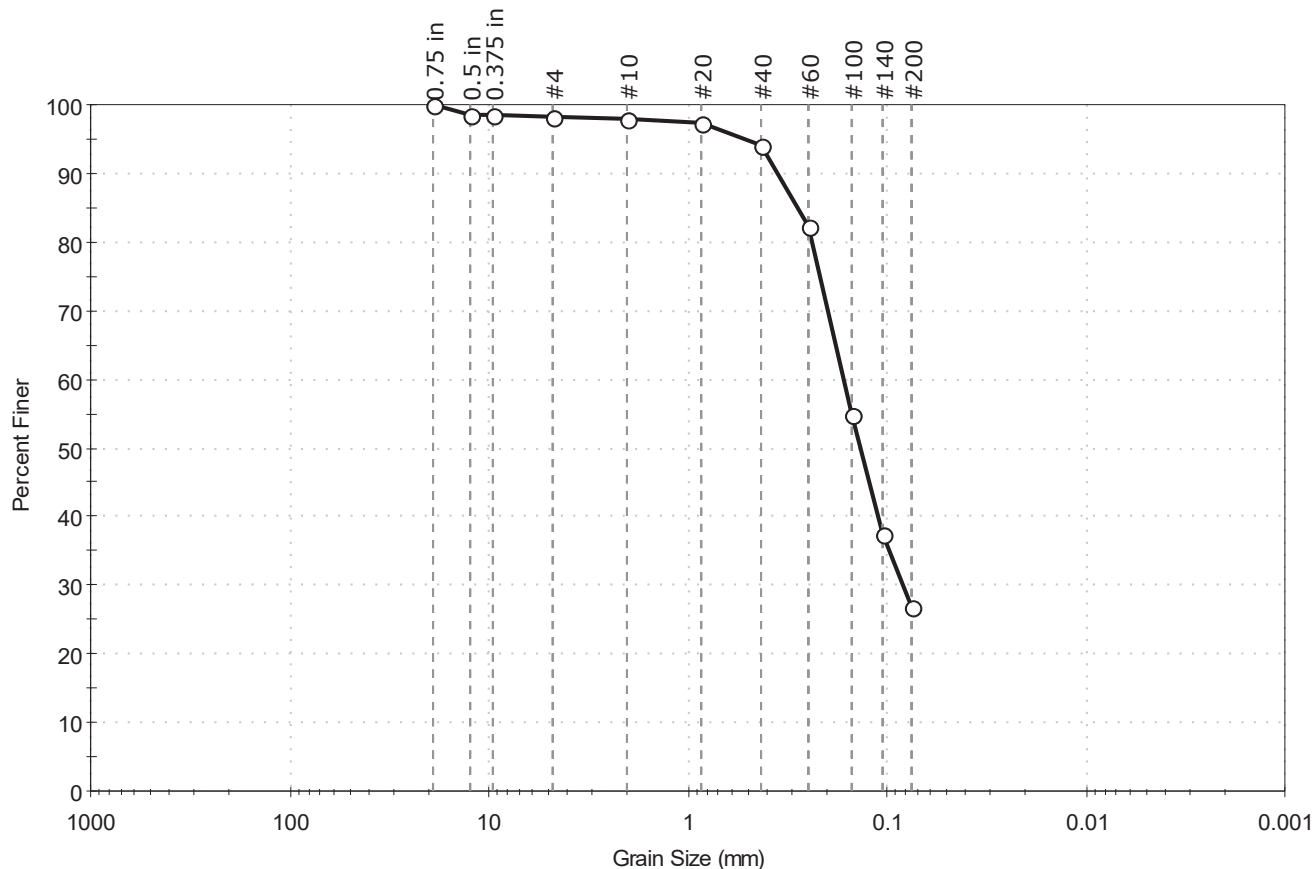
Client: Kleinfelder, Inc.
Project: Ware River Bridge
Location: Ware, MA

Project No: GTX-308410

Boring ID: West Bank Sample Type: bag Tested By: jbr
Sample ID: HA-W-Bank Test Date: 10/17/18 Checked By: emm
Depth: 0-1 Test Id: 477945

Test Comment: ---
Visual Description: Moist, very dark brown silty sand
Sample Comment: Sample contains organics

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.7	71.5	26.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	98		
0.375 in	9.50	98		
#4	4.75	98		
#10	2.00	98		
#20	0.85	97		
#40	0.42	94		
#60	0.25	82		
#100	0.15	55		
#140	0.11	37		
#200	0.075	27		

Coefficients

D₈₅ = 0.2818 mm D₃₀ = 0.0832 mm
D₆₀ = 0.1649 mm D₁₅ = N/A
D₅₀ = 0.1360 mm D₁₀ = N/A
C_u = N/A C_c = N/A

Classification

ASTM Silty SAND (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

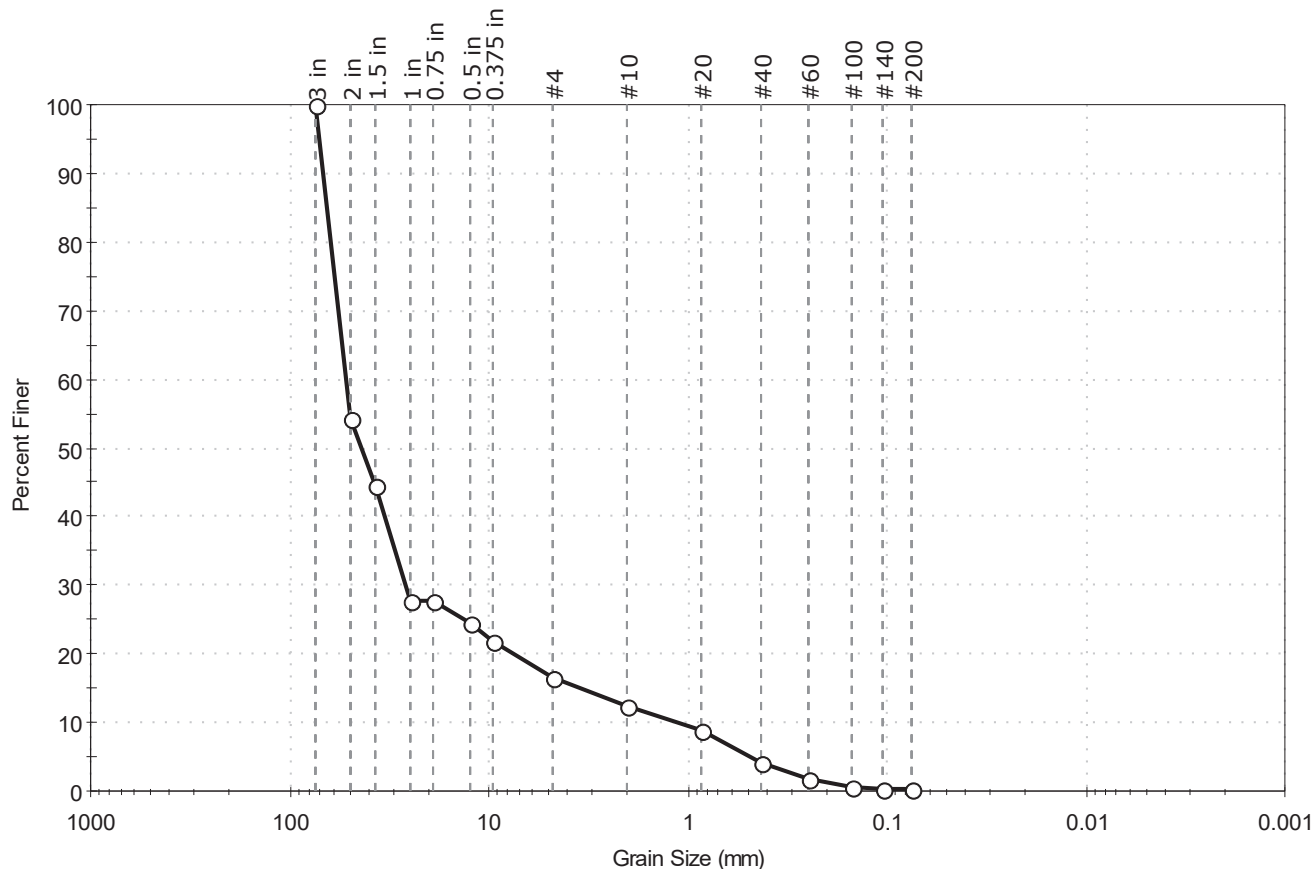
Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	Kleinfelder, Inc.	Project No:	GTX-308410
Project:	Ware River Bridge		
Location:	Ware, MA		
Boring ID:	River Bottom	Sample Type:	bag
Sample ID:	RB-1	Test Date:	10/17/18
Depth:	0-1	Test Id:	477947
Test Comment:	---		
Visual Description:	Moist, dark brown gravel with sand		
Sample Comment:	Sample contains organics		

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	83.4	16.4	0.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3 in	75.00	100		
2 in	50.00	54		
1.5 in	37.50	45		
1 in	25.00	28		
0.75 in	19.00	28		
0.5 in	12.50	24		
0.375 in	9.50	22		
#4	4.75	17		
#10	2.00	13		
#20	0.85	9		
#40	0.42	4		
#60	0.25	2		
#100	0.15	1		
#140	0.11	0		
#200	0.075	0.2		

Coefficients

D ₈₅ = 65.6657 mm	D ₃₀ = 26.3963 mm
D ₆₀ = 52.6180 mm	D ₁₅ = 3.4123 mm
D ₅₀ = 44.0230 mm	D ₁₀ = 1.1029 mm
C _u = 47.709	C _c = 12.006

Classification

ASTM Poorly graded GRAVEL with Sand (GP)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

Sample/Test Description

Sand/Gravel Particle Shape : Rounded

Sand/Gravel Hardness : HARD



Client:	Kleinfelder, Inc.		
Project:	Ware River Bridge		
Location:	Ware, MA	Project No:	GTX-308410
Boring ID:	East Bank	Sample Type:	bag
Sample ID:	HA-E-Bank (2)	Test Date:	10/17/18
Depth :	0-1	Test Id:	477949
Test Comment:	---		
Visual Description:	Moist, very dark brown silty sand		
Sample Comment:	---		

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	HA-E-Bank	East Bank	0-1	19	n/a	n/a	n/a	n/a	Silty SAND (SM)

18% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic



Client:	Kleinfelder, Inc.		
Project:	Ware River Bridge		
Location:	Ware, MA	Project No:	GTX-308410
Boring ID:	West Bank	Sample Type:	bag
Sample ID:	HA-W-Bank	Test Date:	10/17/18
Depth :	0-1	Test Id:	477948
Test Comment:	---		
Visual Description:	Moist, very dark brown silty sand		
Sample Comment:	Sample contains organics		

Atterberg Limits - ASTM D4318

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	HA-W-Bank	West Bank	0-1	67	n/a	n/a	n/a	n/a	Silty SAND (SM)

6% Retained on #40 Sieve

Dry Strength: MEDIUM

Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

SECTION 11
SPECIFICATIONS

ITEM 697.2**FLOATING SILT FENCE****FOOT**

The work under this item shall consist of furnishing and erecting floating silt fence (turbidity barrier) to act as a silt barrier for work within the waterway and as required by the Engineer. The floating silt fence shall be installed prior to commencing any work in or near the water.

The Contractor shall maintain the floating silt fence in satisfactory working order until removed, including any necessary replacements of damaged or deteriorated sections, at no additional compensation. The floating silt fence shall be maintained until all work within and adjacent to the waterway has been completed. Sediment deposited into the area enclosed by the floating silt fence shall be removed and lawfully disposed prior to relocating or removal of the floating silt fence barrier(s).

Installation procedures may be varied to comply with manufacturers recommended procedures with the approval of the Engineer. If required, the Contractor shall submit alternate installation and/or staging procedures for approval.

MATERIALS

Floating Silt Fence barrier shall consist of a nylon reinforced PVC fabric siltation curtain with solid plastic foam flotation members enclosed in a top pocket, tension link in floatation section and a ballast chain enclosed in bottom pocket and meet the following property specifications:

1. Length: 50 feet per section.
2. Draft: 3 feet to 10 feet. Contractor shall field verify draft requirements.
3. Floatation Element: Minimum 6" Dia. closed cell solid plastic foam logs with 17 lbs. per ft. buoyancy.
4. Floatation Fabric: Shall be impermeable 22 oz. nylon reinforced PVC having 450 psi tensile strength.
5. Tension Cables: 1/4-inch cable enclosed in top portion of the floatation section. It shall secure to each end of connector of the curtain sections. Cable system shall be tamperproof.
6. Ballast: 5/16-inch or heavier, galvanized steel chain enclosed in bottom pocket of the entire length of floating silt fence.
7. Connectors: Aluminum or galvanized steel universal connectors on each end of floatation section. Below the connectors, the skirts shall be joined by 5/8-inch polypropylene rope ties between the grommets on the two skirts. The ballast chains can be shackled.
8. Steel posts shall be a minimum of 10 feet in length and 4 inches diameter galvanized fence post or other manufacturer approved supporting device approved by the Engineer.

ITEM 697.2(Continued)**METHOD OF MEASUREMENT**

Item 697.2 will be measured for payment by the Foot, complete installation, removing and resetting, and final removal of floating silt fence.

BASIS OF PAYMENT

Item 697.2 will be paid for at the contract unit price per Foot, which price shall include all labor, materials, equipment, tools and incidental costs required to complete installation, removing and resetting, and final removal.

No separate payment will be made for removal and disposal of built-up silt or debris deposited or accumulated into the enclosed area or at the bottom of the floating silt fence, but all costs in connection therewith shall be included in the contract unit price bid.

ITEM 698.4 **GEOTEXTILE FABRIC FOR PERMANENT** **SQUARE YARD**
EROSION CONTROL

The work under these items shall conform to the requirements of Section M9.50.0 of the Standard Specifications and the following:

The work shall include furnishing and placing geotextile fabrics for permanent erosion control prior to placing crushed stone beneath riprap and modified rock fill as shown on the plans and as required by the Engineer.

MATERIAL

The geotextile fabric used shall be selected from the MassDOT Qualified Construction Materials List for the appropriate application.

CONSTRUCTION METHODS

Before placing the fabric, grade the area smooth and remove all stones, roots, sticks, or other matter that might prevent the fabric from completely contacting the soil. Place the fabric loosely and lay it parallel to the direction of water movement. The Engineer may require pinning or stapling to hold the geotextile fabric in place. Join separate pieces of fabric by overlapping or sewing. Overlap the fabric in the joints at least 24 inches in the direction of flow. If using sewn seams, ensure that all seams develop a tensile strength equal to or greater than 60 percent of the specified grab tensile strength of the fabric, unless specified otherwise.

After placing, do not expose the fabric longer than 48 hours before covering. Construction equipment shall not be allowed directly on the fabric. Cover damaged areas with a patch of fabric that overlaps 3 feet in all directions.

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.

No separate payment will be made for sewing and the 24 inch overlapping, but all costs in connection therewith shall be included in the contract unit price bid.

ITEM 755.99**STREAMBED RESTORATION****LUMP SUM****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 photodocumentation herein (Figures A and B).

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 on-site oversight 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 Tim Dexter (MassDOT Wetlands & Wildlife Unit Supervisor, 857-368-8794 / timothy.dexter@state.ma.us) to set up a meeting with MassDOT's Geomorphologist, Contractor, and Resident Engineer. At this meeting, the Geomorphologist will provide an overview of the restoration work and will discuss the Contractor's anticipated means, methods, and schedule.

Process Approval:

In lieu of a mockup, the Contractor shall schedule an additional 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.

MATERIAL

The top 2 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 cobble native river bed. The following gradation shall be used as a guide.

Stream Bed Material Gradation

Stone Size (mm)	Stone Size (inches)	Particle*	% Finer
1,024	40	Medium boulder	100
256	10	Very large cobble	85
64	2.5	Very coarse gravel	45
0.5	0.02	Coarse sand	10

*(Wentworth, 1992)

The streambed material shall be approved by the Resident Engineer and Geomorphologist prior to use.

Related Items

Crushed Stone. Shall conform to the requirements of Item 156.2 Crushed Stone for Slope Treatment and shall be paid for under that item.

Riprap Stone shall conform to the requirements of Item 983. and shall be paid for under that item.

CONSTRUCTION

Channel

The streambed material shall be reinstalled over riprap (Item 983.xx), as depicted on the plans, to a thickness between 1.0 and 3.5 feet based on the plans. 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 and riparian habitat. Fish passage must be maintained. The streambed materials shall be installed during normal low water conditions behind cofferdams or turbidity curtains 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 or turbidity curtains in such a way as to slowly wet the stream to minimize the initial sediment pulse. Every attempt shall be made to minimize the downstream movement of sediment.

The final streambed shall maintain the general configuration of the existing streambed bedform and there shall be minimal to no 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 Downstream of Bridge



Figure B: Existing Streambed Material Upstream of Bridge

ITEM 756.**NPDES STORMWATER POLLUTION
PREVENTION PLAN****LUMP SUM**

Pursuant to the Federal Clean Water Act, effective March 10, 2003, construction activities which disturb one acre or more are required to apply to the U.S. Environmental Protection Agency (EPA) for coverage under the NPDES General Permit for Stormwater Discharges From Construction Activities (NPDES is the acronym for the National Pollutant Discharge Elimination System). On January 2017 EPA published the NPDES 2017 Construction General Permit (CGP) for discharges from construction activities. The final modified 2017 CGP went into effect on June 27, 2019.

The NPDES General Permit requires the electronic submission of a Notice of Intent (NOI) to the U.S. EPA at least fourteen (14) days prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). The permit authorization date is fourteen (14) calendar days after the EPA notifies you that it has received a complete NOI. The Contractor is advised that, based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA or the Massachusetts Department of Environmental Protection (DEP) for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the DEP, a separate filing to DEP is required. Filing fees may be associated with a DEP filing and shall be paid by the Contractor.

The General Permit also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The SWPPP will include the General Permit conditions, and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. It is the responsibility of the Contractor to complete the SWPPP to meet the requirements of the most recently issued CGP and, if applicable, the DEP requirements prior to construction. It is the responsibility of the Contractor to be familiar with the General Permit conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to this project and to include in the Stormwater Pollution Prevention Plan the methods and means necessary to comply with applicable conditions of said permits.

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP and DEP requirements, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation and the SWPPP shall be updated.

Included in the CGP conditions is the requirement for inspection of all erosion controls and site conditions which must be in accordance with one of the two schedules listed:

ITEM 756. (Continued)

1. Every seven (7) calendar days
2. Once every fourteen (14) calendar days and within twenty-four hours after each incidence of rainfall exceeding 0.25 inch.

The Contractor shall choose a qualified individual who will be on-site during construction to perform these inspections. A qualified person is defined by the EPA as “someone knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.” The Engineer must approve the contractor’s inspector. In addition, if the Engineer and/or local Conservation Commission determines at any time that the inspector’s performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection reports must be completed within twenty-four hours of completing any site inspection and provided to the Engineer and local conservation commission, if required, in a timely manner. Inspection reports must include a summary of inspection findings including but not limited to: stormwater control operation and installation; areas of potential or modified controls needed; signs of visible or potential erosion and sedimentation areas; observed incidents of noncompliance; visual quality of discharges if discharges are occurring; corrective actions needed. Additionally, the following items must include: inspection date, names and titles of personnel making the inspections, signed form, and representative photographs as necessary to document findings.

The Contractor is responsible for preparation of the SWPPP, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. Work associated with performance of inspections is not included under this Item. The Standard Specifications require adequate erosion control for the duration of the Contract. Inspection of these controls is considered incidental to the applicable items. This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, and preparation of weekly inspection reports by a qualified person. In addition, additional erosion controls beyond those specified in bid items elsewhere in this contract which are selected by the Contractor to facilitate and/or address the Contractor’s schedule, methods and prosecution of the work shall be considered incidental to this item.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer’s Final Estimate.

Payment for all work detailed above, including SWPPP preparation, required revisions, revisions/addenda during construction, and weekly inspections, and weekly inspection reports are included in the Lump Sum for this Item. Upon final acceptance of the SWPPP by the Department, a payment equal to 50% of the Contract Lump Sum price shall be paid. The remaining 50% of the Lump Sum shall be paid in 10% increments distributed equally throughout the remaining period of the Contract, not including extensions of time.

765.21**Annual Cover Crop****Pound**

Work under this item shall be in according with Subsection 765 of the Standard Specifications and the following.

DESCRIPTION

Work consists furnishing and applying an annual grass to be seeded as a cover crop in conjunction with upland native seeding. Work shall consist of furnishing and applying the appropriate mix at the quantity 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:

Avena sativa (Grain Oats): 1 January to 31 July
Cecale cereale (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 delivered and applied.

Annual Cover Crop will be paid at the contract unit price per pound upon delivery and application, 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.

ITEM 765.553 WETLAND – RIPARIAN SEEDING SQUARE YARD

The work under this item shall conform to the relevant provisions of Section 765 of the Standard Specifications and the following:

The work shall consist of planting and establishing 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.

Seeding shall be done within 48 hours of placement of loam and final grading. Mulch for seed shall be Compost Topdressing or hydromulch as specified below, and shall be incidental to this item.

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%.

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
- 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.

MATERIALS

Seed

Riparian Seed mix shall be as follows. Substitutions must be approved by MassDOT Landscape Design. Contact george.batchelor@dot.state.ma.us.

	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
Grass			
	Andropogon gerardii 'Niagara'	Big Bluestem 'Niagara'	12.00%
	Schizachyrium scoparium 'Camper'	Little Blue Stem 'Camper'	12.00%

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Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	11.80%
Sorghastrum nutans NY Eco	Indiangrass NY Ecotype	10.20%
Elymus virginicus	Virginia Wild Rye	10.00%
Elymus riparius	Riverbank Wild Rye	10.00%
Carex vulpinoidea	Fox Sedge	5.00%
Panicum rigidulum	Redtop Panicgrass	5.00%
Panicum virgatum	Switchgrass	5.00%
Juncus effuses	Soft Rush	2.00%
Agrostis perennans	Upland Bentgrass	2.00%
		<hr/> 85.00%
Herb/Forb		
Chamaecrista fasciculata	Partridge Pea	3.00%
Asclepias incarnata	Swamp Milkweed	2.20%
Verbena hastata	Blue Vervain	2.00%
Heliopsis helianthoides	Ox-Eye Sunflower	2.00%
Monarda fistulosa	Wild Bergamot	1.00%
Senna hebecarpa	Wild Senna	1.00%
Vernonia noveboracensis	New York Ironweed	1.00%
Aster umbellatus	Flat Topped White Aster	0.50%
Aster prenanthoides	Zig Zag Aster	0.50%
Aster puniceus	Aster – Swamp	0.50%
Aster novae-angliae	New England Aster	0.50%
Eupatorium maculatum	Joe-pye Weed	0.50%
Eupatorium perfoliatum	Boneset	0.30%
		<hr/> 15.00%
		<hr/> 100.00%

Seeding Rate:

Species ecotype shall be as native to New England region as possible. Apply this mix at 30 lbs PLS/acre

Fertilizer

No fertilizers shall be applied.

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.

Mulch

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Mulch for seeding and topdressing shall be incidental to this item. Mulch shall be:

- Compost Mulch meeting the material and submittal requirements of Item 751.72,
OR
- Hydromulch per the manufacturer's recommendation. Mulch for hydroseeding shall be wood fiber only.

Photo Documentation

Contractor shall submit photo documentation to the Engineer and Landscape Design Section. Each photo shall be date stamped. Photos shall be submitted after the following stages of construction:

- Soil preparation
- Seed and hydromulch/compost topdressing
- Germination
- Grass establishment after one full growing season (growing season is June-September)

CONSTRUCTION

Surface Preparation

Soil preparation and seeding shall occur only when the bed is in a friable condition, not muddy or hard. 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 smooth and even finish corresponding to the required grades.

When seeding over existing or compacted soil, surface will be prepared by raking or tracking to a depth of 2 inches prior to seeding and prior to Compost Topdressing (when applicable).

Surface preparation shall be compensated for under Item 751. Loam Borrow.

Surface preparation shall be approved by the Engineer prior to seeding.

Seeding over Various Substrates

Loam: Seeding shall occur within 48 hours of site preparation to prevent loss of topsoil. Seeding shall be hydroseeding or broadcast as specified below.

Compost Topdressing: Compost Topdressing shall be applied as specified under that item. Seed should be broadcast at the same time as compost application to ensure a thin cover of compost over seed. ***When seeding is done after application of Compost Topsoil the rate shall be increased by 50% and area shall be hydromulched.***

Compost Mulch over Modified Rock: Compost Mulch shall be applied as specified under that item and shall be such that only the voids in the rock are filled so that seed has an organic substrate for germination. Seed shall be broadcast after compost application. No hydromulch is required.

SEEDING

Hand broadcast method shall be used for all areas smaller than half an acre or when specified on the plans.

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 Jute mesh 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

Seeding shall occur within 72 hours of top soil placement to prevent loss of topsoil. Seeding for areas less than half an acre and when specified shall be hand broadcast followed by hydromulching as specified below. Large areas may be hydroseeded as specified below.

Jute Mesh: If used, Jute mesh 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.

Compost Mulch over Modified Rock: Compost Mulch and seed shall be applied as specified under that item. No hydromulch is required.

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 Jute mesh in which case it shall be as specified above under seeding with Jute mesh application.

Hydroseeding and Hydromulching

Hydromulching shall be per the manufacturer's directions and as follows.

A 2-step process shall be used. 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.

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.

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.

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 as required 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.

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.

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.

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 765.553 will be measured for payment by the square yard, complete in place.

Item 765.553 will be paid at the Contract unit price by the square yard at the Contract unit price 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, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Site preparation, including raking, tilling, removal of debris and stones, and other work to the prepare site for seeding shall be compensated under Inland Wetland Replication. If used, Jute mesh shall be compensated under the respective item.

Schedule of payment shall be as follows:

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50% upon Conditional Acceptance
50% upon Final Acceptance of 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 jute mesh):

_____ **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).

²Quantity delivered should match pounds **Total Pounds PLS** and **Verification of Seed Delivery**. Pounds should be shown on each Seed Tag.

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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: _____

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Highway Division

Contract No. 605126

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.

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.

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:

- 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 grass mix).
- 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 consist of furnishing and installing jute mesh fabric to prevent soil erosion. Jute mesh shall be placed over all areas of exposed soil as required by the Engineer, and over areas where seeded slopes are greater than 3:1 as shown on the plans, and to the requirements and satisfaction of the Engineer.

MATERIALS

Fabric shall be 100% biodegradable woven jute mesh with minimum 1/4" openings.

Anchoring devices shall consist of minimum 8" bio-degradable 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 mesh.

Contractor shall bury ends of fabric in anchor trenches at top and bottom of slopes.

Installation of jute mesh shall be such as to ensure continuous contact with soil without folds or wrinkles. Jute mesh fabric may be joined by overlapping with a minimum 6 inch overlap. Overlap shall be such that upslope fabric is placed over lower slope fabric.

The mesh shall be anchored in place with vertically driven spikes. The spikes shall be driven until their tops are flush with the soil. Spikes 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 spikes per square yard, or as manufacturer's recommendations for given site conditions.

Reseed all trenched and otherwise disturbed areas with specified slope seed mix. The Contractor shall maintain the jute mesh and make satisfactory repairs of any areas damaged until acceptance of seed establishment.

METHOD OF MEASUREMENT

Item 767.9 will be measured for payment by the Square Yard, complete in place as measured across the surface of grade and does not include buried or overlapped portions.

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, reseeding of trenched and disturbed areas, and all incidental costs required to complete the work.

ITEM 983.11**MODIFIED RIPRAP****TON**

The work under this Item shall conform to the relevant portions of Section 983 of the Standard Specifications, the material requirements outlined in Section M2.02.0, and the following:

The Contractor shall furnish and place new riprap stones or remove and re-lay existing riprap stones, if any, along the proposed pier, abutment, and wingwall walls. Riprap shall consist of scour and slope protection at the locations shown on the Plans and/or as directed by the Engineer.

This work shall consist of installing new or reused angular stones, hand placed, to provide bank protection where damage may be caused by water conditions, as shown on the plans. Riprap shall be placed along the pier, abutment and wingwall walls and shall extended a distance not less than shown on the plans down the bank slope in all directions away from the bridge structures and towards the river. Riprap shall extend a sufficient distance beyond the ends shown on the plans to stabilize the slopes and provide protection during flood events.

Proposed riprap stones shall be placed along the lines, thicknesses, and grades shown on the Plans.

All riprap shall be placed in such a manner as to allow access to the underside of bridge abutments, and wingwalls for inspection purposes. Cervices, voids, and other hazards that may cause bodily harm are to be avoided by careful placement of the riprap stone.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Modified Riprap furnished and placed and/or removed and re-laid shall be paid for at the Contract Unit Price bid per TON for stone complete in place.

Crushed Stone shall be paid for under Item 156.5 Crushed Stone For Filter Fabric.

Geotextile fabric shall be paid for under Item 698.3 Geotextile Fabric For Separation.

ITEM 990.11**TEMPORARY COFFERDAM – STRUCTURE
NO. W-05-015****LUMP SUM**

The work under this Item shall conform to the relevant portions of Section 140 of the Standard Specifications, provisions of Item 991.1: Control of Water – Structure No. W-05-015, and the following:

The Contractor shall design, furnish, install, maintain, and remove temporary cofferdams as required based upon the actual site conditions, for the construction of the pier at the proposed Route 32 (Palmer Road) Bridge over Ware River, Bridge No. W-05-015, during all construction stages and as shown on the Plans and/or as directed by the Engineer. Temporary cofferdam shall be constructed for:

- 3) Excavation for and construction of the proposed reinforced concrete pier stem and pile cap on steel H-piles, including the installation of proposed riprap. A tremie concrete seal shall be provided at the bottom of the cofferdam.

Cofferdam systems shall be designed by the Contractor and shall provide sufficient space for demolition of the existing bridge pier, excavation, and construction of the proposed bridge pier, as shown on the Plans.

The Contractor's design of the temporary cofferdam systems shall be prepared, designed, and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. Prior to installation, the Engineer must approve complete detailed drawings and complete calculations for the temporary cofferdam systems in writing. Payment for the Contractor's design and submittal, including Contractor's engineering services shall be considered incidental to this item and no further compensation will be allowed.

The Contractor is responsible for determining all geotechnical and hydraulic criteria associated with the temporary cofferdam including, but not limited to, lateral earth pressures, base flood discharge rate and water elevation, and design scour depth. Ice loads shall be considered if the cofferdam is to remain in place during winter conditions.

The Contractor's design shall account for all construction stages and include dimensions of each cofferdam to be installed around existing and proposed sections of bridge, accounting for sections of existing or new bridge to remain in place during adjacent demolition and construction. Cofferdams installed against new construction shall not damage or adversely impact any elements of the new bridge.

All elements of the cofferdams shall be completely removed at the conclusion of substructure demolition and new construction. Portions of cofferdams will need to be removed prior to the completion of substructure demolition and new construction due to the staged construction. Any sheet piling to be left in place will require advance approval of the Engineer, and shall be cut off to an elevation specified by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Temporary Cofferdam will be measured and paid at the contract Lump Sum bid price, which price shall include full compensation for the Contractor's design and plans; all material, labor, tools and equipment furnished; and installation, maintenance, dewatering and removal and/or relocation of all temporary cofferdam systems necessary for the proper completion of the work specified, as approved and in a satisfactory manner to the Engineer, regardless of the type of the approved Contractor system.

4. The first payment will be made at fifty percent (50%) of the contract Lump Sum bid price of this Item and will be paid upon completion of the cofferdam installation of Stage 1A/1B, to the satisfaction and approval of the Engineer.
5. The second payment will be made at thirty percent (30%) of the contract Lump Sum bid price of this Item and will be paid upon completion of the cofferdam installation of Stage 2A/2B, to the satisfaction and approval of the Engineer.
6. The final payment will be made for the remaining twenty percent (20%) of the contract Lump Sum bid price for this Item and will be paid upon completion of all work for this Item, including complete removal and satisfactory disposal of the cofferdam systems from the project.

ITEM 991.11 **TEMPORARY CONTROL OF WATER - STRUCTURE** **LUMP SUM**
NO. W-05-015

GENERAL

The work to be done under this item shall conform to the relevant provisions of Section 140 of the Standard Specification and the following:

The work to be performed under this Item shall include all sheeting, pumping, sandbagging, earth and other measures for water control to construct new abutments and wingwalls in the dry. Water shall be discharged as specified in the environmental permits obtained for this project and in compliance with the NPDES permit program. No direct discharge shall be allowed into the Ware River during the dewatering operations. The Contractor shall be responsible for restoration of site following completion of the dewatering operations.

Temporary control of water shall be constructed for:

- 4) Demolition of the existing bridge Piers, including complete and/or partial demolition of stem and pile caps to a depth of 3'-0" below the river bed, as shown on the Plans. Any portions of the existing abutments at depths greater than 3'-0" below the river bed shall remain in place.
- 5) Excavation for and construction of the proposed riprap at the face of abutments and the sides of the abutments and wingwalls, as shown on the plans.

The work shall include all equipment, labor, materials, pumping, and other measures necessary for water control devices required for the control of water for substructure concrete work and for other work that may be required to complete the construction of proposed Bridge No. W-05-015 (C89), and for control of water necessary to accomplish the demolition and removal of existing bridge abutments as shown on the plans, as directed by the Engineer, and as specified herein.

This item does not include the design, furnishment, installation, maintenance, or removal of temporary cofferdam, which is included and paid for in Item 990.11: Temporary Cofferdam – Structure No. W-05-015.

Dewatering shall be conducted to ensure that all construction of the proposed bridge is performed in the dry. For demolition purposes, dewatering shall be conducted on an as needed basis as determined by the Contractor's plan for control of water.

It is the responsibility of the Contractor to determine the need and extent of dewatering required and to submit methods and materials he/she proposes to use for the Engineer's approval.

The Contractor shall follow the guidelines of this specification for which dewatering is to be accomplished. However, except for payment, all work shall conform to the relevant requirements of Section 140, and to the allowed dewatering methods listed herein:

The Contractor shall submit complete working drawings and computation of his or her proposed dewatering system with supporting data, as necessary, to the Engineer for approval, in accordance with Subsection 5.02 and the Special Provisions. These drawings shall be accompanied by design calculations. Both shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The Contractor shall make his or her own evaluation of existing conditions and water flow, and of the effects of his or her proposed temporary works and construction methods, and shall provide in his or her design for all loads and construction conditions necessary to permit demolition and construction of the specified structure while maintaining public safety and protecting complete work and all third party property from damage resulting from construction operations.

Measures to control the discharge of pollutants into water resource areas shall include, but not be limited to the following:

- Rigorous management of construction operations involving potentially hazardous materials, such as refueling and maintenance of construction equipment.
- Formulation of contingency plans to control accidental spillage from potentially hazardous materials.
- Siting of construction laydown and staging areas outside of the riverfront inner riparian area and Wetlands buffer zones, and locating construction staging on relatively flat ground.
- Scheduling of work within the resource areas to avoid periods of high flood (e.g., spring floods) and inclement weather.
- Installation and continuous maintenance of compost filter tube fences to prevent sediment migration into adjacent downstream resource areas. Placement of erosion controls shall be as shown on the plans, as specified herein, or as directed by the Engineer to accomplish maximum control of project related sediment mobilization. Additional erosion control measures shall be employed as necessary to prevent erosion and sedimentation of the streambed. These measures shall be maintained for the duration of the contract.
- All discharge resulting from dewatering activities shall be directed to temporary construction tanks for sedimentation/retention provided as necessary to control turbidity. At no time shall said discharge be directly released into adjacent resource areas.

The Contractor shall provide temporary sheeting, water barriers, filtering fabrics, silt fencing, sedimentation/retention basins, and/or other effective procedures or structures together with all labor, materials, and equipment necessary for controlling water in, under, and around the bridge. Such work shall be subject to the approval of the Engineer, but such approval will not relieve the Contractor of responsibility for the adequacy of construction, maintenance, operation, and safety of the water control system.

Also included shall be all necessary permits that may be required in performing the work under this item.

Upon completion of the work, temporary sheeting, water barriers, and any other water control devices or constructions shall be removed from the site.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Compensation for the work to be done under this item shall be at the contract Lump Sum price. Such price shall be considered full compensation for all labor, tools, equipment, materials, installation, maintenance, and removal of any temporary water barriers such as, sheeting, or other diverting systems or material, filter fences, sedimentation/retention basins, and all incidental work necessary to complete the work under this item as described herein and in a satisfactory manner to the Engineer.

Payment shall be made based upon the following percentages: 10% upon approval of design, 70% upon complete installation, and 20% upon removal.

DOCUMENT A00831

ARMY CORPS OF ENGINEERS

GENERAL PERMIT

ARMY CORPS OF ENGINEERS	
GENERAL PERMIT.....	A00831- 3 through 40
DEPARTMENT OF THE ARMY	
GENERAL PERMITS FOR THE COMMONWEALTH OF MASSACHUSETTS	A00831- 41 through 90

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

September 1, 2022

Regulatory Division
File No. NAE-2022-01398

Melissa Lenker
Massachusetts Department of Transportation – Highway Division
Boston, Massachusetts 02116
(via email: melissa.lenker@dot.state.ma.us)

Dear Ms. Lenker:

This regards your application submitted to the U.S. Army Corps of Engineers (USACE) to permanently discharge 5,204 square feet below the Ordinary High Water (OHW) mark of the Ware River associated with the replacement of the bridge conveying Route 32 (Palmer Road) over the Ware River in Ware, Massachusetts. The existing three-span bridge will be replaced with a new two-span bridge on a slightly different alignment. The two existing in-river piers will be removed to 3' below the riverbed and replaced with one new in-river pier. Rip-rap overtopped with natural streambed material will be installed in front of the new abutments and around the new central pier. The project also includes 9,340 square feet of temporary impact below OHW associated with cofferdams/dewatering and the installation of temporary work platforms to access the work areas (to be designed by the contractor). The work is shown on the enclosed plans titled "MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION PERMITTING PLANS FOR ROUTE 32 (PALMER ROAD) OVER WARE RIVER (BRIDGE NO. W-05-015) IN THE TOWN OF WARE HAMPSHIRE COUNTY", on 21 sheets, and dated "5/20/2022".

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 10 of the April 16, 2018 Federal permits known as the Massachusetts General Permits (GPs). A copy of these permits can be found at: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit/>.

Please review the GPs carefully, including the general conditions beginning on page 19, to be sure that you and whoever does the work understand its requirements. A copy of the GPs and this verification letter shall be available at the project site throughout the time the work is underway. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with any special condition(s) provided below or all of the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations. You must perform this work in compliance with the terms and conditions of the GPs and also in compliance with the following special conditions:

1. You must maintain the activity authorized herein in good condition and in conformance with the terms and conditions of this authorization. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 37 on page 32 of the GPs. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this authorization from this office, which may require restoration of the area.

2. Prior to installation, plans depicting the final design of the work platforms and associated impacts to Waters of the U.S. shall be submitted to the Corps Project Manager for review and approval.

3. Within 180 days of project completion, MassDOT shall forward a set of project plans and relevant technical documentation to the Risk Analysis Branch, Mitigation Division, Federal Emergency Management Agency (FEMA), Region 1, 99 High Street, Boston Massachusetts, 02110. This submission shall be made in a digital format, and provide a level of content detail acceptable to FEMA Region 1 personnel.

4. Your application indicates 1 acre of tree clearing will occur as part of this project. If additional trees will be removed, you must notify this office in advance so we may reinitiate consultation regarding the northern long-eared bat.

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

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

This authorization expires on April 5, 2023. You must commence or be under contract to commence the work authorized herein by April 5, 2023, and complete the work by April 5, 2024. If not, you must contact this office to determine the need for further authorization before beginning or continuing the activity. We recommend that you contact us *before* this authorization expires to discuss reissuance. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction. We must approve any changes before you undertake them.

-3-

This authorization does not obviate the need to obtain other Federal, State, or local authorizations required by law.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at <https://regulatory.ops.usace.army.mil/ords/f?p=136:4>.

Please contact Dan Vasconcelos, of my staff, at (978) 318-8653 if you have any questions.

Sincerely,



Tammy Turley
Chief, Regulatory Division

cc:

Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts; reiner.ed@epa.gov
David Simmons, USFWS; david_simmons@fws.gov
Kerry Bogdan, FEMA, Region 1, Boston, Massachusetts, Kerry.Bogdan@fema.dhs.gov
Christopher Markesich, FEMA, Region 1, Boston, Massachusetts,
christopher.markesich@fema.dhs.gov
MassDEP-WRP, Boston, Massachusetts; dep.waterways@mass.gov
Heidi Davis, MassDEP, Boston, Massachusetts, heidi.davis@state.ma.us
Tyler Lewis, MassDEP, Boston, Massachusetts, Tyler.Lewis@mass.gov
David Robinson, Massachusetts Board of Underwater Archaeological Resources
(BUAR); david.s.robinson@mass.gov
Conservation Commission, Ware, Massachusetts, ncroteau@townofware.com
Cori Beckwith, MassDOT – Highway Division, Boston, Massachusetts,
corinna.beckwith2@state.ma.us
Timothy Dexter, MassDOT – Highway Division, Boston, Massachusetts,
timothy.dexter@state.ma.us

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

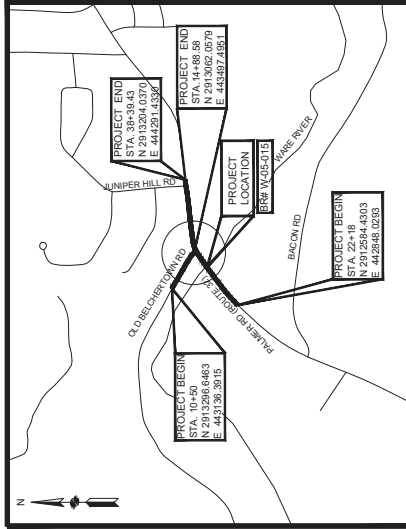
PERMITTING PLANS FOR
ROUTE 32 (PALMER ROAD) OVER WARE RIVER
(BRIDGE NO. W-05-015)

IN THE TOWN OF
WARE
HAMPSHIRE COUNTY
FEDERAL AID PROJECT NO.

ENVIRONMENTAL PERMITTING PLANS

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND INDEX
2	KEY PLAN, PROFILE, AND LOGIC MAP
3	GENERAL NOTES AND ESTIMATED QUANTITIES
4-8	CONSTRUCTION PLANS
9	PROFILE - PALMER ROAD (ROUTE 32)
10	RIPRAP PLAN AND ELEVATION
11	CHANNEL APPROACH SECTIONS
12	PAVED CONSTRUCTION SECTIONS
13-20	STAGE CONSTRUCTION PLANS
21	ENVIRONMENTAL IMPACT PLAN



LENGTH OF PROJECT = 2,000 FEET = 0.38 MILES
SCALE: 1" = 1250'



WARE PALMER ROAD (ROUTE 32) OVER WARE RIVER			
DATE	REV	DESCRIPTION	DATE
05/05/2022	1	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	2	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	3	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	4	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	5	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	6	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	7	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	8	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	9	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	10	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	11	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	12	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	13	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	14	ISSUED FOR PERMITTING	05/05/2022
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05/05/2022	16	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	17	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	18	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	19	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	20	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	21	ISSUED FOR PERMITTING	05/05/2022

TITLE SHEET

DATE	DESCRIPTION	REV
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05/05/2022	ISSUED FOR PERMITTING	3
05/05/2022	ISSUED FOR PERMITTING	4
05/05/2022	ISSUED FOR PERMITTING	5
05/05/2022	ISSUED FOR PERMITTING	6
05/05/2022	ISSUED FOR PERMITTING	7
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05/05/2022	ISSUED FOR PERMITTING	16
05/05/2022	ISSUED FOR PERMITTING	17
05/05/2022	ISSUED FOR PERMITTING	18
05/05/2022	ISSUED FOR PERMITTING	19
05/05/2022	ISSUED FOR PERMITTING	20
05/05/2022	ISSUED FOR PERMITTING	21



RECOMMENDED FOR APPROVAL

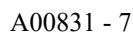
CHIEF ENGINEER

DATE

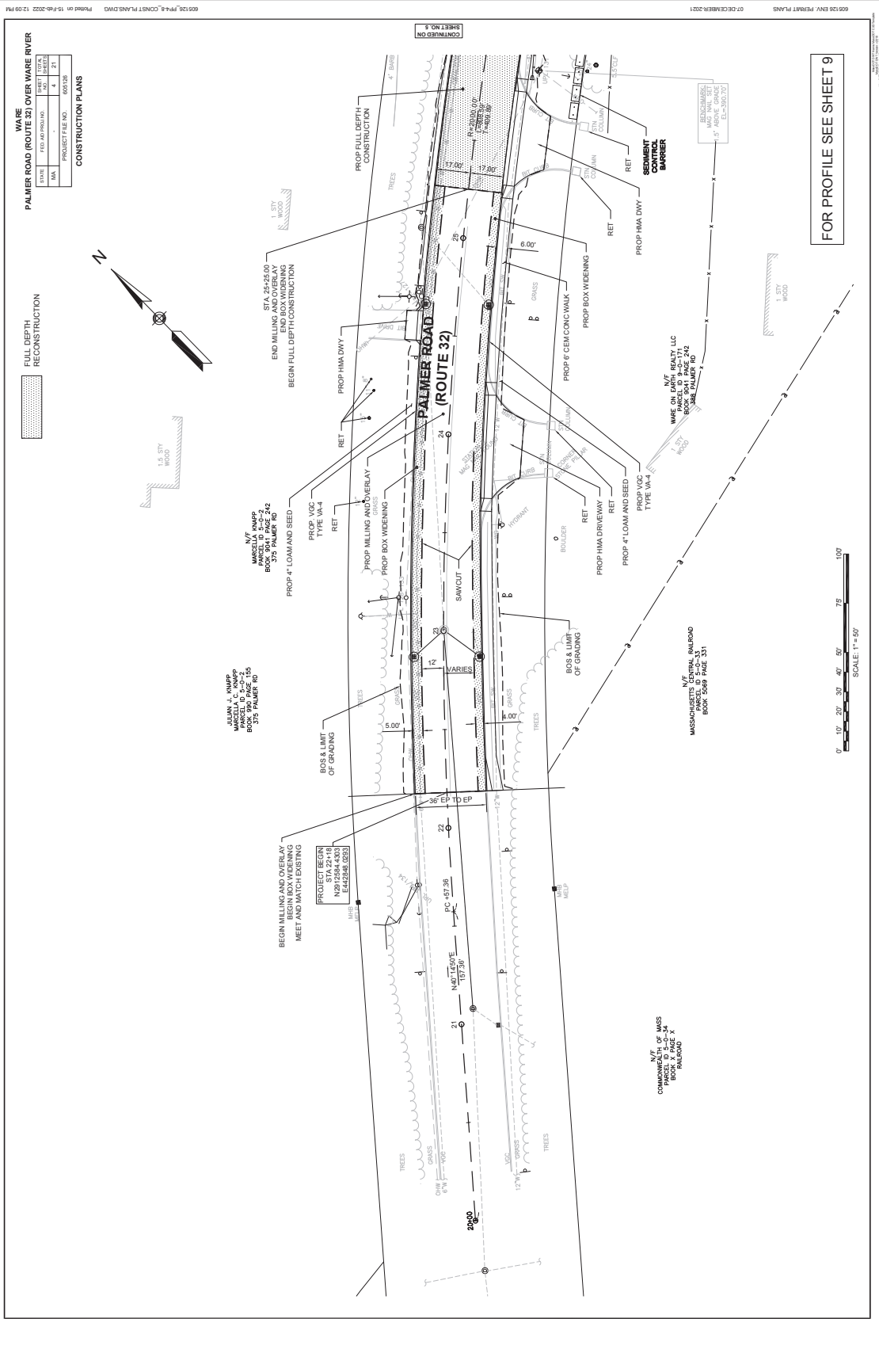
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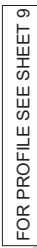
HIGHWAY ADMINISTRATOR

DATE

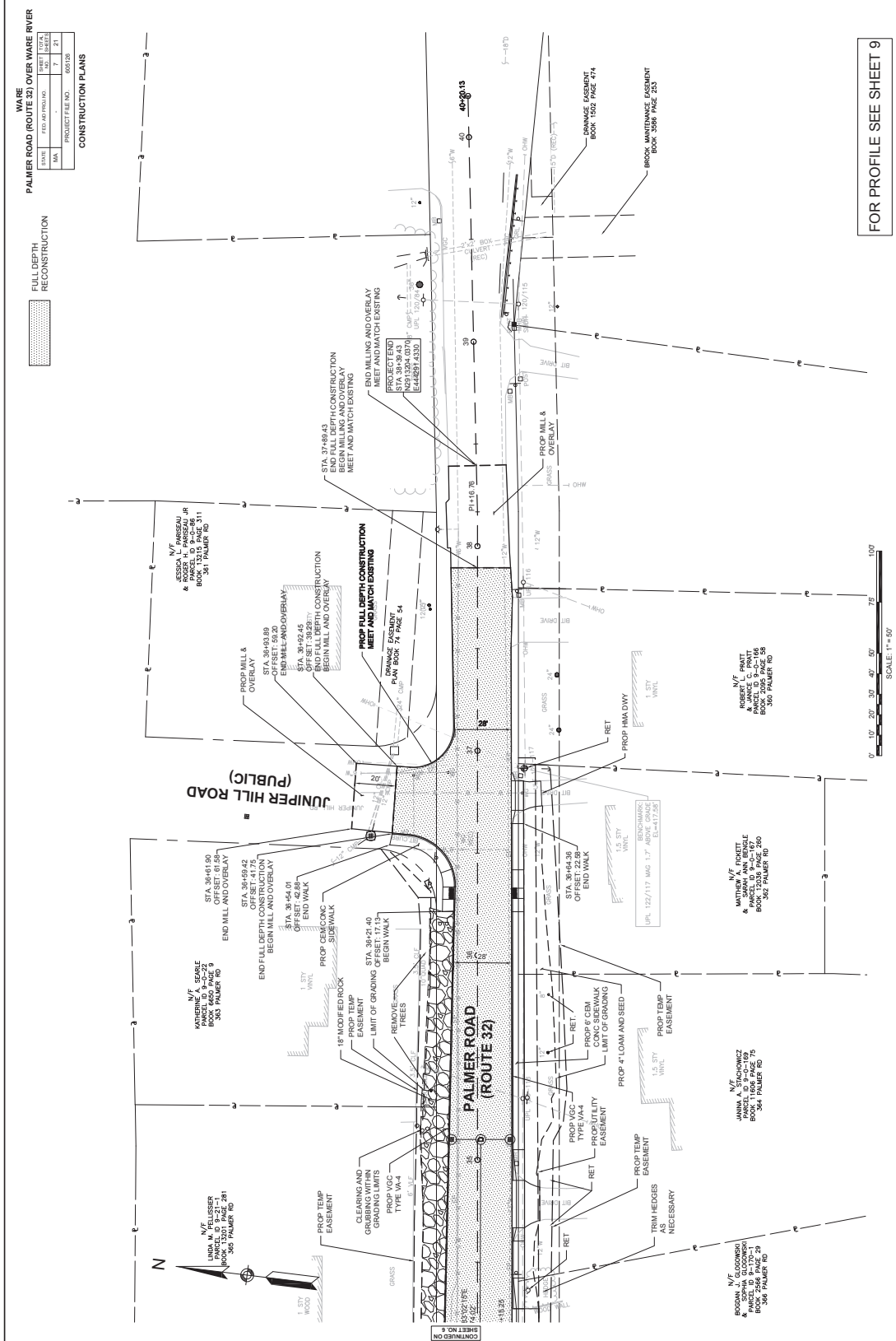


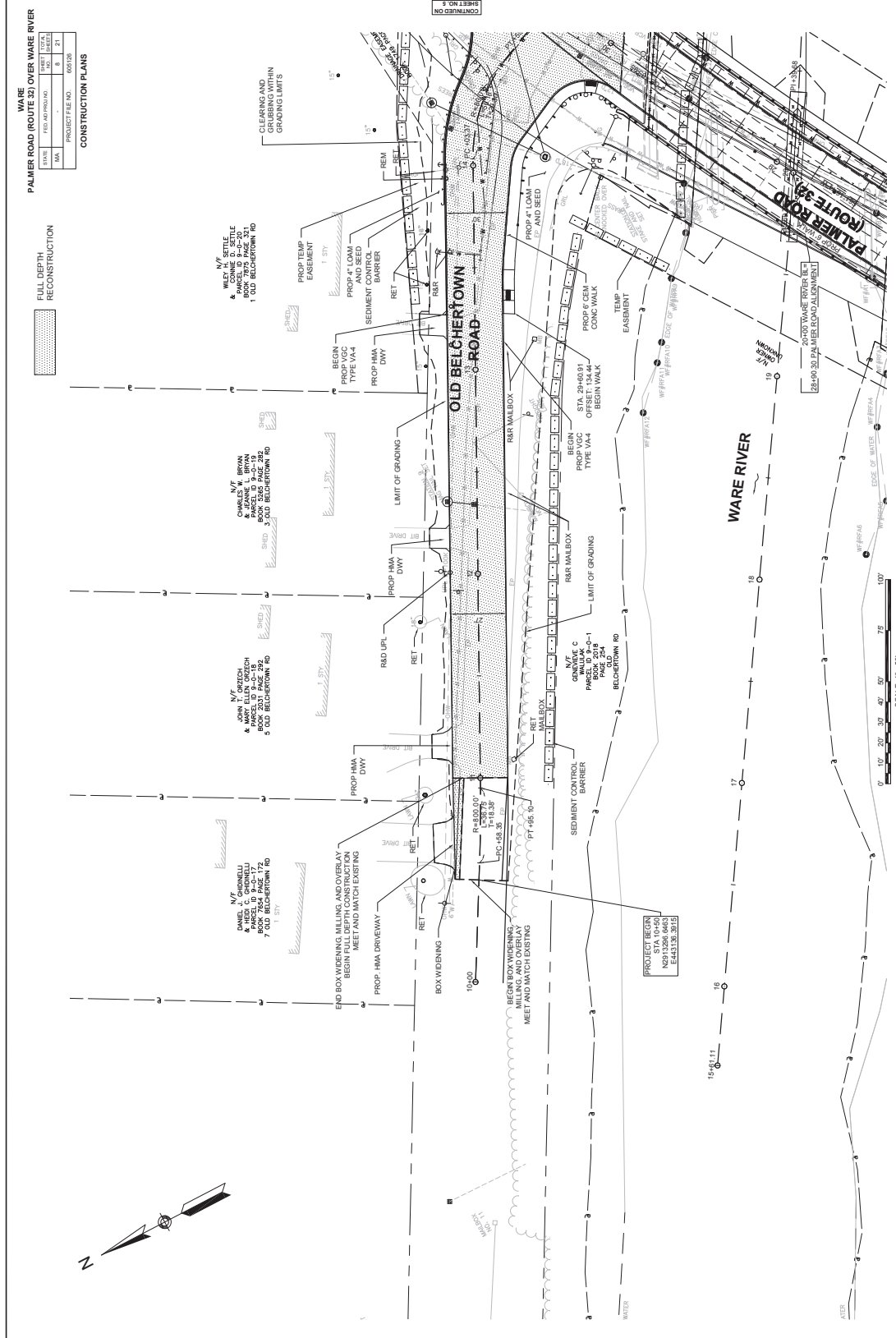
BRIDGE NO. W-05-015 (C89)

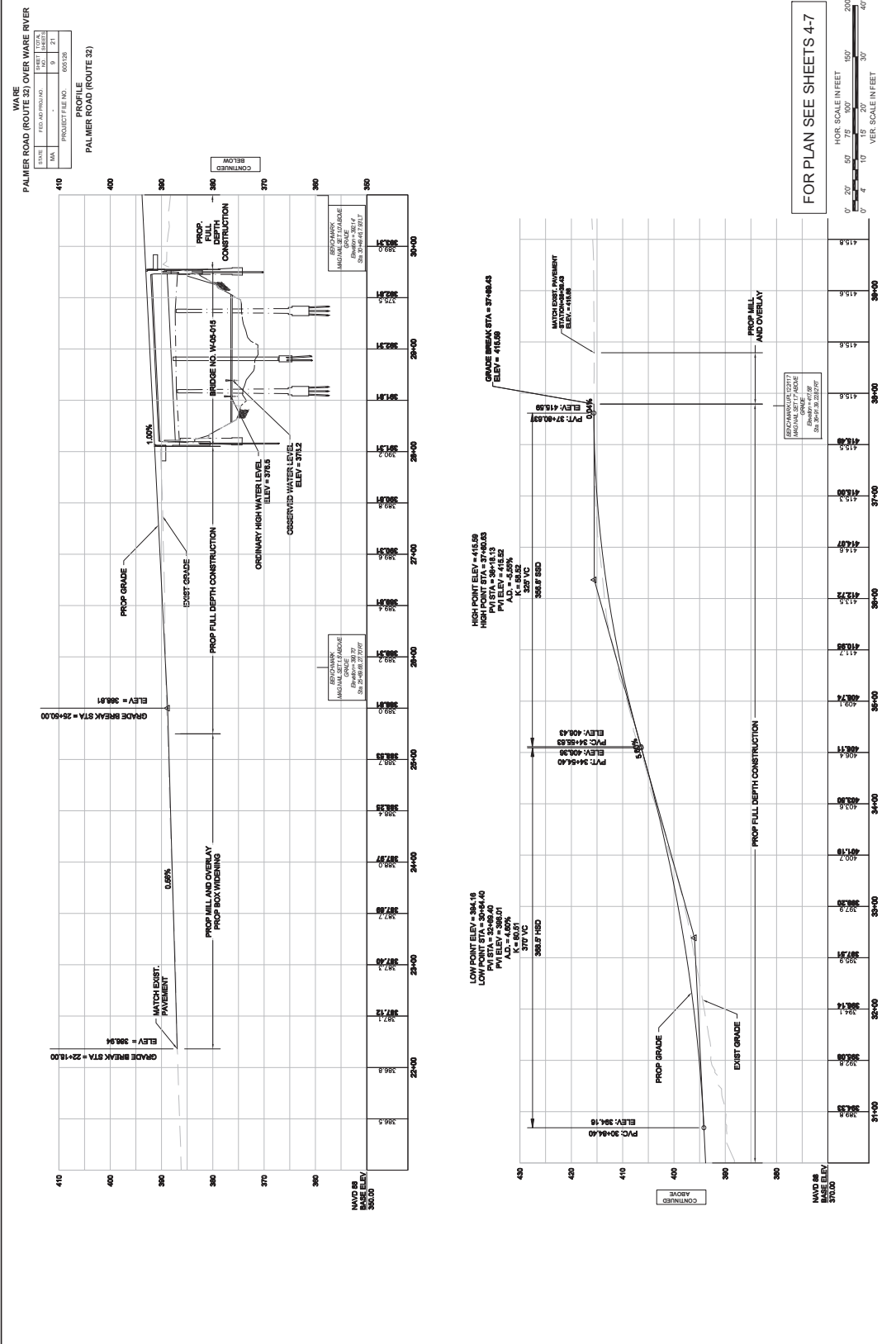


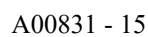


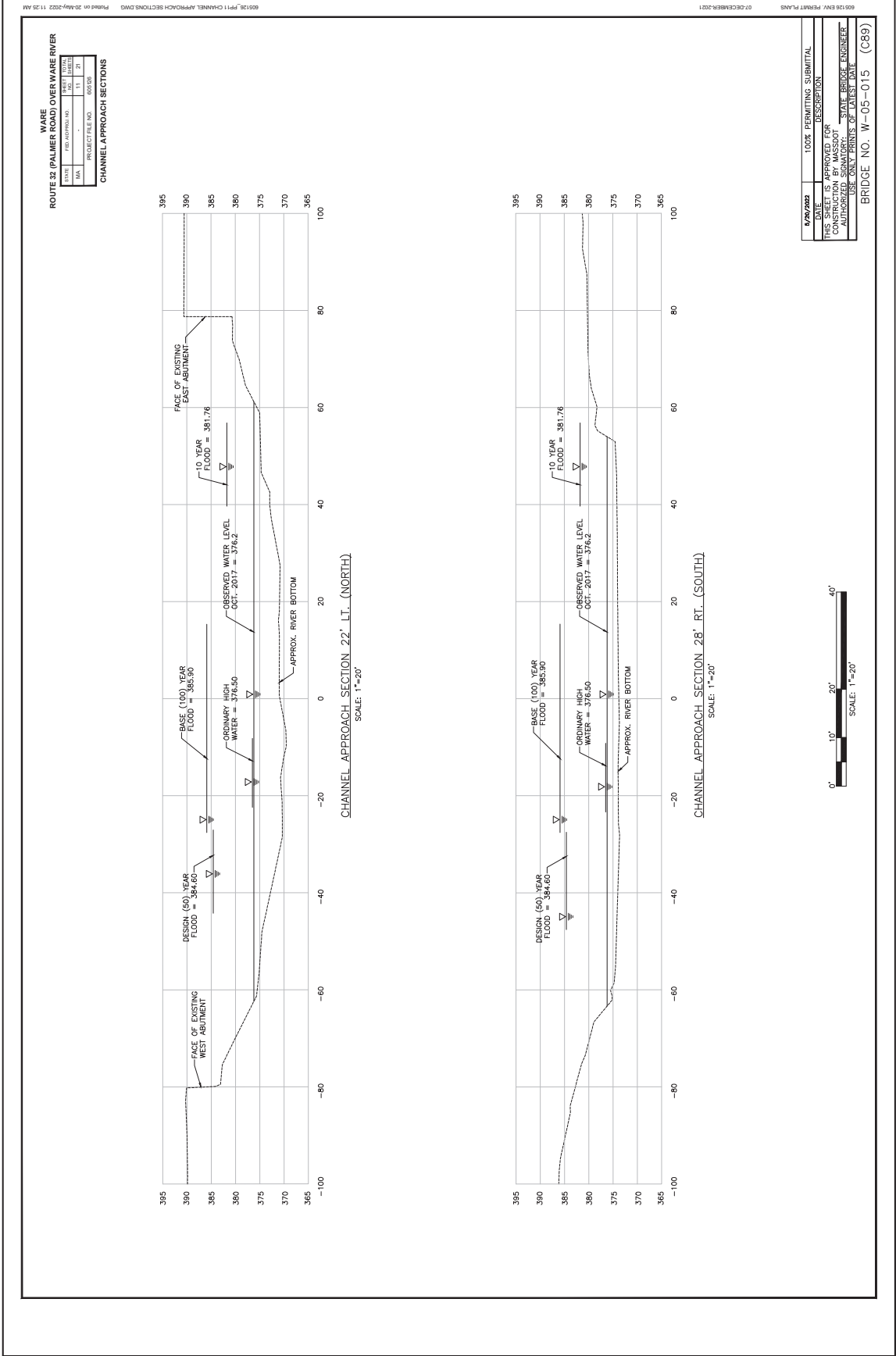


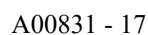






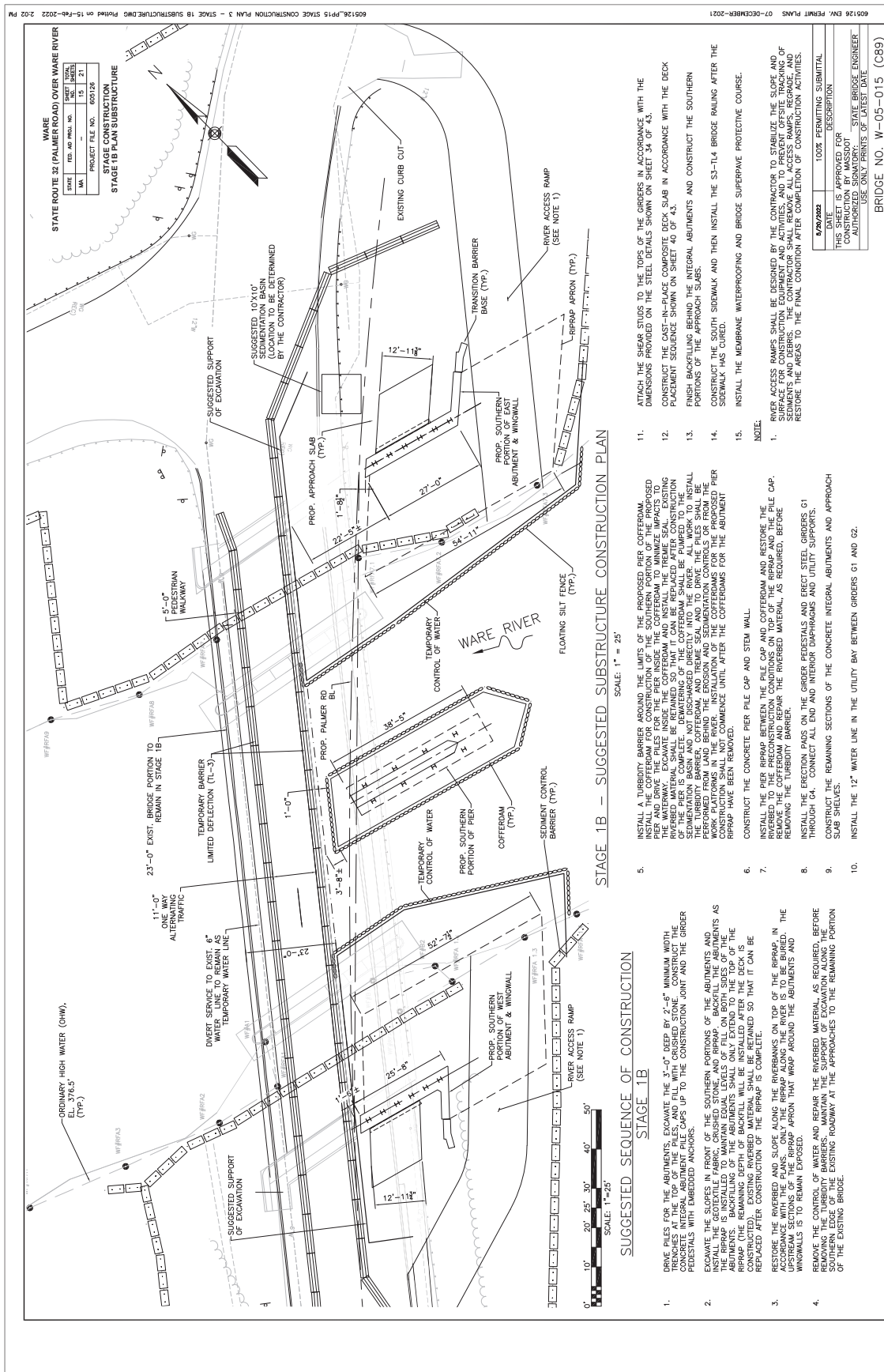


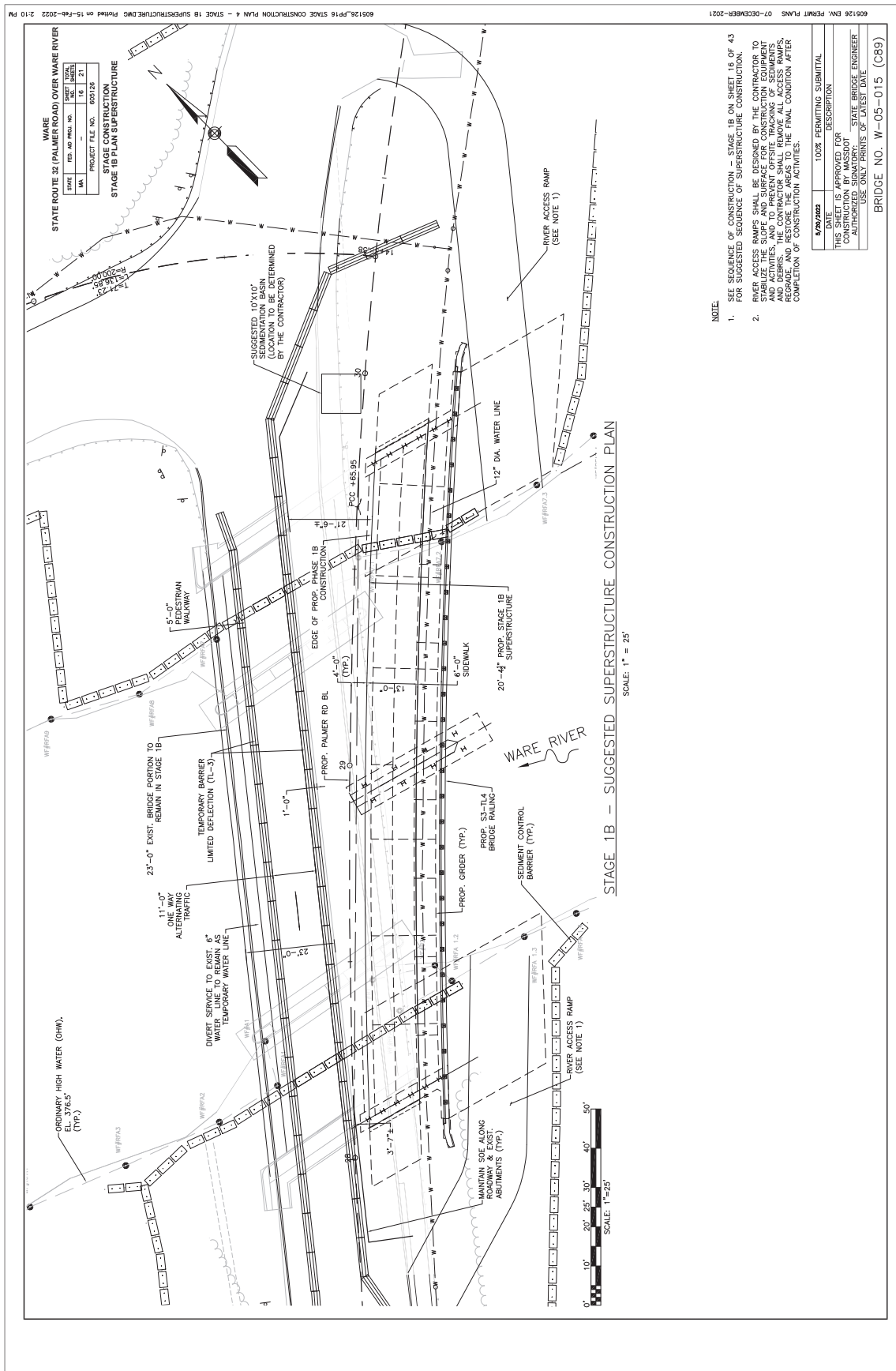


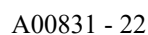




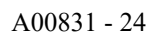




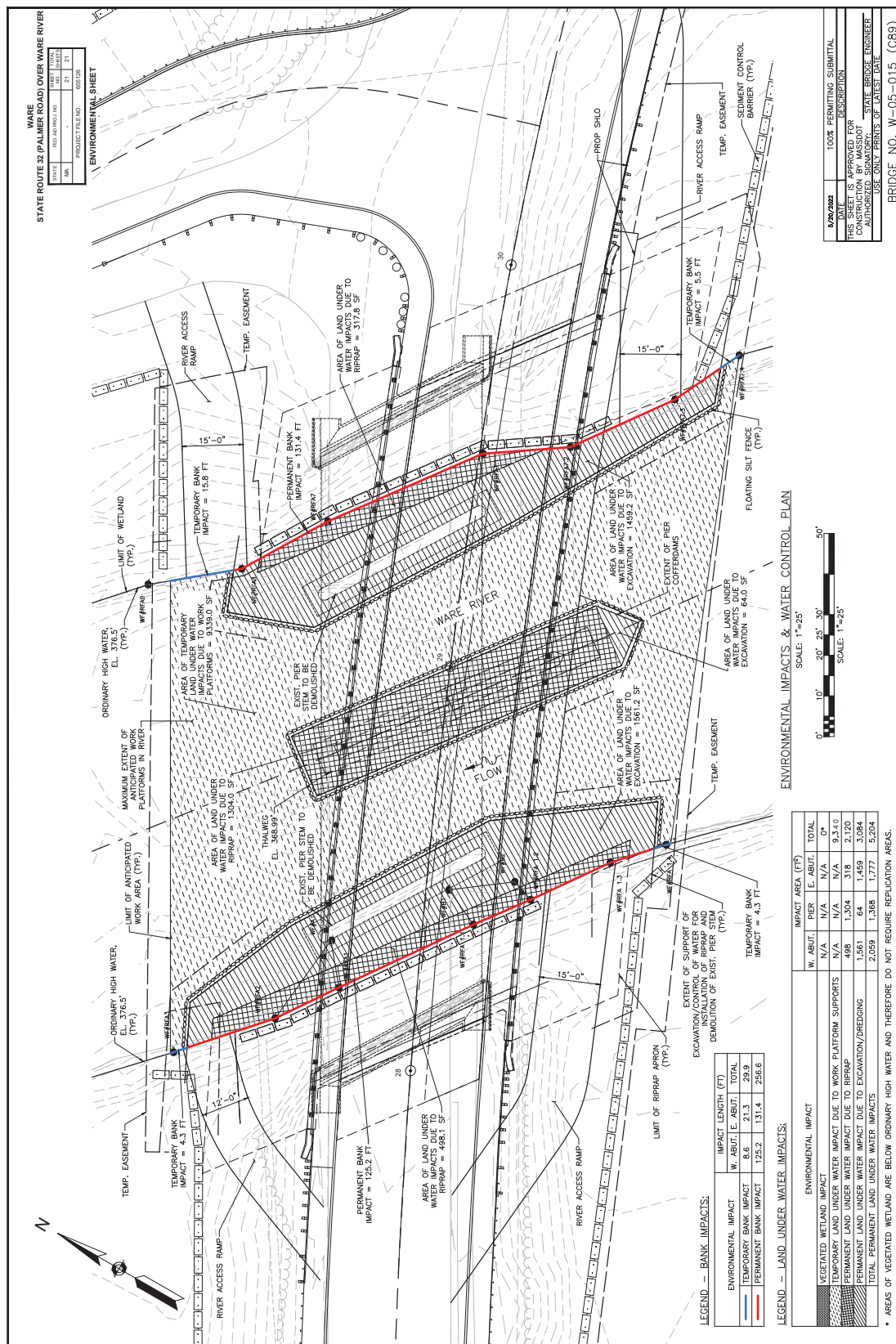














**US Army Corps
of Engineers®**
New England District

WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

* EMAIL TO: cenae-r@usace.army.mil; or *

* *

* MAIL TO: U.S. Army Corps of Engineers, New England District *

* Permits and Enforcement Branch *

* Regulatory Division *

* 696 Virginia Road *

* Concord, Massachusetts 01742-2751 *

Corps of Engineers Permit No. NAE-2022-01398 was issued to MassDOT – Highway Division and authorized the applicant to permanently discharge 5,204 square feet below the Ordinary High Water (OHW) mark of the Ware River associated with the replacement of the bridge conveying Route 32 (Palmer Road) over the Ware River in Ware, Massachusetts. The existing three-span bridge will be replaced with a new two-span bridge on a slightly different alignment. The two existing in-river piers will be removed to 3' below the riverbed and replaced with one new in-river pier. Rip-rap overtopped with natural streambed material will be installed in front of the new abutments and around the new central pier. The project also includes 9,340 square feet of temporary impact below OHW associated with cofferdams/dewatering and the installation of temporary work platforms to access the work areas (to be designed by the contractor).

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone Numbers: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ Date: _____

Printed Name: _____ Title: _____

Date Permit Issued: _____ Date Permit Expires: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Vasconcelos Submittals Required: _____

Inspection Recommendation: _____



**US Army Corps
of Engineers®**
New England District

COMPLIANCE CERTIFICATION FORM
(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

Permit Number: NAE-2022-01398

Project Manager: Vasconcelos

Name of Permittee: MassDOT – Highway Division

Permit Issuance Date: August 31, 2022

Please sign this certification and return it to our office upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

```

*****
* E-MAIL TO: cenae-r@usace.army.mil; or *
* *
* MAIL TO: Permits and Enforcement Branch A *
* U.S. Army Corps of Engineers, New England District *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *
*****

```

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Beth Card
Secretary

Martin Suuberg
Commissioner

August 26, 2022

MassDOT – Highway Division
Ten Park Plaza, Suite 4160
Boston, MA 02116
ATTN: Melissa Lenker

RE: 401 WATER QUALITY CERTIFICATION

Application for: BRP WW 10 (X288430)
MAJOR FILL AND EXCAVATION PROJECTS
BRP WW 08 (X288429)
MINOR DREDGE CERTIFICATION

AT: Bridge Replacement (W-05-015) Route 32 (Palmer Road) over Ware River
Ware, Massachusetts
Chicopee Watershed

USACE Application No: NAE-2022-01398

Dear Ms. Lenker:

The Department of Environmental Protection (“MassDEP”) has reviewed your application for a Water Quality Certification, as referenced above. 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 proposed project is located on Route 32 (Palmer Road) over the Ware River in Ware, MA. The purpose of this project is to replace the structurally deficient bridge and substructures and to realign Palmer Road near the bridge to allow for safer traffic flow. The roadway and sidewalk will also be replaced. There will be temporary and permanent alterations to Land Under Water (LUW) as a result of the installation of the new abutments and pier as well as the use of a cofferdam to complete the work.

The existing Palmer Road bridge was built in 1937 and is a 3-span continuous steel girder bridge that is approximately 154-feet long and 30-feet wide. The bridge has severe concrete spalling and exposed

401 WQC – Ware – Bridge Replacement- (W-05-015) Route 32 (Palmer Road) over Ware River
Transmittal # X288430 & X288429

rebar in some areas. The bridge is on the National Highway System and is part of an emergency evacuation route and is considered critical or essential. The surrounding area is primarily residential, but Route 32 carries a substantial amount of traffic through the area. The Ware River is part of the Chicopee River watershed.

The proposed project will replace the existing bridge superstructure with a two-span steel girder concrete superstructure, with integral abutments and a center wall pier. The new bridge will provide two 11-foot travel lanes, two six-foot shoulders and two six-foot sidewalks, for a total width of 34 feet, curb to curb. The bridge span will be a total of 167 feet; however, the center pier will only provide an 83-foot-wide opening on each side. Improvements to Palmer Road and Old Belchertown Road include reconstruction of the concrete sidewalks, milling and repaving of the roadway, reconstruction of driveway aprons, and the replacement of all stormwater basins with deep sump catch basins. A stormwater infiltration basin will also be constructed to the northeast of the new intersection.

The proposed demolition and bridge replacement will require the installation of cofferdams; this work will result in temporary impacts to LUW totaling 9,340 square feet (sf). The new abutments, piers, and surrounding rip rap will result in 5,204 sf of permanent impacts to LUW. Two small delineated BVWs are near the project location but will not be impacted. Approximately 1,015 cubic yards of soils will be dredged from the river for the installation of the pier and abutments. The soils to be dredged were sampled in four locations. The samples had less than 10% of the soil passing through the 200 sieve and a historical study was completed to support the assumption that no contaminants exist within the soils of the project area; therefore, in accordance with 314 CMR 9.07(2)(a), no chemical testing is required.

As the project is considered redevelopment in accordance with the stormwater provisions of 314 CMR 9.06(6)(a)7., stormwater standards will be met to the maximum extent practicable. The project will increase the impervious area by 0.2 acres at the project site. Due to space constraints on site, improvements to stormwater are limited. All catch basins will be replaced with deep sump catch basins. Most of Palmer Road has stormwater sheet flow off the edge of the pavement; new catch basins will be installed to capture this water and direct it into the current stormwater system. During the course of project review, an infiltration basin was proposed in the northeast corner of the intersection of Palmer Road and Old Belchertown Road. In accordance with Special Condition 11, full design of this infiltration basin will be submitted to MassDEP for review and approval.

The project will meet all MA Stream Crossing Standards (the Standards) except for Standard 3. The new proposed abutments meet the required 1.2 times bankfull width of 140 feet overall for this location but the center pier does not allow this to be one continuous opening.

Best management practices for erosion and sedimentation control will be adhered to for all phases of construction to minimize potential impacts to wetland resource areas. To the extent practicable, disturbed soils will be stabilized via seeding. Erosion and sedimentation controls will be installed prior to ground disturbance activities and maintained where activities are proposed within 100 feet of the streambank. The erosion controls will prevent silt and sediments from migrating into or towards the resource areas. Sediment controls will consist of compost-filled filter tubes and silt fencing; silt sacks or the equivalent will be installed in existing catch basins.

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. Public notice was provided in the Ware River News on June 2, 2022. No comments were received.

401 WQC – Ware – Bridge Replacement- (W-05-015) Route 32 (Palmer Road) over Ware River
Transmittal # X288430 & X288429

Therefore, based on information currently in the record, MassDEP grants a 401 Water Quality Certification for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. MassDEP further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, MassDEP has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

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. In addition, those conditions with the (Submittal) designation shall be included in the Special Provisions and reviewed at the District Pre-Construction Conference.

1. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. All work shall be performed in accordance with the following documents and plans:*
 - a. 401 Water Quality Certificate Application for Bridge Replacement and Rehabilitation, Route 32 (Palmer Road) over Ware River, prepared by Kleinfelder on behalf of MassDOT, dated May 26, 2022, Transmittal Form #X288429 and #X288430, with plans and supporting attachments;
 - b. Route 32 (Palmer Road) over Ware River Bridge Replacement Project Stormwater Report; Prepared by McMahon on behalf of MassDOT; dated July 20, 2022;
 - c. Kleinfelder Response Letter to MassDEP comments and supporting documents, submitted August 19, 2022; and
 - d. Draft plan of proposed stormwater infiltration basin; submitted August 25, 2022, by MassDOT.

Pre-construction

2. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. A minimum of twenty-one (21) days prior to commencement of construction, MassDOT shall contact MassDEP to schedule a pre-construction on-site or virtual inspection to review the plans and terms and conditions of this Water Quality Certificate (WQC). The Resident Engineer, the contractor, and a representative from MassDOT's Environmental Section and/or the District Engineer shall attend the pre-construction inspection. (Submittal)*
3. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. Any proposed changes, alterations or amendment requests as well as any required submittals shall be sent by email to heidi.davis@mass.gov and tyler.lewis@mass.gov. (Submittal)*
4. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. Prior*

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to the start of work, the applicant shall provide MassDEP with the name, address and phone number(s) of the MassDOT representative responsible for ensuring that all work complies with the conditions of this Water Quality Certification. **(Submittal)**

5. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* MassDEP shall be copied on the Army Corps of Engineers (USACE) Work Start Notification Form which is due at least two weeks before the anticipated starting date and the USACE Compliance Certification Form within one month following the completion of the authorized work. **(Submittal)**
6. *Pursuant to 314 CMR 9.06, the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* A minimum of twenty-one (21) days prior to commencement of construction, Mass DOT shall submit a water control/dewatering plan for review and approval. Should dewatering be required, it shall be conducted under the supervision of the RE and comply with the applicable conditions identified herein. This plan will include descriptions for any dewatering that will occur on site as well as dredge and debris material dewatering prior to shipment off site. **(Submittal)**
7. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared and implemented in accordance with the most recent U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP). The SWPPP must meet the requirements of a construction period erosion, sedimentation and pollution prevention plan as stipulated in Standard 8 of the Massachusetts Stormwater Management Standards. The SWPPP shall be provided to MassDEP for review and approval no less than two (2) weeks prior to the commencement of construction. See Condition 16 for required inspection frequencies. **(Submittal)**
8. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* The SWPPP 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.
9. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* Training required by the SWPPP must include the MassDEP approved *MassDOT Erosion Prevention & Sediment Control Training Program* and a comprehensive review of the Final SWPPP. All new contractors and subcontractors must be trained throughout the project. Verification of such training shall be submitted to MassDEP prior to the commencement of construction and kept on site for inspection. **(Submittal)**
10. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* Prior to the commencement of work, approved erosion and sedimentation control measures shall be installed per the approved SWPPP 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, and limiting the amount of disturbance at one time, etc.

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11. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* The applicant shall submit a plan within 60 days after the issuance of this WQC for the fully designed infiltration basin depicted in the document referenced in Condition 1.d. This plan will require the review and approval of MassDEP prior to its construction. **(Submittal)**

Construction Period

12. *Pursuant to 310 CMR 9.06(2), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* Impacts to Land Under Water shall not exceed **14,544 square feet** (9,340 sf temporary and 5,204 sf permanent).
13. *Pursuant to 310 CMR 9.06(2), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* No more **than 1,015 cubic yards** of material shall be dredged from the Ware River.
14. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* Streambed restoration work to temporarily impacted areas shall utilize locally sourced materials that match the surrounding streambed conditions if needed.
15. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* The project shall not result in any increase in turbidity within Resource Areas during rainfall events. In the event of a significant erosion and sedimentation control failure (e.g., sedimentation to a Resource Area), MassDEP and the Ware Conservation Commission shall be notified immediately and MassDEP shall have the authority to direct immediate corrective measures and remediation and the applicant shall comply with MassDEP's response. The Contractor shall immediately stabilize, control and contain any impacts.
16. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* SWPPP inspections shall occur at a frequency of no less than one inspection every seven days, and after any storm event measuring more than 0.5-inch of precipitation in a 24-hour period.
17. *Pursuant to 314 CMR 9.06(6)(a)4, the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* 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 street flooding during periods of precipitation. Stockpiles shall be located no less than fifty (50) feet from wetland resource areas and catch basins or other drainage conveyances that discharge to wetland resource areas. The SWPPP shall specify measures to implement this Special Condition. Filter fabric stretched under the storm drain inlet grate is not acceptable for this purpose.
18. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* Erosion and sedimentation controls must be inspected, maintained, and replaced if damage occurs until all disturbed areas have been fully stabilized. The Resident Engineer shall be responsible for the inspection of erosion and sedimentation controls in accordance with the SWPPP and with the frequency of those inspections

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being dictated as described herein. The Resident Engineer shall have the authority to require modifications to existing erosion and sedimentation controls, require additional controls as they deem necessary, and require that erosion or sedimentation problems be addressed immediately.

19. *Pursuant to 314 CMR 9.07, the following condition is necessary to minimize turbidity and sediment caused by construction activities and to ensure that water quality is not degraded, and that biology of the waters are not negatively impacted by potential discharges.* Measures should be in place to prevent turbid waters, due to demolition, dredging or debris removal activities, from extending past the limits of work in all stream crossings. These measures can be items such as turbidity curtains and/or sheet piles.
20. *Pursuant to 314 CMR 9.07, the following condition is necessary to minimize turbidity and sediment caused by construction activities and to ensure that water quality is not degraded, and that biology of the waters are not negatively impacted by potential discharges.* If visual turbidity escapes the controls in place, as described in condition 19, MassDEP shall be contacted and work shall stop, until the issue is corrected.
21. *Pursuant to 314 CMR 9.07, the following condition is necessary to protect water quality because it ensures that the project proponent is using planning and construction practices that will maintain the integrity of the site hydrology and maintain the aquatic resource functions and values.* Stockpiled materials shall be properly contained and shall not be located within at least 50 feet of catch basins or other drainage features that discharge to wetlands or waters to ensure water runoff and/or stockpiled materials will not escape the approved stockpile locations.
22. *Pursuant to 314 CMR 9.07(5), The following condition is in place to help avoid fugitive dust and siltation into wetland resources and waters.* Best management practices shall be implemented during transportation of dredge materials to the receiving facility. At a minimum, when transported upon public roadways, all dredged materials shall have no free liquid as determined by a paint filter test or other suitable method. This condition is necessary to protect surrounding area water quality during transportation.
23. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* A temporary shielding system shall be in place beneath the bridge structure prior to concrete excavation and removal to prevent debris from falling into the water below. If any debris falls in the river, it shall be immediately removed.

Post-Construction

24. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* All temporary erosion controls shall be removed at the conclusion of work once the surrounding area is stabilized.

General Conditions

25. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* This Certification remains in effect for the same duration as the federal permit that requires it.

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26. *Pursuant to 314 CMR 9.11, the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. No Special Conditions set forth herein shall be construed or operate to prohibit the Department from taking enforcement against the MassDOT or its contractors for any failure to comply with the terms and requirements of this 401 Water Quality Certification.*
27. *Pursuant to 314 CMR 9.09(1)(e), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. No activity authorized by this Water Quality Certification may begin prior to expiration of the 21-day appeal period or until a final decision is issued by MassDEP if an appeal is filed.*

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
One Winter Street, 2nd Floor
Boston, MA 02108

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

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One Winter Street, 2nd Floor
Boston, MA 02108

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):

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

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:

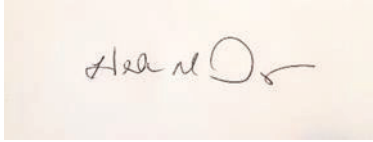
Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
PO Box 4062
Boston, MA 02211

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 me at Heidi.davis@state.ma.us or tyler.lewis@state.ma.us.

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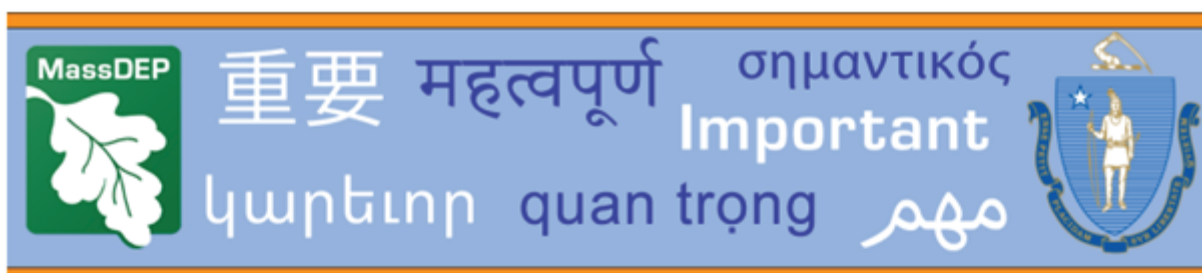
Very truly yours,

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 – Judy Schmitz
USACE - Dan Vasconcelos
MassDOT – Corinna Beckwith
MassDOT – Rob Natario
Ware Conservation Commission – John Prenosil - ncroteau@townofware.com
Kleinfelder – Rafic Khalil – rkhalil@kleinfelder.com

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Communication for Non-English-Speaking Parties

English

This document is important and should be translated immediately.
If you need this document translated, please contact MassDEP's Diversity Director at the telephone number listed below.

Español Spanish

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

Português Portuguese

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

繁體中文 Chinese Traditional

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

简体中文 Chinese Simplified

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

Ayisyen Kreyòl Haitian Creole

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

Việt Vietnamese

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

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះគឺសំខាន់ហើយត្រូវបានបកប្រែភ្លាមៗ។ ប្រសិនបើអ្នកត្រូវការឱ្យគេបកប្រែឯកសារនេះ សូមទាក់ទងមកនាយកដ្ឋានពិពិធកម្មរបស់ MassDEP តាមលេខទូរស័ព្ទខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

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

Contact **Glynis L. Bugg, Acting Diversity Director/Civil Rights** 857-262-0606

Massachusetts Department of Environmental Protection

One Winter Street, Boston MA 02108

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(Version revised 7.22.2022) 310 CMR 1.03(5)(a)

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Русский Russian

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

العربية Arabic

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

한국어 Korean

이 문서는 중요하고 즉시 번역해야 합니다. 이 문서의 번역이 필요하시다면, 아래의 전화 번호로 MassDEP의 다양성 담당 이사에 문의하십시오.

հայերեն Armenian

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

فارسی Farsi Persian

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

Français French

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

Deutsch German

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

Ελληνική Greek

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

Italiano Italian

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

Język Polski Polish

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

हिन्दी Hindi

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

Contact Glynis L. Bugg, Acting Diversity Director/Civil Rights 857-262-0606
Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108

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(Version revised 7.22.2022) 310 CMR 1.03(5)(a)

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Applicant: General Public in Massachusetts

Effective Date: April 16, 2018

Expiration Date: April 5, 2023

Department of the Army General Permits for the Commonwealth of Massachusetts

The New England District of the U.S. Army Corps of Engineers (Corps) hereby issues General Permits (GPs) for activities subject to Corps jurisdiction in waters of the U.S., including navigable waters, within the boundaries of, and off the coast of, the Commonwealth of Massachusetts, excluding work within the boundaries of Indian tribal lands. These GPs are issued in accordance with Corps regulations at 33 CFR Parts 320-332 (see 33 CFR 325.2(e)(2)). The GPs will protect the aquatic environment and the public interest while effectively authorizing activities that have no more than minimal individual and cumulative adverse environmental effects. This document supersedes the February 4, 2015 GPs.

This GP document contains the following sections:	<u>Page</u>
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II. Jurisdiction/Authorities to Issue Permits	2
III. Eligible Activities	3
IV. General Conditions	19
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VII. Definitions and Acronyms	40
VIII. Contacts and Tribal Areas of Concern	47
IX. Historic Property Notification Form	49

I. GENERAL CRITERIA

- See Section II to determine if the activity requires Corps authorization, and [Sections III](#) and [IV](#) to determine if the activity may be eligible for authorization under the GPs, specifically whether it is eligible for self-verification (SV) or a preconstruction notification (PCN) or an individual permit (IP) is required.
- In order for activities to qualify for these GPs, they must comply with all applicable GP eligibility criteria and general conditions in [Section IV](#).
- Project proponents are encouraged to contact the Corps with questions at any time. Pre-application meetings (see 33 CFR 325.1(b)) are encouraged to facilitate early review and help streamline the permit process by alerting the applicant to potential obstacles that may arise during the evaluation (e.g., historic properties general condition (GC) 7 and endangered species (GC 10)).
- Regulated activities that are not authorized by these GPs require IPs (see 33 CFR 325.5(b)) and proponents must submit an application directly to the Corps. (Projects that require an IP will also require an individual 401 Water Quality Certification (WQC) from the Massachusetts Department of Environmental Protection (MassDEP) and Coastal Zone Management (CZM) individual consistency concurrence from the Massachusetts Office of CZM.) These GPs do not affect the Corps IP review process or activities exempt from Corps permit requirements. The Corps retains discretionary authority on a case-by-case basis to elevate a SV to PCN or IP, or a PCN to IP based on concerns for the aquatic environment or for any other factor of the public interest (33 CFR 320.4(a)). Whenever the Corps notifies an applicant that a PCN or IP is required, no work in Corps jurisdiction may be conducted until the Corps issues the required authorization in writing indicating that work may proceed.

5. How to Obtain/Apply for Authorization

a. Self-verification (Self-Verification Notification Form (SVNF) required):

The project proponent may proceed with activities authorized under these GPs that are eligible for SV without submitting a PCN to the Corps provided the prospective permittee has:

i. Verified that the activity will comply with all applicable terms and conditions of the GPs and ensured that a PCN is not required. Consultation with the Corps and/or other relevant Federal and State agencies may be necessary to ensure compliance with the applicable GCs in [Section IV](#) and related Federal laws such as 33 U.S.C. 408 (GC 5), the National Historic Preservation Act (GC 7), the Endangered Species Act (GC 10) and the Wild and Scenic Rivers Act (GC 8). The Corps can confirm that SV eligible activities are authorized under the GPs upon request.

ii. Submitted the SVNF ([Section V](#)) to the Corps unless otherwise specified. By submitting the SVNF, you are self-verifying that your project meets the terms and conditions of the applicable GPs.

b. Preconstruction Notification (application required):

i. For activities that do not qualify for SV or when it is stated that a PCN is required, the permittee must submit a PCN to obtain written verification from the Corps before starting work in Corps jurisdiction. Applicants must include the information in [Section VI](#) to ensure the application is complete and to expedite project review. Applications should be emailed to cenae-r@usace.army.mil or to the Corps project manager if one has been assigned. If the Corps determines that the PCN activity qualifies for authorization under these GPs, the Corps will send a verification letter to the applicant. If the Corps determines that the activity does not qualify for authorization under these GPs, or that additional information is required, the Corps will notify the applicant in writing.

ii. Emergency Situations: Contact the Corps in the event of an emergency situation for information on the application and approval process. Emergency situations are limited to sudden, unexpected occurrences that could potentially 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 is subject to the same terms and conditions of these GPs as non-emergency work, and similarly, must qualify for authorization under the GPs; otherwise an IP is required. The Corps will work with all applicable agencies to expedite verification according to established procedures in emergency situations.

II. JURISDICTION/AUTHORITIES TO ISSUE PERMITS

1. The following regulated activities require authorization under the [Corps Regulatory Program](#):

a. The construction of any structure in, over or under any navigable water of the United States (U.S.), the excavating or dredging from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters. The Corps regulates these activities under Section (§) 10 of the Rivers and Harbors Act of 1899. See 33 CFR 322;

b. The discharge of dredged or fill material into waters of the U.S. The Corps regulates these activities under §404 of the Clean Water Act (CWA). See 33 CFR 323; and

c. The transportation of dredged material for the purpose of disposal in the ocean. The Corps regulates these activities under §103 of the Marine Protection, Research and Sanctuaries Act. See 33 CFR 324.

2. Related laws: 33 CFR 320.3 includes a list of related laws, including but not limited to: §401 and §402 of the CWA, §307(c) of the CZM Act of 1972, the National Historic Preservation Act of 1966, the Endangered Species Act, the Fish and Wildlife Act of 1956, the Marine Mammal Protection Act of 1972, the Magnuson-Stevens Fishery Conservation and Management Act, and §7(a) of the Wild and Scenic Rivers Act.

III. ELIGIBLE ACTIVITIES

The terms “navigable waters of the U.S.” and “waters of the U.S.” are used frequently throughout this document and it is important that the reader understand these terms, which are defined in [Section VII](#).

The area thresholds stated in GPs 1, 8-14, 16-20 and 23 apply when there is a discharge of dredged or fill material or a discharge associated with excavation in waters of the U.S. Unless otherwise stated, the total temporary and permanent impact area is used to determine if a single and complete project is eligible for SV or requires a PCN. An IP is required if the total permanent impact area exceeds the PCN/GP threshold.

Permanent impacts mean 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. Temporary impacts include, but are not limited to, waters of the U.S. that are temporarily filled, flooded, excavated, or drained because of the regulated activity. Temporary impacts are usually associated with construction activities and often involve the placement of cofferdams and construction mats. These fills are removed when construction is completed. Pilings and associated structures do not ordinarily constitute a discharge of fill material. Impacts resulting from activities eligible for exemptions under §404(f) of the CWA are not considered when calculating the impact area.

General Permits

1. Maintenance
2. Moorings
3. Structures in Navigable Waters of the U.S.
4. Aids to Navigation, and Temporary Recreational Structures
5. Dredging, Disposal of Dredged Material, Beach Nourishment, and Rock Removal and Relocation
6. U.S. Coast Guard Approved Bridges
7. Bank and Shoreline Stabilization
8. Residential, Commercial and Institutional Developments, and Recreational Facilities
9. Utility Line Activities
10. Linear Transportation Projects and Stream Crossings
11. Mining Activities
12. Boat Ramps and Marine Railways
13. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects
14. Temporary Construction, Access, and Dewatering
15. Reshaping Existing Drainage Ditches, New Ditches, and Mosquito Management
16. Response Operations for Oil and Hazardous Substances
17. Cleanup of Hazardous and Toxic Waste
18. Scientific Measurement Devices
19. Survey Activities
20. Agricultural Activities
21. Fish and Wildlife Harvesting and Attraction Devices and Activities
22. Aquaculture Activities
23. Aquatic Habitat Restoration, Establishment and Enhancement Activities

GP 1. Maintenance (Authorities: §§10 and 404) Authorized are: (a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified in the original permit or the most recently authorized modification (see Note 1). Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are also eligible. This GP also authorizes the removal of previously authorized structures or fills. 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. This also authorizes the removal of accumulated sediment and debris within, and in the immediate vicinity of, the structure or fill. This also authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided it is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, the Corps may waive the two-year limit in writing provided the permittee can demonstrate funding, contract, or other similar delays; (b) The removal of accumulated sediments and debris outside the immediate vicinity of existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.). All dredged or excavated materials must be deposited and retained in an area that has no waters of the U.S. unless otherwise specifically approved by the Corps under separate authorization; and (c) Temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the maintenance activity.

Not authorized under GP 1 (IP required): (a) Permanent impacts that are >1 acre in non-tidal waters of the U.S.; >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; (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; (c) Stream crossing modifications (including sliplining), replacements or extensions (see GPs 8 - 10); (d) New stream channelization or stream relocation projects (e.g., those in response to storm or flood events); or (e) Maintenance dredging, beach nourishment or beach restoration (see GP 5).

Self-Verification Eligible ¹	PCN Required ¹
Activities that do not require a PCN or an IP.	<ol style="list-style-type: none"> 1. Minor deviations result in expansions (e.g., structures) or new permanent or temporary impacts (i.e., outside of the previously authorized footprint) in waters of the U.S. This includes bank or shoreline stabilization in front of existing structures; or 2. For authorized activity (b) above, the removal of sediment is limited to the minimum necessary to restore the waterway in the vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend >200 feet in any direction from the structure; or 3. Impacts occur in special aquatic sites (SAS) other than non-tidal wetlands; or 4. Stream crossing work that does not require an IP. Minor repairs are SV eligible. 5. Dam and flood control or levee repair, rehabilitation, or replacement involves: <ol style="list-style-type: none"> (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; or (c) any modification that changes the character, scope, or size of the original fill design; or 6. The discharge of more than de minimis (i.e., inconsequential) quantities of accumulated bottom sediment occur from or through a dam into downstream waters (see Note 2); or 7. Work on tide gates without a Corps-approved operation and maintenance plan or changes affecting the hydraulic regime; or 8. Repair or replacement of currently-serviceable tide gates through the use of duckbill, flap gate or manual check valves unless installed on existing outfall discharge pipes conveying

¹ Temporary construction mats placed in an area of any size in non-tidal waters necessary to conduct activities do not count towards the SV or PCN/GP thresholds. Temporary construction mats in tidal SAS or >5000 SF in tidal waters require a PCN, but mats placed in an area of any size do not count towards the PCN/GP area thresholds. This only applies to temporary construction mats, not other temporary fill. See GCs 3(a), 13 and 14.

	<p>stormwater and/or industrial NPDES-permitted discharges from waters that are not waters of the U.S.; or</p> <p>9. 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: (a) ≤ 5 feet waterward from the ordinary high water mark (OHW) or high tide line (HTL) and in the dry; or (b) from Sep. 1 to Oct. 14. This is to protect endangered species; or</p> <p>10. 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 Corps permits may have included authorization to maintain the activity, in which case authorization under this GP is not necessary.</p> <p>2. See Corps Regulatory Guidance Letter No. 05-04 for more info.</p>	

GP 2. Moorings (Authority: §10)

New moorings and mooring fields; the relocation of previously authorized² moorings; expansions, boundary reconfigurations or modifications of previously authorized mooring fields; and maintenance and replacement of moorings.

Not authorized under GP 2 (IP required): (a) Moorings or mooring fields converted to or associated with a new boating facility³; (b) Moorings in a Corps [Federal anchorage](#) that are classified as a boating facility³ except municipal-operated mooring fields; or (c) Moorings in a Corps [Federal channel](#).

Self-Verification Eligible	PCN Required
<p>1. New or relocated moorings that meet all of the following terms:</p> <ul style="list-style-type: none"> a. Authorized by a local harbormaster/municipality under MGL Chapter 91 §10A; and b. Single boat, single-point and non-commercial; and c. Not associated with a boating facility³; and d. Neither placed within nor impact tidal vegetated shallows (e.g., eelgrass); and e. Attached to boats that do not contact the substrate during any tidal cycle; and f. Not located within a Corps Federal navigation project (FNP) or the FNP buffer zone. <p>2. Existing, authorized moorings are converted from traditional moorings to low impact mooring technology (see note below) and/or helical anchors.</p> <p>3. Maintenance and replacement of authorized² moorings.</p>	<p>1. New mooring fields; or expansions, boundary reconfigurations or modifications of existing, authorized mooring fields; or</p> <p>2. Moorings that are not SV eligible and do not require an IP. See Note 2.</p>
<p>Notes:</p> <p>1. Low impact mooring technology prevents any part of the tackle from dragging on the bottom during the tidal cycle.</p> <p>2. Locating new individual moorings in tidal vegetated shallows shall be avoided to the maximum extent practicable. If tidal vegetated shallows cannot be avoided, plans should show low impact mooring technology that prevent moorings chains from resting or dragging on the bottom substrate at all tides and helical anchors, or equivalent SAS protection systems, where practicable. For moorings that appear to impact tidal vegetated shallows, the Corps may require an eelgrass survey.</p>	

² For all GPs, “authorized” means authorized by the Corps in writing or by 33 CFR 330.3, not a state or municipality, unless otherwise stated. An SVNF was not required before January 21, 2010.

³ Boating facilities provide for a fee, rent or sell mooring or docking space, such as marinas, yacht clubs, boat clubs, boat yards, dockominiums, town facilities, land/home owners associations, etc. 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 3. Structures in Navigable Waters of the U.S. (Authority: §10)	
New, expansions, reconfigurations or modifications of structures in navigable waters of the U.S. including pile and pole-supported piers, floats, stairs, shore outhauls, and boat and float lifts.	
<u>Not authorized under GP 3 (IP required):</u> (a) Structures associated with a new boating facility; (b) Structures in a Corps Federal anchorage or channel; or (c) Artificial reefs	
Self-Verification Eligible	PCN Required
1. Private, non-commercial piers, floats and lifts that meet all of the following terms: <ul style="list-style-type: none"> a. Piers span ≤ 75 feet over salt marsh and are ≤ 4 feet wide and ≥ 4 feet above the marsh substrate (the height is measured from the marsh substrate to the bottom of the lowest longitudinal support); and b. Floats and lifts in tidal waters and non-tidal navigable waters of the U.S. are ≥ 18 inches above the substrate during all tidal cycles. Skids can only be used in areas where piles are not feasible and on sandy or hard bottom substrates; and c. Piers and floats in: (i) Tidal waters total ≤ 600 SF combined; and (ii) Non-tidal <u>navigable waters</u> of the U.S. total ≤ 300 SF combined; and d. Piers, floats and lifts: (i) Are ≥ 25 feet from previously mapped or existing vegetated shallows, or riparian property line extensions; and (ii) Extend $\leq 25\%$ of the waterway width or ≤ 75 feet waterward from OHW in non-tidal <u>navigable waters</u> of the U.S. or mean high water (MHW). See Note 1. 2. Fenders and similar structures.	1. Shore outhauls; or 2. Expansions, modifications, or new reconfiguration zones at any authorized boating facility; or 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.; or 4. Miscellaneous structures; or 5. Structures that are not SV eligible and do not require an IP.
Notes: 1. See www.nae.usace.army.mil/missions/regulatory/useful-documents-forms-and-publications >> Structure Placement in Navigable Waterways for guidance. 2. GC 11, Pile Driving and Removal, is particularly relevant.	

GP 4. 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, chapter I, subchapter C, 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 6.	
Self-Verification Eligible	PCN Required
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; (b) placed during winter events on ice and removed before spring thaw; (c) authorized by the local harbormaster; (d) Not located within an FNP; and (e) Not located in SAS.	Activities that are not SV eligible.
Note: An SVNf is not required for work authorized under SV #1 above.	

<p>GP 5. Dredging (Authority: §10; navigable waters of the U.S.), Disposal of Dredged Material (Authorities: §§10, 404 & 103; tidal waters of the U.S.), Beach Nourishment (Authorities: §§10 & 404; tidal and non-tidal waters of the U.S.), Rock Removal (Authority: §10, navigable waters of the U.S.) and Rock Relocation (Authorities: §§10 & 404; tidal and non-tidal waters of the U.S.)</p> <p>(a) <u>New, maintenance and improvement dredging</u>, including: (i) Return water from an upland contained dredged material disposal area; and (ii) Disposal of dredged material at an upland, confined aquatic disposal cell, beach nourishment, nearshore, designated open water or ocean water disposal site, provided the Corps finds the dredged material to be suitable for such disposal; and (b) Beach nourishment from upland sources.</p> <p><u>Not authorized under GP 5 (IP required):</u> (a) New dredging >½ acre; ≥10,000 CY; >1000 SF of impacts to intertidal areas, saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or >100 SF of impacts to tidal vegetated shallows; (b) Maintenance or improvement dredging and/or disposal with >1 acre of impacts to SAS; (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.</p>	
Self-Verification Eligible ¹	PCN Required ¹
<p>1. Maintenance dredging of previously dredged areas, with upland disposal, that meet all of the following terms:</p> <ul style="list-style-type: none"> a. Dredged area ≤½ acre; and b. Not located in right whale critical habitat (see Note 1), tidal waters from Mar 16 to Oct 31, 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; and c. Not located in: (i) Tidal waters from Jan 15 to Oct 31; (ii) The Connecticut River from the MA/NH border to the Turners Falls Dam from Mar 15 to Nov 15; (iii) The Merrimack River from the MA/NH border to the Essex Dam from Mar 1 to Nov 15; or (iv) The Charles River from the Watertown Dam to the Amelia Earhart Dam from Feb 15 to Nov 15. However, the time-of-year restriction(s) stated in Appendix B of the MA DMF Technical Report TR-47 (see Note 2) can apply instead if they are provided for a specific waterbody and less restrictive. This is to protect EFH and other species; and d. No impacts to tidal SAS, intertidal areas, areas located within 25' of salt marsh or 100' of vegetated shallows, or areas containing shellfish (an area contains shellfish unless: (i) it is verified that minimal shellfish are present per the local shellfish constable or an actual survey; or (ii) it is not a shellfish suitability area per the MassGIS shellfish suitability maps (see Note 3)); and e. No return water from upland disposal areas. <p>2. Boulder relocation with ≤100 SF of impacts, no impacts to SAS and relocated to a similar depth and substrate.</p>	<p>1. Maintenance dredging where the primary purpose is sand mining for beach nourishment; or</p> <p>2. New dredging and associated disposal <1/2 acre or <10,000 cubic yards; or</p> <p>3. Improvement dredging; or</p> <p>4. Beach nourishment in waters of the U.S. not associated with dredging; or</p> <p>5. Activities that are not eligible for SV and do not require an IP.</p>
<p>Notes:</p> <p>1. See www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit >> right whale critical habitat. The approximate boundaries are from the MA/NH border to Chatham.</p> <p>2. See www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit >> MA DMF Technical Report TR-47.</p> <p>3. See www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit >> MassGIS shellfish suitability maps.</p> <p>4. Compensatory mitigation is generally required for impacts to tidal SAS and intertidal areas resulting from new dredging.</p> <p>5. Contact the Corps if a ten-year authorization to maintain an area is desired.</p>	

GP 6. 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 §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 6: Causeways and approach fills (see GP 10).

Self-Verification Eligible	PCN Required
Discharges of dredged or fill material incidental to the construction of bridges.	
Note: As with all other GPs, a PCN may be required if stated in the General Conditions section.	

GP 7. Bank and Shoreline Stabilization (Authorities: §§10 & 404)

Bank and shoreline stabilization activities in waters of the U.S. necessary for erosion control or prevention, such as vegetative stabilization, sills, rip rap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of techniques (e.g., living shorelines), provided the activity meets all of 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.; and (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).

Not authorized under GP 7 (IP required): (a) Bank stabilization >500 feet in total length including both stream banks unless the Corps waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse effects; (b) Stream channelization or relocation activities; or (c) Breakwaters, groins or jetties.

Self-Verification Eligible ¹	PCN Required ¹
Activities in non-tidal waters that meet all of the following terms: <ol style="list-style-type: none"> ≤100 feet in length including both stream banks; or ≤100 feet in length on each side of the stream bank when necessary to protect transportation infrastructure; and ≤1 cubic yard of fill per linear foot average along the bank waterward of the plane of OHW; and The slope of the structure is more gradual than 1V:3H in lakes/ponds; and 1V:1H in non-tidal streams; and No impacts to SAS. 	<ol style="list-style-type: none"> Activities in non-tidal waters that are: <ol style="list-style-type: none"> >100 feet to ≤500 feet in length including both stream banks; or >100 feet in total length on each side of the stream bank and ≤500 feet including both stream banks when necessary to protect transportation infrastructure; or >1 cubic yard of fill per linear foot average along the bank waterward of the plane of OHW; or The slope of the structure is steeper than 1V:3H in lakes/ponds; and 1V:1H in non-tidal streams; or Impacts to SAS; or The activity is located in tidal waters; or Bulkheads, seawalls or similar structures for maritime activities; or 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: (a) <5 feet waterward from OHW or HTL and in the dry; or (b) from Sep. 1 to Oct. 14. This is to protect endangered species; or Activities that are not eligible for SV and do not require an IP.

Note: See GP 1 for information on the replacement or maintenance of existing, currently serviceable structures.

GP 8. Residential, Commercial and Institutional Developments and Recreational Facilities (Authorities: §404)	
Discharges of dredged or fill material into non-tidal waters of the U.S for the construction or expansion of: (a) Residences and residential subdivisions; (b) Residential, commercial and institutional building foundations and building pads and attendant features such as roads, parking lots, garages, yards, and utility lines; and (c) Recreational facilities.	
Not authorized under GP 8 (IP required): (a) Permanent impacts in non-tidal waters of the U.S. that are >1 acre, or >1000 SF in riffle and pool complexes or vegetated shallows; or (b) Subsurface sewerage disposal systems in waters of the U.S. (see Note 1 below).	
Self-Verification Eligible ¹	PCN Required ¹
Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) ≤5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes.	1. Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) >5000 SF; or (b) located in vegetated shallows or riffle and pool complexes; or 2. Stream and wetland crossings (see Note 2) that require a PCN per GC 19(b)-(e); or 3. Stream channelization, relocation, impoundment, or loss of streambed occurs; or 4. Activities that are not SV eligible and do not require an IP.
Notes: 1. Stormwater conveyance components and non-porous, septic effluent pipes that transmit effluent to or between components may be eligible for authorization under GP 9. 2. Stream and wetland crossings include permanent and temporary crossings, including those built with construction mats; and modifications (including sliplining), replacements or extensions to existing crossings.	

GP 9. Utility Line Activities (Authorities: §§10 & 404)

Activities required for: (a) The construction, maintenance, repair or removal of utility lines, including outfall and intake structures, and the associated excavation, backfill, or bedding for the utility lines in tidal and non-tidal waters of the U.S.; (b) The construction, maintenance, or expansion of utility line substation facilities associated with a power line or utility line in non-tidal waters of the U.S.; and (c) The construction or 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 for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the U.S., provided the activity, in combination with all other activities included in one single and complete project, does not cause the permanent loss of greater than 1 acre of non-tidal waters of the U.S. Access roads used solely for construction of the utility line must be removed upon completion of the work (see GC 15).

Not authorized under GP 9 (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 shallows¹; or (c) New tide gates that do not meet SV 3 below.

Self-Verification Eligible ¹	PCN Required ¹
<p>Activities that meet all of the following terms:</p> <ol style="list-style-type: none"> 1. Cumulative permanent and temporary impacts for all single and complete projects associated with the overall project (see Note 2) in non-tidal waters of the U.S. that: (a) total ≤5000 SF; and (b) are not located in vegetated shallows or riffle and pool complexes; and 2. Intake structures that are dry hydrants used exclusively for firefighting activities with no stream impoundments; and 3. 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. 	<ol style="list-style-type: none"> 1. Cumulative permanent and temporary impacts for all single and complete projects associated with the overall project (see Note 2) in non-tidal waters of the U.S. that: (a) total >5000 SF; or (b) are located in vegetated shallows or riffle and pool complexes; or 2. The activity occurs in tidal waters or in, over or under navigable waters of the U.S.; or 3. Access roads involving stream and wetland crossings (see Note 3) that require a PCN per GC 19(b)-(e); or 4. Stream channelization, relocation, impoundment, or loss of streambed occurs; or 5. The utility line is placed within and runs parallel to or along a streambed; or 6. There is a permanent change in preconstruction contours in waters of the U.S.; or 7. Material resulting from trench excavation is temporarily sidecast into waters of the U.S. for >3 months (material must be placed such that it is not dispersed by currents or other forces); or 8. Activities that are not SV eligible and do not require an IP.

Notes:

1. A utility line is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, data, 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.
2. The PCN must describe the locations of the starting point, end point, and all proposed impacts to aquatic resources in between in order to assess the cumulative effects for the overall project.
3. Stream and wetland crossings include permanent and temporary crossings, including those built with construction mats; and modifications (including sliplining), replacements or extensions to existing crossings.
4. Impacts resulting from mechanized pushing, dragging, or other similar activities that redeposit excavated soil material shall be figured into the area limit determination.

GP 10. Linear Transportation Projects and Stream Crossings (Authorities: §§10 & 404)

Activities 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. Any stream channel modification is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project. Access roads constructed above preconstruction contours and elevations in waters of the U.S. must be properly bridged or culverted to maintain surface flows.

Not authorized under GP 10 (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 shallows¹; (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 8); or (d) Tide gates.

Self-Verification Eligible ¹	PCN Required ¹
Cumulative permanent and temporary impacts for all single and complete projects associated with the overall project (see Note 2) in non-tidal waters of the U.S. that: (a) total ≤5000 SF; and (b) are not located in vegetated shallows or riffle and pool complexes.	<ol style="list-style-type: none"> 1. Cumulative permanent and temporary impacts in non-tidal waters of the U.S. for all single and complete projects associated with the overall project (see Note 2) that: (a) total >5000 SF; or (b) are located in vegetated shallows or riffle and pool complexes; or 2. The activity occurs in tidal waters or in, over or under navigable waters of the U.S.; or 3. Stream and wetland crossings (see Note 3) that require a PCN per GC 19(b)-(e); or 4. Stream channelization, relocation, or loss of streambed (see Note 4) including impoundments, occur; or 5. Activities that are not eligible for SV and do not require an IP.
<p>Notes:</p> <ol style="list-style-type: none"> 1. Discharges of dredged or fill material incidental to the construction of bridges across navigable waters of the U.S. may be authorized under GP 6. 2. The PCN must describe the locations of the starting point, end point, and all proposed impacts to aquatic resources in between in order to assess the cumulative effects of the overall project. 3. Stream and wetland crossings include permanent and temporary crossings, including those built with construction mats; and modifications (including sliplining), replacements or extensions to existing crossings. 4. Loss of streambed does not require a PCN when: a) stream crossings are constructed in accordance with GC 19; or b) bridge piers or similar supports are used. 	

GP 11. Mining Activities (Authorities: §§10 and 404)

Discharges of dredged or fill material into non-tidal waters of the U.S. for mining activities, except for coal mining and metallic mineral mining activities.

Not authorized under GP 11 (IP required): (a) Permanent impacts >1 acre in non-tidal waters of the U.S.; or (b) Activities in tidal waters.

Self-Verification Eligible ¹	PCN Required ¹
Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) ≤5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes.	<ol style="list-style-type: none"> 1. Permanent and temporary impacts in non-tidal waters and wetlands that are: (a) >5000 SF; or (b) located in vegetated shallows or streams; or 2. The activity occurs in non-tidal navigable waters of the U.S.; or 3. Stream channelization, relocation, impoundment, loss of streambed, or discharge of tailings into streams occurs; or 4. Activities that are not eligible for SV and do not require an IP.

GP 12. Boat Ramps and Marine Railways (Authorities: §§10 and 404)

Activities required for the construction of boat ramps and marine railways.

Not authorized under GP 12 (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 5).

Self-Verification Eligible ¹	PCN Required ¹
Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) ≤5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes ¹ .	<ol style="list-style-type: none"> 1. Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) >5000 SF; or (b) located in vegetated shallows or riffle and pool complexes; or 2. The activity occurs in tidal or navigable waters of the U.S.; or 3. Boat ramps are located within 25 feet of property line extensions unless the properties are owned by the same owner. The Corps may require a letter of no objection from the abutter(s); or 4. Activities that are not eligible for SV and do not require an IP.

GP 13. Land and Water-Based Renewable Energy Generation Facilities (Authorities: §§10 and 404), and Hydropower Projects (Authority: §404)

Structures and work in navigable waters of the U.S. and discharges of dredged or fill material into tidal and non-tidal waters of the U.S. for the construction, expansion, modification or removal of: (a) Land-based renewable energy production facilities, including 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.

For (a) and (b) above, such facilities include water-based wind or hydrokinetic renewable energy generation projects and infrastructure to collect solar (concentrating solar power and photovoltaic), wind, biomass, or geothermal energy. 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.

Not authorized under GP 13 (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 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 shallows¹.

Self-Verification Eligible ¹	PCN Required ¹
For land-based facilities, permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) ≤5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes.	<ol style="list-style-type: none"> 1. For land-based facilities, permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) >5000 SF; or (b) located in vegetated shallows or riffle and pool complexes¹; or 2. Water-based wind or hydrokinetic renewable energy generation projects, and hydropower projects; or 3. For all activities eligible for authorization under GP 13: a) The activity occurs in tidal waters or in, over or under navigable waters of the U.S.; or b) Stream channelization, relocation, impoundment, or loss of streambed occurs; or 4. Activities that are not eligible for SV and do not require an IP.

Note: 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 9.

GP 14. 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 14 (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 (see exception in Note 3 below); (c) Use of cofferdams to dewater wetlands or other aquatic areas to change their use; (d) Temporary stream crossings (see GPs 8 - 10); (e) Structures or fill left in place after construction is completed.

Self-Verification Eligible	PCN Required
Activities that meet all of the following terms: 1. Impacts in non-tidal waters of the U.S. that are: (a) ≤ 5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes (see exception in Note 2); and 2. Impacts in tidal waters that are: (a) ≤ 5000 SF; and (b) not located in SAS; and 3. Structures in navigable waters of the U.S. provided no impacts occur in tidal SAS and they are left in place ≤ 30 days.	1. Impacts in non-tidal waters of the U.S. that are: (a) >5000 SF; or (b) located in vegetated shallows or riffle and pool complexes (see exception in Note 2); or 2. Impacts in tidal waters of the U.S. that are: (a) >5000 SF; or (b) located in SAS (see Note 3); or 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: (a) <5 feet waterward from OHW or HTL and in the dry ; or (b) from Sep. 1 to Oct. 14. 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. PCNs must include plans to demonstrate this.
2. Temporary construction mats placed in an area of any size in non-tidal waters of the U.S. do not count towards the SV or PCN/GP area thresholds (see GCs 3(a), 13 and 14). This only applies to temporary construction mats, not other temporary fill.
3. Temporary construction mats in tidal SAS or >5000 SF in tidal waters require a PCN, but mats placed in an area of any size do not count towards the PCN/GP area thresholds (see GCs 3(a), 13 and 14). This only applies to temporary construction mats, not other temporary fill.

GP 15. 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 waters of the U.S., 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 15 (IP required): Temporary impacts¹; stream channelization, relocation, impoundments, or loss of streambed.

Self-Verification Eligible ¹	PCN Required ¹
≤ 500 linear feet of drainage ditch will be reshaped provided excavated material is deposited in an upland area.	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.); or 2. 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); or 3. Mosquito reduction activities in tidal waters, or those in non-tidal waters that are not SV eligible; or 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 16. Response Operations for Oil and Hazardous Substances (Authorities: §§10 and 404)

Eligible for authorization are the following activities in waters of the U.S.: (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. SAS should be restored in place at the same elevation.

Self-Verification Eligible¹

1. Activities are conducted in accordance with (a) or (b) above that are not planned or scheduled, but an emergency response (see Note 1); and
2. Booms placed in navigable waters of the U.S. for oil and hazardous substance containment, absorption and prevention; and
3. Temporary impacts for spill response training exercises <5000 SF in non-tidal waters of the U.S. and <1000 SF in tidal waters with no impacts to SAS; and
4. Temporary structures in tidal waters with no impacts to SAS and in place ≤30 days.

PCN Required¹

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 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 Corps at (978) 318-8338 before or as soon as possible after the work authorized under GP 16(a) - (c) commences for the Corps to address the effects under the Federal Endangered Species Act.
2. Permittees have until two weeks following commencement of the activities in GP 16 to submit the SVNf. However, an SVNf need not be submitted 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 17. Cleanup of Hazardous and Toxic Waste (Authorities: §§10 and 404)

Specific activities in waters of the U.S. to effect 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. The SAS should be restored in place at the same elevation to the maximum extent practicable.

Self-Verification Eligible¹

Permanent and temporary impacts in non-tidal waters of the U.S. that are:
(a) ≤5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes.

PCN Required¹

1. Permanent and temporary impacts in non-tidal waters of the U.S. that are:
(a) >5000 SF; or (b) located in vegetated shallows or riffle and pool complexes; or
2. The activity occurs in tidal or [navigable waters](#) of the U.S.; or
3. Stream channelization, relocation, impoundment, or loss of streambed occurs; or
4. The activity involves establishing new disposal sites or expanding existing sites used for the disposal of hazardous or toxic waste in waters of the U.S.; or
5. Activities that are not eligible for SV and do not require an IP.

Notes:

1. Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under §404 of the CWA or §10 of the Rivers and Harbors Act.
2. Permittees have until two weeks following commencement of the activities in GP 17 to submit the SVNf.

GP 18. Scientific Measurement Devices (Authorities: §§10 and 404) Scientific measurement devices in waters of the U.S. 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.	
<u>Not authorized under GP 18 (IP required):</u> (a) Permanent impacts that are >5000 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; >5000 SF in saltmarsh, mud flats, or riffle and pool complexes; or >1000 SF in vegetated shallows ¹ .	
Self-Verification Eligible ¹	PCN Required ¹
Temporary measuring devices and associated structures (e.g., anchors, buoys, etc.) in tidal and non-tidal waters of the U.S. provided: (a) in non-tidal waters of the U.S. permanent impacts are ≤1000 SF, temporary impacts are ≤5000 SF, and no impacts occur in riffle and pool complexes or vegetated shallows; and (b) no impacts in tidal waters.	1. In non-tidal waters of the U.S., permanent impacts are >1000 SF, temporary impacts are >5000 SF, or impacts occur in riffle and pool complexes or vegetated shallows; or 2. Impacts occur in tidal waters; or 3. Biological sampling devices, weirs or flumes, or the activity restricts or concentrates movement of aquatic organisms; or 4. Devices that are not eligible for SV and do not require an IP.
Note: An SVNf need not be submitted for temporary measuring devices with a footprint of <10 square feet, with a profile of <3 feet high measured from the substrate, and located in water deeper than -10 feet MLW.	

GP 19. Survey Activities (Authorities: §§10 and 404) Survey activities in waters of the U.S. 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.	
<u>Not authorized under GP 19 (IP required):</u> (a) Permanent impacts that are >1 acre in tidal and non-tidal waters of the U.S.; >1000 SF in tidal saltmarsh, mud flats, or riffle and pool complexes; or >100 SF in tidal vegetated shallows ¹ ; 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 ¹ .	
Self-Verification Eligible ¹	PCN Required ¹
1. Permanent impacts that are ≤1000 SF and temporary impacts that are ≤5000 SF ¹ in non-tidal waters of the U.S. provided no impacts occur in riffle and pool complexes or vegetated shallows; and 2. Survey activities including temporary structures in tidal waters provided no impacts occur; and 3. Temporary structures in navigable waters of the U.S.	1. In non-tidal waters of the U.S., permanent impacts are >1000 SF, temporary impacts are >5000 SF, or impacts occur in riffle and pool complexes or vegetated shallows; or 2. Impacts occur in tidal waters; or 3. Exploratory trenching (see Note 2) occurs in waterways (e.g., streams, tidal waters); or 4. Activities associated with the recovery of historic resources, and the drilling and discharge of excavated material from test wells for oil and gas exploration; or 5. 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; or 6. Activities that are not eligible for SV and do not require an IP.
Notes: 1. An SVNf need not be submitted for wetland delineations, and core sampling conducted for preliminary evaluation of dredge project analysis. 2. For the purposes of GP 19, 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 20. Agricultural Activities (Authority: §404) Discharges of dredged or fill material in non-tidal waters of the U.S. 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. <u>Not authorized under GP 20 (IP required):</u> (a) Permanent impacts that are >1 acre in non-tidal waters of the U.S.; 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 ¹	PCN Required ¹
Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) ≤5000 SF; and (b) not located in vegetated shallows or riffle and pool complexes.	1. Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) >5000 SF; or (b) located in vegetated shallows or riffle and pool complexes; or 2. Activities occur in non-tidal navigable waters of the U.S.; or 3. Stream channelization, relocation, impoundment, loss of streambed, or farm ponds in non-perennial streams occurs; or 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 21. 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 lobster pound nets, crab traps, 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.). <u>Not authorized under GP 21 (IP required):</u> 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 >½ acre.	
Self-Verification Eligible ¹	PCN Required ¹
Fish and wildlife harvesting and attraction devices and activities that do not require a PCN or IP.	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 ≤½ acre, fish aggregating devices, or small fish attraction devices; or 2. Devices and activities that are located in tidal SAS; or 3. Devices and activities that do not require an IP. Activities that do not require a PCN or an IP may be SV eligible.
Note: An SVNf need not be submitted for work authorized under GP 21.	

GP 22. 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 waters of the U.S. necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities; and (c) Shellfish seeding or brushing the flats projects. The area and any elevated structures within it must be marked in conformance with 33 CFR 64, and the permittee must contact the USCG, First District, Aids to Navigation Branch (617) 223-8347 to coordinate the proper buoy markings for the activity. Buoys shall be deployed and maintained as appropriate. 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.

Not authorized under GP 22 (IP required): (a) 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; (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, stockpiles, or staging areas, or the deposition of shell material back into waters of the U.S. as waste; (e) Private sites > 10 acres or municipal areas > 25 acres; (f) Rafts and other floating equipment that cover $> 10\%$ of the project area or 20,000 SF, whichever is greater. An area is considered covered with floating equipment if normal navigation through the area is precluded; or (g) Activities, including any vehicular access, that negatively impact coastal or freshwater wetlands, or with more than minimal negative impacts on: (1) Avian resources such as, but not limited to, shore birds, wading birds, or members of the waterfowl group. This is meant to include migratory bird nesting, feeding or resting activities (see 50 CFR 10.13); or (2) Existing or naturally occurring beds or population of shellfish, marine worms or other invertebrates that could be used by humans, other mammals, birds, reptiles, or predatory fish.

Self-Verification Eligible¹: Devices and activities that do not require a PCN or an IP.

PCN Required¹

1. Permanent & temporary impacts in tidal or non-tidal waters of the U.S. including cultch or spat shell; or
2. Structures such as cages, trays, racks, bags, rafts or other floating equipment. However, structures are SV eligible provided a PCN is not required elsewhere in this document and they are: (a) located within the footprint of an existing authorized fixed or floating structure in which case in-water lines, ropes or chains may be used; (b) comprised of floating upweller docks totaling ≤ 640 SF in area; (c) structures (e.g., cages, racks) elevated ≥ 2 feet above the ocean floor with legs within a lease site with ≤ 4 buoys marking the corners and no other lines; or (d) 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; and
3. Research, educational, commercial-viability or experimental aquaculture gear activities for indigenous species; or
4. Activities include a species not previously cultivated in the waterbody; or
5. Kelp or finfish aquaculture; or
6. Land-based hatchery intakes > 3 inches in diameter; or
7. Activities in water depths > 10 feet mean low lower water (MLLW); or
8. Activities with in-water lines, ropes or chains (see exceptions in 2(a), (c) and (d) above); or
9. Activities occur in SAS or involve mechanical or hydraulic dredging;
10. 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; or
11. 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 $\leq 1/2$ acre; or
12. Aquaculture facilities < 25 acres applied for by municipalities; or
13. Activities that do not require an IP. Activities that do not require a PCN or an IP may be SV eligible.

Notes: (1) 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.” (2) Aquaculture applicants do not need to notify the SHPO since these projects are unlikely to affect historic or archaeological resources, but must notify the BUAR and applicable tribes per GC 7(c). (3) The MA Shellfish Planting Guidelines are located at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

GP 23. Aquatic Habitat Restoration, Enhancement, and Establishment Activities (Authorities: §§10 and 404)

Activities in waters of the U.S. associated with the restoration, enhancement and establishment of non-tidal and tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters; the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site; the restoration and enhancement of shellfish, finfish and wildlife habitat; 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. To be authorized by this GP, the activity must be planned, designed, and implemented so that it results in aquatic habitat that resembles an ecological reference. An ecological reference may be based on the characteristics of an intact aquatic habitat or riparian area of the same type that exists in the region, or based on a conceptual model developed from regional ecological knowledge of the target aquatic habitat type or riparian area.

Activities authorized by this GP include, but are not limited to: the removal of accumulated sediments; the removal, installation, and maintenance of small water control structures, dikes, and berms, as well as discharges of dredged or fill material to restore appropriate stream channel configurations after small water control structures, dikes, and berms, are removed; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels; the removal of existing drainage structures, such as drain tiles, and the filling, blocking, or reshaping of drainage ditches to restore wetland hydrology; the installation of structures or fills necessary to establish or re-establish wetland or stream hydrology; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or disking for seed bed preparation and the planting of appropriate wetland species; re-establishment of submerged aquatic vegetation in areas where those plant communities previously existed; re-establishment of tidal wetlands in tidal waters where those wetlands previously existed; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species may be planted at the site.

Not authorized under GP 23 (IP required): Stream channelization activities or artificial reefs.

Self-Verification Eligible ¹	PCN Required ¹
<p>1. Permanent or temporary impacts in non-tidal waters of the U.S. that are ≤5000 SF; and</p> <p>2. Eelgrass or salt marsh planting and transplanting ≤100 SF in tidal waters; and</p> <p>3. Shellfish seeding without cultch or spatbed-shell.</p> <p>Activities 1 and 2 above must be authorized by a Final Order of Conditions, or 401 WQC if required, in order to be SV eligible.</p>	<p>1. Permanent or temporary impacts in non-tidal waters of the U.S. that are >5000 SF; or</p> <p>2. Permanent or temporary impacts or structures are located in tidal waters of the U.S. including cultch or spatbed-shell placement; or</p> <p>3. Eelgrass or salt marsh planting and transplanting >100 SF in tidal waters; or</p> <p>4. Permanent water impoundments, dam removal or fish ladders; or</p> <p>5. Stream relocation, impoundment, or loss of streambed occurs; or</p> <p>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). See Note 2; or</p> <p>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: (a) <5 feet waterward from OHW or HTL and in the dry; or (b) from Sep. 1 to Oct. 14. This is to protect endangered species; or</p> <p>8. Activities that are not eligible for SV and do not require an IP.</p>

Notes: 1. GC 10 states a PCN is required for any activity that may affect listed species or habitat. This includes beneficial effects. 2. 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.

IV. GENERAL CONDITIONS:

To qualify for GP authorization, the prospective permittee must comply with the following general conditions, as applicable.

1. Other Permits
2. Federal Jurisdictional Boundaries
3. Mitigation (Avoidance, Minimization, and Compensatory Mitigation)
4. Single and Complete Projects
5. Activities Affecting Structures or Works Built by the United States
6. Navigation
7. Historic Properties
8. Wild and Scenic Rivers
9. Essential Fish Habitat and Fish and Wildlife Resources
10. Federal Threatened and Endangered Species
11. Pile Driving and Removal
12. Utility Line Installation and Removal
13. Heavy Equipment in Waters and Wetlands
14. Temporary Fill
15. Removal of Temporary Fills and Restoration
16. Soil Erosion and Sediment Controls
17. Aquatic Life Movements
18. Management of Water Flows
19. Stream Work and Crossings and Wetland Crossings
20. Floodplains and Floodways
21. Storage of Seasonal Structures
22. Spawning, Breeding, and Migratory Areas
23. Vernal Pools
24. Coral reefs
25. Invasive and Other Unacceptable Species
26. Blasting
27. Suitable Material
28. Stormwater Treatment or Detention Systems
29. Tide gates
30. Water Quality Certification
31. Coastal Zone Management
32. Permit On Site
33. Self-Verification Notification Form
34. Inspections
35. Maintenance
36. Property Rights
37. Transfer of GP Verifications
38. Modification, Suspension, and Revocation
39. Special Conditions
40. False or Incomplete Information
41. Abandonment
42. Enforcement Cases
43. Previously Authorized Activities
44. Duration of Authorization

1. Other Permits. The permittee must obtain the following State approvals, when applicable, prior to the commencement of work in Corps jurisdiction in order for authorizations under these GPs to be valid: WQC (see GC 30) and CZM Consistency Concurrence (see GC 31).

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). Applicants 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 Corps jurisdiction. Note: Waters of the U.S. includes all waters pursuant to 33 CFR 328.3(a), and adjacent wetlands as that term is defined in 33 CFR 328.3(c).
- b. Applicants shall identify all aquatic resources on the project site. They are all presumed to be waters of the U.S. unless an approved jurisdictional determination has been obtained from the Corps that determines otherwise. Wetlands shall be delineated in accordance with the Corps of Engineers Wetlands Delineation Manual and the most recent Northcentral/Northeast Regional Supplement. Vegetated shallow survey guidance 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.

3. Mitigation (Avoidance, Minimization, and Compensatory Mitigation)

- a. Activities must be designed and constructed to avoid and minimize direct, indirect, secondary and cumulative adverse effects, both permanent and temporary, to waters of the U.S. to the maximum extent practicable at the project site (i.e., on site). Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are no more than minimal.
- b. After avoidance and minimization, compensatory mitigation⁴ will generally be required for permanent impacts that require PCNs, and may be required for temporary impacts that require PCNs. Proactive restoration projects, or temporary impact work with no secondary effects, may generally be excluded from this requirement.
- c. Applicants shall consider riparian/forested buffer best management practices (BMPs) for stormwater management, and low impact development (LID) BMPs to reduce impervious cover and manage stormwater, to minimize impacts to the maximum extent practicable.⁵

4. Single and Complete Project

- a. The term “single and complete project” is defined as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. The GPs shall not be used for piecemeal work and shall be applied to single and complete projects.
- b. Proponents must quantify all permanent impacts associated with the single and complete project that have occurred since October 5, 1984 (the date of the original MA GP) and add that to any proposed permanent and temporary impacts to determine if the work is SV eligible or if a PCN is required. Provide that information in the PCN. For real estate subdivisions created or subdivided after October 5, 1984, a

⁴ Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR 332. See also the New England District Compensatory Mitigation Guidance at www.nae.usace.army.mil/missions/regulatory >> Mitigation.

⁵ See the three documents at www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit >> Mitigation. LID BMPs include, but are not limited to: replacing curbs and gutters with swales; using an open space design for subdivisions; using permeable, pervious or porous pavements; constructing bio-retention systems; and/or adding a green roof or rain garden.

PCN is required for any discharge which would cause the aggregate total loss of waters of the U.S. for the entire subdivision to exceed 5,000 square feet.

- c. 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.
- d. Unless the Corps 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 treated together as constituting one single and complete project.
- e. 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 separate 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/total linear project shall be reviewed as one project under PCN or the IP procedures.

5. Activities Affecting Structures or Works Built by the United States

- a. If a GP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a Corps federally authorized Civil Works project, the prospective permittee must submit a PCN. The Regulatory Division will assist the proponent with contacting the appropriate Corps district office for work in the vicinity of FNP, Corps properties and/or Corps-controlled easements, flood control projects, etc. An activity that requires §408 permission is not authorized by these GPs until the appropriate Corps district office issues the §408 permission to alter, occupy, or use the Corps project, and the Corps issues a written GP verification.
- b. A PCN is required for GP activities within, or with any secondary or indirect adverse environmental effects on, any National Wildlife Refuge, National Forest, National Marine Sanctuary (e.g., Stellwagen Bank), National Park or any other area administered by the National Park Service (e.g., Cape Cod National Seashore), U.S. Fish and Wildlife Service (USFWS) or U.S. Forest Service (USFS).

6. Navigation

- a. 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 of the U.S. at or adjacent to the activity authorized herein.
- b. Any safety lights and signals prescribed by the USCG, through regulations or otherwise, must be installed and maintained at the permittee’s expense on authorized facilities in navigable waters of the U.S.
- c. 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 the Corps, 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.
- d. A PCN and §408 permission (see GC 5) is required for all work in, over or under a Corps FNP or its buffer zone.

7. Historic Properties

- a. In cases where the Corps determines that the activity may have the potential to cause effects to

properties listed, or eligible for listing, in the National Register of Historic Places (NRHP)⁶, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

b. Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the NHPA. If a PCN is required for the proposed activity, the Federal permittee must provide the Corps with the appropriate documentation to demonstrate compliance with those requirements and the Corps will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under Section 106 may be necessary. The respective Federal agency is responsible for fulfilling its obligation to comply with Section 106.

c. Non-federal permittees must submit a PCN to the Corps if the activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the NRHP, including previously unidentified properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer (SHPO), Board of Underwater Archaeological Resources (BUAR), applicable Tribal Historic Preservation Officers (THPOs)⁷, and the NRHP⁶. Use of the [Historic Property Notification Form](#) (Section IX) to notify the SHPO, BUAR and applicable THPOs⁷ is recommended. The SHPO, BUAR and THPOs are expected to provide comments to the Corps within 30 days of receipt if there are historic properties that need to be addressed.

d. All PCNs shall:

i. Include a copy of the [Historic Property Notification Form](#) and the email or certified mail receipt that was used to send the form to the SHPO (does not accept email), BUAR and applicable THPOs⁷ for their identification of historic properties in their area of concern;

ii. State which historic properties might have the potential to be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties; and

iii. Include any available documentation from the SHPO, BUAR and THPO(s) indicating that there are or are not historic properties affected. The SHPO, BUAR and THPO(s) will contact the Corps within 30 days of receiving the notification if they believe that the activity has the potential to cause effects on historic properties.

e. Based on the information submitted in the PCN and the Corps identification efforts, the Corps shall determine whether the proposed GP activity has the potential to cause effects on the historic properties. Section 106 consultation is required when the Corps determines that the activity has the potential to cause effects on historic properties. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the Corps either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

f. Federal and non-Federal applicants shall coordinate with the Corps before conducting any onsite archaeological work (reconnaissance, surveys, recovery, etc.) requested by the SHPO, BUAR and THPOs, as the Corps will determine the permit area for the consideration of historic properties based on 33 CFR 325 Appendix C. This is to ensure that work is done in accordance with Corps requirements.

g. If Federal or non-Federal applicants discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the Corps of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been

⁶ See www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permits >> Historic Properties. The majority of historic properties are not listed on the NRHP and may require identification and evaluation by qualified historic preservation and/or archaeological consultants in consultation with the Corps and the SHPO, BUAR and/or THPO(s).

⁷ [Section VIII](#) provides contact information and each tribe's "area of concern."

completed. The Corps will initiate the Federal, State and tribal coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

h. (c) - (e) above are not applicable when the Corps has approved alternate procedures or another Federal agency is the lead.

8. Wild and Scenic Rivers

a. The following activities in designated river or study river segments in the National Wild and Scenic River (WSR) System require a PCN unless 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:

- i. 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;
 - ii. Activities that occur in wetlands within 0.25 miles of WSR segments;
 - iii. Activities that have the potential to alter free-flowing characteristics in WSR segments.
- b. As of April 16, 2018, the Taunton River, Sudbury/Assabet/Concord Rivers, and Westfield River are designated rivers; and the Nashua River is a study river. The most up to date list and descriptions of the WSR segments are provided at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit >> Wild and Scenic Rivers.

9. Essential Fish Habitat and Fish and Wildlife Resources. A PCN is required for GPs 1, 6-20 and 23 when an activity may cause greater than minimal [sedimentation or turbidity](#) in streams or tidal waters. The Corps may include specific time-of-year restrictions and/or specific construction techniques or activities. This is to protect Essential Fish Habitat and/or fish and wildlife resources.

10. Federal Threatened and Endangered Species

a. No activity is authorized under any GP which:

i. Is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species (i.e., listed species) or a species proposed for such designation, as identified under the Federal Endangered Species Act of 1973, as amended (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species; or

ii. “May affect” a listed species or critical habitat unless consultation under §7 of the ESA addressing the effects of the proposed activity, has been completed.

b. Non-Federal permittees must check <http://ecos.fws.gov/ipac> and submit a PCN if any listed species or designated critical habitat might be affected or if the activity is located in designated critical habitat. However, an activity is SV eligible (i.e., a PCN is only required if indicated elsewhere in this document) if the IPaC website indicates that only:

- i. Northern long-eared bats (NLEB, *Myotis septentrionalis*) are present, but the activity:
 1. Will not remove trees ≥ 3 inches dbh;
 2. Is not within the “buffer” of a NLEB hibernacula or maternity roost tree shown on the map at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit/ >> NLEB Locations; and
 3. Does not involve work on existing dam riprap or bridges.
- ii. The roseate tern (*Sterna dougallii*), piping plover (*Charadrius melodus*) or red knot (*Calidris canutus*) are present, but the activity and all disturbance will occur: (1) >300 feet from the HTL; (2) entirely in a previously developed or urbanized area such as a paved parking lot or road, a harbor or marina with stabilized shoreline (docks, seawalls, etc.), a residential area (contains lawn, ornamental plants, etc.); or (3) between October 1 and April 15 and any alteration or disturbance to beaches, sand dunes, mud flats, sloughs, estuaries, or other tidally influenced areas is temporary and restored to its previous condition before April 15. Contact the Corps with any questions.

- c. Federal agencies should follow their own procedures for complying with the requirements of the ESA. Non-Federal representatives designated by the Corps to conduct informal consultation or prepare a biological assessment should follow the requirements in the designation document(s) and the ESA. Federal permittees and non-Federal representatives must provide the Corps with the appropriate documentation to demonstrate compliance with those requirements. The Corps will review the documentation and determine whether it is sufficient to address ESA compliance for the GP activity, or whether additional ESA consultation is necessary. Unless it is required elsewhere in this document, a PCN is not required if: (i) another (lead) Federal agency has completed all required §7 consultation; or (ii) a non-Federal representative designated by the Corps in writing has completed all required §7 informal consultation.
- d. Verification under these GPs 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 USFWS or the NMFS, the ESA prohibits any person 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.

11. Pile Driving and Removal

- 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 method⁸ 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, their substrate or mudflats. Pile removal work is SV eligible under GP 1. See GC 16(d) for sheet pile removal.
- b. A PCN is required for the installation or removal of structures with jetting techniques.
- c. A PCN is required for the removal of >100 piles from January 15 to November 15.
- d. A PCN is required for the installation of >12 inch-diameter piles or any size steel piles 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, unless they are installed [in the dry](#). Installation of ≥12-inch-diameter piles or any size steel piles in tidal waters, or all piles in the aforementioned river segments, must use a soft start each day of pile driving, building up power slowly from a low energy start-up over a period of 20-40 minutes to provide adequate time for fish and marine mammals to leave the vicinity. The buildup of power should occur in uniform stages to provide a constant increase in output. Bubble curtains can be used to reduce sound pressure levels during vibratory or impact hammer pile driving. This is to protect endangered species.

12. Utility Line Installation and Removal

- a. Subsurface utility lines shall remain subsurface.
- b. 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. The bottom cover associated with the initial installation of utility lines under [navigable waters](#) of the U.S. and FNP's shall be a

⁸ **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.

minimum of 48 inches in soil or a minimum of 24 inches in competent rock unless otherwise specified in a written determination. The maximum depth of dredging in waterways having existing FNP is generally considered to be the authorized FNP depth plus any allowance for advanced maintenance and the allowable overdepth for dredging tolerances. In waterways that do not have existing FNPs, this depth should be taken as two feet below the existing bottom or maximum depth of proposed dredging, as applicable.

c. The permittee and their contractor shall have onsite and implement the procedures detailed in a frac-out contingency plan for monitoring drilling operations and for the immediate containment, control and recovery/removal of drilling fluids released into the environment should a discharge of material occur during drilling operations.

d. 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 Corps is required if they are to remain in place, e.g., to protect sensitive areas or ensure safety.

e. 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.

13. Heavy Equipment in Waters and Wetlands

a. To the maximum extent practicable, operating heavy equipment within wetlands or mudflats shall be avoided or minimized, measures must be taken to minimize soil or substrate disturbance, and equipment other than fixed equipment (drill rigs, fixed cranes, etc.) shall not be stored, maintained or repaired in wetlands. Where construction requires heavy equipment operation, 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](#)”) that are adequate to support the equipment in such a way as to minimize disturbance of wetland soil and vegetation; or (iii) Be operated on adequately dry or frozen wetlands such that shear pressure does not cause subsidence of the wetlands immediately beneath equipment and upheaval of adjacent wetlands. Construction mats are to be placed in the wetland from the upland or from equipment positioned on swamp 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 Corps authorization. An adequate supply of spill containment equipment shall be maintained on site. Construction mats should be managed in accordance with the Construction Mat BMPs at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

b. Construction equipment such as barges in tidal waters shall provide clearance above the substrate to avoid impacts to SAS.

14. Temporary Fill

a. Temporary fill, which includes construction mats and corduroy roads, shall be entirely removed as soon as it is no longer needed to construct the authorized work. Temporary fill shall be placed in its original location, or disposed of at an upland site and suitably contained to prevent its subsequent erosion into waters of the U.S. A PCN is required for: (i) all temporary fill that is in place for >2 years; or (ii) construction mats and corduroy roads filling >5000 SF that are in place for: (1) >1 year when installed during the growing period; or (2) any portion of more than one growing period when installed outside the growing period. The growing period is from May 1 to October 1 for the purposes of these GPs.

b. A PCN is required for construction mats and corduroy roads that involve underlying fill.

c. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable. Materials must be placed in a location and manner that does not adversely impact surface or subsurface water flow into or out of wetlands. Temporary fill shall be placed on geotextile fabric or other appropriate material laid on the preconstruction wetland grade where

practicable to minimize impacts and to facilitate restoration to the original grade (construction mats are excluded from this requirement).

15. Removal of Temporary Fills and Restoration

- a. Temporary fills/excess materials must be removed in their entirety as soon as they are no longer needed to construct the authorized work. The affected areas must be restored to their preconstruction conditions, functions and elevations, and revegetated as appropriate. Restoration shall typically commence no later than the completion of construction.
- b. For excavated areas, “restored to preconstruction conditions, functions and elevations” means careful removal of existing soil and vegetation, separate topsoil and subsoil stockpiling, soil protection, and replacement back to the original location such that the original soil layering and vegetation schemes are approximately the same, unless otherwise authorized. Plan for natural settling that will occur and ensure that topsoil is void of gravel and subsoil. A minimum of 4 inches of topsoil should be at the surface after the soil has settled. Wetland areas temporarily disturbed shall be stabilized (e.g., seeded or planted). See GC 25 for seed mix and vegetation requirements.
- c. Limit compaction to the minimum needed to promote a successful seedbed. Test soils for compaction. Equipment refusal shall be considered a failure of restoration, in which case the soil should be restored and wetland hydrology must be maintained.
- d. For (a) - (c) above, see the BMPs at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit >> Restoration of Special Aquatic Sites.
- e. In areas of authorized temporary disturbance, if trees are cut they shall be cut at or above ground level, and not uprooted, in order to prevent disruption to the wetland soil structure and to allow stump sprouts to revegetate the work area, unless otherwise authorized.
- f. Trenches shall be constructed or backfilled so that the trench does not drain waters of the U.S. (e.g., materials or methods that create a French drain effect).

16. Soil Erosion and Sediment Controls

- a. Appropriate soil erosion, sediment and turbidity controls⁹ (hereinafter referred to as “controls”) must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work waterward of OHW or HTL, must be permanently stabilized at the earliest practicable date. Controls shall be capable of preventing erosion; collecting sediment, suspended and floating materials; and filtering fine sediment. Permittees are encouraged to perform work during periods of low-flow or no-flow, or when the stream or tide is waterward of the work, and must plan for unexpected high flows.
- b. A PCN is required for GPs 1, 6-20 and 23 when an activity causes greater than minimal [sedimentation or turbidity](#) in streams (rivers, streams, brooks, etc.) or tidal waters, which may be avoided with the appropriate measures specified in (a) above. For activities that require controls, e.g., cofferdams, in non-tidal streams and tidal waters:
 - i. In non-tidal streams, it is recommended that controls be installed and removed between July 1 and Feb. 28, and not be in place between March 1 and June 30. A PCN is required when controls encroach >25% of the stream width measured from OHW from March 1 to June 30. This is to protect upstream fish passage. Proponents must also maintain safe, timely and effective downstream fish passage throughout the project.

⁹ 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 (e.g., vegetated filter strips, geotextile silt fences and turbidity curtains, 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.

- ii. In tidal waters, controls placed waterward of MHW shall be installed and removed between July 1 and Jan. 14, shall not be in place between Jan. 15 and June 30, and shall not encroach >50% of a tidal stream's width measured from MHW. Otherwise a PCN is required. This is to protect upstream fish passage and winter flounder spawning and rearing habitat.
- c. 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 where suspended solids shall be removed prior to discharge back into waters or wetlands. All discharge points back into waters and wetlands shall use appropriate energy dissipaters and erosion and sedimentation control BMPs.
- d. 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.
- e. The material within sandbags shall not be released during their removal and trenches must be backfilled as soon as practicable to reduce turbidity impact duration.

17. Aquatic Life Movements. 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, beyond the actual duration of construction unless the activity's primary purpose is to impound water. Permanent water impoundments require a PCN. All permanent and temporary crossings of waterbodies (e.g., streams, wetlands) shall be suitably culverted, spanned¹⁰, or otherwise designed and constructed to: (a) maintain low flows to sustain the movement of those aquatic species, which includes maintaining a continuous low flow channel/thalweg through non-tidal structures; (b) preserve hydraulic and ecological connectivity; and (c) prevent bank erosion or streambed scour, both adjacent to and inside, the culvert or span by proper alignment and construction.

18. Management of Water Flows

- a. To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must 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, in which case a PCN is required. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
- b. Activities that temporarily or permanently impact upstream or downstream flood conditions, or permanently impact wetlands in excess of SV eligible thresholds, require a PCN. See the "Dam Removal and the Wetland Regulations" document at www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity for guidance to evaluate the impacts of culvert replacement, including the loss of upstream wetlands, which may be offset by the overall benefits of the river restoration.

19. Stream and Wetland Crossings

The following conditions apply to temporary and permanent stream and wetland crossings, including new crossings, and replacement, modifications and expansions/extensions of existing crossings, which are only authorized under GPs 8 - 10. Minor repairs may be SV eligible under GP 1.

¹⁰ For the purposes of this GP, spans are bridges, three-sided box culverts, open-bottom culverts or arches that span the stream with footings landward of bankfull width. The use of bridge piers or similar supports does not prevent a structure from being considered as a span.

a. Stream crossings in tidal streams. A PCN is required for temporary or permanent crossings in tidal streams that are not SV eligible under GP 1 or do not involve construction mat stream crossings built in accordance with the Construction Mat BMPs¹¹, particularly the Wetland/Stream Channel Crossing section. The Corps may use the following criteria to evaluate permanent crossings:

i. Match the velocity, depth, cross-sectional area, and substrate of the existing stream outside the crossing, if it exists, and size crossings such that they do not restrict tidal flow over the full natural tide range seaward of the crossing. The Corps will typically require an engineering study to ensure flooding is not a concern.

ii. Construct crossings in dry conditions.

b. Modifications to existing, authorized permanent stream crossings in non-tidal streams. A PCN is not required for modifications to these crossings for the purpose of improving passage and flow if they are authorized in writing by a Final Order of Conditions, or 401 WQC if required, or they comply with 19(c) below. However, a PCN is required if stated elsewhere in this document or any activity:

i. Involves sliplining (retrofitting an existing culvert by inserting a smaller diameter pipe), culvert relining or invert lining;

ii. Decreases the diameter of the crossing;

iii. Decreases the friction coefficient; or

iv. Increases velocity.

c. New, replacement, modifications and expansions/extensions of existing, permanent stream crossings in non-tidal streams. A PCN is not required for these crossings provided the following conditions are met and a PCN is not required elsewhere in this document:

i. Design and construct the crossing in accordance with the USFS stream simulation manual¹².

ii. Span¹⁰ streams or size culverts or pipe arches such that they are at least 1.2 times bankfull width of the reference reach¹³. Spans are strongly preferred as they avoid or minimize disruption to the streambed, and avoid entire streambed reconstruction and maintenance inside culverts or pipe arches (see v, vi & viii below), which may be difficult in smaller structures. In many cases bankfull width is not necessarily interchangeable with the elevation of OHW.

iii. Embed culverts or pipe arches below the grade of the streambed. This is not required when ledge/bedrock prevents embedment, in which case spans¹⁰ are required. The following depths are required to prevent streambed washout, and ensure compliance and long-term success:

1. ≥ 2 feet for box culverts and pipe arches¹⁴, or

2. ≥ 2 feet and at least 25% for round pipe culverts¹⁴.

¹¹ See www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

¹² See www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity for the USFS stream simulation manual titled "Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings. Section 5.3.3 Headcutting Potential and 6.2 Design of the Stream-Simulation Channel Bed are particularly relevant. Chapter 6.1 is relevant for proper alignment and construction to prevent bank erosion or streambed scour. Sections 7.5.2.3 Construction Methods and 8.2.11 Stream-Simulation Bed Material Placement both show important construction steps.

¹³ The following guides located at www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity may assist in identifying bankfull width and the reference reach: (a) the USFS stream simulation manual (pages 5-20 and 5-76 are particularly relevant); (b) "Stream Channel Reference Sites: An Illustrated Guide to Field Technique" (Harrelson, et al. 1994); (c) "A Guide to Identification of Bankfull Stage in the Northeastern United States"; and (d) General Standard 3, page 10, of the Massachusetts River and Stream Crossing Standards, revised March 1, 2011.

¹⁴ These minimum embedment depths should be sufficient for many culverts. However, circumstances may dictate a need for deeper substrates that are based on site specific analysis. These include high gradient streams and streams experiencing instability or with potential instability that could result in future adjustments to channel elevation. In these cases long profiles and calculations of potential channel adjustments should be used to determine embedment depth. Deeper embedment depths may be also needed if there are elements of the constructed stream bed that are >15 inches in diameter.

iv. Match the culvert gradient (slope) with the anticipated stream channel profile that will form after the channel readjusts to post-crossing-replacement conditions.

v. Construct crossings with a natural bottom substrate within the structure matching the characteristics of the substrate in the natural stream channel and the banks (mobility, slope, stability, confinement, grain and rock size) at the time of construction and over time as the structure has had the opportunity to pass substantial high flow events.

vi. Construct crossings with appropriate 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 at the time of construction and over time. In order to provide appropriate water depths and velocities at a variety of flows and especially low flows, it is usually necessary to reconstruct the streambed (sometimes including a low flow channel), or replicate or preserve the natural channel within the structure. Otherwise, the width of the structure needed to accommodate higher flows will create conditions that are too shallow at low flows. The grain and rock size, and arrangement of streambed materials within the structure should be in accordance with (v) above. Flows could go subsurface within the structure if only large material is used without smaller material filling the voids.

vii. Openness >0.82 feet (0.25 meters). Openness is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units (e.g. feet). For a box culvert, openness = (height x width)/length. For crossing structures with multiple cells or barrels, openness is calculated separately for each cell or barrel. At least one cell or barrel must meet the appropriate openness standard. The embedded portion of a culvert is not included in the calculation of cross-sectional area for determining openness.¹⁵ Openness >0.82 feet is recommended to make the structure more likely to pass small, riverine wildlife such as turtles, mink, muskrat and otter that may tend to avoid structures that appear too constricted. This openness standard is too small to accommodate large wildlife such as deer, bear, and moose. Structures that meet this openness standard are much more likely than traditional culverts to pass flood flows and woody debris that would otherwise obstruct water passage. It is likely that most structures that meet all the other general standards will also meet this openness standard. However, for some very long structures it may be impractical or impossible to meet this standard.

viii. Construct banks on each side of the stream inside the crossing that match the horizontal profile of the existing stream and banks outside the crossing. To prevent failure, all constructed banks should have a height to width ratio of no greater than 1:1.5 (vertical:horizontal) unless the stream is naturally incised. Tie the banks into the up and downstream banks and configure them to be stable during expected high flows. Use materials that match the up and downstream banks (avoid the use of angular riprap and armored slopes).

d. Temporary crossings in non-tidal streams. The following conditions must be met for temporary crossings (e.g., spans, culverts, construction mats or fords) in non-tidal streams to be SV eligible:

i. All temporary crossings:

1. Avoid excavating the stream or embedding crossings.

2. Impacts to the streambed or banks require restoration to their original condition. See the USFS stream simulation manual for restoration methods¹². Use geotextile fabric and bedding as appropriate to ensure restoration to the original grade.

ii. Culverts:

1. The water height should be no higher than the top of the culvert's inlet and the culvert shall be large enough to pass debris.

2. Install energy dissipating devices downstream if necessary to prevent scour.

iii. Stream fords: Equipment may ford streams when it is not feasible to construct a span or culvert (e.g., streams having no or low banks, emergency situations); the natural stream bed and banks consist of ledge, rock or sand that prevents disturbance and turbidity; and there is a stable, gradual approach.

¹⁵ The [Openness Ratio Spreadsheet](#) shows how to calculate the open area for embedded pipe culverts to meet the 0.82 standard for openness. See www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity.

iv. Spans: Anchor spans where practicable so they do not wash out during high water. A typical span method is provided at www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity >> Skidder Bridge Fact Sheet.

v. Construction mats: Build construction mat stream crossings in accordance with the Construction Mat BMPs, particularly the Wetland/Stream Channel Crossing section.

e. **Wetland Crossings.** To assist in meeting the requirements in GCs 17 and 18, culverts or spans¹⁰ shall be placed at least every 50 feet with an opening at least 2-feet high and 3-feet wide at ground level where practicable. Closed bottom culverts shall be embedded at least 6 inches with a natural bottom. In the case of non-compliance, the permittee shall take necessary measures to correct wetland damage due to lack of hydraulic and ecological connectivity.

20. Floodplains and Floodways

- a. Appropriate measures must be taken to minimize flooding to the maximum extent practicable.
- b. Activities within 100-Year Floodplains must comply with applicable Federal Emergency Management Agency (FEMA)-approved State and/or local floodplain management permitting requirements.

21. Storage of Seasonal Structures. Seasonal or recreational structures such as pier sections, floats, aquaculture structures, 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 landward of MHW or OHW and not in wetlands, tidal wetlands or mudflats. These seasonal structures may be stored on the fixed, pile-supported portion of the structure that is waterward of MHW or OHW.

22. Spawning, Breeding, and Migratory Areas

- a. Direct, indirect and secondary adverse effects in spawning areas shall be avoided and minimized 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.
- b. Activities in waters of the U.S. that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable. The permittee 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 permittee should contact the appropriate local office of the USFWS to determine if such “take” permits are required for a particular activity.

23. Vernal Pools

- a. For projects requiring a PCN, vernal pools must be identified on the plan showing aquatic resource delineations.
- b. A PCN is required if a discharge of dredged or fill material is proposed in a vernal pool located within Federal jurisdictional boundaries.
- c. Adverse impacts to vernal pools should be avoided and minimized to the maximum extent practicable.

24. 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.

25. Invasive and Other Unacceptable Species¹⁶

- a. The introduction or spread of invasive or other unacceptable plant or animal species on the project

¹⁶ See www.nae.usace.army.mil/missions/regulatory/mitigation. The June 2009 “Corps of Engineers Invasive Species Policy” provides policy, goals and objectives and is located at www.nae.usace.army.mil/missions/regulatory/invasive-species. Additional information can be found at: www.eddmaps.org/ipane.

site or areas adjacent to the project site caused by the site work shall be avoided to the maximum extent practicable. For example, construction mats and equipment shall be thoroughly cleaned and free of vegetation and soil before and after use. The introduction or spread of invasive plant or animal species on the project site caused by the site work shall be controlled.

b. No cultivars, invasive species or other unacceptable plant species may be used for any mitigation, bioengineering, vegetative bank stabilization or any other work authorized by these GPs. Seed mixes and vegetation shall include only plant species native to New England and shall not include any species listed in Appendix D, “Invasive and Other Unacceptable Plant Species,” of the “New England District Compensatory Mitigation Guidance”¹⁶. This list may be updated periodically.

26. Blasting. Blasting in waters of the U.S. associated with work such as dredging, trenching, pile installation, etc. is not authorized under these GPs.

27. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see §307 of the CWA).

28. Stormwater Treatment or Detention Systems. Stormwater treatment or detention systems in waters of the U.S are not authorized under these GPs and require an IP. Stormwater conveyance components and non-porous, septic effluent pipes that transmit effluent to or between components may be SV eligible under GP 9.

29. Tide Gates. New tide gates conveying water between waters of the U.S. are not authorized under these GPs and require an IP. Tide gates on discharge pipes conveying stormwater and/or industrial NPDES-permitted discharges from waters that are not waters of the U.S. may be authorized under GPs 1 and 9.

30. Water Quality Certification

a. Any activity under these GPs that requires authorization under §404 of the CWA for the discharge of dredged or fill material into waters of the U.S. also requires applicants to obtain a §401 water quality certification (WQC) from the State (hereinafter referred to as “§401 WQC”) or a Final Order of Conditions from the town or city which serves as the WQC. In Massachusetts, the MassDEP has authority to issue or deny §401 WQC. Activities authorized under these GPs must comply with all conditions set forth in the April 5, 2018 conditional WQC for these GPs (located at www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit/) or in an Individual §401 WQC. Authorization under the GPs is not valid and no work may commence in Corps jurisdiction until the MassDEP has issued or waived §401 WQC.

b. If a §401WQC is issued for work that is different from that in the Corps authorization, the Corps authorization is not valid and the permittee must contact the Corps to allow the Corps to resolve the discrepancy.

31. Coastal Zone Management

a. Each activity under these GPs within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. The Massachusetts Office of Coastal Zone Management (MA CZM) administers the [Massachusetts CZM program](#).

b. For SV eligible activities, MA CZM has agreed with the Corps consistency determination and therefore these activities do not require any additional MA CZM Federal consistency review.

c. For PCN activities in the coastal zone, authorization under these GPs becomes valid only after MA CZM determines that the activity is consistent with the MA CZM program. The Corps will typically coordinate review with MA CZM and then notify applicants if MA CZM determines that the activity is

consistent with the MA CZM program or if an individual consistency concurrence is required. If the MA CZM consistency concurrence is for work different from that in the Corps authorization, the Corps authorization is not valid and the permittee must contact the Corps to allow the Corps to resolve the discrepancy.

32. Permit On Site. The permittee shall ensure that any contractor(s) and or workers executing the activities authorized by this GP(s) have knowledge of the terms and conditions of this authorization and any modification(s), and that a copy of this GP document and any accompanying verification letter and attached plans are at the site of the authorized work throughout the period(s) of time the work is underway.

33. Self-Verification Notification Form. For those activities that do not require PCNs and are eligible for self-verification, permittees must complete and submit the [SVNF](#) to the Corps for work authorized by these GPs unless otherwise stated. See the SVNF for submittal requirements and timing.

34. Inspections. The permittee shall allow the Corps to inspect the authorized activities and mitigation parcels at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of the applicable GP(s) and any written verification from the Corps. To facilitate these inspections, the permittee shall complete and return to the Corps the following forms:

- For Self-Verification: The SVNF. See GC 33.
- For PCN: The Work-Start Notification Form, Compliance Certification Form, and/or Mitigation Work-Start Notification Form whenever these forms are provided with a verification letter.

35. Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable general conditions and activity-specific special conditions provided in a written verification from the Corps. This does not include maintenance of dredging, related disposal, or beach nourishment projects unless specified in a written authorization from the Corps.

36. Property Rights. 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.

37. Transfer of GP Verifications. If the permittee sells the property associated with a GP verification, the permittee may transfer the GP verification to the new owner by submitting a letter to the Corps to validate the transfer. A copy of the GP verification must be attached to the letter, the letter must contain the name, address and phone number of the transferee (new owner), include the following statement and signature, and be mailed to: Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751:

“When the structures or work authorized by these GPs are 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 new owner(s) of the property.

Transferee Printed Name

Transferee Signature

Date

38. Modification, Suspension, and Revocation. These GPs or any work authorized under these GPs may be either modified, suspended, or revoked, in whole or in part, pursuant to the policies and procedures of 33 CFR 325.7. Any such action shall not be the basis for any claim for damages against the U.S.

39. Special Conditions. The permittee must comply with any special conditions added by the Corps to this GP. Failure to comply with all applicable terms and conditions of the authorization, including special conditions, constitutes a permit violation and may subject the permittee to criminal, civil or administrative penalties and/or an ordered restoration, and/or the permit may be modified, suspended or revoked by the Corps.

40. False or Incomplete Information. If the Corps 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 permittee, the Corps may determine that the GP authorization is not valid and modify, suspend or revoke the authorization. In such cases, the U.S. Government may institute legal proceedings.

41. Abandonment. If the permittee abandons or decides to abandon the activity authorized under these GPs, the work must be removed and the area restored to the maximum extent practicable unless a GP or IP specifically authorizes the abandonment.

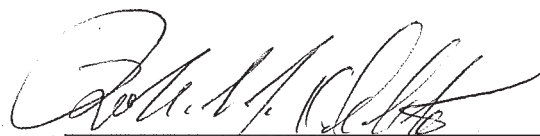
42. Enforcement cases. These GPs do not apply to any existing or proposed activity in Corps jurisdiction associated with an ongoing Corps or EPA enforcement action, until such time as the enforcement action is resolved or the Corps or EPA, as appropriate, determines that the activity may proceed independently without compromising the enforcement action.

43. Previously Authorized Activities

- a. Activities that were authorized and completed in accordance with previous GPs or nationwide permits are not affected by these GPs and continue to be authorized in accordance with the original terms and conditions of those authorizations, including their terms, general conditions, expiration date, 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 this GP.

44. Duration of Authorization

- a. These GPs expire on April 5, 2023. Activities authorized under GPs 1 - 23 that have either commenced (i.e., are under construction) or are under contract to commence before these GPs expire will have until April 5, 2024 to complete the activity under the terms and conditions of the current GPs. The permittee must be able to document to the Corps' satisfaction that the project was under construction or under contract by the appropriate date. If work is not completed within the one year extended timeframe nor SV eligible under any subsequently issued GPs, the permittee must contact the Corps to discuss obtaining a separate Corps authorization to complete the work.
- b. Activities completed under these GPs will continue to be authorized unless special conditions require removal of the authorized work and restoration of the affected area after a specified time period.


 DISTRICT ENGINEER 4/10/18
 DATE



**US Army Corps
of Engineers®**
New England District

V: Self-Verification Notification Form

(for all tidal and non-tidal projects subject to Corps jurisdiction)

Complete **all** fields (write “none” if applicable) below or use the fillable form at

www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit.

Before work within Corps jurisdiction commences, and unless otherwise specified, email this form, a location map, and project plans drawn to scale and not larger than 11” x 17”, to cenae-r@usace.army.mil, (978) 318-8303 (fax), or “Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751”. The Corps will acknowledge receipt of this form in writing. Please call (978) 318-8338 with questions.

Permittee: _____
Address, City, State & Zip: _____
Phone(s) and Email: _____

Contractor (write none if same as permittee): _____
Address, City, State & Zip: _____
Phone(s) and Email: _____

Prior Corps File or Permit Numbers(s): _____
Project Location (provide detailed description if necessary): _____

Address, City, State & Zip: _____
Latitude/Longitude Coordinates (if address doesn’t exist): _____
Waterway Name: _____

Work will be done under the following activity(s) in Section III, Eligible Activities (check all that apply):

1_____	5_____	9_____	13_____	17_____	21_____
2_____	6_____	10_____	14_____	18_____	22_____
3_____	7_____	11_____	15_____	19_____	23_____
4_____	8_____	12_____	16_____	20_____	

Project Purpose: _____

Work Description: _____

(continued on next page)

Aggregate total wetland impact area:	temporary_____SF	permanent_____SF
Aggregate total waterway impact area:	temporary_____SF	permanent_____SF
Aggregate total area of structures (e.g., floats, pile-supported structures)	temporary_____SF	permanent_____SF

Does your project include any indirect or secondary impacts? (See General Condition 3.)

Yes_____ No_____

If yes, describe here: _____

Proposed Work Dates: Start: _____ Finish: _____

Your name/signature below, as permittee, confirms that: a) your project meets the self-verification criteria; and b) you accept and agree to comply with the applicable terms and conditions in the General Permits for Massachusetts.

Permittee Printed Name: _____

Permittee Signature: _____ Date: _____

VI: Content of Preconstruction Notification

Applications should be emailed to cenae-r@usace.army.mil or to the Corps project manager if one has been assigned. In addition to the following required information, the applicant must provide additional information as the Corps deems essential to make a public interest determination including, where applicable, a determination of compliance with the §404(b)(1) guidelines or ocean dumping criteria.

1. Written information required for all projects:

- Corps application form ([ENG Form 4345](#)). The MassDEP WQC, Chapter 91 application form and Notice of Intent cannot be substituted for the form, but can be used supplementally.
- All anticipated direct, indirect and secondary impacts, both permanent and temporary, to waters of the U.S. (in wetlands, and waterward of OHW in inland waters and the HTL in coastal waters) in square feet, acres, or linear feet (for stream and bank impacts), and cubic yards or other appropriate units of measure. The New England District Compensatory Mitigation Guidance is a resource for assessing secondary impacts (see www.nae.usace.army.mil/missions/regulatory/mitigation.aspx).
- For the discharge of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized. For the remaining impacts, include a statement describing how impacts to waters of the U.S. are to be compensated for or explain why compensatory mitigation should not be required for the proposed impacts.
- For any activity that will alter or temporarily or permanently occupy or use a Corps Federally authorized civil works project, the PCN must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps. See GC 5(a).
- Information on historic properties (see GC 7), including a copy of the [Historic Property Notification Form](#) (Section IX) and the email or certified mail receipt that was used to send the form to the SHPO, BUAR and applicable THPOs.
- Information on Federal threatened or endangered species (see GC 10).
- A restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions (see GC 15).
- Photographs of wetland/waterway to be impacted. Photos at low tide are preferred for work in tidal waters.
- Invasive Species Control Plan (see GC 25). For sample control plans, see www.nae.usace.army.mil/missions/regulatory/invasive-species.
- Provide discussion of habitat, including type of sediment/soil effected (sand, mudflat, etc), along with presence or absence of wildlife, plants, fisheries, and shellfish. Explain how the applicant has determined the presence or absence of the required wildlife, fisheries, shellfish, information, e.g., divers, surveys, personal observation, online maps, etc.
- Provide a description of the federal wetlands and provide a map of their locations within the project area. Provide an assessment of the impacts expected from the project on the wetlands and wildlife functions.
- Provide historic information of project area, e.g., existing Corps 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 “grandfathering.”
- If the project is located in the floodway, state whether the project will increase the 100-year frequency flood level? How much floodplain storage will be removed from the 100-year floodplain by fill.

For dredging projects, include:

- Date the area was last dredged.
- Whether it is new, improvement or maintenance dredging and the method of handling/transporting.
- Type of dredging equipment to be used and dredging method (e.g. mechanical or hydraulic).
- Grain-size of material to be dredged (e.g., silty sand). Provide any existing sediment grain size and bulk sediment chemistry data from the proposed or nearby projects.
- Information on any recent spills of oil and/or other hazardous materials and on nearby outfalls. Document the information source, e.g., the harbormaster or fire chief.
- Total footprint of the dredged area when characterizing impact to resources.
- Discuss alternatives to open-water disposal.

2. Plans for all projects shall include:

- 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". 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. Show the north arrow and wetland and waterway area impacts. Provide a color locus map and, if necessary, a plan overview of the entire property with a key index to the individual impact sheets.
- Datum in plan and elevation views.
- The horizontal datum shall be in the NAD 83 Massachusetts State Plane Coordinate System (zone is either Mass Mainland or Mass Island) 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.
- Existing and proposed conditions, and plan views and cross sections for all work.
- Limits and area (SF) of temporary and permanent fill to be placed in any wetlands or waterway, including construction access and work areas, cofferdams, bedding, and backfill. Show delineation of all wetlands 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, and perennial, intermittent, and ephemeral streams; on the project site. Use Federal delineation methods and include Corps wetland delineation data sheets (see GC 2) for all wetlands. 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.
- Copies of sections of National Wetland Inventory Maps, marked to show locations and site boundaries. Identify the quad name and year.
- Ebb and flood in tidal waters and direction of flow in non-tidal waters.
- Indicate the relationship of the proposed work site to waters of the U.S., i.e. adjacent wetlands, tidal influence through culverts, etc.
- Total plan of development, including the proposed use of upland and wetland areas.
- Names or numbers of all roads in the site's vicinity.
- Names of adjoining property owners in plan view.
- For typical pipeline cross-sections, the details of the bedding and backfill to be used in wetlands and waterways. Show proposed trench dams and detail for inland projects.
- Adjacent Federal navigation project (FNP) (anchorage or channel) and/or state/local navigation projects, distance to them, the authorized depths of the FNP, and state plane coordinates of seaward end(s) of structures near an FNP.
- The 100, 500-year and regulatory floodway boundaries as shown on the community's current National Flood Insurance Program maps, if applicable.
- A statement regarding how the project proponent has determined the absence or presence of vegetated

shallows, mudflats, or riffles and pools, e.g., personal visual observation, divers, online maps, conversations with local officials, etc.

- Shellfish information. A survey may be required.

2a. Plans for structures shall also include:

- The MLLW, MHW and HTL elevations in tidal waters, and OHW in non-tidal navigable waters.
- Water depths around the project in all views.
- Dimensions of the existing and proposed structures. Show the location and dimensions of existing bulkheads and/or shoreline stabilization on adjacent properties and, if applicable, how the proposed work will tie into existing structures.
- For piers and other structures, the minimal height of structure above the marsh.
- For floats, the methods of securing (piles, bottom anchors) and keeping off substrate (skids, stops).
- 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, reconfiguration zone or aquaculture activity. 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. If no structures exist or are proposed, state this on the project plans.
- The dimensions of the structure or work and extent of encroachment waterward of MHW and from a fixed point on the shoreline or upland.
- Shoreline of adjacent properties.
- In narrow waterbodies, the distance to opposite shoreline, waterway width, and structures across from proposed work.
- For reconfiguration zones, the coordinates of the corners and specify the maximum number of slips and/or moorings within the zone.
- 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.

2b. Plans for projects involving fill shall also include:

- All locations of discharges of dredged or fill material waterward of the HTL or OHW.
- Any historic permanent fill previously authorized by the Corps and the date of authorization.
- The MLLW, MHW and HTL elevations in tidal waters, and OHW elevation in lakes and non-tidal streams.
- Structures, if any, proposed to be erected on the fill.
- Limits of wetlands (label: wetland boundary) and waterways (labels: OHW or HTL) on all views.
- Limits of temporary and permanent fill to be used in any wetlands or waterway, including construction access and work areas, cofferdams, bedding, and backfill.
- Area (SF) of each fill that is waterward of the OHW in non-tidal waters, waterward of the HTL in tidal waters, and in wetlands. State if the fill is permanent or temporary.
- Disposal site of the excess excavated material. If necessary, submit an additional sheet showing the location of the proposed disposal site. Provide quantity of excess excavated material.
- Existing and proposed ground or waterway contours or spot elevations on all views.
- Mitigation areas clearly identifying each area and showing the boundaries and SF of each area.
- Total plan of development, including the proposed use of upland and wetland areas.

2c. Plans for projects involving dredging shall also include:

- The area (SF) and volume (CY) of material to be dredged waterward of MHW for each dredge location.
- Dredge boundaries.
- Bathymetry: existing, proposed and historical (include dates and Corps permits) dredge depths
- 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.
- Whether the dredging is new, maintenance, improvement, or a combination.
- A description of the area to be dredged, i.e. open water, existing channel, wetlands, uplands, etc.
- Location of the disposal site (include locus sheet).
- The methods and areas used to retain or prevent dredged material from running back into the wetland or waterway. Provide the capacity and points of runback, including the overflow route, into the aquatic system.
- For beach nourishment, 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.
- Show the finished top elevation of the disposal site.
- For open-water disposal, explain why inland or beneficial reuse sites are not practicable.
- Identification and description of any potential impacts to Essential Fish Habitat and threatened or endangered species.
- Note: For projects proposing open water, nearshore disposal, or beach nourishment, contact the Corps as early as possible regarding sampling and testing protocols. Sediment testing, including physical (e.g., grain-size analysis), chemical and biological testing may be required. Sampling and testing of sediments without such contact should not occur and if done, would be at the applicant's risk.

VII. Definitions and Acronyms

Definitions

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.

Brushing the Flats: The placement of tree boughs, wooden lath structure, or small-mesh fencing on mud-flats, or any bottom disturbance (e.g., discing, plowing, raking, etc.), to enhance recruitment of shellfish.

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.

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 Effects: The changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual 1) discharges of dredged or fill material, or 2) structures. 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.

Direct Effects: The loss of aquatic ecosystem within the footprint of the discharge of dredged or fill material. Direct effects are caused by the action and occur at the same time and place.

Dredging:

Improvement Dredging: For the purposes of these GPs, this is dredging deeper than previously authorized by the Corps and dredged.

Maintenance Dredging: For the purposes of these GPs, this is dredging from an area previously authorized by the Corps and dredged. The Corps 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 Corps 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 dredging of an area that has never been authorized by the Corps and dredged.

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.

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.

Expansions: Work that increases the footprint of fill, structures 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: These are defined at 33 CFR 323.2(e) and (f). The term fill material is defined as 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.

Federal anchorages: See the definition of “Federal navigation projects.”

Federal channels: See the definition of “Federal navigation projects.”

Federal navigation projects (FNPs): These areas are maintained by the Corps; authorized, constructed and maintained on the premise that they will be accessible and available to all on equal terms; and comprised of Corps 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	Green Harbor	Pollock Rip Shoals, Nantucket
Aunt Lydia’s Cove	Hingham Harbor	Sound
Beverly Harbor	Hyannis Harbor	Provincetown Harbor
Boston Harbor	Ipswich River	Red Brook Harbor
Buttermilk Bay Channel	Island End River (Chelsea, MA)	Rockport Harbor
Canapitsit Channel	Kingston Harbor	Salem Harbor
Cape Cod Canal	Lagoon Pond	Sandy Bay Harbor of Refuge
Chatham Harbor	Little Harbor Woods Hole	Saugus River
Cohasset Harbor	Lynn Harbor	Scituate Harbor
Cross Rip Shoals, Nantucket	Malden River	Sesuit Harbor
Sound	Menemsha Creek	Taunton River
Cuttyhunk Harbor	Merrimack River	Vineyard Haven Harbor
Dorchester Bay and Neponset	Mystic River	Wareham Harbor
River	Nantucket Harbor of Refuge	Wellfleet Harbor
Duxbury Harbor	New Bedford and Fairhaven	Westport River and Harbor
Edgartown Harbor	Harbor	Weymouth Back River
Essex River	Newburyport Harbor	Weymouth Fore and Town
Fall River Harbor	Oak Bluffs Harbor	Rivers
Falmouth Harbor	Pigeon Cove Harbor	Winthrop Harbor
Gloucester Harbor and	Plymouth Harbor	Woods Hole Channel
Annisquam River		

Federal turning basin: See the definition of “Federal navigation projects.”

Flume: An open artificial water channel, in the form of a gravity chute, which leads water from a diversion dam or weir completely aside a natural flow. A flume can be used to measure the rate of flow.

FNP buffer zone: The buffer zone of a Corps FNP is equal to three times the authorized depth of the FNP.

Frac out: During normal drilling 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.

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 Corps 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.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

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.

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: Living shorelines stabilize banks and shores in coastal waters along 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. Living shorelines must have a substantial biological component, either tidal or lacustrine fringe wetlands or oyster or mussel reef structures.

Maintenance: Maintenance does not include any modification that changes the character, scope, or size of the original fill design.

Mechanized land clearing: As a general rule, mechanized land clearing is a regulated activity (see [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.

Mouth: The river mouths referenced in this document can be determined using the maps located at: <http://www.mass.gov/eea/agencies/massdep/water/watersheds/wetlands-maps-mouth-of-coastal-river.html>.

Navigable waters or Navigable waters of the U.S.: See the definition of “waters of the U.S.” below.

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-tidal wetlands: See the definition of “Waters of the U.S.” below.

Ordinary High Water Mark (OHW): 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: See the definition of “single and complete linear project.”

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 project proponent to the Corps 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 project proponent 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.

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 Corps-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.

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.

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.

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.

Secondary effects: These are 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

§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).

Sedimentation and turbidity: For the purposes of this document, “greater than minimal sedimentation or turbidity” is generally not considered to occur from the installation of sheet piles, removal of sheet piles when done in accordance with GC 16, the installation or removal of piles, dredging or excavating in predominantly sand and courser material, and dredged material disposal in the upland (e.g., beach or parking lot) into properly constructed upland contained dredged material disposal area.

Shellfish dredging: Shellfish dredging typically consists of a net on a frame towed behind a boat to capture shellfish and leave the sediment behind. Dredges may skim the surface, utilize hydraulic jets, toothed rakes or suction apparatus.

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.

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.

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: 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.

Stream: The term “stream” in the document means rivers, streams, brooks, etc.

Streambed: The substrate of the stream channel between the OHW marks. 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, waters of the U.S. that are temporarily filled, flooded, excavated, or drained because of the regulated activity.

Tidal wetlands: 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: See the definition of “Sedimentation and turbidity” above.

Utility line: Any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and 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 go dry 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.

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 (not unlike a dam) and allows water to flow over the top. Weirs are commonly used to alter the flow regime of the river, prevent flooding, measure discharge and help render a river navigable.

Waters of the United States (U.S.)

- **Navigable waters of the United States** are waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR 329 and identify waters where permits are required for work or structures pursuant to §§9 and 10 of the Rivers and Harbors Act of 1899. They are generally defined in 33 CFR 329.4 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.”

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.

- **Waters of the United States** are defined in 33 CFR 328. These waters include more than navigable waters of the U.S. and are the waters where permits are required for the discharge of dredged or fill material pursuant to §404 of the CWA. Waters of the U.S. include jurisdictional wetlands.
- **Non-tidal wetland:** 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).

- **Tidal wetland:** A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the HTL.
- **Waterbody:** For purposes of these GPs, a waterbody is a jurisdictional water of the U.S. 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)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

Acronyms

BMPs	Best Management Practices
BUAR	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

VIII: Contacts and Tribal Areas of Concern

1. Federal

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

U.S. Environmental Protection Agency
5 Post Office Square
Suite 100 (OEP05-2)
Boston, Massachusetts 02109-3912
(617) 918-1692 (phone)

National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930
(978) 281-9300 (phone)
(*Federal endangered species & EFH*)

U.S. Fish & Wildlife Service
70 Commercial Street, Suite 300
Concord, New Hampshire 03301
(603) 223-2541 (phone)
(*Federal endangered species*)

National Park Service
15 State Street
Boston, MA 02109
(617) 223-5191 (phone)
(*Wild and Scenic Rivers*)

Commander (dpb)
First Coast Guard District
Battery Building
One South Street
New York, NY 10004-1466
(212) 514-4331 (phone); (212) 514-4337 (fax)
(*bridge permits*)

Chief, Risk Analysis Branch
FEMA Region 1
U.S. Department of Homeland Security
99 High Street, 6th Floor
Boston, MA 02110
(617) 956-7576

2. State of Massachusetts

Department of Environmental Protection (MassDEP)

DEP Division of Wetlands and Waterways
One Winter Street
Boston, MA 02108
(617) 292-5695

DEP Northeast Region
Wetlands Protection Program
205B Lowell Street
Wilmington, MA 01887
(978) 694-3200

DEP Western Region
Wetlands Protection Program
436 Dwight Street
Springfield, MA 01103
(413) 784-1100

DEP Central Region
Wetlands Protection Program
8 New Bond Street
Worcester, MA 01606
(508) 792-7650

DEP Southeast Region
Wetlands Protection Program
20 Riverside Drive, Route 105
Lakeville, MA 02347
(508) 946-2800

Massachusetts Office of Coastal Zone Management (CZM)

MA Office of Coastal Zone Management
251 Causeway Street, Suite 800
Boston, MA 02114
(617) 626-1200 (phone)

3. Historic Resources:

- a. Massachusetts Historical Commission (MHC)
The Massachusetts Archives Bldg.
220 Morrissey Boulevard
Boston, MA 02125
(617) 727-8470 (phone); (617) 727-5128 (fax)
Area of concern: The entire Commonwealth of Massachusetts

- b. Massachusetts Board of Underwater Archaeological Resources (BUAR)
251 Causeway Street, Suite 800
Boston, MA 02114
(617) 626-1141 (phone); (617) 626-1240 (fax); victor.mastone@state.ma.us
Area of concern: All Massachusetts lakes, ponds, rivers and navigable waters.

- c. Tribal Historic Preservation Officers (THPOs)

Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road
Aquinnah, MA 02535
(508) 645-9265, x175 (phone); (508) 645-3790 (fax); bettina@wampanoagtribe.net
Area of concern: The entire Commonwealth of Massachusetts

Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe
483 Great Neck Road South
Mashpee, MA 02649
(508) 477-0208, x101 (phone); (508) 477-1218 (fax); rpeters@mwtribe.com
Area of concern: The entire Commonwealth of Massachusetts

Tribal Historic Preservation Officer
Stockbridge-Munsee Mohican Tribal Historic Preservation, New York Office
65 1st Street
Troy, NY 12180
(518) 244-3164 (phone); bonney.hartley@mohican-nsn.gov
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.

Tribal Historic Preservation Officer
Narragansett Indian Longhouse
4425 South County Trail
Charlestown, RI 02813
(401) 585-0142 (phone); (413) 325-7691 (cell); tashtesook@aol.com, dhnthpo@gmail.com
Area of concern: Boston and its surrounding cities and towns; Lynn; Newton; these cities and towns in Plymouth County (Carver, Duxbury, Hingham, Kingston, Marshfield, Middleborough, Plymouth, Plympton, Scituate); these cities and towns in Norfolk County (Milton, Quincy, Braintree, Randolph, Canton, Sharon and Foxborough); the Blackstone River valley; and the cities and towns west of Worcester (which are those including and west of Ashburnham, Westminster, Princeton, Holden, Paxton, Leicester, Oxford and Webster).



**US Army Corps
of Engineers®**
New England District

IX: HISTORIC PROPERTY NOTIFICATION FORM

In accordance with General Condition 7, proponents must ensure and document that all potential historic properties within the permit area have been identified. To assist with this effort, proponents may send this form for self-verification activities, but must send this form for PCN activities, to the SHPO, BUAR and applicable THPO(s). You must include any Corps or state waterway agency application forms, plans and a copy of the USGS quadrangle map section that clearly marks the project location. It is recommended that you complete **all** fields (write “none” or “see attached application form” if applicable). The PCN sent to the Corps must include proof of having sent this form, e.g. the email or certified mail receipt that was used to send it, to the SHPO (does not accept email), BUAR and applicable THPOs. Please include any comments or requests received from these agencies with your PCN.

Project Name: _____

Address, City, State & Zip: _____

Project Proponent Name: _____

Address: _____

Phone(s) and Email: _____

Project Location (provide detailed description if necessary) Address, City, State & Zip: _____

Latitude/Longitude Coordinates (if address doesn't exist): _____

Waterway Name: _____

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name

Type of License or Funding (specify)

Project Description: _____

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition: _____

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: _____

Does the project include new construction? If so, describe (attach plans and elevations if necessary): _____

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: _____

What is the total acreage of the project area?

Woodland _____ acres

Wetland _____ acres

Floodplain _____ acres

Underwater and/or bottomlands _____ acres

Open space _____ acres

Developed _____ acres

Productive Resources:

Agriculture _____ acres

Forestry _____ acres

Mining/Extraction _____ acres

Total Project Acreage _____ acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area? _____

Signature of person submitting this form: _____ Date: _____

Name: _____

Address: _____

City/Town/Zip: _____

Telephone: _____

DOCUMENT A00841

MASSACHUSETTS
Department of Environmental Protection
Water Quality Certification

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Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Beth Card
Secretary

Martin Suuberg
Commissioner

August 26, 2022

MassDOT – Highway Division
Ten Park Plaza, Suite 4160
Boston, MA 02116
ATTN: Melissa Lenker

RE: 401 WATER QUALITY CERTIFICATION

Application for: BRP WW 10 (X288430)
MAJOR FILL AND EXCAVATION PROJECTS
BRP WW 08 (X288429)
MINOR DREDGE CERTIFICATION

AT: Bridge Replacement (W-05-015) Route 32 (Palmer Road) over Ware River
Ware, Massachusetts
Chicopee Watershed

USACE Application No: NAE-2022-01398

Dear Ms. Lenker:

The Department of Environmental Protection (“MassDEP”) has reviewed your application for a Water Quality Certification, as referenced above. 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 proposed project is located on Route 32 (Palmer Road) over the Ware River in Ware, MA. The purpose of this project is to replace the structurally deficient bridge and substructures and to realign Palmer Road near the bridge to allow for safer traffic flow. The roadway and sidewalk will also be replaced. There will be temporary and permanent alterations to Land Under Water (LUW) as a result of the installation of the new abutments and pier as well as the use of a cofferdam to complete the work.

The existing Palmer Road bridge was built in 1937 and is a 3-span continuous steel girder bridge that is approximately 154-feet long and 30-feet wide. The bridge has severe concrete spalling and exposed

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Transmittal # X288430 & X288429

rebar in some areas. The bridge is on the National Highway System and is part of an emergency evacuation route and is considered critical or essential. The surrounding area is primarily residential, but Route 32 carries a substantial amount of traffic through the area. The Ware River is part of the Chicopee River watershed.

The proposed project will replace the existing bridge superstructure with a two-span steel girder concrete superstructure, with integral abutments and a center wall pier. The new bridge will provide two 11-foot travel lanes, two six-foot shoulders and two six-foot sidewalks, for a total width of 34 feet, curb to curb. The bridge span will be a total of 167 feet; however, the center pier will only provide an 83-foot-wide opening on each side. Improvements to Palmer Road and Old Belchertown Road include reconstruction of the concrete sidewalks, milling and repaving of the roadway, reconstruction of driveway aprons, and the replacement of all stormwater basins with deep sump catch basins. A stormwater infiltration basin will also be constructed to the northeast of the new intersection.

The proposed demolition and bridge replacement will require the installation of cofferdams; this work will result in temporary impacts to LUW totaling 9,340 square feet (sf). The new abutments, piers, and surrounding rip rap will result in 5,204 sf of permanent impacts to LUW. Two small delineated BVWs are near the project location but will not be impacted. Approximately 1,015 cubic yards of soils will be dredged from the river for the installation of the pier and abutments. The soils to be dredged were sampled in four locations. The samples had less than 10% of the soil passing through the 200 sieve and a historical study was completed to support the assumption that no contaminants exist within the soils of the project area; therefore, in accordance with 314 CMR 9.07(2)(a), no chemical testing is required.

As the project is considered redevelopment in accordance with the stormwater provisions of 314 CMR 9.06(6)(a)7., stormwater standards will be met to the maximum extent practicable. The project will increase the impervious area by 0.2 acres at the project site. Due to space constraints on site, improvements to stormwater are limited. All catch basins will be replaced with deep sump catch basins. Most of Palmer Road has stormwater sheet flow off the edge of the pavement; new catch basins will be installed to capture this water and direct it into the current stormwater system. During the course of project review, an infiltration basin was proposed in the northeast corner of the intersection of Palmer Road and Old Belchertown Road. In accordance with Special Condition 11, full design of this infiltration basin will be submitted to MassDEP for review and approval.

The project will meet all MA Stream Crossing Standards (the Standards) except for Standard 3. The new proposed abutments meet the required 1.2 times bankfull width of 140 feet overall for this location but the center pier does not allow this to be one continuous opening.

Best management practices for erosion and sedimentation control will be adhered to for all phases of construction to minimize potential impacts to wetland resource areas. To the extent practicable, disturbed soils will be stabilized via seeding. Erosion and sedimentation controls will be installed prior to ground disturbance activities and maintained where activities are proposed within 100 feet of the streambank. The erosion controls will prevent silt and sediments from migrating into or towards the resource areas. Sediment controls will consist of compost-filled filter tubes and silt fencing; silt sacks or the equivalent will be installed in existing catch basins.

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. Public notice was provided in the Ware River News on June 2, 2022. No comments were received.

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Therefore, based on information currently in the record, MassDEP grants a 401 Water Quality Certification for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. MassDEP further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, MassDEP has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

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. In addition, those conditions with the (Submittal) designation shall be included in the Special Provisions and reviewed at the District Pre-Construction Conference.

1. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. All work shall be performed in accordance with the following documents and plans:*
 - a. 401 Water Quality Certificate Application for Bridge Replacement and Rehabilitation, Route 32 (Palmer Road) over Ware River, prepared by Kleinfelder on behalf of MassDOT, dated May 26, 2022, Transmittal Form #X288429 and #X288430, with plans and supporting attachments;
 - b. Route 32 (Palmer Road) over Ware River Bridge Replacement Project Stormwater Report; Prepared by McMahon on behalf of MassDOT; dated July 20, 2022;
 - c. Kleinfelder Response Letter to MassDEP comments and supporting documents, submitted August 19, 2022; and
 - d. Draft plan of proposed stormwater infiltration basin; submitted August 25, 2022, by MassDOT.

Pre-construction

2. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. A minimum of twenty-one (21) days prior to commencement of construction, MassDOT shall contact MassDEP to schedule a pre-construction on-site or virtual inspection to review the plans and terms and conditions of this Water Quality Certificate (WQC). The Resident Engineer, the contractor, and a representative from MassDOT's Environmental Section and/or the District Engineer shall attend the pre-construction inspection. (Submittal)*
3. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. Any proposed changes, alterations or amendment requests as well as any required submittals shall be sent by email to heidi.davis@mass.gov and tyler.lewis@mass.gov. (Submittal)*
4. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. Prior*

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to the start of work, the applicant shall provide MassDEP with the name, address and phone number(s) of the MassDOT representative responsible for ensuring that all work complies with the conditions of this Water Quality Certification. **(Submittal)**

5. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* MassDEP shall be copied on the Army Corps of Engineers (USACE) Work Start Notification Form which is due at least two weeks before the anticipated starting date and the USACE Compliance Certification Form within one month following the completion of the authorized work. **(Submittal)**
6. *Pursuant to 314 CMR 9.06, the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* A minimum of twenty-one (21) days prior to commencement of construction, Mass DOT shall submit a water control/dewatering plan for review and approval. Should dewatering be required, it shall be conducted under the supervision of the RE and comply with the applicable conditions identified herein. This plan will include descriptions for any dewatering that will occur on site as well as dredge and debris material dewatering prior to shipment off site. **(Submittal)**
7. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared and implemented in accordance with the most recent U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP). The SWPPP must meet the requirements of a construction period erosion, sedimentation and pollution prevention plan as stipulated in Standard 8 of the Massachusetts Stormwater Management Standards. The SWPPP shall be provided to MassDEP for review and approval no less than two (2) weeks prior to the commencement of construction. See Condition 16 for required inspection frequencies. **(Submittal)**
8. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* The SWPPP 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.
9. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* Training required by the SWPPP must include the MassDEP approved *MassDOT Erosion Prevention & Sediment Control Training Program* and a comprehensive review of the Final SWPPP. All new contractors and subcontractors must be trained throughout the project. Verification of such training shall be submitted to MassDEP prior to the commencement of construction and kept on site for inspection. **(Submittal)**
10. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* Prior to the commencement of work, approved erosion and sedimentation control measures shall be installed per the approved SWPPP 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, and limiting the amount of disturbance at one time, etc.

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11. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* The applicant shall submit a plan within 60 days after the issuance of this WQC for the fully designed infiltration basin depicted in the document referenced in Condition 1.d. This plan will require the review and approval of MassDEP prior to its construction. **(Submittal)**

Construction Period

12. *Pursuant to 310 CMR 9.06(2), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* Impacts to Land Under Water shall not exceed **14,544 square feet** (9,340 sf temporary and 5,204 sf permanent).
13. *Pursuant to 310 CMR 9.06(2), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* No more **than 1,015 cubic yards** of material shall be dredged from the Ware River.
14. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* Streambed restoration work to temporarily impacted areas shall utilize locally sourced materials that match the surrounding streambed conditions if needed.
15. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* The project shall not result in any increase in turbidity within Resource Areas during rainfall events. In the event of a significant erosion and sedimentation control failure (e.g., sedimentation to a Resource Area), MassDEP and the Ware Conservation Commission shall be notified immediately and MassDEP shall have the authority to direct immediate corrective measures and remediation and the applicant shall comply with MassDEP's response. The Contractor shall immediately stabilize, control and contain any impacts.
16. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* SWPPP inspections shall occur at a frequency of no less than one inspection every seven days, and after any storm event measuring more than 0.5-inch of precipitation in a 24-hour period.
17. *Pursuant to 314 CMR 9.06(6)(a)4, the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* 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 street flooding during periods of precipitation. Stockpiles shall be located no less than fifty (50) feet from wetland resource areas and catch basins or other drainage conveyances that discharge to wetland resource areas. The SWPPP shall specify measures to implement this Special Condition. Filter fabric stretched under the storm drain inlet grate is not acceptable for this purpose.
18. *Pursuant to 314 CMR 9.06(6)(a), the following condition is necessary to ensure that stormwater controls prevent degradation to wetlands and waters.* Erosion and sedimentation controls must be inspected, maintained, and replaced if damage occurs until all disturbed areas have been fully stabilized. The Resident Engineer shall be responsible for the inspection of erosion and sedimentation controls in accordance with the SWPPP and with the frequency of those inspections

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being dictated as described herein. The Resident Engineer shall have the authority to require modifications to existing erosion and sedimentation controls, require additional controls as they deem necessary, and require that erosion or sedimentation problems be addressed immediately.

19. *Pursuant to 314 CMR 9.07, the following condition is necessary to minimize turbidity and sediment caused by construction activities and to ensure that water quality is not degraded, and that biology of the waters are not negatively impacted by potential discharges.* Measures should be in place to prevent turbid waters, due to demolition, dredging or debris removal activities, from extending past the limits of work in all stream crossings. These measures can be items such as turbidity curtains and/or sheet piles.
20. *Pursuant to 314 CMR 9.07, the following condition is necessary to minimize turbidity and sediment caused by construction activities and to ensure that water quality is not degraded, and that biology of the waters are not negatively impacted by potential discharges.* If visual turbidity escapes the controls in place, as described in condition 19, MassDEP shall be contacted and work shall stop, until the issue is corrected.
21. *Pursuant to 314 CMR 9.07, the following condition is necessary to protect water quality because it ensures that the project proponent is using planning and construction practices that will maintain the integrity of the site hydrology and maintain the aquatic resource functions and values.* Stockpiled materials shall be properly contained and shall not be located within at least 50 feet of catch basins or other drainage features that discharge to wetlands or waters to ensure water runoff and/or stockpiled materials will not escape the approved stockpile locations.
22. *Pursuant to 314 CMR 9.07(5), The following condition is in place to help avoid fugitive dust and siltation into wetland resources and waters.* Best management practices shall be implemented during transportation of dredge materials to the receiving facility. At a minimum, when transported upon public roadways, all dredged materials shall have no free liquid as determined by a paint filter test or other suitable method. This condition is necessary to protect surrounding area water quality during transportation.
23. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* A temporary shielding system shall be in place beneath the bridge structure prior to concrete excavation and removal to prevent debris from falling into the water below. If any debris falls in the river, it shall be immediately removed.

Post-Construction

24. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that practicable steps have been taken which will avoid and minimize impacts to wetlands and waters.* All temporary erosion controls shall be removed at the conclusion of work once the surrounding area is stabilized.

General Conditions

25. *Pursuant to 314 CMR 9.09(1)(d), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters.* This Certification remains in effect for the same duration as the federal permit that requires it.

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26. *Pursuant to 314 CMR 9.11, the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. No Special Conditions set forth herein shall be construed or operate to prohibit the Department from taking enforcement against the MassDOT or its contractors for any failure to comply with the terms and requirements of this 401 Water Quality Certification.*
27. *Pursuant to 314 CMR 9.09(1)(e), the following condition is necessary to ensure that construction practices are implemented in such a manner as to prevent degradation to wetlands and waters. No activity authorized by this Water Quality Certification may begin prior to expiration of the 21-day appeal period or until a final decision is issued by MassDEP if an appeal is filed.*

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
One Winter Street, 2nd Floor
Boston, MA 02108

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

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One Winter Street, 2nd Floor
Boston, MA 02108

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):

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

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:

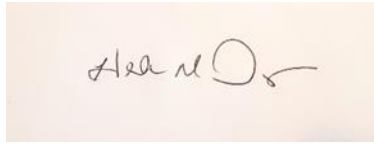
Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
PO Box 4062
Boston, MA 02211

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 me at Heidi.davis@state.ma.us or tyler.lewis@state.ma.us.

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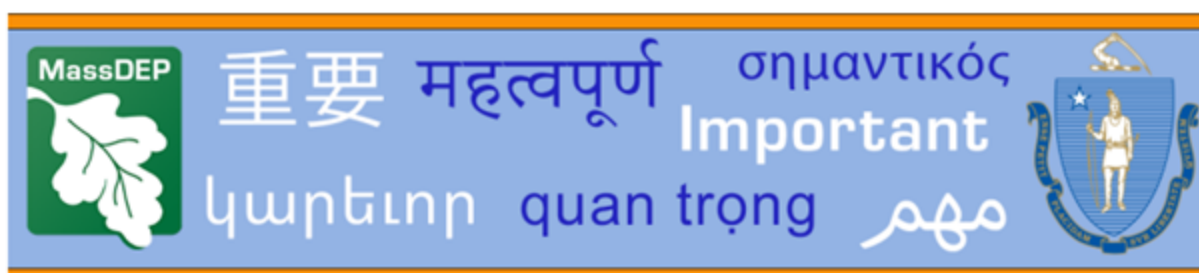
Very truly yours,

A handwritten signature in dark ink on a light-colored background. The signature appears to be "Heidi M. Davis" with a stylized flourish at the end.

Heidi M. Davis
Highway Unit Supervisor

Ecc: DEP-CERO – Judy Schmitz
 USACE - Dan Vasconcelos
 MassDOT – Corinna Beckwith
 MassDOT – Rob Natario
 Ware Conservation Commission – John Prenosil - ncroteau@townofware.com
 Kleinfelder – Rafic Khalil – rkhalil@kleinfelder.com

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Communication for Non-English-Speaking Parties

English

This document is important and should be translated immediately.
If you need this document translated, please contact MassDEP's Diversity Director at the telephone number listed below.

Español Spanish

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

Português Portuguese

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

繁體中文 Chinese Traditional

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

简体中文 Chinese Simplified

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

Ayisyen Kreyòl Haitian Creole

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

Việt Vietnamese

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

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះគឺសំខាន់ហើយត្រូវបានបកប្រែភ្លាមៗ។ ប្រសិនបើអ្នកត្រូវការឱ្យគេបកប្រែឯកសារនេះ សូមទាក់ទងមកនាយកដ្ឋានពិពិធកម្មរបស់ MassDEP តាមលេខទូរស័ព្ទខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

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

Contact **Glynis L. Bugg, Acting Diversity Director/Civil Rights 857-262-0606**
Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108

TTY# MassRelay Service 1-800-439-2370 • <https://www.mass.gov/environmental-justice>
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401 WQC – Ware – Bridge Replacement- (W-05-015) Route 32 (Palmer Road) over Ware River
Transmittal # X288430 & X288429

Русский Russian

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

العربية Arabic

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

한국어 Korean

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

հայերեն Armenian

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

فارسی Farsi Persian

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

Français French

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

Deutsch German

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Ελληνική Greek

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

Italiano Italian

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Język Polski Polish

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

हिन्दी Hindi

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

Contact Glynis L. Bugg, Acting Diversity Director/Civil Rights 857-262-0606
Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108

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DOCUMENT A00842

**Additional Reports
to
Water Quality Certification - Application**

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Charles D. Baker, Governor
 Karyn E. Polito, Lieutenant Governor
 Jamey Tesler, Secretary & CEO
 Jonathan L. Gulliver, Highway Administrator



August 5, 2022

Heidi M. Davis
 Senior Wetland Analyst
 Highway Unit Supervisor
 Wetlands Program
 MassDEP
 1 Winter St.
 Boston, MA 02108

RE: Ware Bridge Replacement (Project No. 605126)
Bridge No. W-05-015
Rt. 32 (Palmer Rd) over Ware River
Response to DEP Comments for 401 Water Quality Certification
Transmittal No. X288429

Dear Ms. Davis,

MassDOT and McMahon Associates have prepared the following responses to your comments (*italicized*) dated June 13, 2022, for the above-mentioned project.

Stormwater Management Standards Comment:

1. *Please provide a stormwater report that demonstrates the calculations used to obtain the proposed discharge rates, recharge volumes and TSS removal.*

Response: The stormwater report with an appendix that demonstrates the calculations used to obtain the proposed discharge rates, recharge volumes and TSS removal is attached.

General Comments:

1. *Will the trees being removed as part of the proposed 18-inch modified rock area be replaced elsewhere on the project site?*

Response: The two trees being removed are 12 inch and 10 inch diameter per the survey plans. They are located approximately 700 feet north of the riverbank. They are removed because it is necessary to install modified rockfill to stabilize the grading slope of the adjacent lot near Juniper Hill Road. The area is expected to reseed naturally over a few seasons. No replacement trees are proposed.

2. *Was a chemical analysis of soil samples conducted? Please provide the results if so.*

Response: The sieve analysis of the sediments was provided to DEP in the 401 application package. The sieve analysis demonstrated that less than 10% of the sediment passed the No. 200 sieve. Since the representative samples collected contain less than 10% passing the No. 200 sieve and there is no known history of contaminants, a sediment analysis for chemical constituents was not performed per 314 CMR 9.07(2)(a).

3. *Please depict and call out the proposed locations for the construction period sedimentation basins that will be used during dewatering activities.*

Response: In the permit plans on Sheet 13 through 20 of 21, we show the suggested sedimentation basin areas during staged construction. The exact location, area and details of the sedimentation basin(s) are part of the Contractor's means and methods, where the Contractor is responsible for designing them and to submit for prior review and acceptance by the Engineer or the permitting authority. These exact means and methods are the responsibility of the Contractor, therefore, we are not intending to show further details. If the Contractor's methods result in the need to amend the permit, then the Contractor is obligated to apply for the amendment on their own.

4. *The bridge replacement project proposes a center pier; subsequently, each opening should be treated as two separate crossings. In accordance with 314 CMR 9.06(2)(b), if the project includes work on an existing non-tidal crossing, the applicant needs to demonstrate the crossing complies with the MA Stream Crossing Standards to the maximum extent practicable based onsite considerations, impact on resource areas or cost considerations. Please elaborate on how the stream crossings standards have been met to the maximum extent practicable.*

Response: The following are the 7 MA Stream Crossing Standards (*italicized*).

Standard 1. Spans (bridges, 3-sided box culverts, open-bottom culverts or arches) that preserve the natural stream channel are strongly preferred.

(Meets)

The bridge replacement project will restore the existing riverbed on top of the riprap and pile caps for both crossings. The project will allow full aquatic organism passage by maintaining unrestricted movement within the Ware River. The addition of a new center pier and riprap within LUW around the abutments and center pier is anticipated to minimally affect the movement for fish and other aquatic organisms and may support movement corridors for some of the species. The continuity of the river, including average river water depths, turbulence, velocities, and flow patterns will remain unchanged. The natural stream channel will be preserved with minimal disruption to the streambed.

Standard 2. If a culvert, then it should be embedded.

(Not Applicable)

The Ware River is being spanned with the existing and proposed bridges.

Standard 3. Spans channel width (a minimum of 1.2 times the bankfull width).

(Does Not Meet)

The estimated bankfull channel width opening at the project site is 123 feet and the bankfull channel depth is 4.4 feet (Bent and Waite, 2013). The proposed bridge span is 167 feet as measured from the centerline of the west abutment bearing to the centerline of the east abutment bearing. The proposed width of the bridge hydraulic opening is estimated as an average on both sides, but reduced by the thickness of the pier stem. The proposed available flow width under the structure is about 137 feet. The width of the proposed structure is thus 1.1 times the estimated bankfull channel width.

Note that the bankfull standard applies to the full hydraulic width of a bridge since it is the full channel that carries the effective discharge leading to sediment transport of a given grain-size distribution that gives the channel its dimensions. For a bridge with a single pier, the openings are hydraulically connected and act together to pass water, sediment, large wood, and ice. If each bay of a multi-span bridge were sized to the bankfull standard the bridge would be too wide and one of the bays would fill in with sediment.

Culverts are a different case where a larger area of fill tends to exist between crossings with more than one pipe or box and the structures operate more independently in terms of sediment transport. In the case of a multiple culverts at a single crossing location, the bankfull standard is more likely to be applied to each individual structure, especially if they are separated.

The bridge replacement project proposes removing the existing two piers and constructing one center pier in the middle of the Ware River. The pier must be maintained otherwise the horizontal girders will have to be redesigned, increasing the depth (thickness) of the girders thus reducing the opening over the river and reducing the desired freeboard. The pier is located in the center of the channel because the placement of the pier will give two equal spans which will allow for the shallowest depth of beams, therefore maximizing the river opening and the desired freeboard.

The option of a single center pier for the replacement bridge as the preferred alternative provided several benefits in addition to the reduction of piers. Not only would existing piers be cut below the mudline and river bottom substrate restored in place enhancing land under water in the project area, but the new center pier could be constructed without interference from the existing piers, resulting in a more cost-effective construction sequencing and less coordination time.

Bent, G. C. and A. M. Waite, 2013. Equations for Estimating Bankfull Channel Geometry and Discharge for Streams in Massachusetts (U.S. Geological Survey Scientific Investigations Report 2013–5155). U.S. Geological Survey.

Standard 4. Natural bottom substrate within the structure.
(Meets)

Since the stream is being spanned by a bridge, the natural bottom of the channels will match existing channel conditions. In locations with rip rap scour protection, streambed restoration is proposed so the composition, function, and aesthetic of the streambed will be maintained.

Standard 5. Designed with appropriate 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.
(Meets)

The river is being spanned and although the project proposes an average 3.5 foot-wide center pier which creates two openings, it is not expected to alter bed forms or streambed characteristics. The bed forms and streambed characteristics including water depths and velocities will match existing conditions.

Standard 6. Openness > 0.82 feet (0.25 meters).
(Meets)

Openness ratio of the two bridge crossings is 11.77; meeting the openness requirement, as 11.77 feet > 0.82 feet. Openness = (height x width)/length. Height (from OHW to bottom of bridge girder) is 11.25

feet for both crossings. Width of crossing 1 (east side of west abutment to west side of center pier) is 51.00 feet and width of crossing 2 (west side of east abutment to east side of center pier) is 51.00 feet. Length of the bridge (north to south) is 48.75 feet for both crossings.

Standard 7. Banks should be present on each side of the stream matching the horizontal profile of the existing stream and banks.
(Meets)

The banks will be reconstructed on each side of the Ware River upon completion of construction. The existing riverbed and slopes will be restored with loam and seed on top of the riprapped slope above the OHW.

Thank you for your careful consideration of the enclosed and attached information.

Respectfully,



Melissa Lenker
Wetlands & Water Resources Supervisor
MassDOT Highway Division

Attachment: Stormwater Report

Cc: DEP-CERO – Judy Schmitz
USACE – Dan Vasconcelos
MassDOT – Corinna Beckwith
Kleinfelder – Rafic Khalil - rkhalil@kleinfelder.com
McMahon – Stephanie MacDonald - smacdonald@mcmahonassociates.com
SLR – Roy Schiff – rschiff@slrconsulting.com



July 20, 2022

Corinna Beckwith
Wetlands Analyst
Massachusetts Department of Transportation
10 Park Plaza
Boston, MA 02116

RE: Route 32 (Palmer Road) over Ware River Bridge Replacement

This Stormwater Management Memorandum has been prepared to show compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Water Quality Certification Regulations (314 CMR 9.00) to support the Project's Section 401 Water Quality Certificate Application.

Project Description

The Applicant, MassDOT, is proposing Project No. 605126 to construct a bridge replacement of Bridge No. W-05-015 (C89), Route 32 (Palmer Road) over Ware River located in Ware, MA. As proposed, the Project consists of replacement of an existing bridge superstructure and substructures. In addition to the bridge replacement, it involves roadway reconstruction and realignment, drainage improvements, replacement of existing sidewalks, guardrail improvements, and intersection improvements at Old Belchertown Road. The replacement bridge vertical alignment will be adjusted approximately 8 to 10 inches across the bridge and tie back into the existing grade at the end of the project limits. There will also be a slight horizontal realignment on the eastern portion of the bridge to accommodate safety and sight distance at Old Belchertown Road. In addition, a crest curve will be constructed across the bridge, satisfying all minimum requirements for crest curvature per MassDOT Project Design and Development Guide (PDDG).

Existing and Proposed Drainage Conditions

Ware River

The Ware River originates in the Town of Hubbardston and flows southwesterly from its source. The river crosses northwest under the subject bridge. The Ware River's drainage area at the bridge crossing site is estimated to be 198 square miles and is part of the Chicopee Watershed. The observed water elevation is 376.2' North American Vertical Datum of 1988 (NAVD88) as observed in October 2017. In addition, the bankfull width of the river at the bridge is approximately 117 feet.

The Ware River is federally regulated as "Waters of the United States" and its corresponding segment ID, obtained from MassGIS, is MA36-06. The water body is impaired due to fecal coliform pathogens. Currently, no written Total Maximum Daily Loads (TMDLs) have been recorded by EPA for the water body.

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There are two small areas of vegetated wetlands adjacent to the Palmer Road Bridge footings. There is also a small area of freshwater marsh containing herbaceous vegetation in the northwest quadrant and the southwest quadrant. Recreational activities allowed include, but are not limited to, shoreline fishing, walking trails, and biking on allowed trails only. Direct water contact activities, such as swimming, are strictly prohibited by regulations.

Existing Bridge

The bridge, located on Route 32 (Palmer Road), was originally built in 1937 and has not been reconstructed. The local/memorial name of the bridge is Three Mile Bridge. It is 154 feet long and is owned by MassDOT. The bridge has been classified as structurally deficient by FHWA. The asphaltic wearing surface curb to curb width of the bridge is approximately 30'-0" with useable travel ways of 11'-0". The approximate out-to-out width is 40'-0". The 11'-0" travel ways carry one westbound and one eastbound vehicular travel lane. A sidewalk exists along the south side of the bridge. The sidewalk was originally constructed having a raised concrete curb separating the travel way and the raised sidewalk but has since been removed leaving an available sidewalk width of 6'-6". The bridge railing consists of four steel pipe rails with steel posts and safety chain-link panels between the rails. The railing elements do not meet current crash standards and the curbing and sidewalk have horizontal cracking and scattered spalls with and without exposed rebars.

The superstructure is a 3-span continuous steel girder bridge with a reinforced concrete deck. There are stone, slope embankments at both the west and east ends of the bridge under the shorter spans, 1 and 3. The concrete abutments are constructed further away from the river having the footings above the bottom of the river. Span 2 is the center, longer span over river with both piers 1 and 2 in the river having the bottom of the footings under water. The pier footings are supported on timber pile deep foundations. The routine inspection report dated September 9, 2020, indicates scour, settlement, and rip-rap at the piers is rated 7 (Good).

Overhead wires are located on the southern side of the bridge, approximately 9-feet away from the southern face. One utility pole labelled "UPL 129-124" is located at the southwestern side of the bridge and a second labelled "UPL 128" is located on the southeastern side of the bridge. The subsurface utilities consist of one 12-inch water main underneath the sidewalk on the southern side of the bridge and one 6-inch water main carried along the northern side of the bridge. As part of this project the Town of Ware indicated the 6-inch water main can be taken out of commission.

The approach guardrails consist of W-beam rails with steel posts and steel spacers with dents and scrapes. The southwest and northeast approach guardrails have buried ends. The northwest and southwest approach guardrails have terminal ends. The bridge rail has areas of minor surface rust and random anchor bolts that are not fully tightened. Several sections of chain-link panels are damaged along both bridge walls. The outside face of the north concrete rail base has scattered full-height vertical hairline cracks with and without leaching efflorescence.



The bridge has been classified as severely deficient, based on the most recent FHWA National Bridge Inspection Standards (NBIS) inspection report (2020). According to the inspection report the rating is as follows:

- 26 ton for H20 (2 axle)
- 27 ton for Type 3 (3 axle)
- 31 ton for Type 3s2 (5 axle)

According to signs, the bridge is currently posted as follows:

- 20 ton for H20 (2 axle)
- 25 ton for type 3 (3 axle)
- 34 ton for Type 3s2 (5 axle)

Based on the latest bridge inspection report (2020) the deck is rated 3-Serious; the superstructure is rated 6-Satisfactory and substructure is rated 6-Satisfactory. The concrete deck has multiple areas of severe concrete spalling with main reinforcing steel exposed and actively corroding. The substructure including the wingwalls, abutments, and piers are in satisfactory condition with minor deterioration and appear to not be reinforced. The backwalls have some spalls and efflorescence staining with vertical hairline cracks. The wingwalls also have a few scattered hairline cracks with leaching efflorescence and some scaled areas. The piers have hairline map cracking with leaching efflorescence around spalled areas.

The bridge does not meet current Load and Resistance Factor Design (LRFD) Standards while the associated roadway alignment over the Ware River does not meet current MassDOT standards. Additionally, safety concerns have been raised over the sight distance of Old Belchertown Road intersection that is located northeast of the bridge. Due to multiple standards not being met, for both the federal and state, associated with the bridge and roadway it was concluded the bridge and associated roadway are in need of replacement.

Route 32 (Palmer Road) carries two-way vehicular traffic and is classified as an urban principal arterial. The present day average daily traffic (ADT) is approximately 10,300 vehicles per day. The roadway runs east and west crossing over the Ware River which flows south to north. In addition, this route is identified as an emergency evacuation route and is therefore considered critical or essential.

Existing Land Use and Land Cover

Land use in the project area includes forested land directly abutting the Ware River. Residential land uses occur along Route 32 to the east and west of the bridge. Additionally, there is approximately 29,364 sf of existing impervious area and approximately 24,219 sf of pervious area (grass and forested land).

Existing Drainage

The bridge carries scuppers along the southern edge and one on the southwest corner of the bridge. The stormwater from the bridge deck flows into the scuppers and enters the Ware River untreated. The stormwater from the southwest bridge approach is collected by a catch basin on the southside of the roadway approximately 150 feet from the bridge deck. This stormwater enters an existing drainage system that

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discharges to the Ware River north of the bridge. The northeast approach roadway drainage is collected by a catch basin at the northeast quadrant of Old Belchertown and Route 32 (Palmer Road) and discharges untreated stormwater to the Ware River at a concrete headwall on the bridge slope. There are no existing stormwater control measures (SCM) within the project area.

Environmental Constraints

Impaired Waterbody Status

The Ware River is federally regulated as "Waters of the United States" and its corresponding segment ID, obtained from MassGIS, is MA36-06. The water body is impaired due to fecal coliform pathogens. Currently, no written Total Maximum Daily Loads (TMDLs) have been recorded by EPA for the water body.

Flood Zone Classification

According to the most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) on Community-Panel Number 2501720021B, effective date 8/17/1981, the project area is within the 100-year floodplain, Zone AE.

Area of Critical Environmental Concern (ACEC)

The project area is not located within an Area of Critical Environmental Concern.

Outstanding Resource Water (ORW)

The project area is not located within an Outstanding Resource Water.

Cold Water Fishery

The Ware River is not classified as a Cold Water Fishery.

Rare Species

The project area is located within the Estimated Habitat of Rare Wetlands Wildlife and Priority Habitat (PH 1183/EH885) associated with the Ware River as determined by reference to the most recently available data from the Massachusetts Division of Fisheries and Wildlife (MADFW) – Natural Heritage and Endangered Species Program (NHESP) as provided by MassGIS. The Ware River provides habitat for mussels including the Brook Floater (*Alasmodonta varicosa* – state-listed Endangered), the Creeper (*Strophitus undulata* – state-listed Special Concern), and the Triangle Floater (*Alasmodonta undulata* – no state status). MassDOT Environmental Services is coordinating with the Massachusetts Department of Fish and Wildlife -Natural Heritage and Endangered Species Program (NHESP) regarding MESA compliance for the rare mussels located on site. A survey and relocation plan was undertaken in the fall of 2021. MassDOT will file a Project Review Checklist with NHESP concurrently with the submittal of this Water Quality Certificate application for determination of whether this

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work is considered a take, and, if necessary, what steps and actions will be required for mitigation or restoration. Proposed mitigation measures include an additional mussel survey and relocation prior to construction, and restoration of the riverbed following construction and installation of scour protection.

MassDOT Environmental submitted the Section 7 consultation for the Northern Long-eared Bat to the US Fish and Wildlife Service (USFWS) on behalf of the Army Corps on April 1, 2021. 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 15 miles southeast of the project site in Sturbridge, MA. Based on this information the proposed project is not located within habitat that would support the NLEB; therefore, it can be assumed that this project will not result in any impacts to the NLEB. See attached iPaC Resources Determination in Section 6 USFW Coordination.

Wetland Resources

A field inspection was conducted on September 21, 2017, by Rimmer Environmental Consulting to determine the location and extent of wetland resources within the project area. (See Appendix E - Wetlands Report) Wetland resources within the project area consist of, vegetated wetland, Land Under Water bodies (the areas below Ordinary High Water), and the site is located within the Priority Habitat and Estimated Habitat of Rare Wildlife. The boundary of OHW was determined based upon water marks on the bridge abutments, evidence of scouring and undercut banks, point bars and changes in vegetation from primarily aquatic to primarily terrestrial. The banks are steep and rocky and contain small trees and brush above the active bank. Wetland flags for the OHW on the northside and southside of the bridge were also located.

There are two very small areas of wetland vegetation adjacent to the existing west pier. In the northwest quadrant is a triangle shaped area below the OHW containing herbaceous vegetation, including reed canary grass (*Phalaris arundinacea*), pink smartweed (*Polygonum pensylvanicum*), purple loosestrife (*Lythrum salicaria*), wild mint (*Mentha sp.*) and manna grass (*Glyceria canadensis*). On the south quadrant below the OHW is a small area also of freshwater marsh including some aquatic vegetation, including water plantain (*Alisma trivale*). The adjacent upland area includes honeysuckle (*Lonicera tatarica*) and some thinly vegetated portions of rock rip-rap adjacent to the bridge abutment.

Wetland scientists from Epsilon Associates reestablished OHW and vegetated wetland flags within the project area on October 11, 2021. Epsilon confirmed that the wetland delineation was accurate and had not changed since the previous delineation completed in 2017. (See photo in Section 4)

This resource includes the lateral extent of flooding which occurs from overtopping of streams during storm events up to and including the 100-year storm, or storm of record. The flood plain elevation currently is 386' National Geodetic Vertical Datum of 1929 (NGVD29) approximately 160' north of Palmer Road and 387' NGVD29 approximately 100' south of Palmer Road. The design flood elevation for the two-span continuous steel girder with conventional cast in place is approximately 384.4' NAVD88.



Proposed Project

The new bridge will consist of a two-span continuous steel girder with conventional cast in place composite concrete slab deck superstructure, with integral abutments and a center wall pier. The proposed bridge will have a 167-foot chord length. Both abutments and pier will be supported on steel H-pile foundation. On the new bridge, the lane, shoulder, and sidewalk widths will be slightly adjusted as required for the NHS roadways which includes a 48'-9" wide structure to accommodate a total roadway width of 34'-0" curb to curb. The S3-TL4 bridge railing will be provided on both sides of the bridge. The two existing piers are to be removed to three feet below the riverbed. The removal and installation of the bridge piers will be completed once the contractor-designed cofferdam sheeting is installed for control of water. The use of a backhoe, dragline or similar equipment is expected to be used. A barge is expected to aid in providing access to the bridge for excavation and mechanical means. The barge will be supported on spuds in the riverbed, as needed, for stabilization.

Two 11'-0" vehicular lanes with 6'-0" shoulders on each side and 6'-0" wide sidewalks on the north and south sides of the bridge are proposed. Roadway surface conditions and drainage and utility lines will also be improved as part of the project. Existing drainage patterns will remain. Drainage structures and associated piping will be added to the two existing drainage systems within the project area. Stormwater within the systems will discharge to a deep sump catch basin prior to discharging into the Ware River. The proposed drainage systems will contain deep sump catch basins to provide stormwater treatment to help minimize the amount of untreated stormwater entering the Ware River. The new bridge will not have scuppers but stormwater will be collected in catch basins located to the east of the bridge. The new bridge will have new clearances over the Ware River due to the roadway superelevation transition at the northeast; the exterior girder will be the controlling location for the vertical clearance change.

The proposed land cover will be 58,154 sf of impervious surface and 21,178 sf of pervious surface resulting in an increase of 28,790 sf or 0.66 acres of impervious surface.

Wetland Impacts

The proposed bridge will require work platforms which include cofferdams and footings resulting in a approximately 9,339 sf of temporary Land Under Water (LUW) impact and approximately 5,204 sf of permanent impact, the permanent bank impacts are approximately 260 linear feet and approximately 30 linear feet of temporary impacts. In addition, the installation of the new pier will require dredging and filling of approximately 1,015 cubic yards (cy). All of the above temporary and permanent impacts are due to the working platform surface, and installation of the new concrete pier.

This project will incorporate sedimentation controls and stormwater measures to minimize runoff into the river. Temporary cofferdam sheeting is proposed to minimize siltation and turbidity when the existing pier sections are being removed and the new pier and rip-rap are being installed along with dewatering. The project will require scour protection/ fill material in the Ware River or associated wetland areas to aid in preventing future

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erosion. The contractor will design temporary river access ramps for use during construction. Sedimentation controls will border the ramps and the areas will be restored to their pre-existing conditions once construction has been completed.

Sedimentation controls will consist of compost filter tubes or equivalent for earth slope areas and silt sack or similar catch basin inlet filter bags. Controls will be removed following the completion of work. The Contractor will be required to inspect the river bottom and remove any demolition debris or other construction related materials.

Proposed Stormwater Management

Stormwater flows will generally match existing drainage patterns. However, the existing bridge contains scuppers and the new bridge will not, therefore the untreated stormwater discharging directly to the Ware River will now be conveyed to deep sump catch basins prior to discharging into the Ware River. The additional impervious area associated with the widening of the vehicular bridge will be captured by a proposed catch basin.

During construction, the existing catch basins and bridge scuppers will be protected from silt and debris through the use of a silt sack or similar catch basin inlet filter bag.

Due to site constraints, there is no available space to install a best management practice for treatment of fecal coliform. The project will replace existing catch basins with deep sump catch basins and add additional deep sump catch basins throughout the project. A total of seven deep sump catch basins will be installed. The right of way is limited within the project area with steep slopes outside the roadway or abutting land uses (residential) which limits the feasibility of using the area adjacent to the roadway as an infiltration swale. The project does not contain MassDOT or municipally owned parking lots, rest areas, or other similar areas. There is a small area available where Old Belchertown Road will be realigned. However, the proximity to a private property along Ware River limits the use of this area.

Massachusetts Department of Environmental Protection (MassDEP) – Stormwater Management Standards

As demonstrated below, the proposed Project complies with the MassDEP Stormwater Management Standards (the Standards). Under the Stormwater Management Standards, the Project is considered a redevelopment project because it involves maintenance and improvement of an existing bridge and re-alignment of an existing roadway to correct a substandard intersection. 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. No new stormwater outfalls are proposed for the Project. Existing headwall outfalls have remained untouched, one of which will be abandoned in place. Existing bridge scupper outfalls have been eliminated and stormwater from the bridge will flow to the east or west based on grading of the bridge and roadway to a closed drainage system with deep sump catch basins that will provide stormwater quality treatment where none currently exist. The treatment provided by the deep sump catch basins is an improvement to the existing water quality runoff from the Project Area. In addition, existing outfalls will be retrofitted with improved scour protection through the use of rip-rap at the outfalls.

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. This project is a bridge replacement project and an intersection safety improvement project.

The project increases post-development peak runoff rates for the 2-year, 10-year, and 100-year 24-hour design storm events based on NOAA Atlas 14 precipitation data for Ware, Massachusetts as shown in Table 1.

Table 1 Rainfall Depths (in) & Rainfall Intensities (in/hr)

Design Storm Event	Rainfall Depth (in)	Rainfall Intensity (in/hr)
2-year	3.04	3.38
10-year	4.83	4.83
100-year	7.70	7.15

Three existing headwalls all outlet to the Ware River within 100' of each other. Since the receiving waterbody is the Ware River, it has been selected as the design point for the Project. Table 2 provides a summary of peak rates for the design point under existing and proposed conditions. The project will increase impervious cover by 0.66 acres from 0.67 acres to 1.33 acres. Using the rational method with a C value of 0.90 for impervious area, the peak discharge rates are as follows:

**Table 2 Peak Discharge Rates (cfs)**

Design Point	Existing			Proposed		
	2-year	10-year	100-year	2-year	10-year	100-year
DP-EX-Ware River	2.05	2.93	4.34	4.06	5.80	8.59

The project proposes roadway widening of approximately 5 feet for less than half of a mile. Due to space constraints within the limited Right of Way, the proximity to the Ware River, and the topography within the project area, the stormwater management design does not include a stormwater control measure to reduce peak runoff rates. Based on the Flood Insurance Study for Town of Ware, Massachusetts, the peak discharges for the Ware River at the Gibbs Crossing gaging station is 4,310 cubic feet per second (cfs) for the 10-year storm and 12,720 cfs for the 100-year storm. The project increases the peak flow in the Ware River by 0.067% in the 10-year storm and 0.033% in the 100-year storm. This minor increase in peak flow to the Ware River is likely to not cause downstream flooding.

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. This project is a bridge replacement project and intersection redevelopment project proposed to improve safety at the intersection of Palmer Road (Route 32) at Old Belchertown Road. The roadway project area provides very limited space for stormwater recharge measures for the increase of 0.66 acres of impervious area. Leaching catch basins were not a viable option because introducing water underneath the roadway has the potential to compromise its structural integrity. Table 3 provides the required recharge volume for the Project.

**Table 3 Required Recharge Volume for Project**

	HSG A	HSG B	HSG C	HSG D	Total
Existing Impervious (sq. ft.)		29,364			
Proposed Impervious (sq. ft.)		58,154			
Net Impervious Area (sq. ft.)		28,790			
Target depth, F (in)	0.60	0.35	0.25	0.10	-
Required Recharge Volume, ReV (cf)		840			840

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 project is required to provide 80% TSS removal and the water quality volume is calculated using the one half-inch rule. The Project discharges to the Ware River, which is a Category 5 impaired waterbody without a TMDL. MassDOT focuses on implementing mitigation measures for discharges within a Category 5 watershed.

However, because of the lack of space and the urbanized character within the project limit, further treatment for water quality cannot be achieved. The project proposes to replace existing catch basins with new catch basins that will include deep sumps and hoods. In addition, the project proposes to remove the existing bridge scuppers that discharged untreated stormwater directly into the Ware River. The proposed design directs the stormwater from the bridge to the catch basins with deep sumps and hoods providing water quality where currently none exist. The catch basins with deep sumps and hoods provide 25% TSS removal. Table 4 shows the treatment potential for the Design Point as part of the bridge replacement.

**Table 4 Required Water Quality Volume (WQV) at Design Point for Standard 4**

Design Point	WQV for New IA (cf)	WQV for Existing IA (cf)	Total WQV (cf)
DP- EX-Ware River	2,423	1,225	
Total	2,423	1,225	1,200

For MassDOT facilities, Long-Term Pollution Prevention Plans (LTPPPs) are implemented at a programmatic level through MassDOT's highway operation and maintenance program by district.

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 is the redevelopment of an existing bridge and roadways/intersection. The Project meets Standard 1 (for existing discharges, no new discharges proposed), and Standards 2, 3, 4, 5, and 6 to the maximum extent practicable. The project improves existing conditions by providing water quality treatment with the use of deep sump catch basins within the site constrained roadway where none currently exists. Additionally, bridge scuppers have been removed from the bridge design preventing untreated stormwater discharge from entering the Ware River directly. Stormwater, instead, will be directed via sheet flow to the east and west sides of the bridge where it will enter deep sump catch basins prior to discharging to the Ware River.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

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 a sediment barrier consisting of silt fence and compost filter tubes and stormwater inlet protection consisting of silt sacks. Within the river, cofferdams are proposed to control water for installation of riprap and new pier and demolition of existing pier stem. The chosen contractor will be responsible for a Stormwater Pollution Prevention Plan. An Erosion and Sediment Control Plan is included within the Project Plans found in Appendix A.

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.

MassDOT O&M plans are implemented on a programmatic level by each MassDOT district. Each MassDOT district office is responsible for providing operation and maintenance for the MassDOT stormwater management systems within their respective jurisdictions.

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The O&M Plan for the Project is as follows:

All new and existing components of the drainage system within the project area are the responsibility of MassDOT. MassDOT shall track inspections and corresponding maintenance needs and activities through its asset management system. For the most up-to-date inspection and maintenance procedures refer to MassDOT's O&M Programmatic Plan, included in Appendix G. The following summarizes the actions that shall be taken:

1. Catch basins shall be inspected at an interval that maintains the functionality of the catch basin (sumps shall always be less than 50% full). Catch basin inspections and catch basin cleanings will generally occur simultaneously. MassDOT shall record sediment depth and status of condition for catch basins. Inspections shall include observations of erosion, settling, root intrusion, depth of sediment/debris, sources of excess sediment and trash, causes of unwanted flow patterns and corrective measures to prevent further issues. Maintenance shall include removal and proper disposal of trash, sediment, debris, and root intrusions.
2. Street sweeping shall be performed as part of the regular maintenance schedule for MassDOT. Accumulated materials (e.g. sediment, trash, leaf litter, debris) shall be removed and properly disposed of. At a minimum, street sweeping shall occur annually.

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. Appendix G includes the Long Term Pollution Protection Plan (LTPPP) for this project.



Attachments:

- Appendix A – Stormwater Checklist
- Appendix B – Proposed Project Plans
- Appendix C – TSS Removal Worksheet & Water Quality Volume Calculations
- Appendix D – Existing & Proposed Watershed Figures
- Appendix E - Hydrologic Soil Group Map & Groundwater Recharge Calculations
- Appendix F – Wetlands Report
- Appendix G – Operation & Maintenance Plan & Long-Term Pollution Prevention
- Appendix H – Site Photographs

APPENDIX A

STORMWATER CHECKLIST

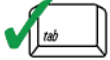


Massachusetts Department of Environmental Protection
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Checklist for Stormwater Report

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.



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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.

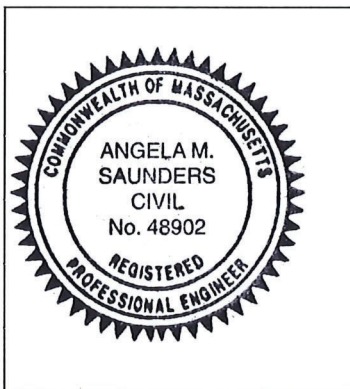
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the 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



Angela Saunders 7/19/2022
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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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.



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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.

APPENDIX B

PROPOSED PROJECT PLANS

WARE PALMER ROAD (ROUTE 32) OVER WARE RIVER			
DATE	REV	DESCRIPTION	DATE
05/05/2022	1	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	2	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	3	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	4	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	5	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	6	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	7	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	8	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	9	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	10	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	11	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	12	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	13	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	14	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	15	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	16	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	17	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	18	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	19	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	20	ISSUED FOR PERMITTING	05/05/2022
05/05/2022	21	ISSUED FOR PERMITTING	05/05/2022

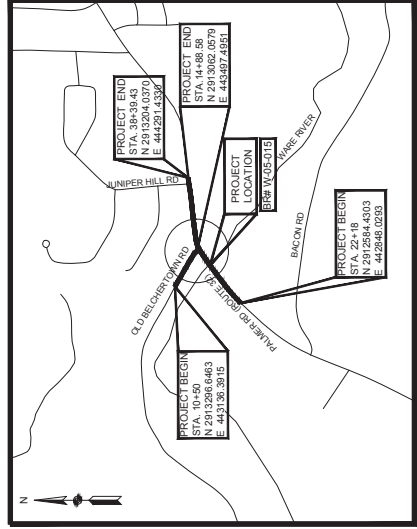
TITLE SHEET

PERMITTING PLANS FOR
ROUTE 32 (PALMER ROAD) OVER WARE RIVER
(BRIDGE NO. W-05-015)
IN THE TOWN OF
WARE
HAMPSHIRE COUNTY
FEDERAL AID PROJECT NO.

ENVIRONMENTAL PERMITTING PLANS

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND INDEX
2	KEY PLAN, PROFILE, AND LOGIC MAP
3	GENERAL NOTES AND ESTIMATED QUANTITIES
4-8	CONSTRUCTION PLANS
9	PROFILE - PALMER ROAD (ROUTE 32)
10	RIPRAP PLAN AND ELEVATION
11	CHANNEL APPROACH SECTIONS
12	PAVEMENT CONSTRUCTION SECTIONS
13-20	STAGE CONSTRUCTION PLANS
21	ENVIRONMENTAL IMPACT PLAN



LENGTH OF PROJECT = 2,000 FEET = 0.38 MILES
SCALE: 1" = 1250'



DATE	DESCRIPTION	REV
05/05/2022	ISSUED FOR PERMITTING	1
05/05/2022	ISSUED FOR PERMITTING	2
05/05/2022	ISSUED FOR PERMITTING	3
05/05/2022	ISSUED FOR PERMITTING	4
05/05/2022	ISSUED FOR PERMITTING	5
05/05/2022	ISSUED FOR PERMITTING	6
05/05/2022	ISSUED FOR PERMITTING	7
05/05/2022	ISSUED FOR PERMITTING	8
05/05/2022	ISSUED FOR PERMITTING	9
05/05/2022	ISSUED FOR PERMITTING	10
05/05/2022	ISSUED FOR PERMITTING	11
05/05/2022	ISSUED FOR PERMITTING	12
05/05/2022	ISSUED FOR PERMITTING	13
05/05/2022	ISSUED FOR PERMITTING	14
05/05/2022	ISSUED FOR PERMITTING	15
05/05/2022	ISSUED FOR PERMITTING	16
05/05/2022	ISSUED FOR PERMITTING	17
05/05/2022	ISSUED FOR PERMITTING	18
05/05/2022	ISSUED FOR PERMITTING	19
05/05/2022	ISSUED FOR PERMITTING	20
05/05/2022	ISSUED FOR PERMITTING	21

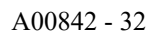
RECOMMENDED FOR APPROVAL

CHIEF ENGINEER _____ DATE _____

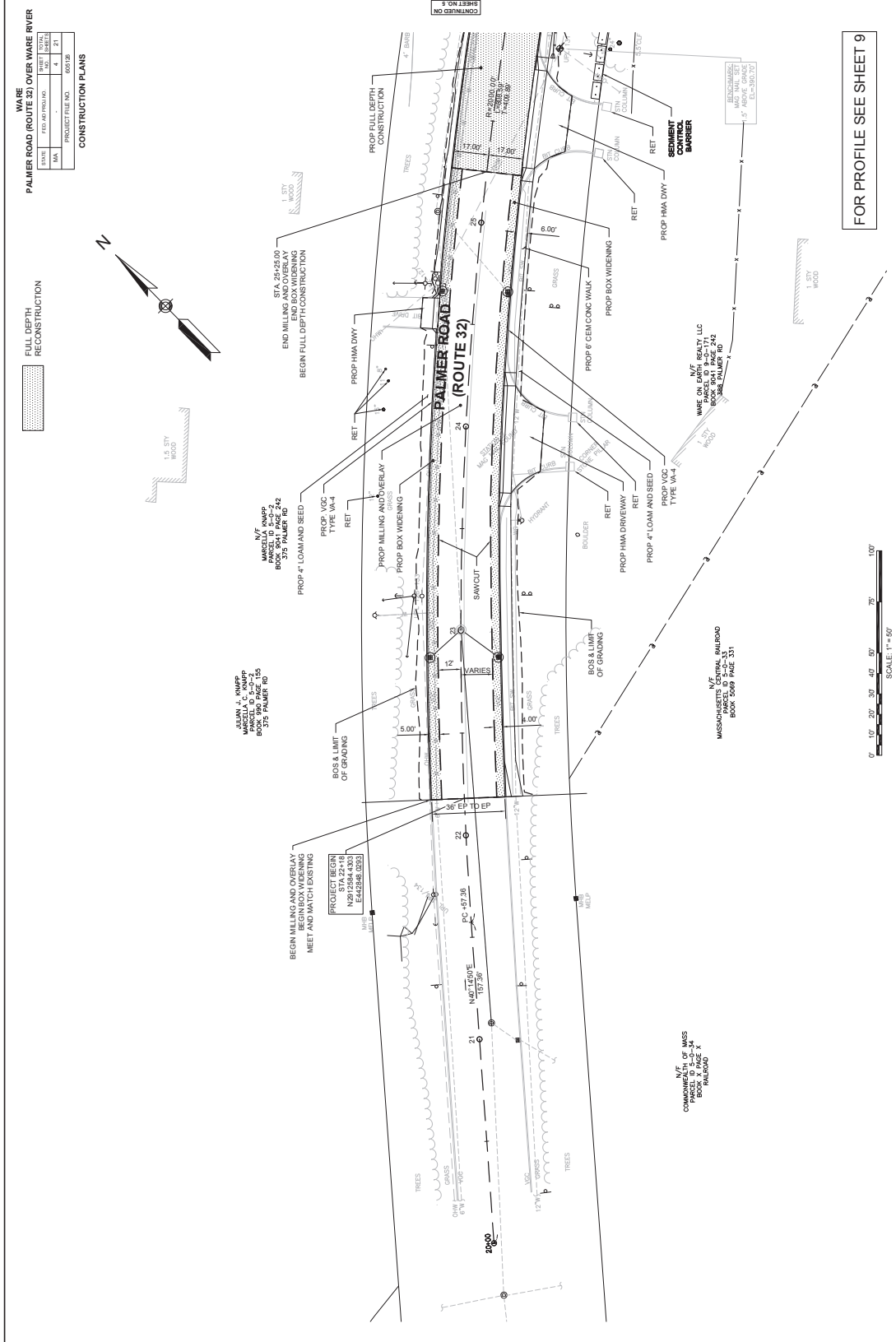
APPROVED _____

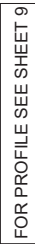
HIGHWAY ADMINISTRATOR _____ DATE _____

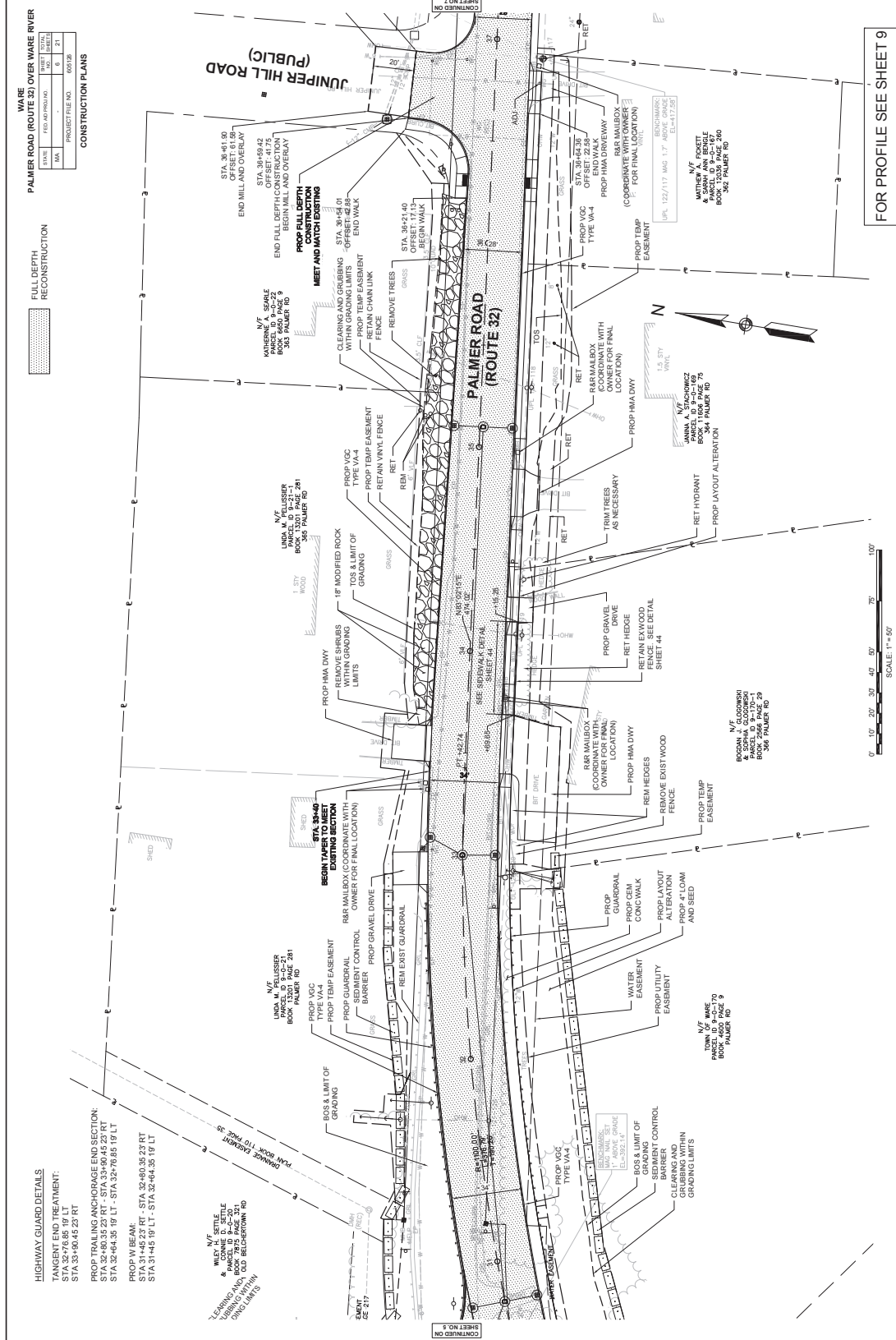
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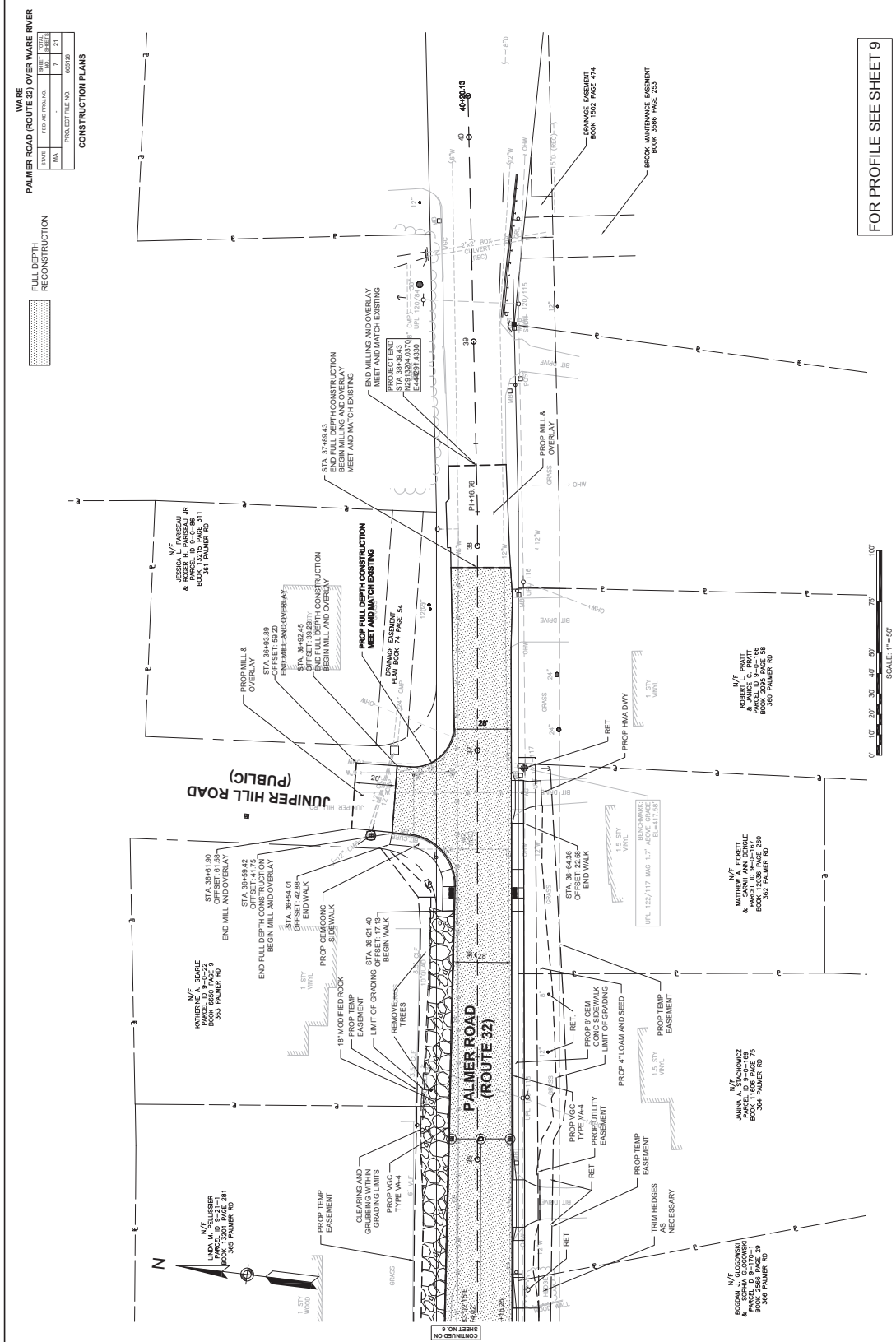


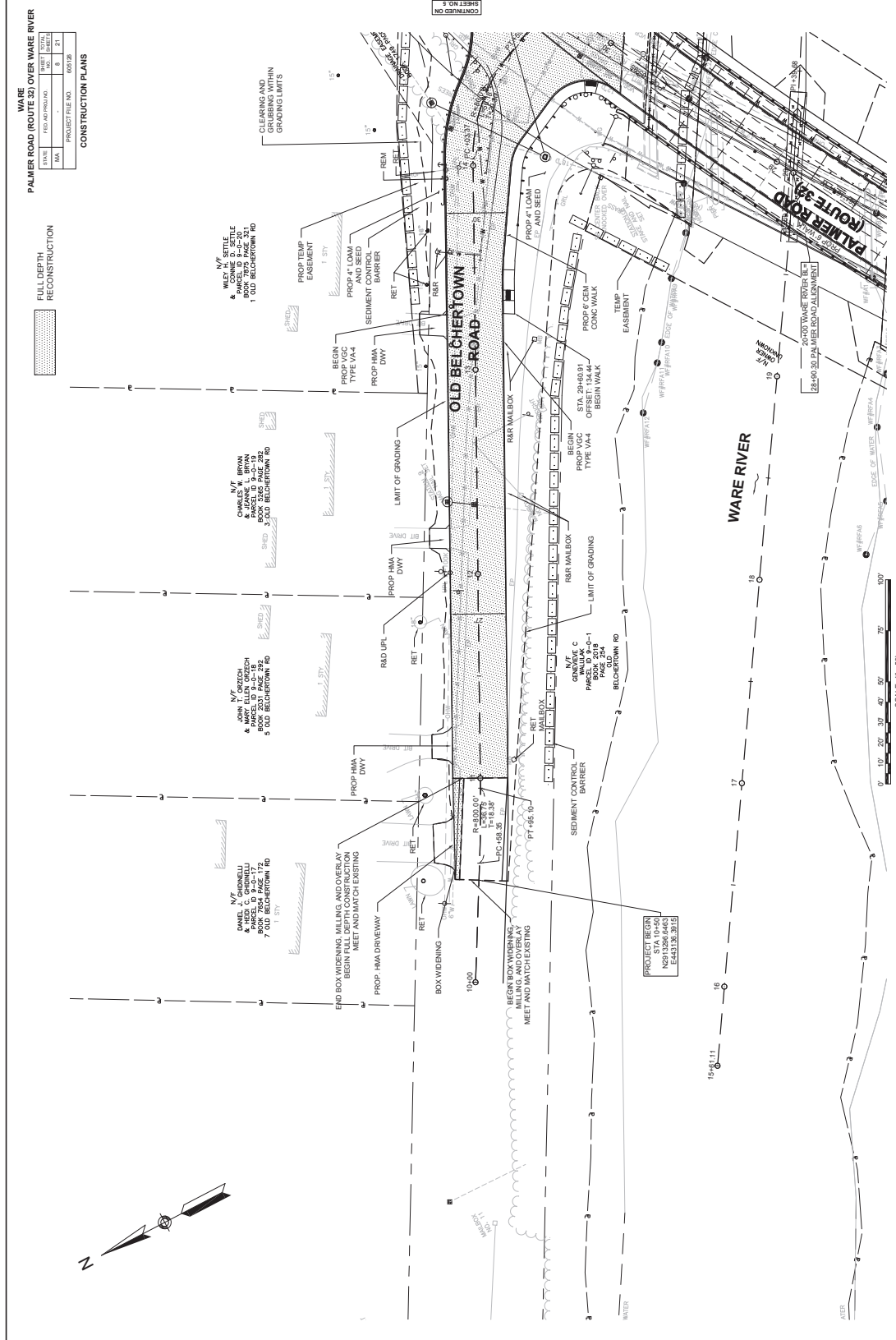
BRIDGE NO. W-05-015 (C89)

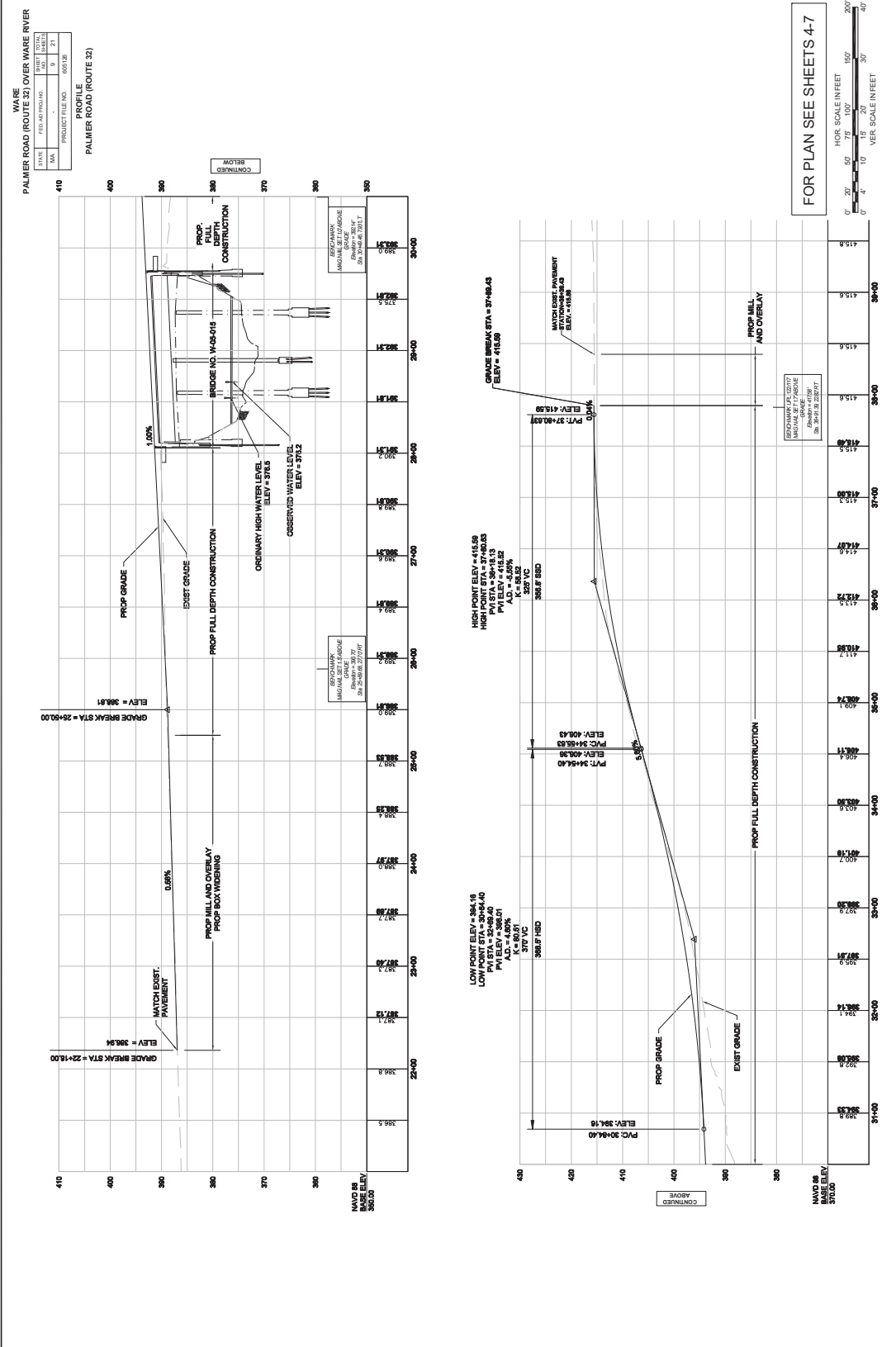


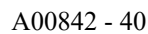


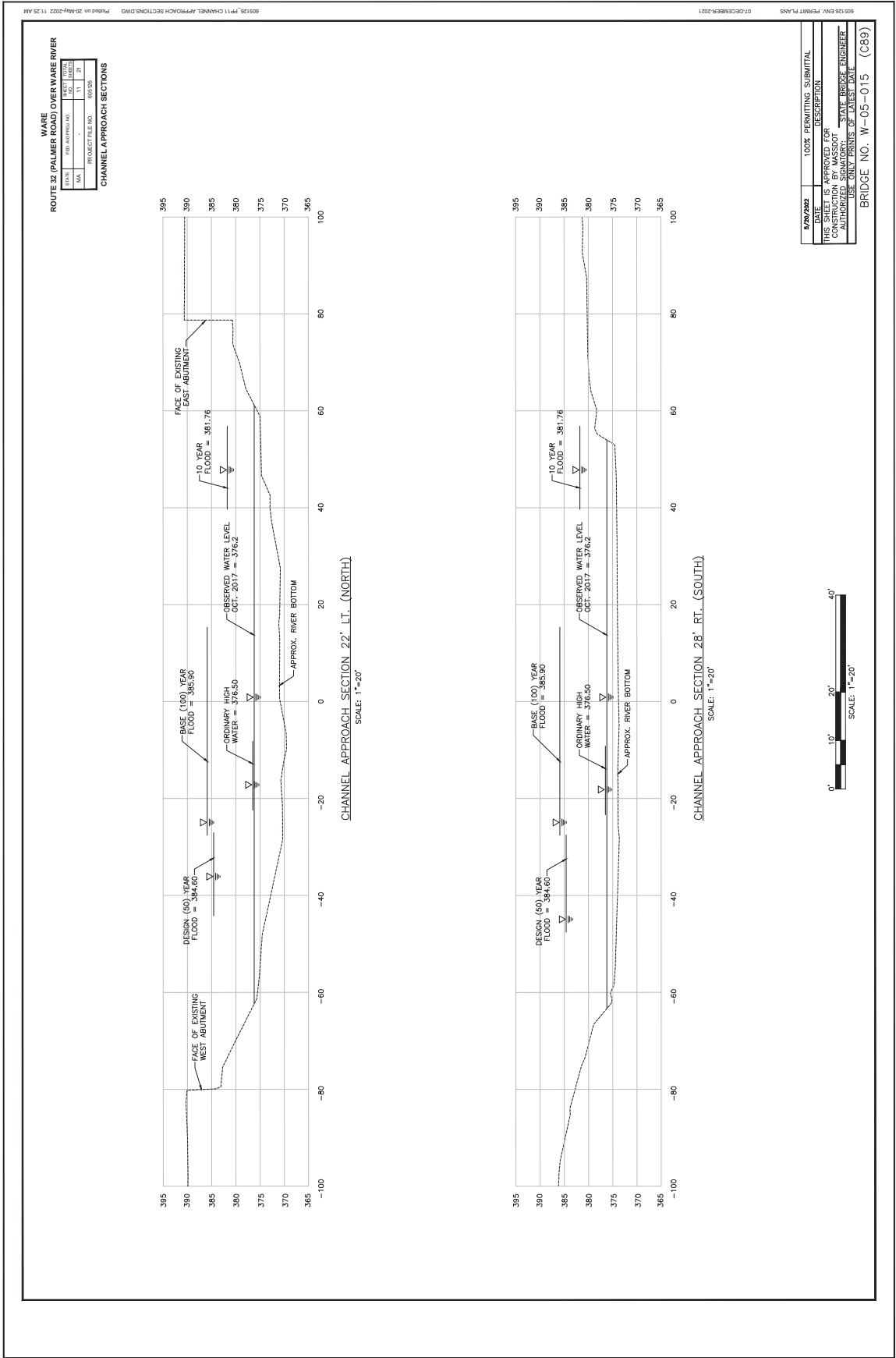


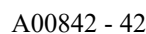


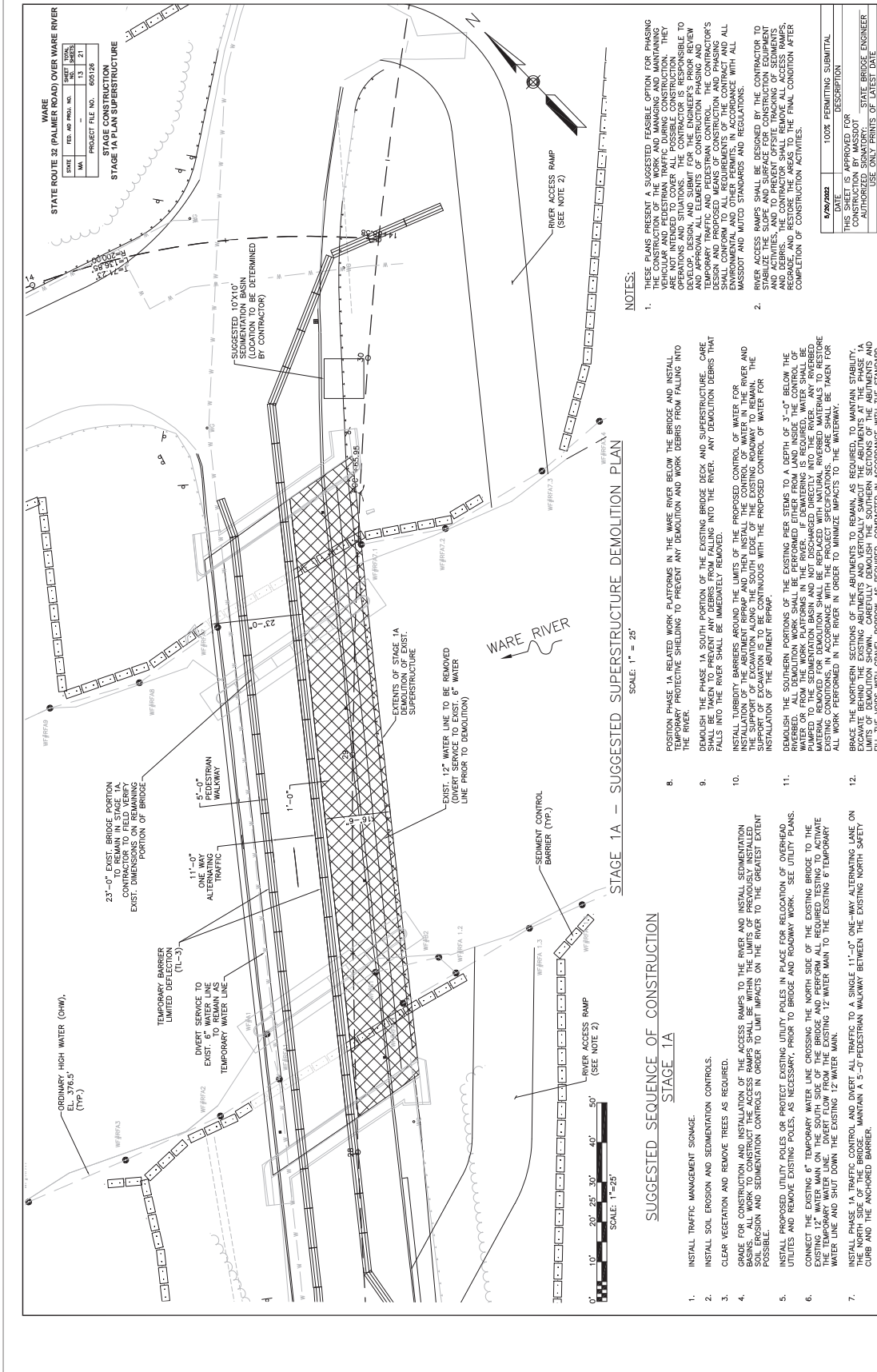


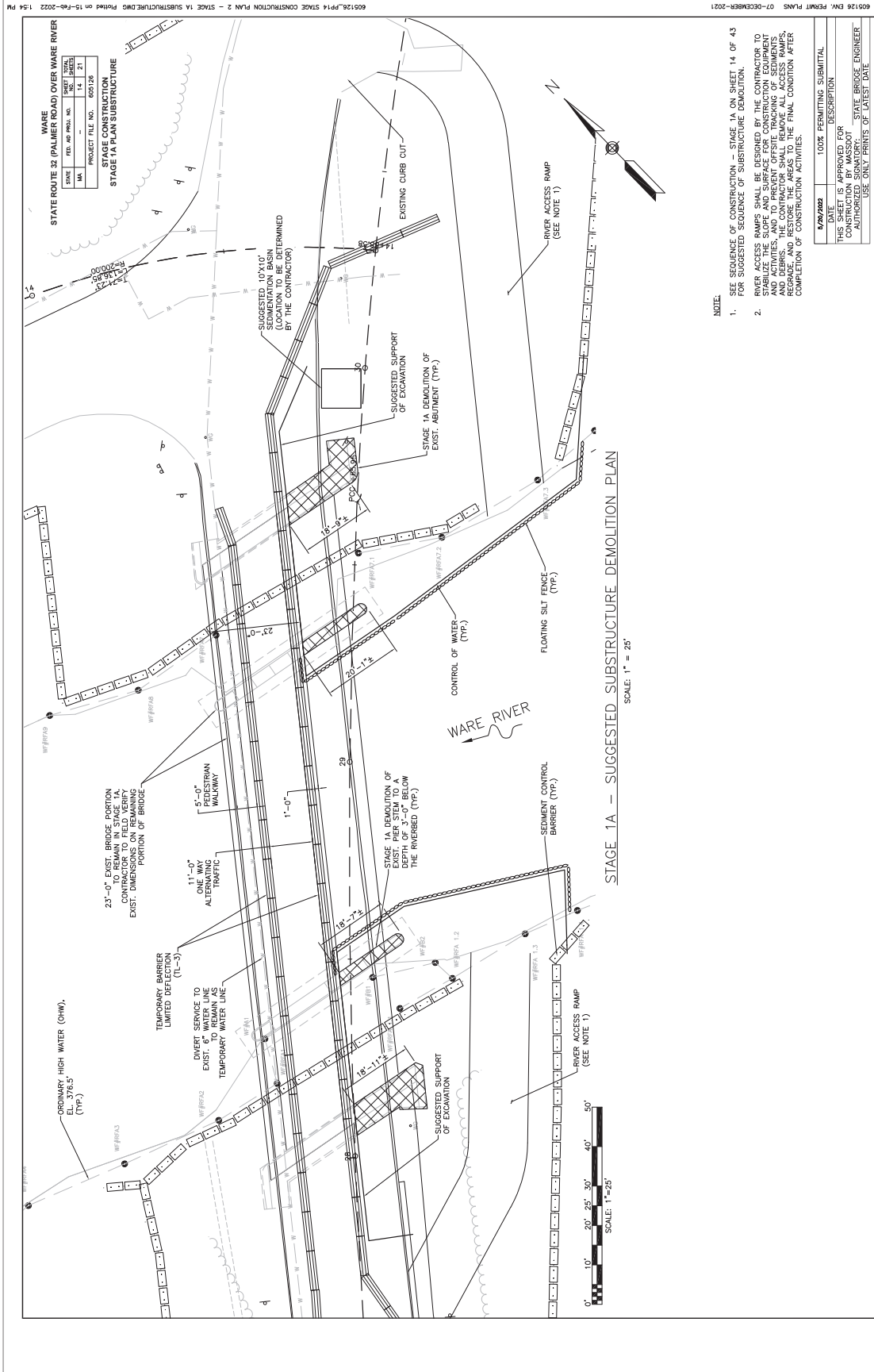


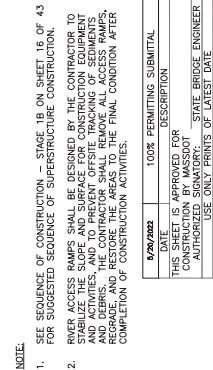


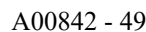




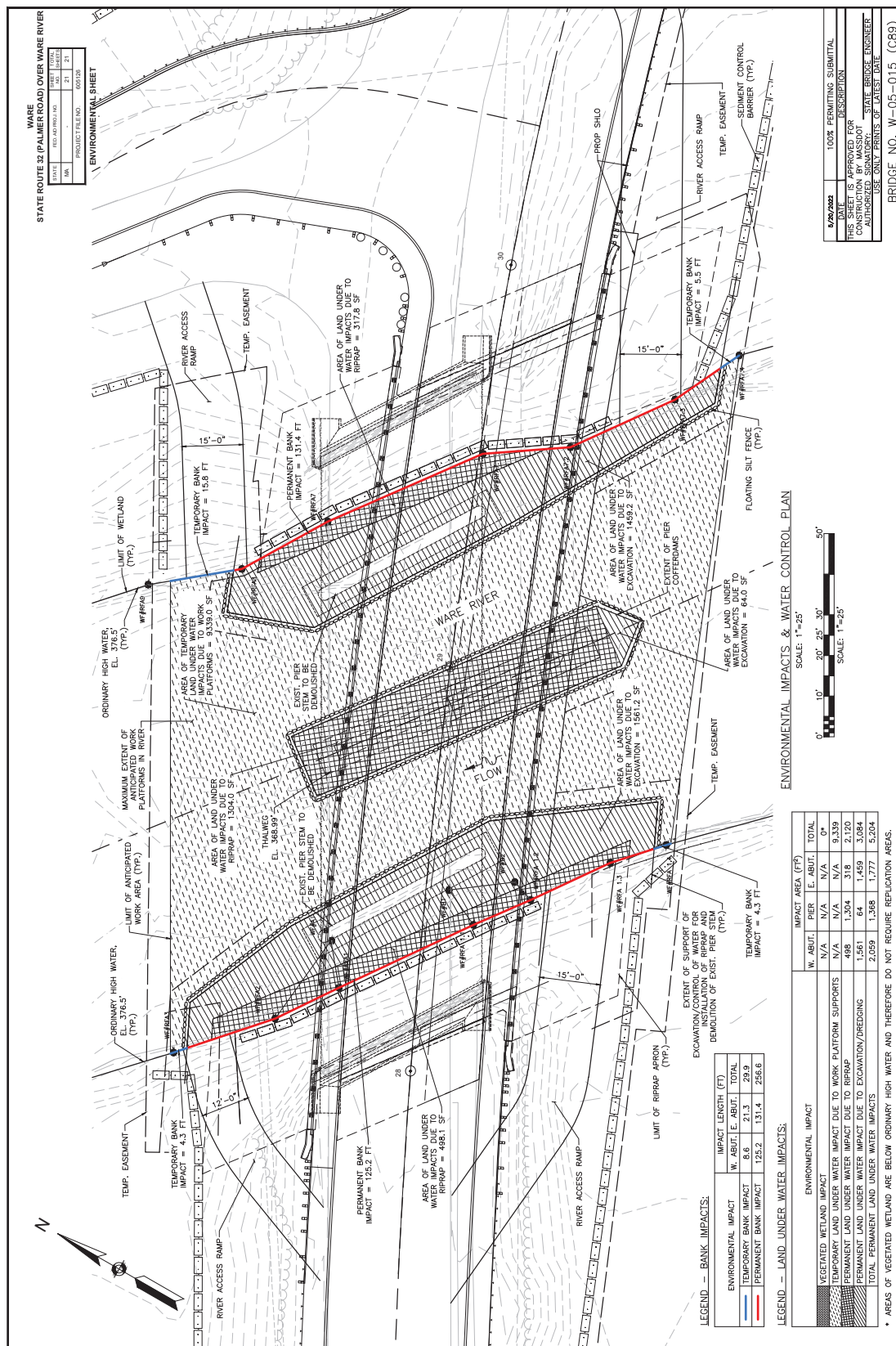












APPENDIX C

TSS REMOVAL WORKSHEET & WATER QUALITY VOLUME CALCULATIONS

V

INSTRUCTIONS:

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Palmer Road (Route 32) over Ware River, Ware, MA

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	0.25	1.00	0.25	0.75
	0.00	0.75	0.00	0.75
	0.00	0.75	0.00	0.75
	0.00	0.75	0.00	0.75
	0.00	0.75	0.00	0.75

Total TSS Removal =

Separate Form Needs to be Completed for Each Outlet or BMP Train

PLAMER ROAD (ROUTE 32) OVER
WARE RIVER BRIDGE REPLACEMENT
Prepared By: ALT
Date: 7/12/2022

Project:

Prepared By:

Date:

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

Mass. Dept. of Environmental Protection



MA STORMWATER HANDBOOK
REQUIRED WATER QUALITY VOLUME

STORMWATER TREATMENT REQUIREMENTS

Stormwater Treatment Impervious Area Tabulation

	<u>SF</u>	<u>ACRES</u>
Total Pre Development Impervious Area (I_X):	29,364	0.674
Total Post Development Impervious Area (I_P):	58,154	1.335
Impervious Area to be Treated (I_{RV})*:	28,790	0.661

* For Redevelopment ($I_{RV} = I_P - I_X$)

Standard 4: Water Quality (WQv)

Water Quality Factor " D_{WQ} "

$D_{WQ} = 0.5$ (inch)

Pre-Development Water Quality Volume = $V_{WQ} = (D_{WQ})(I_{TR})/12 = 0.028$ AC-FT = 1,224 CF

Post-Development Water Quality Volume = $V_{WQ} = (D_{WQ})(I_{TR})/12 = 0.056$ AC-FT = 2,423 CF

Total Required Water Quality Volume " V_{WQ} "

$F = 0.5$ (unitless)

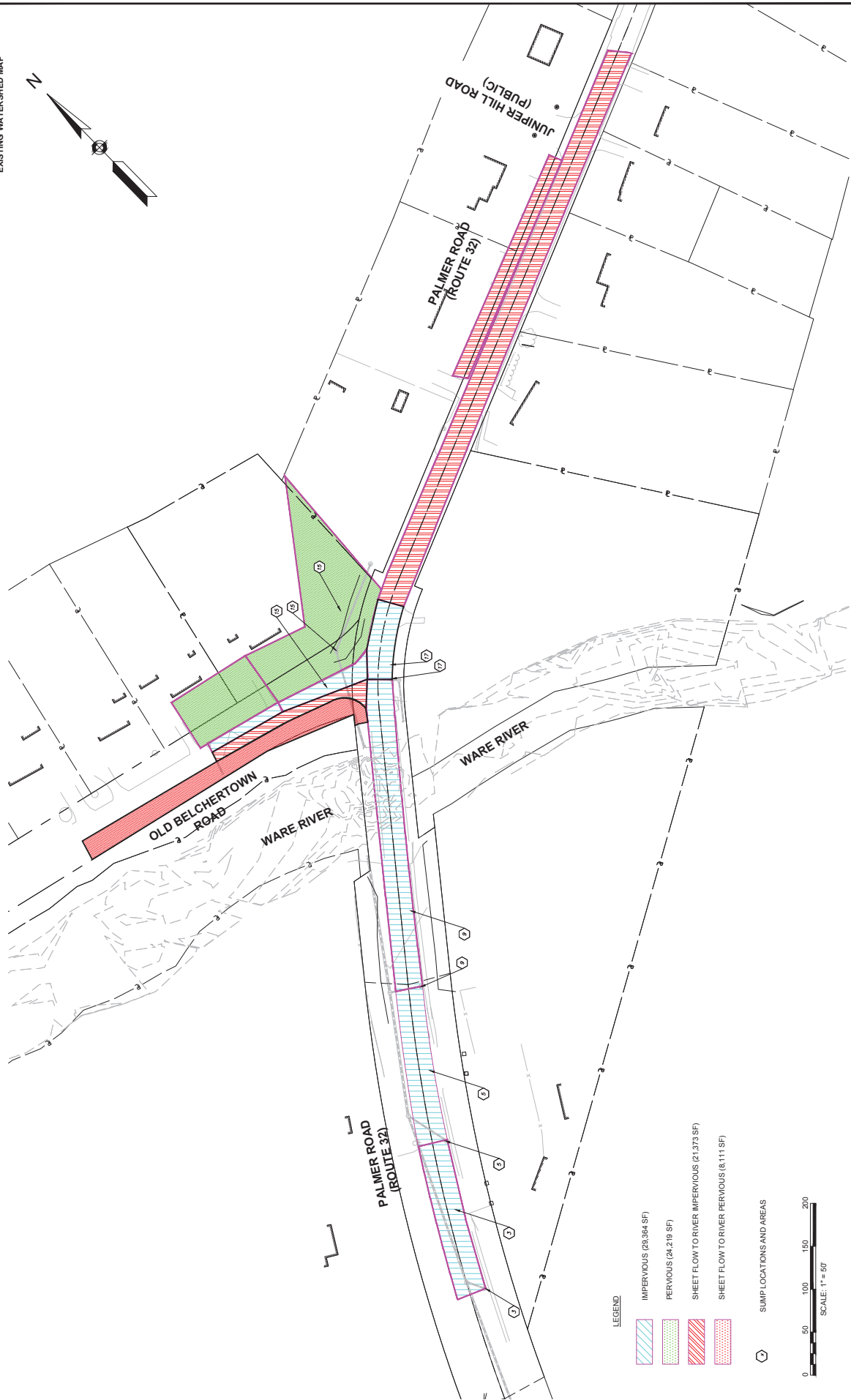
$I_{TR} = 0.661$ AC

Water Quality Volume = $V_{WQ} = (D_{WQ})(I_{TR})/12 = 0.028$ AC-FT = 1,200 CF

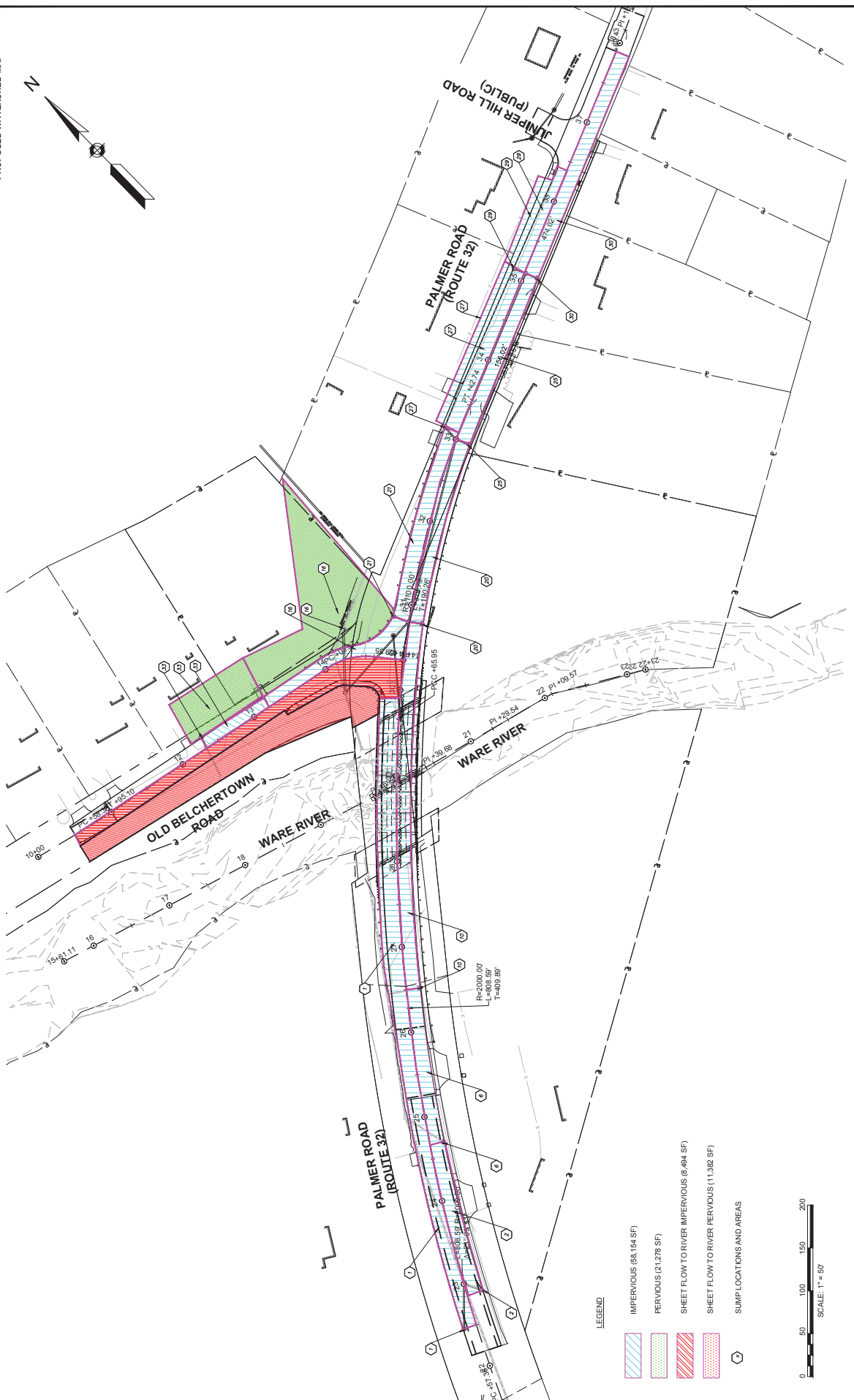
APPENDIX D

EXISTING & PROPOSED WATERSHED FIGURES

WARE PALMER ROAD (ROUTE 32)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	1
PROJECT FILE NO.		605126	
EXISTING WATERSHED MAP			



WARE PALMER ROAD (ROUTE 32)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	1
PROJECT FILE NO.		605126	
PROPOSED WATERSHED MAP			



WARE BRIDGE STORM FLOW CALCULATIONS									
						Storm Year			
			SA (SF)	IMPERVIOUS ACRES	C	2 YEAR TC= 10 MIN	10 YEAR TC= 10 MIN	100 YEAR TC= 10 MIN	
					0.90	3.38	4.83	7.15	
						Q (CFS)	Q (CFS)	Q (CFS)	
EXISTING CONDITIONS			29364.00	0.67		2.05	2.93	4.34	
PROPOSED CONDITIONS			58154.00	1.34		4.06	5.80	8.59	

APPENDIX E

HYDROLOGIC SOIL GROUP MAP & GROUNDWATER RECHARGE CALCULATIONS

Custom Soil Resource Report
Soil Map



Custom Soil Resource Report

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	8.2	6.6%
2A	Pootatuck fine sandy loam, 0 to 3 percent slopes, occasionally flooded	41.3	33.4%
100E	Brookfield-Brimfield-Rock outcrop complex, steep	13.3	10.8%
253B	Hinckley loamy sand, 3 to 8 percent slopes	9.8	7.9%
253C	Hinckley loamy sand, 8 to 15 percent slopes	38.1	30.8%
407D	Charlton fine sandy loam, 15 to 25 percent slopes, extremely stony	5.8	4.7%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	7.0	5.7%
Totals for Area of Interest		123.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a



MA STORMWATER HANDBOOK
REQUIRED RECHARGE VOLUME

STORMWATER TREATMENT REQUIREMENTS

Stormwater Treatment Impervious Area Tabulation

	<i>SF</i>	<i>ACRES</i>
Total Pre Development Impervious Area (I_X):	29,364	0.674
Total Post Development Impervious Area (I_P):	58,154	1.335
Total Impervious Area to be Recharged (I_{RV})*:	28,790	0.661

* For New Development or Redevelopment ($I_{RV} = I_P - I_X$)

Standard 3: Groundwater Recharge

Soils

Predominant Underlying Soil Type:

Hinckley Loam Sand

Hydrologic Soil Group:

b

Target Depth Factor "F"

F = 0.35 inch

Required Recharge Volume "Rv"

F = 0.35 inch

I_{RV} = 0.661 AC

Total Required Recharge Volume = $R_v = (I')(F)(I_{RV})/12 = 0.019 \text{ AC-FT} = 840 \text{ CF}$

APPENDIX F

WETLANDS REPORT



Wetland Resource Evaluation
Route 21 (Palmer Road) over Ware River
Ware, MA
October 17, 2017

Project Location

The project site includes the Route 32 (Palmer Road) Bridge over the Ware River in Ware, Massachusetts, including the area extending 100 feet from the bridge itself. The project location is indicated in Figure 1 below.

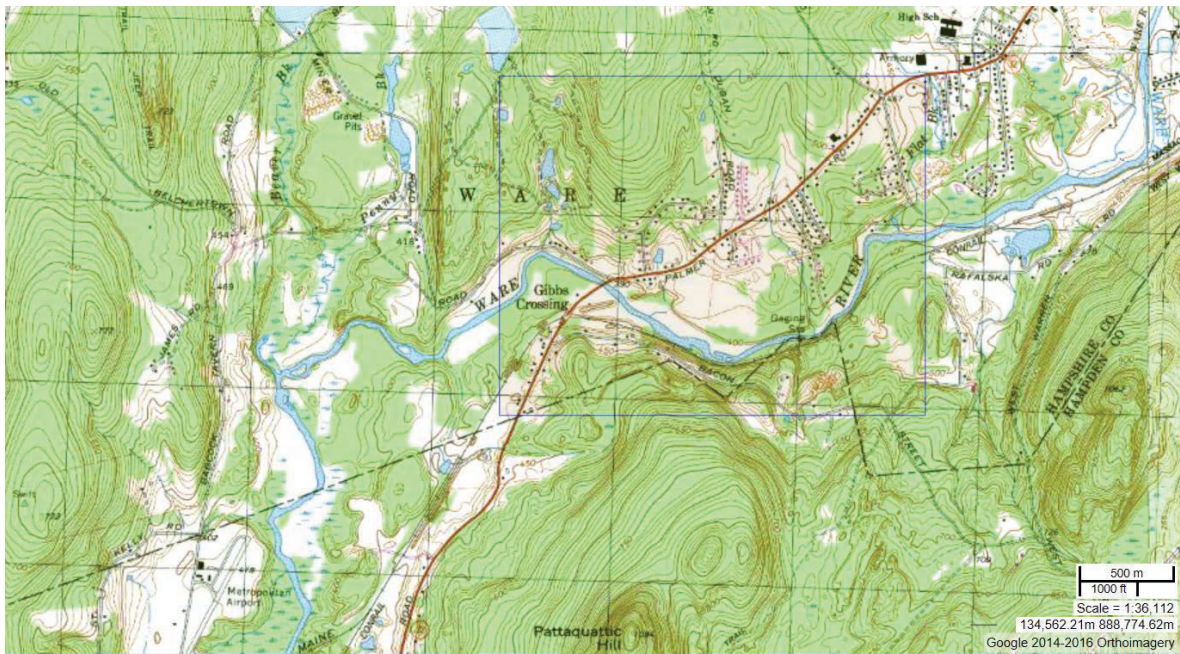


Fig. 1: USGS Topographic Quadrangle - Site Locus

Delineation Methods

Rimmer Environmental Consulting (REC) conducted a field inspection on September 21, 2017 to determine the location and extent of wetland resources subject to jurisdiction under the Mass. Wetlands Protection Act (MGL Ch. 131 s. 40) and Section 404 of the Federal Clean Water Act within the project area. Wetland resources were delineated in accordance with the procedures described in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and the Army Corps of Engineers Wetlands Delineation Manual. Numbered sequences of flags were placed in the field to delineate the boundary between wetland and upland resources. The presence of 50% wetland vegetation as well as

other indicators of wetland hydrology including hydric soils were used to identify wetland resources. The following wetland resources are present:

Riverfront Area:

The Ware River is perennially flowing and is therefore subject to the Riverfront Regulations of the Mass. Wetlands Protection Act contained within 310 CMR 10.58. A 200-foot Riverfront Area extends horizontally landward from the limits of Mean Annual High Water (MAHW). The boundary of MAHW was determined based upon observation of water marks on the bridge abutments, evidence of scouring and undercut banks, point bars and changes in vegetation from primarily aquatic to primarily terrestrial. The banks are steep and rocky and generally contain small trees and brush above the active bank. The area immediately adjacent to and under the bridge abutments contains sloped rock riprap. Wetland flags RFA1-RFA6 and RFA7-RFA12 delineate MAHW on the north side of the bridge and flags RFA 7.1-RFA7.6 and RFAA1.1-A1.6 represent MAHW on the south side of the bridge. Water levels at the time of observation were slightly below estimated MAHW.

Bordering Vegetated Wetland:

There are two very small areas of wetland vegetation adjacent to the bridge footings. In the northwest quadrant, between flags A1 and RFA2 is a triangle shaped area below MAHW containing herbaceous vegetation, including reed canary grass (*Phalaris arundinacea*), pink smartweed (*Polygonum pensylvanicum*), purple loosestrife (*Lythrum salicaria*), wild mint (*Mentha sp.*) and manna grass (*Glyceria canadensis*). The adjacent upland area is the rock riprap embankment under and adjacent to the bridge.

On the southwest quadrant, adjacent to flags FFA 1.1 and RFA 1.2 and also below MAHW is a similarly small area of freshwater marsh, with similar vegetation, but also including some aquatic vegetation, including water plaintain (*Alisma trivale*). The adjacent upland area contains honeysuckle (*Lonicera tatarica*) and some thinly vegetated portions of the rock riprap adjacent to the bridge abutment.

Bordering Land Subject to Flooding:

This resource is regulated under the Mass. Wetlands Protection Act and includes the lateral extent of flooding which occurs from overtopping of streams during storm events up to and including the 100-year storm, or storm of record, whichever is greater. The limits of BLSF are determined based on reference to FEMA flood maps of the area. FEMA has not provided mapping of this section of the Water River so the limits of BLSF could not be determined.

Other Resources

The project site is located within Priority Habitat and Estimated Habitat of Rare Wetlands Wildlife as determined by reference to data provided by the Mass. Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program available on MassGIS (see Figure 2 below). Prior notification and consultation with the NHESP is required prior to any construction proposed within this area.

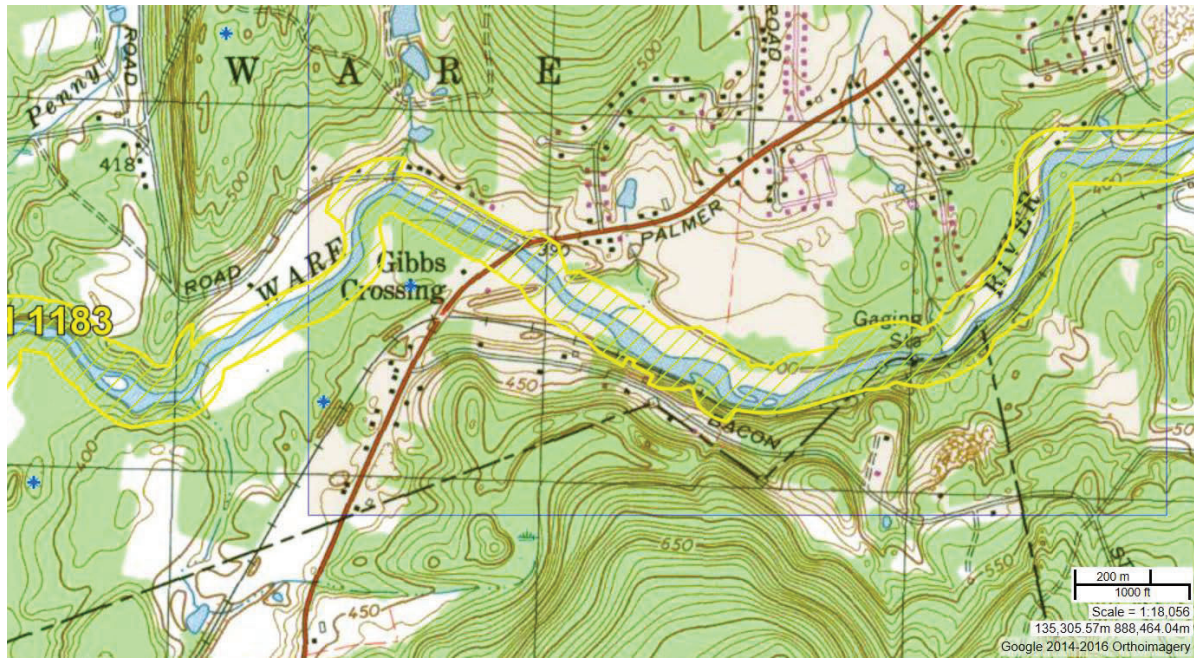


Fig 2: NHESP Priority Habitat Mapping

APPENDIX G

**OPERATION & MAINTENANCE
PLAN & LONG-TERM
POLLUTION PREVENTION PLAN**

**Route 32 (Palmer Road) over Ware River (Bridge No. W-05-015)
Stormwater Management System
Operation and Maintenance Plan (O&M)
and
Long Term Pollution Prevention Plan (LTPPP)**

July 2022

This Stormwater Management System Operation and Maintenance Plan provides for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution associated with the improvements to Route 32 (Palmer Road) over the Ware River (Bridge No. W-05-015) in the Town of Ware, MA.

This document has been prepared in accordance with the requirements of the Stormwater Regulations included in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10).

Responsible Party

MassDOT is the owner of the stormwater system and will be responsible for the operation and maintenance of the roadway and associated stormwater management features, in accordance with MassDOT standards once construction has been completed. The Town of Ware will retain existing responsibility for stormwater structures, pipe culverts, and pipes within its jurisdiction.

The contractor shall be responsible for the operation and maintenance of the roadway and stormwater management systems throughout construction in accordance with MassDOT standards.

Questions or concerns regarding maintenance activities may be addressed to MassDOT through the following department:

MassDOT Highway District 2 Office:

Patricia Leavenworth

811 North King Street

Northampton, MA 01060

Phone: (857) 368-2000

Email: Patricia.Leavenworth@dot.state.ma.us

Maintenance Measures

The stormwater management system covered by this Operation and Maintenance Plan consists of the following components:

- Catch Basins with deep sumps and hoods
- Roadways and Roadway Shoulders

Maintenance of these components will be conducted in accordance with town, state, and manufacturer standard maintenance practices, as noted in the attached Operation and Maintenance table summarizing the pertinent inspection and maintenance activities.

If inspection indicates the need for major repairs of structural surfaces, the inspector should contact MassDOT to initiate procedures to effect repairs in accordance with MassDOT standard construction practices.

Practices for Long Term Pollution Prevention

For the facilities covered by this Operation and Maintenance Plan, long term pollution prevention includes the following measures:

Routine Inspection and Maintenance of Stormwater BMPs

MassDOT will conduct inspection and maintenance of the stormwater management practices in accordance with the guidelines discussed above. MassDOT District 2 Post Construction O&M schedule is attached and is summarized below. Note inspections and cleanings are a minimum frequency.

- The deep sump catch basins shall be inspected a minimum of once a year to maintain proper operation. Sediment and debris shall be removed from structures and pipes. Sedimentation should be removed from each deep sump catch basin annually. Deep sump catch basins shall be cleaned at a minimum at the end of the fall and winter seasons.
- Stormwater structures and pipes should be inspected each spring (April) for accumulation of sediment and debris. Clean as needed based on inspection.

Spill Prevention and Response

MassDOT will implement response procedures for releases of significant materials such as fuels, oils, or chemical materials onto the ground or other areas that could reasonably be expected to discharge to surface or groundwater.

- Reportable quantities will immediately be reported to the applicable Federal, State, and local agencies as required by law. MassDOT should also be notified. Reportable quantities of chemical, fuels, or oils are established under the Clean Water Act and enforced through MassDEP. The MassDEP Emergency Response Program shall be immediately notified in accordance with required procedures for the report of a release (telephone 888-304-1133).
- Applicable containment and cleanup procedures will be performed immediately. Impacted material collected during the response must be removed promptly and

disposed of in accordance with Federal, State, and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release and the ability of the responsible party to perform the required response.

- Reportable quantities of chemical, fuels, or oils are established under the Clean Water Act and enforced through DEP.

Maintenance of Landscaped Areas

Routine mowing should be conducted according to standard MassDOT practices.

Invasive Species Management

If stormwater facility inspection notes the presence of invasive species within the best management practice measure, the representative of MassDOT on site performing construction inspection will coordinate with MassDOT Environmental to determine appropriate corrective actions. Control of invasive plants will be conducted in accordance with MassDOT standard specifications for this practice and will be in compliance with all state and federal regulatory requirements for such practices.

Snow and Ice Management

Snow and Ice Management shall be conducted consistent with the typical practices of MassDOT.

- Snow should be plowed to the grass off on the side of the road.
- Excess snow should be removed from site/roadways.

Paved Areas/Roadways/Roadway Shoulders

All paved areas should be free from sediment. Sweeping of pavement should occur a minimum of two times per year in the early spring (after snow melt) and late fall.

Deep Sump Catch Basins

Sediment removal from the sump and any floating debris. The sump shall be cleaned when sediment reaches half the height of the sump or when sediments are visible at the bottom of the outlet pipe.

Prohibition of Illicit Discharges

The MassDEP Stormwater Management Standards prohibit illicit discharges to the storm water management system. Illicit discharges are discharges that do not entirely consist of stormwater, except for certain specified non-stormwater discharges.

Examples of discharges from the following sources are not considered illicit discharges:

Firefighting activities*	Riparian habitats/wetlands
Foundation drain lines	Potable water sources
Line flushing	Dechlorinated swimming pool water
Footing drains	Street sweeping
Irrigation systems	Wash water from buildings (without detergents)
Residential car washing	Condensation from air conditioning units
Uncontaminated groundwater	Run-on from private driveways caused by precipitation
Rising groundwater	Lawn watering

*Water from firefighting activities is allowed under this permit and need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

There are no known or proposed illicit connections associated with this project. If a potential illicit discharge to the facilities covered by this plan is detected (e.g., dry weather flows at any pipe outlet, evidence of contamination of surface water discharge by non-stormwater sources), MassDOT shall be notified for assistance in determining the nature and source of the discharge, and for resolution.

Best Management Practices: Operation & Maintenance Inspection Measures Schedule and Evaluation Checklist During Construction

Inspections shall be completed every seven calendar days and within 24 hours of the end of a 0.25 inch or greater storm event during construction.

Project Location: Route 32 (Palmer Road) over Ware River, Ware, MA

Date of Inspection: _____ Inspector Name: _____ Weather: _____

Best Management Practice (BMP)	BMP Cleaning Frequency (min.)	Clean	Inspection Completed (Y/N)	Cleaning Completed (Y/N)	Repair Completed (Y/N)	Action(s) Taken	Notes/Recommendations/ Follow-up required (Y/N)
Deep Sump Catch Basins	ANI. Min. 4 times/year (after snow melt)	<ul style="list-style-type: none"> When sediment reaches half of the height of the sump Litter and debris clogging inlet grate or curb inlet opening 					
Roadways and Roadway Shoulders	Min. 2 times/year (April & October)	<ul style="list-style-type: none"> Remove sand and debris as needed. Sweep. 					

Abbreviation Key:

ANI = As needed based on Inspection Min. = at a minimum of

APPENDIX H

SITE PHOTOGRAPHS



Aerial image of the project intersection.



This is the general context of Route 32 (Palmer Road) over Ware River. This picture illustrates the Northbound approach of Palmer Road over Ware River.



This is the general context of intersection of Route 32 (Palmer Road) and Old Belchertown Road.
This picture illustrates the Southbound approach of Palmer Road over Ware River.



This is the general context of the Ware River upstream from the Palmer Road Bridge.



This is the general context of the Ware River downstream from the Palmer Road Bridge.



This is the general context of the northwest quadrant (far bank) and the southwest quadrant (close bank) of the Palmer Road Bridge over the Ware River.



This is the general context of the northwest quadrant of the Palmer Road Bridge over the Ware River. In addition, there is stream gauge for USGS 01173500 Ware River at Gibbs Crossing, MA and the location can also be found at <https://waterdata.usgs.gov/usa/nwis/uv?01173500> .



This is the general context of the southwest quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the southwest quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the northeast quadrant (near bank) and the southeast context (far bank) of the Palmer Road Bridge over the Ware River.



This is the general context of the northeast quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the southeast quadrant of the Palmer Road Bridge over the Ware River.



This is the general context of the piers supporting the Palmer Road Bridge over the Ware River.



This is the general context of a bridge scupper on the Palmer Road Bridge over the Ware River.



August 19, 2022

Kleinfelder Project No.: 20181590.001A

Heidi M. Davis
Senior Wetland Analyst
Highway Unit Supervisor
Wetlands Program
MassDEP
1 Winter Street
Boston, MA 02108
Attn:

SUBJECT: Ware Bridge Replacement (MassDOT Project No. 605126)
Bridge No. W-05-015 (C89)
Ware – Palmer Road (Route 32) over Ware River
Response to August 10, 2022 DEP comments for 401 Water Quality Certification

Dear Ms. Davis,

MassDOT, Kleinfelder Associates and McMahon Associates have prepared the following response to your comments an (*italicized*) dated August 10, 2022, as further discussed in our meeting of August 11, 2022.

1. *Provide the full Hydrocad (or equivalent program used) report used to develop the stormwater report.*

The Rational method was used with Excel. The Excel files are provided. (See Attachment A)

2. *A map of the catchment areas with all stormwater structures and discharge locations.*

A map of the catchment areas, stormwater structures and discharge locations for the project drainage area for existing and proposed conditions is provided in Attachment B. The catchment areas include those areas that flow to the storm sewers that discharge to the river as well as those areas that sheet flow to the river.

3. *Clarify what impervious area increases are proposed for the project. The initial application and the Stormwater report state two different values*

The impervious area increases by a total of 0.2 acres as shown in the following table. The table provides a summary of the areas shown on the maps in Attachment B. The watershed tables show the difference in pervious/impervious areas within the project limits and do not correlate with the Storm Sewer Design areas.

Please note that the Old Belchertown Road intersection design was requested to be revised for safety requirements, after the initial Water Quality Certification application and before the Stormwater Report was prepared, to accommodate a different guardrail that



necessitated the revising of the intersection's layout. The initial application stated an increase in impervious area of 0.31 acres. The current increase of 0.2 acres as shown in the table is correct based on the most current design.

Project Drainage Areas

EXISTING				PROPOSED			
Sheet Flow to River	Flow to Storm sewer	Total		Sheet Flow to River	Flow to Storm sewer	Total	
SF	SF	SF	Acres	SF	SF	SF	Acres
Impervious				Impervious			
28,745	29,364	58,109	1.33	8,494	58,154	66,648	1.53
Pervious				Pervious			
8,111	24,219	32,330	0.74	11,382	21,278	32660	0.75
Total Drainage Area				Total Drainage Area			
		90,439	2.08			99308	2.28

Please note that the Stormwater Report only noted the flows to the storm sewer. The revised information has been updated to also include the areas within the project limits that sheet flow to the river. The existing catchment area for impervious area sheet flowing to the river has been revised to include all of Old Belchertown Road included in the project area (Attachment B) and the table updated to include the revised impervious area accordingly.

4. Clarify what peak flow rates are correct. The initial application and the Stormwater report state many different values.

Peak flow rates are provided within the Excel spreadsheet. There are a total of 3 discharge points within the proposed project area. These discharge points are part of storm sewer systems outside the limits of the project. All pipes entering our project area are assumed to be flowing full. The discharge location at the SE corner (HW 1) of the existing bridge will be removed due to the relocation of the bridge. Below are the proposed peak flow rates at each discharge location.

Total **Proposed** Peak Flow Rates:

Discharge at NW Corner of Bridge (HW 3) = 20.6 CFS (10 YR)

Discharge at NE Corner of Bridge = 14.9 (HW 2) CFS (10 YR)

Discharge Along Old Belchertown = 0.3 CFS (HW 4) (10 YR)

As noted in the response to Comment #3, the Old Belchertown Road intersection was redesigned. The Peak Flow rates noted in this response to comments and attachments are the correct based on the most current design.

5. Provide an alternatives analysis of what Stormwater BMPs were considered and why they were not viable or why they were used. For Example: A marked up plan calling out specific locations looked at for BMPs. These locations will have comment bubbles stating something like why a retention basin didn't work in a specific spot but an infiltration basin did.



Stormwater BMPs proposed include replacing existing catch basins, which do not have deep sumps and thus allowing untreated stormwater entering the river, with new catch basins containing deep sumps. The existing bridge has scuppers, allowing untreated stormwater runoff to directly enter the river. The new bridge will eliminate the scuppers. Stormwater runoff from the bridge will instead flow into a deep sump catch basin prior to discharging into the river.

A leaching catch basin was considered for a location near the intersection of Old Belchertown Road. However, this alternative was rejected as infeasible by MassDOT due to concerns that the additional water could undermine the structural integrity of the roadway if infiltration is provided within/adjacent to the roadway. The soil boring nearest to this location (Boring #101) indicates that the roadway was constructed on fill over gravel on top of a five-foot layer of organic peat/sandy at a depth of approximately 14 feet down to 19 feet below the surface.

An infiltration basin was considered for a location near the intersection of Old Belchertown Road. This alternative was rejected as infeasible due to concerns the infiltration would compromise the road base and lead to water penetration, frost heaving and pavement failure.

Four curb cuts approximately 6-inches wide spaced at 50 feet will be installed around the Northwest corner of Palmer Rd and Old Belchertown Rd. The cuts will have small riprap flow dissipaters. This will allow the miscellaneous water flowing along the curb to be discharged and dissipated down the grassed side slopes of the roadway. The gravel and fill stated in Boring #101 should allow for the filtration of the water as it makes its way to the proposed Catch Basin #16 (as shown on the Proposed Project Drainage Map in Attachment B.)

Due to site constraints, there is limited available space to install BMPs. The right of way is limited within the project area with steep slopes outside the roadway or abutting land uses (residential) which limits the feasibility of using the area adjacent to the roadway as an infiltration swale. The project does not contain MassDOT or municipally owned parking lots, rest areas, or other similar areas. See Attachment C for the locations considered for BMPs and associated constraints.

6. *Explain what improvements (if any are needed) will be completed to the existing discharge locations to prevent erosion. Improvements may be necessary since discharge rates are being doubled (according to the stormwater report).*

Stormwater discharging from the two existing outfalls will discharge to a proposed riprap slope, located on each side of the abutments. The riprap slope provides protection to the banks from erosion. A dispersion pad will be added at the discharge point for area 33 (as shown on the Proposed Project Drainage Map in Attachment B.)

7. *Please provide more information regarding the sediment samples taken for the grain size analysis. It is unclear what samples are being attributed to the dredge area. The regulations were also cited in your response stating that no chemical testing is required if*



less than 10% by weight of the sample passes through a #200 sieve. Many of the sediment samples did not meet this and we are unsure if all samples were averaged together to achieve the result of less than 10% through the #200 sieve. Averaging results together is not allowed, and chemical analysis is still required

Sediment borings taken within the river include sediment samples BB-103, BB-104 and Riverbed. The map showing the location of the borings along with the sieve analysis for each location have been provided as Attachment D to this letter. The results of the sediment analysis within the river are summarized in the following table. All contain less than 10% passing through a #200 sieve. The samples were not averaged to achieve the result.

Boring Location	Depth (feet)	Percent Passing #200 Sieve Size
BB-103	23.4-25.4	4.6
BB-103	65-37	5.1
BB-104	21.8-23.8	3.0
BB-104	34-36	6.6
River Bottom		0.2

The initial application included all of the boring locations for the project. Those with sediment analysis results of greater than 10% passing the #200 sieve were all from upland locations for the east and west bridge abutments, and not within the area to be dredged.

The watershed of the Ware River upstream of the bridge is primarily forested land, with areas of agricultural land use and low density residential. Hayfields are the predominant agricultural use. (See map in Attachment E). A list of Waste Sites and Reportable Releases from the MA Executive Office of Energy and Environmental Affairs (EEA) Data Portal was generated on December 12, 2020 as part of the MassDOT Early Environmental Coordination process. (See Attachment E). A review of the list indicated that there were no significant sources of contamination within proximity to the bridge. That information, along with the fact that the upstream watershed was primarily low density rural residential and less than 10% of the sediment passed a #200 sieve, led to the statement in the application that no chemical testing was required.

Further review was conducted to provide additional information regarding the potential for the sediment proposed to be dredged to have concentrations of oil or hazardous materials, as defined in 310 CMR 40.0000: Massachusetts Contingency Plan, the EEA Data Portal-Waste Sites and Reportable Releases website ¹was searched again on August 18, 2022, to determine if there were any additional sites that may pose a concern for contamination of the river sediments. (See Attachment E for a list of release sites. A summary of the reportable releases in proximity of the river is also provided.) The review resulting in a similar finding that there were no significant sources of contamination in proximity to the bridge

Town of Ware officials were also contacted for information on prior dredging projects and/or discharges of pollutants in the project area watershed. The Town of Ware Board of Health has stated they searched through Board of Health files from 346 Palmer Road to 388 Palmer

¹ <https://eeaonline.eea.state.ma.us/portal#!/search/wastesite/results?TownName=WARE>



Road and have not found anything regarding oil or hazardous materials². The Town of Ware Conservation Agent not familiar with any town records related to releases of OHM in this area.³ The Ware Fire and Public Works Departments were also contacted but no responses have been received to date.

Sincerely,

KLEINFELDER

A handwritten signature in blue ink that reads "Rafic Khalil". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Rafic Khalil, PE
Senior Project Manager

² Email response from Betty Barlow, Administrative Assistant, Quabbin Health District to Stephanie MacDonald, McMahon Associates, August 16, 2022

³ Email response from John Prenovil, Conservation Agent, Town of Ware to Stephanie MacDonald, McMahon Associates, August 17, 2022

Attachment A

Rational Method Storm Drainage Calculations

KLEINFELDER

RATIONAL FORMULA COMPUTATION FORM

PROJECT: Palmer Road (route 32) over Ware River
 LOCATION: Ware, Massachusetts (NORTH OF BRIDGE)
 DATE: 8/18/22
 BY: BLW

FILE: 0.011 INVERTS BY: 0.011 MATCHING INVERTS 0.011 MATCHING CROWNS

#	DRAINAGE AREA				TIME		RAINFALL INTENSITY		DISCHARGE			L feet	D I PIPE SLOPE ft/ft	V E SLOPE L fps	FRICTION SLOPE 10 YR ft/ft	HGL ELEVATION 10 YR	INVERT		GRATE ELEV.	CUT TO INVERT feet	COVER TO INSIDE TOP feet	#			
	AREA acres	SUM acres	C	CA	SUM CA	DELTA TIME minutes	SUM TIME	5 YR		10 YR							Q cfs	5 YR					10 YR		
								in/hr	in/hr	5 YR	10 YR														
PROP CB10	0.07	0.07	0.90	0.07	0.07	10.0	10.0	4.18	4.83	0.3	0.3					404.47	OK	403.47	408.96	5.49	4.49	PROP CB10			
PROP CB9	0.11		0.18	0.90	0.10	0.16		4.18	4.83	0.7	0.8	15.0	12	0.0050	3.8	0.0001									
PROP CB9	0.11		0.18	0.90	0.10	0.16	0.1	10.1	4.18	4.83	0.7	0.8				404.40	OK	403.40	403.40	5.51	4.51	PROP CB9			
PROP MH6	0.00		0.18	-	0.00	0.16	0.1	10.1	4.18	4.83	0.7	0.8	15.0	12	0.0050	3.8	0.0004								
PROP MH6	0.00		0.18	-	0.00	0.16	0.1	10.1	4.18	4.83	0.7	0.8	211.0	12	0.0450	11.4	0.0004	403.09	OK	402.09	403.32	409.18	5.86	4.86	PROP MH6
PROP MH5	0.00		0.18	-	0.00	0.16	0.3	10.4	4.18	4.83	0.7	0.8						393.49	OK	392.49	392.59	399.20	6.61	5.61	PROP MH5
PROP CB8	0.13	0.13	0.90	0.12	0.12	10.0	10.0	4.18	4.83	0.5	0.6					395.33	OK	394.33		399.20	4.88	3.88	PROP CB8		
PROP CB7	0.08	0.21	0.90	0.07	0.07	10.1	10.1	4.18	4.83	0.3	0.4	18.0	12	0.0050	3.8	0.0002									
PROP CB7	0.08	0.21	0.90	0.07	0.07	10.1	10.1	4.18	4.83	0.3	0.4	17.0	12	0.0050	3.8	0.0001	395.24	OK	394.24	394.24	398.88	4.64	3.64	PROP CB7	
PROP MH5	0.00	0.21	-	0.00	0.35	0.1	10.2	4.18	4.83	1.5	1.7					393.49	OK	392.49	394.15	399.20	5.05	4.05	PROP MH5		
PROP MH5	0.00	0.39	-	0.00	0.35		10.4	4.18	4.83	1.5	1.7					393.49	OK	392.49	392.59	399.20	6.61	5.61	PROP MH5		
PROP MH4	0.00	0.39	-	0.00	0.35	0.5	10.9	4.18	4.83	1.5	1.7	220.0	12	0.0200	7.6	0.0016									
PROP MH4	0.00	0.39	-	0.00	0.35	0.5	10.9	4.18	4.83	1.5	1.7					388.99	OK	387.99	388.09	394.11	6.02	5.02	PROP MH4		
PROP CB6	0.10	0.10	0.90	0.09	0.09	10.0	10.0	4.18	4.83	0.4	0.4					390.46	OK	389.46		393.69	4.23	3.23	PROP CB6		
PROP CB5	0.09	0.18	0.90	0.08	0.08	0.1	10.1	4.18	4.83	0.3	0.4	17.0	12	0.0050	3.8	0.0001									
PROP CB5	0.09	0.18	0.90	0.08	0.08	0.1	10.1	4.18	4.83	0.3	0.4					390.38	OK	389.38	389.38	393.79	4.42	3.42	PROP CB5		
PROP MH4	0.00	0.18	-	0.00	0.52	0.1	10.9	4.18	4.83	2.2	2.5	17.0	12	0.0050	3.8	0.0001									
PROP MH4	0.00	0.18	-	0.00	0.52	0.1	10.9	4.18	4.83	2.2	2.5					388.99	OK	388.09	389.29	394.11	4.82	3.82	PROP MH4		
PROP MH4	0.00	0.57	-	0.00	0.52		10.9	4.18	4.83	2.2	2.5					388.99	OK	387.99	388.09	394.11	6.02	5.02	PROP MH4		
PROP MH3	0.00	0.57	-	0.00	0.52	0.1	11.0	4.18	4.83	2.2	2.5	112.0	12	0.0990	16.9	0.0035									
PROP MH3	0.00	0.57	-	0.00	0.52	0.1	11.0	4.18	4.83	2.2	2.5					378.95	OK	376.80	376.90	390.64	13.74	12.74	PROP MH3		
EX PIPE																									
PROP CB12	0.45	0.45	0.41	0.18	0.18	10.0	10.0	4.18	4.83	0.8	0.9					378.96	OK	377.28	377.28	386.46	9.18	7.68	PROP CB12		
PROP MH3	0.00	0.45	-	0.00	0.70	0.3	10.3	4.18	4.83	14.1	14.9	75.9	18	0.0050	5.0	0.0001									
PROP MH3	0.00	0.45	-	0.00	0.70	0.3	10.3	4.18	4.83	14.1	14.9					378.95	OK	376.80	376.90	390.64	13.74	12.24	PROP MH3		
PROP MH3	0.00	1.03	-	0.00	0.70		11.0	4.18	4.83	14.1	14.9					378.95	OK	376.80	376.90	390.64	13.74	12.24	PROP MH3		
EX HW2	0.00	1.03	-	0.00	0.70	0.2	11.3	4.18	4.83	14.1	14.9	68.7	18	0.0050	5.0	0.0144									
EX HW2	0.00	1.03	-	0.00	0.70	0.2	11.3	4.18	4.83	14.1	14.9					377.96	OK		376.46	379.46	3.00		EX HW2		

FILE:		INVERTS BY:										0 1) MATCHING CROWNS										0) MATCHING INVERTS																			
		n=										0.011										0 1) MATCHING CROWNS										0) MATCHING INVERTS									
#	DRAINAGE AREA				TIME		RAINFALL		DISCHARGE		L	D	I	V	FRICTION		HGL	ELEVATION		INVERT		GRATE ELEV.	CUT TO INVERT	COVER TO INSIDE TOP	#																
	AREA	SUM AREA	C	CA	SUM CA	DELTA TIME	5 YR	10 YR	5 YR	10 YR					Q	10 YR		E	SLOPE	10 YR	OUT					IN	feet	feet													
EX PIPE	ASSUMING 18" PIPE FLOWING FULL										15.3	15.3													EX PIPE																
EX MH1	0.00	0.00	-	0.00	0.00	10.0	4.18	4.83	15.3	15.3	200.0	18	0.0150	8.6	0.0151		383.99	OK	378.52	378.54	387.40	8.86	7.36	EX MH1																	
PROP CB1	0.34	0.34	0.90	0.31	0.31	10.0	4.30	4.83	1.3	1.5	21.0	12	0.0584	13.0	0.0013		385.89	OK	384.89		387.39	2.50	1.50	PROP CB1																	
PROP CB2	0.08	0.08	0.90	0.07	0.07	10.0	4.30	4.83	0.3	0.3	23.0	12	0.0089	5.1	0.0001		383.63	OK	382.63		387.50																				
EX MH1	0.00	0.42	-	0.00	0.31	0.1	10.03	4.18	4.83	16.9	17.1						383.99	OK	378.52	378.54	387.40	8.86	7.86	EX MH1																	
EX MH1	0.00	0.42	-	0.00	0.31	10.03	4.18	4.83	16.9	17.1							383.99	OK	378.52	378.54	387.40	8.86	7.36	EX MH1																	
PROP CB3	0.07	0.07	0.90	0.06	0.06	10.0	4.18	4.83	0.3	0.3	205.0	18	0.0029	3.8	0.0190		380.10	OK	378.27		387.66	9.39	#REF!	PROP CB3																	
EX MH2	0.00	0.49	-	0.00	0.37	0.2	10.24	4.18	4.83	17.2	17.4						380.10	OK	377.95	377.95	389.15	11.20	10.20	EX MH2																	
EX MH2	0.00	0.49	-	0.00	0.37	0.1	10.24	4.18	4.83	17.2	17.4						380.10	OK	377.95	377.95	389.15	11.20	9.20	EX MH2																	
PROP CB4	0.16	0.16	0.90	0.15	0.16	10.0	10.24	4.18	4.83	0.6	0.6	145.1	24	0.0025	4.3	0.0042	385.17	OK	384.17		389.49	5.32	4.32	PROP CB4																	
EX MH3	0.00	0.65	0.00	0.00	0.53	0.6	10.48	4.18	4.83	17.8	18.0						379.49	OK	377.49	377.62	389.59	11.97	10.97	EX MH3																	
EX MH3	0.00	0.65	0.00	0.00	0.53	0.1	10.58	4.18	4.83	17.8	18.0						379.49	OK	377.49	377.62	389.59	11.97	9.97	EX MH3																	
EX HW1	0.00	0.65	-	0.00	0.53	0.4	10.69	4.18	4.83	20.0	20.6	161.2	24	0.0050	6.0	0.0045	378.30	OK	376.30	376.30	379.31	3.01	1.01	EX HW1																	

KLEINFELDER

RATIONAL FORMULA COMPUTATION FORM

PROJECT: Palmer Road (route 32) over Ware River
 LOCATION: Ware, Massachusetts (NORTH OF BRIDGE)
 DATE: 8/18/22
 BY: BLW

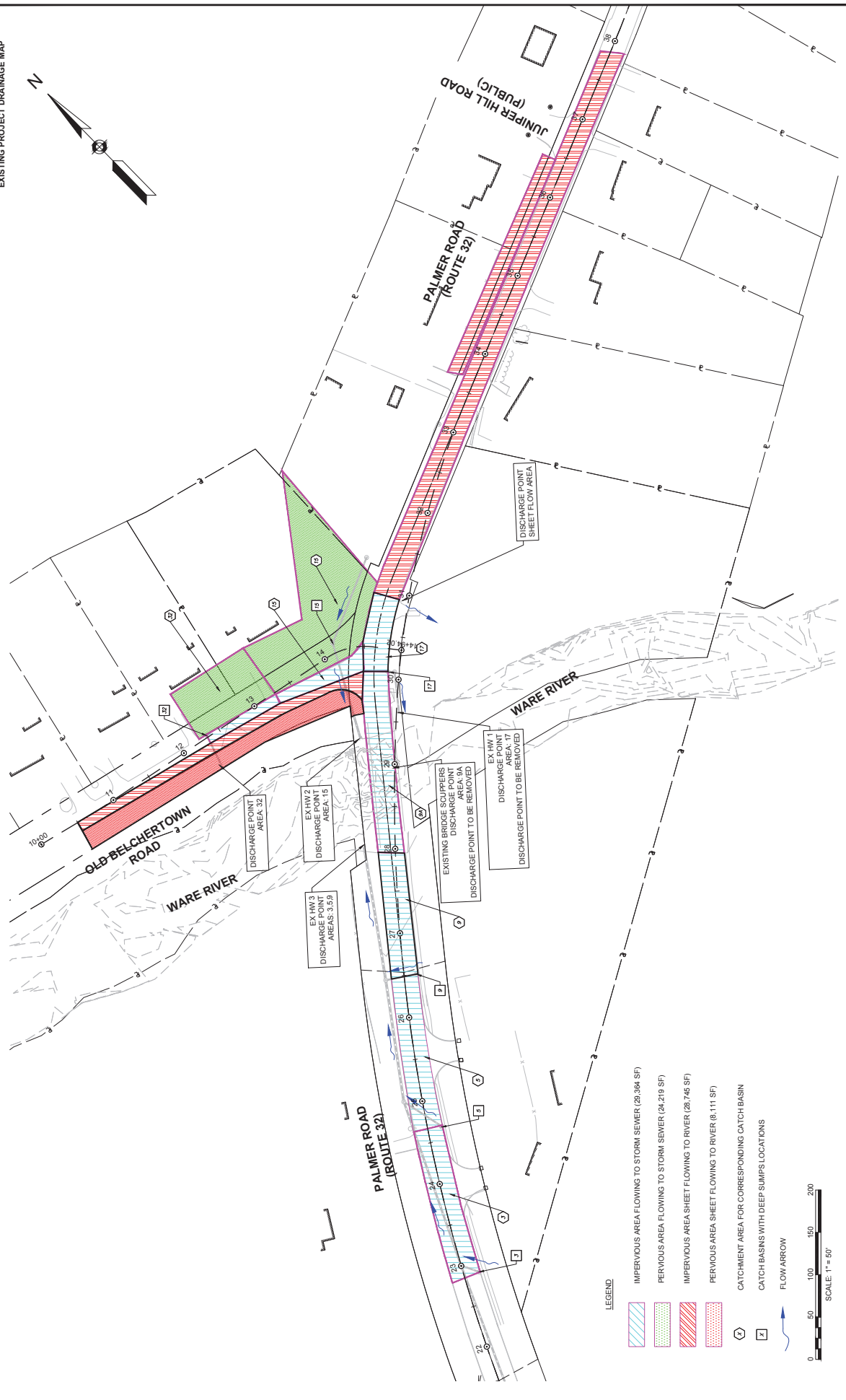
FILE: 0.011 INVERTS BY: 0.011 MATCHING CROWNS

#	DRAINAGE AREA				TIME		RAINFALL INTENSITY		DISCHARGE			L feet	D I A in	PIPE SLOPE ft/ft	V E SLOPE L fps	FRICTION SLOPE 10 YR ft/ft	HGL ELEVATION 10YR	INVERT		GRATE ELEV.	CUT TO INVERT feet	COVER TO INSIDE TOP feet	#		
	AREA acres	SUM acres	C	CA	SUM CA	DELTA TIME minutes	SUM TIME	5YR in/hr	10YR in/hr	5YR cfs	10YR cfs							OUT	IN						
PROP CB10	0.07	0.07	0.90	0.07	0.07	10.0	10.0	4.18	4.83	0.3	0.3		15.0	12	0.0050	3.8	0.0001	404.47	OK	403.47		408.96	5.49	4.49	PROP CB10
PROP CB9	0.11		0.18	0.90	0.10	0.16		4.18	4.83	0.7	0.8		15.0	12	0.0050	3.8	0.0004	404.40	OK	403.40	403.40	408.90	5.51	4.51	PROP CB9
PROP MH6	0.00	0.18	-	0.00	0.16	0.1	10.1	4.18	4.83	0.7	0.8		211.0	12	0.0450	11.4	0.0004	403.09	OK	402.09	403.32	409.18	5.86	4.86	PROP MH6
PROP MH5	0.00	0.18	-	0.00	0.16	0.3	10.4	4.18	4.83	0.7	0.8							393.49	OK	392.49	392.59	399.20	6.61	5.61	PROP MH5
PROP CB8	0.13	0.13	0.90	0.12	0.12	10.0	10.0	4.18	4.83	0.5	0.6		18.0	12	0.0050	3.8	0.0002	395.33	OK	394.33		399.20	4.88	3.88	PROP CB8
PROP CB7	0.08	0.21	0.90	0.07	0.07	0.1	10.1	4.18	4.83	0.3	0.4		17.0	12	0.0050	3.8	0.0001	395.24	OK	394.24	394.24	398.88	4.64	3.64	PROP CB7
																		393.49	OK	392.49	394.15	399.20	5.05	4.05	PROP MH5
PROP MH5	0.00	0.39	-	0.00	0.35		10.4	4.18	4.83	1.5	1.7		220.0	12	0.0200	7.6	0.0016	393.49	OK	392.49	392.59	399.20	6.61	5.61	PROP MH5
PROP MH4	0.00	0.39	-	0.00	0.35	0.5	10.9	4.18	4.83	1.5	1.7							388.99	OK	387.99	388.09	394.11	6.02	5.02	PROP MH4
PROP CB6	0.10	0.10	0.90	0.09	0.09	10.0	10.0	4.18	4.83	0.4	0.4		17.0	12	0.0050	3.8	0.0001	390.46	OK	389.46		393.69	4.23	3.23	PROP CB6
PROP CB5	0.09	0.18	0.90	0.08	0.08	0.1	10.1	4.18	4.83	0.3	0.4		17.0	12	0.0050	3.8	0.0001	390.38	OK	389.38	389.38	393.79	4.42	3.42	PROP CB5
PROP MH4	0.00	0.18	-	0.00	0.52	0.1	10.9	4.18	4.83	2.2	2.5							388.99	OK	388.09	389.29	394.11	4.82	3.82	PROP MH4
PROP MH4	0.00	0.57	-	0.00	0.52		10.9	4.18	4.83	2.2	2.5							388.99	OK	387.99	388.09	394.11	6.02	5.02	PROP MH4
PROP MH3	0.00	0.57	-	0.00	0.52	0.1	11.0	4.18	4.83	2.2	2.5		112.0	12	0.0990	16.9	0.0035	378.95	OK	376.80	376.90	390.64	13.74	12.74	PROP MH3
EX PIPE																									
PROP CB12	0.45	0.45	0.41	0.18	0.18	10.0	10.0	4.18	4.83	0.8	0.9							378.96	OK	377.28	377.28	386.46	9.18	7.68	PROP CB12
PROP MH3	0.00	0.45	-	0.00	0.70	0.3	10.3	4.18	4.83	14.1	14.9							378.95	OK	376.80	376.90	390.64	13.74	12.24	PROP MH3
PROP MH3	0.00	1.03	-	0.00	0.70		11.0	4.18	4.83	14.1	14.9							378.95	OK	376.80	376.90	390.64	13.74	12.24	PROP MH3
EX HW2	0.00	1.03	-	0.00	0.70	0.2	11.3	4.18	4.83	14.1	14.9		68.7	18	0.0050	5.0	0.0144	377.96	OK		376.46	379.46	3.00		EX HW2

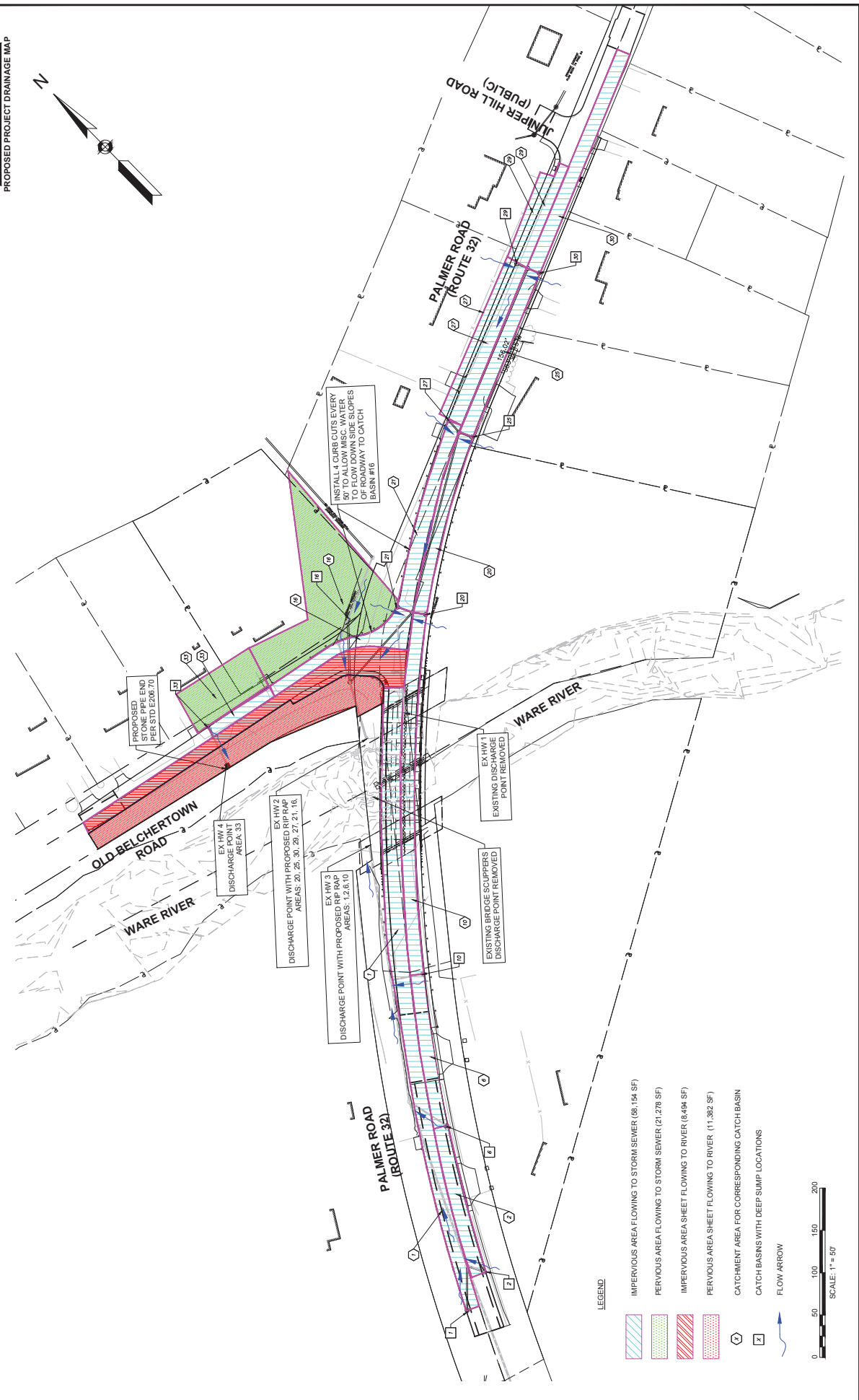
Attachment B
Drainage Area Maps

WARE PALMER ROAD (ROUTE 32)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	1
PROJECT FILE NO.		605126	

EXISTING PROJECT DRAINAGE MAP



WARE PALMER ROAD (ROUTE 32)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	1
PROJECT FILE NO.		605126	



Attachment C
BMP Evaluation Map

605126_120185_CD.CONSTR.PLAN.DWG Printed on 11/06/21 1:10 PM SHEET NO. 19

WARE
PALMER ROAD (ROUTE 32) OVER WARE RIVER
BRIDGE NO. W45915

STATE	FED. AID PROJ. NO.	FED. AID DIST. NO.	TOTAL SHEETS
MA	-	-	125
PROJECT FILE NO.			605126

CONSTRUCTION PLANS

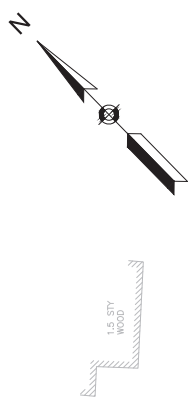
FULL DEPTH
RECONSTRUCTION

DRAINAGE DETAILS
SEE SHEETS 44-48

WATER SUPPLY ALTERATIONS
SEE SHEETS 44-48

TRAFFIC SIGNAL CONDUIT
NONE

HIGHWAY GUARD DETAILS
NONE



JULIAN J. KNAPP
MARCELO J. KNAPP
PARCEL ID 5-0-2
BOOK 380 PAGE 156
375 PALMER RD

BEGIN MILLING AND OVERLAY
BEGIN BOX WIDENING
MEET AND MATCH EXISTING

PROJECT BEGIN
N2912594.4303
S171221416
E442848.2293

END MILLING AND OVERLAY
END BOX WIDENING
BEGIN FULL DEPTH CONSTRUCTION

N/F
MARCELO J. KNAPP
PARCEL ID 5-0-2
BOOK 375 PALMER RD

PROP. 4" LOAM AND SEED
PROP. VGC TYPE VA-4
RET

PROP. MILLING AND OVERLAY
PROP. BOX WIDENING
RET

BOS & LIMIT
OF GRADING

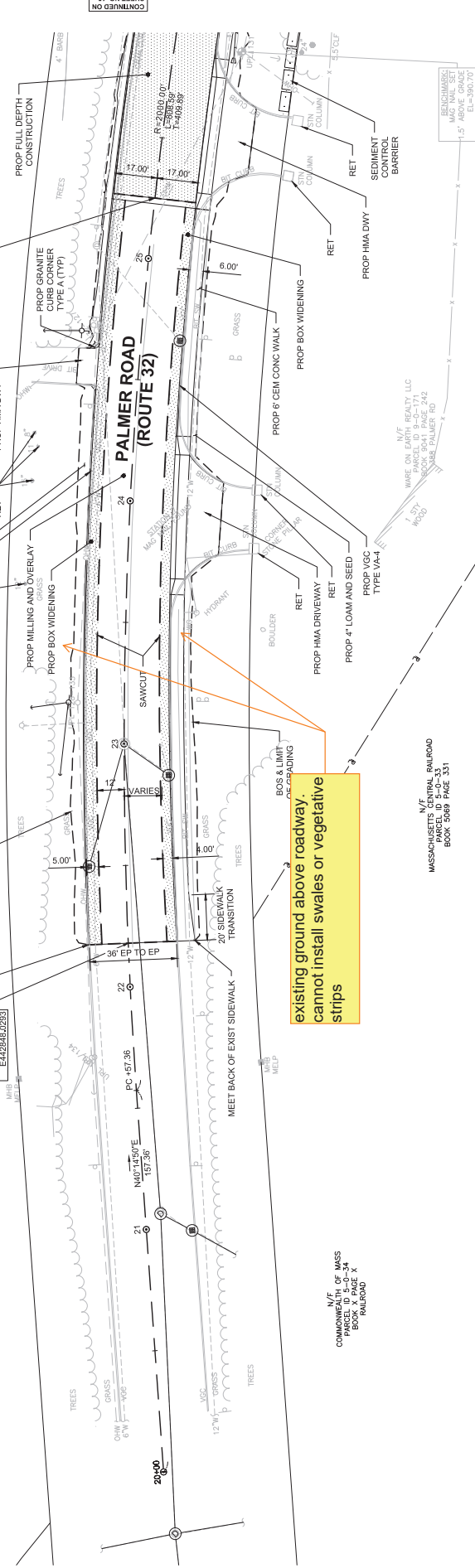
MEET BACK OF EXIST SIDEWALK
TRANSITION

MEET BACK OF EXIST SIDEWALK
TRANSITION

MEET BACK OF EXIST SIDEWALK
TRANSITION

MEET BACK OF EXIST SIDEWALK
TRANSITION

MEET BACK OF EXIST SIDEWALK
TRANSITION



existing ground above roadway.
cannot install swales or vegetative
strips

N/F
COMMONWEALTH OF MASS
PARCEL ID 5-0-34
BOOK 380 PAGE 156
PALMER RD

N/F
MASSACHUSETTS CENTRAL RAILROAD
PARCEL ID 5-0-33
BOOK 380 PAGE 156

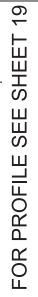
N/F
WARE ON EAT REALTY LLC
PARCEL ID 9-0-171
BOOK 342
PALMER RD

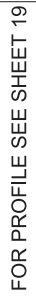
BENCHMARK
MAD NAIL SET
ASB 100000000
ELEV=390.70



FOR PROFILE SEE SHEET 19

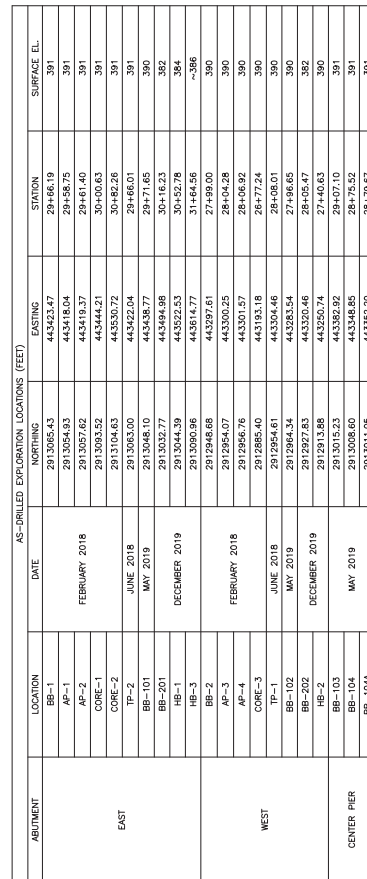












Attachment D
Sieve Data



NOTES:

1. LOCATIONS OF DRIVE SAMPLE BORINGS ARE SHOWN THUS: 
2. LOCATIONS OF LUER, PROBER, & SHOWN THUS: 
3. LOCATIONS OF TEST PITS ARE SHOWN THUS: 
4. LOCATIONS OF ASPHALT CORES ARE SHOWN THUS: 
5. BENCH MARK: NAIL IN UTILITY POLES 131 (EL. 390.70) AND 127 (EL. 390.70) REFERRED TO THE NAVD83 DATUM.
6. DATA COLLECTED ON HIGHWAY PLAN DATED 10/19/2019 BY GREEN INTERNATIONAL AFFILIATES, INC. ELEVATIONS ARE REFERRED TO THE NAVD83 DATUM.
7. EXPLORATION LOCATIONS WERE TAPPED OUT TO EXISTING SITE FEATURES DURING EXPLORATION, AND THE LOCATIONS SHOWN ON THE PLAN SHOULD BE USED FOR EXPLORATION PURPOSES.

PROJECT FILE NO. 605126



FIGURE 2
EXPLORATION LOCATION PLAN

WARE

PALMER ROAD

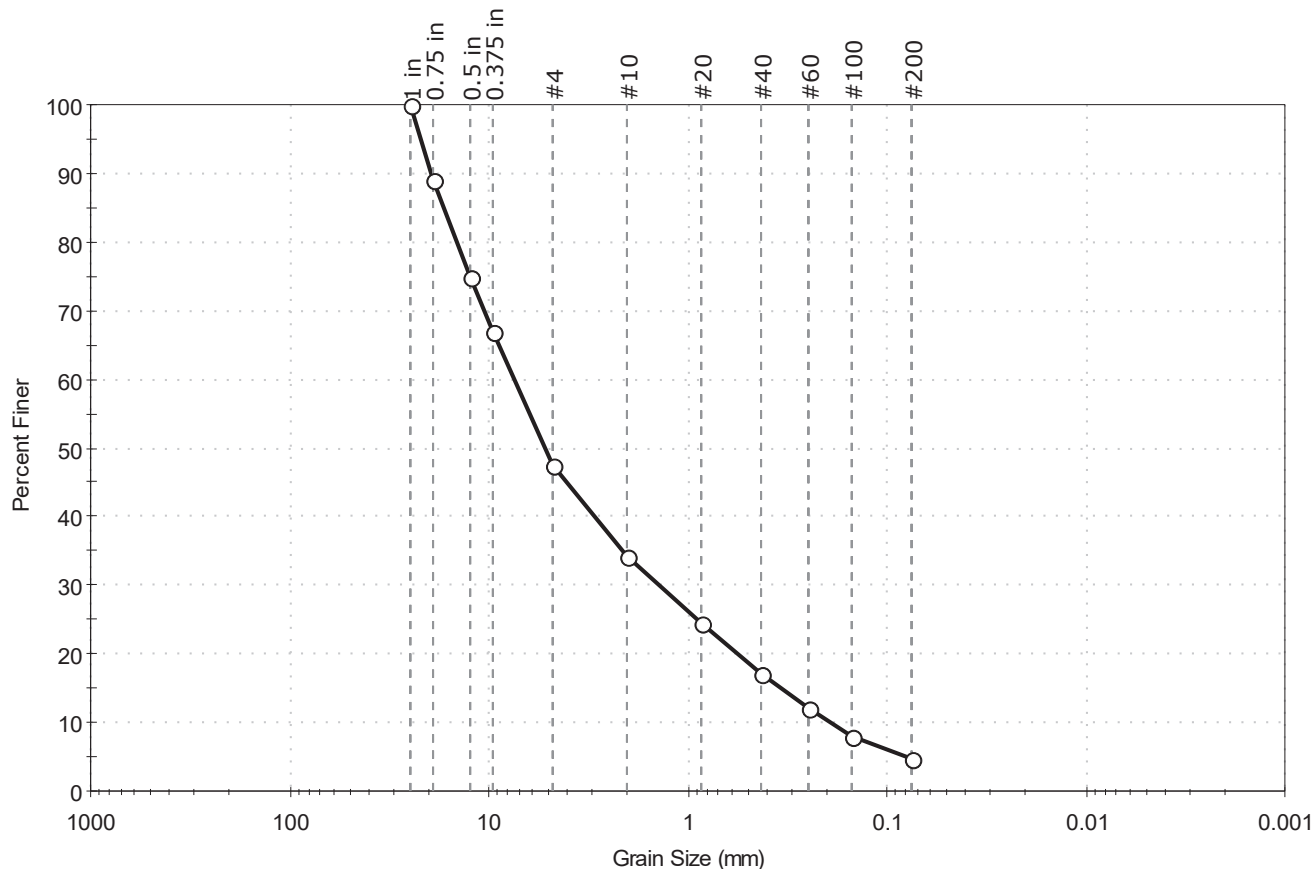
OVER WARE RIVER
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

JANUARY, 2020

BRIDGE NO. W-05-015

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-103	Sample Type:	jar
Sample ID:	S-1	Test Date:	06/25/19
Depth :	23.4-25.4	Test Id:	510089
Test Comment:	---	Tested By:	ckg
Visual Description:	Moist, olive brown gravel with sand	Checked By:	jsc
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	52.5	42.9	4.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	89		
0.5 in	12.50	75		
0.375 in	9.50	67		
#4	4.75	48		
#10	2.00	34		
#20	0.85	25		
#40	0.42	17		
#60	0.25	12		
#100	0.15	8		
#200	0.075	4.6		

Coefficients

D ₈₅ = 16.8241 mm	D ₃₀ = 1.3744 mm
D ₆₀ = 7.4147 mm	D ₁₅ = 0.3394 mm
D ₅₀ = 5.1805 mm	D ₁₀ = 0.1937 mm
C _u = 38.279	C _c = 1.315

Classification

ASTM Well-graded GRAVEL with Sand (GW)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

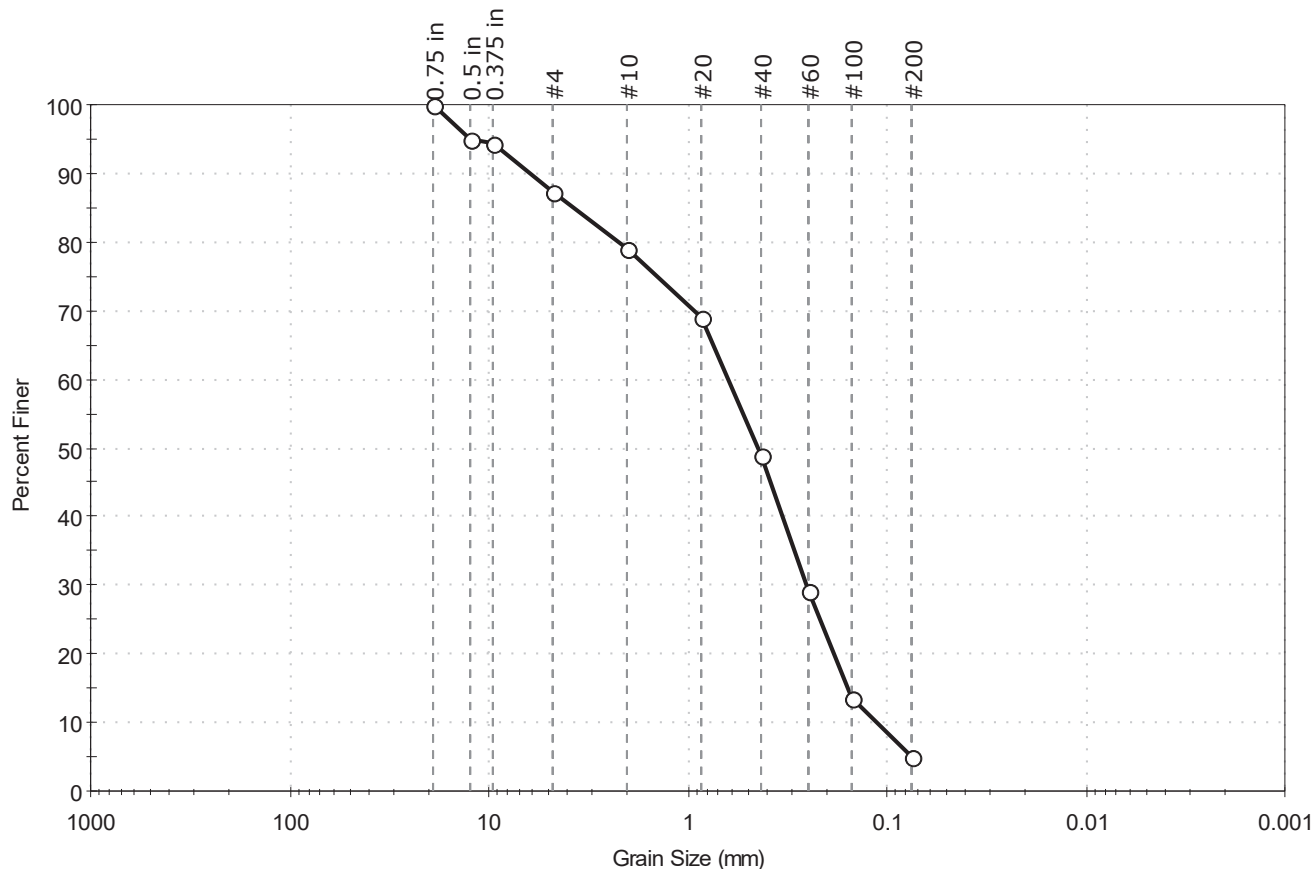
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-103	Sample Type:	jar
Sample ID:	S-3	Test Date:	06/25/19
Depth :	35-37	Test Id:	510090
Test Comment:	---		
Visual Description:	Moist, yellowish brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	12.8	82.1	5.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	94		
#4	4.75	87		
#10	2.00	79		
#20	0.85	69		
#40	0.42	49		
#60	0.25	29		
#100	0.15	14		
#200	0.075	5.1		

Coefficients

D ₈₅ = 3.7492 mm	D ₃₀ = 0.2551 mm
D ₆₀ = 0.6218 mm	D ₁₅ = 0.1573 mm
D ₅₀ = 0.4384 mm	D ₁₀ = 0.1120 mm
C _u = 5.552	C _c = 0.934

Classification

ASTM N/A

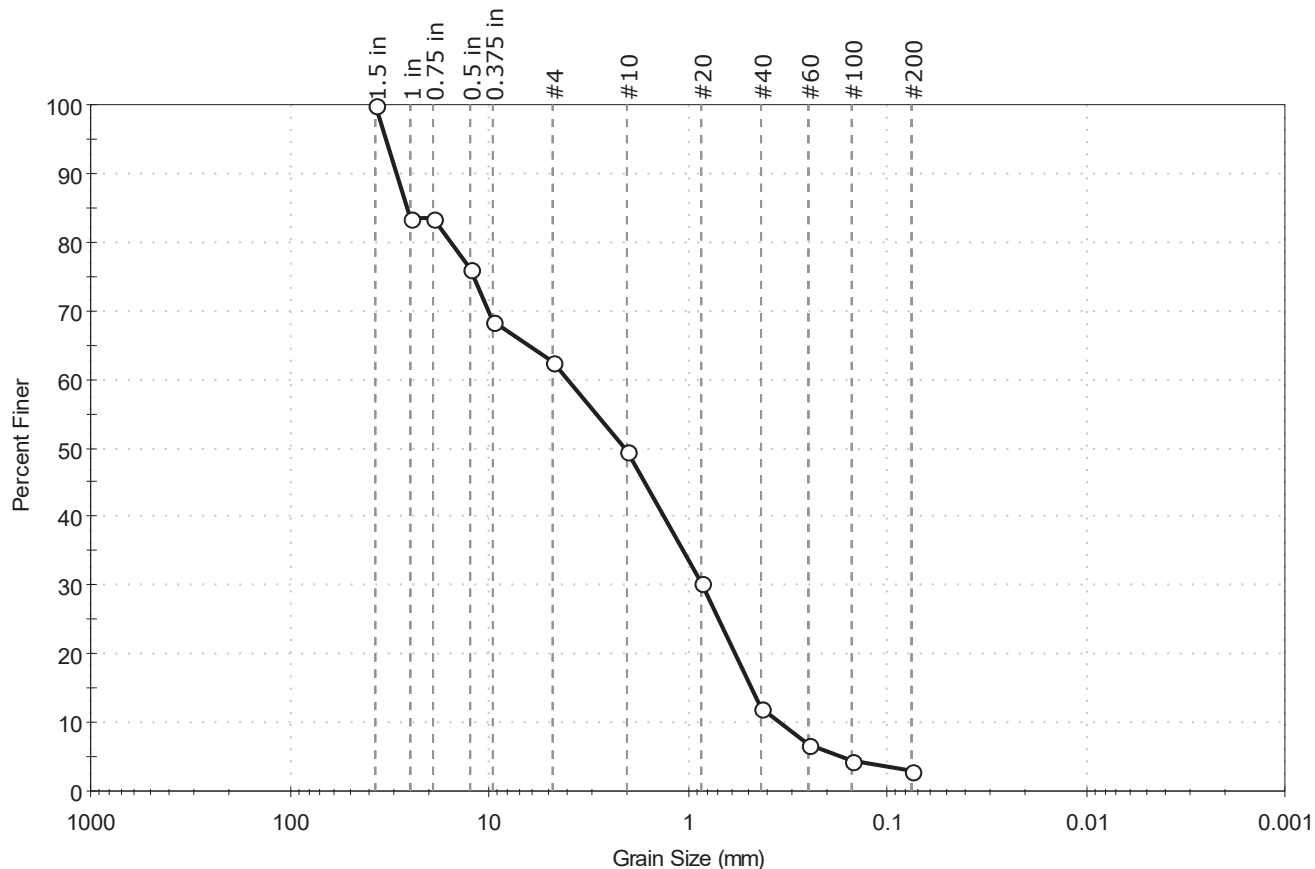
AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-104	Sample Type:	jar
Sample ID:	S-1	Test Date:	06/25/19
Depth :	21.8-23.8	Test Id:	510091
Test Comment:	---		
Visual Description:	Moist, olive brown sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	37.4	59.6	3.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	84		
0.75 in	19.00	84		
0.5 in	12.50	76		
0.375 in	9.50	68		
#4	4.75	63		
#10	2.00	49		
#20	0.85	30		
#40	0.42	12		
#60	0.25	7		
#100	0.15	4		
#200	0.075	3.0		

Coefficients

D ₈₅ = 25.9011 mm	D ₃₀ = 0.8396 mm
D ₆₀ = 3.9931 mm	D ₁₅ = 0.4733 mm
D ₅₀ = 2.0698 mm	D ₁₀ = 0.3430 mm
C _u = 11.642	C _c = 0.515

Classification

ASTM Poorly graded SAND with Gravel (SP)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

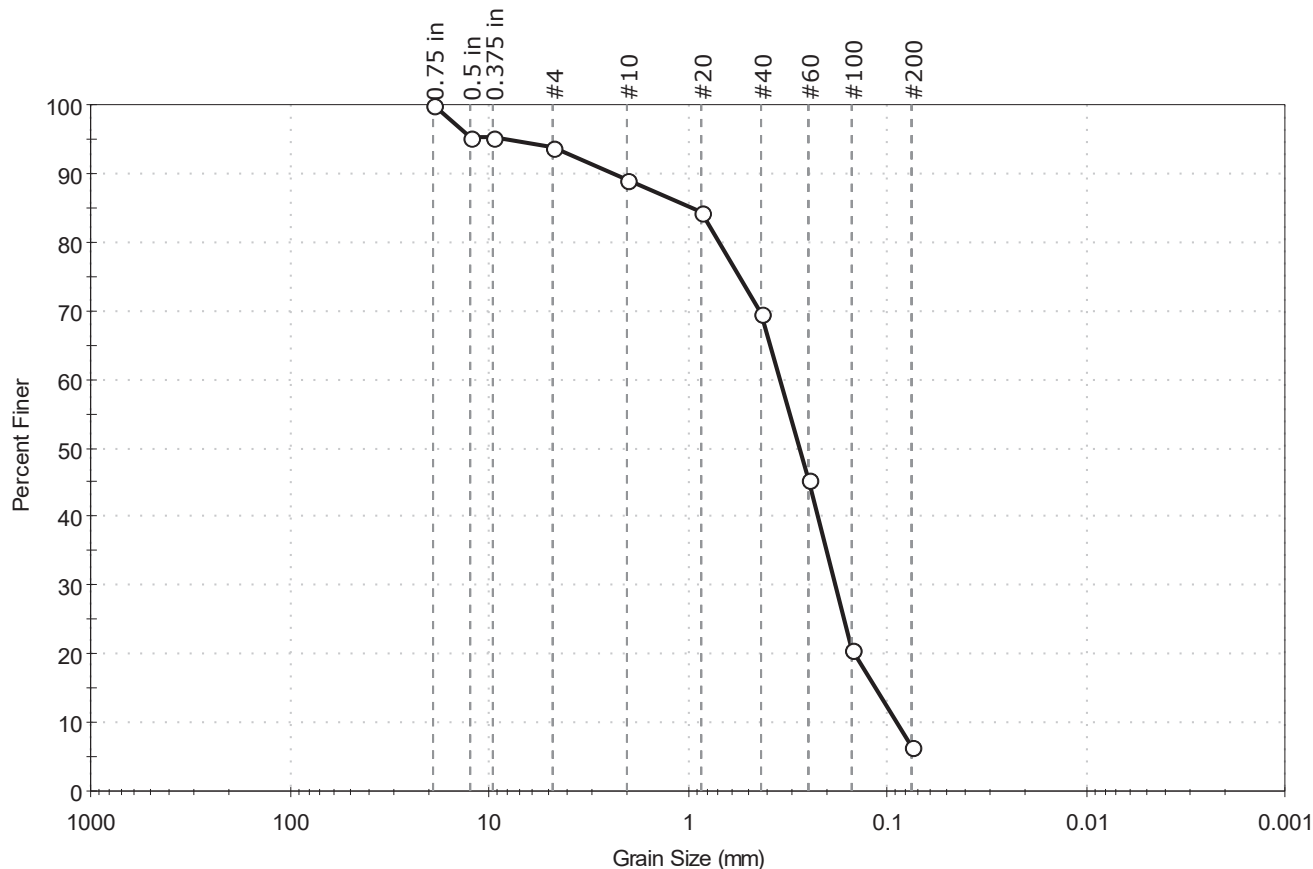
Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Kleinfelder, Inc.	Project No:	GTX-310168
Project:	Rte 32 (Palmer Rd) over Ware River		
Location:	Ware, MA		
Boring ID:	BB-104	Sample Type:	jar
Sample ID:	S-3	Test Date:	06/25/19
Depth :	34-36	Test Id:	510092
Test Comment:	---		
Visual Description:	Moist, olive brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	6.3	87.1	6.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	95		
#4	4.75	94		
#10	2.00	89		
#20	0.85	84		
#40	0.42	70		
#60	0.25	45		
#100	0.15	21		
#200	0.075	6.6		

Coefficients

D ₈₅ =0.9561 mm	D ₃₀ =0.1822 mm
D ₆₀ =0.3441 mm	D ₁₅ =0.1138 mm
D ₅₀ =0.2766 mm	D ₁₀ =0.0887 mm
C _u =3.879	C _c =1.088

Classification

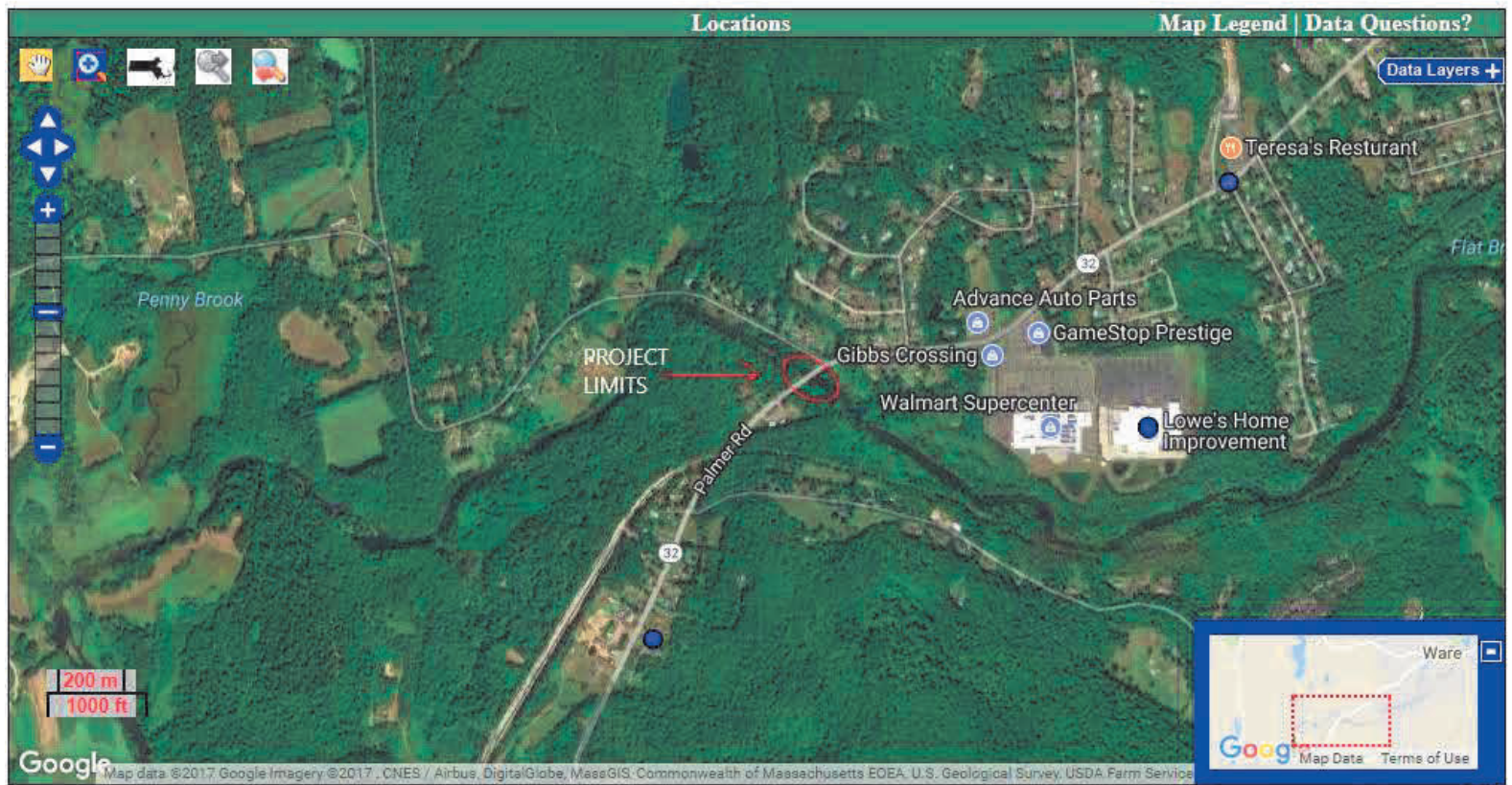
ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Attachment E
Reportable Releases and Waste Sites



● Open Sites ● Closed Sites ● Closed Sites with Use Limitation

The search returned 66 results | Search Keywords >> 'WARE' | Data last updated: 11/09/2017

Page: 1 of 1							Sorted by: RTN			GIS	Previous	Next	
Select	RTN	City/ Town	Release Address	Site Name Location Aid	Reporting Category	Notification Date	Compliance Status	Date	Phase	RAO Class	Chemical type Oil and Hazardous Material	Files	GIS
<input type="checkbox"/>	1-0000218	WARE	20 CUMMINGS ST	LUDLOW SPECIALTY PAPERS FMR	NONE	1987-03-04	RAO	2010-01-29	PHASE V	A2		Files	MAP
<input type="checkbox"/>	1-0000290	WARE	MILNER ST	WARE COUPLING & NIPPLE	NONE	1987-06-08	DEPNFA	1990-07-18			Oil	Files	MAP
<input type="checkbox"/>	1-0000370	WARE	26 WEST ST	GIBBS SERVICE STATION	NONE	1988-01-15	RAO	2001-03-09	PHASE IV	A2		Files	MAP
<input type="checkbox"/>	1-0000441	WARE	300 CUMMINGS ST	KANZAKI PAPER	NONE	1987-06-08	RAO	1996-09-09	PHASE IV	TN	Oil	Files	MAP
<input type="checkbox"/>	1-0000517	WARE	EAST MAIN ST	PROPERTY	NONE	1988-10-15	PENNDS	1996-01-25				Files	MAP
<input type="checkbox"/>	1-0000547	WARE	18 WEST ST	FORMER GIARDS AUTO SERVICE	NONE	1989-01-15	RAO	1997-11-07	PHASE II	A2	Oil	Files	MAP
<input type="checkbox"/>	1-0000643	WARE	208 WEST ST	WARE EQUIPMENT CO	NONE	1989-10-15	RAO	2005-10-31	PHASE IV	B1	Oil	Files	MAP
<input type="checkbox"/>	1-0000718	WARE	105 WEST ST	GERVAIS BUICK	NONE	1990-01-15	RAO	2012-08-22	PHASE IV	A2		Files	MAP
<input type="checkbox"/>	1-0000720	WARE	PALMER RD	PROFILES INC	NONE	1990-01-15	LSPNFA	1994-02-14				Files	MAP
<input type="checkbox"/>	1-0010113	WARE	70 GREENWICH PLAINS RD	AJ DESANTIS TRUCKING	TWO HR	1993-12-08	RAO	1994-03-08			Oil	Files	MAP
<input type="checkbox"/>	1-0010319	WARE	15 BANK ST	NYNEX	72 HR	1994-05-03	RAO	1994-08-31		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0010527	WARE	10 MAPLE ST	QUABBIN WIRE & CABLE CO	TWO HR	1994-09-23	RAO	1994-11-28		A1	Oil	Files	MAP
<input type="checkbox"/>	1-0010632	WARE	16 EAGLE ST	DEMERS RESIDENCE	TWO HR	1994-11-25	RAO	1995-10-11		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0010830	WARE	18 WEST ST	GIBBS OIL STATION	TWO HR	1995-04-21	RAO	1995-06-16		A1	Oil	Files	MAP
<input type="checkbox"/>	1-0011257	WARE	82 MONSON TURNPIKE RD	OAKWOOD MOBILE HOME	TWO HR	1996-02-22	RAO	1996-04-26		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0011708	WARE	100 EAST ST	PETES PACKAGE STORE	120 DY	1997-02-11	RAO	1997-02-11		A2	Hazardous Material	Files	MAP
<input type="checkbox"/>	1-0011960	WARE	60 EAST ST (REAR)	SUPERIOR DISTRIBUTION CO	TWO HR	1997-08-15	RAO	1997-12-24		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0012042	WARE	16 WALNUT ST	STEEL RESIDENCE	TWO HR	1997-10-09	TIERID	2008-07-07			Oil	Files	MAP
<input type="checkbox"/>	1-0012173	WARE	184 WEST ST	CUMBERLAND FARMS STATION	72 HR	1998-01-20	RAO	1998-03-25		A1	Oil	Files	MAP
<input type="checkbox"/>	1-0012575	WARE	85 SOUTH ST	MARY LANE HOSPITAL	120 DY	1998-09-11	RAO	1998-09-11		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0012590	WARE	282 PALMER RD	RESIDENTIAL	TWO HR	1998-09-19	RAO	1998-11-24		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0012653	WARE	60R EAST ST	OPPOSITE KNOX STREET	120 DY	1998-10-23	RAO	1999-02-22	PHASE II	A1	Hazardous Material	Files	MAP
<input type="checkbox"/>	1-0012663	WARE	235 BELCHERTOWN RD	RTE 9	TWO HR	1998-10-29	RAO	1998-12-21		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0013122	WARE	239 WEST ST	WARE MIDDLE SCHOOL	120 DY	1999-09-21	RAO	2000-09-28		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0013200	WARE	239 WEST ST	WARE MIDDLE SCHOOL	TWO HR	1999-11-19	RAO	2000-09-08		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0013283	WARE	77 1/2 PLEASANT ST	RESIDENCE	TWO HR	2000-01-19	RAO	2001-01-26		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0013425	WARE	9 COTTAGE ST	RESIDENCE	TWO HR	2000-05-03	RAO	2003-08-20	PHASE II	A2	Oil	Files	MAP
<input type="checkbox"/>	1-0013850	WARE	1007 C ST	OFF MONSON TURNPIKE ROAD	TWO HR	2001-03-28	RAO	2001-07-30		A2		Files	MAP
<input type="checkbox"/>	1-0013909	WARE	64 PLEASANT ST	MCQUAID RESIDENCE	TWO HR	2001-05-01	RAO	2001-06-21		A2	Oil	Files	MAP
<input type="checkbox"/>	1-0014054	WARE	OLD BLECHERTOWN RD	SANDPIT	TWO HR	2001-07-27	RAO	2005-07-29	PHASE II	A2	Oil	Files	MAP
<input type="checkbox"/>	1-0014100	WARE	EAST MAIN ST	WARE HIST. MILLYARD BLDG. #3	120 DY	2001-09-04	RAO	2001-11-05		B1	Hazardous Material	Files	MAP
<input type="checkbox"/>	1-0014237	WARE	WEST ST	PARCEL ID 56-0-95 (ACROSS FROM 131 WEST)	120 DY	2001-12-07	RAO	2002-08-19		B1	Oil and Hazardous Material	Files	MAP
<input type="checkbox"/>	1-0014358	WARE	113 SCZYGIEL RD	NO LOCATION AID	TWO HR	2002-04-11	RTN CLOSED	2005-05-25	PHASE II		Oil	Files	MAP
<input type="checkbox"/>	1-0014524	WARE	EAST MAIN ST	FORMER WARE MILL YARD BLDG 12	120 DY	2002-08-13	RAO	2004-08-11		B1	Hazardous Material	Files	MAP

1-0014358	WARE	11502 PALMER RD	NO LOCATION AID	TWO HR	2002-04-11	RTN CLOSED	2005-05-25	PHASE II		Oil	Files	MAP
1-0014524	WARE	EAST MAIN ST	FORMER WARE MILL YARD BLDG 12	120 DY	2002-08-13	RAO	2004-08-11		B1	Hazardous Material	Files	MAP
1-0014691	WARE	414 PALMER RD	SINCLAIR RESIDENCE	TWO HR	2003-01-01	RAO	2003-11-12		A2	Hazardous Material	Files	MAP
1-0014950	WARE	JIM ASH RD	CORNER OF JIM ASH ROAD	TWO HR	2003-07-29	RAO	2003-09-26		A2		Files	MAP
1-0015047	WARE	8 SMITH AVE	MESSIER RESIDENCE	72 HR	2003-10-09	RAO	2004-01-12		A2	Oil	Files	MAP
1-0015174	WARE	RTE 32	#408	TWO HR	2004-01-19	RAO	2004-03-19		A2		Files	MAP
1-0015395	WARE	18 SHERWIN ST	NO LOCATION AID	72 HR	2004-08-03	RAO	2006-06-01	PHASE II	A2	Oil	Files	MAP
1-0015790	WARE	84 CHURCH ST	RESIDENTIAL	72 HR	2005-06-07	RAO	2005-06-24		A2	Oil	Files	MAP
1-0015887	WARE	18 WEST ST	HESS STATION 21341	120 DY	2005-08-24	RAO	2009-11-20	PHASE IV	PC	Hazardous Material	Files	MAP
1-0015903	WARE	15 SOUTH ST	AMERICAN ATHLETIC SHOE	120 DY	2005-09-13	RAO	2005-09-13		A2		Files	MAP
1-0016100	WARE	WEST ST	ACROSS FROM INTERSECTION VERNON AND WEST	120 DY	2006-03-06	RAO	2007-06-01		B2	Oil and Hazardous Material	Files	MAP
1-0016259	WARE	20 CUMMINGS ST	KANZAKI SPECIALTY PAPERS	120 DY	2006-07-11	RAO	2006-11-13		A2	Hazardous Material	Files	MAP
1-0016309	WARE	OSBORNE RD	FORMER WARE MACHINE WORKS PROPERTY	120 DY	2006-08-16	RAO	2006-10-23		A2	Oil and Hazardous Material	Files	MAP
1-0016325	WARE	PRENDIVILLE RD	DIRT ROAD	TWO HR	2006-08-29	RAO	2006-09-22		A1	Oil	Files	MAP
1-0016565	WARE	182 WEST ST AND ROBBINS RD	CUMBERLAND FARMS LOCATION	TWO HR	2007-04-02	RAO	2007-06-08		A1	Oil	Files	MAP
1-0017368	WARE	348 PALMER RD	LOWES HARDWARE	TWO HR	2009-02-28	RAO	2009-04-28		A1	Oil	Files	MAP
1-0017859	WARE	57 EAST ST	BOBS SERVICE CENTER	120 DY	2010-05-27	RAO	2010-08-17		B1	Oil	Files	MAP
1-0017892	WARE	MAP#56-PARCEL 142-1	FORMER WARE COAL GASIFICATION FACILITY	120 DY	2010-06-18	TIER1D	2011-06-27				Files	MAP
1-0017912	WARE	39 MAPLE STREET	RESIDENTIAL	TWO HR	2010-07-16	RAO	2010-09-13		A2	Oil	Files	MAP
1-0018158	WARE	312 MONSON TURNPIKE	ROADWAY SPILL	TWO HR	2011-03-11	RAO	2011-03-18		A1	Oil	Files	MAP
1-0018453	WARE	348 PALMER ROAD	LOWES STORE	TWO HR	2011-09-14	RAO	2011-11-14		A1	Oil	Files	MAP
1-0018539	WARE	59 CHESTNUT STREET	GRANLUND RESIDENCE	TWO HR	2011-11-04	RAO	2012-09-10		A2	Oil	Files	MAP
1-0018654	WARE	16 BELLEVUE AVENUE	RESIDENCE	120 DY	2012-11-26	RAO	2013-12-06		A2		Files	MAP
1-0018666	WARE	159 OSBORNE ROAD	RESIDENCE	TWO HR	2012-03-07	PSNC	2014-06-03	PHASE II		Oil	Files	MAP
1-0018752	WARE	198 EAST ST	ABC & D RECYCLING	120 DY	2012-06-05	PSNC	2015-01-07			Oil	Files	MAP
1-0018842	WARE	10 PARK AVENUE	SULLIVAN RESIDENCE	TWO HR	2012-08-23	RAO	2012-10-22		A2	Oil	Files	MAP
1-0019075	WARE	55 JAMES ROAD	RESIDENCE	TWO HR	2013-04-28	RAO	2013-08-16		A1	Oil	Files	MAP
1-0019320	WARE	16 EAST MAIN STREET	COMMERCIAL BUILDING	TWO HR	2014-01-18	TIER 2	2016-04-06	PHASE II		Oil	Files	MAP
1-0019555	WARE	20 CUMMINGS STREET	KANZAKI LOADING DOCK	TWO HR	2014-10-17	PSNC	2014-12-22			Oil	Files	MAP
1-0019762	WARE	348 PALMER ROAD	LOWES	TWO HR	2015-07-10	PSNC	2015-09-04				Files	MAP
1-0019887	WARE	SOUTH STREET	WARE RIVER LOWER DAM	TWO HR	2015-12-27	PSNC	2016-02-22				Files	MAP
1-0020031	WARE	61 CRESCENT ST	RESIDENCE	TWO HR	2016-07-20	PSNC	2016-11-23				Files	MAP
1-0020047	WARE	NORTH AND PLEASANT STREETS	PAVED INTERSECTION	TWO HR	2016-08-08	PSNC	2016-10-06				Files	MAP
1-0020358	WARE	60 EAST STREET	A&R LOGISTICS DISTRIBUTION AND WAREHOUSE	TWO HR	2017-09-11	PSNC	2017-10-06				Files	

Contaminated Sites Research

A search was performed on MassDEP's Searchable Sites website. The following is the URL that was used:

<https://eeaonline.eea.state.ma.us/portal#!/search/wastesite/results?SearchType=All%20Sites&TownName=WARE&Address=PALMER%20RD>

No AULs fall within a 500 feet radius of the site location. The data from the website was reviewed December 16, 2020.

Superfund Sites Research

A search was performed on United States Environmental Protection Agency's "Search for Superfund Sites Where You Live." The following is the URL that was used:

<https://www.epa.gov/superfund/search-superfund-sites-where-you-live>

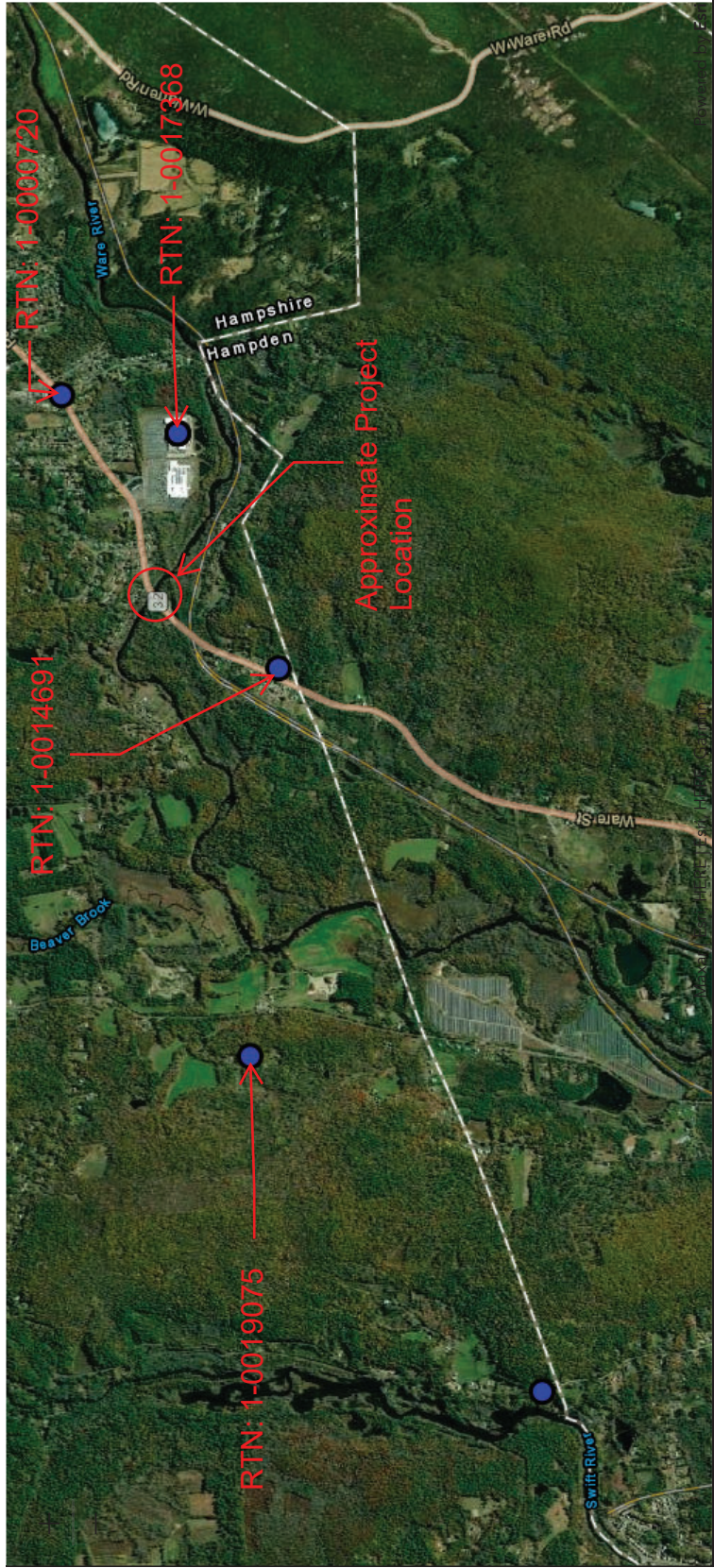
There are no superfund sites located in the Town of Ware. The data from this site is current as of December 16, 2020.



Waste Site & Reportable Releases Results

HIDE MAP

Locations

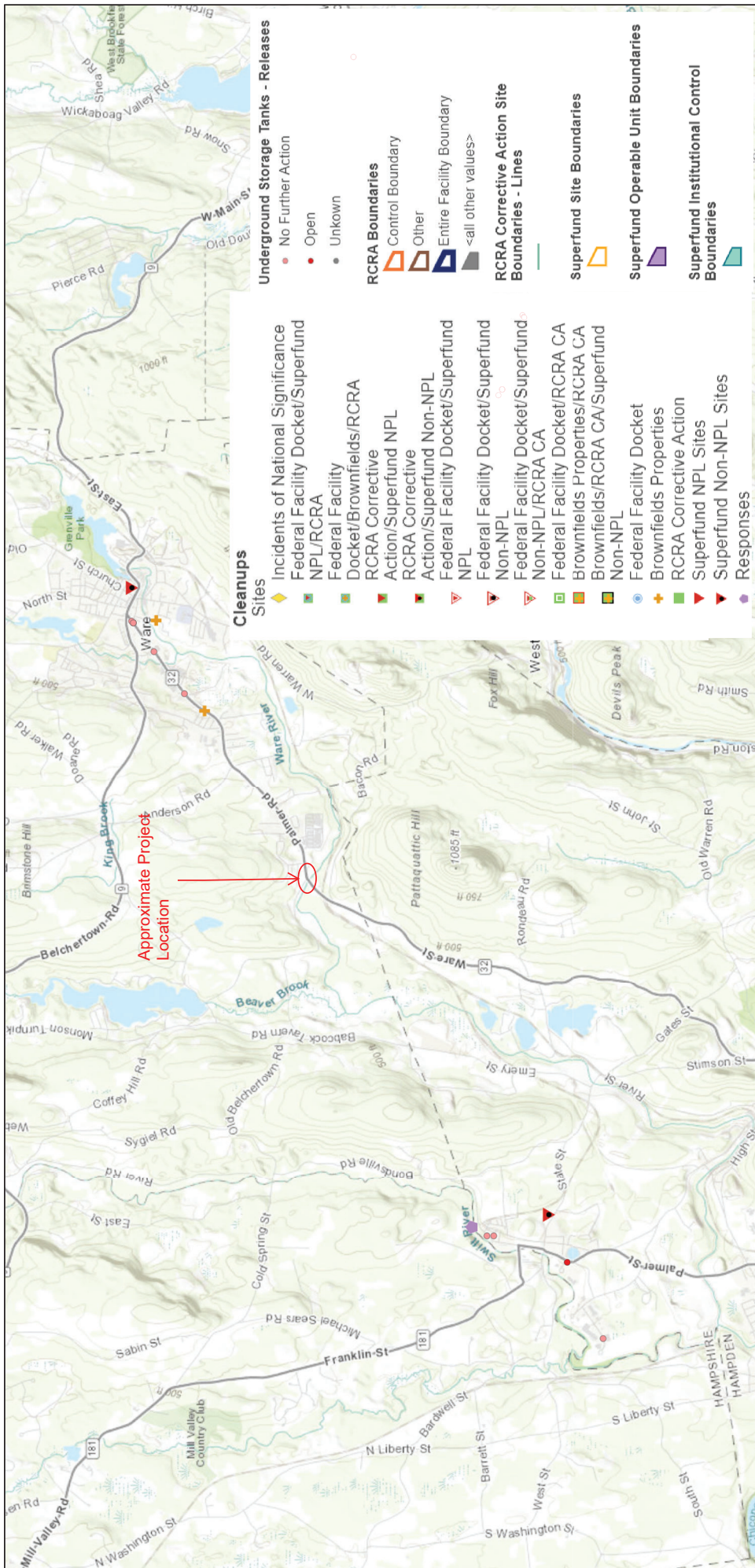


● Open Sites ● Closed Sites ● Closed Sites with Use Limitation

Search Criteria Search Type: All Sites City/Town: WARE

200 1/1 1 - 74 of 74 items

Ware Bridge



August 17, 2022

underGroundStorageTanks Sites

State Outlines

Brownfields Properties

Superfund Non-NPL Sites

Responses

LM Sites

CERCLA/RCRA

D&D

FUSRAP

MED/AEC Legacy Site

NWPA

Nevada Offsites

Plowshare / Vela Uniform

UMTRCA Title I

UMTRCA Title II

Unknown

SiteBoundaries

Cleanups

Sites

Incidents of National Significance

Federal Facility Docket/Superfund

NPL/RCRA

Federal Facility

Docket/Brownfields/RCRA

RCRA Corrective

Action/Superfund NPL

RCRA Corrective

Action/Superfund Non-NPL

Federal Facility Docket/Superfund

NPL

Federal Facility Docket/Superfund

Non-NPL

Federal Facility Docket/Superfund

Non-NPL/RCRA CA

Federal Facility Docket/RCRA CA

Brownfields Properties/RCRA CA

Brownfields/RCRA CA/Superfund

Non-NPL

Federal Facility Docket

Brownfields Properties

RCRA Corrective Action

Superfund NPL Sites

Superfund Non-NPL Sites

Responses

Underground Storage Tanks - Releases

No Further Action

Open

Unknown

RCRA Boundaries

Control Boundary

Other

Entire Facility Boundary

<all other values>

RCRA Corrective Action Site

Boundaries - Lines

Superfund Site Boundaries

Superfund Operable Unit Boundaries

Superfund Institutional Control

Boundaries

1:69,442

0 0.5 1 1.5 2 mi

0 0.75 1.5 3 km

US EPA, MassGIS, Esri Canada, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS, U.S. Department of Energy, Office of Legacy Management

Generated from: Cleanups in My Community. Date above is the EPA CIMC Map

BMP EXHIBIT

DOCUMENT A00870

**MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE
MASSACHUSETTS ENDANGERED SPECIES ACT
(MESA)
CONSERVATION AND MANAGEMENT PERMIT**

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DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

MASS.GOV/MASSWILDLIFE

MASSWILDLIFE

MA ENDANGERED SPECIES ACT (G.L. c.131A) CONSERVATION AND MANAGEMENT PERMIT

DATE	August 3, 2022
CONSERVATION PERMIT NO.:	022-400.DFW
NHESP FILE NO.	21-40400
PERMIT HOLDER	Timothy Dexter MassDOT Highway Division 10 Park Plaza, Suite 4260 Boston, MA 02116
PROJECT	Rt 32 (Palmer Road) Bridge over the Ware River, Bridge Replacement

A. Permit Authority

Pursuant to the authority granted in the Massachusetts Endangered Species Act ("MESA") (G.L. c. 131A) and its implementing regulations (321 CMR 10.23), the Director of the Massachusetts Division of Fisheries & Wildlife (the "Division") hereby issues a Conservation and Management Permit (the "Permit") to MassDOT Highway Division (the "Permit Holder"). This Permit authorizes the Take of the Brook Floater (*Alasmodonta varicosa*), a species state-listed as Endangered, and Creeper (*Strophitus undulatus*), a species state-listed as Special Concern, pursuant to the MESA, arising out of the demolition and replacement of the Route 32 (Palmer Road) Bridge over the Ware River (the "Project") on a ±[3.3] acre site extending 785 feet west of Belchertown Road and 160 feet east of Juniper Hill Road on Route 32 (Palmer Road) and extending 430 feet along Belchertown Road from the intersection with Route 32 (Palmer Road) in the Town of Ware, Massachusetts (Book 14572, Page 198, Hampshire County Registry of Deeds; the "Property").

B. Description of Take

The Division has determined (letter dated 6/14/2022) that the Project, as proposed, will result in a Take of Brook Floater and Creeper through the permanent loss of suitable habitats and interference with the feeding, breeding, over-wintering and migratory activities. Specifically, 5,204 Square Feet of Permanent Impact to Land Under Water and 9,340 Square Feet of Temporary Impact to Land Under Water.

MASSWILDLIFE

C. Permit Performance Standards

Under the authority granted by and in accordance with MGL c131A§3 and 321 CMR 10.23, the Director may permit the Take of a State-listed species for conservation and management purposes provided that there is a long-term Net Benefit to the conservation of the impacted species. If the Director determines that the applicant for a permit has avoided, minimized and mitigated impacts to the State-listed Species consistent with the following performance standards, then the Director may issue a conservation and management permit, provided:

- (a) the applicant has adequately assessed alternatives to both temporary and permanent impacts to State-listed Species;
- (b) an insignificant portion of the local population would be impacted by the Project or Activity, and;
- (c) the applicant agrees to carry out a conservation and management plan that provides a long-term Net Benefit to the conservation of the State-listed Species that has been approved by the Director, as provided in 321 CMR 10.23(5), and shall be carried out by the applicant.

The Director has determined that the applicant for this Permit has met the above noted performance standards and that the conservation and management plan described herein provides a long-term Net Benefit to the conservation of the Brook Floater and Creeper.

D. Conservation and Management Plan

In order to provide a long-term Net Benefit to the conservation of Brook Floater and Creeper, the Permit Holder has proposed, by way of the Permit Application, to: (a) conduct Thirty (30) total hours of additional surveys for Brook Floater and Creeper within pre-approved focus areas agreed upon by MassDOT and the Division; in order to minimize impacts the Permit Holder will (b) have a qualified biologist implement a Division approved mussel protection plan that surveys for, relocates, and monitors state-listed mussel species from within the limits of work.

Therefore, the Project can be permitted pursuant to the MESA. This Permit is issued to condition the Project and to provide a long-term Net Benefit to the Brook Floater and Creeper.

E. Documents and Plans of Records

In accordance with the documents and plans of record submitted to the Division entitled:

- “Conservation and Management Permit Application” (dated 07/26/22; prepared by Timothy Dexter, MassDOT.; the “Permit Application”);
- Massachusetts Department of Transportation Highway Division Permitting Plans For Route 32 (Palmer Road) Over Ware River (Bridge NO. W-05-015) In The Town of Ware Hampshire County Environmental Permitting Plans (dated 05/20/22; prepared by Kleinfelder; the “Project Plan”; Attachment 1);

and any other plans and documents referenced herein (collectively, the “Plans of Record”), this Permit is issued with the following General and Special Conditions:

F. General Conditions

GC 1.	The Permit Holder shall comply with all General and Special Conditions of this Permit and complete the Project consistent with all Division-approved plans and supporting documents referenced herein, except as otherwise approved by the Division in writing.
-------	---

GC 2.		A violation of any General or Special Condition of this Permit will result in an unauthorized Take and may be subject to civil and or criminal penalties pursuant to M.G.L. c. 131A. The Division reserves the right to require an immediate cessation of Work (as defined in Special Condition #1), in whole or in part and at its sole discretion, should the Permit Holder violate any General or Special Condition of this Permit.
GC 3.		The Permit Holder shall submit in writing any documents, plans, reports, or other items required for submission in accordance with this Permit, for review and written approval by the Division, except as otherwise approved by the Division in writing.
GC 4.		Division representatives shall have the right to enter and inspect the Property subject to this Permit at reasonable hours to evaluate Permit compliance and require the submittal of additional, reasonable information not otherwise required by this Permit but deemed necessary by the Division to complete its evaluation.
GC 5.		Any land protected to achieve a long-term Net Benefit associated with this Permit shall remain undeveloped and protected as habitat for State-listed Species in perpetuity.
GC 6.		This Permit shall not preclude the review of future projects on the Property that are subject to the Wetlands Protection Act Regulations (310 CMR 10.37, 10.58(4)(b), 10.59), as applicable, by the Division.
GC 7.		This Permit does not relieve the Permit Holder of the necessity of complying with all applicable federal, state or local statutes, ordinances, bylaws or regulations, including but not limited to those administered by the Town of Ware Conservation Commission and the Massachusetts Department of Environmental Protection.
GC 8.		All Work shall be in conformance with the Plans of Record. Any changes, updates, or revisions to the Project, or any additional work beyond that shown on the Plans of Record, shall require additional review and approval by the Division prior to implementation, pursuant to General Condition #9. This Permit prohibits any work not specifically authorized by this Permit, unless otherwise approved by the Division in writing prior to performing the additional work.
GC 9.		Any proposed change to any plan identified in this Permit, or to the State-listed species conservation and management plan required by way of this Permit, shall require the Permit Holder to inquire of the Division, in writing, whether the change is significant enough to require the filing of a new Conservation and Management Permit Application, and or require additional long-term Net Benefit for affected State-listed Species. The Division retains the right to require the submittal of additional, reasonable information to evaluate the proposed plan change.
GC 10.		This Permit shall apply to, and inure to the benefit of, the Permit Holder and any successor-in-interest of the Permit Holder, or to a subsequent successor-in-control of the Property or portion thereof subject to this Permit should the Permit Holder convey its record ownership of the Property to said successor-in-control, as well as to any contractor or other person performing Work conditioned by this Permit. Within three (3) days of the transfer of an interest in the Property or a portion thereof, any successor-in-interest or subsequent successor-in-control [i.e., subsequent owners or operators] of the Property or a portion thereof shall provide the Division with a letter indicating (1) that the successor is the successor-in-interest of the Permit Holder or the successor-in-control [i.e., current owner or operator] of the Property or a portion thereof, and (2) that said successor will perform the obligations of the Permit Holder as set forth in this Permit.

GC 11.	<p>Prior to the initiation of Work, the Permit Holder shall notify the Division in writing of the name, address, email, business and home telephone numbers of the project supervisor(s) and/or contractor(s) responsible for compliance with this Permit. The Permit Holder shall provide updated information in writing to the Division should new or additional project supervisors and/or contractors be hired after Work has commenced. Prior to the initiation of Work, said project supervisor(s) and/or contractor(s) shall be provided a copy of this Permit. Said project supervisor(s) and/or contractor(s) may be held responsible for violations of this Permit performed by said project supervisor(s) and/or contractor(s).</p>
GC 12.	<p>Prior to the initiation of Work, the text of this Permit shall be recorded by the Permit Holder in the Registry of Deeds or the Land Court for the district in which the Property is located so as to become a record part of the chain of title of the Property. In the case of recorded land, the Permit shall be noted in the Registry's Grantor Index under the name of the owner of the Property upon which the proposed Work is to be done. In the case of registered land, the Permit shall be noted on the Land Court Certificate of Title of the owner of the Property upon which the proposed Work is done. The Permit Holder shall submit to the Division a date-stamped and signed copy of said recorded Permit showing the date and book and page of recording within five (5) business days after recording and/or filing, as applicable. No Work shall be initiated on the Property until the Permit is recorded and said recorded copy is submitted to the Division, except as otherwise approved by the Division in writing.</p>
GC 13.	<p>Prior to the initiation of Work, the Permit Holder shall send a summary report to the Division which: (a) demonstrates compliance with all pre-Work General and Special Conditions of the Permit; and (b) requests permission to initiate the Work authorized by the Permit. Unless otherwise authorized by the Division in writing, no Work may be initiated on the Property until the Permit Holder has received written confirmation from the Division confirming compliance with all pre-Work General and Special Conditions and authorizing the initiation of Work. Within three (3) days of the initiation of Work, the Permit Holder shall send a letter to the Division confirming the date upon which Work commenced.</p>
GC 14.	<p>The Project authorized by this Permit shall be completed within five (5) years from the date of issuance. If needed, the Permit Holder shall submit a written request to the Division for an extension of time to complete said Project, and the Division will review the Project pursuant to MESA for any continuing impacts as described herein and for any new impacts to any State-listed species found subsequent to the issuance date of this Permit. Said request shall be submitted to the Division at least sixty (60) days prior to expiration of this Permit, and shall include a summary report demonstrating compliance with all General and Special Conditions of this Permit.</p>
GC 15.	<p>Within (3) months of the completion of Work the Permit Holder shall submit to the Division a written request for a Certificate of Permit Compliance (the "Certificate"), including as-built plans and other supporting materials demonstrating the completion of Work and compliance with all General and Special Conditions of the Permit.</p> <p>The text of the Division-issued Certificate shall be recorded by the Permit Holder in the Registry of Deeds or the Land Court for the district in which the Property is located so as to become a record part of the chain of title of the Property. Unless an extension is granted in writing by the Division pursuant to General Condition #14, the Permit Holder shall record the Division-issued Certificate prior to expiration of the Permit. The Permit Holder shall submit to the Division a date-stamped and signed copy of said recorded Certificate showing the date and book and page of recording within five (5) business days after recording and or filing, as applicable.</p>

G. Special Conditions:

SC 1.		<u>Work Authorized by the Permit:</u> This Permit authorizes the replacement of the Rt 32 (Palmer Road) Bridge over the Ware River in Ware as shown on the Project Plan (the “Work”; Attachment 1). The Work also includes any other on-site activity required by the Division as a condition of this Permit. All Work shall be confined to the area of the Property within the limits of Work shown on the Project Plan (Attachment 1).
SC 2.		<u>Temporary Demarcation of Limits of Work:</u> Prior to the initiation of Work, the limits of Work shown on the Project Plan (Attachment 1) shall be monumented and marked with temporary flagging, silt fencing, and or other similar visual marker sufficient to clearly delineate the area of the Property within which all Work will occur.
SC 3.		<p><u>State-listed Species Conservation/Research:</u> In order to provide a Net Benefit to the conservation of the State-listed species impacted by this Project, the Permit Holder has proposed, by way of the Permit Application, to conduct thirty (30) hours of additional surveys for Brook Floater and Creeper within pre-approved focus areas that have been identified and agreed upon by MassDOT and the Division.</p> <p>Prior to the start of work, the Division shall review and approve in writing a Brook Floater and Creeper Survey and Reporting Plan and Schedule. Surveys shall be conducted under appropriate conditions and at the direction of the Division. Within 30 days of completion of the surveys a final report shall be submitted to the Division via the Heritage Hub.</p>
SC 4.		<u>Brook Floater and Creeper Protection Plan:</u> Prior to the initiation of Work , the Division shall review and approve in writing a Brook Floater and Creeper Mussel Protection Plan and Schedule (the “Protection Plan”). The Protection Plan will be implemented in order to minimize direct impacts to Brook Floaters and Creepers. Within 30 days of completion of the Protection Plan a final report shall be submitted to the Division via the Heritage Hub.
SC 5.		<u>Construction Staff Education:</u> 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 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, Division-approved wildlife biologist or the Division except as necessary to receive veterinary treatment in the case of harm during construction.
SC 6.		<u>Observations of State-listed Species:</u> The Division shall be notified, in the form of an NHESP Rare Animal or Plant Observation Form, within ten (10) days of the observation of any State-listed species within or outside the limits of Work. Visit https://www.mass.gov/how-to/report-rare-species-vernal-pool-observations for access to observation reporting forms.

H. Notice of Appeal of Rights:

This Permit is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.23. Any person aggrieved by this decision shall have the right to an adjudicatory hearing at the Division pursuant to M.G.L. c. 30A, s.11 in accordance with the procedures for informal hearings set forth in 801 CMR 1.02 and 1.03.

Any notice of claim for an adjudicatory hearing shall be made in writing and be accompanied by a filing fee in the amount of \$500.00. The notice of claim shall be sent to the Division by certified mail, hand delivered or postmarked within twenty-one (21) days of the date of issuance of this Permit to:

Mark S. Tisa, Director
Massachusetts Division of Fisheries and Wildlife
Field Headquarters
One Rabbit Hill Road
Westborough, MA 01581

Any notice of claim for an adjudicatory hearing shall include the following information:

1. The file number for the project;
2. The complete name, address and telephone number of the person filing the request, and the name, address and telephone number of any authorized representative;
3. The specific facts that demonstrate that a party filing a notice of claim satisfies the requirements of an "aggrieved person," including but not limited to (a) how they have a definite interest in the matters in contention within the scope of interests or area of concern of M.G.L. c. 131A or the regulations at 321 CMR 10.00 and (b) have suffered an actual injury which is special and different from that of the public and which has resulted from violation of a duty owed to them by the Division;
4. A clear statement that an adjudicatory hearing is being requested;
5. A clear and concise statement of facts which are grounds for the proceeding, the specific objections to the actions of the Division and the basis for those objections; and the relief sought through the adjudicatory hearing; and a statement that a copy of the request has been sent by certified mail or hand delivered to the applicant and the record owner, if different from the applicant.



Everose Schluter, Assistant Director
Massachusetts Division of Fisheries & Wildlife

On this 3rd day of August, 20 22, before me, the undersigned notary public, personally appeared Everose Schluter, Assistant Director, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.



MELANY CHEESEMAN
Notary Public
Commonwealth of Massachusetts
My Commission Expires
January 24, 2025



Melany Cheeseman, Notary Public
My Commission Expires: January 24, 2025

Conservation and Management Permit 022-400.DFW

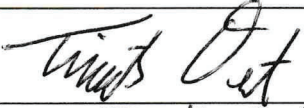
Issued: August 3, 2022

Expires: August 3, 2027

MASSWILDLIFE

Acknowledgement and Acceptance of all Terms of this Permit

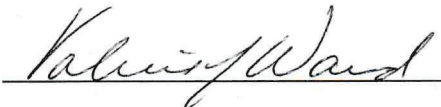
The undersigned below agrees that commencement of any work authorized by and described in this Permit constitutes acknowledgement and acceptance of all terms of this Permit.


Signatory 1 <u>Timothy Dexter</u>
Organization <u>MassDOT Highway Division</u>

COMMONWEALTH OF MASSACHUSETTS

On this 9th day of August, 2022, before me, the undersigned notary public, personally appeared Timothy D. Dexter, proved to me through satisfactory evidence of identification which was NH drivers license to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Notary Public:



SEAL

My Commission Expires: 5-1-24

VALERIE J. WARD, Notary Public
State of New Hampshire
My Commission Expires May 1, 2024

MASSWILDLIFE

Distribution List

Ware Board of Selectmen
Ware Conservation Commission
Ware Planning Board
DEP Western Regional Office, Wetlands Program
Joseph Rogers, DFW CT Valley Wildlife District Office
Joseph Snively, Normandeau Associates

Attachment 1

Massachusetts Department of Transportation Highway Division Permitting Plans For Route 32 (Palmer Road) Over Ware River (Bridge NO. W-05-015) In The Town of Ware Hampshire County Environmental Permitting Plans (dated 05/20/22; prepared by Kleinfelder_); the “Project Plan”

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

PERMITTING PLANS FOR
ROUTE 32 (PALMER ROAD) OVER WARE RIVER
(BRIDGE NO. W-05-015)

IN THE TOWN OF

WARE

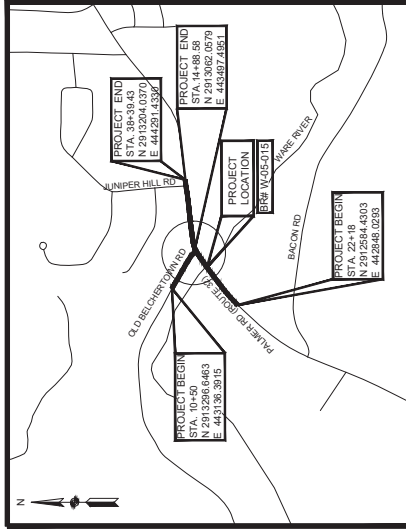
HAMPSHIRE COUNTY

FEDERAL AID PROJECT NO.

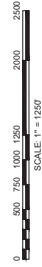
ENVIRONMENTAL PERMITTING PLANS

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND INDEX
2	KEY PLAN, PROFILE, AND LOGIC MAP
3	GENERAL NOTES AND ESTIMATED QUANTITIES
4-8	CONSTRUCTION PLANS
9	PROFILE - PALMER ROAD (ROUTE 32)
10	RIPRAP PLAN AND ELEVATION
11	CHANNEL APPROACH SECTIONS
12	PAVEMENT CONSTRUCTION SECTIONS
13-20	STAGE CONSTRUCTION PLANS
21	ENVIRONMENTAL IMPACT PLAN



LENGTH OF PROJECT = 2,000 FEET = 0.38 MILES



WARE PALMER ROAD (ROUTE 32) OVER WARE RIVER			
DATE	REV	DESCRIPTION	DATE
05/05/2022	1	ISSUED FOR PERMITTING	05/05/2022
PROJECT FILE NO. 605126			

TITLE SHEET

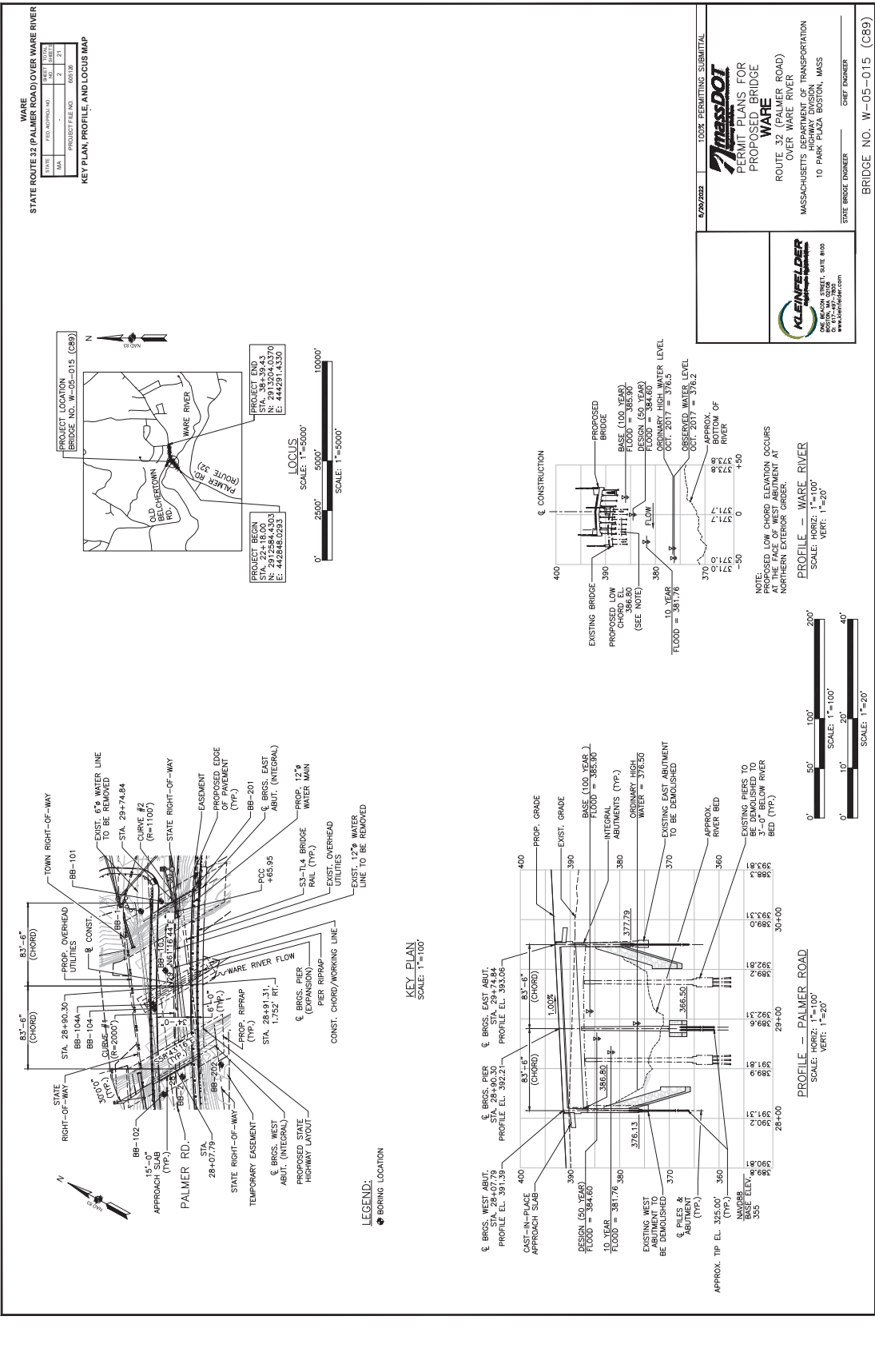
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05/05/2022	ISSUED FOR PERMITTING	2
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05/05/2022	ISSUED FOR PERMITTING	0
05/05/2022	ISSUED FOR PERMITTING	0



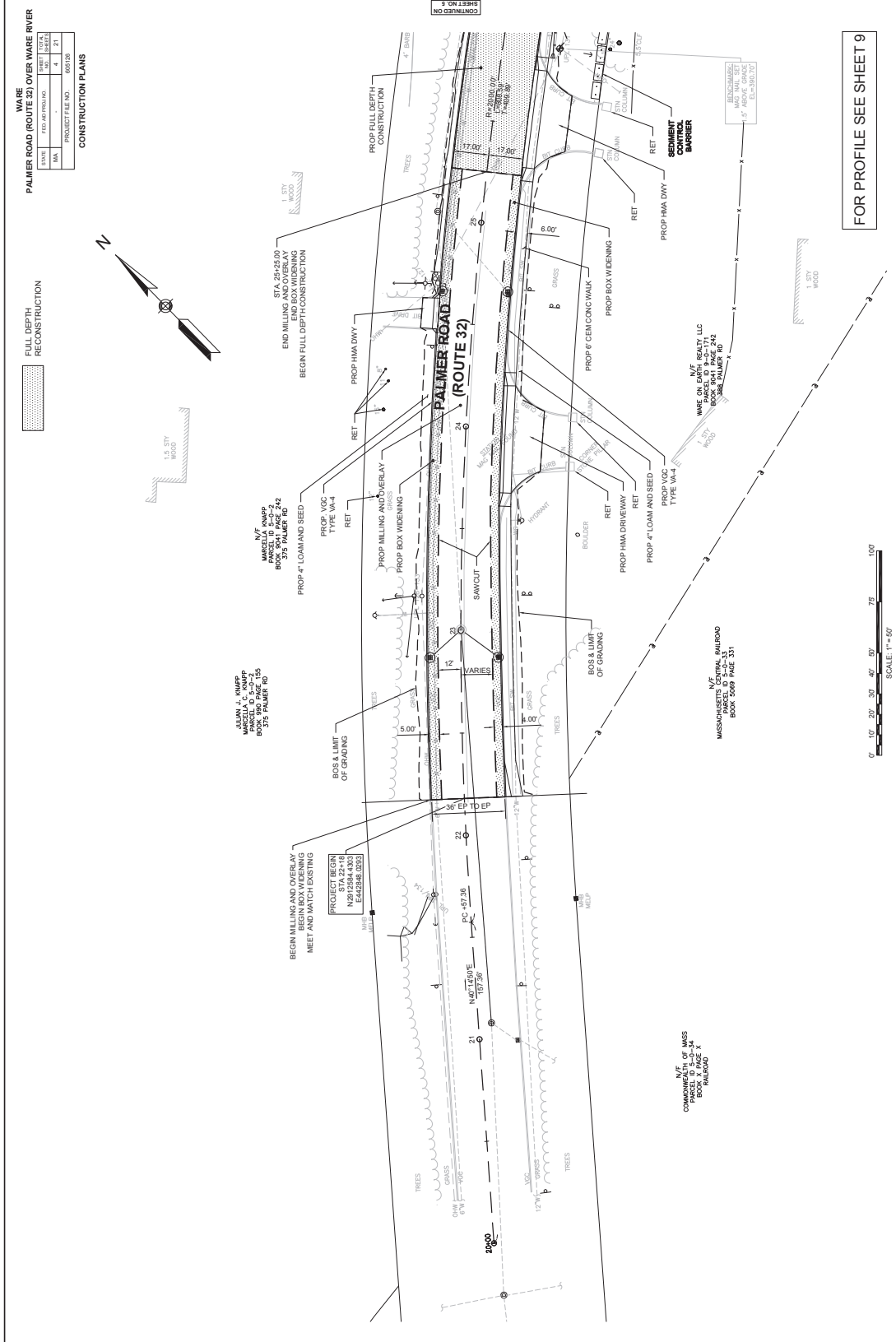
RECOMMENDED FOR APPROVAL

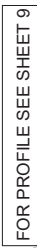
CHIEF ENGINEER _____ DATE _____
APPROVED

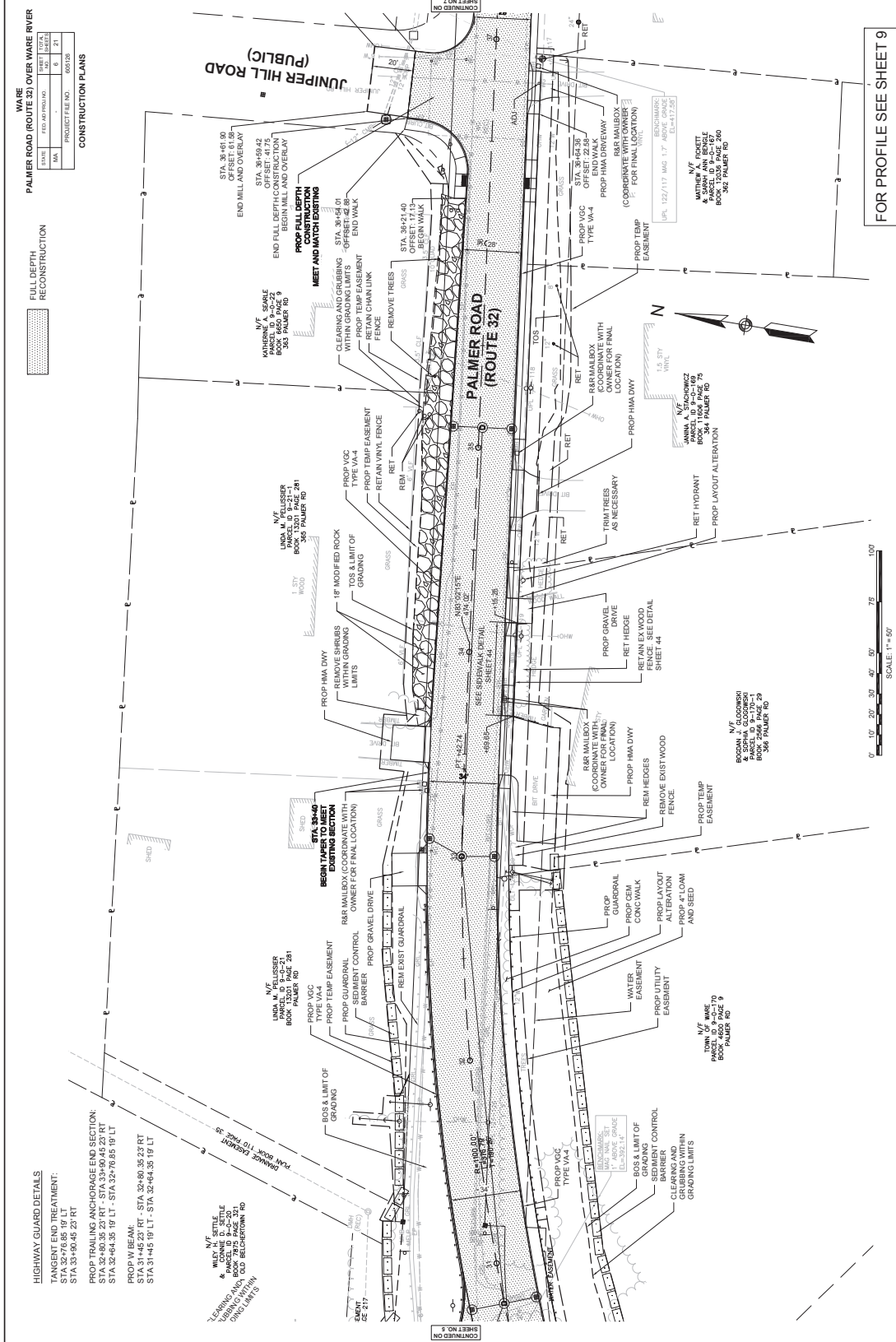
HIGHWAY ADMINISTRATOR _____ DATE _____

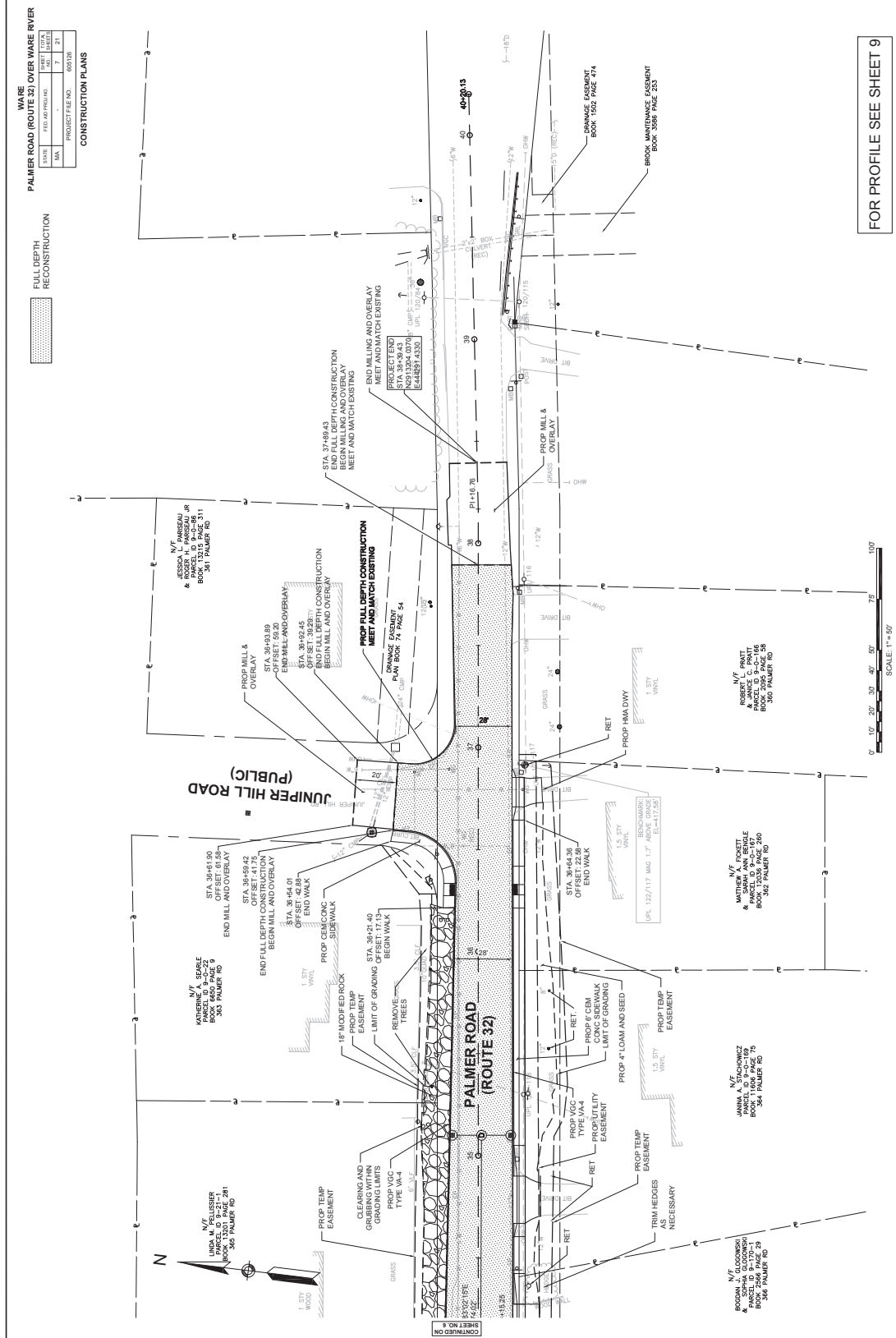


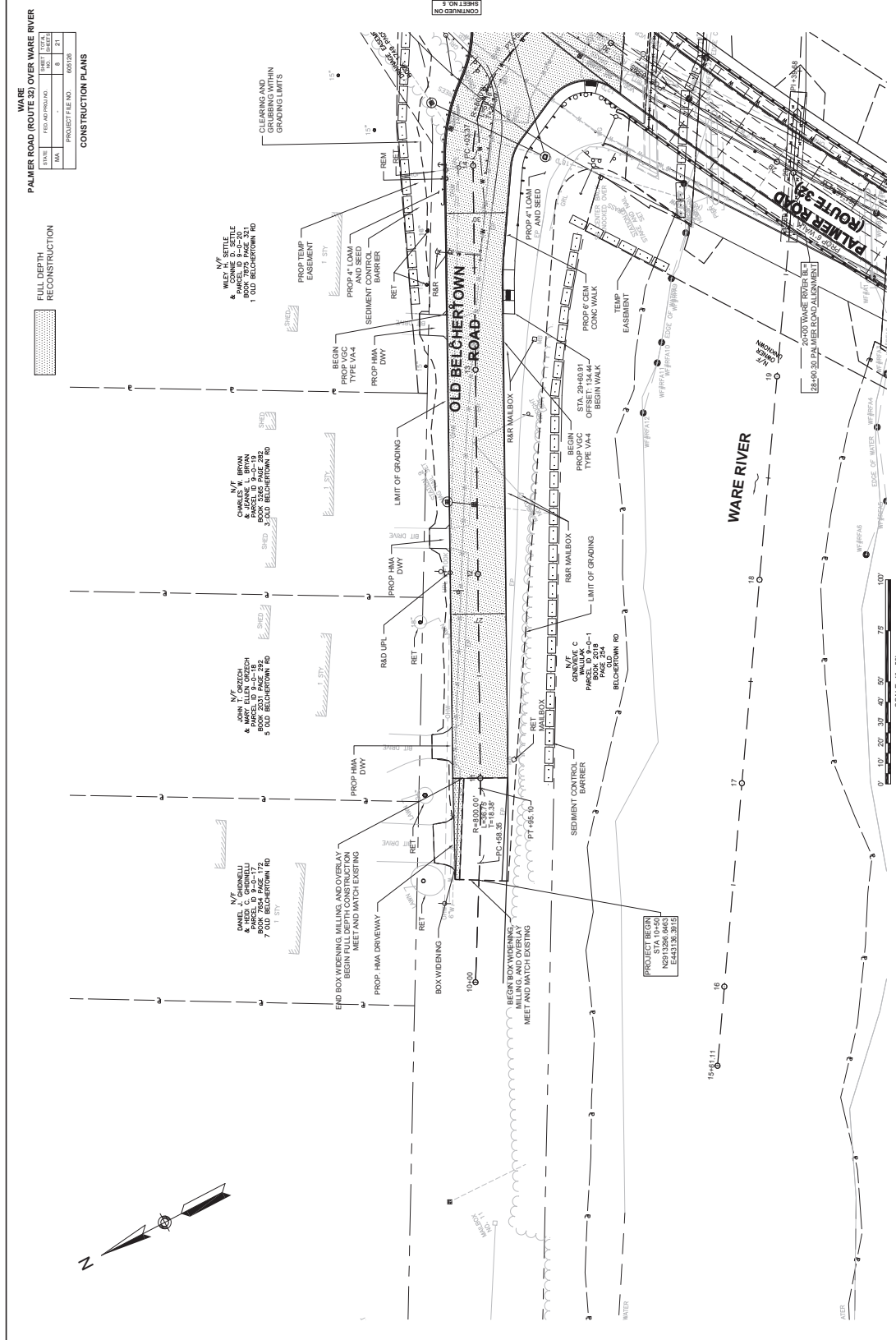
BRIDGE NO. W-05-015 (C89)

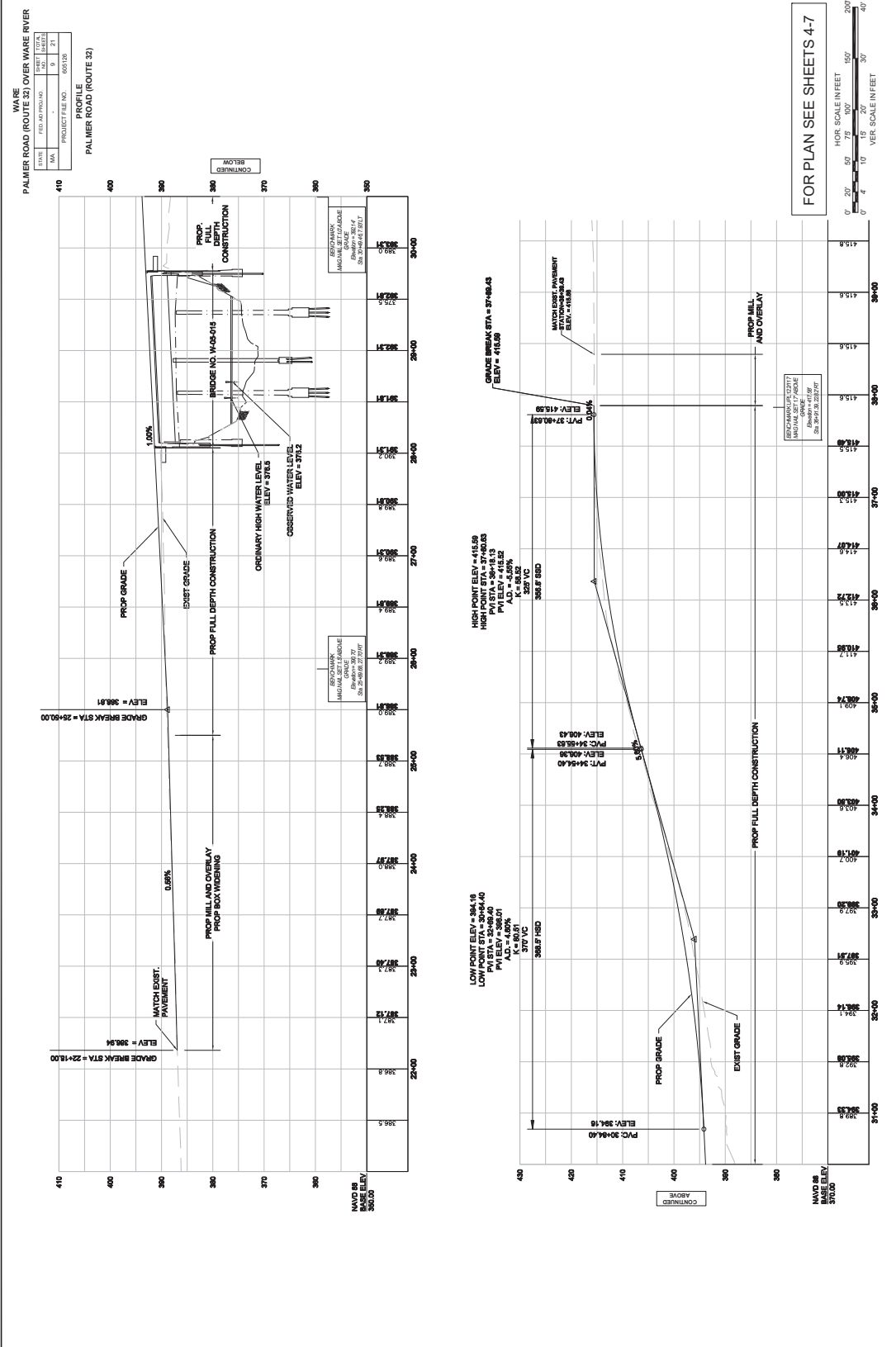


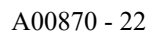








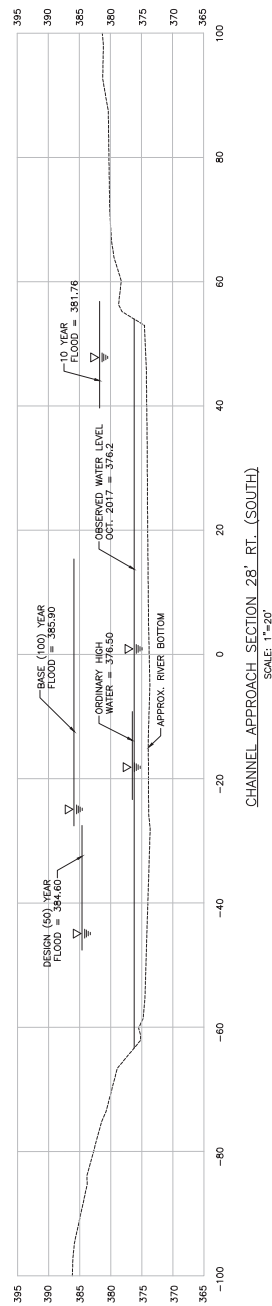
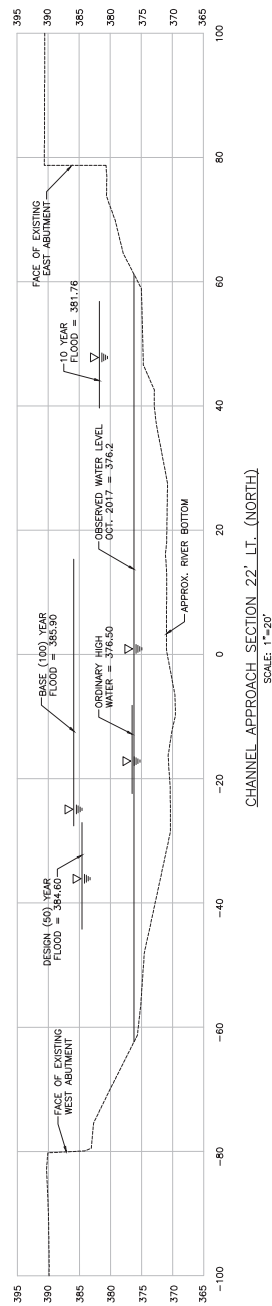




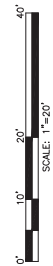
WARE
ROUTE 32 (BAL MED ROAD) OVER WADE DIVID

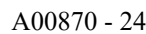
STATE	FED. AID PROJ. NO.	SHEET NO.	TO TAL SHEETS
MA	.	11	21
PROJECT FILE NO.			605 D6

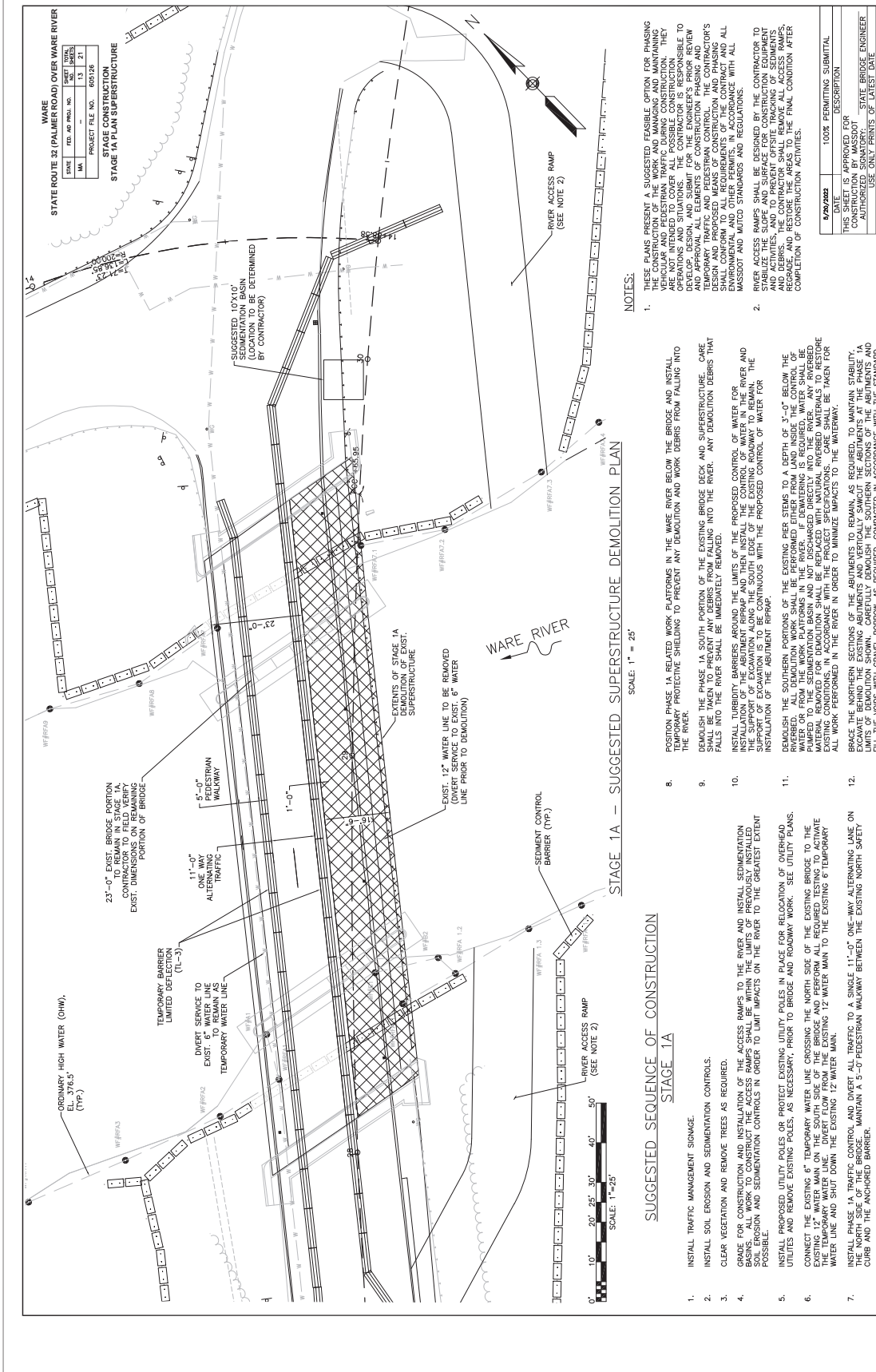
CHANNEL APPROACH SECTIONS

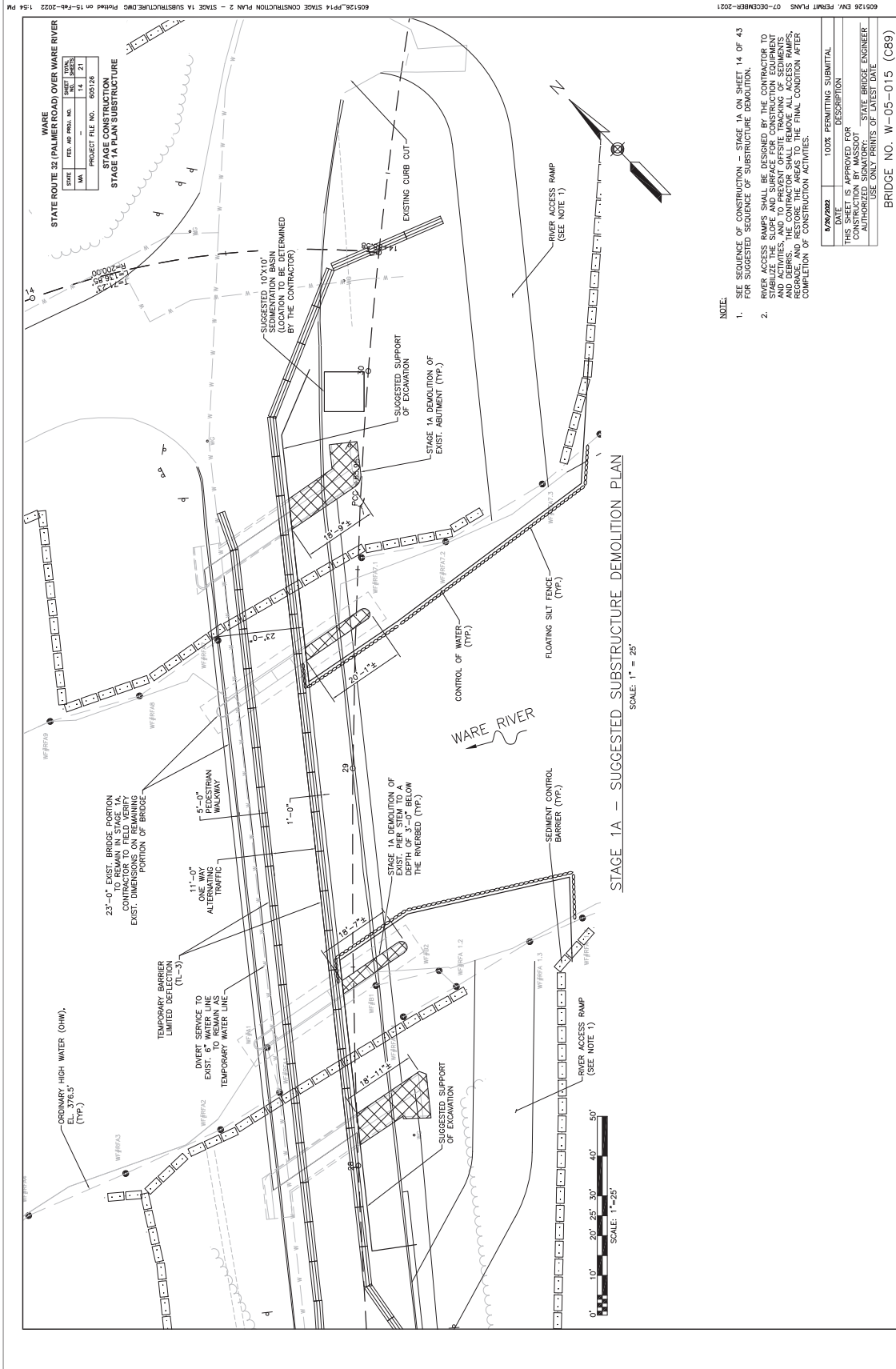


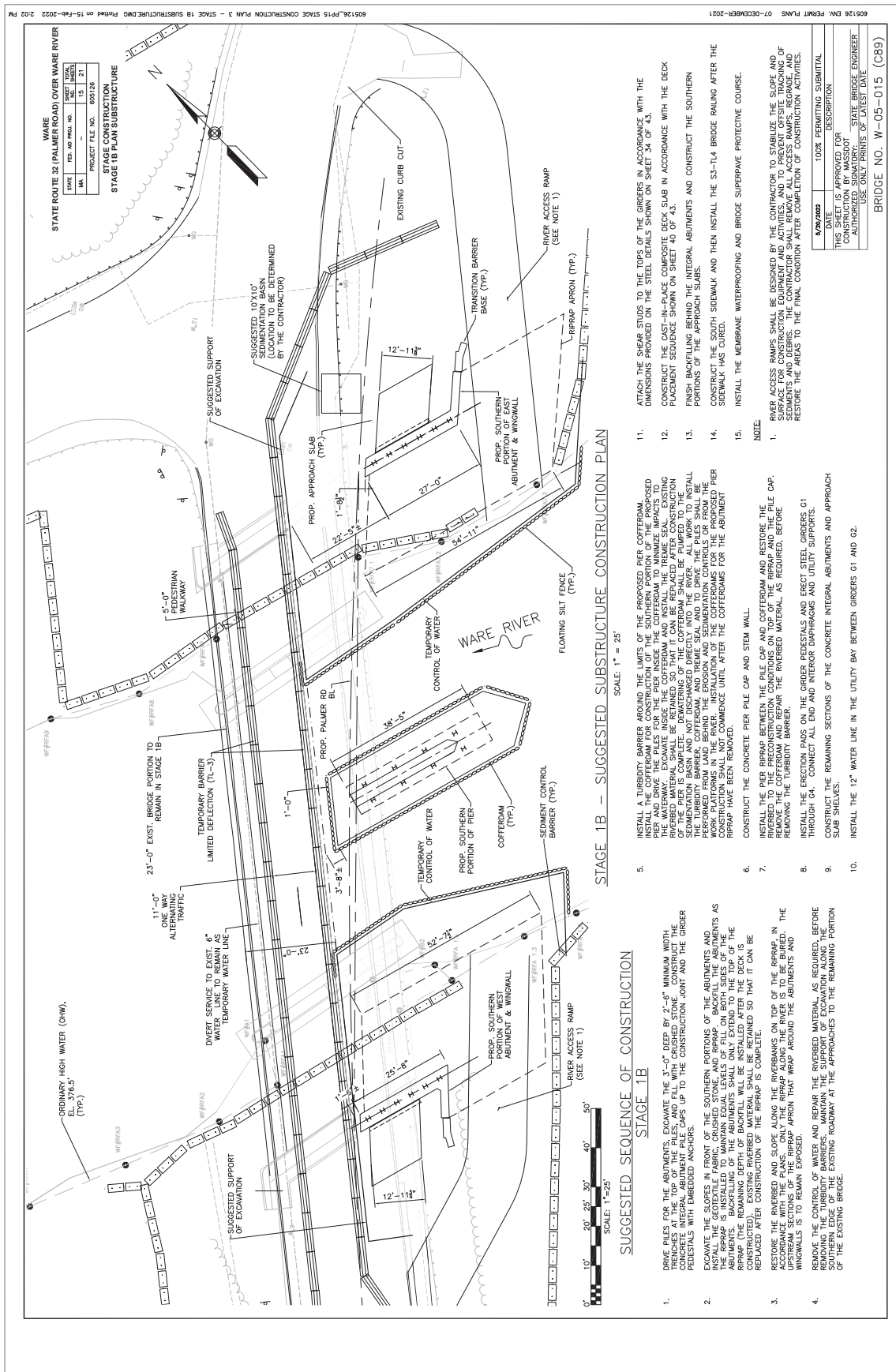
1/7/2022	100% PERMITTING SUBMITTAL
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT	
AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	
BRIDGE NO. W-05-015 (C89)	

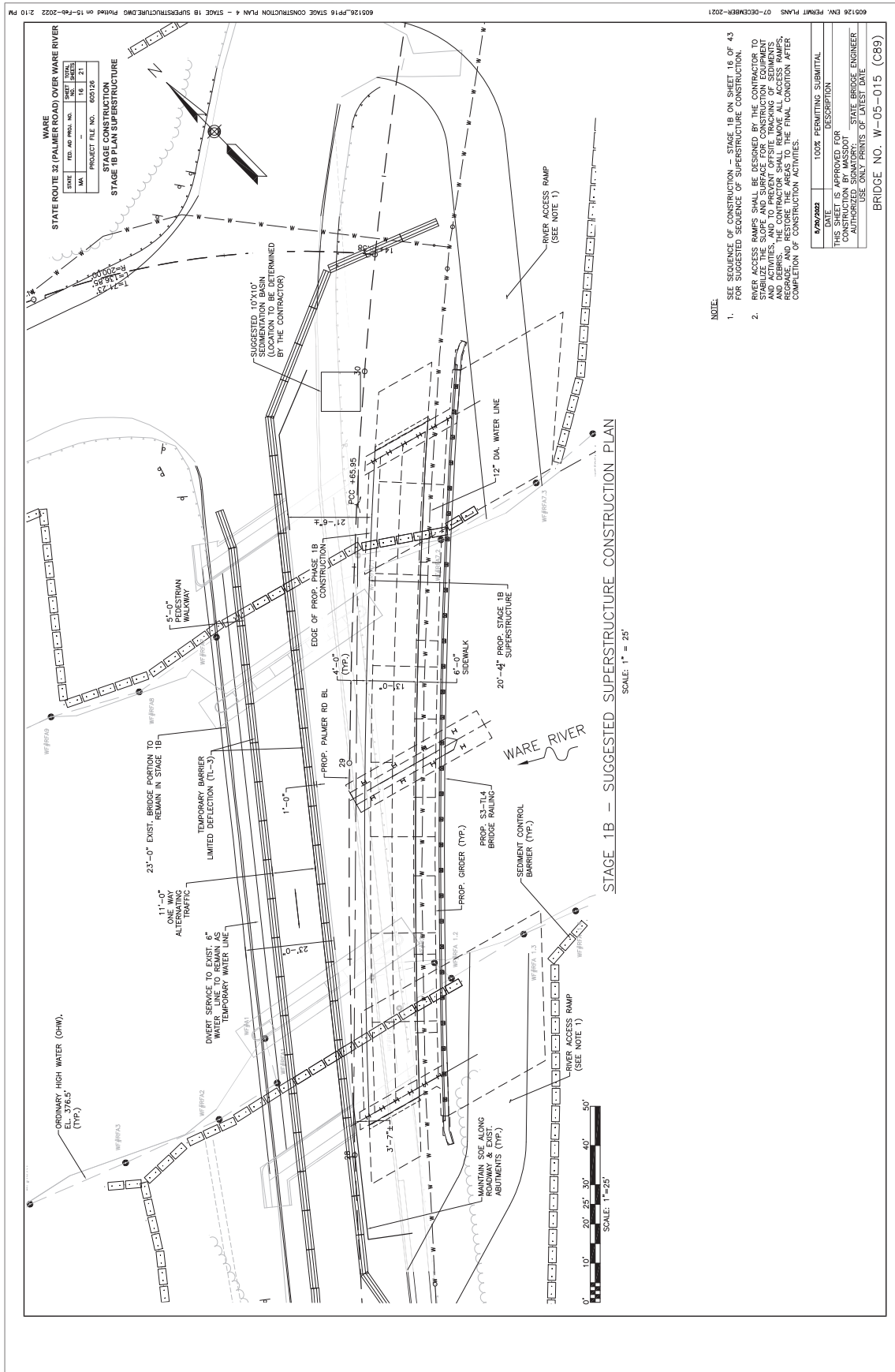


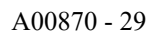




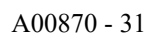


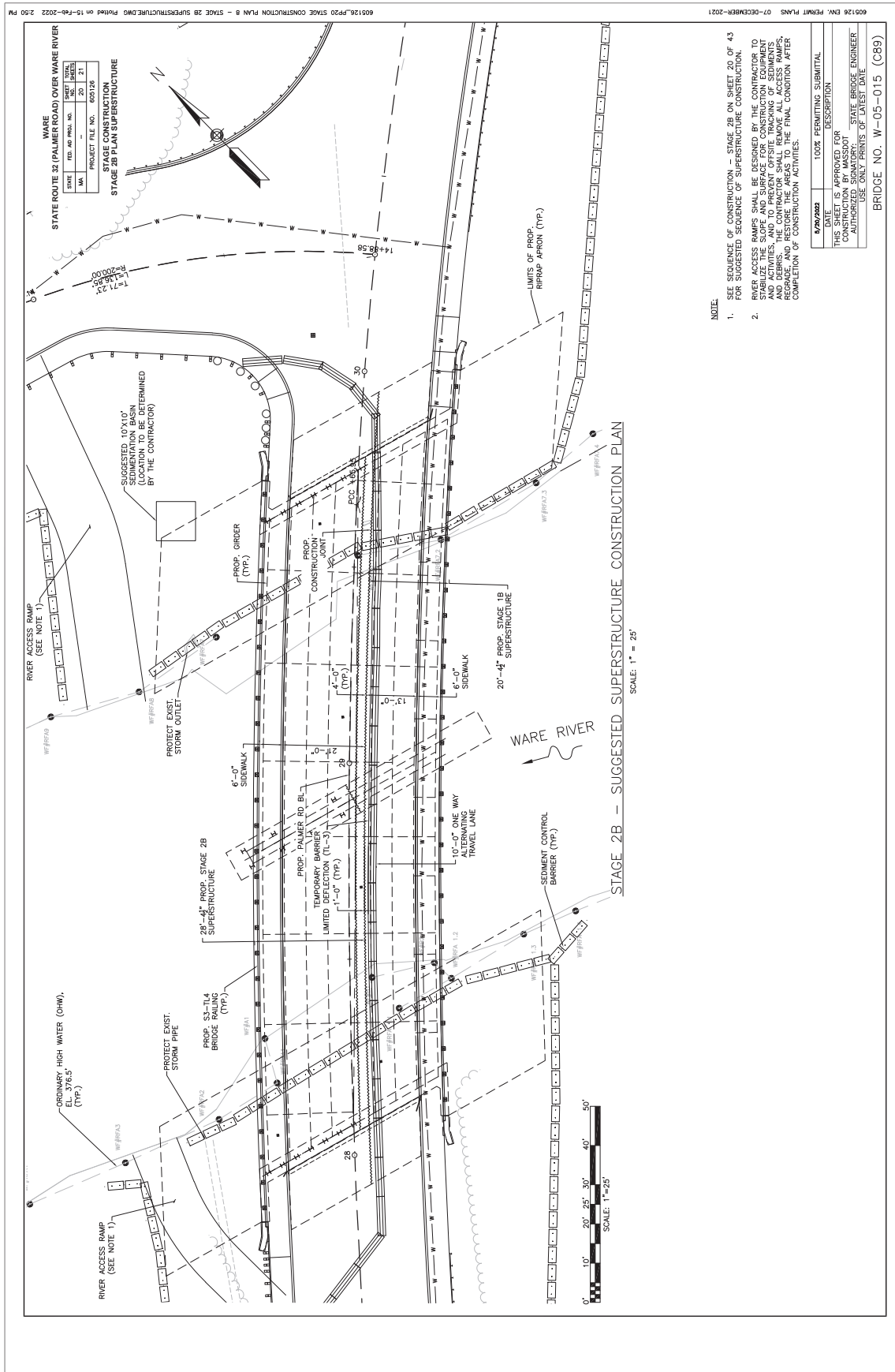


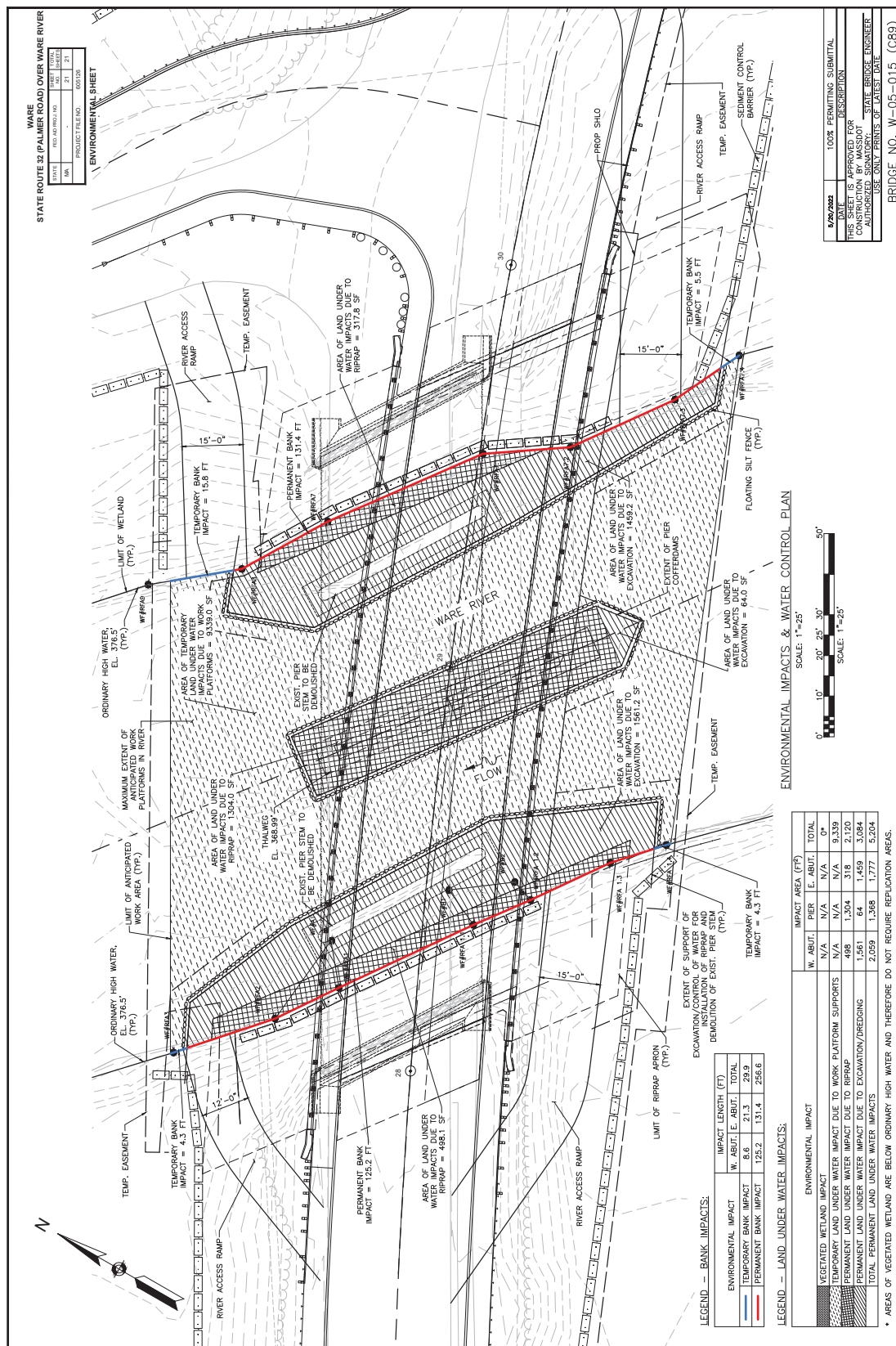












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DOCUMENT A00871

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
(USFWS – NLAA)

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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:

June 01, 2022

Project code: 2022-0028898

Project Name: 605126 WARE- BRIDGE REPLACEMENT, W-05-015, ROUTE 32 (PALMER ROAD) OVER THE WARE RIVER

Subject: Concurrence verification letter for the '605126 WARE- BRIDGE REPLACEMENT, W-05-015, ROUTE 32 (PALMER ROAD) OVER THE WARE RIVER' project under the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated June 01, 2022 to verify that the **605126 WARE- BRIDGE REPLACEMENT, W-05-015, ROUTE 32 (PALMER ROAD) OVER THE WARE RIVER** (Proposed Action) may rely on the concurrence provided in the February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion 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, and may affect, but is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the threatened Northern long-eared bat (*Myotis septentrionalis*). Consultation with the 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.

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 assessments failed to detect Indiana bats, but you later detect bats 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. In these instances, potential incidental take of Indiana bats may be exempted 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. 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

605126 WARE- BRIDGE REPLACEMENT, W-05-015, ROUTE 32 (PALMER ROAD)
OVER THE WARE RIVER

Description

605126 WARE- BRIDGE REPLACEMENT, W-05-015, ROUTE 32 (PALMER ROAD)
OVER THE WARE RIVER

The work for the Route 32 over Ware River bridge shall consist of reconstructing the bridge and approach wearing surface; reconstructing the reinforced concrete deck slab; upgrading the bridge rail; upgrading the approach guard rail; replacing the existing drainage system at the bridge; removing the deteriorated insulation around the water pipe and securing the pipe from moving sideways; cleaning the rust and adding plates for the section losses on the beams; replacing the existing bearings as it is required per field verification; repairing the existing substructure; cleaning and painting the structural steel.

Monarch Butterfly: Candidate Species only, no conservation measures at this time.

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 threatened 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 revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion 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

- 605126_ Ware_Bat Report_VHB_2021.pdf <https://ipac.ecosphere.fws.gov/project/JSTPID7CWVDG3CPHZ57Z7N5ROQ/projectDocuments/111789573>

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?

Yes

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.

No

27. Is the bridge **within** a known maternity colony's home range^[1]?

[1] Contact your local FWS office for more information if you are uncertain about where the nearest known maternity colony is located.

No

28. Have presence/probable absence (P/A) summer surveys^{[1][2]} been conducted for this project with at least one survey point **within** suitable habitat and **within** 0.25 miles of the bridge^{[3][4]}?

[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, P/A summer surveys were conducted within 0.25 miles of the bridge

SUBMITTED DOCUMENTS

- 605126_ Ware_Bat Report_VHB_2021.pdf <https://ipac.ecosphere.fws.gov/project/JSTPID7CWVDG3CPHZ57Z7N5ROQ/projectDocuments/111789573>

29. 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, Indiana bats and/or NLEBs were not detected during the P/A surveys

30. Did the local Service Field Office verify^[1] that this presence/probable absence (P/A) summer survey can be used for determining Indiana bat and/or NLEB absence from the bridge?

[1] Coordination with local US Fish and Wildlife Service Field Office regarding the applicability of P/A surveys for this use is required.

Yes, the local FWS office confirmed that this P/A survey can be used to assume Indiana bats and/or NLEBs are absent from the bridge

31. Will the bridge removal, replacement, and/or maintenance activities include installing new or replacing existing **permanent** lighting?

Yes

32. 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

33. 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

34. 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

35. Will the project install *any* new or replace any existing **permanent** 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

36. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **permanent** 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 installed or replaced?

Yes

37. 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

38. 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

39. 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

40. 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

41. Will the project raise the road profile **above the tree canopy**?

No

42. 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.

43. 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.

44. 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

45. 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.

46. 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

47. **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:

The new bridge will consist of a two-span continuous steel girder with conventional cast in place composite concrete slab deck superstructure, with integral abutments and a center wall pier. The proposed bridge will have a 167-foot chord length. Both abutments and pier will be supported on steel H-pile foundation. On the new bridge, the lane, shoulder, and sidewalk widths will be slightly adjusted as required for the NHS roadways which includes a 48'-9" wide structure to accommodate a total roadway width of 34'-0" curb to curb. The S3-TL4 bridge railing will be provided on both sides of the bridge. The two existing piers are to be removed to three feet below the riverbed. The removal and installation of the bridge piers will be completed once the contractor-designed cofferdam sheeting is installed for control of water. The use of a backhoe, dragline or similar equipment is expected to be used. A barge is expected to aid in providing access to the bridge for excavation and mechanical means. The barge will be supported on spuds in the riverbed, as needed, for stabilization.

Two 11'-0" vehicular lanes with 6'-0" shoulders on each side and 6'-0" wide sidewalks on the north and south sides of the bridge are proposed. Roadway surface conditions and drainage and utility lines will also be improved as part of the project. Existing drainage patterns will remain. Drainage structures and associated piping will be added to the two existing drainage systems within the project area. Stormwater within the systems will discharge to a deep sump catch basin prior to discharging into the Ware River. The proposed drainage systems will contain deep sump catch basins to provide stormwater treatment to help minimize the amount of untreated stormwater entering the Ware River. The new bridge will not have scuppers but stormwater will be collected in catch basins

located to the east of the bridge. The new bridge will have new clearances over the Ware River due to the roadway superelevation transition at the northeast; the exterior girder will be the controlling location for the vertical clearance change.

5. Please state the timing of all proposed bridge work:

Fall 2022-Winter 2026

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 March 22, 2022. 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 threatened **Northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's [February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion 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: Hana Isihara

Address: 10 Park Plaza

City: Boston

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Phone: 6178964454

Lead Agency Contact Information

Lead Agency: Federal Highway Administration

DOCUMENT B00420

PROPOSAL

WAREFor: **Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the Town of WARE in Hampshire 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:

Route 32 (Palmer Road)**Beginning – Station 22+18.00 +/-****Ending –Station 38+39.43 +/-**

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 **1620 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 # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
100.	1	SCHEDULE OF OPERATIONS - FIXED PRICE \$67500 AT Sixty Seven Thousand Five Hundred Dollars LUMP SUM	\$67,500.00	\$67,500.00
101.	1	CLEARING AND GRUBBING AT _____ PER ACRE		
114.1	1	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. W-05-015 AT _____ LUMP SUM		
120.	5,440	EARTH EXCAVATION AT _____ PER CUBIC YARD		
121.	50	CLASS A ROCK EXCAVATION AT _____ PER CUBIC YARD		
127.1	550	REINFORCED CONCRETE EXCAVATION AT _____ PER CUBIC YARD		
127.4	43	REINFORCED CONCRETE DECK EXCAVATION (FULL DEPTH) AT _____ PER SQUARE YARD		
127.41	5	REINFORCED CONCRETE DECK EXCAVATION (PARTIAL DEPTH) AT _____ PER CUBIC YARD		
129.6	283	BRIDGE PAVEMENT EXCAVATION AT _____ PER SQUARE YARD		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
140.	1,910	BRIDGE EXCAVATION AT _____ PER CUBIC YARD		
140.1	840	BRIDGE EXCAVATION WITHIN COFFERDAM AT _____ PER CUBIC YARD		
141.1	100	TEST PIT FOR EXPLORATION AT _____ PER CUBIC YARD		
142.	50	CLASS B TRENCH EXCAVATION AT _____ PER CUBIC YARD		
144.	140	CLASS B ROCK EXCAVATION AT _____ PER CUBIC YARD		
145.	7	DRAINAGE STRUCTURE ABANDONED AT _____ EACH		
146.	2	DRAINAGE STRUCTURE REMOVED AT _____ EACH		
150.	1,270	ORDINARY BORROW AT _____ PER CUBIC YARD		
151.	2,001	GRAVEL BORROW AT _____ PER CUBIC YARD		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
151.1	900	GRAVEL BORROW FOR BRIDGE FOUNDATION AT _____ PER CUBIC YARD		
153.	2	CONTROLLED DENSITY FILL - EXCAVATABLE AT _____ PER CUBIC YARD		
156.01	60	CRUSHED STONE FOR INTEGRAL ABUTMENTS AT _____ PER TON		
156.1	20	CRUSHED STONE FOR BRIDGE FOUNDATIONS AT _____ PER TON		
156.5	300	CRUSHED STONE FOR FILTER BLANKET AT _____ PER CUBIC YARD		
157.1	3	GABIONS AT _____ PER CUBIC YARD		
170.	8,845	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ PER SQUARE YARD		
180.01	1	ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AT _____ LUMP SUM		
180.02	100	PERSONAL PROTECTION LEVEL C UPGRADE AT _____ PER HOUR		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
182.1	1	INSPECTION AND TESTING FOR ASBESTOS AT _____ LUMP SUM		
182.2	500	REMOVAL OF ASBESTOS AT _____ PER FOOT		
184.1	2	DISPOSAL OF TREATED WOOD PRODUCTS AT _____ PER TON		
191.	4	DRIVE SAMPLE BORING AT _____ PER FOOT		
201.	14	CATCH BASIN AT _____ EACH		
202.	4	MANHOLE AT _____ EACH		
202.2	2	MANHOLE (9 TO 14 FOOT DEPTH) AT _____ EACH		
204.	1	GUTTER INLET AT _____ EACH		
208.	2	DROP INLET, TYPE C AT _____ EACH		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
220.	3	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH		
221.1	5	FRAME AND COVER - SECURED AT _____ EACH		
222.1	14	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		
222.2	1	FRAME AND GRATE - MASSDOT DROP INLET AT _____ EACH		
223.2	2	FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED AT _____ EACH		
227.3	3	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT AT _____ PER CUBIC YARD		
227.31	565	REMOVAL OF DRAINAGE PIPE SEDIMENT AT _____ PER FOOT		
234.08	44	8 INCH DRAINAGE PIPE - OPTION AT _____ PER FOOT		
234.12	626	12 INCH DRAINAGE PIPE - OPTION AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
234.18	80	18 INCH DRAINAGE PIPE - OPTION AT _____ PER FOOT		
258.	4	STONE FOR PIPE ENDS AT _____ PER SQUARE YARD		
302.06	50	6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) AT _____ PER FOOT		
302.08	150	8 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) AT _____ PER FOOT		
302.12	410	12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) AT _____ PER FOOT		
309.	3,150	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
315.06	250	6 INCH WATER MAIN REMOVED AND STACKED AT _____ PER FOOT		
315.12	250	12 INCH WATER MAIN REMOVED AND STACKED AT _____ PER FOOT		
336.2	170	1-INCH CTS PLASTIC WATER SERVICE LINE AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
349.06	1	6 INCH GATE VALVE AT _____ EACH		
350.06	1	6 INCH GATE AND GATE BOX AT _____ EACH		
350.08	2	8 INCH GATE AND GATE BOX AT _____ EACH		
350.12	5	12 INCH GATE AND GATE BOX AT _____ EACH		
355.06	3	6 INCH GATE AND GATE BOX REMOVED AND STACKED AT _____ EACH		
355.12	2	12 INCH GATE AND GATE BOX REMOVED AND STACKED AT _____ EACH		
373.12	408	12 INCH WATER PIPE INSULATION AT _____ PER FOOT		
376.	1	HYDRANT AT _____ EACH		
376.3	1	HYDRANT - REMOVED AND STACKED AT _____ EACH		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
381.2	5	SERVICE BOX REMOVED AND STACKED AT _____ EACH		
384.	5	CURB STOP AT _____ EACH		
402.1	600	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER TON		
415.2	1,220	PAVEMENT FINE MILLING AT _____ PER SQUARE YARD		
431.	330	HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE AT _____ PER SQUARE YARD		
440.	17,070	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL AT _____ PER POUND		
443.	20	WATER FOR ROADWAY DUST CONTROL AT _____ PER 1000 GALLONS		
450.231	660	SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) AT _____ PER TON		
450.32	560	SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) AT _____ PER TON		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
450.42	1,610	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		
450.61	60	SUPERPAVE BRIDGE SURFACE COURSE - 12.5 (SSC-B - 12.5) AT _____ PER TON		
450.71	88	SUPERPAVE BRIDGE PROTECTIVE COURSE – 12.5 (SPC-B - 12.5) AT _____ PER TON		
451.	50	HMA FOR PATCHING AT _____ PER TON		
452.	1,080	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
453.	2,130	HMA JOINT ADHESIVE AT _____ PER FOOT		
472.	50	TEMPORARY ASPHALT PATCHING AT _____ PER TON		
482.5	870	SAWCUTTING ASPHALT PAVEMENT FOR BOX WIDENING AT _____ PER FOOT		
504.	1,920	GRANITE CURB TYPE VA4 - STRAIGHT AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
504.1	180	GRANITE CURB TYPE VA4 - CURVED AT _____ PER FOOT		
509.	50	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT AT _____ PER FOOT		
509.1	30	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - CURVED AT _____ PER FOOT		
514.	11	GRANITE CURB INLET - STRAIGHT AT _____ EACH		
516.	7	GRANITE CURB CORNER TYPE A AT _____ EACH		
580.	400	CURB REMOVED AND RESET AT _____ PER FOOT		
594.	600	CURB REMOVED AND DISCARDED AT _____ PER FOOT		
620.13	660	GUARDRAIL, TL-3 (SINGLE FACED) AT _____ PER FOOT		
620.33	20	GUARDRAIL - CURVED, TL-3 (SINGLE FACED) AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
627.83	6	GUARDRAIL TANGENT END TREATMENT, TL-3 AT _____ EACH		
628.24	3	TRANSITION TO BRIDGE RAIL AT _____ EACH		
628.26	1	MODIFIED TRANSITION TO BRIDGE RAIL AT _____ LUMP SUM		
628.315	13	TEMPORARY IMPACT ATTENUATOR, REDIRECTIVE, TL-3 AT _____ EACH		
628.4	11	TEMPORARY IMPACT ATTENUATOR, REMOVED AND RESET AT _____ EACH		
630.2	1,200	HIGHWAY GUARD REMOVED AND DISCARDED AT _____ PER FOOT		
657.	255	TEMPORARY FENCE AT _____ PER FOOT		
697.1	18	SILT SACK AT _____ EACH		
697.2	100	FLOATING SILT FENCE AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
698.3	1,100	GEOTEXTILE FABRIC FOR SEPARATION AT _____ PER SQUARE YARD		
698.4	340	GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL AT _____ PER SQUARE YARD		
701.	680	CEMENT CONCRETE SIDEWALK AT _____ PER SQUARE YARD		
701.1	190	CEMENT CONCRETE SIDEWALK AT DRIVEWAYS AT _____ PER SQUARE YARD		
701.2	60	CEMENT CONCRETE PEDESTRIAN CURB RAMP AT _____ PER SQUARE YARD		
702.	100	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY AT _____ PER TON		
710.4	4	BOUND - PLAIN GRANITE AT _____ EACH		
711.	4	BOUND REMOVED AND RESET AT _____ EACH		
712.	4	BOUND REMOVED AND STACKED AT _____ EACH		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
715.1	9	MAIL BOX REMOVED AND RESET AT _____ EACH		
740.	56	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) AT _____ PER MONTH		
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.	590	LOAM FOR ROADSIDES AT _____ PER CUBIC YARD		
751.1	70	LOAM FOR LAWNS AT _____ PER CUBIC YARD		
755.99	1	STREAMBED RESTORATION AT _____ LUMP SUM		
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN AT _____ LUMP SUM		
765.	4,760	SEEDING AT _____ PER SQUARE YARD		
765.21	30	ANNUAL COVER CROP FOR NATIVE SEEDING AT _____ PER POUND		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
765.553	200	WETLAND - RIPARIAN SEEDING AT _____ PER SQUARE YARD		
767.121	1,470	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
767.9	2,380	JUTE MESH AT _____ PER SQUARE YARD		
769.	940	PAVEMENT MILLING MULCH UNDER GUARD RAIL AT _____ PER FOOT		
816.81	1	TEMPORARY TRAFFIC CONTROL SIGNAL AT _____ LUMP SUM		
823.72	4	HIGHWAY LIGHTING ARM AND LUMINARE REMOVED AND RESET AT _____ EACH		
824.50	1	FLASHING WARNING BEACON REMOVED AND RESET AT _____ LUMP SUM		
832.	175	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
847.1	24	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
851.1	130	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	635	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
852.12	2	TEMPORARY PEDESTRIAN RAMP AT _____ EACH		
853.1	20	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		
853.2	390	TEMPORARY BARRIER (TL-2) AT _____ PER FOOT		
853.21	1,040	TEMPORARY BARRIER REMOVED AND RESET AT _____ PER FOOT		
853.33	750	TEMPORARY BARRIER - LIMITED DEFLECTION (TL-3) AT _____ PER FOOT		
853.8	50	TEMPORARY ILLUMINATION FOR WORK ZONE AT _____ PER DAY		
854.016	3,600	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
854.1	1,160	PAVEMENT MARKING REMOVAL AT _____ PER SQUARE FOOT		
856.	250	ARROW BOARD AT _____ PER DAY		
856.12	260	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ PER DAY		
859.	16,000	REFLECTORIZED DRUM AT _____ PER DAY		
859.1	1,600	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AT _____ PER DAY		
864.35	25	SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW AT _____ EACH		
868.206	4,045	6 INCH WET REFLECTIVE RECESSED WHITE LINE (POLYUREA) AT _____ PER FOOT		
868.212	380	12 INCH WET REFLECTIVE RECESSED WHITE LINE (POLYUREA) AT _____ PER FOOT		
869.206	4,240	6 INCH WET REFLECTIVE RECESSED YELLOW LINE (POLYUREA) AT _____ PER FOOT		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
874.2	1	TRAFFIC SIGN REMOVED AND RESET AT _____ EACH		
874.4	26	TRAFFIC SIGN REMOVED AND STACKED AT _____ EACH		
903.	10	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE AT _____ PER CUBIC YARD		
909.5	14	RAPID SETTING CONCRETE AT _____ PER CUBIC YARD		
942.124	2,100	STEEL PILE HP 12 X 84 AT _____ PER FOOT		
944.124	16	STEEL PILE SPLICE HP 12 X 84 AT _____ EACH		
948.02	210	DRILLING FOR PILE OBSTRUCTIONS AT _____ PER FOOT		
948.41	6	DYNAMIC LOAD TEST BY CONTRACTOR AT _____ EACH		
948.5	42	PILE SHOES AT _____ EACH		

Project # 605126		Contract # 120185		
Location : WARE				
Description : Bridge Replacement Br. No. W-05-015 (Steel) Route 32 (Palmer Road) over the Ware River				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
950.11	1	TEMPORARY SUPPORT OF EXCAVATION AT _____ LUMP SUM		
983.11	2,300	MODIFIED RIPRAP AT _____ PER TON		
986.	300	MODIFIED ROCKFILL AT _____ PER TON		
988.01	40	SEDIMENT FOREBAY PAVING AT _____ PER SQUARE FOOT		
990.11	1	TEMPORARY COFFERDAM - STRUCTURE NO. W-05-015 AT _____ LUMP SUM		
991.11	1	TEMPORARY CONTROL OF WATER – STRUCTURE NO. W-05-015 AT _____ LUMP SUM		
994.01	1	TEMPORARY PROTECTIVE SHIELDING BRIDGE NO. W-05-015 AT _____ LUMP SUM		
995.01	1	BRIDGE STRUCTURE, BRIDGE NO. W-05-015 AT _____ LUMP SUM		
Total Qty:		114,391		

DOCUMENT B00853

SCHEDULE OF PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBES)

PRIME BIDDER: _____

DATE OF BID OPENING: _____ PROJECT NO.: 605126FEDERAL AID PROJECT NO. STP(BR-OFF)-003S(606)XPROJECT LOCATION: WARE

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.: 605126 FEDERAL AID PROJECT NO.: STP(BR-OFF)-003S(606)XPROJECT LOCATION: WARE

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: 605126FEDERAL AID PROJECT NUMBER: STP(BR-OFF)-003S(606)XPROJECT LOCATION: WARE

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: 120185 Project No. 605126 Federal Aid No.: STP(BR-OFF)-003S(606)Location: WARE Bid Opening Date: _____Project Description: Bridge Replacement, W-05-015, Route 32 (Palmer Road) over the 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 ***