

## COMMONWEALTH OF MASSACHUSETTS



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# CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

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PROPOSAL NO.	606024-120178
P.V. =	17,119,000.00
PLANS	YES

FOR

**Federal Aid Project No. STP/HPP/CMQ-0035(015)X  
Roadway Reconstruction and Related Work (Including Signals)  
on a Section of Route 44 (Dean Street)**

**in the City of****TAUNTON**

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

This Proposal to be opened and read:

**WEDNESDAY, JANUARY 4, 2022 at 2:00 P.M.**



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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](http://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.

**WEDNESDAY, JANUARY 4, 2022 at 2:00 P.M.\*\***

**TAUNTON**

**Federal Aid Project No. STP/HPP/CMQ-0035(015)X  
Roadway Reconstruction and Related Work (Including Signals)  
on a Section of Route 44 (Dean Street)**

**\*\*Date Subject to Change**

PROJECT VALUE = \$17,119,000.00

Bidders must be pre-qualified by the Department in the HIGHWAY 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](mailto:prequal.r109@dot.state.ma.us).

Proposal documents for official bidders are posted on [www.bidx.com](http://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](http://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](mailto: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 TAUNTON.

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 \$4.059 per gallon, and gasoline \$3.313 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](http://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.

**\*\*<<<<<<<<<<<<<<>>>>>>>>>>>>>>>\*\***

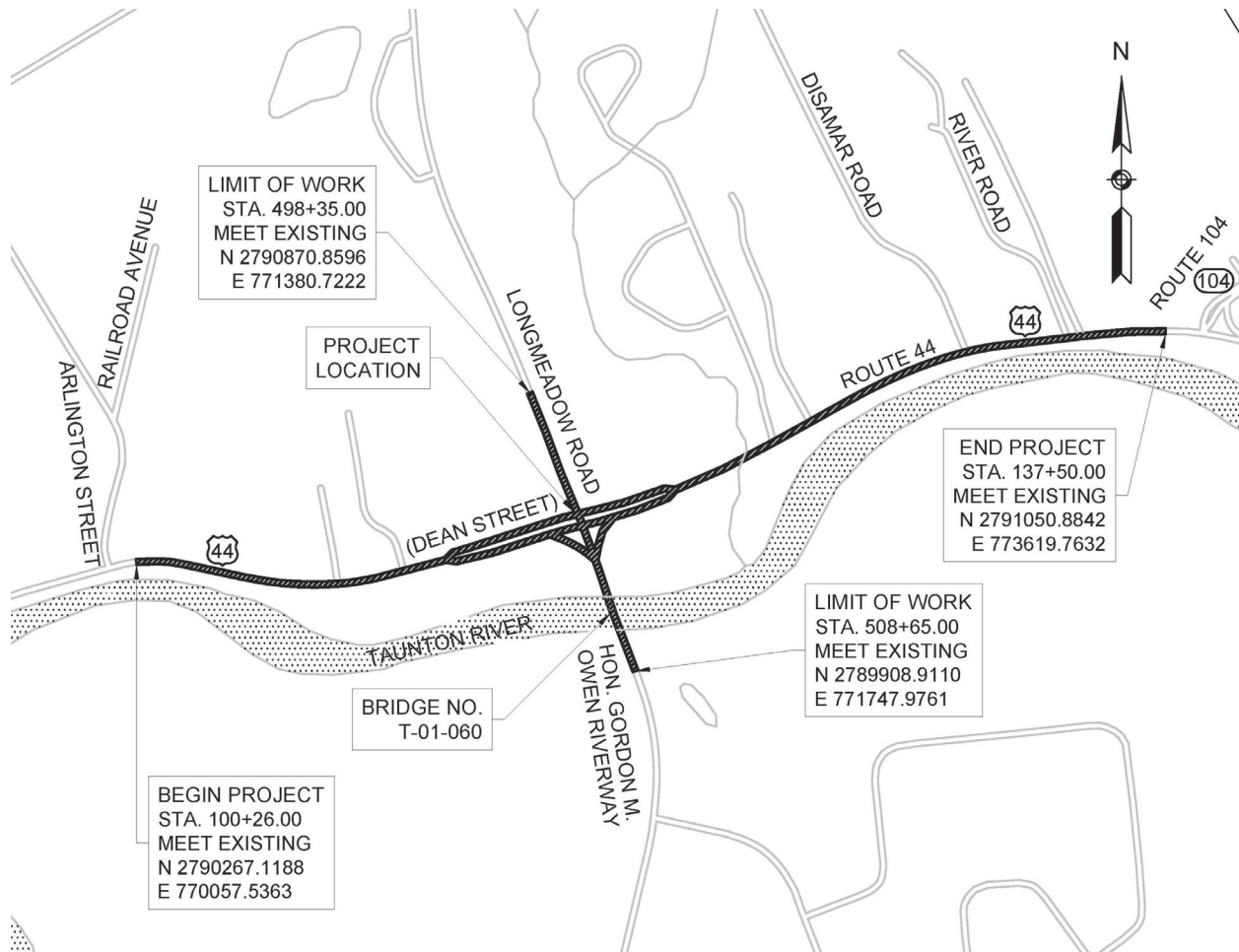
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DOCUMENT 00331

**LOCUS MAP****TAUNTON****Federal Aid Project No. STP/HPP/CMQ-0035(015)X  
Roadway Reconstruction and Related Work (Including Signals)  
on a Section of Route 44 (Dean Street)**



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DOCUMENT 00439

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
<b>1. Workmanship</b>								x 2=
<b>2. Safety</b>								x 2=
<b>3. Schedule</b>								x 1.5=
<b>4. Home Office Support</b>								x 1=
<b>5. Subcontractors Performance</b>								x 1=
<b>6. Field Supervision/ Superintendent</b>								x 1=
<b>7. Contract Compliance</b>								x 0.5=
<b>8. Equipment</b>								x 0.5=
<b>9. Payment of Accounts</b>								x 0.5=
(use back for additional comments)							<b>Overall Rating:</b>	

*(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)							<b>Overall Rating:</b>	

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

District Construction Engineer's Signature/Date \_\_\_\_\_

Resident Engineer's Signature/Date \_\_\_\_\_

Contractor Signature Acknowledging Report/Date \_\_\_\_\_

Subcontractor Signature Acknowledging Report/Date \_\_\_\_\_

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

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

Contractor's Comments: \_\_\_\_\_



## SUBCONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: \_\_\_\_\_ Contract Number: \_\_\_\_\_

## INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

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

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

## RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR

(Write Yes or No in space provided)

I recommend a deduction for Contractor's unsatisfactory performance: \_\_\_\_\_

I recommend a deduction for project completed late: \_\_\_\_\_

Signed: \_\_\_\_\_  
District Highway Director

EXPLANATION OF RATINGS 1 – 8: \_\_\_\_\_

[illegible]

WORK NOT COMPLETED WITHIN SPECIFIED TIME:

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Revised: 04/28/17

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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.



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**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 <sup>(b)</sup>	Sublot Size <sup>(c)</sup>	Frequency	Point of Sampling
Slump (in.) <sup>(a)</sup>	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 <sup>(c)</sup>	Sublot Size <sup>(d)</sup>	Frequency	Point of Sampling
Slump (in.) <sup>(a)</sup>	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 <sup>(b)</sup>				

**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 <sup>(a)</sup>	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 <sup>(b)</sup>	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) <sup>(c)</sup>	ASTM C 1567	Per ASTM	M4.02.00	Quality Control
Resistance to Chloride Ion Penetration <sup>(d)</sup>	AASHTO T 358 <sup>(e)</sup>	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
$50^{\circ}\text{F} \leq ^{\circ}\text{F} \leq 90^{\circ}\text{F}$	$\geq 70\% f'_c$

**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
$50^{\circ}\text{F} \leq ^{\circ}\text{F} \leq 90^{\circ}\text{F}$	$\geq 70\% f'_c$



## **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°F ≤ °F ≤ 90°F	≥ 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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**SUSECTION 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 <sup>[1]</sup>

<sup>[1]</sup> 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.**

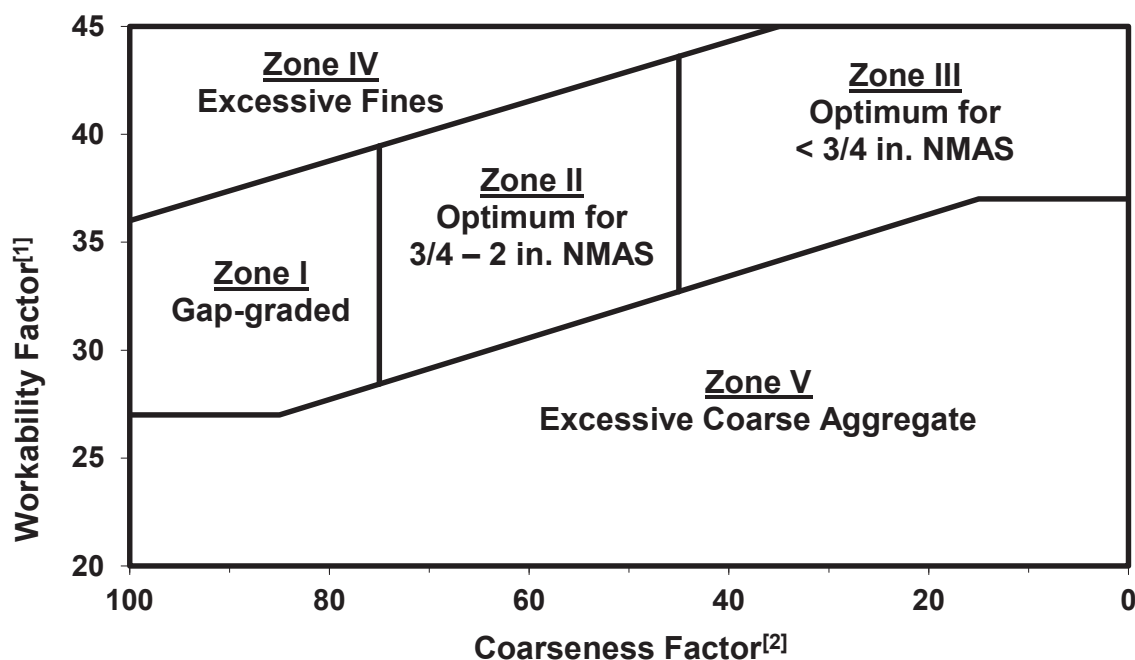
The combined aggregate system for the mix design may be analyzed using the Shilstone Workability-Coarseness Chart, to evaluate potential properties of the concrete, including workability.

**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



<sup>[1]</sup> 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.

<sup>[2]</sup> 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	$\leq 0.45$

## 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<sup>[1][2]</sup>**

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 <sup>[3]</sup>	–
			Fly Ash (Class F)	15 – 30
			Slag (Grade 100 or 120)	25 – 50
			Silica Fume	5 – 10
			Total SCM	$\leq 50$
			Total Fly Ash and Silica Fume	$\leq 35$

<sup>[1]</sup> 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.

<sup>[2]</sup> 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.

<sup>[3]</sup> 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 <sup>[1]</sup>	–
	Optically Strained, Microfractured or Microcrystalline Quartz (%)	$\leq 5.0$
	Chert or Chalcedony (%)	$\leq 3.0$
	Trydimite or Cristobalite (%)	$\leq 1.0$
	Opal (%)	$\leq 0.5$
	Natural Volcanic Glass (%)	$\leq 3.0$
T 380	Alkali Silica Reaction Resistance: Expansion of Miniature Concrete Prisms at 56 days (%)	$\leq 0.03$ <sup>[2]</sup>

<sup>[1]</sup> 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.

<sup>[2]</sup> 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 <sup>[1]</sup>	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

<sup>[1]</sup> 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) <sup>[1]</sup>	27
Paste Content (%) <sup>[2]</sup>	≤ 28 <sup>[3]</sup>
Paste Content to Aggregate Void Content Ratio <sup>[4]</sup>	1.25 – 1.75
Excess Volume of Paste for Workability (%) <sup>[5]</sup>	–

<sup>[1]</sup> 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).

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

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

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

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

<sup>[4]</sup> 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.

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



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

<sup>[5]</sup> 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 ft<sup>2</sup>/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 ft<sup>2</sup>/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/ft<sup>2</sup>/hr), T<sub>c</sub> = concrete temperature of the evaporating surface (°F), r = relative humidity of air surrounding the evaporating surface (%), T<sub>a</sub> = 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 ft<sup>2</sup>. 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 <sup>[1]</sup>
50°F ≤ °F ≤ 90°F	≥ Seven (7) days	≥ 70% f <sub>c</sub>

<sup>[1]</sup> 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 <sup>[1]</sup>	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

<sup>[1]</sup> Recommended number of operators.



**Table 701.62-2: Minimum Operator Activities (Continued)**

Operation	Operators <sup>[1]</sup>	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

<sup>[1]</sup> 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.) <sup>[1]</sup>	100 cy	1 per Sublot	Point of Discharge	Target $\pm 1.5$
Workability	T 119	Segregation Resistance <sup>[2]</sup>	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) <sup>[3]</sup>	100 cy	1 per Sublot	Point of Discharge	$\geq 70\% f'_c$
		Compressive Strength at 28 Days (psi) <sup>[3]</sup>	100 cy	1 per Sublot	Point of Discharge	$\geq 100\% f'_c$
		Compressive Strength at 56 Days (psi) <sup>[3][4]</sup>	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	–	$\leq 0.08$

<sup>[1]</sup> 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.

<sup>[2]</sup> 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.

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

<sup>[4]</sup> 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	
<b>701.30.A</b>	<b>Combined Aggregate System</b>	
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
<b>701.30.B</b>	<b>Paste System</b>	
701.30.B.1	The mix design's Water-Cementitious Ratio should be $\leq 0.40$ (Table 701.30-3: Freezing, Thawing, and De-icing Resistance).	Recommendation
701.30.B.1	The mix design's Water-Cementitious Ratio shall be $\leq 0.45$ (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



<b>701.73</b>	<b>Acceptance Sampling and Testing</b>	
T 119	The Slump shall meet Table 701.71-1: Minimum Acceptance Sampling and Testing Requirements ( $\pm 1.5$ 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**

<b>Section</b>	<b>Activity</b>	
<b>701.40</b>	<b>Pre-Placement</b>	
	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
<b>701.41</b>	<b>Placement (Concrete Discharging)</b>	
	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
<b>701.41</b>	<b>Placement</b>	
	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
<b>701.42</b>	<b>Initial Curing (When Applicable)</b>	
	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
<b>701.43</b>	<b>Finishing</b>	
	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
<b>701.44</b>	<b>Intermediate Curing (When Applicable, Apply One of the Methods)</b>	
	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
<b>701.45</b>	<b>Final Curing (Apply One of the Methods)</b>	
	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
<b>701.46</b>	<b>Protective Sealing (If Required)</b>	
	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 <b>NOT REQUIRED IF 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing was applied.</b>	Required if 701.30.E.3.b Curing and Sealing Compound was Not Applied
<b>701.47</b>	<b>Cold Weather Concreting (When Applicable)</b>	
	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
<b>701.48</b>	<b>Hot Weather Concreting (When Applicable)</b>	
	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
<b>701.61</b>	<b>Contractor Quality Control Plan</b>	
	The Contractor shall prepare and submit a Quality Control Plan (QC Plan) to the Department for review.	Requirement
<b>701.62</b>	<b>Production Personnel</b>	
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"> <li>• NRMCA Concrete Exterior Finisher Certification</li> <li>• ACI Concrete Flatwork Technician and Flatwork Finisher</li> </ul>	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	<b>Operators</b>	
	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
<b>701.63</b>	<b>Quality Control Inspection</b>	
	<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"><li>• NRMCA Concrete Exterior Finisher Certification</li><li>• ACI Concrete Flatwork Technician and Flatwork Finisher</li></ul> <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)

JUNE 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) Delete the term Interim Supplemental 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 7.00: LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

##### **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 I.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 I.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 I.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.

No payments will be made for general superintendence, the use of small hand tools, and manual equipment.

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 Pip .....	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 9<sup>th</sup> 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 7<sup>th</sup> 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 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup> 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 <sup>2</sup>
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 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.



### **M8.01.9 Mechanical Reinforcing Bar Splicer**

*(page III.95) Replace Table M8.01.9 – with the following.*

**Table M8.01.9-1: Requirements for Mechanical Reinforcing Bar Splicers**

Description	Test Method	Requirement
Ultimate Tensile Strength of Mechanical Splicer System	ASTM A1034 (Monotonic Tension Test)	100% of ultimate tensile strength of reinforcement bars per AASHTO M31.
Allowable Slip	California Test No. 670 – Slip Test	0.01 in., maximum for #14 and smaller bars, 0.03 in. maximum for #18 bars

## SECTION M9: MISCELLANEOUS MATERIALS

### **Subsection M9.10.0 Jointing Materials for Pipe**

*(page II.136) Delete this entire subsection.*

[illegible]

END OF SUPPLEMENTAL SPECIFICATIONS



## DOCUMENT 00719

*(Revised September 27, 2021 – 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	<a href="https://www.mass.gov/disadvantaged-business-enterprise-goals-2019-2022">https://www.mass.gov/disadvantaged-business-enterprise-goals-2019-2022</a>	MassDOT– Highway Div’n Page
For copies of the Code of Federal Regulations	<a href="http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR">http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR</a>	FDsys – US Gov’t Printing Office
For information about the U.S.DOT DBE Program	<a href="https://www.transportation.gov/civil-rights/disadvantaged-business-enterprise">https://www.transportation.gov/civil-rights/disadvantaged-business-enterprise</a>	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.<sup>1</sup>

"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:

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<sup>1</sup> <http://www.fhwa.dot.gov/resourcecenter/teams/operations/gloss.cfm>



- (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 16 %  
(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.sdo.osd.state.ma.us> .

#### **b. DBE Certification**

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



### **c. Joint Venture Approval**

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

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

## **6. COUNTING DBE PARTICIPATION TOWARDS DBE PARTICIPATION GOALS**

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

### **a. Commercially Useful Function**

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

### **b. Counting Participation Toward The Contract Participation Goal**

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

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



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

### **c. Joint Check Policy**

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

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

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



Other factors MassDOT may consider:

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

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

#### **d. Joint Check Procedure(s)**

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



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## 7. AWARD DOCUMENTATION AND PROCEDURES

- a. The two lowest bidders shall submit, by the close of business on the third (3<sup>rd</sup>) 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.
- f. If, for reasons beyond its control, the Prime Contractor cannot comply with its DBE participation commitment in accordance with the Schedule of Participation submitted under Section 7, the Prime Contractor shall submit to MassDOT the reasons for its inability to comply with its obligations and shall submit, and request approval for, a revised Schedule of Participation. If approved by MassDOT, the revised Schedule shall govern the Prime Contractor's performance in meeting its obligations under these Special Provisions.
- g. A Prime Contractor's compliance with the participation goal in Section 2 shall be determined by reference to the established percentage of the total contract price, provided, however, that no decrease in the dollar amount of a bidder's commitment to any DBE shall be allowed without the approval of MassDOT.
- h. If the contract amount is increased, the Prime Contractor may be required to submit a revised Schedule of Participation in accordance with paragraphs **8.f** and **8.j** of this section.
- i. In the event of the decertification of a DBE scheduled to participate on the Contract for credit toward the participation goal, but not under subcontract, the Contractor shall proceed in accordance with paragraphs **8.f** and **8.j** of this section.
- j. The Prime Contractor shall notify MassDOT immediately of any facts that come to its attention indicating that it may or will be unable to comply with any aspect of its DBE obligation under this Contract.
- k. Any notice required by these Special Provisions shall be given in writing to: (1) the Resident Engineer; (2) the District designated Compliance Officer; and (3) the Director of Compliance, MassDOT Office of Civil Rights, 10 Park Plaza, 4<sup>th</sup> Floor East, Boston, MA, 02116.
- l. The Prime Contractor and its Subcontractors shall comply with MassDOT's Electronic Reporting System Requirements (MassDOT Document 00821) and submit all information required by MassDOT related to the DBE Special Provisions through the Equitable Business Opportunity Solution ("EBO"). MassDOT reserves the right to request reports in the format it deems necessary anytime during the performance of the Contract.
- m. Termination of DBE by Prime Contractor
- (1) A Prime Contractor shall not terminate a DBE Subcontractor or an approved substitute DBE firm without the prior written consent of MassDOT. This includes, but is not limited to, instances in which a Prime Contractor seeks to perform work originally designated for a DBE Subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.



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



**n. Prompt Payment.**

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

**9. SANCTIONS**

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

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

**10. FURTHER INFORMATION; ENFORCEMENT, COOPERATION AND CONFIDENTIALITY.**

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



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



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

## 11. LIST OF ADDITIONAL DOCUMENTS.

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



**REQUIRED CONTRACT PROVISIONS  
FEDERAL-AID CONSTRUCTION CONTRACTS**

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

**ATTACHMENTS**

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

**I. GENERAL**

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

#### 6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### 10. Assurances Required:

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

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

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

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

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

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



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

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

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

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

### III. NONSEGREGATED FACILITIES

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

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

### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

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

#### 1. Minimum wages (29 CFR 5.5)

a. 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.

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## 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.

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#### **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.

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#### **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

September 15, 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	\$0.77
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note below.)	\$1.07
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	\$1.07
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	\$1.13
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	\$1.19
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	\$1.11
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	\$1.19
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	\$1.11
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	\$1.23
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	\$1.13
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	\$1.23
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	\$1.13
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	\$1.32
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	\$1.39
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	\$2.11
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	\$1.23
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	\$1.13
18	ASTM A276 Type 316 Stainless Steel	\$6.30
19	ASTM A240 Type 316 Stainless Steel	\$6.30
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	\$2.17
21	ASTM A53 Grade B Structural Steel Pipe	\$1.40
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	\$1.40
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	\$1.10
24	ASTM 252, Grade 2 Permanent Steel Casing	\$1.10
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	\$1.18
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	\$2.07
27	ASTM A572 / A572M, Grade 50 Sheetpiling	\$2.07
28	ASTM A36/36M, Grade 50	\$1.19
29	ASTM A570, Grade 50	\$1.18
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	\$1.19
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	\$1.40
32	AREA 140 LB Rail and Track Accessories	\$0.70

**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.



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## 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](http://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.

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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: 120178 Project No. 606024 Federal Aid No.: STP/HPP/CMQ-0035(015)XLocation: TAUNTONProject Description: Roadway Reconstruction and Related Work (Including Signals) on a Section of Route 44 (Dean Street)

**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/constag.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 week 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. 606024-120178

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:** 120178 **City/Town:** TAUNTON  
**Description of Work:** TAUNTON: FAP No. STP/HPP/CMQ-0035(015)X  
Roadway Reconstruction and Related Work (Including Signals) on a Section of Route 44 (Dean Street)  
**Job Location:** Section of Route 44 (Dean Street)

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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
<b>Construction</b>						
(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 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2022	\$37.06	\$9.10	\$16.64	\$0.00	\$62.80
	12/01/2022	\$37.91	\$9.10	\$16.64	\$0.00	\$63.65
	06/01/2023	\$38.81	\$9.10	\$16.64	\$0.00	\$64.55
	12/01/2023	\$39.71	\$9.10	\$16.64	\$0.00	\$65.45
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$36.16	\$9.10	\$16.64	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SOUTHERN MASS)</i>	12/01/2020	\$38.10	\$12.80	\$9.45	\$0.00	\$60.35
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	06/01/2022	\$37.06	\$9.10	\$16.64	\$0.00	\$62.80
	12/01/2022	\$37.91	\$9.10	\$16.64	\$0.00	\$63.65
	06/01/2023	\$38.81	\$9.10	\$16.64	\$0.00	\$64.55
	12/01/2023	\$39.71	\$9.10	\$16.64	\$0.00	\$65.45
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$36.16	\$9.10	\$16.64	\$0.00	\$61.90
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



## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

## 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)	08/01/2022	\$57.01	\$11.49	\$21.65	\$0.00	\$90.15
BRICKLAYERS LOCAL 3 (FOXBORO)	02/01/2023	\$58.21	\$11.49	\$21.65	\$0.00	\$91.35
	08/01/2023	\$60.26	\$11.49	\$21.65	\$0.00	\$93.40
	02/01/2024	\$61.51	\$11.49	\$21.65	\$0.00	\$94.65
	08/01/2024	\$63.61	\$11.49	\$21.65	\$0.00	\$96.75
	02/01/2025	\$64.91	\$11.49	\$21.65	\$0.00	\$98.05
	08/01/2025	\$67.06	\$11.49	\$21.65	\$0.00	\$100.20
	02/01/2026	\$68.41	\$11.49	\$21.65	\$0.00	\$101.55
	08/01/2026	\$70.61	\$11.49	\$21.65	\$0.00	\$103.75
	02/01/2027	\$72.01	\$11.49	\$21.65	\$0.00	\$105.15



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Foxboro****Effective Date - 08/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.51	\$11.49	\$21.65	\$0.00	\$61.65
2	60	\$34.21	\$11.49	\$21.65	\$0.00	\$67.35
3	70	\$39.91	\$11.49	\$21.65	\$0.00	\$73.05
4	80	\$45.61	\$11.49	\$21.65	\$0.00	\$78.75
5	90	\$51.31	\$11.49	\$21.65	\$0.00	\$84.45

**Effective Date - 02/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.11	\$11.49	\$21.65	\$0.00	\$62.25
2	60	\$34.93	\$11.49	\$21.65	\$0.00	\$68.07
3	70	\$40.75	\$11.49	\$21.65	\$0.00	\$73.89
4	80	\$46.57	\$11.49	\$21.65	\$0.00	\$79.71
5	90	\$52.39	\$11.49	\$21.65	\$0.00	\$85.53

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

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$42.33	\$9.10	\$17.72	\$0.00	\$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING 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"						
CAISSON & UNDERPINNING TOP MAN <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"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	09/01/2022	\$45.18	\$8.68	\$19.97	\$0.00	\$73.83
	03/01/2023	\$45.78	\$8.68	\$19.97	\$0.00	\$74.43



## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

**Apprentice - CARPENTER - Zone 2 Eastern MA****Effective Date - 09/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.59	\$8.68	\$1.73	\$0.00	\$33.00
2	60	\$27.11	\$8.68	\$1.73	\$0.00	\$37.52
3	70	\$31.63	\$8.68	\$14.78	\$0.00	\$55.09
4	75	\$33.89	\$8.68	\$14.78	\$0.00	\$57.35
5	80	\$36.14	\$8.68	\$16.51	\$0.00	\$61.33
6	80	\$36.14	\$8.68	\$16.51	\$0.00	\$61.33
7	90	\$40.66	\$8.68	\$18.24	\$0.00	\$67.58
8	90	\$40.66	\$8.68	\$18.24	\$0.00	\$67.58

**Effective Date - 03/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.89	\$8.68	\$1.73	\$0.00	\$33.30
2	60	\$27.47	\$8.68	\$1.73	\$0.00	\$37.88
3	70	\$32.05	\$8.68	\$14.78	\$0.00	\$55.51
4	75	\$34.34	\$8.68	\$14.78	\$0.00	\$57.80
5	80	\$36.62	\$8.68	\$16.51	\$0.00	\$61.81
6	80	\$36.62	\$8.68	\$16.51	\$0.00	\$61.81
7	90	\$41.20	\$8.68	\$18.24	\$0.00	\$68.12
8	90	\$41.20	\$8.68	\$18.24	\$0.00	\$68.12

**Notes:**

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
 Step 1&2 \$31.01/ 3&4 \$48.64/ 5&6 \$57.24/ 7&8 \$63.54

**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

**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

\$44.67

\$12.75

\$22.41

\$0.62

\$80.45

BRICKLAYERS LOCAL 3 (FOXBORO)

**Apprentice - CEMENT MASONRY/PLASTERING - Foxboro****Effective Date -** 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.34	\$12.75	\$15.41	\$0.00	\$50.50
2	60	\$26.80	\$12.75	\$17.41	\$0.62	\$57.58
3	65	\$29.04	\$12.75	\$18.41	\$0.62	\$60.82
4	70	\$31.27	\$12.75	\$19.41	\$0.62	\$64.05
5	75	\$33.50	\$12.75	\$20.41	\$0.62	\$67.28
6	80	\$35.74	\$12.75	\$21.41	\$0.62	\$70.52
7	90	\$40.20	\$12.75	\$22.41	\$0.62	\$75.98

**Notes:**

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

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



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$52.38	\$14.00	\$16.05	\$0.00	\$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$33.69	\$14.00	\$16.05	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</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

**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**



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: ADZEMAN <i>LABORERS - ZONE 2</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"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 2</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: BURNERS <i>LABORERS - ZONE 2</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: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 2</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 2</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 2</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"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</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 1)</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 1)</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 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 223</i>	09/01/2022	\$46.35	\$11.50	\$16.18	\$0.00	\$74.03
	09/01/2023	\$47.87	\$11.75	\$16.86	\$0.00	\$76.48



## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

**Apprentice -** *ELECTRICIAN - Local 223***Effective Date -** 09/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.54	\$11.50	\$0.56	\$0.00	\$30.60
2	45	\$20.86	\$11.50	\$0.63	\$0.00	\$32.99
3	50	\$23.18	\$11.50	\$0.70	\$0.00	\$35.38
4	55	\$25.49	\$11.50	\$7.35	\$0.00	\$44.34
5	60	\$27.81	\$11.50	\$7.86	\$0.00	\$47.17
6	65	\$30.13	\$11.50	\$8.37	\$0.00	\$50.00
7	70	\$32.45	\$11.50	\$8.89	\$0.00	\$52.84
8	75	\$34.76	\$11.50	\$9.40	\$0.00	\$55.66

**Effective Date -** 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.15	\$11.75	\$0.57	\$0.00	\$31.47
2	45	\$21.54	\$11.75	\$0.65	\$0.00	\$33.94
3	50	\$23.94	\$11.75	\$0.72	\$0.00	\$36.41
4	55	\$26.33	\$11.75	\$7.79	\$0.00	\$45.87
5	60	\$28.72	\$11.75	\$8.31	\$0.00	\$48.78
6	65	\$31.12	\$11.75	\$8.65	\$0.00	\$51.52
7	70	\$33.51	\$11.75	\$9.38	\$0.00	\$54.64
8	75	\$35.90	\$11.75	\$9.90	\$0.00	\$57.55

**Notes:****Apprentice to Journeyworker Ratio:2:3\*\*\***

ELEVATOR CONSTRUCTOR

ELEVATOR CONSTRUCTORS LOCAL 4

01/01/2022

\$65.62

\$16.03

\$20.21

\$0.00

\$101.86

**Apprentice -** *ELEVATOR CONSTRUCTOR - Local 4***Effective Date -** 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.81	\$16.03	\$0.00	\$0.00	\$48.84
2	55	\$36.09	\$16.03	\$20.21	\$0.00	\$72.33
3	65	\$42.65	\$16.03	\$20.21	\$0.00	\$78.89
4	70	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
5	80	\$52.50	\$16.03	\$20.21	\$0.00	\$88.74

**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 4

01/01/2022

\$45.93

\$16.03

\$20.21

\$0.00

\$82.17



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2022	\$47.18	\$14.00	\$16.05	\$0.00	\$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2022	\$48.72	\$14.00	\$16.05	\$0.00	\$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2022	\$23.33	\$14.00	\$16.05	\$0.00	\$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 223</i>	09/01/2020	\$43.66	\$10.90	\$14.66	\$0.00	\$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE <i>/ COMMISSIONINGELECTRICIANS LOCAL 223</i>	09/01/2020	\$36.86	\$10.90	\$12.45	\$0.00	\$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$41.76	\$14.00	\$16.05	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$24.50	\$9.10	\$16.64	\$0.00	\$50.24
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE I</i>	03/01/2022	\$49.93	\$8.68	\$20.27	\$0.00	\$78.88

**Apprentice - FLOORCOVERER - Local 2168 Zone I**

**Effective Date - 03/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.97	\$8.68	\$1.79	\$0.00	\$35.44
2	55	\$27.46	\$8.68	\$1.79	\$0.00	\$37.93
3	60	\$29.96	\$8.68	\$14.90	\$0.00	\$53.54
4	65	\$32.45	\$8.68	\$14.90	\$0.00	\$56.03
5	70	\$34.95	\$8.68	\$16.69	\$0.00	\$60.32
6	75	\$37.45	\$8.68	\$16.69	\$0.00	\$62.82
7	80	\$39.94	\$8.68	\$18.48	\$0.00	\$67.10
8	85	\$42.44	\$8.68	\$18.48	\$0.00	\$69.60

**Notes:** Steps are 750 hrs.  
% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)  
Step 1&2 \$32.94/ 3&4 \$39.66/ 5&6 \$60.32/ 7&8 \$67.10

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

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$33.69	\$14.00	\$16.05	\$0.00	\$63.74



**Classification****Effective Date****Base Wage****Health****Pension****Supplemental  
Unemployment****Total Rate**

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR  
SYSTEMS)

GLAZIERS LOCAL 1333

06/01/2020

\$39.18

\$10.80

\$10.45

\$0.00

\$60.43

**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**

HOISTING ENGINEER/CRANES/GRADALLS

OPERATING ENGINEERS LOCAL 4

12/01/2021

\$51.38

\$14.00

\$16.05

\$0.00

\$81.43

**Apprentice - OPERATING ENGINEERS - Local 4****Effective Date - 12/01/2021**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$28.26	\$14.00	\$0.00	\$0.00	\$42.26
2	60	\$30.83	\$14.00	\$16.05	\$0.00	\$60.88
3	65	\$33.40	\$14.00	\$16.05	\$0.00	\$63.45
4	70	\$35.97	\$14.00	\$16.05	\$0.00	\$66.02
5	75	\$38.54	\$14.00	\$16.05	\$0.00	\$68.59
6	80	\$41.10	\$14.00	\$16.05	\$0.00	\$71.15
7	85	\$43.67	\$14.00	\$16.05	\$0.00	\$73.72
8	90	\$46.24	\$14.00	\$16.05	\$0.00	\$76.29

**Notes:****Apprentice to Journeyworker Ratio:1:6**

HVAC (DUCTWORK)

SHEETMETAL WORKERS LOCAL 17 - A

02/01/2022

\$53.70

\$13.80

\$25.60

\$2.79

\$95.89

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS)

ELECTRICIANS LOCAL 223

09/01/2020

\$43.66

\$10.90

\$14.66

\$0.00

\$69.22

For apprentice rates see "Apprentice- ELECTRICIAN"



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2022	\$53.70	\$13.80	\$25.60	\$2.79	\$95.89
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS &amp; PIPEFITTERS LOCAL 51</i>	08/30/2021	\$46.49	\$10.15	\$19.95	\$0.00	\$76.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS &amp; PIPEFITTERS LOCAL 51</i>	08/30/2021	\$46.49	\$10.15	\$19.95	\$0.00	\$76.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	06/01/2022	\$37.06	\$9.10	\$16.64	\$0.00	\$62.80
	12/01/2022	\$37.91	\$9.10	\$16.64	\$0.00	\$63.65
	06/01/2023	\$38.81	\$9.10	\$16.64	\$0.00	\$64.55
	12/01/2023	\$39.71	\$9.10	\$16.64	\$0.00	\$65.45
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$36.16	\$9.10	\$16.64	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SOUTHERN MASS)</i>	09/01/2022	\$48.95	\$13.80	\$17.14	\$0.00	\$79.89

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Southern MA****Effective Date -** 09/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.48	\$13.80	\$12.42	\$0.00	\$50.70
2	60	\$29.37	\$13.80	\$13.36	\$0.00	\$56.53
3	70	\$34.27	\$13.80	\$14.31	\$0.00	\$62.38
4	80	\$39.16	\$13.80	\$15.25	\$0.00	\$68.21

**Notes:**

Steps are 1 year

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

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 37</i>	03/16/2021	\$42.46	\$7.70	\$17.10	\$0.00	\$67.26
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## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

**Apprentice - IRONWORKER - Local 37****Effective Date -** 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	\$29.72	\$7.70	\$17.10	\$0.00	\$54.52
2	75	\$31.85	\$7.70	\$17.10	\$0.00	\$56.65
3	80	\$33.97	\$7.70	\$17.10	\$0.00	\$58.77
4	85	\$36.09	\$7.70	\$17.10	\$0.00	\$60.89
5	90	\$38.21	\$7.70	\$17.10	\$0.00	\$63.01
6	95	\$40.34	\$7.70	\$17.10	\$0.00	\$65.14

**Notes:****Apprentice to Journeyworker Ratio:1:4****JACKHAMMER & PAVING BREAKER OPERATOR***LABORERS - ZONE 2*

06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95

For apprentice rates see "Apprentice- LABORER"

**LABORER***LABORERS - ZONE 2*

06/01/2022	\$36.31	\$9.10	\$16.64	\$0.00	\$62.05
12/01/2022	\$37.16	\$9.10	\$16.64	\$0.00	\$62.90
06/01/2023	\$38.06	\$9.10	\$16.64	\$0.00	\$63.80
12/01/2023	\$38.96	\$9.10	\$16.64	\$0.00	\$64.70

**Apprentice - LABORER - Zone 2****Effective Date -** 06/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.79	\$9.10	\$16.64	\$0.00	\$47.53
2	70	\$25.42	\$9.10	\$16.64	\$0.00	\$51.16
3	80	\$29.05	\$9.10	\$16.64	\$0.00	\$54.79
4	90	\$32.68	\$9.10	\$16.64	\$0.00	\$58.42

**Effective Date -** 12/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.30	\$9.10	\$16.64	\$0.00	\$48.04
2	70	\$26.01	\$9.10	\$16.64	\$0.00	\$51.75
3	80	\$29.73	\$9.10	\$16.64	\$0.00	\$55.47
4	90	\$33.44	\$9.10	\$16.64	\$0.00	\$59.18

**Notes:****Apprentice to Journeyworker Ratio:1:5****LABORER (HEAVY & HIGHWAY)***LABORERS - ZONE 2 (HEAVY & HIGHWAY)*

12/01/2021	\$35.41	\$9.10	\$16.64	\$0.00	\$61.15
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
<b>Apprentice -   LABORER (Heavy &amp; Highway) - Zone 2</b>							
<b>Effective Date -   12/01/2021</b>							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	60	\$21.25	\$9.10	\$16.64	\$0.00	\$46.99	
2	70	\$24.79	\$9.10	\$16.64	\$0.00	\$50.53	
3	80	\$28.33	\$9.10	\$16.64	\$0.00	\$54.07	
4	90	\$31.87	\$9.10	\$16.64	\$0.00	\$57.61	
<div><div>Notes:</div></div>							
<b>Apprentice to Journeyworker Ratio:1:5</b>							
LABORER: CARPENTER TENDER							
LABORERS - ZONE 2							
		06/01/2022	\$36.31	\$9.10	\$16.64	\$0.00	\$62.05
		12/01/2022	\$37.16	\$9.10	\$16.64	\$0.00	\$62.90
		06/01/2023	\$38.06	\$9.10	\$16.64	\$0.00	\$63.80
		12/01/2023	\$38.96	\$9.10	\$16.64	\$0.00	\$64.70
For apprentice rates see "Apprentice- LABORER"							
LABORER: CEMENT FINISHER TENDER							
LABORERS - ZONE 2							
		06/01/2022	\$36.31	\$9.10	\$16.64	\$0.00	\$62.05
		12/01/2022	\$37.16	\$9.10	\$16.64	\$0.00	\$62.90
		06/01/2023	\$38.06	\$9.10	\$16.64	\$0.00	\$63.80
		12/01/2023	\$38.96	\$9.10	\$16.64	\$0.00	\$64.70
For apprentice rates see "Apprentice- LABORER"							
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER							
LABORERS - ZONE 2							
		06/01/2022	\$36.40	\$9.10	\$16.70	\$0.00	\$62.20
		12/01/2022	\$37.25	\$9.10	\$16.70	\$0.00	\$63.05
		06/01/2023	\$38.15	\$9.10	\$16.70	\$0.00	\$63.95
		12/01/2023	\$39.05	\$9.10	\$16.70	\$0.00	\$64.85
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER							
LABORERS - ZONE 2							
		06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
		12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
		06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
		12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER (HEAVY & HIGHWAY)							
LABORERS - ZONE 2 (HEAVY & HIGHWAY)							
		12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
LABORER: MULTI-TRADE TENDER							
LABORERS - ZONE 2							
		06/01/2022	\$36.31	\$9.10	\$16.64	\$0.00	\$62.05
		12/01/2022	\$37.16	\$9.10	\$16.64	\$0.00	\$62.90
		06/01/2023	\$38.06	\$9.10	\$16.64	\$0.00	\$63.80
		12/01/2023	\$38.96	\$9.10	\$16.64	\$0.00	\$64.70
For apprentice rates see "Apprentice- LABORER"							
LABORER: TREE REMOVER							
LABORERS - ZONE 2							
		06/01/2022	\$36.31	\$9.10	\$16.64	\$0.00	\$62.05
		12/01/2022	\$37.16	\$9.10	\$16.64	\$0.00	\$62.90
		06/01/2023	\$38.06	\$9.10	\$16.64	\$0.00	\$63.80
		12/01/2023	\$38.96	\$9.10	\$16.64	\$0.00	\$64.70
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"							



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	08/01/2022	\$45.29	\$11.49	\$20.37	\$0.00	\$77.15
	02/01/2023	\$46.25	\$11.49	\$20.37	\$0.00	\$78.11
	08/01/2023	\$47.89	\$11.49	\$20.37	\$0.00	\$79.75
	02/01/2024	\$48.89	\$11.49	\$20.37	\$0.00	\$80.75
	08/01/2024	\$50.57	\$11.49	\$20.37	\$0.00	\$82.43
	02/01/2025	\$51.61	\$11.49	\$20.37	\$0.00	\$83.47
	08/01/2025	\$53.33	\$11.49	\$20.37	\$0.00	\$85.19
	02/01/2026	\$54.41	\$11.49	\$20.37	\$0.00	\$86.27
	08/01/2026	\$56.17	\$11.49	\$20.37	\$0.00	\$88.03
	02/01/2027	\$57.29	\$11.49	\$20.37	\$0.00	\$89.15

**Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile****Effective Date -** 08/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.65	\$11.49	\$20.37	\$0.00	\$54.51
2	60	\$27.17	\$11.49	\$20.37	\$0.00	\$59.03
3	70	\$31.70	\$11.49	\$20.37	\$0.00	\$63.56
4	80	\$36.23	\$11.49	\$20.37	\$0.00	\$68.09
5	90	\$40.76	\$11.49	\$20.37	\$0.00	\$72.62

**Effective Date -** 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.13	\$11.49	\$20.37	\$0.00	\$54.99
2	60	\$27.75	\$11.49	\$20.37	\$0.00	\$59.61
3	70	\$32.38	\$11.49	\$20.37	\$0.00	\$64.24
4	80	\$37.00	\$11.49	\$20.37	\$0.00	\$68.86
5	90	\$41.63	\$11.49	\$20.37	\$0.00	\$73.49

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



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE MASONS,TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	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

**Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile****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**

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) <i>MILLWRIGHTS LOCAL 1121 - Zone 2</i>	01/03/2022	\$40.67	\$8.58	\$21.57	\$0.00	\$70.82
	01/02/2023	\$41.92	\$8.58	\$21.57	\$0.00	\$72.07



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - MILLWRIGHT - Local 1121 Zone 2</b>						
<b>Effective Date - 01/03/2022</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.37	\$8.58	\$5.72	\$0.00	\$36.67
2	65	\$26.44	\$8.58	\$17.93	\$0.00	\$52.95
3	75	\$30.50	\$8.58	\$18.98	\$0.00	\$58.06
4	85	\$34.57	\$8.58	\$20.01	\$0.00	\$63.16
<b>Effective Date - 01/02/2023</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.06	\$8.58	\$5.72	\$0.00	\$37.36
2	65	\$27.25	\$8.58	\$17.93	\$0.00	\$53.76
3	75	\$31.44	\$8.58	\$18.98	\$0.00	\$59.00
4	85	\$35.63	\$8.58	\$20.01	\$0.00	\$64.22
<div> <b>Notes:</b> Step 1&amp;2 Appr. indentured after 1/6/2020 receive no pension,  but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)  Steps are 2,000 hours </div>						
<b>Apprentice to Journeyworker Ratio:1:4</b>						
MORTAR MIXER	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
LABORERS - ZONE 2	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS)	12/01/2021	\$23.48	\$14.00	\$16.05	\$0.00	\$53.53
OPERATING ENGINEERS LOCAL 4						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS)	12/01/2021	\$28.44	\$14.00	\$16.05	\$0.00	\$58.49
OPERATING ENGINEERS LOCAL 4						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
OPERATING ENGINEERS LOCAL 4						
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 2	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 2*

07/01/2022	\$45.76	\$8.65	\$23.05	\$0.00	\$77.46
01/01/2023	\$46.96	\$8.65	\$23.05	\$0.00	\$78.66
07/01/2023	\$48.16	\$8.65	\$23.05	\$0.00	\$79.86
01/01/2024	\$49.36	\$8.65	\$23.05	\$0.00	\$81.06
07/01/2024	\$50.56	\$8.65	\$23.05	\$0.00	\$82.26
01/01/2025	\$51.76	\$8.65	\$23.05	\$0.00	\$83.46



## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New****Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.88	\$8.65	\$0.00	\$0.00	\$31.53
2	55	\$25.17	\$8.65	\$6.27	\$0.00	\$40.09
3	60	\$27.46	\$8.65	\$6.84	\$0.00	\$42.95
4	65	\$29.74	\$8.65	\$7.41	\$0.00	\$45.80
5	70	\$32.03	\$8.65	\$19.63	\$0.00	\$60.31
6	75	\$34.32	\$8.65	\$20.20	\$0.00	\$63.17
7	80	\$36.61	\$8.65	\$20.77	\$0.00	\$66.03
8	90	\$41.18	\$8.65	\$21.91	\$0.00	\$71.74

**Effective Date - 01/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.48	\$8.65	\$0.00	\$0.00	\$32.13
2	55	\$25.83	\$8.65	\$6.27	\$0.00	\$40.75
3	60	\$28.18	\$8.65	\$6.84	\$0.00	\$43.67
4	65	\$30.52	\$8.65	\$7.41	\$0.00	\$46.58
5	70	\$32.87	\$8.65	\$19.63	\$0.00	\$61.15
6	75	\$35.22	\$8.65	\$20.20	\$0.00	\$64.07
7	80	\$37.57	\$8.65	\$20.77	\$0.00	\$66.99
8	90	\$42.26	\$8.65	\$21.91	\$0.00	\$72.82

**Notes:**

Steps are 750 hrs.

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

PAINTER (SPRAY OR SANDBLAST, REPAINT)

PAINTERS LOCAL 35 - ZONE 2

07/01/2022	\$43.82	\$8.65	\$23.05	\$0.00	\$75.52
01/01/2023	\$45.02	\$8.65	\$23.05	\$0.00	\$76.72
07/01/2023	\$46.22	\$8.65	\$23.05	\$0.00	\$77.92
01/01/2024	\$47.42	\$8.65	\$23.05	\$0.00	\$79.12
07/01/2024	\$48.62	\$8.65	\$23.05	\$0.00	\$80.32
01/01/2025	\$49.82	\$8.65	\$23.05	\$0.00	\$81.52



## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint****Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.91	\$8.65	\$0.00	\$0.00	\$30.56
2	55	\$24.10	\$8.65	\$6.27	\$0.00	\$39.02
3	60	\$26.29	\$8.65	\$6.84	\$0.00	\$41.78
4	65	\$28.48	\$8.65	\$7.41	\$0.00	\$44.54
5	70	\$30.67	\$8.65	\$19.63	\$0.00	\$58.95
6	75	\$32.87	\$8.65	\$20.20	\$0.00	\$61.72
7	80	\$35.06	\$8.65	\$20.77	\$0.00	\$64.48
8	90	\$39.44	\$8.65	\$21.91	\$0.00	\$70.00

**Effective Date - 01/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$8.65	\$0.00	\$0.00	\$31.16
2	55	\$24.76	\$8.65	\$6.27	\$0.00	\$39.68
3	60	\$27.01	\$8.65	\$6.84	\$0.00	\$42.50
4	65	\$29.26	\$8.65	\$7.41	\$0.00	\$45.32
5	70	\$31.51	\$8.65	\$19.63	\$0.00	\$59.79
6	75	\$33.77	\$8.65	\$20.20	\$0.00	\$62.62
7	80	\$36.02	\$8.65	\$20.77	\$0.00	\$65.44
8	90	\$40.52	\$8.65	\$21.91	\$0.00	\$71.08

**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 2*

07/01/2022	\$44.36	\$8.65	\$23.05	\$0.00	\$76.06
01/01/2023	\$45.56	\$8.65	\$23.05	\$0.00	\$77.26
07/01/2023	\$46.76	\$8.65	\$23.05	\$0.00	\$78.46
01/01/2024	\$47.96	\$8.65	\$23.05	\$0.00	\$79.66
07/01/2024	\$49.16	\$8.65	\$23.05	\$0.00	\$80.86
01/01/2025	\$50.36	\$8.65	\$23.05	\$0.00	\$82.06



## Classification

Effective Date

Base Wage

Health

Pension

Supplemental  
Unemployment

Total Rate

**Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW****Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.18	\$8.65	\$0.00	\$0.00	\$30.83
2	55	\$24.40	\$8.65	\$6.27	\$0.00	\$39.32
3	60	\$26.62	\$8.65	\$6.84	\$0.00	\$42.11
4	65	\$28.83	\$8.65	\$7.41	\$0.00	\$44.89
5	70	\$31.05	\$8.65	\$19.63	\$0.00	\$59.33
6	75	\$33.27	\$8.65	\$20.20	\$0.00	\$62.12
7	80	\$35.49	\$8.65	\$20.77	\$0.00	\$64.91
8	90	\$39.92	\$8.65	\$21.91	\$0.00	\$70.48

**Effective Date - 01/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.78	\$8.65	\$0.00	\$0.00	\$31.43
2	55	\$25.06	\$8.65	\$6.27	\$0.00	\$39.98
3	60	\$27.34	\$8.65	\$6.84	\$0.00	\$42.83
4	65	\$29.61	\$8.65	\$7.41	\$0.00	\$45.67
5	70	\$31.89	\$8.65	\$19.63	\$0.00	\$60.17
6	75	\$34.17	\$8.65	\$20.20	\$0.00	\$63.02
7	80	\$36.45	\$8.65	\$20.77	\$0.00	\$65.87
8	90	\$41.00	\$8.65	\$21.91	\$0.00	\$71.56

**Notes:**

Steps are 750 hrs.

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

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 2

07/01/2022	\$42.42	\$8.65	\$23.05	\$0.00	\$74.12
01/01/2023	\$43.62	\$8.65	\$23.05	\$0.00	\$75.32
07/01/2023	\$44.82	\$8.65	\$23.05	\$0.00	\$76.52
01/01/2024	\$46.02	\$8.65	\$23.05	\$0.00	\$77.72
07/01/2024	\$47.22	\$8.65	\$23.05	\$0.00	\$78.92
01/01/2025	\$48.42	\$8.65	\$23.05	\$0.00	\$80.12



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT****Effective Date - 07/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.21	\$8.65	\$0.00	\$0.00	\$29.86
2	55	\$23.33	\$8.65	\$6.27	\$0.00	\$38.25
3	60	\$25.45	\$8.65	\$6.84	\$0.00	\$40.94
4	65	\$27.57	\$8.65	\$7.41	\$0.00	\$43.63
5	70	\$29.69	\$8.65	\$19.63	\$0.00	\$57.97
6	75	\$31.82	\$8.65	\$20.20	\$0.00	\$60.67
7	80	\$33.94	\$8.65	\$20.77	\$0.00	\$63.36
8	90	\$38.18	\$8.65	\$21.91	\$0.00	\$68.74

**Effective Date - 01/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.81	\$8.65	\$0.00	\$0.00	\$30.46
2	55	\$23.99	\$8.65	\$6.27	\$0.00	\$38.91
3	60	\$26.17	\$8.65	\$6.84	\$0.00	\$41.66
4	65	\$28.35	\$8.65	\$7.41	\$0.00	\$44.41
5	70	\$30.53	\$8.65	\$19.63	\$0.00	\$58.81
6	75	\$32.72	\$8.65	\$20.20	\$0.00	\$61.57
7	80	\$34.90	\$8.65	\$20.77	\$0.00	\$64.32
8	90	\$39.26	\$8.65	\$21.91	\$0.00	\$69.82

**Notes:**

Steps are 750 hrs.

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

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2021	\$35.41	\$9.10	\$16.64	\$0.00	\$61.15
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 1)	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - PILE DRIVER - Local 56 Zone 1</b>						
<b>Effective Date - 08/01/2020</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$9.40	\$23.12	\$0.00	\$57.06
2	60	\$29.44	\$9.40	\$23.12	\$0.00	\$61.96
3	70	\$34.35	\$9.40	\$23.12	\$0.00	\$66.87
4	75	\$36.80	\$9.40	\$23.12	\$0.00	\$69.32
5	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
6	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
7	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68
8	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68
<b>Notes:</b> % Indentured After 10/1/17; 45/45/55/55/70/70/80/80 Step 1&2 \$34.01/ 3&4 \$41.46/ 5&6 \$62.80/ 7&8 \$69.25						
<b>Apprentice to Journeyworker Ratio:1:5</b>						
PIPELAYER	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
LABORERS - ZONE 2	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY)	12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
LABORERS - ZONE 2 (HEAVY & HIGHWAY)						
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER	08/30/2021	\$46.49	\$10.15	\$19.95	\$0.00	\$76.59
PLUMBERS & PIPEFITTERS LOCAL 51						

**Apprentice - PLUMBER/PIPEFITTER - Local 51****Effective Date - 08/30/2021**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.60	\$10.15	\$2.50	\$0.00	\$31.25
2	50	\$23.25	\$10.15	\$2.50	\$0.00	\$35.90
3	60	\$27.89	\$10.15	\$8.80	\$0.00	\$46.84
4	70	\$32.54	\$10.15	\$14.08	\$0.00	\$56.77
5	80	\$37.19	\$10.15	\$17.60	\$0.00	\$64.94

**Notes:**  
Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

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

PNEUMATIC CONTROLS (TEMP.)	08/30/2021	\$46.49	\$10.15	\$19.95	\$0.00	\$76.59
PLUMBERS & PIPEFITTERS LOCAL 51						

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



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i>	06/01/2022	\$37.31	\$9.10	\$16.64	\$0.00	\$63.05
	12/01/2022	\$38.16	\$9.10	\$16.64	\$0.00	\$63.90
	06/01/2023	\$39.06	\$9.10	\$16.64	\$0.00	\$64.80
	12/01/2023	\$39.96	\$9.10	\$16.64	\$0.00	\$65.70
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$36.41	\$9.10	\$16.64	\$0.00	\$62.15
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$33.69	\$14.00	\$16.05	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 170 - Dauphinis (Bellingham)</i>	01/01/2022	\$25.75	\$9.76	\$4.00	\$0.00	\$39.51
	12/01/2022	\$26.40	\$10.26	\$4.75	\$0.00	\$41.41
	01/01/2023	\$26.40	\$10.26	\$4.75	\$0.00	\$41.41
	12/01/2023	\$27.00	\$10.76	\$5.45	\$0.00	\$43.21
	01/01/2024	\$27.00	\$10.76	\$5.45	\$0.00	\$43.21
	12/01/2024	\$27.60	\$11.26	\$6.15	\$0.00	\$45.01
	01/01/2025	\$27.60	\$11.26	\$6.15	\$0.00	\$45.01
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofing &Roofers Damproofg) <i>ROOFERS LOCAL 33</i>	02/01/2022	\$47.03	\$12.28	\$19.45	\$0.00	\$78.76



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - ROOFER - Local 33</b>						
<b>Effective Date - 02/01/2022</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.52	\$12.28	\$5.21	\$0.00	\$41.01
2	60	\$28.22	\$12.28	\$19.45	\$0.00	\$59.95
3	65	\$30.57	\$12.28	\$19.45	\$0.00	\$62.30
4	75	\$35.27	\$12.28	\$19.45	\$0.00	\$67.00
5	85	\$39.98	\$12.28	\$19.45	\$0.00	\$71.71
<b>Notes:</b> ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1 Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs. (Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)						
<b>Apprentice to Journeyworker Ratio:**</b>						

ROOFER SLATE / TILE / PRECAST CONCRETE	02/01/2022	\$47.28	\$12.28	\$19.45	\$0.00	\$79.01
ROOFERS LOCAL 33						

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER	02/01/2022	\$53.70	\$13.80	\$25.60	\$2.79	\$95.89
SHEETMETAL WORKERS LOCAL 17 - A						

**Apprentice - SHEET METAL WORKER - Local 17-A****Effective Date - 02/01/2022**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$22.55	\$13.80	\$6.01	\$0.00	\$42.36
2	42	\$22.55	\$13.80	\$6.01	\$0.00	\$42.36
3	47	\$25.24	\$13.80	\$11.26	\$1.51	\$51.81
4	47	\$25.24	\$13.80	\$11.26	\$1.51	\$51.81
5	52	\$27.92	\$13.80	\$12.23	\$1.62	\$55.57
6	52	\$27.92	\$13.80	\$12.48	\$1.63	\$55.83
7	60	\$32.22	\$13.80	\$13.87	\$1.80	\$61.69
8	65	\$34.91	\$13.80	\$14.84	\$1.91	\$65.46
9	75	\$40.28	\$13.80	\$16.77	\$2.13	\$72.98
10	85	\$45.65	\$13.80	\$18.20	\$2.33	\$79.98

**Notes:**  
Steps are 6 mos.

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

SPECIALIZED EARTH MOVING EQUIP < 35 TONS	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B						

SPECIALIZED EARTH MOVING EQUIP > 35 TONS	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B						



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPRINKLER FITTER	03/01/2022	\$64.36	\$10.44	\$22.10	\$0.00	\$96.90
<i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	10/01/2022	\$66.06	\$10.44	\$22.10	\$0.00	\$98.60
	03/01/2023	\$67.76	\$10.44	\$22.10	\$0.00	\$100.30
	10/01/2023	\$69.51	\$10.44	\$22.10	\$0.00	\$102.05
	03/01/2024	\$71.31	\$10.44	\$22.10	\$0.00	\$103.85
	10/01/2024	\$73.11	\$10.44	\$22.10	\$0.00	\$105.65
	03/01/2025	\$74.91	\$10.44	\$22.10	\$0.00	\$107.45

**Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1****Effective Date -** 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$22.53	\$10.44	\$12.35	\$0.00	\$45.32
2	40	\$25.74	\$10.44	\$13.10	\$0.00	\$49.28
3	45	\$28.96	\$10.44	\$13.85	\$0.00	\$53.25
4	50	\$32.18	\$10.44	\$14.60	\$0.00	\$57.22
5	55	\$35.40	\$10.44	\$15.35	\$0.00	\$61.19
6	60	\$38.62	\$10.44	\$16.10	\$0.00	\$65.16
7	65	\$41.83	\$10.44	\$16.85	\$0.00	\$69.12
8	70	\$45.05	\$10.44	\$17.60	\$0.00	\$73.09
9	75	\$48.27	\$10.44	\$18.35	\$0.00	\$77.06
10	80	\$51.49	\$10.44	\$19.10	\$0.00	\$81.03

**Effective Date -** 10/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$23.12	\$10.44	\$12.35	\$0.00	\$45.91
2	40	\$26.42	\$10.44	\$13.10	\$0.00	\$49.96
3	45	\$29.73	\$10.44	\$13.85	\$0.00	\$54.02
4	50	\$33.03	\$10.44	\$14.60	\$0.00	\$58.07
5	55	\$36.33	\$10.44	\$15.35	\$0.00	\$62.12
6	60	\$39.64	\$10.44	\$16.10	\$0.00	\$66.18
7	65	\$42.94	\$10.44	\$16.85	\$0.00	\$70.23
8	70	\$46.24	\$10.44	\$17.60	\$0.00	\$74.28
9	75	\$49.55	\$10.44	\$18.35	\$0.00	\$78.34
10	80	\$52.85	\$10.44	\$19.10	\$0.00	\$82.39

**Notes:** Apprentice entered prior 9/30/10:  
40/45/50/55/60/65/70/75/80/85  
Steps are 850 hours

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

STEAM BOILER OPERATOR	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
<i>OPERATING ENGINEERS LOCAL 4</i>						

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
<i>OPERATING ENGINEERS LOCAL 4</i>						

For apprentice rates see "Apprentice- OPERATING ENGINEERS"



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN	09/01/2022	\$38.16	\$11.25	\$13.31	\$0.00	\$62.72
<i>ELECTRICIANS LOCAL 223</i>	09/01/2023	\$39.40	\$11.50	\$13.91	\$0.00	\$64.81
	09/01/2024	\$40.69	\$11.75	\$14.53	\$0.00	\$66.97

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 223****Effective Date - 09/01/2022**

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

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

**Apprentice to Journeyworker Ratio:2:3\*\*\***

TERRAZZO FINISHERS	08/01/2022	\$58.09	\$11.49	\$22.34	\$0.00	\$91.92
<i>BRICKLAYERS LOCAL 3 - MARBLE &amp; 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
	02/01/2026	\$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

**Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile****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:1:3**



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
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
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 2</i>	06/01/2022	\$36.56	\$9.10	\$16.64	\$0.00	\$62.30
	12/01/2022	\$37.41	\$9.10	\$16.64	\$0.00	\$63.15
	06/01/2023	\$38.31	\$9.10	\$16.64	\$0.00	\$64.05
	12/01/2023	\$39.21	\$9.10	\$16.64	\$0.00	\$64.95
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2021	\$35.66	\$9.10	\$16.64	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 51</i>	08/30/2021	\$46.49	\$10.15	\$19.95	\$0.00	\$76.59
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
<b>Outside Electrical - East</b>						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$29.67	\$9.25	\$1.89	\$0.00	\$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$42.03	\$9.25	\$10.27	\$0.00	\$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
For apprentice rates see "Apprentice- LINEMAN"						



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$22.25	\$9.25	\$1.82	\$0.00	\$33.32
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

**Apprentice - LINEMAN (Outside Electrical) - East Local 104****Effective Date -** 08/30/2020

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

**Notes:****Apprentice to Journeyworker Ratio:1:2**

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



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Additional Apprentices Information:

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

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

All steps are six months (1000 hours.)

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

\*\* Multiple ratios are listed in the comment field.

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

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



## DOCUMENT 00870

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT  
SPECIFICATIONS  
(EXECUTIVE ORDER 11246)  
Revised April 9, 2019

1. As used in these specifications:
  - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:
  - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.
  - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
  - d. "Minority" includes:
    - (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
    - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
    - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
    - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$ 10,000 the provisions of the specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.



6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
  - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
  - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
  - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
  - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
  - g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
  - h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.



- i. Direct its recruitment efforts both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
  - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
  - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
  - l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
  - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
  - n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
  - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
  - p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
  9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
  10. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
  11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.



12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as many be required by the Government and keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).



## APPENDIX A

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of \$ 10,000. The goals are applicable to the Contractor's aggregate on-site construction workforce whether or not part of that workforce is performing work on a Federal or federally-assisted construction contract or subcontract.

Area covered: Goal for Women apply nationwide

Goals and TimetablesTimetableGoals (percent)

From Apr. 1, 1980 until further notice

6.9



## APPENDIX B-80

Until further notice, the following goals for minority utilization in each construction craft and trade shall included in all Federal or federally assisted construction contracts and subcontracts in excess of \$ 10,000 to be performed in the respective geographical areas. The goals are applicable to each nonexempt contractor's total on- site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally assisted or nonfederally related project, contract or subcontract.

Construction contractors participating in an approved Hometown Plan (see 41 CFR 6-4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply with the applicable SMSA or EA goal contained in this Appendix B-80.

Economic AreasSTATE:Goals (percent)

## MASSACHUSETTS

004 Boston MA:

SMSA Counties:

1123 Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH

4.0

MA Essex, MA Middlesex, MA Norfolk, MA Plymouth,  
MA Suffolk, NH Rockingham.

5403 Fall River- New Bedford MA, Bristol

1.6

9243 Worcester-Fitchburg-Leominster, MA

1.6

6323 Springfield-Chicopee-Holyoke MA-CT

4.8

MA Hampden, MA Hampshire

Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket

3.6

Non-SMSA Counties: MA Franklin

5.9



## APPENDIX C

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontractors, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Massachusetts Department of Transportation (MassDOT) or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to MassDOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor’s noncompliance with the Nondiscrimination provisions of this contract, MassDOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:
  - a. withholding payments to the contractor under the contract until the contractor complies; and/or
  - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as MassDOT or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request MassDOT to enter into any litigation to protect the interests of MassDOT. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.



## APPENDIX D

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor,” which includes consultants) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

**PERTINENT NON-DISCRIMINATION AUTHORITIES:**

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-Aid programs and projects)
- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 *et seq.*) (prohibits discrimination on the basis of sex)
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability) and 49 CFR Part 27
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 *et seq.*) (prohibits discrimination on the basis of age)
- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex)
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of Federal-Aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not)
- Titles II and III of the Americans with Disabilities Act (42 U.S.C. §§ 12131-12189), as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38 (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities)
- The Federal Aviation Administration’s Non-Discrimination Statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations)
- Executive Order 13166, Improving Access to Services for People with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100)
- Title IX of the Education Amendments Act of 1972, as amended (20 U.S.C. 1681 *et seq.*) (prohibits discrimination on the basis of sex in education programs or activities)

\*\*\* END OF DOCUMENT \*\*\*



DOCUMENT 00875  
TRAINEE SPECIAL PROVISIONS  
Revised October, 2016

THE REQUIRED NUMBER OF TRAINEES TO BE TRAINED UNDER THIS CONTRACT WILL BE **5**

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: MA20220017 09/02/2022

Superseded General Decision Number: MA20210017

State: Massachusetts

Construction Type: Highway

County: Bristol 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).

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If the contract is entered	. Executive Order 14026
into on or after January 30,	generally applies to the
2022, or the contract is	contract.
renewed or extended (e.g., an	. The contractor must pay
option is exercised) on or	all covered workers at
after January 30, 2022:	least \$15.00 per hour (or
	the applicable wage rate
	listed on this wage
	determination, if it is
	higher) for all hours

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[illegible]

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
3	08/05/2022
4	09/02/2022

ELEC0103-003 03/01/2022

	Rates	Fringes
ELECTRICIAN (Includes Traffic Signalization).....	\$ 57.32	34.68

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ENGI0004-021 12/01/2021

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 51.38	31.10
GROUP 2.....	\$ 50.83	31.10

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

Loader; Broom/Sweeper; Crane; Gradall; Loader; Paver  
 (Asphalt, Aggregate, and Concrete); Post Driver  
 (Guardrail/Fences)

Group 2: Bulldozer; Grader/Blade; Milling Machine; Roller

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IRON0007-029 03/16/2022

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 50.60	39.20



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\* LABO0133-001 06/01/2022

	Rates	Fringes
LABORER (Concrete Surfacers) .....	\$ 36.31	26.64

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LABO0385-001 06/01/2018

	Rates	Fringes
LABORER		
Common or General .....	\$ 33.25	22.92
Fence Erection .....	\$ 33.50	22.92

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-----

LABO0721-001 06/01/2018

	Rates	Fringes
LABORER (Guardrail		
Installation) .....	\$ 33.50	22.92

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LABO0876-002 06/01/2018

	Rates	Fringes
LABORER (Landscape) .....	\$ 33.25	22.92

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PAIN0035-023 07/01/2019

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

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SUMA2014-007 01/11/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 56.70	21.08



IRONWORKER, REINFORCING.....	\$ 42.13	18.15
IRONWORKER, STRUCTURAL.....	\$ 45.19	17.30
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 34.72	16.01
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 44.43	14.18
LABORER: Jack Hammer.....	\$ 35.32	18.48
OPERATOR: Forklift.....	\$ 64.67	0.00
OPERATOR: Mechanic.....	\$ 48.74	11.79
OPERATOR: Piledriver.....	\$ 42.56	17.34
PAINTER: Spray (Linestriping)....	\$ 47.30	6.42
TRAFFIC CONTROL: Flagger.....	\$ 23.00	20.44
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper.....	\$ 53.35	12.78
TRUCK DRIVER: Concrete Truck....	\$ 33.69	15.79
TRUCK DRIVER: Dump Truck.....	\$ 39.03	12.89
TRUCK DRIVER: Flatbed Truck.....	\$ 48.53	0.00

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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)).

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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.



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### 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****TAUNTON****Federal Aid Project No. STP/HPP/CMQ-0035(015)X  
Roadway Reconstruction and Related Work (Including Signals)  
on a Section of Route 44 (Dean Street)**

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**

The work under this contract consists of widening of Route 44 (Dean Street) to accommodate two travel lanes and a buffered bicycle lane, in both the Eastbound and Westbound directions, from the State Highway Layout (east of Arlington Street) and terminating just West of the intersection with Route 104. The overall project length will be approximately 4,754 feet (0.90 miles).

The work also includes but is not limited to the following: excavation, pavement milling and overlay, construction of retaining walls on some stretches along the north and south sides of Route 44, removing and resetting existing granite curb, installing new curbing, reconstruction of drainage systems, extension of an existing culvert, retaining walls; tree removal; providing and spreading loam borrow and seed; installation of traffic signal equipment, traffic signing and pavement markings, traffic control management, and other street improvements including detail officers during construction, GATRA bus kiosk's and other street improvements in accordance with the Plans and these Special Provisions.

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.



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**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.

**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](mailto:massdotSpecifications@dot.state.ma.us) The MassDOT project file number and municipality is to be placed in the subject line.

**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.



**SUBSECTION 6.03: Delivery and Storage of Materials** (Continued)

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.

**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.



**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.

**WORK SCHEDULE**

The Contractor shall work between the hours of 7:00 AM – 3:30 PM. Any shift changes will require approval from the district construction office. The Contractor shall not perform work or accept deliveries that will interfere with through traffic during peak hourly volumes, which occur between the hours of 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM. The Contractor shall notify each abutter at least 24 hours in advance of road closure. The Contractor will, at a minimum, need to perform milling and paving operations in the evening hours between 6:00 PM and 7:00 AM and may also perform other quiet operations at night only upon receiving written permission by the Engineer.

The Contractor shall expect to perform limited night work on this project, subject to approval by the District, for operations that are best performed at night such as connections to existing water lines and electric service connection transfers.

The Taunton High School is located on the Honorable Gordon M. Owen Riverway on the opposite side of the river from the project. The Contractor shall keep the Taunton School Department apprised of any work that could potentially impede traffic.



## **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.



## **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.

## **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 June 23-28, 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 June 23, 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 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.



## **WORK IN COLDWATER FISHERIES**

Best management practices for erosion and sedimentation control must be adhered to for all phases of construction to minimize potential impacts to the fisheries resources. Traditional hay and/or straw bales should be avoided in favor of compost filter tubes. To the greatest extent practicable, all in stream work should be conducted during low flow periods throughout the year. Times of year when stream flow is high due to extended rain and/or snow melt events should be avoided. If at any time during construction fish may become isolated, the District Environmental Engineer should be contacted (Andrea Coates, 857-368-585), and Massachusetts Division of Fisheries and Wildlife (MassWildlife) shall be notified two weeks prior to dewatering to determine if salvage operations are desired and/or feasible. If dewatering is required at any point during construction, heated or sediment laden water should not be allowed to enter the brook directly. If the project will alter the streambed, the existing grade shall be maintained where possible.

## **ENVIRONMENTAL PERMITTING**

If Contractor erection, demolition, storage, or other procedures not originally allowed by existing environmental permits require work to occur in or otherwise impact water or wetland resource areas, the Contractor is advised that no associated work can occur until all required environmental permits have been either amended or obtained allowing such work. The Contractor must notify the District 5 Highway Director and Resident Engineer in writing a minimum of 60 days prior to the desired commencement of the proposed activity. All environmental submittals, including any contact with Local, State, or Federal environmental agencies, must be coordinated through the District 5 Environmental Engineer (name, phone number). The Contractor is expected to fully cooperate with requests for information and provide same in a timely manner. The Contractor is further advised that the Department will not entertain a delay claim due to the time required to modify or obtain the environmental permits.

The Contractor shall be responsible for compliance with all environmental permits, authorizations, and their associated conditions and stipulations. All permits and permit applications can be found in Appendix C, which include: 404 Army Corps of Engineers General Permit, Section 4f Approval, Wetlands Protection Act Superseding Order of Conditions, Chapter 91 License, Section 7 Consultation for Atlantic Sturgeon, and Fish and Wildlife Coordination Act Consultation. All permit condition submittals to permitting agencies shall be prepared by the Contractor and submitted for review to the District 5 Construction and Environmental Offices. Of note, the conditions include, but are not limited to, requirements for: pre-construction meetings, time of-year restrictions, actions and submittals; the development of means and methods submittals; environmental performance standards; and post construction requirements. Questions on environmental permit conditions can be directed to District 5 Environmental Engineer [[andrea.coates@dot.state.ma.us](mailto:andrea.coates@dot.state.ma.us)].



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**ENVIRONMENTAL PERMITTING** (Continued)

The project is subject to the following time of year (TOY) restrictions:

**DIVISION OF MARINE FISHERIES**

- The Taunton River has been identified by MA DMF as spawning habitat for blueback herring (*Alosa aestivalis*), as well as diadromous fish passage for alewife (*Alosa pseudoharengus*), American eel (*Anguilla rostrata*), American shad (*Alosa sapidissima*), and white perch (*Morone americana*).
- A time-of-year (TOY) restriction should be observed on all in-water, silt-producing activities to protect sensitive life stages of the above-listed diadromous species. No in-water, silt-producing activities should take place from March 15 – July 15 of any year. However, work may occur within this TOY restriction period provided appropriate silt containment measures are installed around the work area prior to the TOY period (i.e., prior to March 15).

**NATIONAL MARINE FISHERIES**

1. No work that produces greater than minimal turbidity (e.g. excavation) should be conducted during the spring (March 1 – June 30) and fall (Sept. 1 – Nov. 30) diadromous fish migration periods.
2. Appropriate soil erosion, sediment and turbidity controls should be used and maintained in effective operating condition during construction. Activities capable of producing greater than minimal turbidity or sedimentation should be done during periods of low-flow or no-flow, when the stream is waterward of the work, or when controls are used to obtain dry work conditions. Work that produces greater than minimal turbidity or sedimentation should not be done during the TOY restrictions in CR 1.
3. Sediment controls in streams should be installed and removed during the same TOY work window. Controls (e.g. turbidity curtains) should not encroach >25% of the width of the stream from OHW during the TOY restrictions in CR 1.

**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.



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**HOLIDAY WORK RESTRICTIONS** (Continued)**Martin Luther King's Birthday (Federal Holiday)**

No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

**President's Day (Federal Holiday)**

No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

**Evacuation Day (Suffolk County State Holiday)**

No work restrictions due to traffic concerns.

**Patriot's Day (State Holiday)**

Work restrictions will be in place for Districts 3 and 6 along the entire Boston Marathon route and any other locations that the DHD in those districts determine are warranted so as to not to impact the marathon. All other districts work restrictions will be as per DHD.

**Mother's Day**

No work on Western Turnpike and Metropolitan Highway System from 5:00 AM on the Friday before, until the normal start of business on the following day.

**Memorial Day (Federal Holiday)**

No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

**Bunker Hill Day (Suffolk County State Holiday)**

No work restrictions due to traffic concerns.

**Juneteenth**

No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

**Independence Day (Federal Holiday)**

No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day. No work on local roadways on the holiday without permission by the DHD and the local police chief.

**Labor Day (Federal Holiday)**

No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

**Columbus Day (Federal Holiday)**

No work on major arterials from 5:00 AM on the Friday before, until the normal start of business on the following day

**Veterans' Day (Federal Holiday)**

No work restrictions due to traffic concerns.



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**HOLIDAY WORK RESTRICTIONS** (Continued)**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.

**COMPLIANCE WITH THE NATIONAL DEFENSE AUTHORIZATION ACT**

(Supplementing Subsection 7.01)

On all projects, the “Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment” Regulation (2 CFR 200.216) prohibits the Contractor from using or furnishing the following telecommunications equipment or services:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- Telecommunications or video surveillance services provided by such entities or using such equipment.
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

This prohibition applies to all products manufactured by the aforementioned companies, including any individual components or parts.

By submitting a bid on a project, the Contractor certifies that all work will be in compliance with the terms of 2 CFR 200.216. The Contractor shall submit a COC indicating compliance with the above provisions for all telecommunications equipment or services included in the Contract.

Payment for the item in which the materials are incorporated may be withheld until these COCs are received. Any cost involved in furnishing the certificate(s) shall be borne by the Contractor.



**BIDDERS LIST**

Pursuant to the provisions of 49 CFR Part 26.11 all official bidders will be required to report the names, addresses and telephone numbers of all firms that submitted bids or quotes in connection with this project. Failure to comply with a written request for this information within 15 business days may result in a recommendation to the Prequalification Committee that prequalification status be suspended until the information is received.

The Department will survey all firms that have submitted bids or quotes during the previous year prior to setting the annual goal and shall request that each firm report its age and gross receipts for the year.

**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.

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION FILE NUMBER SIGN**

This project is subject to Massachusetts General Laws, Chapter 131, Section 40 as amended. Signs shall be in accordance with the latest MassDOT Construction Standards. All costs for the manufacture, erection, maintenance, moving, and removal of the signs shall be absorbed by the contractor with no additional compensation other than the contract unit prices.

For this project the Massachusetts Department of Environmental Protection File Number is SE 073-2998 .

**NOTICE TO OWNERS OF UTILITIES**

(Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or municipal and State officials owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one week in advance of the commencement of such operations. The Contractor shall, at the same time, file a copy of such 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 5,  
Select the Town of **TAUNTON** and then locate the utility.



**NOTICE TO OWNERS OF UTILITIES** (Continued)

The following are the names of owners of the principal utilities that may be affected as well as other major contacts, but completeness of this list is not guaranteed:

**Electric Company**

Taunton Municipal Lighting Plant

P.O. Box 870

Contact: Joe Fernandez

Email: [josephfernandes@tmlp.com](mailto:josephfernandes@tmlp.com)

Taunton, MA 02780

(508) 824-5844

**Gas Company**

Enbridge

8 Wilson Way

Contact: Kathy M. Aruda

Email: [kathleen.aruda@enbridge.com](mailto:kathleen.aruda@enbridge.com)

Westwood, MA 02090

(508) 938-7728

**Eversource-Gas**

157 Cordaville Road

Contact: Jeffrey Evan-Mongeon

Email: [Jeffrey.Evan-Mongeon@Eversource.com](mailto:Jeffrey.Evan-Mongeon@Eversource.com)

Southborough, MA 01772

(508) 305-6970

**Telephone Company**

Verizon

385 Myles Standish Blvd.

Contact: Karen Mealey

Email: [karen.m.mealey@verizon.com](mailto:karen.m.mealey@verizon.com)

Taunton, MA 02780

(774) 409-3160

**Water**

Taunton DPW-Water Division

90 Ingell St.

Contact: Paul Gargiulo

Email: [pgargiulo@taunton-ma.gov](mailto:pgargiulo@taunton-ma.gov)

Taunton, MA 02780

(508) 821-1045

**Sewer**

Veolia Water (Municipal)

825 West Water St.

Contact: Anicet Teves

Email: [aniceto.teves@veolia.com](mailto:aniceto.teves@veolia.com)

Taunton, MA 02780

(508) 823-3582

**Cable**

Comcast Cable Corporation

P.O. Box 6505, Omni Way

Contact: Wendy Brown

Email: [Wendy\\_Brown@comcast.com](mailto:Wendy_Brown@comcast.com)

Chelmsford, MA 01824

(978) 848-5163



**NOTICE TO OWNERS OF UTILITIES** (Continued)

AT&amp;T/ Teleport Communications

50 Mall Rd. – Suite 203

Contact: Hayleigh Walker

Email: [Hayleigh.Walker@sienaengineeringgroup.com](mailto:Hayleigh.Walker@sienaengineeringgroup.com)

Burlington, MA 01803

(781) 221-8400

Crown Castle

80 Central St.

Contact: Mark Bonanno

Email: [mark.bonanno@crowncastle.com](mailto:mark.bonanno@crowncastle.com)

Boxborough, MA 01719

(508) 616-7818

**Department of Public Works**

Taunton City Engineer

90 Ingell St.

Contact: Mark Slusarz

Email: [mslusarz@taunton-ma.gov](mailto:mslusarz@taunton-ma.gov)

Taunton, MA 02780

(508) 821-1027

**Railroad**

MBTA Document Control Group

500 Arborway

Contact: Tyler Scott

Email: [tscott@mbta.com](mailto:tscott@mbta.com)

Boston, MA 02130

Mass Coastal Railroad

12 Harding St., Unit 202

Contact: Chris Podgurski

Email: [cpodgurski@capetrain.com](mailto:cpodgurski@capetrain.com)

Lakeville, MA 02347

(508) 291-2116

CSX Transportation

4 Neshaminy Interplex – Suite 205

Contact: Derek S. Mihaly

Email: [derek\\_mihaly@csx.com](mailto:derek_mihaly@csx.com)

Trevose, PA 19053

(215) 218-3391

**EVERSOURCE EMERGENCY TELEPHONE NUMBERS**

GAS:

Outage/ Emergency: 800-592-2000

New Service: 866-678-2744

Customer Support: 800-592-2000



## **DRAINAGE STRUCTURES**

Where new pipe is shown on the drawings to be connected into an existing drainage structure to remain, the existing structure shall be first cleaned to remove all mud, debris and other material. The existing structure wall shall be carefully and neatly cut to provide the minimum size opening required for the insertion of the new pipe. The proposed pipe end shall be set or cut off flush with the inside face of the existing structure wall and the remaining space around the pipe completely filled with red brick set in cement grout for the full thickness of the structure wall. Existing shaped inverts shall be reconstructed as necessary to provide a smooth and uniform flow channel from the new pipe through the existing structure.

Where new structures shown on the plans are to connect to existing pipes to remain, the remaining pipe shall be cleaned from the new structure to the next structure downstream. Test pits to locate and survey the existing pipe shall be performed prior to ordering structure. The existing pipe or pipes shall be carefully cut or removed to allow the installation of the new drainage system. The existing pipe end shall be cut off flush with the inside face of the proposed structure wall and the remaining space around the pipe completely filled with red brick set in cement grout for the full thickness of the structure wall.

No separate payment will be made for the cost of connecting existing pipes to new structures, but all costs in connection therewith shall be included in the unit price bid for the various structure items. If new pipe or pipe section are required to extend the existing line to and through the new structure wall, the new pipe will be paid for under the unit price per foot established under that item.

No separate payment will be made for the cost of connecting new pipes into existing structures and necessary alterations of existing structures, but all costs in connection therewith shall be included in the unit prices bid for the various pipe items.

No separate payment will be made for the cost of connecting new pipes to existing pipes, but all costs in connection therewith shall be included in the unit prices bid for the various pipe items.

Where new pipe connects to existing headwalls and culverts, the old pipe shall be carefully removed, and the headwall or culvert wall cored so the new pipe can be mortared into place. No separate payment will be made of the cost of connecting the new pipe to the existing headwall, but all costs in connection therewith shall be included in the unit prices bid for various pipe items.



**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.

**OPTIONS**

<u>Item Number</u>	<u>Item Description</u>	<u>Unit</u>
234.12	12 Inch Drainage Pipe-Option	Foot
234.15	15 Inch Drainage Pipe-Option	Foot
234.18	18 Inch Drainage Pipe-Option	Foot
234.24	24 Inch Drainage Pipe-Option	Foot

**Pipe Options**

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

**EMERALD ASH BORER ADVISORY**

To the extent possible, all trees and brush shall be disposed on site, typically chipped and spread in place. When trees or brush must be removed, such as in urban, or otherwise populated areas, Contractor shall identify proposed location for disposal, and provide written notification to the Engineer for approval. Disposal shall be in city or town of project, or at minimum, within county, of construction operations.

**EQUIVALENT SINGLE AXLE LOADS (ESALS)**

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is 7.2 Million 18-kip (80-kn) ESALs.



## **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.



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**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.



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**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.

**SUMMARY OF POTENTIALLY IMPACTING RELEASES****RTN 4-166, 113 Dean Street, Texaco Service Station**

- The site is currently occupied by a gasoline service station, as it has been since at least 1949. As of 2019 it was a Canaan Fuels station.
- It was first registered as a release site with MassDEP in 1986 after non-aqueous phase liquid (NAPL) was observed in a nearby construction trench and traced to an earlier gasoline spill at 113 Dean Street.
- Further investigation of the site found various petroleum constituents in soil and groundwater, along with lead in groundwater.
- Depth to groundwater ranged from 4 to 10 feet.
- Response actions included the excavation and removal of impacted soils.
- An A-2 RAO was submitted for the site in 2000.
- Excavation for utilities between approximately Sta 122+25 and Sta 124+00 on the new baseline of Dean Street may encounter contaminated soil and/or groundwater.

**RTN 4-23889, 113 Dean Street, Super Petroleum Gas Station**

- The site is currently occupied by a gasoline service station, as it has been since at least 1949.
- An unrelated release is described above under RTN 4-166.
- RTN 4-23889 was assigned to the site in 2012 after a release of gasoline to the property during delivery operations.



**SUMMARY OF POTENTIALLY IMPACTING RELEASES** (Continued)

- Response actions included the removal of sediments and oily water from stormwater catch basins, the excavation and removal of impacted soil, and the removal, treatment, and disposal of impacted groundwater.
- Constituents of concern for the site were petroleum-related volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and aliphatic and aromatic volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH).
- Depth to groundwater ranged from 3 to 10 feet.
- A Permanent Solution with No Conditions was submitted for the site in 2016.
- Excavation for utilities between approximately Sta 122+25 and Sta 123+00 on the new baseline of Dean Street may encounter contaminated soil and/or groundwater.

**SUPERSEDING ORDER OF CONDITIONS**

The Contractor shall abide by all conditions imposed on the project by the Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection. The Contractor shall provide contact information for Contractor personnel where contact information is requested. With the exception of Special Conditions 32 and 33, work associated with the Invasive Special Management Plan (which will be paid for under Item 102.33 Invasive Plant Management Strategy) and the work associated with the Wetland Scientist (which will be paid for under Item 755.75 Wetland Specialist), all other work required by the SOC shall be incidental to various items of the project. Such work includes, but is not limited to, all work performed by the Environmental Monitor and an as-built survey stamped by a Professional Engineer or Land Surveyor. The Contractor shall also assist MassDOT in securing the Certificate of Compliance at the end of construction.

While an Environmental Monitor is required by the SOC and is listed separately than the Wetland Scientist, the Environmental Monitor and Wetland Scientist may be the same person as long as all conditions are met.

**NPDES STORMWATER POLLUTION PREVENTION PLAN**

The Contractor shall provide the required SWPPP for review as directed in the Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection. The Contractor shall also provide any reports generated by personnel complying with the construction general permit to the City of Taunton Conservation Commission and MassDEP. No additional payments will be made for the additional recipients.

**NOTIFICATION OF FUNDING SOURCES FOR WORK TO BE PAID BY OTHERS**

This contract contains work that shall be paid by the *City of Taunton*. The said *City* shall be responsible for construction costs associated with a Non-Participating Agreement with MassDOT.



## 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 102.2****TREE TRIMMING****LUMP SUM**

The work under this Item shall conform to the relevant provisions of Subsection 101 of the Standard Specifications and the following:

The work includes tree trimming as required to facilitate the relocation of utilities during construction.

**DESCRIPTION**

All branches and limbs of trees, regardless of size, which restrict horizontal or vertical clearances necessary for utility pole and overhead wire relocation shall be trimmed and painted. Coordination with the utility companies doing the relocation will be required.

The trees to be trimmed shall be determined by the Engineer and all work shall be done to the satisfaction of the Engineer. The quality and method of work must conform to accepted tree trimming practices according the following:

- MAA – Massachusetts Arborist Association
- ISA- International Society of Arborists

**CONSTRUCTION METHODS**

All tree trimming work shall be performed by a Massachusetts Certified Arborist. A copy of the Arborist's current certification will be provided to the Engineer prior to the start of the work.

**DISPOSAL, STORAGE, AND HANDLING**

The method of disposal of all materials shall be the responsibility of the Contractor and shall be approved by the Engineer. All methods of disposal shall be accomplished in accordance with all applicable Federal, State and local ordinances. Burning on-site will not be permitted

**BASIS OF PAYMENT**

Item 102.2 will be paid for at the contract Lump Sum price, which price shall include all labor, materials, equipment and incidental costs required to complete the work.



**ITEM 102.3****HERBICIDE TREATMENT OF INVASIVE PLANTS****HOURLY**

Work under this item consists of herbicide treatment of invasive plants currently existing within the project limits and as directed. An Invasive Plant Management Strategy (IPMS) shall be submitted to the Engineer for review and approval and the IPMS shall be implemented on-site. The IPMS shall be measured and paid for under Item 102.33 Invasive Plant Management Strategy.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation items.

Payment is per hour on-site and shall be compensation for a minimum crew of 2 licensed applicators, 2 back-pack sprayers and mist-blowers, a properly equipped spray truck with spray hoses, and a tank with sufficient capacity for a full day of work. If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price. This item is not intended for manual removal of plants.

Management of plants determined to have been introduced to the site via imported loam, compost, mulch, plants, equipment, or other construction activities will be the Contractor's responsibility and at the Contractor's expense.

Herbicide shall be applied during daytime hours only.

Measures to prevent the introduction of invasive plant species to the site and to address introduction due to construction-related activities shall be covered under the Standard Specifications, Division I - Subsections 7.01(D) Plant Pest Control and 7.13 Protection and Restoration of Property as amended in these Special Provisions.

Plant species targeted for management under this item shall be as determined in the field per the site walk and as specified in the IPMS.

The definition of invasive plant species shall be as described by Massachusetts Invasive Plant Advisory Group (MIPAG): "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems."

Control of invasive plants shall begin immediately with the initiation of construction activities and prior to any clearing or site disturbance. Treatment areas shall include stockpile locations and may, upon approval of the Engineer, extend outside the project limit. Treatment shall be done each consecutive year for the duration of the contract unless specified otherwise in the IPMS or unless directed otherwise by the MassDOT invasive species contact. Work shall be done during the growing season from May – October unless otherwise specified in the IPMS.

Areas identified for vegetation control measures shall be as shown on the plans and as determined in the field by the Engineer and a MassDOT Landscape Architect. Contact at MassDOT Landscape Design Section may be contacted at: [andrew.schlenker@dot.state.ma.us](mailto:andrew.schlenker@dot.state.ma.us).



**ITEM 102.3** (Continued)**SUBMITTALS**

No work shall begin without approval of the submittals.

Within 15 business days prior to the site walk, the Contractor shall submit all qualifications to the Engineer for approval by MassDOT Landscape Design.

Submittals include the following items.

**Qualifications**

1. Company must provide proof of qualifications by providing the following:
  - a. Narrative describing company, its expertise and experience with invasive plant control.
  - b. Demonstrate experience with herbicide treatment as part of restorations and in sensitive areas
  - c. Describe company's technical qualifications and past performance.
2. Company must meet licensing requirements:
  - a. All crew applicators must have a Massachusetts Commercial Applicator License (CORE).
  - b. At least one or more applicator must have a ROW certification, if required for work.
  - c. Company must provide name(s) of applicator(s) and Applicator License/Certification number for all contractor crew leaders working on the project.
  - d. Company must provide documentation of any warnings, penalties or fines received in the last three (3) years.
3. Company must provide proof of experience with invasive plant control and include following:
  - a. At least five (5) references from prior invasive plant control work completed in last five (5) years. Provide contact information including address, phone number and email.
  - b. Provide a summary of each of these projects including nature of the problem, specific invasive vegetation treated, dates and period of treatment, methodologies used, and summary of success or not in terms of meeting performance objectives. Include summary of equipment used.
  - c. Photo documentation of these projects.
  - d. GPS coordinates of project locations, if available.
4. Crew leader must have expertise with invasive plant control and provide the following:
  - a. Have held Core license for at least five (5) years.
  - b. Resume listing five (5) or more years of experience applying pesticides with the company or with another company specializing in vegetation management.



**ITEM 102.3** (Continued)

The following companies are pre-approved by MassDOT Landscape Design Section:

<b><i>Groundscapes Express, Inc.</i></b> P.O. Box 737 Wrentham, MA 02093 Contact: Butch Goodwin <a href="mailto:butch@groundscapesexpress.com">butch@groundscapesexpress.com</a> Phone: 508-400-5366	<b><i>Solitude Lake Management</i></b> 590 Lake Street Shrewsbury, MA 01545 Contact: Keith Gazaille <a href="mailto:kgazaille@solitudelake.com">kgazaille@solitudelake.com</a> Phone: 508-885-0101
<b><i>Land Stewardship, Inc.</i></b> PO Box 511 Turner Falls, MA 01376 Contact: Chris Polatin <a href="mailto:info@landstewardshipinc.com">info@landstewardshipinc.com</a> Phone: 413-367-5292	<b><i>SWCA Environmental Consultants</i></b> 15 Research Drive Contact: Scott Fisher Phone: 413-658.2056 <a href="mailto:sfisher@swca.com">sfisher@swca.com</a> Amherst, MA 01002
<b><i>Native Habitat Restoration</i></b> P.O. Box 582 Stockbridge, MA 01262 Contact: Jess M. Toro: 413-358-7400 <a href="mailto:nativehabitatrestoration@gmail.com">nativehabitatrestoration@gmail.com</a> Phone: 413-394-0277	<b><i>Vegetation Control Service, Inc.</i></b> 2342 Main St. Athol, MA 01331 Contact: Andrew Powers <a href="mailto:apowers@vegetationcontrol.com">apowers@vegetationcontrol.com</a> Phone: 800-323-7706
<b><i>Ecological Land Management</i></b> 293 High Road Newbury, MA 01950 <a href="mailto:Brian@ecologicalandmanagement.com">Brian@ecologicalandmanagement.com</a> Phone: (978) 358-1423	

**Invasive Plant Management Strategy (IPMS)**

At least thirty (30) days prior to proposed treatment the IPMS shall be submitted for approval by the Engineer and MassDOT Landscape Architect. All chemicals, methods and work done under this item shall be consistent with the IPMS. The IPMS shall be as described under Item 102.33.

**Herbicide Use Report**

Within two (2) weeks after each application, the Contractor shall provide to the Engineer a completed and signed MassDOT Herbicide Use Report.

**Photo Documentation**

Digital photos with date and time of herbicide application work may be required and shall be submitted upon request.



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**ITEM 102.3** (Continued)**MATERIALS**

All proposed herbicides shall be as approved in the IPMS. Herbicides shall be labeled for the method of treatment and shall meet all federal, state and local regulation requirements. Application rates will depend on herbicide proposed and shall be per the manufacturer's label for specific application.

**METHODS**

All methods used shall be as approved in the IPMS which shall be determined during the Initial Site Walk as described under Item 102.33 Invasive Plant Management Strategy.

The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

The Contractor shall notify the Engineer a minimum of 3 days prior to date of expected herbicide application. Applicators shall notify the Engineer upon arriving on-site.

**Herbicide Applications**

All herbicide application shall conform to Massachusetts Pesticide Laws and Regulations per the Massachusetts Department of Agricultural Resources (MDAR) Pesticide Bureau.

Mixing, applying and/or disposing of herbicides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. Mixing shall not occur within sensitive areas, wetlands, or buffer zones.

Contractor shall not spray 2 hours prior to precipitation, during rain, or during windy conditions. The Contractor shall be responsible for monitoring weather conditions and adjusting the work schedule as appropriate for the herbicide and application method to be used.

Targeted vegetation shall be identified and marked prior to treatment. Plants treated by foliar spray, injection or glove application or other methods that leave standing vegetation, as opposed to cut-stump application, shall remain clearly marked for identification through the contract period.

Desirable vegetation shall be protected from both spray and other physical damage.

Contractor is responsible for any damage to vegetation not designated for removal or treatment. Vegetation damaged shall be restored. Cost of replacement plants and/or restoration shall be borne by the Contractor.

Contractor shall ensure that the public does not enter a work area while herbicide application or spraying is underway.



**ITEM 102.3** (Continued)**Disposal Of Invasive Plant Material**

All material to be cleared shall become the property of the Contractor. The satisfactory disposal of all cleared plant material (seeds, roots, woody vegetation, associated soils, etc.) shall be the Contractor's responsibility.

The Contractor shall take measures to prevent viable plant material from leading to further infestations (seeds, roots, woody material, etc.) while stockpiled, in transit, or at final disposal locations. All precautions shall be taken to avoid contamination of natural landscapes with invasive plants or invasive plant material.

Chipping, shredding, or on-site burning of plant material must be approved by the Engineer and included in the IPMS.

For plant material taken to an incinerating facility per the IPMS, a receipt from that facility shall be submitted to the Engineer as proof of disposal.

Where feasible, it is preferable to dispose of plants on-site or to bury them on-site with on-going monitoring for re-sprouting. Disposal locations and methods must be approved and included in the IPMS. Site work such as grading and seeding to stabilize and restore disposal area shall be incidental to this item.

The Contractor shall be responsible for treating or otherwise managing areas of re-growth due to improper disposal. Treatment shall be at the Contractor's expense.

**Follow-Up Treatment**

Plants and areas shall be re-treated as necessary and as appropriate to the time of year. Treatment shall be for the duration of the contract and per the IPMS.

**MEASURE OF SUCCESS**

The expectation is a minimum of 85-95 percent control achieved after the first treatment, depending on plants targeted and extent of population, and based on the expectations laid out in the IPMS. The expectation for the contract duration is 95-100% eradication by the end of the treatment period, unless otherwise specified in the IPMS.

**METHOD OF MEASUREMENT**

Item 102.3 will be measured for payment by the Hour of crew time spent on the project doing actual herbicide application work. A crew shall be defined as a minimum of two licensed applicators each equipped with (at minimum) back-pack sprayer and mist blower. The crew shall also have a properly equipped spray truck with hoses and a tank with sufficient capacity for a full day of work.



**ITEM 102.3** (Continued)**BASIS OF PAYMENT**

Item 102.3 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment will be based upon time spent on the project doing actual work and shall not include travel time to and from the Contractor's place of business and shall also not include time for investigative field trips.

If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price.

The Invasive Plant Management Strategy will be paid for under Item 102.33.



**ITEM 102.33****INVASIVE PLANT MANAGEMENT STRATEGY****HOUR**

This item consists of providing an Invasive Plant Management Strategy (IPMS) for the control of invasive plants currently existing on the project site and/or as directed and shall be coordinated with Item 102.3 Herbicide Treatment of Invasive Plants. The IPMS shall be submitted for review and approval and the IPMS shall be implemented on-site.

Herbicide treatment for invasive plants shall be as described under Item 102.3 Herbicide Treatment of Invasive Plants and shall be compensated per that Item.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation as relevant to the project.

Individual attending the site walk and determining the Invasive Plant Management Strategy must demonstrate expertise with vegetation management and invasive plant control and submit qualifications as described below.

**SUBMITTALS****Task Summary**

For measurement of payment, the contractor shall submit the total sum and a breakdown of hours for the tasks performed. At a minimum, the tasks shall include the Initial Site Walk, the IPMS Written Report, and if necessary to accommodate project or site changes, a Follow-up Site Inspection and accompanying IPMS Amendment.

Interim Site Monitoring Reports and/or a Final Report shall be submitted if requested by the MassDOT Landscape Design contact. The MassDOT Landscape Design contact shall be notified to attend the final walk through when a Final Report has been requested.

**Qualifications**

Individual shall be from the same company as that providing services for Item 102.3 Herbicide Treatment of Invasive Plants or shall meet the following requirements:

- Submit copy of current Core license.
- Submit a resume listing five (5) or more years of experience managing invasive plants with a company specializing in vegetation management. References shall be submitted if requested.

**Invasive Plant Management Strategy (IPMS)**

At least thirty (30) days prior to construction activities and/or any proposed treatment, submit a written IPMS proposal for approval by the Engineer and MassDOT Landscape Architect. All chemicals and methods proposed shall be consistent with applicable Massachusetts Wetlands Protection Act Order of Conditions.



**ITEM 102.33** (Continued)

The IPMS shall be completed in coordination with the Roadway Contractor and the Engineer and shall include the following as appropriate to the project:

- I. Project Information**
  - a. Company writing IPMS and performing herbicide application.
  - b. Date of site walk
  - c. Attendees at site walk
  - d. Expected end date of contract and expected last treatment (month/season)
- II. Brief Description of Conditions**
  - a. Provide a free-hand sketch on construction plans or aerial image showing species, location, and as relevant, show or note extent of population as relevant to Strategy (i.e., population extends off ROW preventing eradication, small population and eradication deemed feasible within contract schedule, etc.).
- III. Coordination with Roadway Contractor regarding other work**
  - a. Tree Work: Note coordination to be implemented with tree removal, clearing, and clearing and grubbing as applicable to the project.
  - b. Wetland Mitigation - Include management proposed for wetland mitigation areas in the IPMS, if and as required.
  - c. Planting: If there will be planting in areas proposed for treatment, propose treatment and schedule to avoid herbicide damage to plants.
  - d. Mowing: If coordination is required with state mowers, note need in IPMS.
- IV. Soil Management**
  - a. Provide specifics on how soil with invasive plant roots (in particular) or seeds will be handled (i.e., separate stockpiles, plant material will be buried on-site, re-used on-site, disposed off site and if so, where?).
  - b. Show stockpile locations on plan and include treatment schedule.
  - c. Note measures that will be implemented to avoid spread through equipment, including how and where equipment will be cleaned.
- V. Invasive Plant Treatment & Management**
  - a. Proposed chemical and methods of treatment for each species or area.
  - b. Time of treatment based on target plant species.
  - c. Submit product label including application methods and rates (entire MSDS information need not be submitted if available online).
  - d. Proposed performance metrics or measure of treatment success if different from that specified under Item 102.3.
  - e. Method for disposing invasive plant material. This includes material that may result in spread (i.e., seeds, roots) and material that has been treated and/or is not viable (foliage, dead wood, etc.). Methods may include grinding in place, stockpiling and treating, and incinerating offsite.
  - f. Expected follow-up treatment for duration of contract.
- VI. Monitoring Schedule** if requested by MassDOT.

Note: The IPMS is critical for identifying pre-construction conditions as well as strategies for minimizing import or spread of invasive plants. Failure to provide an approved IPMS may jeopardize this item, in which case, the contractor will be responsible for management of invasive plants found on-site at no cost to the contract.



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**ITEM 102.33** (Continued)**Photo Documentation**

Digital photos with date and time verification shall be provided with the IPMS and with any follow-up monitoring or reporting.

**IPMS Follow-Up Amendments**

The IPMS may be amended to address additional concerns or adjust to conditions. The amended IPMS shall be submitted to the Engineer and MassDOT Landscape Architect for approval at least fourteen (14) days prior to any proposed treatment.

**Interim Site Monitoring Inspection Reports**

If required by the MassDOT Landscape Architect and Engineer, Interim Site Monitoring and an accompanying report shall be conducted.

**Final Report**

A final inspection and report documenting the status of the invasive control may be required for regulatory purposes or for instances where control will be continued by others. The report shall include photo documentation of pre-construction (existing) and post-treatment conditions, notations on a plan or aerial image of area treated, summary of treatment performed, and control achieved.

**INITIAL SITE WALK**

Prior to any work the Contractor shall walk the site with the Engineer and the MassDOT Landscape Architect to determine the IPMS. During the site walk the Contractor shall identify limits of work and, as necessary, mark locations of areas designated for treatment and individual plants targeted for treatment or removal. The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

**METHOD OF MEASUREMENT**

Item 102.33 will be measured for payment by the Hour. The basis for measurement shall be per the completion of tasks as approved under the Task Summary submittal.

**BASIS OF PAYMENT**

Item 102.33 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment shall not include travel time to and from the Contractor's place of business.



**ITEM 102.521****TREE AND PLANT PROTECTION FENCE****FOOT**

The work under this Item shall conform to the relevant provisions of Subsections 644 and 771 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, removing and resetting, maintaining fence in a vertical and effective position at all times, and final removal of temporary fence.

The purpose of the fence is to prevent damage to tree roots, tree trunks, soil, and all other vegetation within a delineated Tree and Plant Protection Zone (TPPZ) as shown on the plans, as directed by the Engineer, and as described herein.

Protection shall be for the duration of the construction activities unless otherwise directed.

**MATERIALS**

Temporary Fence shall be such that it provides a minimum 48-inch tall barrier that remains vertical and effective (not sagging) for the duration of period required. Fence shall be plastic orange safety fence (recommended where high visibility is necessary), wooden snow fencing, or other approved material.

Per the Engineer, additional posts, deeper post depths, and/or additional attachments will be used if the fabric or fence sags, leans or otherwise shows signs of failing to create a sufficient barrier to access.

**REFERENCES**

If requested, the Contractor shall provide to the Engineer one copy of the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1, Pruning and Part 5, Construction Management Standard. Provision of reference shall be incidental to this item.

**ESTABLISHMENT OF TPPZ**

Fencing shall be used for construction areas, staging areas, and stockpile areas as shown on the plans and as directed by the Engineer to establish the Tree and Plant Protection Zone (TPPZ).

Fence shall be located as close to the work zone limit and as far from the trunk as possible to maximize the area to be protected. Fence shall run parallel and adjacent to construction activity to create a barrier between the work zone and the root zone or designated limit of plants and soils to be protected.

When construction activities surround (or have the potential to surround) trees or plants to be protected, a circular enclosure shall be used. In these instances, the TPPZ limit shall be the Drip Line of each tree or as close as possible to the Drip Line, and as shown on the plans and details. The Drip Line is defined as the limit of tree canopy.



**ITEM 102.521** (Continued)

The Contractor shall not engage in any construction activity within the TPPZ without the approval of the Engineer, including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets; and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks.

**METHOD OF WORK**

Fence shall be installed prior to any construction work or staging activities and shall be installed and maintained in a vertical and effective position at all times.

Fence shall be repositioned where and as necessary for optimum effectiveness. Repositioning shall be incidental to this item. Fence shall not be moved without prior approval by the Engineer.

The TPPZ shall be protected at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves, and roots of all plants; and contamination of the soil with construction materials, debris, silt, fuels, oils, and any chemicals substance.

After construction activities are completed, or when directed by the Engineer, fence, stakes, and other materials shall be removed and disposed off-site by the Contractor.

**REQUIRED WORK WITHIN THE TPPZ**

In the event that grading, trenching, utility work, or storage is unavoidable within the TPPZ, the Engineer shall be notified. Measures may be required for tree protection and preservations, including air spading, the use of six-inch depth of wood chips or approved matting for root protection, pruning of branches, and/or trunk protection. These protection measures will be paid under applicable items.

Landscaping work specified within the TPPZ shall be accomplished by hand tools. Where hand work is not feasible, with permission of the Engineer, work shall be conducted with the smallest mechanized equipment necessary.

**TREE AND PLANT DAMAGES OR LOSS**

If the TPPZ is intruded upon, at the discretion of the Engineer, the Contractor will be required to provide a more durable barrier (e.g., Jersey Barriers) to secure the area. Cost of furnishing and installing additional or more durable barrier shall be borne by the Contractor.

If the Contractor intrudes into a TPPZ without approval, soil will be considered compacted and tree root damage will be assumed. Action will be taken as specified below.

In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense obtain an Arborist. The Arborist shall be approved by MassDOT.



**ITEM 102.521** (Continued)

In the event of spills, compaction or damage, the Contractor shall take corrective action immediately using methods approved by the Engineer in coordination with the Arborist.

If, based on the recommendations of the Arborist, the Engineer determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering, the damage will be repaired as soon as possible within the appropriate season for such work and according to industry standards.

If the Engineer determines that damages are irreparable, the Contractor shall pay for the damages in the amount of \$500.00 per diameter inch at breast height (DBH) per tree.

Additionally, if the Engineer determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include cleanup of all wood parts, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil.

Shrubs will be replaced with a plant of similar species and equal size or the largest size plants reasonably available. The Engineer will approve the size and quality of the replacement plant. Replacement will include a minimum of one year of watering and care.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 102.521 will be measured and paid for payment by the foot of Tree and Plant Protection Fence, complete in place. This includes all labor, materials, equipment, maintenance, final removal and disposal of the protective materials, damages repair, and all incidental cost required to complete the work.

Payment of 40 percent of value will be made upon installation of Fence. The remaining 60 percent will be made when protection materials have been removed and disposed off-site.

No separate payment will be made for costs of remedial actions, including addition of more durable barriers, or arborist services, but all costs in connection therewith shall be included in the Contract unit price bid.

In the event of irreparable damage due to lack of proper protective measures being take there will be no compensation in addition to the \$500.00 per diameter inch penalty.



**ITEM 102.531****TREE CARE - PRUNING****EACH**

The work under this item shall conform to the relevant provisions of Subsection 771 of the Standard Specifications and shall be for when specialized or significant limb pruning is required. Pruning shall be to prevent injury to the tree from construction equipment and activities, pruning of dead limbs, and/or pruning for health and balance of the tree to mitigate impacts of construction activities on the root zone.

Trees to be pruned shall be those listed below.

<u>Station</u>	<u>Offset</u>	<u>Baseline</u>
122+47	46' LT	Route 44

**QUALIFICATIONS**

Individuals performing the work must have, at a minimum, an ISA Certified Tree Worker or demonstrate equivalent training and experience. Certification shall be submitted to the Engineer for approval prior to work.

**REFERENCES**

If requested, the Contractor shall provide to the Engineer one copy of the latest edition of the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance: Part 1-Pruning and Part 5-Construction Management Standard. Provision of reference shall be incidental to this item.

**METHODS OF WORK**

Prior to construction activities, the Engineer, the Contractor, and the Arborist shall review trees noted on the plans and listed herein to be pruned. Final decision as to trees pruned shall be per the Engineer.

Pruning of limbs shall conform to the techniques and standards of the most recent ANSI A300 standards.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 102.531 will be measured and paid at the contract unit price per Each. This will include full compensation for all labor, equipment, tools, materials, and incidentals for the satisfactory completion of the work.

Arborist services shall be paid for separately under Arborist, Item 102.55.



**ITEM 102.55****ARBORIST****HOUR**

The work under this Item is for the services of a Certified Arborist. Arborist shall be an International Society of Arboriculture (ISA) Certified Arborist or a Massachusetts Certified Arborist. The Arborist shall have at least 10 years of experience in tree care, including tree protection during construction, and shall demonstrate a familiarity with the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1 Pruning, Part 5 Construction Management Standards, and Part 9 Tree Risk Assessment.

The Arborist's general responsibilities include protecting high priority trees within and adjacent to the project limits, stating areas, and access routes; recommending removal of diseased, damaged or otherwise unhealthy trees that pose a potential safety hazard; evaluating effects of construction on future health of trees close to proposed work; and recommending and/or overseeing tree work and care.

The Arborist for this item shall not be from the same company as the company responsible for selective clearing or tree removal work.

For projects with multiple phases, projects where construction activities (work or stockpiling) shifts, or when otherwise directed by the Engineer, the Arborist shall re-evaluate conditions and provide follow-up recommendations.

**SUBMITTALS**

- B Contractor shall submit to the Engineer for approval by MassDOT Landscape Design the qualifications and experience of the Arborist. Submittal shall include copy of current certification and a resume summarizing specific construction experience (including relevant MassDOT projects) for a minimum of five projects.
- B Arborist's Report documenting recommendations shall be submitted to the Engineer and an electronic copy forwarded to MassDOT Landscape Design Section. Report shall include the following:

**SCOPE OF WORK**

The Arborist shall be responsible for the following tasks:

- Initial Evaluation and Report
  - recommend and prioritize trees that require removal as appropriate to contract scope, project limits, and project intent;
  - review and modify, if necessary, tree protection measures shown on the drawings
  - review and mark limits of protective fencing for trees and groups of trees to be retained;
  - review and recommend protection measures for high priority trees;
  - submit a marked-up Construction Plan that briefly notes recommendations and decisions made in the field;
  - submit a corresponding report including photo documentation;
- Oversight
  - direct or execute pruning of branches and/or roots, air spading, and/or other tree care operations



**ITEM 102.55** (Continued)

- Monitoring and Inspections
  - periodically inspect fencing and ensure root zones are properly protected and clear of equipment and materials as required by the Engineer
  - reevaluate tree protection measures for various phases of a project
  - submit inspection notes with relevant and dated photos to the Engineer.
- Special Care
  - oversee tree pruning for health and aesthetics
  - recommend fertilization and amendments
  - recommend and oversee pest control

**METHODS**

Prior to any work, the Arborist shall walk the site with the Contractor, the Engineer, the Town Tree Warden, and, if specified, the MassDOT Landscape Architect, to review trees, limits of construction activities, and other concerns. Where required for proper assessment of tree impacts, limits of work shall be staked or otherwise marked in the field prior to the site walk.

Trees to be removed shall be painted or otherwise marked.

Trees to be retained shall be marked such that it does not mar or damage the tree and such that marker is not easily removed. As applicable to the work and scope of the project, trees designated for removal or to be retained shall be noted on the plan and/or in the arborist's report and photographed.

Trees designated to remain that are damaged or removed by construction activities shall be noted and photographed for inclusion in inspection reports submitted to the Engineer.

**MEASUREMENT AND BASIS OF PAYMENT**

Item 102.55 will be measured for payment by the Hour of time spent onsite.

Item 102.55 will be paid at the contract unit price per hour upon submittal and acceptance of Reports described above.



**ITEM 120.****EARTH EXCAVATION****CUBIC YARD**

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

The work shall also include the removal of brush, bushes, shrubs and trees and stumps up to 9" in diameter in areas outside clearing and grubbing limits. The work also includes the removal of free-standing rocks or boulders found at the edge of the road, typically used for landscaping purposes and highway bounds which are not labeled to be removed and reset or stacked.

The work shall also include the removal of debris/trash from the Riverfront Mitigation Area and general grading activity to restore a topography which reduces runoff and increases infiltration.



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

Work under this item shall conform to the relevant provisions of Subsection 120 of the Standard Specifications and the following:

The contractor's attention is directed to the existence of a reinforced concrete roadway bed below the existing roadway and median. The contractor shall remove all reinforced concrete encountered within drainage and utility trenches as shown on the plans. The costs of all work required to sawcut, excavate, break up, transport and dispose of the reinforced cement concrete materials shall be included in the contract unit price per cubic yard for this item.

**METHOD OF MEASUREMENT**

Item 127.1 will be measured for payment by the cubic yard, complete in place.

**BASIS OF PAYMENT**

Item 127.1 will be paid for at the Contract unit price per Cubic Yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for sawcutting slab, but all costs in connection therewith shall be included in the Contract unit price bid.

The excavation and disposal of existing cement concrete sidewalks will be paid for separately under Earth Excavation, Item 120.



**ITEM 151.6****LIGHTWEIGHT FILL****CUBIC YARD**

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

Lightweight fill is to be placed over the box culvert and behind the wingwalls, Wall 5, to the limits shown on the plans. The lightweight fill is to contain expanded shale aggregate and the fully compacted weight is not to exceed 65 pound per cubic foot.

Maximum thickness of each lift is not to exceed 12 inches. Lifts are to be performed concurrently with the adjacent Gravel Borrow for Backfilling Structures and Pipes. Care shall be taken to separate the two materials and maintain the limits for each, as shown on the plans. If the contractor proposes to use a fabric or other method or separating the adjacent materials, the fabric or other material shall be included in the price for the lightweight fill and no additional compensation will be given.

**SUBMITTALS**

A minimum of 14 days prior to lightweight aggregate fill placement, submit proposed methods of placement and compaction of lightweight aggregate fill above the bridge arch. Include proposed lift thickness; make, model, type, and weight of spreading and compaction equipment, and; number of passes. A product data sheet and certification from the Manufacturer that the lightweight fill product supplied meets the requirements of this section.

**MATERIALS****Lightweight Aggregate Fill**

- A. Lightweight aggregate fill shall consist of inert, hard, durable, washed, angular or subangular aggregate particles of expanded stone or natural lightweight stone, free of deleterious materials (including slags, cinders or by-products of coal combustion) conforming to ASTM C 330 and the following gradation:

<u>Sieve Size</u>	<u>% Passing by Weight</u>
1" (25 mm)	100
3/4" (19 mm)	90-100
3/8" (9.5 mm)	10-50
#4 (4.75 mm)	0-15

- B. Lightweight aggregate fill shall have a maximum dry loose bulk density of 55 pounds per cubic foot, and a maximum moist, in-place density of 65 pounds per cubic foot.



**ITEM 151.6** (Continued)

- C. The maximum soundness loss when tested with 5 cycles of magnesium sulfate shall be 10% per ASTM C-88.
- D. In-situ Phi Angle of the soil shall be 34 degrees in accordance with ASTM D 4030.
- E. Abrasive resistance shall be 40% as per ASTM C 131.
- F. The maximum chloride content (per CAL DOT 422) shall be 100 ppm. The maximum sulfate content per AASHTO T 290 I shall be 200 ppm. The pH shall be 5-10 when tested by AASHTO T 289 I and the resistivity shall be greater than 3000 ohm-cm when tested in accordance with AASHTO T 288 I.
- G. Lightweight Aggregate Fill shall be enveloped on all sides with non-woven Geotextile Fabric, using 2-foot overlaps, to mitigate intrusion of fine particles into the Lightweight Aggregate Fill. Geotextile fabric in this area shall be considered incidental to the lightweight fill item.

**Non-Woven Geotextile Fabric**

Material shall conform to Section M9.50.0 of the MHD Standard and Supplemental Specifications.

**USE OF MATERIALS****Lightweight Aggregate Fill**

- a. Use as fill above the bridge arch and below pavement base course material, within the limits shown on the Bridge Plans.

**COMPACTION**

Lightweight aggregate fill – used to fill above bridge arch, to 65 percent relative density per ASTM D-4253 and ASTM D-4254, and in accordance with the following:

1. Compaction of lightweight aggregate fill shall be performed using appropriately sized vibratory equipment to achieve the required relative density and stable, unyielding compacted lifts without (in the opinion of the Engineer) causing significant particle breakage.
2. Should visual observation indicate significant particle breakage, degree of particle breakage shall be judged solely by the Engineer based upon the results of laboratory grain size analyses on pre- and post-compaction samples.



**ITEM 151.6** (Continued)

3. Material with significant particle breakage shall be removed and replaced with material compacted as specified herein. Costs for laboratory grain size analyses, and removal and replacement of material due to significant particle breakage shall be borne by the Contractor.
4. Maximum thickness of each lift is not to exceed 12 inches. Lifts are to be performed concurrently with the adjacent Gravel Borrow for Backfilling Structures and Pipes. Care shall be taken to separate the two materials and maintain the limits for each, as shown on the plans.
5. Non-woven Geotextile Fabric shall be used to envelop the Lightweight Aggregate Fill on all sides to help separate it from adjacent materials and mitigate intrusion of fine particles into the Lightweight Aggregate Fill. The cost for the Geotextile Fabric shall be included in the price for the lightweight fill and no additional compensation will be given.
6. Each lift shall be compacted to at least 95% of maximum laboratory dry density in accordance with ASTM D-698.

**METHOD OF MEASUREMENT**

Item 151.6 will be measured for payment by the Cubic Yard of lightweight fill complete in place.

**BASIS OF PAYMENT**

Item 151.6 will be paid for at the contract unit price per the Cubic Yard, which price shall include all labor, tools, equipment, materials, geotextile fabric, and incidental costs required to complete the work.



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

The work under this item shall conform to the relevant provisions of Subsections 150 and 901 of the Standard Specifications and the following:

Work shall include furnishing and installing controlled density fill – excavatable as shown on Contract Drawings. This item shall be used as directed by the engineer when backfilling structures and pipes where obstructions or other utilities prevent proper compaction in mill and overlay areas.

**MATERIALS**

Controlled Density Fill Type 2E shall meet Materials Specification M4.08.0.

**METHOD OF MEASUREMENT**

Item 153. will be measured for payment by the Cubic Yard, complete in place to the limits shown on the plans and details.

**BASIS OF PAYMENT**

Item 153. will be paid for at the Contract unit price per Cubic Yard, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.



**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****HOURL**

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 180.03****LICENSED SITE PROFESSIONAL SERVICES****HOUR**

Within limited areas of the project site, soils, sediments and/or groundwater may be contaminated. A Licensed Site Professional (LSP) shall be required to provide the services necessary to comply with the requirements of the MCP. These services may include sampling, analysis and characterization of potentially contaminated media, preparation of Immediate Response Action (IRA) Plans, Utility-Related Abatement Measure (URAM) and Release Abatement Measure (RAM) Plans, Imminent Hazard Evaluations, status reports, transmittal forms, release notification forms, risk assessments, completion statements, and related documents required pursuant to the Massachusetts Contingency Plan (MCP). LSP hours related to the characterization and disposal of contaminated soil and/or sediment are incidental to the disposal items. An estimate of LSP services to be provided shall be submitted to the Engineer for approval before any LSP activity begins.

The name and qualifications of the LSP and all environmental technicians to be assigned to the project shall be submitted to the Engineer for approval at least four weeks prior to initial site activities. The LSP shall have a current, valid license issued by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals. The LSP shall have significant experience in the oversight of MCP activities at active construction sites. Qualification packages for the LSP and each technician shall include a resume, all recent work assignments with responsibilities identified (previous 5 years), and applicable training and certifications. A list of all Notices of Noncompliance, Notice of Audit Findings and Enforcement Orders issued by the DEP shall be submitted for all work assignments listed for the LSP and environmental technicians.

The LSP shall evaluate soil and/or sediment with discoloration, odor, and presence of petroleum liquid or sheening on the groundwater surface, or any abnormal gas or materials in the ground which are known or suspected to be oil or hazardous materials. Excavated soil and sediment which is suspected of petroleum contamination shall be field screened using the jar headspace procedures according to established DEP Guidance. All field screening equipment must be pre-approved by the Engineer. The LSP shall ensure proper on site calibration of all field screening instrumentation.

The Engineer shall be contacted immediately when observations or any field screening results verify contamination requiring further analysis, and/or enhanced management of suspect soil and/or sediment. Any enhanced management of contaminated soil to ensure proper stockpiling and storage is incidental to the LSP Services item. The LSP shall adequately characterize subsurface conditions prior to backfill in areas where contaminated material has been excavated. The Engineer shall approve the locations of the testing sites prior to the sampling.



**ITEM 180.03** (Continued)

Contaminated soil, sediment and/or groundwater shall be handled in accordance with all applicable state and federal statutes, regulations and policies. The LSP shall adequately characterize contaminated media for comparison to the requirements of the MCP. The Contractor and the LSP shall be aware of the reporting requirements for releases of oil and/or other hazardous material (OHM) as set forth in federal and state laws and regulations, and shall both be held responsible for performing the work in accordance with all applicable Federal and State laws and regulations. The LSP shall maintain written records in a clear and concise format which tracks the excavation, stockpiling, analysis and reuse/disposal of all suspect contaminated soils, sediments and groundwater. These records shall be up-to-date and available to the Engineer on a bi-weekly basis. The LSP shall review and summarize the laboratory data from any analyses performed on contaminated media. A report shall be delivered to the Engineer outlining the material sampling methods, laboratory analysis results and proposed course of action. The laboratory report together with Chain of Custody forms for all analytical results shall be submitted to the Engineer within 14 days after completion of such analyses.

The LSP and Contractor shall be held responsible for the submission of all MCP-related documents to the Engineer at least 14 days in advance of any timeframe specified in the MCP and for the timely submission of data and tracking information as noted within this Item. All documents prepared under this Item must be reviewed and signed by the approved LSP. The Contractor and LSP shall be responsible for all fines, penalties and enforcement requirements imposed by applicable regulatory agencies for failure to meet regulatory and contract timeframes. No compensation will be provided for such fines, penalties and enforcement actions.

The Contractor and the LSP shall be aware of the reporting requirements for releases of oil and/or other hazardous material (OHM) as set forth in federal and state laws and regulations, and shall both be held responsible for performing the work in accordance with all applicable Federal and State laws and regulations.

If the Contractor causes a release of OHM, the Contractor shall be responsible for assessing and remediating the release in accordance with all pertinent State and Federal regulations, including securing the services of a LSP, at his own expense.

The LSP shall coordinate all activities involving both MassDOT and the DEP through the Engineer. Any notification of release shall be approved by the Department before submittal to the DEP, except if an imminent hazard condition exists as defined in 309 CMR 4.03(4)(b).



**ITEM 180.03** (Continued)**Laboratory Testing in Support of LSP Services**

Laboratory testing provides for analytical testing in support of LSP services related to maintaining MCP compliance, such as delineating the extent and type of contamination present. Sampling and testing for disposal purposes are not included.

In order to maintain compliance with the MCP or other regulatory requirements, the LSP shall request approval from the Engineer to obtain samples from various locations and depths within the project area and to perform laboratory analyses on those samples. The samples shall be delivered to a DEP-certified laboratory using proper chain-of-custody documentation for analyses which, depending upon site conditions and suspected and/or identified contaminants of concern, may include, but are not limited to, metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polycyclic aromatic hydrocarbons (PAHs), extractable petroleum hydrocarbons (EPHs) and volatile petroleum hydrocarbons (VPHs). Subsequent testing, depending upon initial results, may be required for Toxicity Characteristic Leaching Procedure (TCLP) analyses (EPA Method 1311) for metals.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

LSP Services for work under this item will be measured per person, per hour of service provided by LSP, Environmental Technicians and other approved personnel. Travel time shall not be included in the billable hours. LSP hours related to soil/sediment disposal (disposal characterization, landfill acceptance, disposal package preparation, etc.) shall be incidental to disposal items.

The quantity and type of laboratory tests must be approved by the Engineer beforehand. The contractor will be reimbursed upon satisfactory written evidence of payment. The contractor may be required to obtain cost estimates from three DEP certified laboratories for the Engineer to choose the service provider. Laboratory testing related to soil/sediment disposal (disposal characterization, landfill acceptance, disposal package preparation, etc.) shall be incidental to disposal items.

LSP Services will be paid at the Contractor bid price for each hour, or fraction thereof, spent to perform the work as described above. The bid price shall be a blended rate that includes the cost of the LSP, environmental technicians and other personnel, the performance of all work tasks and field screening, including required equipment, materials and instrumentation, and production of all documentation described above. All requests for payment must be accompanied by the following information: the names of the personnel associated with the work charged under LSP Services, dates and hours worked, work conducted, including, where appropriate, locations as identified on the construction plans, and a copy of the field diary for the dates submitted.

Laboratory Testing will be reimbursed upon receipt of paid invoices for testing approved by the Engineer.



<b><u>ITEM 181.11</u></b>	<b><u>DISPOSAL OF UNREGULATED SOIL</u></b>	<b><u>TON</u></b>
<b><u>ITEM 181.12</u></b>	<b><u>DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY</u></b>	<b><u>TON</u></b>
<b><u>ITEM 181.13</u></b>	<b><u>DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY</u></b>	<b><u>TON</u></b>
<b><u>ITEM 181.14</u></b>	<b><u>DISPOSAL OF HAZARDOUS WASTE</u></b>	<b><u>TON</u></b>

The work under these Items shall include the transportation and disposal of contaminated material excavated, or excavated and stockpiled. It shall also include the cost of any additional laboratory analyses required by a particular disposal facility beyond the standard disposal test set.

Excavation of existing subsurface materials may include the excavation of contaminated soils. The Contractor shall be responsible for the proper coordination of characterization, transport and disposal, recycling or reuse of contaminated soils. Disposal, recycling or reuse will be referred to as “disposal” for the purposes of this specification. However, regardless of the use of the term herein, there will be no compensation under these items for reuse within the project limits. The Contractor will be responsible for coordinating the activities necessary for characterization, transport and disposal of contaminated soils. Such coordination will include the Engineer and his/her designee overseeing management of contaminated materials. Contaminated soils must be disposed of in a manner appropriate for the soil classification as described below and in accordance with the applicable laws of local, state and federal authorities. The Contractor shall be responsible for identifying disposal facility (ies) licensed to accept the class of contaminated soils to be managed and assure that the facility can accept the anticipated volume of soil contemplated by the project. The Contractor shall be responsible for hiring a Licensed Site Professional (LSP) and all ancillary professional services including laboratories as needed for this work. The Contractor will be responsible for obtaining all permits, approvals, manifests, waste profiles, Bills of Lading, etc. subject to the approval of the Engineer prior to the removal of the contaminated soil from the site. The Contractor and LSP shall prepare and submit to the Engineer for approval all documents required under the Massachusetts Contingency Plan (MCP) and related laws and environmental regulations to conduct characterization, transport, and disposal of contaminated materials.

#### **CLASSES OF CONTAMINATED SOILS**

The Contractor and its LSP shall determine if soil excavated or soil to be excavated is unregulated soil or contaminated soil as defined in this section. Such materials shall be given a designation for purposes of reuse or disposal based on the criteria of the MCP. Soils and sediments which are not suitable for reuse will be given a designation for purposes of off-site disposal based on the characterization data and disposal facility license requirements. The Classes of Contaminated Soils are defined as follows:



**ITEMS 181.11 through 181.14** (Continued)

UNREGULATED SOIL consists of soil, fill and dredged material with measured levels of oil and hazardous material (OHM) contamination at concentrations below the applicable Reportable Concentrations (RCs) presented in the MCP. Unregulated soil consists of material which may be reused (or otherwise disposed) as fill within the Commonwealth of Massachusetts subject to the non-degradation criteria of the MCP (310 CMR 40.0032(3), in a restricted manner, such that they are sent to a location with equal or higher concentrations of similar contaminants. Disposal areas include licensed disposal facilities, approved industrial settings in areas which will be capped or covered with pavement or loamed and seeded, and for purposes of this project should be reused as fill within the project site construction corridor whenever possible. The material cannot be placed in residential and/or environmentally sensitive (e.g. wetlands) areas. Under no circumstances shall contaminated soils be placed in an uncontaminated or less contaminated area (including the area above the groundwater table if this area shows no sign of contamination).

The Contractor shall submit to MassDOT the proposed disposal location for unregulated soils for approval. If such a disposal location is not a licensed disposal facility, the Contractor shall submit to the Engineer analytical data to characterize the disposal area sufficiently to verify that the unregulated material generated within the MassDOT construction project limits is equal to or less than the contaminant levels at the disposal site and meets the non-degradation requirements of the MCP. In addition, the Contractor shall provide written confirmation from the owner of the proposed disposal location that they have been provided with the analytical data for both the materials to be disposed as well as the disposal site characterization and that s/he agrees to accept this material. A Material Shipping Record or Bill of Lading, as appropriate, shall be used to track the off-site disposal of unregulated soil and a copy, signed by the disposal facility or property owner, shall be provided to the Engineer in order to document legal disposal of the unregulated material.

The cost of on-site disposal of unregulated soil within the project area will be considered incidental to the item of work to which it pertains.



**ITEMS 181.11 through 181.14** (Continued)

REGULATED SOIL consists of materials containing measurable levels of OHM that are equal to or exceed the applicable Reportable Concentrations for the site as defined by the MCP, 310 CMR 40.0000. Regulated soil which meets the MCP reuse criteria of the applicable soil/groundwater category for this project area may be reused on site provided that it meets the appropriate geotechnical criteria established by the Engineer. Regulated Soil may be reused (as daily or intermediate cover or pre-cap contouring material) or disposed (as buried waste) at lined landfills within the Commonwealth of Massachusetts or at an unlined landfill that is approved by the Massachusetts Department of Environmental Protection (DEP) for accepting such material, in accordance with DEP Policy #COMM-97-001, or at a similar out-of-state facility. It should be noted that soils which exceed the levels and criteria for disposal at in-state landfills, as outlined in COMM-97-001, may be shipped to an in-state landfill, but require approval from the DEP Division of Solid Waste Management and receiving facility. An additional management alternative for this material is recycling into asphalt. Regulated Soils may also be recycled at a DEP approved recycling facility possessing a Class A recycling permit subject to acceptance by the facility and compliance with DEP Policy #BWSC-94-400. Regulated Soil removed from the site for disposal or treatment must be removed via an LSP approved Bill of Lading, Manifest or applicable material tracking form. This type of facility shall be approved/permitted by the State in which it operates to accept the class of contaminated soil in accordance with all applicable local, state and federal regulations.

HAZARDOUS WASTE consists of materials which must be disposed of at a facility permitted and operated in full compliance with Federal Regulation 40 CFR 260-265, Massachusetts Regulation 310 CMR 30.000, Toxic Substances Control Act (TSCA) regulations, or the equivalent regulations of other states, and all other applicable local, state, and federal regulations. All excavated materials classified as hazardous waste shall be disposed of at an out-of-state permitted facility. This facility shall be a RCRA hazardous waste or TSCA facility, or RCRA hazardous waste incinerator. This type of facility shall be approved/permitted by the State in which it operates to accept hazardous waste in accordance with all applicable local, state and federal regulations and shall be permitted to accept all contamination which may be present in the soil excavate. The Contractor shall ensure that, when needed, the facility can accept TSCA waste materials i.e. polychlorinated biphenyls (PCBs). Hazardous waste must be removed from the site for disposal or treatment via an LSP approved Manifest.

**MONITORING/SAMPLING/TESTING REQUIREMENTS**

The Contractor shall be responsible for monitoring, sampling and testing during and following excavation of contaminated soils to determine the specific class of contaminated material. Monitoring, sampling and testing frequency and techniques should be performed in accordance with Item 180.03 – LSP Services. Additional sampling and analysis may be necessary to meet the requirements of the disposal facility license. The cost of such additional sampling and analysis shall be included in the bid cost for the applicable disposal items. The Contractor shall obtain sufficient information to demonstrate that the contaminated soil meets the disposal criteria set by the receiving facility that will accept the material.



**ITEMS 181.11 through 181.14** (Continued)

No excavated material will be permanently placed on-site or removed for off-site disposal until the results of chemical analyses have been received and the materials have been properly classified. The Contractor shall submit to the Engineer results of field and laboratory chemical analyses tests within seven days after their completion, accompanied by the classification of the material determined by the Contractor, and the intended disposition of the material. The Contractor shall submit to the Engineer for review all plans and documents relevant to LSP services, including but not limited to, all documents that must be submitted to the DEP.

**WASTE TRACKING:**

Copies of the fully executed Weight Slips/Bills of Lading/ Manifests/Material Shipping Records or other material tracking form received by the Contractor from each disposal facility and for each load disposed of at that facility, shall be submitted to Engineer and the Contractor's LSP within three days of receipt by the Contractor. The Contractor is responsible for preparing and submitting such documents for review and signature by the LSP or other appropriate person with signatory authority, three days in advance of transporting soil off-site. The Contractor shall furnish a form attached to each manifest or other material tracking form for all material removed off-site, certifying that the material was delivered to the site approved for the class of material. If the proposed disposition of the material is for reuse within the project construction corridor, the Contractor shall cooperate with MassDOT to obtain a suitable representative sample(s) of the material to establish its structural characteristics in order to meet the applicable structural requirements as fill for the project.

All material transported off-site shall be loaded by the Contractor into properly licensed and permitted vehicles and transported directly to the selected disposal or recycling facility and be accompanied by the applicable shipping paper. At a minimum, truck bodies must be structurally sound with sealed tail gates, and trucks shall be lined and loads covered with a liner, which shall be placed to form a continuous waterproof tarpaulin to protect the load from wind and rain.

**DECONTAMINATION OF EQUIPMENT**

Tools and equipment which are to be taken from and reused off site shall be decontaminated in accordance with applicable local, state and federal regulations. This requirement shall include, but not be limited to, all tools, heavy machinery and excavating and hauling equipment used during excavation, stockpiling and handling of contaminated material. Decontamination of equipment is considered incidental to the applicable excavation item.



**ITEMS 181.11 through 181.14** (Continued)**REGULATORY REQUIREMENTS**

The Contractor shall be responsible for adhering to regulations, specifications and recognized standard practices related to contaminated material handling during excavation and disposal activities. MassDOT shall not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers and others. The Contractor shall comply with all rules, regulations, laws, permits and ordinances of all authorities having jurisdiction including, but not limited to, Massachusetts DEP, the U.S. Environmental Protection Agency (EPA), Federal Department of Transportation (DOT), Massachusetts Water Resources Authority (MWRA), the Commonwealth of Massachusetts and other applicable local, state and federal agencies governing the disposal of contaminated soils.

All labor, materials, equipment and services necessary to make the work comply with such regulations shall be provided by the Contractor without additional cost to MassDOT. Whenever there is a conflict or overlap within the regulations, the most stringent provisions shall apply. The Contractor shall reimburse MassDOT for all costs it incurs, including penalties and/or for fines, as a result of the Contractor's failure to adhere to the regulations, specifications, recognized standard practices, etc., that relate to contaminated material handling, transportation and disposal.

**SUBMITTALS****I. Summary of Sampling Results, Classification of Material and Proposed Disposal Option.**

The following information, presented in tabular format, must be submitted to the Engineer for review and approval prior to any reuse on-site or disposal off-site. This requirement is on-going throughout the project duration. At least two weeks prior to the start of any excavation activity, the Contractor shall submit a tracking template to be used to present the information as stipulated below. Excavation will not begin until the format is acceptable to MassDOT.

Characterization Reports will be submitted for all soil, sediment, debris and groundwater characterized through the sampling and analysis program. Each report will include a site plan which identifies the sampling locations represented in the Report. The Construction Plan sheets may be used as a baseplan to record this information.

The Sampling Results will be presented in tabular format. Each sample will be identified by appropriate identification matching the sample identification shown on the Chain of Custody Record. The sample must also be identified by location (e.g. grid number or stockpile number). For each sample, the following information must be listed: the classification (unregulated, regulated, etc.), proposed disposal option for the stockpile or unit of material represented, and, all analytical results.



**ITEMS 181.11 through 181.14** (Continued)

Each Characterization Report will include the laboratory analytical report and Chain of Custody Record for the samples included in the Report.

**II. Stockpiling, Transport, and Disposal.**

At least two weeks prior to the start of any excavation activity, the Contractor shall submit, in writing, the following for review and shall not begin excavation activity until the entire submittal is acceptable to MassDOT.

**Excavation and Stockpiling Protocol:**

Provide a written description of the management protocols for performing excavation and stockpiling and/or direct loading for transport, referencing the locations and methods of excavating and stockpiling excavated material.

**Disposal and Recycling Facilities:**

1. Provide the name, address, applicable licenses and approved waste profile for disposal and/or recycling location(s) where contaminated soil will be disposed. Present information substantiating the suitability of proposed sites to receive classifications of materials intended to be disposed there, including the ability of the facility to accept anticipated volumes of material.
2. Provide a summary of the history of compliance actions for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. Material should not be sent to facilities which are actively considered by the DEP, USEPA or other responsible agency to be in violation of federal, state or local hazardous waste or hazardous material regulations. MassDOT reserves the right to reject any facility on the basis of poor compliance history.

**Transportation:**

The name, address, applicable license and insurance certificates of the licensed hauler(s) and equipment and handling methods to be used in excavation, segregation, transport, disposal or recycling.

**III. Material Tracking and Analytical Documentation for Reuse/Disposal.**

The following documents are required for all excavation, reuse and disposal operations and shall be in the format described. At least two weeks prior to the start of any excavation or demolition activity, the Contractor shall submit the tracking templates required to present the information as stipulated below. Excavation or demolition will not begin until the format is acceptable to MassDOT.



**ITEMS 181.11 through 181.14** (Continued)

All soils, sediments and demolition debris must be tracked from the point of excavation to stockpiling to onsite treatment/processing operations to off-site disposal or onsite reuse as applicable.

**Demolition Debris:**

Demolition debris must be tracked if the debris is stockpiled at a location other than the point of origin or if treatment or material processing is conducted. Identification of locations will be based on the station-offset of the location. The tracking table will identify date and point of generation, any field screening such as PID or dust monitoring, visual observations/comments, quantity, and stockpile ID/processing operation location. For each unit of material tracked, the table will also track reuse of the material on-site, providing reuse date, location of reuse as defined by start and end station, width of reuse location by offset, the fill elevation range, quantity, and finish grade for said location. For demolition debris which is not reused on site, the table will also track disposal of the material as defined by disposal date, quantity and disposal facility. The table must provide a reference to any analytical data generated for the material.

**Soil/Sediment:**

Soil excavation will be identified based on the station-offset of the excavation location limits. The tracking table will identify date and point of generation, any field screening such as PID or dust monitoring, visual observations, quantity, and stockpile number/location. For each unit of material tracked, the table will also track reuse of the material on-site and disposal of the material off-site using the same categories identified for demolition debris above.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Disposal of contaminated soil shall be measured for payment by the Ton of actual and verified weight of contaminated materials removed and disposed of. The quantities will be determined only by weight slips issued by and signed by the disposal facility. The most cost-effective, legal disposal method shall be used. The work of the LSP for disposal under all of these items shall be incidental to the work with no additional compensation.

ITEM 181.11 Measurement for Disposal of Unregulated Soil shall be under the Contract Unit Price by the weight, in tons, of contaminated materials removed from the site and transported to and disposed of at an approved location or licensed facility, and includes any and all costs for approvals, permits, fees and taxes, additional testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEM 181.12 Measurement for Disposal of Regulated Soil – In-State Facility shall be under the Contract Unit Price by the weight in tons of contaminated materials removed from the site and transported to and disposed of at an approved in-state facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.



**ITEMS 181.11 through 181.14** (Continued)

ITEM 181.13 Measurement for Disposal of Regulated Soil - Out-of-State Facility shall be under the Contract Unit Price by the weight in tons of contaminated materials removed from the site and transported to and disposed of at an approved out-of-state facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEM 181.14 Measurement for Disposal of Hazardous Waste shall be under the Contract Unit Price by the weight in tons of hazardous waste removed from the site and transported to and disposed of at the licensed hazardous waste facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.



**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



**ITEM 182.1** (Continued)

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

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.

**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 and Industries Regulations, (DLI) including but not limited to:

- 453 CMR 6.00 Removal, Containment and Encapsulation of Asbestos

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



**ITEM 182.2** (Continued)

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 and Industries. 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 Abatement Supervisor and Asbestos Abatement Project Designer as required by 453 CMR 6.00.

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.

The Contractor shall also obtain and pay all other applicable asbestos waste transportation and disposal permits, licenses and fees.



**ITEM 182.2** (Continued)**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 workspaces.
2. Proper protective clothing and respiratory protection prior to entering the workspaces.
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 workspace 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 workspace, 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.

1. Name, experience and DLI 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 DLI, 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.



**ITEM 182.2** (Continued)

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.

**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 183.1****TREATMENT OF  
CONTAMINATED GROUNDWATER****GALLON**

This Item addresses the treatment and disposal of contaminated groundwater encountered during excavation operations. The work generally consists of furnishing the materials, equipment, labor, services, testing/sampling, waste characterization, transportation, disposal, permits and agreements necessary to perform the work required for the collection, treatment and disposal of contaminated groundwater.

The Contractor is advised that contaminated groundwater may be encountered during dewatering activities. The levels and nature of contamination may vary depending on location and/or depth. No data has been provided in this specification indicating the types of contaminants that may be found in groundwater encountered during this work. It will be the responsibility of the Contractor to ensure that water removed during dewatering operations is treated and disposed of in accordance with all applicable laws and regulations and in accordance with this specification.

The Contractor shall monitor the quantity of groundwater collected for treatment using an in-line totalizer flowmeter or an alternate method approved by MassDOT. The Contractor shall, at all times, minimize the quantity of groundwater removed from the excavations. All groundwater determined to be contaminated will be managed in accordance with all applicable local, state and federal regulations.

It is not the intent herein for the Department to design for or specify to the Contractor which particular treatment is to be used, if necessary. Rather, it is the Department's intent to provide guidance to the Contractor for informational and bidding purposes only. It is, therefore, the Contractor's responsibility to use a treatment method to allow him/her to meet any and all laws, regulations, policies, guidelines and permit requirements. Treatment of contaminated groundwater for dewatering operations is generally performed using a mobile treatment trailer equipped with one or more granular-activated carbon (GAC) canisters, although other techniques are also used.

It is likely that treatment of the contaminated groundwater using granular-activated carbon will be required to complete the work under this Contract. The Methods described under Item 183.1 provides for the identification, testing, management and treatment or disposal of contaminated groundwater and shall be implemented, at a minimum and as necessary by the Contractor via Methods under Item 183.1.

The overall handling and management of contaminated groundwater is regulated under the provisions of 310 CMR 40.0000, 314 CMR 3.00 and 5.00, NPDES and other applicable laws. The unpermitted discharge of contaminated dewatering effluent into the environment (storm drain, surface water body, onto the ground) is a violation of federal and state laws and regulations. Should dewatering of contaminated groundwater be necessary, approvals must be sought from the appropriate federal, state, or local regulatory jurisdiction. The USEPA will not specify a treatment system or method, but normally requires that the treated discharge meet Massachusetts Drinking Water Standards.



**ITEM 183.1** (Continued)

The discharge standards are normally met by treating the dewatered groundwater through granular-activated carbon canisters, or similar techniques. Longer term discharges to surface waters or storm drains, and any discharges to the ground, require approval and/or issuance of a permit from the DEP Division of Water Pollution Control. The Contractor shall be responsible for applying for, paying all fees for and obtaining all permits required for treatment and/or disposal of contaminated groundwater. Additional requirements may be mandated by local/regional sewer authorities for discharge to sanitary sewer or Publicly Owner Treatment Works (POTW). Copies of permit applications and correspondence from federal and state agencies and sewer authorities shall be supplied to the Engineer prior to dewatering activities.

EPA regulations published in the Federal Register on September 9, 2005 (70 FR 53663) require a National Pollutant Discharge Elimination System (NPDES) Remediation & Miscellaneous Contaminated Sites General Permit (RGP) for all contaminated construction site dewatering activities in Massachusetts (MAG910000) that will involve the discharge of water to classes of receiving waters designated in the Massachusetts Water Quality Standards (314 CMR 4.00). The application requires that operators of proposed new discharges seeking coverage under this general permit submit a Notice of Intent (NOI) to EPA New England post-marked at least 14 days prior to commencement of discharge. The Contractor is solely responsible for applying for and obtaining coverage under the NPDES Remediation General Permit from EPA and, if applicable, DEP, including the costs associated with sampling and analysis of groundwater and any application fees. The Contractor is required to submit a completed copy of the NOI to the Engineer and the Director of Environmental Programs, Construction Division, 10 Park Plaza, Boston, prior to commencement of discharge.

Upon permanent cessation of the discharges authorized by the RGP, the Contractor shall be responsible for submitting a Notice of Termination (NOT) to EPA New England within 30 days of the permanent cessation. The Contractor is required to submit to MassDOT a completed copy of the NOT within 14 days of the permanent cessation of the discharges authorized by the RGP. All costs and fees associated with the submission of the NOT will be the responsibility of the Contractor.

The Contractor shall be responsible for adhering to regulations, specifications, and recognized standard practices related to contaminated groundwater handling during dewatering activities. MassDOT shall not be responsible at any time for the Contractor's violation of pertinent local, state or federal regulations or endangerment of laborers and others. The Contractor shall comply with all rules regulations, laws, permits and ordinances of all authorities having jurisdiction including, but not limited to, Massachusetts Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (EPA), Federal Department of Transportation (DOT), Massachusetts Water Resources Authority (MWRA), the Commonwealth of Massachusetts and other applicable local, state and federal agencies governing this work.



**ITEM 183.1** (Continued)

The Contractor shall be responsible for determining compliance with the requirements of any permit and for any sampling, testing, and disposal required in connection with said permits. MassDOT and the City/Town reserve the right to collect additional samples of dewatered groundwater to determine the Contractor's compliance with the Permit's requirements. All laboratory testing is to be performed by a DEP certified laboratory for all parameters being tested. Copies of all field and laboratory testing results, reports, etc. required by the permits must be supplied to the Engineer. MassDOT, DEP, and the permit-granting agency, where applicable, reserve the right to collect additional samples of discharged groundwater to verify compliance with permit requirements.

For the purpose of these specifications and to establish a basis for the bid, it is anticipated that granular-activated carbon will be the treatment medium for dewatered contaminated groundwater. The bidder shall factor into the payment item all costs associated with the testing and analyses that may be required by the permitting agency. In addition, any laboratory testing of groundwater is to be performed by a DEP certified laboratory for the parameters being tested. Copies of all field and laboratory testing results will be supplied to the Engineer. Bid price shall also include full compensation for labor, materials, maintenance, mobilization, rental and other related costs. Item 183.2 will be used for disposal of used granular-activated carbon canisters.

**SUBMITTALS:**

Prior to initiating work, the Contractor shall submit an excavation dewatering plan to the MassDOT that includes a detailed description of the approach to dewatering, a description of methodology for sealing the excavation to minimize infiltration of groundwater, if deemed applicable to the work, anticipated treatment, discharge points, sampling frequency, required permits, transporters and waste facilities complete with license numbers, permit numbers, contact person, and address and telephone number that the Contractor plans to utilize for waste disposal. The plan shall be submitted for the record.

The Contractor shall submit to MassDOT for review, the proposed methods for dewatering and groundwater treatment and disposal for the various portions of the work to be done. The review shall be for methods only. The Contractor shall remain responsible for the maintenance, performance, structural integrity and safety of the systems installed for this work as well as regulatory compliance of the applicable local, state and federal discharge standards. The contractor shall provide all groundwater sampling and analyses, results and reports required by all applicable local, state and federal agencies. The Contractor shall submit to MassDOT for review all plans and documents that must be submitted to the EPA and DEP, including NOI, NOT, treatment system analytical reports and correspondence. Copies of all permits and approvals and lab analyses and test results associated with groundwater treatment and disposal must be submitted to MassDOT within 3 days of receipt by the Contractor.



**ITEM 183.1** (Continued)**ESTABLISHMENT OF TREATMENT PROCEDURE:**

Since concentrations of contaminants in groundwater cannot be easily assessed in the field, all groundwater extracted from the ground will be considered contaminated and will be initially pumped and stored into open settling tank(s) or a fractionation tank until it can be sampled and analyzed, unless otherwise directed by MassDOT. The Contractor will perform initial sampling and analyses of the groundwater to determine the need for a permit to dispose of contaminated groundwater. Based on the results of the initial sample analysis, which must be provided to the Engineer within twenty-four (24) hours of the time the samples are received by the laboratory, the Contractor will determine the necessity for treatment(s) and disposal procedures. Sampling must also be performed to meet applicable discharge criteria as set by the appropriate regulatory agencies for the permit obtained for disposal. All discharges must meet regulatory standards set forth in the permits required for discharge. For the purposes of the bidding process, it is anticipated that the treatment system will consist of sedimentation tanks, an oil water separator and liquid-phase granular activated carbon as the primary on-site treatment medium for dewatered contaminated groundwater. MassDOT may require additional treatment processes if such is determined necessary during the groundwater testing procedure. The Contractor shall integrate the additional treatment process into the treatment system, if necessary.

The Contractor shall provide all labor, equipment and appurtenances required to treat the groundwater, subject to the approval of MassDOT. Groundwater stored and tested but not requiring treatment or off-site disposal shall be discharged to a location subject to the approval of MassDOT without payment to the Contractor.

**TREATMENT UNITS:**

The Contractor shall furnish all labor and materials, and shall install and operate temporary groundwater treatment and disposal system(s) as necessary to treat contaminated groundwater pumped from excavations during construction activities under the Contract. Such systems shall be capable of treating groundwater to meet applicable discharge criteria as set by the appropriate regulatory agencies.

The Contractor or their Environmental Consultant shall operate, maintain and modify the selected treatment system, and conduct the necessary monitoring and reporting of influent, midpoint and effluent results, as required by the discharge permit for the disposal option selected.



**ITEM 183.1** (Continued)**METHOD OF MEASUREMENT:**

Provide a treatment system that meets permit discharge requirements, mobilize it to the site, provide copies of laboratory analytical data indicating that the system is performing appropriately to meet permit requirements, and demobilize it from the site. This includes management and disposal of wastes generated during treatment prior to discharging such as activated carbon, etc. Work under Item 183.1 is based upon the number of gallons disposed or contaminated groundwater pumped through the granular-activated carbon (Item 183.2) as the medium for the treatment of contaminated groundwater that is found in pipe trenches, manhole excavations, catch basin excavations, that need to be dewatered.

**BASIS OF PAYMENT:**

Payment shall be made at the unit price bid per gallon of groundwater pumped, stored, treated as needed and tested as required by discharge permits and regulatory requirements, which price shall be full compensation for all necessary labor and materials, mobilization, maintenance, demobilization of the appropriate unit(s), freight, rental costs, field and laboratory testing costs and permits. Costs associated with the disposal of granular-activated carbon shall be covered under Item 183.2.



**ITEM 183.2****DISPOSAL OF  
GRANULAR-ACTIVATED CARBON****POUND**

Work under Item 183.2 is based upon the disposal of used granular-activated carbon as the treatment medium for contaminated groundwater (Item 183.1) that is found during excavations in which contaminated groundwater is encountered.

**BASIS OF PAYMENT**

Payment shall be made at the unit price bid per pound of carbon that is properly disposed and replaced, as necessary, to meet treated water discharge requirements during dewatering operations at the site. Payment for Disposal of Granular Activated Carbon shall include compensation for all labor, equipment, materials, permits, characterization, sampling and on-site or laboratory analysis as needed or required by permits, for replacement and disposal of liquid-phase activated carbon for the on-site contaminated groundwater pumping, collection, treatment and treated water discharge system during the time period required to complete the work. No payments shall be made for replacing carbon which is spent due to the Contractor's failure to remove floating petroleum product or excess sediments prior to the groundwater entering the carbon treatment units. All other costs associated with treatment of contaminated groundwater will be covered under Item 183.1- Treatment of Contaminated Groundwater.



**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.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

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 necessary for the completion of the work.



<b><u>ITEM 201.</u></b>	<b><u>CATCH BASIN</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 202.</u></b>	<b><u>MANHOLE</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 202.05</u></b>	<b><u>MANHOLE 5 FEET ID</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 202.2</u></b>	<b><u>MANHOLE (9 TO 14 FOOT DEPTH)</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 203.</u></b>	<b><u>SPECIAL MANHOLE</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 204.</u></b>	<b><u>GUTTER INLET</u></b>	<b><u>EACH</u></b>

The work under these items shall conform to the relevant provisions of Subsection 201 of the Standard Specifications and the following:

All castings located within the pavement area shall not be set to finished grade until after the binder course has been placed.

Special manhole shall be placed on 2'-6" gravel borrow in accordance with the detail, with excavation paid for under the cost of the structure. Gravel borrow shall be paid for under the unit price for Item 151. Gravel Borrow.

Where required, cone sections of manholes and catch basins shall be replaced by flat top sections or eccentric sections at no additional cost.

All frames shall be set in a concrete collar conforming to Construction Standard Detail E 202.9.0 prior to placement of top course. All frames shall be set on a minimum of two courses of mortared brick as specified in the Standard Specifications. Cost of such work shall be included in the cost of the structure or item of which it forms a part.

Where new catch basins or manholes are shown on the drawings to be constructed over existing pipes, the work shall also include the connecting of the pipe to the structures and the necessary cutting and removal of the existing pipe within the structures. The existing pipe shall be neatly cut to provide a smooth uniform face flush with the inside wall surface of the structure and totally removed or neatly cut longitudinally and partially removed to retain the lower half of the existing pipe barrel to form the required (manhole) shaped invert.

A gutter inlet may be used as necessary as a substitute for, or in addition to, a catch basin when known or unknown utility conflicts are encountered and at the discretion of the Engineer.

Special manholes shall have precast riser sections. The riser sections and the manhole structure below shall have steps incorporated into the walls. The steps within the riser sections and the manhole structure shall be in line.

#### **METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Manhole 5 feet ID will be measured for payment based on standard depths and partial depths as specified for similar items under Subsection 201.80, complete in place.

Manhole 5 feet ID 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. No separate payment will be made for excavation, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEMS 201. through 204.** (Continued)

Special manhole 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. No separate payment will be made for excavation (including for gravel borrow for bridge foundation), excavation support, removal of existing pipe, backfill and connection to existing pipe where applicable, but all costs in connection therewith shall be included in the Contract unit prices bid.

Over excavation to remove unsuitable subgrade material and provide a stable foundation, as determined by the Engineer, will be paid for under Item 142. Class B Trench Excavation.

Crushed stone bedding material, as required by the Engineer to provide a stable foundation, will be paid for under Item 156. Crushed Stone.



**ITEM 210.02****SANITARY SEWER MANHOLE REMOVED****EACH**

The work under this item shall conform to the relevant provisions of Subsection 140 of the Standard Specifications and the following:

The work shall consist of removing and discarding existing sewer manholes designated as not required for reuse on this project. Said items shall become the property of the Contractor and shall be removed from the project and disposed of legally.

Existing sewer pipe connected to the structure shall also be removed and discarded.

**METHOD OF MEASUREMENT**

Item 210.02 will be measured for payment by the Each sanitary sewer manhole removed.

**BASIS OF PAYMENT**

Item 210.02 will be paid for at the Contract unit price per the Each, which will include all labor, materials, equipment, removal and disposal of the sanitary sewer manhole and sewer pipe connected to the structure, and incidental costs required to complete the work.



**ITEM 210.1      SANITARY SEWER MANHOLE MUNICIPAL STANDARD      EACH**

The work under this item shall conform to the relevant provisions of Subsection 201 of the Standard Specifications and the following:

The Contractor shall furnish all labor, materials, equipment and incidentals required to provide all manholes and precast structures specified and otherwise required to complete the Work.

Structures shall conform in shape, size, dimensions, material, and other respects to the details shown in Appendix A or as ordered by the Engineer.

Inverts shall conform accurately to the size and elevation of the adjoining pipes. Side inverts shall be curved and main inverts, where direction changes, shall be laid out in smooth curves of the longest possible radius which is tangent to the centerline of adjoining pipelines.

**Reference Standard**

1. ASTM C 32, sewer and Manhole Brick (made from Clay or Shale).
2. ASTM A48, Gray Iron Castings.
3. ASTM C 139, Concrete Masonry Units for Construction of Catch basins and Manholes
4. ASTM C 140, Sampling and Testing Concrete Masonry Units.
5. ASTM C 207, Hydrated Lime for Masonry Purposes.
6. ASTM C478, Precast Reinforced Concrete Manhole Sections.
7. ASTM C 923, Resilient Connectors Between Reinforced Concrete Manhole

**Submittals**

- A. Shop Drawings: submittals or approval Shop Drawings of design and construction details of all precast concrete structures, manhole frames and covers, and pipe connections. Computations signed and sealed by a Massachusetts licensed Professional Engineer to verify structural adequacy of manholes and reactions to uplift, shall be submitted for review with Shop Drawings. Shop Drawings shall indicate all dimensions, openings, jointing, inserts, reinforcing bars, means of handling and all necessary details.
- B. The precasting company must be a MassDOT approved precasting company and be listed on the Qualified Construction Materials List (QCML).

**MATERIALS****Precast Concrete Manholes**

- A. Precast manholes shall conform to the details shown in Appendix A. Manhole bases may be precast unless cast-in-place is required by the Drawings. Concrete top slabs shall not be less than 8-inches thick.
- B. Precast components shall consist of reinforced concrete pipe sections especially designed for manhole construction. They shall be manufactured in accordance with ASTM C478, latest revision, except as modified herein, and shall conform to the manhole details shown in Appendix A.



**ITEM 210.1** (Continued)

- C. Precast, reinforced concrete manhole bases, riser sections, cone sections, flat slabs and other components shall be manufactured by wet cast methods only using satisfactory forms to provide smooth surfaces free from excessive honeycombing or other imperfections.
- D. The joints shall be tongue and groove type employing butyl sealing material. The circumferential and longitudinal steel reinforcement shall be continuous and extend into the bell and spigot ends of the joint without breaking the continuity of the steel.
- E. All precast manhole components shall be of approved design and of sufficient strength to withstand the loads imposed upon them. They shall be designed for a minimum earth cover loading of 140 pounds per cubic foot, an H-20 wheel loading, and a suitable allowance for impact. Manhole bases shall have reinforcing steel in their walls in accordance with ASTM C478.
- F. Lifting holes if used in manhole components shall be tapered, and no more than two (2) shall be cast in each section. Tapered, solid rubber plugs shall be furnished to seal the lifting holes. The lifting holes shall be constructed to be sealed by plugs driven from the outside face of the section and the remaining void filled with cement mortar outside only.
- G. The point of intersection (P.I.) of the sewer pipe centerlines shall be marked with a 3/8-inch diameter stainless steel pin firmly enclosed in the floor of each manhole base and protruding approximately 1-inch above the finished floor of the base.
- H. The barrel of the manhole shall be constructed of various lengths of riser pipe manufactured in increments of one foot to provide the correct height with the fewest joints. Openings in the barrel of the manholes for sewers or drop connections will not be permitted closer than one foot from the nearest joint. Special manhole base or riser sections shall be furnished as necessary to meet this requirement.
- I. A precast or cast-in-place slab or precast eccentric cone, as shown or approved, shall be provided at the top of the manhole barrel to receive the cast iron frame and cover.
- J. Manhole sections shall contain manhole steps, 12 inches on centers, accurately positioned and embedded in the concrete.
- K. Stubs for connecting sewer pipe to manhole bases shall be as shown in Appendix A. A watertight joint shall be provided in the manhole wall by the manufacturer, and shall be a lockjoint gasket



**ITEM 210.1** (Continued)**Precast Structures**

- A. Precast concrete structures shall be installed, as shown on the plans.
- B. Precast, reinforced concrete bases, riser sections, flat slabs and other components of precast structures shall be manufactured by wet cast methods only using satisfactory forms to provide smooth surfaces free from excessive honeycombing or other imperfections.
- C. The joints between the components shall have continuous shear keys with hydrophilic waterstop and shall be watertight.
- D. Precast structures shall conform to the details shown in Appendix A. Bases may be precast unless cast-in-place is required by the Drawings. Bases shall have two cages of reinforcing steel in their walls, each of the area equal to that required in the riser sections.
- E. Wall thicknesses shall be five (5) inches, minimum. Thickness of base shall be six (6) inches minimum.
- F. Design Criteria:
  - Soil Pressure (psf) =  $90H$ , where  $H$  is the height of soil above in feet.
  - Unit weight of soil = 140 pcf.
  - Live Load = H-20 Truck loading or 300 psf, whichever critical.
  - Allowable soil bearing pressure = 4000 psf.
- G. Base slab shall be designed for uplift.
- H. Structures shall be installed to the grades shown.

**Manhole Steps**

Manhole steps shall be copolymer polypropylene plastic with continuous, 1/2-inch diameter steel reinforcing rod.

**Drop Connections**

Drop connections for manholes shall be constructed where shown or ordered and shall conform to the design and details shown. Pipe and fittings shall be polyvinylchloride (PVC) grade SDR-26, as shown or otherwise approved.

**Brick**

Brick used shall conform to MassDOT specification M4.05.0.

**Mortar**

Cement mortar used shall conform to MassDOT specification M4.02.15.



**ITEM 210.1** (Continued)**Coating**

- A. The exterior of all manholes and precast structures shall be coated with a minimum of two coats of bitumastic sealant. Total Dry film thickness per coat shall be 8 to 10 mils.
- B. The interior of all manholes and precast structures shall be fully coated with a 1/8-inch-thick coating of coal tar epoxy.

**CONSTRUCTION METHODS****Precast Manholes and Structures**

- A. All precast structures shall be set on a 12-inch crushed stone foundation where foundation is undisturbed earth, and 6 inches where foundation is rock. The base shall be set at the proper grade and carefully leveled and aligned. A concrete base or leveling course under precast structures shall be poured where, if in the opinion of the Engineer, foundation conditions at a specific location are such that a concrete base is required and the Engineer so orders. Where specifically ordered, such concrete, in the amount ordered, will be included for payment as additional concrete.
- B. The precast manhole components shall be assembled truly plumb. The base of the bell or groove end at joints between components shall be buttered with 1:2 cement mortar to provide a uniform bearing between components. All joints shall be sealed with cement mortar inside and out and troweled smooth to the contour of the wall surface. Raised or rough joint finishes will not be accepted.
- C. All lifting holes shall be sealed tight with a tapered solid rubber plug driven into the hole and the remaining void filled with cement mortar outside only.

**Brick Stacks and Grade Rings**

- A. Manholes shall have a brick masonry stack not over 12-inches in height constructed on the top slab or cone section on which the manhole frame and cover shall be placed. The height of the stack shall be such as is necessary to bring the manhole frame to the proper grade and elevation.
- B. Bricks shall be thoroughly wet when laid and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. Joints shall not be wider than 3/8-inch except when bricks are laid radially, in which case the narrowest part of the joint shall not exceed 1/4-inch. The bricks shall be laid in a workmanlike manner, true to line, and all joints shall be carefully struck and pointed. Brickwork shall be kept moist for a period of five (5) days after completion and suitable precautions shall be taken to prevent freezing during cold weather. The entire stack shall be cement plastered as shown. Final plastering of the inside of the brick stack shall be done after all final grading and paving is complete and the frame and cover will not be disturbed by additional construction work.



**ITEM 210.1** (Continued)Stubs for Future Connections

As shown or required for connections, PVC pipe stubs with approved watertight plugs shall be installed in manholes. Where pipe stubs, sleeves or couplings for future connections are shown or ordered, the Contractor shall provide all materials and work for their construction.

Frames, Covers and Steps

- A. Frames shall be cast into top slab of precast structure or firmly set and bonded to the masonry at the proper grade to conform with the finished surface of the street or ground surface as shown in Appendix A.
- B. Steps shall be uniformly spaced at 12 inches on center and shall project evenly as shown in Appendix A. For precast manholes, tapered holes shall be cast in the manhole walls using special, tapered plugs supplied by the manufacturer of the steps. The steps shall be installed in accordance with the Manufacturer's instructions.

Grading

- A. As shown in Appendix A or as directed, certain manholes are to extend above existing ground level. Fill shall be placed around these manholes to the level of the rim of the cast iron manhole frame, and the surface evenly graded on a 1:5 slope to the surrounding ground as shown unless directed otherwise.
- B. All other manholes in unpaved areas shall be built to an elevation higher than the original ground, as directed, and the ground surface shall be graded to drain away from the manhole rim.
- C. Manholes in paved areas shall be constructed to meet the final surface grade. Manholes shall not project above finished roadway pavements to prevent damage from snowplows.

Height of Manholes and Structures

The Contractor shall be solely responsible for the proper height of all manholes and structures necessary to reach the final grade at all locations. The Contractor is cautioned that the Engineer's review of shop drawings for manhole components will be general in nature and that the Contractor shall provide an adequate supply of random, precast manhole riser sections to adjust any manhole height to meet field conditions for final grading.

Leakage Tests

All manholes and structures shall be hydraulically tested for leakage, and any leakage found shall be repaired in a satisfactory manner and the manhole retested. Leakage test shall consist of plugging all influent or effluent piping, then filling the manhole with water to the top of concrete of the cone or flat top section. After water level has stabilized, the structure shall be refilled to the top and left standing within the manhole for twenty-four (24) hours. Cover top of manhole to prevent loss of water through evaporation. The water loss shall not exceed 0.75 gallons/vertical foot within a twenty-four (24) hour period.



**ITEM 210.1** (Continued)**METHOD OF MEASUREMENT**

Item 210.1 will be measured for payment by the Each sanitary sewer manhole municipal standard, regardless of depth, complete in place.

**BASIS OF PAYMENT**

Item 210.1 will be paid for at the Contract unit price per Each, which price will include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for excavation, including excavation for crushed stone installation, resilient connectors, testing and any bypass operations needed for testing and steps, but all costs in connection therewith shall be included in the Contract unit price bid.

Crushed stone bedding shall be paid for separately under Crushed Stone, Item 156.



**ITEM 220.8****SANITARY STRUCTURE REMODELED****EACH**

The work under this item shall conform to the relevant provisions of Subsection 220 of the Standard Specifications and the following:

The brick for sanitary structures shall be sound, hard and uniformly burned brick, regular and uniform in shape and size, of compact texture and satisfactory to the Engineer. Brick shall comply with ASTM Standard Specifications for sewer brick (made from clay or shale), Designation C-32-63 or Grade SA, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.

**METHOD OF MEASUREMENT**

Item 220.8 will be measured for payment by the Each sanitary structure remodeled, when the adjustment of structures to line or grade or both line and grade is greater than 6 inches, complete in place.

**BASIS OF PAYMENT**

Item 220.8 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. No separate payment will be made for removing and resetting frame and covers, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 222.3     FRAME AND GRATE (OR COVER) MUNICIPAL STANDARD     EACH**

The work under this item shall conform to the relevant provisions of Subsection 220 of the Standard Specifications and the following:

Municipal frame and grates or covers shall be constructed to conform to the City of Taunton, Massachusetts Rules and Regulations Governing the Subdivision of Land Standard Details as found in Appendix A.

Manhole covers shall have a diamond pattern; pick holes and the appropriate word “DRAIN” or “SEWER” cast in 3-inch letters to match the corresponding utility.

Casting frames shall be set in a full mortar bed with bricks, a maximum of 8 inches thick. All castings shall be set in a full concrete collar, conforming to Construction Standard Detail E 202.9.0.

**METHOD OF MEASUREMENT**

Item 222.3 will be measured for payment by the Each frame and grate (or cover) municipal standard, complete in place.

**BASIS OF PAYMENT**

Item 222.3 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.



**ITEM 245.04****4 FOOT X 4 FOOT REINFORCED CONCRETE  
BOX CULVERT****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 112, 127, 140 and 230 of the Standard Specifications and the following:

Work under this item shall include all materials, equipment and labor needed to construct the precast concrete box culvert, and includes concrete, reinforcing steel, membrane waterproofing and bituminous damp-proofing. Work shall also include the removal of the existing concrete box culvert, headwall and wingwalls to the extents shown on the Plans.

This work shall consist of designing, fabricating, and installing cast-in-place or precast concrete box culverts. The box sections shall conform to the dimensions and geometry shown on the Plans. All elements to be designed in accordance with current AASHTO LRFD specifications.

Prior to construction, the Contractor shall investigate and dimension the existing culvert end and match them for the proposed culvert extension. This investigation shall be reflected in the shop drawings to show the method of connecting the existing culvert to the proposed culvert segment.

The Contractor shall install a 2'-6" bedding of gravel borrow below the proposed box culvert extension and 3'-6" under the wingwalls in accordance with the contract documents. If additional unsuitable material below this bedding is found, it shall be removed and replaced with gravel borrow at the direction of the engineer.

If chosen as the selected method of culvert construction, all precast sections shall have positive connections between segments thru the use of shear keys and bolted connections. Details to be designed by the contractor and approved by the engineer prior to any fabrication. Shear keys, if used, shall be filled with non-shrink grout and waterproofed.

Bituminous damp-proofing will be required on the top and sides of the proposed box culvert extension and 2 feet beyond the cut line onto the existing culvert as shown on the Plans. Bituminous damp-proofing is also required along any below grade section of the head wall, cutoff and wing walls.

**Design**

The Contractor shall submit design calculations and drawings for the proposed box culvert extension, headwall, and cutoff prepared in accordance with the latest AASHTO LRFD Bridge Design Specifications and the MassDOT LRFD Bridge Design Manual for HL-93 loading using English units for approval of the Engineer. Design computations shall be submitted for approval. To expedite the review and approval process, submissions containing computer computations shall include electronic copies of the actual input and output files. The design computations shall consider all loadings as are appropriate for each stage of fabrication, shipment, construction and upon completion. Design computations and shop drawings shall be prepared by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

The culvert extension end is to be constructed as stone masonry in accordance with E302.2.0 of the MassDOT Construction Standards and as shown on the Plans.



**ITEM 245.04** (Continued)

Prior to fabrication, eight (8) sets of complete shop drawings showing, as a minimum, the following information shall be submitted to the Engineer for approval of the precast concrete option:

1. Plan layout of the structure indicating the piece mark of each box culvert section;
2. Complete details of all precast box sections, including all dimensions and tolerances, locations and types of reinforcement, finish treatments, and concrete strengths at lifting and at 28 days;
3. Joint dimensions and details including type and brand of joint sealing materials;
4. Locations and methods of forming lifting holes, type and location of lifting devices, and the method of handling and transporting all precast box sections to the job site.

**Damp-Proofing**

Damp-proofing shall be applied to surfaces as listed above. This work shall conform to Subsection 970 of the Standard Specifications.

**METHOD OF MEASUREMENT**

Item 245.04 will be measured for payment by the Foot, along the center of the culvert, complete in place.

**BASIS OF PAYMENT**

Item 245.04 will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for design, drawings, excavation, existing culvert/headwall/wingwall demolition, culvert extension, culvert stone masonry end, stone bedding, and damp-proofing, but all costs in connection there with shall be included in the Contract unit price bid.

Unsuitable material encountered at the bottom of the culvert excavation will be removed and paid for under Item 141., Class A Trench Excavation.

Gravel borrow for backfilling structures and pipes shall be used in backfilling area where unsuitable material has been removed and will be paid under Item 151.2, Gravel Borrow for Backfilling Structures and Pipes.

Control of water during removal of existing headwall and the construction of the proposed culvert extension will be paid under Item 991.11, Control of Water - Structures.



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<b><u>ITEM 247.18</u></b>	<b><u>23 INCH X 14 INCH ELLIPTICAL REINFORCED CONCRETE SANITARY SEWER PIPE</u></b>	<b><u>FOOT</u></b>
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The work under this item shall conform to the relevant provisions of Subsection 230 of the Standard Specifications and the following:

Elliptical pipes shall meet AASHTO M207 Standards for Elliptical pipes.

The interior surface of all reinforced concrete pipes for sanitary sewers shall receive a protective coating of an approved epoxy resin compound at the plant where the pipe is manufactured prior to delivery to the site.

The coating material shall be a non-toxic resin for use specifically for the interior of concrete pipes and applied by the manufacturer. The contractor shall submit the information regarding the coating to the Commission for review and approval.

The protective coating shall be applied in accordance with the manufacturer's recommendations. In doing this work, the coating manufacturer's instructions for the best application procedures, temperatures and allowable working life of the material shall be strictly adhered to. Any deficiency in total film thickness shall be corrected by the application of an additional protective coat. If a prime coat is necessary, it shall be as per the manufacturer's specifications. A prime epoxy coat shall not be applied on a smooth concrete pipe. Before placement in field, all areas abraded in transit shall be repaired by the application of 2 coats of the same material that was used in the shop, in accordance with the directions of the coating manufacturer.

The protective coating shall be applied in accordance with the manufacturer's recommendations and specifications.

### **METHOD OF MEASUREMENT**

Item 247.18 will be measured for payment by the Foot of 23 inch by 14 inch elliptical reinforced concrete sanitary sewer pipe, complete in place.

### **BASIS OF PAYMENT**

Item 247.18 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.



**ITEM 248.001****SEWER SERVICE RECONSTRUCTION****FOOT**

The work under this item shall conform to the relevant provisions of Subsection 230 of the Standard Specifications and the following:

This item covers work required to reconstruct existing sewer house connections that are affected by proposed drainage pipes, which are not shown on the plans.

The Contractor shall furnish all pipe, couplings, jointing materials, labor, tools and equipment necessary to reconstruct the sections of affected sewers.

The size of replacement pipe shall closely approximate the size of existing section to be replaced, allowing a watertight joint to be made while maintaining the existing invert and slope.

Pipe materials shall be PVC, schedule 80, or ductile iron pipe.

Unless field conditions or the plans require otherwise, storm drains shall pass over sewers, except where, in the opinion of the Engineer, suitable cover cannot be provided. In such cases storm drains shall pass under sewers.

Where proposed storm drains pass under existing vitrified clay sewers and damage to the sewer line cannot be prevented, if approved by the Engineer, the sewer line shall be reconstructed using a minimum 10-foot section of ductile iron pipe or PVC sewer pipe. The pipe shall be installed such that joints of the reconstructed sewer are at a minimum distance of 5 feet on either side of the proposed storm drain.

The Contractor shall coordinate with the City to schedule service interruptions to adjacent properties. The City will notify the property owners once a schedule has been agreed to.

**METHOD OF MEASUREMENT**

Item 248.001 will be measured for payment by the Foot of sewer service reconstruction, complete in place.

**BASIS OF PAYMENT**

Item 248.001 will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for excavation, backfill, couplings or the removal and disposal of existing sewer pipe materials, but all costs in connection therewith shall be included in the Contract unit price bid.

Pipes damaged by the Contractor which pass below the proposed storm drain or are outside the specified trench limits shall be repaired by the Contractor at no cost to the department.



**ITEM 249.001****SANITARY SEWER BYPASS PUMPING****LUMP SUM**

The work of this item is to provide for the maintenance of existing sewer flows during the re-routing of the proposed sewer main in the vicinity of the 4'x4' culvert extension.

The sanitary sewer bypass pumping system shall be determined by the Contractor and shall be acceptable to the City. The sanitary sewer bypass pumping system shall also provide a backup system in the event the primary system fails. The backup shall be within five minutes of the project site. Some alternatives acceptable as a sewer bypass system include pumps, with suction and discharge lines or vacuum trucks to remove and transport sewerage to a downstream discharge manhole.

Prior to any construction, the Contractor shall submit a proposed plan to the Engineer and the City of Taunton outlining the procedures, tasks and work to maintain operation of the sewer. The plan shall be submitted after Notice to Proceed (NTP) and at least 14 days prior to the work and shall be revised, if required, to the satisfaction of the Engineer and the City.

If the private sewer pump stations require access by the Contractor, or for shut-off of the pumps, the Contractor is responsible for all coordination. The wet-well shall not be left open without personnel present. If the sewer pumps are deactivated for any reason, the Contractor shall be responsible for turning the pumps back on and ensuring the system is functioning. If the pumps are deactivated daily, the Contractor shall ensure the pumps are on and functioning at the end of each workday.

The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the Engineer that the design and operation of temporary bypass pumping systems is their specialty.

The bypass pumping vendor shall provide at least five (5) project references of a similar size and complexity performed by the vendor within the past three years. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

If pipe plugs are required to isolate upstream sewer flows, they shall be inclusive in the cost of this item.

**Submittal**

The Contractor shall prepare and submit his plan for bypass pumping system showing calculations of ranges of flow anticipated during normal and wet weather conditions and shall review these calculations with the Engineer, who shall review the installation, and approve the bypass pumping system. Calculations shall be signed and stamped by a Massachusetts registered Professional Engineer.



**ITEM 249.001** (Continued)

The Contractor shall submit to the Engineer plans and the descriptions pertaining to the bypass pumping provisions to be taken by the Contractor regarding the handling of peak dry weather flows. No construction shall begin until the Engineer has reviewed all submittals and they are determined to be complete. The plans shall contain the following:

- A. A detailed flow bypass plan shall be submitted for each set up.
- B. The plan shall include, but not be limited to, details of the following:
  - 1. Footprint of pumps within indicated staging area.
  - 2. Sewer plugging plan, including type, location, and manufacturer of plugs and emergency release procedures.
  - 3. Material and location of suction piping installation and associated valves.
  - 4. Material and location of discharge piping installation and associated valves.
  - 5. Locations and number of bypass pump and power requirements.
  - 6. Discharge plan that will consist of a written description and drawings (as necessary) to demonstrate how the flow will be returned to the sewer.
  - 7. Plan for protecting discharge manholes or structures from erosion and damage.
  - 8. Plan for noise control for each pump and/or generator.
  - 9. Schedule for installation of and maintenance of bypass pumping lines.
  - 10. Alarm system(s) that will allow prompt determination of either excessive sewer surcharging or loss of bypass piping integrity during operation.
- C. The Engineer's receipt of flow bypass plan does not relieve Contractor for responsibility for means, methods, and sequences of construction, requirement to pump peak dry weather flows, and for safety.

**BASIS OF PAYMENT**

Item 249.001 will be paid for at the Contract Lump Sum price, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

No separate payment will be made for transportation, excavation, HMA trench repair and crushed stone, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 250.18****18 INCH POLYVINYL CHLORIDE  
SANITARY SEWER PIPE****FOOT**

The work under this item shall conform to the relevant provisions of Subsection 230 of the Standard Specifications and the following:

This item shall be used for both gravity sewer pipe and cleanouts.

Solid wall Polyvinyl Chloride Pipe, couplings and fittings shall conform to the ASTM D3034, with an SDR of 35 unless otherwise shown on the Drawings. Joints for PVC pipe shall be push-on joints with permanently bonded elastomeric ring joints. Such joints shall be installed in accordance with the pipe manufacturer's written instructions. Any joint which is not properly made, shows signs of leakage or is in the opinion of the Engineer, defective in any way shall be redone to the satisfaction of the Engineer. Gaskets shall be made of a composition and texture, which is resistant to common ingredients of sewage and industrial wastes, including, oils and ground water and which will endure permanently under the conditions of its proposed use.

Wye Branches or Tees shall be of the same material and of the same class and type to be compatible with the pipe they are used.

Pipe utilized for service connections and chimneys shall match the diameter of the existing pipe to be connected and be manufactured of PVC. PVC pipe shall conform to ASTM D3034, with an SDR of 35. Joints for PVC pipe shall be push-on using elastomeric ring gaskets.

All pipe and fittings delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM specifications.

Underground tape shall be provided for all gravity sewers and shall be 3-inch wide silver metal detectable tape which permanently identifies the underground sewer and services. The tape shall meet APWA requirements and use brown colored stripes with black print indicating "CAUTION BURIED SEWER BELOW".

**CONSTRUCTION METHODS**

All pipe shall be stored at the site until installation in a manner acceptable to the Engineer which will keep the pipe at ambient outdoor temperatures. Temporary shading shall be provided as required to meet this requirement. Simply covering the pipe or structures which allows temperature build-up when exposed to direct sunlight will not be permitted.

Each pipe unit shall be handled into its position in the trench only in such manner, and by such means as acceptable to the Engineer. Care shall be taken to avoid damaging the pipe and fittings.

Sewer pipe shall be laid at the lines and grades as shown on the plans and specified herein. Whenever encountered within the trench, existing sewer lines shall be removed unless otherwise noted. All existing sewer lines, which are to be abandoned in place, shall be plugged at all open ends.



**ITEM 250.18** (Continued)

Each pipe and/or fitting to be installed shall be subjected to a careful inspection just prior to installation. Each straight length of pipe shall be generally straight. Centerline deviation of more than 1/16 inch per foot of length shall be deemed unacceptable and such pipe shall immediately be removed from the site.

PVC Pipe shall be supported by compacted ¾" crushed stone. No pipe or fitting units shall be supported on saddles, blocking or stones. Suitable bell holes shall be provided so that after installation only the barrel of the pipe receives bearing pressure from the supporting material.

All pipe and fittings shall be cleaned of all debris, dirt, or other foreign substances prior to being installed and shall be kept clean until accepted.

Before any joint is made, the previously installed unit shall be checked to ensure that a closed joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade. Pipe shall not be driven down to the required grade by striking with an unyielding object.

Immediately before joining the pipe all joint surfaces shall be cleaned and the bell or groove shall be lubricated in accordance with the manufacturer's recommendations. Each pipe unit shall be pushed into place without damage to the pipe or gasket.

All open ends of pipe and branches shall be closed with stoppers secured in place in an acceptable manner.

After each pipe has been properly bedded, enough sand shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment. Bell holes shall be filled with sand and compacted, and then screened gravel shall be placed and compacted to complete the pipe bedding as indicated on the drawings.

The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.

At all times when the pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs, or by other acceptable means.

If water is in the trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe.

Pipelines shall not be used as conductors for trench drainage during construction.

All manhole connections shall be as shown on the drawings except that concrete and mortared connections shall be equipped within integral O-ring or other sealant such that a positive watertight seal is established.

When the sewer pipe is installed with less than 4' of cover to the top of pipe, the Contractor shall install a board of 3" rigid insulation as shown on the plans.



**ITEM 250.18** (Continued)Allowable PVC Pipe Deflection

Pipe provided under this specification shall be so installed as to not exceed a maximum deflection of 4.0 percent. Such deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.

Upon completion of a section of sewer, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gage assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer and be acceptable to the Engineer.

Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem as the Engineer may require without additional compensation.

Cleaning

Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the Contractor shall clean out the pipeline and manholes, being careful to prevent soil, water, and debris from entering any existing sewer.

Service Connections

Service connections shall be installed at a minimum slope of 2 percent at the locations determined by the Engineer in the field.

It should be anticipated that each building along the sewer being installed will have one sewer connection. Also, wye connections for future construction may be required.

Services may be connected to new PVC using solid wye connections, approved saddles, or flexible connectors. Solid wye connections shall be the same material as the main pipe. Saddles shall be a full PVC or iron saddle with rubber gaskets and tightened with stainless steel straps. Saddles cemented onto the pipe are not acceptable. Resilient connectors shall be either tees or wyes as required by the plans or approved by the Engineer. Both shall make a watertight connection to the host pipe through a gasketed connection and connect to the service lateral using a stainless-steel clamp. The use of saddles or flexible connectors require that an opening be made in the pipe with a coring machine and appropriate cutting tool for the type of pipe to be cored. When installing a flexible wye, the contractor shall use the coring guide supplied by the manufacturer of the wye connector.

The Contractor shall reconnect all service connections except those eliminated by approval of the Engineer.

Each wye or Tee branch installed for future use shall be fitted with a watertight plug.



**ITEM 250.18** (Continued)

Chimneys shall be installed when directed by the Engineer. Such chimneys shall be constructed in accordance with the details on the drawings

Prior to acceptance, all pipelines shall be inspected for cleanliness and to be sure no sandbags, broken pipe, or other obstructions exist.

Service connections shall have cleanouts as detailed on the plans.

**Leakage Testing**

Leakage tests and measurements shall be made for all manhole-to-manhole sections in which no service laterals are connected.

Where the groundwater level is more than 1 foot above the top of the pipe at its upper end, the Contractor shall conduct either infiltration tests or joint testing per ASTM C1103.

Where the groundwater level is less than 1 foot above the top of the pipe at its upper end, the Contractor shall conduct either exfiltration tests or joint testing per ASTM C1103.

At the time of the test, the Contractor shall determine the groundwater elevation from observation wells, excavations or other means, all subject to the acceptance of the Engineer.

For making the infiltration and exfiltration tests, the Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests on sections as directed.

Upon completion of a section of the sewer, the Contractor shall dewater it and conduct a satisfactory test to measure the infiltration for at least 24 hours. The amount of infiltration, including manholes, tees, and connections, shall not exceed 50 gallons per inch diameter per mile of pipe per 24 hours for PVC pipe.

For making the exfiltration tests, the sewers shall be subjected to an internal pressure by plugging the pipe at the lower end and then filling the pipelines and manholes with clean water to a height of 2 feet above the top of the sewer at its upper end. Where conditions between manholes may result in test pressures, which would cause leakage at the stoppers in branches, provisions shall be made by suitable ties, braces, and wedges to secure the stoppers against leakage resulting from the test pressures.

The rate of leakage from the sewers shall be determined by measuring the amount of water required to maintain the level 2 feet above the top of the pipe.

Leakage from the sewers under test shall not exceed the requirements for leakage into sewers as hereinbefore specified.

The sewers shall be tested before any connections are made to buildings.



**ITEM 250.18** (Continued)

The Contractor shall construct weirs or other means of measurements as may be required.

Suitable bulkheads shall be installed, as required, to permit the test of the sewer.

Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

If in the judgment of the Engineer, it is impracticable to follow the foregoing procedures for any reason, modifications in the procedures shall be made as required and as acceptable to the Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

An alternate method of testing that is acceptable shall be to pressurize the pipeline with air to 4 PSI for 5 minutes. If the pressure is maintained consistently, the tested section shall be considered acceptable.

The Contractor will perform joint testing per ASTM C1103 when required by the Engineer.

**METHOD OF MEASUREMENT**

Item 250.18 will be measured for payment by the Foot of 18 inch polyvinyl chloride sanitary sewer pipe, complete in place.

**BASIS OF PAYMENT**

Item 250.18 will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for saw-cutting, excavation, concrete encasement, steel sleeves, all fittings including wyes, tees and bends, insulation (if applicable), backfilling (including gravel borrow), connection to existing and testing, but all costs in connection therewith shall be included in the Contract unit price bid.

Crushed stone backfill shall be paid for separately under Crushed Stone, Item 156.



<b><u>ITEM 251.10</u></b>	<b><u>10 INCH CURED IN PLACE PIPE</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 251.15</u></b>	<b><u>15 INCH CURED IN PLACE PIPE</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 251.18</u></b>	<b><u>18 INCH CURED IN PLACE PIPE</u></b>	<b><u>FOOT</u></b>

The work shall include the rehabilitation of existing sewer pipe to remain located in the project area. This shall be accomplished by the installation of resin impregnated flexible felt tube into the existing pipeline. For materials, submittals, CCTV requirements, Construction Methods and Warranty please see Appendix B provided by the City of Taunton.

1. 02610 – Manhole Rehabilitation
2. 02611 – Manhole Epoxy Lining
3. 02763 – Pipeline Cleaning
4. 02764 – Television Inspection
5. 02149 – Maintaining Existing Flow
6. 02766 – Cured-in-Place (CIPP) Installation in Sewer Main

#### **METHOD OF MEASUREMENT**

Item 251.10, Item 251.15, and Item 251.18 will be measured for payment by the Foot of cured in place pipe, complete in place.

#### **BASIS OF PAYMENT**

Item 251.10, Item 251.15, and Item 251.18 will be paid for at the respective Contract unit prices by the Foot, which prices shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for pipe cleaning, disposal of pipe sediments, maintaining existing flows, reestablishing service laterals, manhole lining, both pre-rehabilitation and post-rehabilitation video inspections and CIPP installation, and all other requirements set forth in the above-referenced specifications, but all costs in connection therewith shall be included in the Contract unit prices bid.



<b><u>ITEM 272.12</u></b>	<b><u>12 INCH AND UNDER PIPE REMOVED AND DISCARDED</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 272.18</u></b>	<b><u>18 INCH AND UNDER PIPE REMOVED AND DISCARDED</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 272.24</u></b>	<b><u>24 INCH AND UNDER PIPE REMOVED AND DISCARDED</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 272.30</u></b>	<b><u>30 INCH AND UNDER PIPE REMOVED AND DISCARDED</u></b>	<b><u>FOOT</u></b>

The work under these items shall conform to the relevant provisions of Subsection 230 of the Standard Specifications and the following:

The work shall consist of removing and discarding abandoned drainage and sewer pipe and backfilling trench with gravel borrow as required and as designated on the Plans to be removed and are located outside the pay limits of excavation required under other items of Work. The pipe shall become the property of the Contractor and shall be removed from the project and disposed of legally.

Existing utility pipes designated on the Plans to be removed and are located within the excavation limits of other work shall be considered incidental to that item of work.

#### **METHOD OF MEASUREMENT**

Item 272.12, Item 272.18, Item 272.24, and Item 272.30 will be measured for payment by the Foot of pipe removed and discarded. No additional measurement will be made for any bells or overlapping segments.

#### **BASIS OF PAYMENT**

Item 272.12, Item 272.18, Item 272.24, and Item 272.30 will be paid for at the respective Contract unit prices per Foot, which prices shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for excavation regardless of depth, gravel borrow backfill and compaction, but all costs in connection therewith shall be included in the Contract unit price bid



**ITEM 292.1****TRENCH DRAIN****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 201 and 220 of the Standard Specifications and the following:

The work shall consist of the construction of trench drains to replicate the function of existing trench drains removed as part of the roadway expansion and adjacent slope work at 104 Dean Street.

The Contractor shall investigate the existing trench drains to locate outfall pipes and determine invert elevations as well as where the outlet pipes discharge. The Contractor shall use this information when laying out the proposed trench drain to maintain slopes within the trench drain as well as the pipe connection.

Trench drain frame and grate shall be cast iron. Grates shall not be bolted to the frame.

The trench drain shall sit on a bedding of 1½" crushed stone and shall conform to Material Section M2.01.1.

**METHOD OF MEASUREMENT**

Item 292.1 will be measured for payment by the Foot of trench drain, complete in place.

**BASIS OF PAYMENT**

Item 292.1 will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for field investigation, excavation, gravel backfill, crushed stone bedding, concrete, reinforcing, frame and grate and PVC pipe, but all costs in connection therewith shall be included in the Contract unit price bid



**ITEM 347.1****1 INCH COPPER TUBING TYPE K****FOOT**

The work under this item shall conform to the relevant provisions of Subsection 301 of the Standard Specifications and the following:

Where proposed services connect to an existing service of a different size, the Contractor shall provide a compression fitting with the appropriate size fitting on each side.

**BASIS OF PAYMENT**

Fittings to connect existing pipe to proposed pipe, regardless of pipe size, shall be incidental to the cost of the proposed pipe.



**ITEM 376.5****HYDRANT - ADJUSTED****EACH**

The work under this item shall conform to the relevant provisions of Subsection 301 of the Standard Specifications and the following:

All hydrants shall be adjusted one hydrant at a time. The contractor shall have all the necessary tools, materials, equipment and workmen needed to do the work on site and ready before any hydrant is removed. The contractor shall give at least 48 hours written notice to the City's Fire Department prior to working on any hydrant. Hydrants which will be out of service for more than twenty-four (24) hours shall be replaced by temporary hydrants.

Hydrants to be adjusted shall be carefully removed and set on blocks temporarily. The contractor shall install a riser extension of the appropriate length on the existing riser and reset the hydrant. Extension sections used to adjust hydrants shall be ductile iron only and shall adapt readily to the existing hydrant and fittings. Extension sections shall also include extensions for hydrant stem approved by the City and all fittings. Extensions shall be a minimum of 6-inch long.

**METHOD OF MEASUREMENT**

Item 376.5 will be measured for payment by the Each hydrant adjusted, complete in place.

**BASIS OF PAYMENT**

Item 376.5 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. No separate payment will be made for connection to existing and extension sections, but all costs in connection therewith shall be included in the Contract unit prices bid.



**ITEM 385.2****MONITORING WELL ADJUSTED****EACH**

The work under this Item shall conform to the relevant provisions of Subsection 190 and Section 300 of the Standard Specifications and the following:

The work shall include adjusting the grade of existing monitoring wells located within the project limits to match the proposed finished pavement grade elevation. New concrete collars shall be constructed around the casting in areas not in traffic. Wells in traffic shall be fitted with traffic safe covers. The interior sleeve shall be either be extended by using a PVC adaptor for use in the ground or neatly cut as directed by the Engineer. The work shall also include adjusting the monitoring wells to the intermediate pavement elevations with no additional compensation for the intermediate adjustments.

Traffic safe covers shall be inscribed with any identifying information listed on the existing casting. The work shall include removal and disposal of the existing casting being replaced.

Where the exiting monitoring well does not have a metal casting the Contractor shall provide it with one prior to setting to finished grade.

**METHOD OF MEASUREMENT**

Item 385.2 will be measured for payment by the Each monitoring well adjusted complete in place.

**BASIS OF PAYMENT**

Item 385.2 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. No separate payment will be made for new castings but all costs in connection therewith shall be included in the Contract unit price bid.



<b><u>ITEM 470.2</u></b>	<b><u>HOT MIX ASPHALT BERM, TYPE A - MODIFIED</u></b>	<b><u>FOOT</u></b>
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The work under this item shall conform to the relevant provisions of Subsection 470 of the Standard Specifications and the following:

**CONSTRUCTION**

Hot Mix Asphalt Berm, Type A – Modified, shall be constructed by means of an approved extrusion machine in conformance with the dimensions and at the locations shown on the Plans.

**METHOD OF MEASUREMENT**

Item 470.2 will be measured for payment by the Foot of Hot Mix Asphalt Berm, Type A – Modified, complete in place.

**BASIS OF PAYMENT**

Item 470.2 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.



**ITEM 482.31****SAWING & SEALING JOINTS IN ASPHALT  
PAVEMENT AT BRIDGES****FOOT**

The work to be done under this Item consists of making a sealed kerf across the full width of the finished asphalt pavement at bridge abutments where called for on the Plans. The shape, width, and depth of the kerf shall be as shown on the Plans.

Prior to the start of the asphalt pavement operation, the Contractor shall place a mark on each curb or barrier on either side of the paved roadway. These marks shall be aligned with the actual end of the bridge deck and shall be placed so that they will not be covered or otherwise obscured by the asphalt pavement.

After the completion of the paving operation, the Contractor shall snap a straight chalk line on the pavement between these two marks. The Contractor shall then saw cut the pavement along this line to the depth, width and shape as shown on the Plans. The equipment shall be approved by the Engineer prior to commencing work.

After completing the saw cutting, the Contractor shall clean the saw groove of any dust and debris with an oil free air blast. If the groove was wet sawn, the groove shall be cleaned with a water blast to remove any remaining slurry and debris, vacuumed with a Wet-or-Dry vacuum to remove any standing water, and then dried with an air blast from a Hot-Air-Lance.

Once the groove is clean and dry, the Contractor shall fill it completely with a hot-applied bituminous crack sealer meeting the requirements of M3.05.4 in accordance with the manufacturer's application instructions and restrictions regarding ambient and material temperatures. The crack sealer shall be thoroughly cured prior to opening the road to traffic. To reduce tackiness, only boiler slag aggregate shall be scattered over the sealer when required by the Engineer. Conventional sand shall not be used for this purpose.

**METHOD OF MEASUREMENT**

Item 482.31 will be measured for payment by the Foot, of the actual number of feet of kerf sawed and sealed in the asphalt pavement surface, complete in place.

**BASIS OF PAYMENT**

Item 482.31 will be paid for at the Contract unit price by the Foot, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.



**ITEM 482.32****SAWING AND SEALING JOINTS IN  
ASPHALT PAVEMENT****FOOT**

Work under this Item shall consist of saw cutting, cleaning, and sealing longitudinal and transverse joints in the finished hot mix asphalt pavement. The joints shall be constructed over the joints in the existing underlying concrete pavement where necessary as determined by the Engineer. The intent of this is to establish a weakened plane joint to control the reflective cracking in the newly installed bituminous concrete pavement.

**MATERIAL**

Joint seal material shall conform to subsection M3.05.2.

**GENERAL**

Locate and reference the location of each existing joint prior to the placement of any hot mix asphalt.

Do not perform saw cutting until the top course pavement had thoroughly cooled. Perform saw cutting within seven (7) days after placement of the wearing course. Perform this work in all finished overlay areas prior to discontinuing of work due to seasonal paving limitations.

If the top course is to be placed the following Spring, due to seasonal paving limitations, all underlying courses shall receive a one (1") inch deep by one-eighth (1/8") inch wide sawcut to facilitate and control reflective cracking as well as to provide a means of properly referencing the sawcut to eventually be made in the top course. These sawcuts shall be made in all underlying courses within seven (7) days after the underlying courses are placed and before any evidence of reflective cracking has developed. Sealing of these sawcuts will be not be required.

**Accurately Locating Joint**

The most critical step in sawing and sealing the overlay is the process of locating the joints in the existing pavement. The Contractor shall be responsible for the accuracy of the procedure used for locating the joints. Experience has shown that as little as one (1") inch deviation from the joint location can cause the joint to reflect through the overlay at its location rather than the sawed joint.

Therefore, extreme care must be taken in referencing the existing joints before they are covered with hot mix asphalt overlay.

Where applicable, the transverse sawcut joints shall normally extend the full width of the pavement and shall extend into the asphalt shoulder to a distance of two (2) feet beyond the edge of the underlying cement concrete pavement, unless otherwise detailed on the plans or in the proposal.

Existing transverse joints that are offset at the joint by more than one (1) inch, measured between the centers of the joint cavities, shall require separate sawcuts terminating at the longitudinal joints.



**ITEM 482.32** (Continued)Saw-Cutting of Transverse Joints

The hot mix asphalt shall have aged sufficiently to allow a clean cut to be made and to withstand the eroding effects of the saw or other cutting devices.

The sawcut portion of the joint shall be made with an approved power driven saw. The blade or blades shall be of such size and configuration that the desired dimensions of the sawcut can be made with one pass. The sawcut shall be made with an abrasive blade and sawn dry or with a diamond blade and sawn wet. If wet sawing is used, immediately flush the reservoir with water.

Wet sawed joints shall be thoroughly cleaned with a water blast to remove any sawing slurry, dirt, or deleterious matter adhering to the joint walls or remaining in the joint cavity. The joints shall then be blown with air to provide dry joint surfaces prior to sealing. A Hot-Air Lance shall be used for this operation. Dry sawed joints shall be thoroughly cleaned with a stream of air sufficient to remove any dirt, dust, and deleterious matter adhering to the joint walls or remaining in the cavity.

The Contractor shall sawcut joints to the appropriate dimensions as determined by the District Maintenance Engineer. The Contractor shall conduct his operations so that saw-cutting of joints, cleaning and sealing is a continuous operation.

Traffic shall not be allowed to knead together or damage the sawed joints. Sawed joints shall be filled and cured prior to opening to traffic. Sawed joints not sealed before traffic is allowed on the overlay shall be re-sawn when sawing and sealing operations resume at no additional cost to the Department.

Sealing

After cleaning, and just prior to sealing, bond breaker tape shall be placed in the bottom of the sawcut joint. Bond breaker tape shall consist of regular masking tape or a suitable bond breaker tape designed for use with hot poured sealants. The width of the tape shall be equal to the width of the sawcut.

Equipment

Equipment used in the performance of the work required by this section of the specification shall be approved by the Engineer and maintained in a satisfactory working condition at all times.

1. The joint sealant material shall be heated in a kettle or melter constructed as a double boiler, with a space between the inner and outer shells filled with oil or other heat transfer medium. The equipment shall include positive temperature controls, automatic and continuous mechanical agitation, recirculation pumps and thermometers for the continuous reading of temperature of both the sealing compound and the heat transfer medium. The melter shall be equipped with a thermostat to maintain the sealing compound within the range of temperatures specified by the manufacturer.



**ITEM 482.32** (Continued)

2. Air compressor: Air Compressors shall be portable and capable of furnishing no less than one hundred (185) cubic feet of air per minute at no less than one hundred thirty (130) lbs. per square inch pressure at the nozzle (If the velocity of this unit is not sufficient enough to thoroughly clean the joint, as determined by the Engineer, a Hot-Air-Lance must be used). The compressor shall be equipped with traps that will maintain the compressed air free of oil and water.
3. The joint sealant shall be applied with a mobile carriage and a rubber or metal shoe and have a flow control valve which allows all joints to be filled to refusal, so as to eliminate all voids or entrapped air, and not to leave unnecessary surplus joint sealant on the pavement surface.

Pour pots or similar devices shall not be used to fill sawed joints.

The joint sealant shall completely fill the joint such that after cooling, the level of the sealer will not be greater than one-eighth (1/8) inch below the pavement surface.

Any depression in the sealant greater than three-sixteenth (3/16) inch shall be brought up to the specified limit by the further addition of joint sealant. Overfilling of the joints will not be allowed and spillage of the sealant shall be avoided.

Sand shall not be spread on the sealed joint to allow early opening to traffic. Sealant shall be tack free prior to opening to traffic.

4. Boiler Slag Aggregate: Black Beauty should be used at locations deemed necessary by the Engineer (i.e. Intersections of high volume traffic).

**Preparation**

No joint sealant material shall be applied in wet joints or where frost, snow or ice is present, nor when ambient temperature is below 40 deg. F. Any given quantity of material shall never be heated at the pouring temperature for more than six hours and shall not be reheated more than once.

All joints, as determined by the Engineer, to be dried or rejuvenated shall be heated, prior to application of sealant, with a Hot-Air Lance which operates at 2,000 deg. F. at 2,000 feet per second velocity. The lance shall not exit flame which burns the asphalt.

**Workmanship**

All workmanship shall be of the highest quality, and excess or spilled sealant shall be removed from the pavement by approved methods and discarded. Any workmanship determined to be below the high standards of the particular craft involved will not be accepted, and will be corrected and/or replaced as required by the Engineer in charge.



**ITEM 482.32** (Continued)**Performance**

The Department reserves the right to withhold Subcontractor approval if the bidder cannot furnish satisfactory evidence that the subcontractor has the ability and experience to perform this class of work and that he has sufficient capital and equipment to enable him to prosecute the work successfully and complete it within the time specified in the contract.

Care shall be taken in the sealing of the joints so that the final appearance will present a neat fine line. Overfilling of joints will not be allowed and spillage of the sealant shall be avoided.

**METHOD OF MEASUREMENT**

Item 482.32 will be measured for payment by the Foot of sawing and sealing joints in asphalt pavement, complete in place.

**BASIS OF PAYMENT**

Item 482.32 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.



**ITEM 504.2****GRANITE CURB TYPE VA4 - SPLAYED END****EACH**

The work to be done under this item shall conform to the relevant provisions of Subsection 501 of the Standard Specifications and the following:

The work shall consist of installing transition curbs between sloped Type A-Modified HMA Berm or Granite Edging Type SA and vertical curbing at the locations shown on the Plans and as directed by the Engineer.

**METHOD OF MEASUREMENT**

Item 504.2 will be measured for payment by the Each Granite Curb Type VA4 – Splayed End installed, complete and in place.

**BASIS OF PAYMENT**

Item 504.2 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. No separate payment will be made for concrete backfill and gravel subbase, sawcutting, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 601.2****TIMBER GUARDRAIL****FOOT**

The work under this item shall conform to the relevant provisions of Section 600 and Subsection 955 of the Standard Specifications and the following:

Work under this item shall include the provision and installation of wood guard rail and wood post as specified herein.

**MATERIALS**

Wood used for guard rail and posts shall be pressure treated southern yellow pine. All wood shall conform to ASTM D245.

All wood components, including preservatives, shall meet the requirements of Subsection 955.

All pressure treated members shall be nominal size as shown on the Drawings. All steel fastenings used for assembling guard rails and posts including bolts, hex nuts and flat washers shall be in accordance with ASTM A307 and hot-dipped galvanized in accordance with ASTM A-123, A-153 or A-386.

**CONSTRUCTION**

The wood guard rail and posts shall be installed in conformity with the lines, grades, heights, setbacks and dimensions as shown on the plans and as specified herein.

The Contractor will be familiar with the guardrail stations as shown on the plans. The Contractor shall field stake the intended locations of all guard rail. The staked locations will be approved by the Engineer prior to installation.

All guardrails will be set plumb to the proper height and gravel borrow around the posts will be firmly compacted to prevent any movement of the post after its placement.

Rails will be set to the proper height with all joints properly aligned, smoothly cut and fit without gaps greater than 1/8th of an inch.

Rails will run continuously from post to post. Joints will secure at the center line of each post. No splicing of rails between posts will be allowed.

**METHOD OF MEASUREMENT**

Item 601.2 will be measured for payment by the Foot, as measured along the top of the rail, complete in place.

**BASIS OF PAYMENT**

Item 601.2 will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for wood guardrail, posts and fastenings, excavation, gravel borrow backfill, grading and compacting, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 655.2****ORNAMENTAL HAND RAIL****FOOT**

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

Work under this item shall include furnishing and installing ornamental hand rail, fabricated with hot-rolled carbon steel hand rail moldings and channel, malleable iron fittings, and forged steel posts, as shown on the drawings or as directed by the Engineer.

**References**

American Society for Testing and Materials (ASTM) Publications:

1. ASTM A36 - Structural Steel.
2. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
4. ASTM A1264.1 - Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall and Roof Openings; Stairs and Guardrail/Handrail Systems.
5. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
6. ASTM D822 - Tests on Paint and Related Coatings Using Filtered Open-Flame Carbon-Arc Exposure Apparatus.
7. ASTM D2794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
8. ASTM D3363 - Test Method for Film Hardness by Pencil Test.
9. ASTM E894 - Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
10. ASTM E935 - Permanent Metal Railing Systems and Rails for Buildings.

**Design Requirements**

Railing assemblies and attachments shall be designed, fabricated, and installed in accordance with ASTM A1264.1, ASTM E894, ASTM E935 to support:

1. 200 pounds concentrated loading applied at any point in any direction.
2. 50 pounds per linear foot uniform load applied horizontally to top of rail.

**Submittals**

Contractor shall prepare and submit detailed plans for each location showing railing layout, dimensions, spacing of components, and anchorage and installation details. Product data for components and accessories.

Sample: 6" minimum size sample of railing section design, fabrication workmanship, and selected color coating.

Copy of warranty specified for review by Engineer.

**Warranty**

10-year warranty for factory finish against cracking, peeling, and blistering under normal use.



**ITEM 655.2** (Continued)**MATERIALS**Hand Rail System

Stair hand rail components shall consist of traditional handrail moldings, posts, and straight “lamb’s tongue” termini. Railing components shall be fabricated from available rail systems manufactured by one of the following manufacturers:

- The Wagner Companies, 10600 W. Brown Deer Rd.; Milwaukee, WI 53224; Tel: 414-214-0444; Web: [www.wagnercompanies.com](http://www.wagnercompanies.com);
- Julius Blum & Co. Inc., P.O. Box 816; Carlstadt, NJ 07072-0816; Tel: 800-526-6293; Web: [www.juliusblum.com](http://www.juliusblum.com);
- King Architectural Metals, 6301 Eastern Ave.; Baltimore. MD 21224; Tel: 410-644-5932; Web: [www.kingmetals.com](http://www.kingmetals.com).

No substitutions without approval by the Engineer.

Rail Posts

Rail posts shall be 1-1/2” x 1-1/2” square solid forged steel posts. Post will be anchored in a 3” dia. core hole with grout, or as otherwise recommended by the manufacturer.

Steel Channel

Steel channel will be hot-rolled steel and shall be sized to fit underneath the contoured top rail. All post connections will be affixed to the steel channel.

Contoured Top Rail

Contoured top rail shall consist of a hot-rolled carbon steel railing. Cross section of rail shall be similar to that shown on the drawings. Railing shall be 2-inches in width and shall comply with the dimensional requirements for a non-circular rail cross section found in Paragraph R409.72 of the Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way, most recent edition. Fabricate top rail for concealed attachment to supporting steel channel.

Grout

Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water reducing and plasticizing additives. Sufficient grout will be placed so that it sheds water and prevents it from collecting and prematurely deteriorating the metal posts. Grout shall be as listed in the MassDOT Qualified Construction Materials List.

Fasteners

Stainless steel bolts and screws of type, size, and spacing as recommended by handrail manufacturer for specific condition.



**ITEM 655.2** (Continued)**Factory Finish**

Steel railing, posts, and other components shall be hot dip galvanized to 1.25 ounces per square foot minimum zinc coating in accordance with ASTM A123. Components shall receive polyester powder coating.

Polyester powder coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.

1. Minimum hardness measured in accordance with ASTM D3363: 2H.
2. Direct impact resistance tested in accordance with ASTM D2794: Withstand 160 inch-pounds.
3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than 3/16-inch undercutting.
4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1-year exposure in South Florida with test panels tilted at 45 degrees.

**Color**

Color to be black.

**CONSTRUCTION METHODS****Preparation**

Prior to fabrication, field verify required dimensions.

**Installation**

1. Install railing in accordance with manufacturer's installation instructions to configurations indicated on Drawings and approved shop drawings.
2. Install posts plumb and level before grouting.
3. Do not install bent, bowed, or otherwise damaged rails or posts. Remove damaged components from site and replace.
4. Any field welding shall be performed by a certified welder.
5. Touch-up damaged finish with paint supplied by manufacturer and matching original coating.

**METHOD OF MEASUREMENT**

Item 655.2 will be measured by the Foot of ornamental handrail installed, measured horizontally, complete in place.

**BASIS OF PAYMENT**

Item 655.2 will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for primer, paint and incidental costs required to fabricate and install the rail, including coring into stair treads and / or cheek walls, but all costs in connection therewith shall be included in the Contract unit price bid.

Concrete footings will be paid for separately under Bluestone Steps, Item 706.3.



**ITEM 669.****FENCE REMOVED AND STACKED****FOOT**

The work under this item shall conform to the relevant provisions of Subsection 665 of the Standard Specifications and the following:

The work under this item shall include the dismantling, removal and stacking of existing fence as designated on the plans and as directed by the Engineer including the removal of all associated posts and foundations. Arrangements shall be made with the homeowner to determine if the fence shall be removed and discarded or removed and stacked. If the homeowner requests that the fence be stacked, care shall be taken to salvage all components for reuse and neatly stack all materials in a location coordinated with the homeowner.

**CONSTRUCTION**

Existing fence not required to be stacked on this project shall be disassembled, stored away from the traveled way and shall become the property of the Contractor, who shall dispose of the fence at a suitable location away from the site. All foundations associated with the fence shall be excavated and removed and the hole filled with compacted gravel. The work shall also include the replacement in kind of any surface material disturbed.

**METHOD OF MEASUREMENT**

Item 669. will be measured for payment by the Foot of fence removed and stacked.

**BASIS OF PAYMENT**

Item 669. will be paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for the excavation and disposal of the existing foundations, backfilling hole and restoration of existing surface, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 690.****STONE MASONRY WALL REMOVED AND  
REBUILT IN CEMENT MORTAR****CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsections 685 and 690 of the Standard Specifications and the following:

The work shall include removing and rebuilding stone masonry walls in cement mortar utilizing existing on-site stones in accordance with these specifications, and in close conformity with the lines and grades shown on the plans or established by the Engineer.

**Submittals**

Product Data: If supplemental stone is required, provide stone source quarry or stone distributors data, including photographs of the material proposed, with narrative description on installation and limitations in use for review and approval by the Engineer.

**Quality Assurance**

Provide a five-foot long section of stone masonry wall in cement mortar utilizing existing on-site stones for sample approval.

Approval of the mock-up will be considered a **hold point**. No work shall proceed until written acceptance of the mock-up section of wall is received from the Engineer.

Sample wall section shall be inspected by the Engineer and the Designer. If the wall section is not acceptable, the Designer shall provide direction to the Engineer as the sample wall's deficiencies and direction for improvement in either materials or workmanship. Additional wall sections shall be constructed at no cost to the Department until an acceptable sample is provided.

Accepted sample shall become the standard for the entire job and shall remain undisturbed until completion of all work. Contractor may incorporate mock-up of wall section into final work but will remove and replace if found to be unacceptable to the City or MassDOT.

**MATERIALS**

Contractor shall utilize the stone from the existing walls to the maximum extent practical.

If supplemental stone is required, any new stone shall be consistent with the color, size, and texture of the existing walls.

**CONSTRUCTION METHODS****Reuse of Existing Stone**

At select wall locations, the intent is to reuse the existing on-site stone to the greatest extent possible. The shape and weathered appearance of the original stone gives the walls a historic quality and therefore the reuse of existing stone is considered an essential part of work.



**ITEM 690.** (Continued)

All existing stone at each location shall be carefully stockpiled separately and shall not be commingled with new stones or stone from other locations without the approval of the Department. Stone to be reused shall be broken as little as possible so as to preserve the weathered surface of the existing stones. Only excess stones shall be stockpiled for use at other locations as designated by the Department. In the event of a shortage of stones, the Contractor shall use other similar stones stockpiled as surplus or provide new stone of similar size, color and type.

Selected stones shall be used for the wall cap to produce a uniform top of wall surface at the elevations shown on the plans and as directed by the Department. Cap stones shall be a minimum of 4" thick and shall extend the full width of the wall. The surface of the stones along the top of the wall shall not vary more than one inch and shall reflect a true even plane at the face of the wall according to the elevation and sections shown on the Drawings.

**METHOD OF MEASUREMENT**

Item 690. will be measured by the Cubic Yard, complete in place.

**BASIS OF PAYMENT**

Item 690. will be paid for at the contract unit price per Cubic Yard, which price shall include all labor, materials, equipment and incidentals required to complete the work.

No separate payment will be made for removing and reuse of existing stones, supplemental stones, mortar, cement concrete, crushed stone, or weep hole pipes but all costs in connection therewith shall be included in the unit price bid.

Excavation will be paid for separately under Class A Trench Excavation, Item 141.

Gravel borrow will be paid for separately under Gravel Borrow for Backfilling Structures and Pipes, Item 151.2.



**ITEM 690.2****STONE MASONRY WALL  
REMOVED AND STACKED****CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsections 120 and 690 of the Standard Specifications and the following:

The work shall include the disassembly and stacking of stone walls as shown on the plans and as directed by the Engineer. The Contractor shall coordinate with the adjacent property owner to determine where on the property the stones shall be stacked. If it's determined, in writing, the property owner does not want the stones, they shall be removed and disposed of offsite at no additional cost.

For the retaining wall along the Taunton River, stones shall be lifted and transported using approved methods that do not scar or chip the facing of the stones. Mortar from joints shall be carefully removed and properly disposed with no additional compensation. Existing stones to be removed and stacked shall consist of granite blocks measuring 8" or greater in both width and height with a minimum length of 4'. Stones that do not meet these criteria will be removed and disposed of offsite at no additional cost.

**METHOD OF MEASUREMENT**

Item 690.2 will be measured for payment by the Cubic Yard, completely removed and stacked.

**BASIS OF PAYMENT**

Item 690.2 will be paid for at the contract unit price by per Cubic Yard, which price shall include all labor, materials, equipment and incidentals required to complete the work.

No separate payment will be made for excavation, coordination and disposal (if applicable), but all costs in connection therewith shall be included in the unit price bid.



**ITEM 694.5****STONES FOR WILDLIFE PASSAGE****CUBIC YARD**

The work shall include the construction of a Stones for Wildlife Passage utilizing stones from the existing retaining wall along the Taunton River in accordance with these specifications, and in close conformity with the lines and grades shown on the plans or established by the Engineer.

**MATERIALS****Stones**

Contractor shall utilize the stone from the existing retaining wall along the Taunton River for construction of the Stones for Wildlife Passage to the maximum extent practical.

If supplemental stone is required, any new stone shall be consistent with the color, size, and texture of the existing stone.

**CONSTRUCTION METHODS**

Stones shall be fitted snug against one another to form a continuous path of travel for small animals, as detailed on the drawings, and shall be embedded in gravel to prevent rocking. The exact sizes and locations are to be determined by the Wetland Specialist.

**METHOD OF MEASUREMENT**

Item 694.5 will be measured for payment by the Cubic Yard of stone installed, complete in place.

**BASIS OF PAYMENT**

Item 694.5 will be paid for at the Contract unit price per Cubic Yard, which price shall include all materials, equipment, labor and incidental costs required to complete the work.

No separate payment will be made for excavation, supplemental stones, gravel borrow and backfill required to place stones in a stable position, but all costs in connection therewith shall be included in the Contract unit price bid.

Removal and stacking of the stones from the existing retaining wall will be paid for separately under Stone Masonry Wall Removed and Stacked, Item 690.2.



**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



**ITEM 697.1 (Continued)****METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

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 conform to the relevant provisions of Subsection 670 of the Standard Specifications and the following:

The work under this item shall consist of furnishing and installing floating siltation curtain in the required amounts in the areas indicated on the plans or as directed.

**MATERIALS**

The fence barrier material shall be 6 inch impervious polyethylene reinforced with nylon cord. The top of the fence shall have a floatation carrier consisting of a floating plastic tube filled with marine quality polyethylene foam. The floatation carrier shall also have a coated steel cable in it of sufficient size and strength to carry loads imposed upon the fence. The fence shall be supported and anchored to the shore with approved devices.

**CONSTRUCTION**

The fence shall be in place and approved before any contract work that interfaces with the stream or river is begun. This shall include but is not limited to, the channel excavation, the culvert installation, the removal of the existing culvert, and the installation of any of the contractor's temporary dewatering control devices that abut the stream.

The contractor shall maintain fences in satisfactory working order until removed, including any necessary replacement of damaged or deteriorated sections, at no additional compensation.

Heavy sediment deposits in the area enclosed by the floating silt fence will be removed before the removal of the barrier.

**METHOD OF MEASUREMENT**

Item 697.2 will be measured for payment by the Foot of floating silt fence, complete in place.

**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 and incidental costs required to complete the work. No separate payment will be made to install, maintain, clean and remove floating silt fence, but all costs in connection therewith shall be included in the Contract unit price bid.



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<b><u>ITEM 698.3</u></b>	<b><u>GEOTEXTILE FABRIC FOR SEPARATION</u></b>	<b><u>SQUARE YARD</u></b>
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The work under this item shall consist of placing a geotextile fabric in the construction of the modified rock fill slopes and other locations as shown on the plans.

The geotextile fabric shall be Class 1 fabrics conforming to AASHTO M 288. For geotextiles for separation the material shall be woven.

**CONSTRUCTION METHODS**

Fabric shall be placed in intimate contact with the base material. Seams shall be overlapped by at least two feet. If the Contractor elects to sew seams instead of overlap, colored thread must be used. The Contractor shall take care not to allow more than two weeks of exposure to direct sunlight. Fabric rolls shall not be dropped more than two feet.

Geotextile shall be listed on the latest MassDOT Qualified Construction Materials List.

**METHOD OF MEASUREMENT**

Item 698.3 will be measured for payment by the Square Yard, complete in place.

**BASIS OF PAYMENT**

Item 698.3 will be paid for at the respective Contract unit prices per Square Yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No additional payment will be made for overlapping material.



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**ITEM 705.1**                    **FLAGSTONE WALK REMOVED AND RESET**                    **SQUARE YARD**

The work under this Item shall conform to the relevant provisions of Subsection 701 of the Standard Specifications and the following:

The work to be done under this Item consists of removing and resetting existing flagstone walks at locations as shown on the plans or where directed by the Engineer.

The reset flagstone walks shall be similar in appearance to the walks which are removed, or which are to abut an existing walk. All flagstones shall be thoroughly cleaned before being reset. If existing flagstones are broken or if the use of new stones is necessary to reset the walks, they shall be of the same color and texture as the existing stones. If the existing flagstone walk is set upon a cement concrete base course, a new concrete base course shall be constructed to the same depth as the existing base course and placed on an 8-inch gravel foundation.

Cement concrete shall conform to Material Specification M4.02.00.

Mortar shall conform to Material Specification M4.02.15.

It is the intention of this special provision that the reset flagstone walks, at the new locations, shall conform as close as possible in every detail to the existing walks.

**METHOD OF MEASUREMENT**

Item 705.1 will be measured for payment by the Square Yard, complete in place.

**BASIS OF PAYMENT**

Item 705.1 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 new flagstones, gravel borrow, mortar, or cement concrete, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 706.3****BLUESTONE STEPS****SQUARE FOOT**

Work shall include the installation of bluestone clad steps as shown on the plans and as required by the Engineer.

**Submittals**

Contractor shall prepare and submit detailed plans for each location showing overall dimensions, total riser and tread relationships, and proposed elevations.

**MATERIALS****Bluestone Treads**

Bluestone treads shall be approximately 2 inches thick.

Bluestone shall be uniform in color and texture with no cracks, fractures or other deformities that will compromise structural integrity or aesthetic character.

Bluestone treads shall be cut and shaped to the dimensions and sizes shown on the plans.

Exposed surfaces shall be thermal finish.

**Thin Stone Veneer**

Thin stone veneer for risers shall consist of sound, durable, field stone, free from seams, cracks and other structural defects of an approved and satisfactory quality and shape.

The stone shall be similar in shape, size, color, and texture to the proposed cemented stone masonry cheek walls / retaining walls that will be adjacent to the steps.

**Cement Concrete**

Cement concrete shall be minimum 28-day compressive strength of 4,000 psi, 1.5", 565, air entrained.

**Mortar**

Mortar shall be in accordance with M4.02.15

**Reinforcing Bars**

Reinforcing Bars shall be MassDOT Specification Section M8.01.00.

**CONSTRUCTION METHODS**

Excavate to provide gravel base as shown on the plans.



**ITEM 706.3** (Continued)

Provide all steel reinforcement as shown on the plans.

Cement concrete foundation shall be set plumb and true to the lines and elevation as shown on the plans.

Set stair treads on a bed of mortar to ensure that they are level side to side, with a longitudinal cross pitch towards the riser for proper drainage. Overlap stair treads as shown to ensure risers are consistent in height and stable from movement. Mortar joints between stair tread and cheek wall.

Attach thin stone veneer to stair risers such that no mortar is exposed.

Align adjacent walk at top of stairs flush to top tread to prevent trip hazards.

**METHOD OF MEASUREMENT**

Item 706.3 will be measured for payment by the Square Foot of horizontal tread, complete in place. This measurement will be for the exposed tread only. Where treads overlap, the covered portion shall not be measured.

**BASIS OF PAYMENT**

Item 706.3 will be paid for at the Contract unit price per Square Foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for excavation, gravel borrow, compaction, bluestone treads, thin stone veneer, cement concrete, steel reinforcement, mortar, and shop drawing submittals, but all costs in connection therewith shall be included in the Contract unit price bid.

Handrails will be paid for separately under Item 655.2 Ornamental Handrail.



**ITEM 706.41****GRANITE STEPS****SQUARE FOOT**

The work under this item shall conform to the relevant provisions of Subsections 485, 701 and 901 of the Standard Specifications and the following:

The work under this item shall include the installation of granite steps as shown on the plans and as required by the Engineer.

**Submittals**

The Contractor shall prepare and submit to the Engineer for approval, detailed plans for each staircase showing overall dimensions, total riser and tread relationships, and proposed elevations.

The Contractor shall submit material sample to Engineer for approval.

**MATERIALS****Granite**

The granite used shall be hard, durable, and of a quality approved by the Engineer, free from seams or other imperfections, with horizontal beds. Natural color variation characteristics of the deposit will be permitted.

All sawn granite surfaces that are to be exposed shall be thoroughly cleaned and any iron rust or iron particles removed by sand blasting or other approved methods satisfactory to the Engineer. In addition, any saw mark in excess of 1/8 inch shall be removed.

Granite steps and cheek walls shall be cut and shaped to the dimensions and sizes shown on the plans. Stone finishes shall be as follows and as directed:

- Stair risers: Split face
- Stair treads: Thermal
- Cheek wall exposed horizontal/vertical faces: Thermal
- All Hidden vertical faces: Sawcut

**Cement Concrete**

Cement concrete shall be minimum 28-day compressive strength of 4,000 psi, 1.5", 565, air entrained.

**Mortar**

Mortar shall be in accordance with M4.02.15.

**Dowels**

Dowels shall be stainless steel.



**ITEM 706.41** (Continued)**CONSTRUCTION METHODS**

Excavate to provide gravel base and benching to resist movement or sliding. Granite cheek wall and stair treads shall be set to the approved lines and grades.

Set granite cheek walls on a bed of gravel borrow, with all elements fixed at the ends with stainless steel dowels set in concrete. Mortar all joints and tool finish prior to setting stair treads.

Set stair treads on a bed of mortar to ensure that they are level side to side, with a longitudinal cross pitch towards the riser for proper drainage. Overlap stair treads as shown to ensure risers are consistent in height and stable from movement. Mortar joints between stair tread and cheek wall.

Align adjacent walk at top of stairs flush to top tread to prevent trip hazards.

**METHOD OF MEASUREMENT**

Item 706.41 will be measured for payment by the Square Foot of horizontal tread and cheek wall, complete in place. This measurement will be for the exposed tread only. Where treads overlap, the covered portion shall not be measured.

**BASIS OF PAYMENT**

Item 706.41 will be paid for at the Contract unit price by the Square Foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work. No separate payment will be made for excavation, gravel borrow, compaction, granite treads and cheek walls, cement concrete, mortar, stainless steel dowels, and shop drawing submittals, but all costs in connection therewith shall be included in the Contract unit price bid.

Handrails will be paid for separately under Item 655.2 Ornamental Handrail.



**ITEM 718.2****FLAGPOLE REMOVED AND STACKED****EACH**

Work under this item includes the removal and stacking of existing flagpole as shown on plans to be “Removed and Stacked” and/or as directed by the Engineer. This work shall be performed only if these objects have not been removed from the state highway layout by the owners, and only when these items will interfere with the progress of the work. The Contractor shall stack flagpole on the private property to which it belongs.

**CONSTRUCTION METHODS**

Prior to commencing the work called for under these Items, the Contractor shall coordinate with the owner for the removal and the final stacking location of the flagpole.

The work shall also include removing the pole, excavation of the existing foundations to a depth of at least 3 feet below the existing or proposed grade, whichever is lower, disposing of the concrete, backfilling with compacted gravel and the restoration or replacement in kind of the areas resulting from the excavation. The Contractor shall be responsible for the protection of the flagpole until stacked on the owner’s property and any pole damaged or lost either directly or indirectly as a result of his operations, shall be replaced by the Contractor at his own expense.

**METHOD OF MEASUREMENT**

Item 718.2 will be measured for payment by the Each flagpole removed and stacked.

**BASIS OF PAYMENT**

Item 718.2 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.

No separate payment will be made for excavation and disposal of the existing foundations, backfilling hole, restoration of existing surface and stacking of the flagpole but all costs in connection therewith shall be included in the Contract unit price bid.



**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:

Three computer systems and printer system meeting minimum requirements set forth below including installation, maintenance, power, paper, disks, and other supplies shall be provided at the Resident Engineer's Office:

All equipment shall be UL approved and Energy Star compliant.

The Computer System shall meet the following minimum criteria or better:

Processor:	Intel, 3.5 GHz
System Memory (RAM):	12 GB
Hard Drive:	500 GB
Optical Drive:	DVD-RW/DVD+RW/CD-RW/CD+RW
Graphics Card:	8 GB
Network Adapter:	10/100 Mbit/s
USB Ports:	6 USB 3.0 ports
Keyboard:	Generic
Mouse:	Optical mouse with scroll, MS-Mouse compliant

Video/Audio the computer system shall be capable of allow video calling and recording:

Video camera shall be High Definition 1080p widescreen capable video calling and recording with built in microphone. The microphone system shall capture natural audio while filtering out background noise.

Audio shall be stereo multimedia speaker system delivering premium sound.

OS: Latest Windows Professional with all security updates  
Web Browser: Latest Internet Explorer with all security updates  
Applications: Latest MS Office Professional with all security updates  
Latest Adobe Acrobat Professional with all security updates  
Latest Autodesk AutoCAD LT  
Antivirus software with all current security updates maintained through the life of the contract.

Monitors: Two 27" LED with Full HD resolution.  
Max. resolution 1920 x 1080

Flash drives: 2 (two) - 128GB USB 3.0  
Internet access: High Speed (min. 24 mbps) internet access with wireless router.



**ITEM 740.** (Continued)

The Multifunction Printer System shall meet the following minimum criteria or better:

Color laser printer, fax, scanner, email and copier all in one with the following minimum capabilities:

- Estimated volume 8,000 pages per month
- LCD touch panel display
- 50 page reversing automatic document feeder
- Reduction/enlargement capability
- Ability to copy and print 11" x 17" paper size
- email and network pc connectivity
- Microsoft and Apple compatibility
- ability to overwrite latent images on hard drive
- 600 x 600 dpi capability
- 30 pages per minute print speed (color),
- 4 Paper Trays Standard (RADF) (not including the bypass tray)
- Automatic duplexing
- Finisher with staple functions
- Standard Ethernet. Print Controller
- Scan documents to PDF, PC and USB
- ability to print with authenticated access protection

The Contractor shall supply a maintenance contract for next day service, and all supplies (toner, staples, paper) necessary to meet estimated monthly usage.

The Engineer's Field Office and the equipment included herein including the computer system, and printer shall remain the property of the Contractor at the completion of the project. Disks, flash drives, and card readers with cards shall become the property of the Department.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

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 745.3**      **PEDESTRIAN BUS SHELTER (INSTALLATION ONLY)**      **EACH**

The work under this item shall conform to the relevant provisions of Subsection 701 of the Standard Specifications and the following:

The Contractor shall assemble and install pedestrian bus shelters with benches (supplied by Greater Attleboro-Taunton Regional Transit Authority (GATRA) on concrete pads for use along the corridor at designated bus stops.

**MATERIALS**

All pedestrian bus shelter and bench components (including associated hardware for installation) will be supplied by GATRA.

The shelter will be a 5 Series - Barrel Roof Style Passenger Shelter as manufactured by Handi-Hut, Inc., 3 Grunwald Street, Clifton, NJ 07013.

Expansion bolts shall be as recommended by the manufacturer.

**CONSTRUCTION METHODS**

The contractor shall excavate and construct a reinforced concrete pad as shown on the drawings. The pad shall be placed on a gravel borrow foundation. The slab shall have a light broom finish and be edged.

The contractor shall assemble the shelters with benches as per the manufacturer's instructions.

The shelters with benches shall be surface mounted using expansion bolts, as recommended by the manufacturer.

**METHOD OF MEASUREMENT**

Item 745.3 will be measured for payment by the Each pedestrian bus shelter installed.

**BASIS OF PAYMENT**

Item 745.3 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. No separate payment will be made for excavation, gravel borrow, reinforced concrete pad, expansion bolts, or assembly and mounting of bus shelters with benches, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 754.24****ATLANTIC STURGEON PROTECTION PLAN****LUMP SUM**

The work to be done under this item consists of the monitoring and protection of Atlantic Sturgeon during work in the water of the Taunton River or other areas designated by the Engineer and in accordance with applicable environmental permits.

**CONSTRUCTION METHODS**

This work shall consist of three (3) primary tasks as follows:

1. Monitoring of Active Construction Areas:

Prior to the start of any construction activity, the contractor shall submit to the Engineer for approval the name and qualifications of the proposed Atlantic Sturgeon Monitor for the project. The Monitor shall be a qualified biologist approved by the Natural Heritage and Endangered Species Program (NHESP) that has experience in rare species ecology and management during construction projects. The primary objective of the Monitor is to ensure that impacts to the Atlantic Sturgeon are avoided to the greatest extent possible during the project.

Prior to beginning work on the installation of cofferdams or other water control barriers, a turbidity curtain or other suitable barrier shall be installed around the proposed work area. After installation of the turbidity curtain, the Monitor shall be responsible for searching the work areas inside the barrier for any Atlantic Sturgeon and, pursuant to a Scientific Collection permit, shall relocate any Atlantic Sturgeon or protected species to a suitable habitat outside of the work zone. Once any required relocations are complete, the Contractor can begin installing the proposed cofferdams within the turbidity barrier.

The Monitor shall be present as the cofferdams are installed. Once installed, the Monitor shall search within the cofferdams and in the vicinity to remove any Atlantic Sturgeon encountered and, again, after the area is dewatered.

A written report shall be provided to the Resident Engineer following each inspection. Any and all rare species encountered at the site should be reported to NHESP on the rare Animal Observation Form as soon as possible. Furthermore, the NHESP shall receive a report notifying them of the initiation of work and after the completion of work indicating the dates of all searches, species observed, and any corrective measures taken. The Monitor may modify the above noted plan, with NHESP written approval, to accommodate specific construction sequencing details of a particular project.

2. Implementation of a Worker Training Program and Notification Procedure:

There shall be the implementation of a site worker training program. This training program shall be developed and presented by the Monitor prior to the start of the project. Construction crews, project foreman, and site engineers shall participate in a special training session aimed at making them aware of the ongoing rare species concerns and the various protective measures in place to safeguard the Atlantic Sturgeon.



**ITEM 754.24** (Continued)

To help facilitate learning of the important concepts presented during the training, the Monitor shall produce a laminated 'informational sheet' on the Atlantic Sturgeon to be distributed to the workers during the training session and posted at conspicuous locations at the project site. This informational sheet shall include representative photographs and diagnostic features of the Atlantic Sturgeon to aid identification, an outline of the notification procedure, and contact information for the Monitor and NHESP.

3. In-Water Construction Work and Equipment Limited to One-Third of River's Total Width at Any Time

To allow the safe passage of fisheries during construction, the Contractor will be prohibited from blocking more than one-third of the river's width at any time. For short periods between December and February, the Contractor may request, and the Resident Engineer may allow, no more than one-half the width of the river to be blocked by work or equipment at any time.

**BASIS OF PAYMENT**

Item 754.24 will be paid at the Contract lump sum price bid and shall include the cost of the Monitor, permits, training, inspections, reports, and turbidity curtains, including installation, maintenance, and removal of the same and all other work as described in the Item. Upon approval of the Monitor by the Resident Engineer and NHESP, a payment of 30% of the Lump Sum shall be paid. The remaining 70% shall be paid in 10% increments distributed equally throughout the remaining period of the Contract.



**ITEM 755.35****INLAND WETLAND REPLICATION AREA****LUMP SUM**

The work under this Item shall conform to the relevant provisions of Subsections 120, 770, 771 of the Standard Specifications and the following:

Work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist as specified under that item.

Wetland Restoration work shall be as specified and compensated under that item. Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation.

The Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer, specified herein, or specified in permit conditions and approvals. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

**DESCRIPTION OF WORK**

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Approximate Location: STA. 118+15 TO STA. 118+65 LT  
Area: 1,272 SF

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the Contract; including but not limited to damage to soils or vegetation due to erosion, sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the Wetland Replication construction work shall not be from the same company as that which is performing planting, seeding, or participating in any aspect of the Wetland Replication construction. ▯

**SUBMITTALS - DOCUMENTS**

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): As specified below, shall be submitted to the Engineer for distribution to appropriate regulatory agencies.



**ITEM 755.35** (Continued)

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Items 755.75 and 755.76.

**SUBMITTALS - MATERIAL****Soil And Amendments**

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants.

At least sixty (60) days prior to installation and prior to ordering, the Contractor shall submit for approval sources of soil, compost, and amendments. Submittal shall include the supplier and location of the source. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments for soil texture, organic carbon content or other routine soil analysis parameters (e.g., pH, Cation Exchange Capacity, Percent Base Saturation) and Soil Organic Matter Analysis will be required if requested by the Engineer. The grab samples shall be collected by the Contractor or Wetland Specialist from multiple representative locations in the wetland topsoil mix following the "Umass Soil and Plant Tissue Testing Laboratory Sampling and Collection Protocols" (or equivalent certification paperwork provided by the soil supplier). The lab analysis shall be provided to the Engineer along with written certification from the Contractor or Wetland Specialist that the wetland topsoil was collected per the referenced protocol and meets the desired specification. The analysis and written certification of same shall be provided to the Engineer prior to placing the wetland topsoil in the Replication Area.

**Seed Mix**

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.



**ITEM 755.35** (Continued)**Plant Certification**

Plant Certification shall be per the applicable requirements of Subsection 771, PLANTING TREES, SHRUBS AND GROUND COVER, of the Standard Specifications. The nursery source shall certify the provenance or origin of all plants.

**Other Material:** Submittals shall be per the respective item.

**MATERIALS****Sediment Control Barrier and Erosion Prevention Measures**

Sediment control barriers shall be per Item 767.121.

**Wetland Soil**

Soil appropriate for the Replication Area may be either hydric soil excavated from the impacted wetland, a manufactured mix of compost and on-site borrow, or a combination thereof, as approved by the Engineer.

Hydric soil from the impacted wetland area may be spread on the surface of the constructed Replication Area as an inoculant or can be placed in a bulk fashion in a roughly 1:1 ratio of area and depth. Soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Hydric soil from the impacted wetland that is infested with invasive plant species identified on the Massachusetts Invasive Plant Advisory Group (MIPAG) shall not be used in the Replication Area unless approved by the Wetland Specialist and Engineer. To the extent possible, infested soil shall be disposed of within the project limits in an upland area outside of regulated areas and as approved by the Invasive Plant Management Strategy item (if in the contract) or by the Engineer.

A manufactured mix suitable for wetlands shall consist of on-site borrow from the proposed Replication Area (if approved by the Wetland Specialist and Engineer) thoroughly mixed with compost to achieve a target organic carbon content of 10-12% (up to 21% percent organic matter) by dry weight. The organic material used for mixing shall be well or partially decomposed. Clean leaf compost is the preferred soil amendment to achieve these standards though other materials may be used if approved by the Wetland Specialist and Engineer. Note that “clean” refers both to a negligible amount (<1%) of physical contaminants such as plastic and to the lack of chemical contaminants that might pose a hazard to plants or animals. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.



**ITEM 755.35** (Continued)**Plants**

Plant material shall conform to the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUND COVER, of the latest edition of the Standard Specifications and as amended below.

Plants shall be native species, not cultivars. To the extent possible, plants shall originate from the applicable EPA Level III Ecoregion.

Plant species and sizes to be included in the Replication Area shall be as specified on the plans.

Requests for substitutions shall be submitted in writing to the Engineer for review by the Wetland Specialist, MassDOT Landscape Architect, and, if required, the relevant regulatory agency at least thirty (30) days prior to planting. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Transplanting and plant material collected from the wild is prohibited unless approved in writing by the Engineer. Plants shall be selected from certified nurseries that have been inspected by state and/or federal agencies.

**Seed Mix**

Seeding shall conform to the Standard Specifications Section M6, ROADSIDE DEVELOPMENT MATERIALS.

**Wetland Mix – Part Shade**

<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
Grass		
Poa palustris	Fowl Bluegrass	25.00%
Elymus riparius	Riverbank Wild Rye	19.00%
Carex lurida	Shallow Sedge	17.00%
Carex vulpinoidea	Fox Sedge	10.00%
Cinna arundinacea	Sweet Woodreed	5.00%
Sparganium eurycarpum	Giant Bur Reed Eco PA	4.00%
Carex scoparia	Broom sedge	4.00%
Carex lupulina	Hop Sedge	4.00%
Scirpus polyphyllus	Many Leaved Bulrush	3.00%
Juncus effusus	Soft Rush	2.50%
Carex intumescens	Bladder Sedge	2.00%
Sparganium americanum	Burrweed	2.00%
Scirpus cyperinus	Woolgrass	1.00%
Carex crinita	Fringed Sedge	1.00%
Juncus tenuis	Path Rush	0.50%
		100.00%



**ITEM 755.35** (Continued)

Species ecotype shall be as native to New England region as possible.

**Seeding Rate**

Apply this mix at 20 lbs PLS/acre.

**Fertilizer**

Fertilizers shall not be used.

**Water**

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

**Mulch/Compost Blanket for Seeding**

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Mulch shall be incidental to seeding.

Compost Blanket may be used in lieu of mulch for seeding. Compost Blanket shall meet the material and submittal requirements of that Item and shall be applied as specified below. Compost Blanket shall be compensated under that item.

**CONSTRUCTION METHODS & SEQUENCE****Site Protection Measures****Minimizing Damage**

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.



**ITEM 755.35** (Continued)

Wetland topsoil shall be deposited and graded in the Replication Area in a manner that minimizes travel and subsequent compaction of the subgrade (including any specified pit and mound topography) to the extent practicable, including use of track mounted excavators as appropriate. Should soils be compacted, they shall be loosened by a method such as disking, spring-tooth harrowing and/or rototilling. The Contractor shall use boards, timber or composite mats, or other approved materials as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

**Stockpiling of Soil**

Stockpiling of soil, including hydric soil for replication, shall be at least 100 feet from the edge of the bordering and isolated vegetated wetlands and inland banks, unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. Any areas of exposed soil or stockpiles within and adjacent to the Replication Area that will remain inactive for more than 7 calendar days shall be sown with a mix of rapid germinating annual grasses (e.g., annual rye) covered with a layer of straw mulch applied at a rate of 90 pounds per 1,000 square feet. As necessary, the mulch shall be anchored with a tacking coat (non-tar) applied by a hydro seeder or other method recommended by the Wetland Specialist in consultation with the Engineer. In the event that there is excess borrow, it shall be disposed of under Excavation, Item 120.

**Sediment Barriers**

***Placement:*** Sediment barriers shall be installed along the downslope perimeter of the Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Where construction work is immediately upgradient of the wetland, barriers shall be located so as to protect the Replication Area until slopes are stabilized. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

***Maintenance:*** The Contractor shall ensure that all sediment barriers function as intended and at all times per the specifications of those respective items.

**Existing Trees to Remain**

***Tree protection*** shall be per the relevant specifications and as shown on the plans or as required by the Engineer. To protect root systems of existing trees to remain, the limits of the Replication Area may be adjusted, but the total area of replication required by the permits shall not be reduced. Access route may be adjusted as required.

***Trees to be retained as snags*** (upright dead or dying trees left for wildlife habitat) within or adjacent to the Replication Area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect during the initial site walk. Trees to remain as snags shall be clearly marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.



**ITEM 755.35** (Continued)

*Coarse woody debris* in the form of cut trees, stumps, logs, and brush shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect. On site material shall be selected and marked by the Wetland Specialist, retained on the project site, and placed as specified below under Placement of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal.

Work shall be coordinated with Clearing or Tree Removal Item and compensated under that Item.

**PRE-WETLAND CONSTRUCTION SITE WALK**

*Delineating the Replication Area and Access Route.* The Contractor shall stake out the Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

As part of the delineation and approval process, the Wetland Specialist shall mark trees to be converted to snags, select coarse woody debris to be retained for re-use, and select rocks or other elements to be used for habitat features.

**Invasive Plants:** As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found, they shall be addressed as described herein under Invasive Plants.

**SOIL WORK**

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist to achieve the desired hydrology and micro-habitat. If adjustments are required, a Request for Information (RFI) shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

**Excavation & Grading**

When required by permits, the Wetland Specialist shall notify MADEP and the ACOE (as applicable) at least 72 hours prior to excavation.

Soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and disposed of, or, if suitable for reuse, be stockpiled in an approved location. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist and provided to the Engineer and the Contractor.



**ITEM 755.35** (Continued)

Replication area shall be excavated as shown on the drawings. Where replication area is adjacent to existing reference wetland, finish grade of replication shall generally match existing grades and micro-topography, notwithstanding any deviations that are necessary to achieve the desired hydrology and habitat in the Replication Area.

Prior to placement of backfill, scarify subgrade to a depth of 4 to 6 inches.

**Placement of Wetland Soil**

Following excavation, scarification, and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, suitable soil previously removed, or an evenly mixed organic/mineral soil created on-site shall be spread to the design depth and thickness over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Vehicles used to transport soil from offsite shall be washed or cleaned with air pressure to prevent exotic or invasive seeds or root fragments from contaminating the Replication Area.

**Final Grading**

The finished grade of the Replication Area shall be at an elevation that will provide an unrestricted hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland relative to the impacted reference wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography in the form of hummocks, pits and mounds shall be as shown on the plans or as adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with soil as specified herein and at the Contractor's expense.

**Installation of Monitoring Wells in Replication Area**

For a constructed Replication Area over 1,000 square feet, a representative number of monitoring wells shall be installed in locations as shown on the Plans. Monitoring wells shall include data loggers. For purposes of this specification, a data logger refers to a battery powered device that records groundwater level. Data shall be collected by the Wetland Specialist and submitted with Monitoring Reports and as required by applicable permits. Wells shall be installed immediately following completion of construction of the Wetland Replication Area. Wells shall be installed in accordance with USDA/NRCS technical report entitled: "Sprecher, S.W. 2008. Installing monitoring wells in soils (Version 1.0). National Soil Survey Center, Natural Resources Conservation Service, USDA, Lincoln, NE." or equivalent methodology approved by Engineer.



**ITEM 755.35** (Continued)**RESTORING VEGETATION****Placement of Coarse Woody Material**

If specified within this Contract or if directed by the Wetland Specialist or Landscape Architect during the initial site walk, woody debris shall be placed in the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 5-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

**Planting**

Following placement of wetland soil and approval of final grade and conditions, Replication Area shall be planted. Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Specifications and as amended below.

Planting Season shall be May 15-June 15 and September 1-November 1 unless otherwise specified in applicable permit conditions.

Prior to planting, the Wetland Specialist shall approve the condition of the plant material and the method of installation and shall oversee the planting work. Replication Area shall be planted in the dry. Plants shall be placed according to the planting details and within the range of target elevations and at the spacing shown on the Plans or, if spacing is not indicated on the Plans, at the direction of the Wetland Specialist. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer or Wetland Specialist and shall be replaced at the Contractor's expense.

Plant material shall be furnished and installed as indicated including all labor, materials, plants, equipment, incidentals, re-setting of plants (frost heaves, etc.), irrigation, re-planting and clean up. If previously approved species are not available at the time of planting, the Wetland Specialist may propose substitutions relative to species, size, and quantities for review and approval by the MassDOT Landscape Architect. Upon approval by MassDOT, substitutions shall be approved by the regulating authority, if and as necessary. Provisions shall be made for a growth warranty of at least two (2) calendar years from the date of Conditional Acceptance as described below or as required by permits.



**ITEM 755.35** (Continued)**Seeding**

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Broadcast by hand or with a hand-held spreader followed by application of straw mulch. If necessary, seed shall be lightly raked to insure good seed-to-soil contact.
- Hydro-seeded with hydro mulch per the Standard Specifications and per the manufacturer's directions.
- Hand broadcast seed with Compost Blanket pneumatically applied at the same time to ensure light cover of soil topdressing over seed.

If spring conditions are drier than usual, supplemental watering may be required. If sowing during the summer months, supplemental watering will likely be required until germination.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

**PLANT ESTABLISHMENT AND INVASIVE MANAGEMENT**

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by May 15 after fall planting shall be replaced within the immediate or next planting period and at the Contractor's expense.

Seeding that fails to establish according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

Invasive Plants: Corrective measures shall be taken to remove or treat invasive plant species in the Replication Areas. Invasive plants shall include those listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District's Compensatory Mitigation Guidance

If chemical treatment of invasive plants is necessary, the strategy for treatment shall be as determined under Item 102.3 Invasive Plant Management Strategy. That strategy shall be coordinated with the Wetland Specialist and all applicable permits and permitting agencies. Chemical application under 102.33 Invasive Plant Management Strategy shall be compensated under that item and shall be for the duration of the contract only.

**CONDITIONAL ACCEPTANCE OF WORK**

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved.



**ITEM 755.35** (Continued)

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist demonstrating that the wetland replication construction work was done according to plans (or how modified) and meets required permit conditions. The narrative shall include photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Replication Area and surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The final finished target elevations have been met and maintained relative to the approved plans and reference wetland. Areas that are too high or too low should be identified along with suggested corrective measures.
- Hydrology meets performance standards.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions. The Wetland Specialist shall recommend corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

**REQUEST FOR CERTIFICATE OF COMPLIANCE**

If required, a request for a Certificate of Compliance (Partial or Full) pursuant to the Massachusetts Wetlands Protection Act regulations shall be prepared and submitted to MassDOT within 30 days following Conditional Acceptance.



**ITEM 755.35** (Continued)

The Request for Certificate of Compliance shall include the following:

- A brief narrative of the work on company letterhead signed by the Wetland Specialist. Narrative shall be prepared as a MS Word document and shall include substantive explanation that demonstrates compliance with EACH relevant permit condition. Narrative shall note variations from the originally permitted design.
- As-built Drawings signed by the Contractor's PE registered in the Commonwealth of Massachusetts. As-built drawings shall show hydrologic conditions, status of plantings and seeding, and shall include a narrative and minimum of 4 photographs documenting site conditions. Plans should note variations from the originally permitted design.

When required, drawings shall meet the Army Corp of Engineer's New England District's Compensatory Replication Guidance, including: scale in the range of 1" = 20' to 1" = 100', contours at 1' intervals, spot elevations for intermediate elevations, and polygons outlining each Replication Area, and, as applicable, plant community types. The As-built Drawings shall be provided to the Engineer electronically in Portable Document Format (PDF). If requested by the Engineer, the Drawings shall be provided in printed paper format (11" x 17" sheets, unless otherwise directed). Drawings must be scalable.

- Other documents as required.

**FINAL ACCEPTANCE OF WORK**

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Contractor, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. Final Acceptance will initiate the start of the Wetland Monitoring Period.

The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover at least 95 percent of the Replication Area, excluding areas of open water areas or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

If the mitigation work does not meet the above condition and is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions. Work not approved will be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.



**ITEM 755.35** (Continued)**MONITORING REPORTS FOR REGULATORY COMPLIANCE**

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 95 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

**BASIS OF PAYMENT**

Item 755.35 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required soil, site preparation, grading, wetland seeding, planting, mulching, watering, monitoring wells, registered surveyor, as-built plans, Request for Certificate of Compliance, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% after receipt and acceptance of Certificate of Compliance by the Engineer and once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

Sediment Control Barrier will be paid under Item 767.121

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76



**ITEM 755.45****WETLAND RESTORATION****SQUARE YARD**

The work under this item shall conform to the relevant provisions of Subsections 120, 751, 765, 767, and 771 of the Standard Specifications and the following:

The work under this item shall include all labor and furnishing of materials to complete the work specified herein to protect and restore existing inland wetland areas that will be temporarily impacted as shown on the drawings and as required by the Engineer.

Inland Wetland Replication work shall be as specified and compensated under that item. Tidal wetland mitigation shall be as specified under the appropriate item for tidal wetlands.

Restoration Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

All work shall be in coordination with an approved Wetland Specialist. Wetland Specialist qualifications and requirements shall be per Item 755.75, Wetland Specialist.

Construction of the Restoration Areas shall be completed as shown on the drawings at the following locations:

STA. 105+65 RT = 4 SF

STA. 117+00 – 118+15 RT = 399 SF

STA. 121+25 LT = 40 SF

**SUBMITTALS – DOCUMENTS**

Survey: To establish or confirm pre-construction baseline elevation of temporarily impacted area(s), a survey shall be submitted to the Engineer prior to any fill or other land disturbance.

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): If applicable, request for a Certificate of Compliance shall be submitted to the Engineer for distribution to appropriate regulatory agencies as specified below.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.76 Wetland Monitoring Reports.



**ITEM 755.45** (Continued)**ASSOCIATED ITEMS AND MATERIALS****Seed Mix**

Required submittals include:

- Certificate of Materials from the supplier shall be submitted and approved 30 days prior to ordering seed. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).
- Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.
- Bill of lading or a notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

Seed mix shall be:

**Wetland Mix – Part Shade**

<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
Grass		
<i>Poa palustris</i>	Fowl Bluegrass	25.00%
<i>Elymus riparius</i>	Riverbank Wild Rye	19.00%
<i>Carex lurida</i>	Shallow Sedge	17.00%
<i>Carex vulpinoidea</i>	Fox Sedge	10.00%
<i>Cinna arundinacea</i>	Sweet Woodreed	5.00%
<i>Sparganium eurycarpum</i>	Giant Bur Reed Eco PA	4.00%
<i>Carex scoparia</i>	Broom sedge	4.00%
<i>Carex lupulina</i>	Hop Sedge	4.00%
<i>Scirpus polyphyllus</i>	Many Leaved Bulrush	3.00%
<i>Juncus effusus</i>	Soft Rush	2.50%
<i>Carex intumescens</i>	Bladder Sedge	2.00%
<i>Sparganium americanum</i>	Burrweed	2.00%
<i>Scirpus cyperinus</i>	Woolgrass	1.00%
<i>Carex crinita</i>	Fringed Sedge	1.00%
<i>Juncus tenuis</i>	Path Rush	0.50%
		100.00%

Species ecotype shall be as native to New England region as possible.



**ITEM 755.45** (Continued)**Seeding Rate**

Apply this mix at 20 lbs PLS/acre.

**Fertilizers** shall not be used.

**Straw mulch or hydromulch** shall be per Section M6 of the Standard Specifications.

**Water**

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

**CONSTRUCTION METHODS & SEQUENCE****Site Protection Prior to Impacts**

Prior to any land work, as part of the initial site-walk, the Wetland Specialist shall photo-document the site and provide a summary report of existing conditions as outlined under Item 755.75 Wetland Specialist.

Where and as required vegetation shall be cut flush and area surveyed to establish pre-construction elevations.

Following the cutting and surveying, temporary separation fabric or timber matting shall be placed as required to protect soil and vegetation from compaction, contamination, and/or other damages. Fabric and timber mats shall be placed as specified under the respective items and the Engineer shall approval placement.

**Restoration Upon Completion of Roadway Construction Work****Sediment Barriers**

If required for sediment control during Restoration work (i.e., tilling is required to restore soil), sediment barriers shall be installed along the downslope perimeter of the Restoration Area beginning and ending in the surrounding upland so that no disturbed soil can enter adjacent wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to any soil disturbance. No work shall take place outside the barriers.

**Removal of Fill and Grading**

Fill and temporary separation fabric or mats shall be removed and disposed of as specified under the respective items.



**ITEM 755.45** (Continued)

If required, grades shall be restored to pre-construction elevations as shown in the baseline survey or as required by the Engineer and Wetland Specialist to restore hydrologic functions. Final elevations shall be approved by the Engineer prior to soil preparation and seeding. Grading shall be incidental to this item.

Following approval of grading to elevations required, soil shall be prepared and seeded as follows.

**Soil Scarification**

Compacted soil shall be scarified with equipment approved by the Engineer. Upon approval of soil scarification, the area shall be seeded with mulch as specified below. Seeding shall immediately follow soil preparation.

**Seeding with Mulch**

Upon approval of prepared soil, area shall be seeded. Seeding shall be hand broadcast with straw mulch applied per the Standard Specifications and per the manufacturer's directions. Hydromulch shall be straw or wood fiber only and shall be per the manufacturer's recommendations.

Seed tags shall be submitted at time of seeding.

**Planting**

Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Specifications and as amended below.

Planting Season is May 15-June 15 and September 1-November 1 unless otherwise specified in applicable permit conditions.

Restoration Area shall be planted in the dry. Plants shall be placed according to the planting details and within the range of target elevations and at the spacing shown on the Plans or, if spacing is not indicated on the Plans, at the direction of the Wetland Specialist or the MassDOT Landscape Architect. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer and shall be replaced at the Contractor's expense.

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by June 1 after fall planting shall be replaced at the Contractor's expense.



**ITEM 755.45** (Continued)

Plant material shall be furnished and installed as indicated including all labor, materials, plants, equipment, incidentals, re-setting of plants (frost heaves, etc.), irrigation, re-planting and clean up.

If previously approved species are not available at the time of planting, the MassDOT Landscape Architect will propose substitutions relative to species, size, and quantities. Substitutions shall then be approved by the regulating authority if necessary. Provisions shall be made for a growth warranty as described below or as required by permits.

**PLANT AND SEED ESTABLISHMENT**

*Seeding* that fails to establish according to the conditions of acceptance below shall be overseeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

**CONDITIONAL ACCEPTANCE OF WORK**

Conditional Acceptance shall indicate approval of the wetland restoration work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist (if applicable to project) demonstrating that the wetland restoration work was done according to plans (or how modified) and meets required permit conditions (if applicable). The narrative shall include photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Restoration Area and the surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The target elevations have been restored per the survey or adjusted per the Engineer. Areas that are too high or too low should be identified along with suggested corrective measures.
- Soil compaction has been mitigated.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- Hydrology meets performance standards and has been adequately restored.
- Specified seed mix has been seeded and seeded species in the wetland and adjacent upland show signs of good germination and healthy growth.
- Planted woody and herbaceous species (if included) meet specifications and are establishing well.
- There are no invasive plants visible in the restored wetland area.
- Silt fence and non-biodegradable sediment barrier materials have been removed.



**ITEM 755.45** (Continued)

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Restoration work is not approved, MassDOT will issue a rejection letter requiring corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

**FINAL ACCEPTANCE OF WORK**

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist, and regulatory representative (if required) shall assess the Restoration Area. Final Acceptance will initiate the start of the Monitoring Period (if required).

The following conditions shall be inspected and approved for acceptance and payment:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 100 percent of the restoration area, excluding areas of open water, large boulders or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- Planted woody and herbaceous species (if included) meet specifications and are establishing well.
- There are no visible invasive plants.

If the restoration work is not approved, MassDOT will issue a rejection letter requiring corrective action. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation. Work not approved shall be addressed by the Contractor at no extra cost.

**MONITORING REPORTS FOR REGULATORY COMPLIANCE**

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended, relative to the preexisting condition of the restored wetland.
- Seeded species are establishing well and cover 100 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.



**ITEM 755.45** (Continued)

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 755.45 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, compost and amendments, seed, mulch, equipment, submittals, maintenance, grading, and incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 50% upon completion of soil preparation and seeding
- 25% upon Conditional Acceptance
- 25% upon Final Acceptance or approval of the Engineer

Sediment Control Barrier will be paid under Item 767.121

Wetland Specialist will be paid under Item 755.75

Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76



**ITEM 755.75****WETLAND SPECIALIST****HOOR**

Work under this Item shall be for services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications hereafter referred to as the “Wetland Specialist.”

“Wetland Mitigation” shall be used herein for applicable wetland work. For this project, applicable wetland work is for: Item 755.35 Inland Wetland Replication Area (creation of a new wetland) and Item 755.45 Wetland Restoration (restoration after temporary impacts).

“Riverfront Area Mitigation” shall be used herein for all work to construct the off-site Riverfront Area Mitigation. Contractor shall use Contract items to construct the off-site mitigation area.

The Wetland Specialist shall demonstrate knowledge and expertise to coordinate and oversee all work associated with the Wetland Mitigation as defined herein, as shown on the Plans, as required by permits, and as specified under the relevant Wetland Mitigation items.

Regulatory monitoring reports following Final Acceptance of the Wetland Mitigation and Riverfront Mitigation shall be per Item 755.76, Wetland Monitoring Reports.

For all onsite work, the Wetland Specialist shall sign in and sign out with the Engineer.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

**QUALIFICATIONS**

The Wetland Specialist shall have a minimum of five (5) years of experience with construction and monitoring of wetland mitigation areas similar in size, type, and complexity to the Contract mitigation. When required by permits, at least ten (10) years of experience may be required. The Wetland Specialist shall be thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40), U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance, and all other relevant regulations of the Massachusetts Department of Environmental Protection and the U.S. Army Corps of Engineers New England District.

**SUBMITTALS - QUALIFICATION**

Within sixty (60) days following the Notice to Proceed, the Contractor shall provide proof of qualifications for the Wetland Specialist to the Engineer for approval. Submittals shall include, but not be limited to, the following:

- Resume of the individual on-site implementing the Wetland Specialist work. If the Wetland Specialist changes over the course of the project, the new individual shall submit resume and qualifications for approval 30 days prior to doing any work on-site.
- Resume of any personnel working on-site in place of the Wetland Specialist. Individual shall be approved prior to work on-site.
- Narrative describing the company, its expertise, technical qualifications, and experience with wetland construction.



**ITEM 755.75** (Continued)

- At least three (3) references from prior work of a similar nature completed in the last five (5) years and by the individuals who will perform the work. Provide contact information for each reference including address, phone number and email.
- A summary of each reference project including nature of the work, project size, dates, and period of construction and monitoring, methodologies used, and summary of success (or not) in terms of meeting performance objectives. Summary shall include a minimum of one before and one after photo for each project.

Qualifications shall be reviewed and approved by MassDOT, the Taunton Conservation Commission and the Massachusetts Department of Environmental Protection.

**SUBMITTALS – DOCUMENTATION AND REPORTS****Wetland And Riverfront Area Construction Oversight**

Wetland Specialist shall provide documentation of pre-existing conditions and wetland and Riverfront Area construction as specified below and as part of fulfilling the Scope of Work described below. Documentation shall include photos that are clear and legible. Photos are incidental to this item.

- ***Site Walk Prior to Disturbance and Construction of Wetlands:*** Provide brief assessment with photos, including documentation of the existing wetlands to be impacted (both permanent and temporary), proposed wetland replication area, and reference/model wetland areas (typically an adjacent undisturbed wetland or the existing wetland to be impacted). Photos of existing wetlands that will be temporarily impacted shall include a view from at least 3 angles.
- ***Excavation and Grading:*** Documentation shall include minimum of two photos of the excavated wetland and two photos after final grading prior to planting and seeding. For restoration areas, photos shall show soil preparation (i.e, tilling and grading), if applicable.
- ***Approval of Subgrades:*** The Wetland Specialist shall inspect the sub-grade of the Replication Area to ensure that proper hydrology is likely to be established and shall provide the Engineer with written confirmation and photographs upon completion of subgrade excavation work. Written confirmation shall include recommended field adjustments, based on field observations, to achieve the desired hydrology and designed wetland system.
- ***Planting and Seeding:*** Provide assessment and photos of vegetation upon completion of planting and seeding work.
- ***Data logger output from Monitoring Wells*** shall be submitted with reports, if applicable and requested.

Wetland and Riverfront Area construction documentation and reports shall be submitted with Request for Conditional Acceptance and for the Order of Conditions, Water Quality Certifications, and other regulatory permits as required.



**ITEM 755.75** (Continued)**Requests For Acceptance Of Work & Regulatory Compliance**

The Wetland Specialist shall submit the following documents if and as specified herein and under Item the relevant Wetland Mitigation items:

- Request for Conditional Acceptance.
- Request for Certificate of Compliance (Partial or Full) when applicable.
- Request for Final Acceptance.

**SCOPE OF WORK**

In the event of discrepancies with the applicable permits, the Wetland Specialist shall submit a Request for Information (RFI) to the Engineer.

**General**

The Wetland Specialist shall be responsible for the following:

- Review and have a comprehensive knowledge of the environmental permits relevant to the specific mitigation work being done so as to ensure compliance throughout the duration of the contract.
- Identify and inform the Contractor and Engineer of unique site conditions which may require adjustments to the schedule, design, or construction methods. For example, wildlife nesting, illegal dumping, or rare species.
- Identify and inform the Contractor and Engineer of any sediment or erosion control problems observed within mitigation areas.
- Advise so as to avoid impacts to adjacent areas and regulated wetland resources.
- Participate in necessary meetings as required by permits and when requested by the Engineer.

**Inspections & Construction Oversight**

The Wetland Specialist shall be responsible for, but not limited to, the following:

- Pre-Construction Site Walk
  - Following surveying, flagging, and staking of all relevant boundaries and elevations by the Contractor, the Wetland Specialist shall walk the site with the Engineer and the Contractor to review existing and proposed conditions, recommend changes if necessary, and approve the following: location and boundaries of the Mitigation Area, target elevations and grades, location of tree protection associated with the Mitigation Area, and final layout and limits of clearing for access route.
  - Select and mark snags, logs, and woody material to be retained for placement in the Wetland Mitigation and Riverfront Area Mitigation, as appropriate.
  - Note invasive plants in and adjacent to Wetland Mitigation and Riverfront Area Mitigation.
  - Provide summary report if and as specified under Wetland Mitigation items and as required by environmental permits.



**ITEM 755.75** (Continued)

- Excavation, Soil Placement, Grading for Replication Areas
  - Approve excavated depth and grading for appropriate wetland hydrology, subsoil preparation, and finished grade of placed wetland soil.
  - Adjust grades as required and approve microtopography. If grades need to be adjusted, submit an RFI to the Engineer.
  - If requested by the Engineer, the Wetland Specialist shall inspect stockpiled wetland soil for moisture content and signs of undesirable weeds.
- Soil Protection and Restoration Measures for Restoration Areas
  - Review and approve methods of soil protection and restoration if required.
  - Confirm decompaction will adequately restore appropriate wetland hydrology. If decompaction measures need to be adjusted, submit an RFI to the Engineer.
- Re-vegetation of Mitigation Area and Riverfront Area Mitigation
  - Placement of woody material to be re-used.
  - Verify seed used complies with specifications and site conditions, determine limits for wetland seeding based on elevations, approve seeding and mulching methods, and collect seed tags to submit with Request for Conditional Acceptance.
  - Review planting methods (if applicable) prior to installation and oversee layout of wetland plants.

**Conditional Acceptance**

Upon completion of construction of the wetland and Riverfront Area, as part of the Request for Conditional Acceptance, the Wetland Specialist shall provide a brief narrative demonstrating that the wetland and riverfront area construction work was done according to plans (or how modified) and meets the conditions required for acceptance as specified under the Wetland Mitigation items. Submittal shall include a report and photo documentation of pre-construction conditions, construction work, seeding, planting, and other work as specified under the Wetland Mitigation items and as required by environmental permits. Photos of completed Wetland Restoration areas and Riverfront Area shall include the same views as the pre-construction reference photos.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and Riverfront Area Mitigation and surrounding area to ensure that it meets the conditions specified under the Wetland Mitigation items and as required by environmental permits.

Upon approval, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Mitigation and Riverfront Area Mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

**Request For Certificate Of Compliance**

If required, a Request for Certificate of Compliance shall be prepared and submitted to the Engineer immediately following Conditional Acceptance. Request shall be as specified under the relevant Wetland Mitigation items.



**ITEM 755.75** (Continued)**Request For Final Acceptance**

Following one full growing season, the Wetland Specialist shall provide a brief narrative of the status of the Wetland Mitigation and Riverfront Area Mitigation to be submitted with the Request for Final Acceptance.

Upon receipt of the Request, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the relevant Wetland Mitigation items and Riverfront Area Mitigation.

If the Wetland Mitigation and Riverfront Area Mitigation is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

**METHOD OF MEASUREMENT**

Item 755.75 Wetland Specialist shall be measured per hour for on-site service provided by the Wetland Specialist.

Work shall include all inspections, photos, submittals, and associated tasks for construction and restoration oversight, narratives for Conditional and Final Acceptance, Request for Certificate of Compliance (Partial or Full) if required, documentation required for permits, and all other work specified above. Payment shall not include travel time or time spent off-site on reports. Decimal Pay Limits will be 0.25 hours.

**BASIS OF PAYMENT**

Item 755.75 Wetland Specialist shall be paid at the Contractor bid price for each hour, or fraction thereof, spent on-site to perform the work as described above. Reports and photo documentation are required for payment.

Post wetland construction reports shall be per Item 755.76, Wetland Monitoring Reports.



**ITEM 755.76****WETLAND MONITORING REPORTS****LUMP SUM**

Work under this item shall be for the submittal of Wetland Monitoring Reports following the completion of wetland and riverfront area mitigation construction and shall include all inspections, photos, and other work required to complete those reports as specified herein.

“Wetland Mitigation” shall be used herein for applicable wetland work, whether Wetland Replication (creation of a new wetland) and/or Wetland Restoration (restoration after temporary impacts).

“Riverfront Area Mitigation” shall be used herein for all work to construct the off-site Riverfront Area Mitigation.

The Contractor shall retain the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications, hereafter referred to as the “Wetland Specialist,” to complete the Wetland Monitoring reports. Wetland Specialist shall meet requirements specified under Item 755.75 Wetland Specialist.

All on-site Wetland Specialist services required to complete the construction and revegetation of the wetland replication and riverfront area mitigation, including preparation and submission of monitoring reports during construction, shall be per Item 755.75 Wetland Specialist.

**SCOPE OF WORK****Post-Construction Wetland and Riverfront Area Mitigation Monitoring Reports**

Final Acceptance of the wetland and riverfront area mitigation construction work as specified under Items 755.35 and 755.45 shall initiate the beginning of the Monitoring Period.

Inspections and reports shall be performed to ensure compliance with mitigation requirements defined under the relevant Wetland Mitigation items and with all applicable environmental permits. Monitoring reports shall cover the following:

- Identification of all plant species present
- Percent cover for each plant species and overall percent surface area cover by indigenous wetland plant species for replication area and upland
- Description of the viability, health, and vigor of installed plants as well as volunteer plant species within the replication areas
- Description of remedial measures taken to ensure criteria are met
- Depth to apparent water table and/or depth of surface inundation, both as measured from the soil surface and data loggers, as appropriate.
- A conclusion regarding the success of the wetland mitigation area relative to the performance standards at 310 CMR 10.55(4)(b) (unless varied), the design plans, and performance criteria established by MADEP in the variance conditions (when applicable), and the reference wetland.
- A conclusion regarding the success of the riverfront area mitigation area relative to the performance standards at 310 CMR 10.58(4), the design plans, and performance criteria established by MADEP, and the reference riverfront area.
- Recommendation for a corrective plan of action if needed.



**ITEM 755.76** (Continued)

Reports shall be submitted to the Engineer as a digital copy in Portable Document Format (PDF) unless otherwise requested. Hard copies shall be provided as requested by the Engineer. All reports shall be marked with the applicable permit numbers and identifying information as required in the permits. Reports shall include photo documentation of the wetland/s and riverfront areas being monitored and shall include a minimum of 3 views from different orientations. Views shall be labeled.

Spring Reports, when required, shall be submitted to the Engineer by July 1 for dispersal to the appropriate permitting agencies.

End of Year Reports (which may serve as the Fall Report) shall be based on inspections that occur prior to October 15th. Reports shall be submitted to the Engineer no later than November 1 of each year.

Monitoring Reports shall be as follows for 2 years:

- Initial Construction Report
  - City of Taunton Conservation Commission
- Year 1 (Year End)
  - City of Taunton Conservation Commission
  - Massachusetts Department of Environmental Protection
- Year 2 (Year End)
  - City of Taunton Conservation Commission
  - Massachusetts Department of Environmental Protection

**BASIS OF PAYMENT AND METHOD OF MEASUREMENT**

Item 755.76 Wetland Monitoring Reports and associated inspections shall be at the Contract unit price per Lump Sum and shall include all labor, materials, equipment, and all incidental costs required to complete the work. Lump Sum will be paid in equal installments of the Lump Sum divided by the number of reports submitted. Payment shall be upon submittal and acceptance of each report, based on the following schedule:

- Year 1 = 50%
- Year 2 = 50%



**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.

**BASIS OF PAYMENT**

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 be in according with Subsection 765 of the Standard Specifications and the following.

**DESCRIPTION**

Work consists of furnishing and applying the appropriate annual grass to be seeded as a cover crop in conjunction with upland native seeding and at the rate specified herein.

A cover crop shall be used for following conditions:

- when specified under Application Rate for the permanent native upland seed mix
- for slopes 2:1 or steeper and an annual is not already specified as part of the permanent mix
- when seeding out of season and the native seed mix does not already specify an annual
- as required to prevent erosion until the permanent seed establishes.

A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Annual rye (*Lolium multiflorum*) will not be accepted as an annual cover crop.

Using annual rye or exceeding the application rate such that a dense stand of annual grasses prevents germination of the native grasses will require mowing of annual grasses. In this instance, mowing of cover crop will be incidental to this item.

**Seed And Application Rate**

Add 30 pounds/acre of the following seed based on seeding season:

*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 per pound of seed, complete in place.

Annual Cover Crop will be paid at the contract unit price per pound upon approval of seed bag tags or other documentation of correct application rate and species, and upon acceptance of a satisfactory stand of annual grasses three weeks following seeding.

Application and care of cover crop will be paid for separately under Item 765.635 Native Seeding and Establishment



**ITEM 765.442****SEED – RIVERBANK MIX – PART SHADE****POUND**

Work under this item shall consist of furnishing the mix(es) specified below in the required quantity.

**SUBMITTALS**

- 1) Pre-Verification of Seed Availability. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species in the required quantities and for the anticipated date of seeding. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. Species not expected to be available should be noted and substitutions recommended.
- 2) Final Verification of Seed Availability. No earlier than 21 days prior to ordering, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species and in the required quantities. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section. Substitutions or changes in the mix at this time must be approved by MassDOT Landscape Design Section.
- 3) Seed Worksheet provided herein shall be submitted to the Engineer prior to ordering seed to determine the number of pounds of Pure Live Seed required.
- 4) Seed Tags. The contractor shall submit original seed tags from each bag of seed used on the project or ensure that each tag is photo documented by the Engineer while on the unopened bag.

Number of tags submitted must correspond to number of bags delivered.

Species listed on the seed tag shall match the Final Verification of Seed Availability (Submittal #2) unless approved otherwise. Tag must include variety and species name; lot number; purity; percentage of inert matter; percentage of weeds, noxious seeds, and other crop seeds; germination, dormant or hard seed; total viability; origin of seed; germination test date, net weight, and name and address of seller. The origin of seed must be listed on the seed tag for all species in the mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

- 5) Verification of Seed Delivery. Prior to payment, contractor shall submit the Seed Delivery Verification form contained within the contract or the Supplier's Verification on company letterhead or a bill of lading. Supplier verification must include all information requested on the Verification form within this contract. The bill of lading must include variety and species name, lot number, net weight shipped, date of sale, invoice, project or seeding location, and name and address of Supplier. All information must be filled in and complete for acceptance. Information must match the seed tags and quantity of seed used on the job. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section



**ITEM 765.442 (Continued)**

- 6) Seed Sample. If requested or if seed is from a previously opened bag, the contractor may be asked to submit to the Engineer a sample of seed from the seed bag (1-2 cups) at the time of seeding.

**SEEDING SEASON**

The appropriate seeding seasons are:

Spring: April 1 - May 15

Fall: October 1 - December 1 for dormant seeding

**PERMANENT SEED MIX(ES)****Calculating Pure Live Seed (PLS)**

Quantities specified are PURE LIVE SEED. Greater quantities of ordered seed may be required to achieve actual specified seeding rates.

Pure Live Seed (PLS) is defined as a percentage calculated by multiplying the percent of pure seed by the percent of viable seed (total germination, hard seed, and dormant seed). For example:

If a seed label indicates 90% purity, 78% germination, 10% hard seed, and 2% dormancy, it is calculated to be  $90\% \times [78 + 10 + 2]\% = 81\%$  PLS.

Therefore, each pound of PLS would need  $1 \text{ pound} / 0.81 = 1.2$  pounds of seed with a 90% purity and 90% total germination

**Seed Mix(es)** shall be as specified below. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

**Seed – Riverbank Mix – Part Shade**

	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS by Weight</u>
Grass			
	Elymus virginicus	Virginia Wild Rye	20.00%
	Elymus canadensis	Canada Wild Rye	18.00%
	Schizachyrium scoparium 'Camper'	Little Bluestem 'Camper'	15.00%
	Andropogon gerardii NY Eco	Big Bluestem NY Eco	14.00%
	Festuca rubra	Creeping Red Fescue	12.00%
	Dichanthelium clandestinum 'Tioga'	Deertongue grass 'Tioga'	7.00%
	Agrostis perennans	Upland Bentgrass	4.10%
	Juncus tenuis	Path Rush	1.00%
	Carex vulpinoidea	Fox Sedge	1.00%
	Juncus effusus	Soft Rush	<u>0.10%</u>
			92.20%



**ITEM 765.442** (Continued)

<u>Herb/Forb</u>	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS by Weight</u>
	Chamaecrista fasciculata	Partridge Pea	4.00%
	Penstemon digitalis	Beard-tongue	0.60%
	Aster novae-angliae	New England Aster	0.50%
	Solidago nemoralis	Grey Goldenrod	0.50%
	Solidago rigida	Rigid Goldenrod	0.50%
	Eupatorium maculatum	Spotted Joe Pye Weed	0.40%
	Aster laevis NY Ecotype	Smooth Aster NY Ecotype	0.40%
	Verbena hastata	Blue Vervain	0.30%
	Aster cordifolius	Blue Wood Aster	0.30%
	Eupatorium perfoliatum	Boneset	0.30%
			<u>7.80%</u>
			100.00%

**Application Rate**

**Riverbank Mix:** 20 lbs/acre PLS on areas of less than 3:1 slope and 60 lbs/acre PLS on areas of greater than 3:1 slope. In addition, apply 30 pounds of cover crop (grain oats or grain rye) as appropriate to the season.

Any species substitutions shall be with a species having similar characteristics and function. Substitutions must be approved by MassDOT Landscape Design Section per the documentation submittal process.

**50% Increase Adjustment for Field Conditions**

Seeding under the following conditions requires a 50% increase in the permanent mix at the time of construction:

- Seeding out of season  
OR
- Seeding after Compost Blanket has been applied (unless already increased for out of season).

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Seed – Riverbank Mix – Part Shade will be measured for payment by the pound of Pure Live Seed delivered and complete in place.

Seed – Riverbank Mix – Part Shade will be paid at the contract unit price per pound of Pure Live Seed delivered upon approval of all Seed Submittal Documentation. Overseeding required to correct poor germination or establishment shall be incidental to the item.

Cover crop not included as part of the permanent mix composition will be paid for under Item 765.21, Annual Cover Crop for Native Seeding.

Application and care of native seed mix will be paid for separately under Item 735.635 Native Seeding and Establishment.



**ITEM 765.442** (Continued)***NATIVE SEED WORKSHEET***

Project Description: \_\_\_\_\_ Project No: \_\_\_\_\_

Contractor: \_\_\_\_\_ Contract No: \_\_\_\_\_

Seed Mix Number &amp; Description: \_\_\_\_\_

**Contractor: Complete Prior To Ordering**

Pounds of Seed Required Per Contract:

\_\_\_\_\_ lbs./acre for \_\_\_\_\_ Acre(s) OR \_\_\_\_\_ SY

Additional 50% increase if required (out of season or seeding over compost blanket):

\_\_\_\_\_ lbs. **Total Seed Required**Calculated Quantity for Pure Live Seed (PLS<sup>1</sup>):\_\_\_\_\_ **Total Pounds PLS****Engineer: Verification at Time of Application**Number pounds delivered to site<sup>2</sup>: \_\_\_\_\_ Date(s): \_\_\_\_\_

Actual Seed Bag Tag/s Received or photo documented by Engineer: \_\_\_\_\_

<sup>1</sup> PLS=% pure seed x % viable seed (total germination, hard seed, and dormant seed).<sup>2</sup> Quantity delivered should match pounds **Total Pounds PLS** and **Verification of Seed Delivery**. Pounds should be shown on each Seed Tag.



**ITEM 765.442** (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 765.635****NATIVE SEEDING AND ESTABLISHMENT****SQUARE YARD**

Work shall conform to the relevant provisions of Subsections 765 and 767 of the Standard Specifications and the following:

The work under this item shall consist of seeding, mowing, and other care to establish a stand of grass in the areas shown on the plans or as required by the Engineer. For the purposes of these specifications, the term “grass” shall apply to all the forbs, grasses, sedges, and rushes included in the materials.

**QUALIFICATIONS**

Seeding shall be done by a company having a minimum of five years of experience with native seed establishment. Prior to beginning work, the seeding Contractor shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications shall include providing documentation (photos and contacts) to demonstrate knowledge and expertise with native seeding and establishment and proof of having completed successful native seeding projects.

**SEEDING SEASON**

Seeding seasons for native mixes is April 1 - May 15 and October 1 - December 1 for dormant seeding. Written approval must be obtained for seeding outside the seeding season and, if approved, the permanent seed rate shall be increased by 50%.

Seeding season for cover crops shall be grain oats January 1 – July 31 and grain rye August 1 – December 1.

**MATERIAL AND SUBMITTALS**

**Seed Mixes and Submittals** shall be per the item(s) for permanent and annual (cover crop) seed mixes.

**Compost Blanket**, if used, shall meet the material and submittal requirements for that item.

**Hydromulch** shall be wood fiber or straw applied per the Standard Specifications and at the rates specified below and per the manufacturer.

A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of hydromulch, tackifier, and seed, per 100 gallons of water and as applicable to products used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above.

**Fertilizer**

No fertilizers shall be applied.



**ITEM 765.635** (Continued)**Water**

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

**SEEDING**

Hand broadcast method shall be used for all areas smaller than half an acre and when specified on the plans for areas over half an acre.

Seeding shall occur within 72 hours of placement of loam and final grading, or the Contractor shall propose a reasonable, alternative schedule that shall be approved by the Engineer.

**Surface Preparation**

No seeding or soil preparation shall be done if soils are muddy or dry and compacted. Bare soils shall be raked to remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Ruts and depressions shall be filled with additional loam or compost and the soil shall be re-graded to a relatively smooth finish corresponding to the required grades.

When seeding over existing or compacted soil or soil that has sat bare for more than 30 days, surface will be prepared by tilling or raking to a minimum depth of 2 inches prior to seeding and prior to Compost Blanket application (when applied).

Surface preparation shall be compensated for under for loam placement or topsoil rehandled and spread as appropriate to the project.

Jute or coir mesh, when specified in the contract, shall be placed after seeding and per the Standard Specifications and the manufacturer's instruction.

Surface preparation shall be approved by the Engineer prior to seeding.

**Seeding over Various Substrates**

Loam: Seeding shall occur within 72 hours of loam placement to prevent loss of topsoil. Seed shall be manually broadcast for areas less than half an acre (each area, not cumulative area) and when specified on the plans. Broadcasting shall be immediately followed by hydromulching as specified below. When not specified on the plans, larger areas may be hydroseeded as specified below.

Compost Blanket: Compost Blanket shall be applied as specified under that item. Seed should be hand broadcast at the same time as compost application to ensure a thin cover of compost over seed.

When seeding is done after application of Compost Blanket the rate shall be increased by 50%. If the Compost Blanket is applied after December 1, seed shall be broadcast or hydroseeding over the compost in the Spring and the rate increased by 50% specified under Seed Application.



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**ITEM 765.635** (Continued)

Compost Mulch over Modified Rock: Compost Mulch and seed shall be applied as specified under that item. No hydromulch is required.

**Cover Crop**

Cover crop shall be used when seeding out of season, when specified with the permanent native seed mix under that item, and as required to prevent erosion until the permanent seed establishes.

A cover crop should not be used with a steep slope mix or other permanent mix which already contains either cereal rye or oats in the composition of the mix. A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

**Seed Application**

All seed shall be mulched as specified herein.

Seed application shall be by broadcast seeding or by hydroseeding as described below.

**Broadcast Seeding**

Seed shall be broadcast spread using a cyclone or whirlwind seeder or hand broadcast. Small or light-seeded species such as bluestem may be mixed with approved filler to achieve an even distribution. Seed shall not be broadcast when wind velocities are greater than 15 mph.

Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction (horizontally and vertically). To ensure seed to soil contact with broadcasting of seed, seeding shall be followed by rolling or tracking with equipment approved by the Engineer.

Broadcast seed shall be mulched with weed-free straw mulch unless seeding is done as part of Compost Blanket in which case it shall be as specified above under seeding with Compost Blanket application. Hydromulching shall be as specified under Hydromulching.

**Hydroseeding and Hydromulching**

Hydroseed and mulching shall be per the manufacturer's directions and as follows.

Hydroseeding shall only be used for sites over half an acre in size or with permission of the Engineer.

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.



**ITEM 765.635** (Continued)

A 2-step process shall be used for seeding in conjunction with hydromulch. Seed shall be applied with 500 lbs/acre of hydromulch in the first pass. A second pass with 1,000 lbs/ acre of hydromulch shall be applied in a second pass. Each pass shall be applied in a different direction.

Once the seed has been added to the tank mixture a one-hour time limit is set for spreading the mixture on the soil. Once the one hour has passed the excess mixture must be discarded.

For broadcast seeding, hydromulch shall be applied immediately following seeding at a rate of 1,000 lbs/acre. Tank shall be cleaned from any previous hydroseeding.

**CARE DURING GERMINATION AND ESTABLISHMENT**

Contractor shall care for seeded areas as necessary for successful germination. Care will include watering and weed control as necessary to achieve establishment of the specified seeded species after one growing season as specified below.

The contractor shall maintain the stand of grasses to ensure healthy growth of the seeded species. Work shall include mowing or weed-whacking for weed control, watering if necessary, and removal of invasive plants.

Watering shall be sufficient to achieve soil moisture to a depth of 2 inches or more and such moisture is uniform. Method of watering shall not erode or damage soil or grassed surfaces.

General Weed Control: Unless otherwise directed, mowing shall be as specified under Mowing for Weed Control for seed establishment. Weeds shall be mowed prior to weeds setting seed (by the end of July unless otherwise approved).

Control of Invasive and Aggressive Weeds: Invasive and aggressive weeds, including but not limited to mugwort, ragweed, knapweed, foxtail, crabgrass, and chicory must be cut or treated prior to going to seed. Herbicide treatment must be coordinated with MassDOT. Undesired species (such as chicory) introduced due to use of incorrect seed mix shall be removed at the Contractor's expense.

**MOWING FOR WEED CONTROL**

Mowing for weed control shall be completed after weeds have sprouted and show leaf and bud growth, but prior to setting seed, generally between July 7th and August 1st, unless directed otherwise by the MassDOT Landscape Architect and the Engineer.

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.



**ITEM 765.635** (Continued)

Contractor shall give 48-hour notice prior to mowing work. Mowing shall only occur in dry sunny weather. Litter pickup should occur prior to mowing in all areas. If required, cut grass shall be raked and removed. Litter pickup and raking and removal of grass shall be incidental to the work.

Mowing equipment shall be approved by the Engineer prior to work.

**OVER-SEEDING**

Areas of bare ground greater than 2-3 feet in diameter shall be over-seeded with the specified mix during the appropriate season for seeding. Where required for overseeding mowing shall be as close to the soil as possible. Soil that is compacted shall be raked or otherwise roughened prior to over-seeding.

Over-seeding rates and methods shall those specified above under Materials and Methods. Following over-seeding, soil shall be lightly tamped to ensure seed to soil contact and areas shall be mulched with straw mulch and watered with a fine mist to moisten soil to a depth of at least 2 inches.

Over-seeding, mulch, watering, and all work for over-seeding shall be incidental.

**DETERMINING SATISFACTORY GRASS ESTABLISHMENT**

A well-established stand of the specified seeded species as determined by the Engineer and the MassDOT Landscape Architect will be required for Final Acceptance. The expectation is that an acceptable number and variety of the desired permanent seeded species (not the cover crop) will be visible. Generally:

- A minimum of 75% coverage by the specified permanent seeded species after one growing season. Of that percentage, generally, depending on the mix species:
  - At least 3 types of the permanent seeded grass species shall be visible.
  - At least 3 species of wildflowers shall be visible.
- There will be no significant gaps or bare soil (generally 2-3 feet in diameter or greater).
- There will be no more than 25% coverage by weed species.
- All soil shall be stabilized and there shall be no channeling or erosion.
- There will be no invasive or aggressive species within the stand at the time of acceptance.
- There shall be no evidence of seed from non-native mixes (i.e., clover) due to failure to clean the hydroseeding tank or using incorrect mix.

Invasive and aggressive weeds (such as mugwort, ragweed, knapweed, and chicory) must be cut or treated prior to going to seed for Interim Acceptance. Herbicide treatment must be coordinated with MassDOT.

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 765.635** (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 AND BASIS OF PAYMENT**

Native Seeding and Establishment will be measured for payment by the square yard, complete in place.

Native Seeding and Establishment will be paid at the Contract unit price by the square yard upon Conditional, Interim, and Final Acceptances as described above. This price shall include all submittals, seeding, rolling to ensure seed-to-soil contact, weed control other than mowing, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Native seed and cover crop mixes shall be compensated under the respective items.

Site preparation, including raking, tilling, removal of debris and stones, and other work to the prepare site for seeding shall be compensated under loam placement or topsoil rehandled and spread as relevant to the project. If used, Compost Blanket shall be compensated under the respective item.

Mowing for weed control will be incidental to this item.

Schedule of payment shall be as follows:

30% upon Conditional Acceptance

20% upon Interim Acceptance of Care, except this amount will be reduced to zero and final payment will be reduced accordingly when areas requiring weed control are not mowed as specified in the Interim Acceptance criteria.

50% upon Final Acceptance of Establishment



**ITEM 767.121****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.

**MATERIALS AND CONSTRUCTION**

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer's instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.



**ITEM 767.121** (Continued)**Compost Filter Tube**

Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

**Straw Bales**

Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.



**ITEM 767.121** (Continued)**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.

**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.



**ITEM 767.121** (Continued)

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.

Sedimentation fence used in conjunction with compost filter will be measured and paid for separately under Standard Item 697, Sedimentation Fence.

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.



<u>ITEM 772.335</u>	<u>CEDAR - RED 4-5 FEET / #7</u>	<u>EACH</u>
<u>ITEM 773.434</u>	<u>PINE - WHITE 4-5 FEET / #7</u>	<u>EACH</u>
<u>ITEM 776.523</u>	<u>MAPLE - RED 2-2.5 INCH CALIPER</u>	<u>EACH</u>
<u>ITEM 776.565</u>	<u>MAPLE - RED 4-5 FEET / #7</u>	<u>EACH</u>
<u>ITEM 776.567</u>	<u>MAPLE - RED 5-7 FEET / #10</u>	<u>EACH</u>
<u>ITEM 777.263</u>	<u>OAK - SWAMP 2-2.5 INCH CALIPER</u>	<u>EACH</u>
<u>ITEM 777.325</u>	<u>OAK - WHITE 4-5 FEET / #7</u>	<u>EACH</u>
<u>ITEM 777.442</u>	<u>PLANETREE - AMERICAN 2-2.5 INCH CALIPER</u>	<u>EACH</u>
<u>ITEM 777.747</u>	<u>WILLOW – BLACK 5-7 FEET / #10</u>	<u>EACH</u>
<u>ITEM 778.155</u>	<u>BIRCH - BLACK 4-5 FEET / #7</u>	<u>EACH</u>
<u>ITEM 778.47</u>	<u>CRABAPPLE - SPRING SNOW 1.5-2 INCH CALIPER</u>	<u>EACH</u>
<u>ITEM 781.284</u>	<u>HAWTHORN – THORNLESS COCKSPUR</u> <u>1.5-2 INCH CALIPER</u>	<u>EACH</u>
<u>ITEM 783.051</u>	<u>SERVICEBERRY – SHADBLOW 8-10 FOOT CLUMP</u>	<u>EACH</u>
<u>ITEM 783.467</u>	<u>TUPELO 2-2.5 INCH CALIPER</u>	<u>EACH</u>
<u>ITEM 785.634</u>	<u>INKBERRY 2-3 FEET / #3</u>	<u>EACH</u>
<u>ITEM 788.015</u>	<u>ALDER SHRUB – SPECKLED 3-4 FEET / #5</u>	<u>EACH</u>
<u>ITEM 789.333</u>	<u>BAYBERRY SHRUB - NORTHERN 2-3 FEET / #3</u>	<u>EACH</u>
<u>ITEM 789.635</u>	<u>BLUEBERRY - Highbush 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 789.73</u>	<u>BUTTONBUSH 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 789.771</u>	<u>CHOKEBERRY - BLACK 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 789.773</u>	<u>CHOKEBERRY - RED 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 790.635</u>	<u>DOGWOOD - REDOSIER 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 790.721</u>	<u>DOGWOOD – SILKY 3-4 FEET / #5</u>	<u>EACH</u>
<u>ITEM 790.725</u>	<u>DOGWOOD - GRAYTWIG 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 791.031</u>	<u>ELDERBERRY 2-3 FEET / #1</u>	<u>EACH</u>
<u>ITEM 791.035</u>	<u>ELDERBERRY 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 794.335</u>	<u>SUMAC SHRUB - SMOOTH 2-3 FEET / #1</u>	<u>EACH</u>
<u>ITEM 794.737</u>	<u>SUMMERSWEET SHRUB 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 795.013</u>	<u>VIBURNUM – ARROWWOOD 3-4 FEET / #5</u>	<u>EACH</u>
<u>ITEM 795.015</u>	<u>VIBURNUM - BLACKHAW 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 795.017</u>	<u>CRANBERRYBUSH 3-4 FEET / #3</u>	<u>EACH</u>
<u>ITEM 795.187</u>	<u>WITCH HAZEL – AUTUMN BLOOMING 3-4 FEET / #5</u>	<u>EACH</u>
<u>ITEM 795.45</u>	<u>WILLOW – SAND BAR 5 INCH PLUG</u>	<u>EACH</u>
<u>ITEM 795.451</u>	<u>WILLOW – SAND BAR 2-3 FEET / #3</u>	<u>EACH</u>
<u>ITEM 796.071</u>	<u>VIRGINIA CREEPER #1</u>	<u>EACH</u>

The work under these Items shall conform to the relevant provisions of Subsection 771, PLANTING TREES, SHRUBS AND GROUND COVER, of the Standard Specifications.

As indicated on the plans, plantings are schematic and shall be staked out in the field and confirmed with the MassDOT Landscape Design Section.



**ITEM 804.3****3 INCH ELECTRICAL CONDUIT**  
**TYPE NM - PLASTIC -(UL)****FOOT**

The work under this Item shall conform to the relevant provisions of Subsection 800 of the Standard Specifications and the following:

The work shall include the furnishing and installation of 3-inch non-metallic conduit for traffic signal and lighting systems in accordance with the plans and as directed by the Engineer. The conduit material shall be Schedule 80 polyvinyl chloride (PVC) plastic conduit. The conduit quantity may be increased or decreased by the Engineer depending upon actual conditions encountered as provided for in Section 4.06 of the Standard Specifications.

**Conduit in Grass or in Planted Areas**

Where new conduits are installed in grass and planted areas, no separate payment shall be made for the excavation, sand bedding, gravel backfill, including necessary compaction, or incidental materials, but all costs in connection therewith shall be included in the contract unit price for Item 804.3. Loam and seeding shall be measured and paid for under their respective items.

**Conduit under Sidewalk, Median or Driveways**

Where conduit is installed in a sidewalk, paved median or asphalt driveway areas, no separate payment shall be made for the saw-cutting, excavation, sand bedding, gravel backfill, including necessary compaction, or incidental materials, but all costs in connection therewith shall be included in the contract unit price for Item 804.3. Payment for cement concrete or asphalt pavement shall be paid for under the respective item.

**Conduit Crossing Roadways**

Trenches in existing bituminous concrete pavements not subject to full depth reconstruction shall be sawcut to an 18 inch width. The existing pavements shall be sawcut through their full depth and the pavement removed.

After conduit installation, the trench shall be backfilled with controlled density-fill (CDF). CDF shall be Type 2E and shall be specified in Section M4.08.0 of the Standard Specifications. The finished grade of the CDF shall be below existing pavement surface as shown on the construction details.

Where conduit crosses roadways, no separate payment shall be made for the saw-cutting of pavement, excavation, sand bedding, controlled density fill, or incidental materials, but all costs in connection therewith shall be included in the contract unit price for Item 804.3.



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**ITEM 816.01 TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 LUMP SUM**  
**ITEM 816.02 TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2 LUMP SUM**

**Location No. 1: U.S. Route 44 @ Longmeadow Drive/Honorable Gordon M. Owen Riverway**

**Location No. 2: U.S Route 44 @ Route 104**

**SCOPE OF TRAFFIC SIGNAL WORK**

The work to be done under this item consists of furnishing and the installation of a new traffic control signal system, complete with video detection, signal posts, signal heads, mast arm assemblies, controller, cabinet, foundations, wire and cable, emergency vehicle preemption system, communication links for a traffic signal control system, electrical service connections and all other equipment, materials and incidental costs necessary to furnish, install and program a complete and functioning traffic control system as specified and as shown in the contract documents.

Note: Work at Location 2 shall consist of the installation of pedestrian signal equipment to accommodate the proposed pedestrian crossing, the replacement of loop detectors on the eastbound approach and the installation of 3" conduits and pull boxes to connect the pedestrian signal equipment to the existing traffic signal system. Work also include modification to existing controller and cabinet and programming to incorporate countdown pedestrian signals and APS pushbuttons.

All work under these items shall conform to the relevant provisions of Section 800 of the Standard Specification, the 2009 Manual on Uniform Traffic Control Devices (MUTCD), and the following technical provisions:

**SERVICE CONNECTIONS (Location No. 1 Only)**

The Contractor shall coordinate with the servicing utility company for installation of a new service meter to the new controller cabinet.

Service connections shown on the plans are approximate only. The Contractor shall determine exact locations from the servicing utility, arrange to complete the service connections, and be responsible for all charges incidental thereto.

A 100-ampere meter socket approved by the servicing utility company shall be furnished and installed on the side of the control cabinet by the serving utility company.

A 3" PVC Conduit shall be installed from the controller cabinet to the utility pole and/or electric manhole, which will supply electrical service to the controller cabinet. This conduit shall have controlled density fill (CDF) Type 2E where crossing roadways and/or driveways outside of full depth construction areas.



**ITEMS 816.01 and 816.02 (Continued)****FLASHING OPERATION**

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Section 4D.28 – 4D.31 of the 2009 MUTCD.

**TRAFFIC SIGNAL EQUIPMENT**

The traffic signal controller units (CU) malfunction management units (MMU), cabinet power supplies, bus interface units (BIU), and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the National Electrical Manufacturers Association (NEMA) Standard No. TS 2-2003 (R2008) v02.06 and Amendment 4-2012 Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements.

**TRAFFIC SIGNAL CONTROLLER (Location No. 1 Only)**

All controllers shall be rack-mounted, solid state, menu driven, keyboard units conforming to the ATC 5201 v06.25 Advanced Transportation Controller (ATC) Standard. The controller shall be supplied with all necessary interfaces needed to support Advanced Transportation Controller Cabinet (ATCC) / Serial Interface Unit (SIU) communications. Controllers shall be supplied with an internal real-time clock/calendar capable of daily, weekly, and yearly events time programming. The controller shall be designed and supplied to provide the number of phases and sequencing as shown on the plans without any auxiliary equipment.

Traffic signal controllers shall be supplied as follows:

- Contain ATC API operational software conforming to ATC 5401 Standard v02.
- Be configured to operate in an ATCC 5301 v02 cabinet platform.
- Be supplied with the appropriate version of the Linux operating system, Board Support Package (BSP) and internal processing levels necessary to support connected vehicle (CV) as well as local and system operations.
- Shall be fully compliant with NTCIP 1201 and 1202 standards.
- Include a minimum of 3 High Speed USB 2.0 ports.
- Include a minimum of 3 10/100BaseT, RJ45 Ethernet connector ports.
- Meet the functional requirements of the NEMA TS-2, 2016 Standard, including all amendments.
- Support Flashing Yellow Arrow (FYA) and Flashing Red Arrow (FRA) operation with the ability to provide a minimum of 6 flashing pairs.
- Contain the ability to alter the controller unit's internal database using a built-in front panel keyboard, using a computer connected to the controller unit with a USB cable or an Ethernet cable, and remotely using the central management system application.
- Contain the ability to alter the controller unit's internal database using a built-in front panel keyboard, using a computer connected to the controller unit with a USB cable or an Ethernet cable, and remotely using the central management system application.
- Be supplied and installed with the ability to collect, store, and report various measures of effectiveness (MOE's).



**ITEMS 816.01 and 816.02** (Continued)

- Shall collect and process all 255 high resolution enumerations as defined in the report “Indiana Traffic Signal Hi Resolution Data Enumerations”, dated November 2012. This data will be processed in the controller and available via download from the controller USB Ethernet port or, if available, via system communications. As a minimum, the controller will be set up to provide the following performance reports:
  - Approach delay
  - Preemption events
  - Transit Priority Events
  - Split Monitor
  - Approach Volumes
  - Purdue Coordination Diagrams
  - Arrivals on Red
  - Arrivals on Green
  - Phase Termination
  - Pedestrian Delay
- Be able to backup and restore Controller programming data to a USB memory device connected to the front of the controller. No additional software shall be required to perform this function.
- Be able to upgrade the Controller firmware via USB memory device connected to the front of the controller. No additional software shall be required to perform this function.

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

Electrical filtering/surge protection shall be supplied and installed in each cabinet in accordance with ATCC 5301 v02 requirements and the manufacturer’s recommendations. At a minimum, surge suppression shall be provided for incoming electric utility power conductors, all signal control circuits, vehicle detection, and pedestrian detection terminations.

All equipment inputs, outputs, and terminals shall be identified by the phase designations shown on the plans.

Each traffic controller unit, flasher and all other current interrupting devices shall be equipped with a suitable radio interference suppressor installed at the input power point. Interference suppressors shall be designed to minimize interference in both broadcast and aircraft frequencies. Suppressors shall be designed for 125 percent of the total connected load and shall meet standards of the UL and the EIA.

The type of controller, auxiliary equipment and other operational features shall be as noted on the plans.



**ITEMS 816.01 and 816.02** (Continued)

All controllers shall be capable of providing flashing operation of the signal lights, as indicated on the plans. Transfer from flashing operation or to flashing operation shall conform to the MUTCD.

If noted on the plans, hardwire preempt circuits shall be provided for emergency vehicles and/or railroad crossings. The clearance and preempt indications shall be as noted on the plans. Preempt circuits shall function during stop and go and flashing operation unless otherwise noted. The duration of clearance and preempt intervals shall be adjustable over the range noted on the plans and shall be labeled according to function. The railroad preempt circuit shall be designed to operate as a fail-safe loop through a normally made contact on the railroad's control relay in the railroad's control cabinet. Railroad preempt shall have precedence over all preempt intervals for other purposes.

Actuated vehicle phases and actuated pedestrian phases shall be served in that interval of the cycle indicated on the plans. Time for an actuated interval shall be taken from the non- actuated phase(s) as noted on the plans.

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Section 4D.28 – 4D.31 of the 2009 MUTCD.

The controller unit shall be enclosed in a sheet metal case with protective painted finish, designed to permit easy access to the interior and removal of printed circuit boards and modules without the use of special tools. All program controls, fuses, and indicator lights shall be mounted on the front panel and shall be clearly and permanently labeled.

An exclusive pedestrian phase shall not extend or recycle until a vehicle phase has been serviced. Automatic transfer from or to flashing operation shall conform to the MUTCD.

Pedestrian phases shall not be extended by actuations, during the walk or clearance interval. Actuations during the clearance intervals shall be placed in memory.

Each controller supplied shall be the same manufacturer, model and contain the same firmware level and version number.

**ADVANCE TRANSPORTATION CONTROLLER CABINET (Location No. 1 Only)**

The traffic signal control equipment shall be enclosed within a dust and moisture-proof aluminum housing with an auxiliary door in door feature. The door hinge pins shall be made of stainless steel. There are two cabinet configuration options that are specified for use; a ground mounted cabinet and a side of pole mounted cabinet.

All new controller cabinets, traffic signal or lighting, shall be configured to eliminate arc flash. All electrical equipment will be dead front, no open terminals, busbars, breakers, or exposed terminal strips. The cabinet shall be designed, constructed and installed with all necessary provisions to comply with the latest NFPA 70E requirements. All electrically live parts over 50 volts shall be covered with Lexan or a suitable physical barrier to eliminate the possibility of an arc flash.



## **ITEMS 816.01 and 816.02** (Continued)

The cabinet shall be a ground mounted NEMA “P” size cabinet (44”W x 26”D x 67”H). The cabinet shall be supplied with two side by side, 19” rack cages which shall extend from the bottom to top of the cabinet. The cabinet shall be supplied with four doors; two on the front and two on the back. The doors shall open independently with an independent center post latching for each of the four doors. The cabinet front will provide for user interface to the in-cabinet devices including the front panel of the controller, the cabinet status displays and detection system control interface. The cabinet rear would support cable termination and would not typically be accessed except for installation and the troubleshooting of wiring problems.

The left-side rack of the cabinet, relative to facing the cabinet from the front, shall house the control devices such as the controller, Cabinet Monitor Unit (CMU) and Auxiliary Display Unit (ADU), switch packs and power distribution panel. As such, this rack shall be referred to as the “Control” side of the cabinet.

The right-side rack of the cabinet, relative to facing the cabinet from the front, shall house the spare card cage assembly and battery back-up devices and communications elements. As such, this rack shall be referred to as the “Power” side of the cabinet. The ground mounted cabinet shall be supplied with 32 output channels and 48 input channels.

The cabinet shall be configured to provide the following output/input channel assignments:

Channel	Input	Output
1-8	Vehicle Phase Call 1-8	Vehicle Phase 1-8
9-12	Pedestrian Phase Call 2,4,6,8	Pedestrian Phase 2,4,6,8
13-16	-	Overlap A, B, C, D
17+	Special Functions	-

The cabinet shall be supplied with a spare equipment card cage assembly. This card cage assembly will not be wired to any cabinet device, but rather used to store spare rack mounted cabinet devices such as switch packs, SIU’s, CMU’s and phases selectors. This spare rack assembly shall be located at the top of the power rack.

Piano type hinges on cabinet doors shall be fabricated of stainless steel with a stainless-steel hinge pin. The cabinet shall be supplied with reinforcing plates where the cabinet is supported by the pole hangers. The cabinet shall be supplied with a 6” high riser base that elevates the cabinet above the cabinet foundation. The riser base shall be supplied with a brushed aluminum finish.

The cabinet shall be supplied with a laminated door sticker. This sticker shall be permanently affixed to the inside front control side of the cabinet door for the ground mount cabinet and the inside front side of the side of pole mount cabinets. At a minimum, the sticker shall contain the following information:

- Vehicle detection information including detector channel assignment, phase assigned, approach and cabinet termination points.
- If applicable, network communications information for all in-cabinet devices. This includes IP addresses, subnet mask and MAC address.



**ITEMS 816.01 and 816.02** (Continued)

- Vehicle detection information including detector channel assignment, phase assigned, approach and cabinet termination points.
- If applicable, network communications information for all in-cabinet devices. This includes IP addresses, subnet mask and MAC address.
- Per approach preemption information including channel, approach/direction and termination points.
- Field termination chart showing per approach/per phase numbering of all signal circuits.
- Signal phasing and signal plan with intersection geometry and signal head designations.

The locks for the switch compartment door of the cabinet shall unlock with a skeleton style (#1) key. The locks for the main doors of the cabinet shall unlock with a Corbin #2 key. Two sets of two keys (main door/switch door) shall be furnished with each cabinet.

The cabinet shall be supplied with a permanent label mounted on the upper portion of the inside front main door which contains the name of the cabinet manufacturer, controller manufacturer, model/part number and year/month of assembly.

All traffic signal controller cabinets shall be supplied with an internal GFCI duplex outlet, as well as a multi-outlet strip.

The cabinet shall be supplied with a GFI outlet to be installed on the upper left, exterior of the control side wall of the cabinet. The electrical outlet will be GRCI protected, house in a locked access enclosure. The GFI outlet shall be supplied via its own 15-amp circuit breaker. The GFI outlet assembly shall be housed in a heavy-duty vandal resistant, weatherproof, dustproof enclosure designed for exterior applications. The GFI enclosure door shall contain a weatherproof seal and supplied with a lock accessed with a skeleton style (#1) key.

The main cabinet circuit breaker shall be rated at 30 amps. Circuit breakers shall be approved and listed by the UL. The operating mechanism shall be enclosed and shall be trip- free from operating handle under load and shall be trip-indicating. All circuit breakers shall be quick-make, quick-break on either automatic or manual operation. Contacts shall be silver alloy enclosed in an arc quenching chamber. Overload tripping of breakers shall not be influenced by an ambient temperature range of from 0 to +158°F.

The cabinet main doors shall be provided with a stop to limit door opening to both 90° and 180° ±10°. The door stop bar shall be a captive type mechanism that serves to keep the bar in contact with the cabinet at both stop bar ends and provided with a catch that can be operated when the door reaches these 2 positions and will hold the door open securely until released. The cabinet shall be supplied with a three-point draw roller latching system consisting of the following latching points:

- Center of the cabinet (lock)
- Top of the cabinet – controlled by door handle
- Bottom of the cabinet – controlled by door handle



**ITEMS 816.01 and 816.02** (Continued)

The latching points on the top and bottom of the cabinet door shall remain in the locked position until the door lock is disengaged. The locking mechanism shall be equipped with nylon rollers to secure the top and bottom of the door.

The cabinet shall be supplied with a 3/4" diameter shank, stainless steel latching handle for each door. The latching handle shall have a provision for padlocking the door in a closed position.

Controller cabinets shall have a pliable seal composed of caulking compound or mastic placed between the cabinet base and the concrete foundation to prevent dust and dirt from entering the cabinet.

**GPS Time Clock**

The cabinet shall be supplied with a GPS system to provide an accurate time reference for the cabinet. The antenna shall be mounted at the top of the cabinet in the back-left corner of the enclosure. The antenna shall be mounted such that it provides a waterproof seal; eliminating any possibility for water penetration into the cabinet. The GPS system cable shall be connected and integrated into the controller.

**Components**

Each ATC Cabinet shall include the following:

- A cabinet power supply shall be supplied with each cabinet. The cabinet power supply shall comply with ATCC 5301 v02 (EDI Model 2216-2412-HV or equivalent).
- A full complement of switch packs shall be supplied with each cabinet. Switch packs shall comply with ATCC 5301 v02.
- A full complement of flashers shall be supplied with each cabinet. Flashers shall comply with ATCC 5301 v02.
- A full complement of SIUs shall be supplied with each cabinet. The Serial Interface Units (SIU) shall comply with ATCC 5301 v02.
- A full complement of flash transfer relays shall be supplied with each cabinet. Flash transfer relays shall comply with ATCC 5301 v02.

In addition to the full complement of switch packs, flashers, SIU's and flash transfers relays, two additional SIU's shall be supplied. All spare equipment required to be supplied shall be store in the spare equipment rack.

**Transfer Relays**

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

**Surge Protection**

Electrical filtering/surge protection shall be supplied and installed in each cabinet in accordance with ATCC 5301 v02 requirements and the manufacturer's recommendations. At a minimum, surge suppression shall be provided for incoming electric utility power conductors, all signal control circuits, vehicle detection, pedestrian detection, communications and preemption system terminations.



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**ITEMS 816.01 and 816.02** (Continued)**Documentation**

Three copies of the database programming for all in cabinet devices shall be provided with each cabinet. The database programming sheets shall reflect as-built programming resident in each unit at the time of acceptance.

**Cabinet Monitor**

The cabinet monitor unit shall be connected to the field terminals of the signal light circuit to provide protection against conflicting green, yellow or walk indications being simultaneously energized as a result of controller failure, relay or solid-state switch failure, short circuited field wiring or other failures.

When a conflict is detected, the cabinet monitor unit shall cause the signal system to commence flashing operation; energize the stop-timing circuit of the controller while controller power shall remain on; lock-in flashing operation until manual actuation of the momentary contact reset push button resident on the cabinet monitor unit.

**Police Door/Door Switches & Test Panels**

The cabinet shall be supplied with a police door panel located in the middle area of the front door of the cabinet and be accessible, without exposing the controller mechanism. The switches shall be mounted in the police panel and labelled as to function. Three switches shall be supplied as follows:

1. Power On/Off
2. Signal On/Off
3. Signal/Flash

The cabinet shall be supplied with a technician's panel mounted on the back of the police panel. This panel shall be supplied with the following switches:

1. Controller On/Off
2. Flash/Auto (Allows the controller to cycle while flashing)
3. Signals On/Off (Allows the controller to cycle with signal displays being dark)
4. Stop Time Normal/On (Provides the ability to manually activate a controller stop time input)

The cabinet shall be supplied with detector test switch panel. This panel shall be rack mounted and located above the controller. There shall be a total of 12 switches to allow for the manual placement of detector calls into the controller. Each switch shall be clearly labelled as to input channel and function. Each switch position shall correspond to the same controller input; switch one is for controller input channel one, switch two is for controller input channel 2, etc. Switches 1-8 shall correspond to phase 1-8 vehicle calls. Switches 9-12 shall correspond to pedestrian calls 2, 4, 6 and 8. The switch labels shall define the corresponding vehicle or pedestrian phase called and switch position function. Detector switches shall be three position and function as follows:

1. Up Position = Provides a constant call
2. Center Position = Normal operation (Phase receives call from detectors)
3. Down Position = Provides a momentary call



**ITEMS 816.01 and 816.02** (Continued)

The cabinet shall be supplied with white LED light panels which shall automatically illuminate via a door open switch whenever one of the four main cabinet doors are opened. The LED panels shall produce a minimum of 950 lumens and be protected by a clear shatterproof shield. The cabinet shall contain four light panels; two at the top of each rack assembly and two at the bottom portion of each rack assembly.

There shall be two door open switches on each of the four main doors of the cabinet. The switches shall contain a door open status switch that shall activate a controller input to log a report event that one of the doors was opened. All door open status switches shall be connected to the same controller input. For the ground mount cabinet,

**Thermostat and Air Circulation**

All cabinets shall be provided with a thermostatically controlled ventilating fan and throwaway glass fiber air filters. The electric fan shall have ball or roller bearings and shall have a capacity of 100 ft<sup>3</sup> per minute. The fans shall be rated for continuous duty with a minimum service life of 3 years. The fan blades shall be supplied with a safety screen to prevent accident contact with the blades. The ventilating system shall be designed to prevent the entrance of rain, snow, dust, and insects. The fan and vents shall be arranged in such a manner that the air intake is at the cabinet bottom and the exhaust is at the cabinet top. The air intake shall be rain tight and covered with a removable filter. There shall be vents at the bottom of both front doors of the cabinet.

The removable air filter shall be firmly held in place such that cracks and openings are eliminated to ensure that all air is filtered. The cabinet shall contain two fans while the side of pole mounted cabinet shall contain one fan. The thermostat shall be mounted on the top interior of the cabinet and user adjustable to allow for temperature settings from a minimum of 70°F to 140°F and capable of activating the fans within plus or minus five degrees of the set temperature. The intake vent shall be rain tight and located on the bottom half of the cabinet, covered with a removable air filter. There shall be two intake vents provided with the cabinet.

**Cabinet Drawer**

The cabinet shall contain a pull-out drawer, 19" wide with sufficient strength to hold a laptop computer. The top of the drawer shall be covered with a non-conductive, non-skid material and hinged such that a storage space is available to store cabinet documentation or small parts. The pull-out shelf shall be located in the rack space directly under the controller unit. The back of the control side front door shall contain a resealable, heavy-duty opaque plastic envelope with two grommets that provide mounting to two integrated hooks installed on the back side of the front cabinet door. The heavy-duty plastic envelope will be used to store cabinet wiring diagrams and operations manuals that cannot be accommodated in the pull-out draw storage tray.

**Cabinet Monitor Unit (CMU) and Auxiliary Display Unit (ADU)**

A Cabinet Monitor Unit (CMU) and Auxiliary Display Unit (ADU) shall be supplied and installed in each cabinet. The CMU and ADU shall conform to requirements defined in the Advanced Transportation Controller Cabinet (ATCC) 5301 v02 standard. The CMU/ADU units supplied and installed as part of this project shall support 32 channels.



**ITEMS 816.01 and 816.02** (Continued)

All configuration programming shall be resident in a non-volatile Data-key device. Each CMU shall be supplied with a Data-key programmer and associated software. The Data-key programming software shall include a set-up wizard which shall assist the user with the initial set up of the device. The Contractor shall program the Data-key with data entries appropriate for each intersection. All programming resident on the Data-key shall be included in the hardcopy.

**Communications Encryption**

The Contractor shall utilize network communications encryption settings on all forms of wired Ethernet data paths. No “in the clear” communications shall be allowed. At a minimum all wired Ethernet connections shall meet 802.1AE standards. The Contractor shall supply and configure a Cyber Intrusion and Prevention Device (CIPD) in each ATC cabinet. The CIPD shall prevent any unauthorized access / connections to the traffic control system. Upon detection of unauthorized attempts, the CIPD shall notify the agency via SMS message and or email and log the event. The CIPD shall be installed prior to any remote access device. The Contractor shall coordinate with the agencies Information Technology and Operational Technology (IT/OT) staff and or the engineer for finale configuration of the CIPD. No direct access to the traffic system shall be allowed without the installation of a CIPD and or Router/Firewall.

**Testing**

The testing process is required to ensure that the controller and cabinet assembly perform properly and meet all requirements described and required as part of this project have been met. This includes testing of all hardware and all software supplied and installed as part of this project. All tests shall be conducted in accordance with the approved test procedures developed by the Contractor. The Contractor shall submit test procedures and forms/checklists for review and approval to the Engineer.

All components of the controller and cabinet shall be bench tested for a minimum of 72 continuous hours by the Contractor at the Contractor’s facility prior to delivery to the project. Testing shall be performed by an IMSA, level 3 (Field or Bench) Certified Signal Technician using a test board and in conformance with the design loads, phasing, timing and auxiliary equipment such as pre-emption. Upon completion of satisfactory bench testing, a written approval will be supplied to the Contractor by the Engineer. This approval does not relieve the Contractor from ensuring proper operation of the equipment. The approval shall accompany the cabinet and controller when delivered to the project.

At a minimum, the test plan developed by the Contractor shall contain the following sampling of test items:

- (a) Installation of all the equipment into the cabinet as required per the plans and specifications.
- (b) Setting of the phase timings of the controller in accordance with plans.
- (c) Checking all of the wiring connections for physical tightness.
- (d) Observing the sequences, timings and operations of the controller to verify conformance to the plans and specifications.
- (e) Test the police panel switches installed in the panel.



**ITEMS 816.01 and 816.02** (Continued)

- (f) Test Pre-emption and/or Priority operation - Optical Detector - with the receivers wired in the cabinet and using an emitter, test each pre-emption or priority run as per the plans. Hard Wired - Attach a temporary push button as per the plans and test each pre-emption or priority run as per the plans.
- (g) Check exhaust fan controls by applying heat from a 100-watt lamp on an extension cord to the thermostat.
- (h) Check heat lamp controls by cooling the thermostat.
- (i) Check cabinet monitor unit by testing for any conflicting Greens or Yellows by the use of a jumper wire attached to a displayed Green or Yellow and to the other non-parent Greens or Yellows to ascertain that conflicting colors are not present. Test all possible combinations of conflicting displays.

Upon completion of the project, a printout of the databases contained in the controller, CMU, Preemption, Video Detection or any other equipment shall be provided to the Engineer. The databases shall be provided either via a hard copy printout or on a “thumb drive.”

Tests shall be conducted by the Contractor, witnessed by the Engineer, at the Contractor's facility. The test facility shall be located in the State of Massachusetts and be clean, heated/air conditioned and have provisions for the simultaneous testing of at least three (3) controller and cabinet assemblies. The controller and cabinet assembly shall be wired and programmed to provide the signal phasing, timing and operations shown on the design plans for that particular location. A test light board and a manual detector call panel shall be connected to each cabinet assembly to verify display outputs and vehicle/pedestrian input calls.

This test plan, when approved and executed, must demonstrate that the controller and cabinet assembly meet all of the requirements contained in the project Plans and Specifications.

The Contractor shall propose testing plans and submit the test plan(s) and procedures as detailed herein to the Resident and Design Engineers for approval prior to testing. Each of the test plans shall contain the following elements:

- Proposed date, time, and location of the testing
- Names of the Contractor personnel who will be conducting the testing
- Descriptive overview of the proposed test procedure
- List of test equipment required to perform the testing
- Test cases and test logging forms which detail every step of the test procedure:

Test logging forms shall be presented in tabular format, with separate columns for each of the following:

- Test case description detailing the test step to be performed.
- Expected result
- Actual result
- Pass/fail
- Comments



**ITEMS 816.01 and 816.02** (Continued)

The Contractor shall supply separate test logging forms at the time of testing for each test plan, and for each device location. The test logging forms shall show the device location, date, and the start and end times of the test.

At the end of each test logging form, there shall be signature and date locations for each of the following:

- Contractor personnel conducting the test
- MassDOT representative witness
- Engineer witness

Signatures on the test logging form will signify only that the test was performed and witnessed, not that it passed or failed.

The detailed Test Plans shall be submitted to the Engineer no later than thirty (30) days prior to the beginning of each test phase.

The Contractor shall have approved test plans prior to submitting a request to schedule the start of any test activities. The Contractor shall notify the Engineer no less than fourteen (14) days prior to the beginning of any equipment or systems testing.

Testing shall provide verification and documentation that all requirements included in the Contract Documents are met. The Test Plans shall be developed by the Contractor to provide a mechanism that ensures that all contract requirements have been tested fully and verified.

If any deviations or changes to the approved Test Plans arise, it shall be resubmitted by the Contractor for review and approval by the Engineer at least fourteen (14) calendar days prior to any planned test activity stage. No tests shall be conducted until the Engineer have approved the test plan.

A summary of all tests shall be produced at the completion of each testing phase of the project to ensure that all requirements defined by the system are satisfied.

MassDOT reserves the right to examine and test or retest any or all materials furnished by the Contractor for the project to determine if they meet the requirements specified within the Contract Documents.

If MassDOT decides that any material used in the construction of this project is defective or otherwise unsuitable, and the workmanship does not conform to the requirements of this Contract, the Contractor shall replace such defective parts and material at no cost to the Project.

The times and dates of the tests shall be approved by the Engineer. The Contractor shall conduct all tests in the presence of the Engineer. Testing shall take place only on weekdays, which are official working days, unless the Engineer allows the test to be conducted and/or continued on weekends and non-working days. The Contractor shall make a request in writing at least fourteen (14) days prior to the proposed testing, and schedule tests only if permission is granted by MassDOT in writing.



**ITEMS 816.01 and 816.02** (Continued)

The Contractor shall be responsible for the conduct and documentation of the results of these tests that will be countersigned by the Engineers at the end of each test. The signature of the Engineer implies only proof of presence. Test results shall be packaged and submitted to the Engineer within one week of test completion. No test phase shall begin until all prior test phases have been completed, and test results have been approved by the Engineer.

The Contractor shall utilize vendor supplied or any test specific software for testing, as needed, at no additional cost.

**EMERGENCY VEHICLE PREEMPTION** (Location No. 1 Only)

The emergency vehicle preemption system shall be installed in the same cabinet as the controller. The system shall be compatible with the City's existing preemption equipment. MassDOT will own preemption system upon project completion.

The emergency vehicle preemption control system shall consist of a data-encoded phase selector to be installed within the traffic control cabinet. This unit will serve to validate, identify, classify and record the signal from the optical detectors located on support structures at the intersection.

Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans.

The optical detectors shall be single input, single output units used to control one approach. All traffic signal installations shall be supplied with a minimum of two optical detectors unless otherwise noted in the major item list.

The CONTRACTOR shall install a confirmation strobe at the traffic signal location as shown on the plans. The confirmation strobe shall serve to validate to the driver of the emergency vehicle that the traffic signal has recognized the preemption call and will initiate the proper preemption sequence. The confirmation strobe shall have a clear/white lens.

The CONTRACTOR shall be responsible for the proper programming of the phase selector, orientation of the optical detectors, and all other work necessary to provide a complete and operating emergency vehicle preemption system.

The CONTRACTOR may be required to field adjust the location of the optical detectors for optimum line of sight detection in the presence of the Engineer to properly detect preemption calls from approaching vehicles.

The strobe light for the emergency vehicle preemption system shall not be energized by a spare traffic signal conductor. It shall be connected to the cabinet by its own #14-4 wire.



**ITEMS 816.01 and 816.02** (Continued)**VIDEO DETECTION** (Location No. 1 Only)

The Contractor shall furnish and install a vehicle detection system that detects vehicles on a roadway by processing images sent from a sensor to an interface board with detector outputs that can be received by the traffic signal controller. These traffic sensors shall be installed at the locations shown on the plans and in accordance with these specifications. The detection system shall be non-intrusive (i.e. above ground) and shall consist of:

- a. Mounting brackets
- b. Traffic sensor and detection module
- c. Communications cable
- d. Video Monitor

The detection system also, at a minimum, shall be:

- Able to provide stop bar detection; and;
- Be NEMA TS 2 compatibility

The video detection system shall be on the MassDOT Qualified Traffic Control Equipment list.

The contractor shall be responsible to ensure that no false calls are places as result of camera placement.

The detection system shall be connected, via Ethernet, to the server to allow for remote monitoring and control.

Components of the detection system shall all be the same as to make and model.

Mounting Bracket - The mounting brackets associated with the detection system shall be per the manufacturer's recommendations.

Vehicle Detection Zones - The video detection system shall be capable of providing all detection zones shown on the plans, without incurring inclusion from adjacent lane traffic. The Contractor shall be responsible setting the vehicle detection zones as shown on the plans. The Contractor may be required to adjust and readjust the location of existing and proposed vehicle detection zones in the presence of the Engineer, at no additional cost, to properly set the detection areas.

Installation and Training - The manufacturer of the vehicle detection system, or their representative, shall design sensor layout, placement and lens size, and supervise the installation and testing of the equipment. A factory certified representative from the supplier shall be on-site for a minimum of one day.

The manufacturer shall provide 3 complete sets of maintenance manuals for the installed equipment. These manuals shall have complete set-up, maintenance and troubleshooting procedures presented in an organized format. These sets shall be delivered to the City's Engineering Department.



**ITEMS 816.01 and 816.02** (Continued)

Warranty, Maintenance and Support - The traffic sensor shall be warranted by its supplier for a minimum of ten (10) years.

The vehicle detection system shall be warranted by its supplier for a minimum of two (2) years.

During the warranty period, the supplier shall provide technical support by telephone during normal business hours and request for support by telephone shall be answered by factory certified personnel within one (1) hour.

During the warranty period, certified personnel from the supplier shall be on site within seventy-two (72) hours if required.

**Vehicle Detection Communications Cable**

The vehicle detection communications cable shall be supplied and installed per the manufacturer's recommendations.

**Vehicle Detection Software Management System**

The Contractor shall provide and install a management system designed to allow for remote monitoring, data collection and control. The management system shall be compatible with the detection system supplied as part of this project.

**Detector Rack Assemblies**

The detector rack assemblies shall conform to Paragraph 5.3.4 of the NEMA TS 2 Standard. The detector rack assembly shall be supplied in a Type 2 configuration as defined in Table 5-9 of the NEMA TS 2 Standard. All vehicle detection and preemption cards shall be mounted in single, stand-alone detector rack; installing detector or preemption cards directly into the traffic controller chassis is not allowed.

**Cabinet Power Supplies**

Separate power supplies shall be supplied and installed in the TS 2 cabinets. As a minimum, the power supplies shall meet all requirements of Paragraph 5.3.5 of the NEMA TS 2 Standard. The units shall be AC line powered and provide regulated DC power, unregulated AC power, a line frequency reference for the load switches and other auxiliary cabinet equipment as required.

The power supplies shall be either shelf or rack mounted.

The units shall contain four LED indicators on the front panel to indicate the four outputs;

1. + 12 VDC +/- 1 VDC @ 2.0 amps,
2. + 24 VDC +/- 2 VDC @ 2.0 amps,
3. 12 VAC @ 250 milliamps, and
4. 60 Hz line frequency reference.

A test point terminal shall also be located on the unit front panel for + 24VDC and logic ground testing



**ITEMS 816.01 and 816.02** (Continued)**Video Monitor**

The video detection system shall include a video monitor (10-inch color LED at a minimum) to be supplied and installed in the ATC cabinet. This video monitor system shall display the detection zones as programmed by the supplier based on the construction drawings and capable of differentiating normal detection zones and actuated detection zones. This video monitor system shall include a pointing device or a switch to toggle between detection zones.

**VEHICLE LOOP DETECTORS** (Location No. 2 Only)

Wire loop detectors shall be installed in the roadway for vehicle detection. In advance of the loop detector installation, the Contractor shall mark, on site, the loop detectors with any changes required by field conditions such as manholes. The loop detector layout shall be inspected and approved by the Engineer before the loop detectors are installed.

Loop wire shall be encased in a protected plastic tubing of PVC or polyethylene plastic, IMSA 51-5,0.25 inch outside diameter, and the wire may have cross-linked polyethylene insulation, or it may have THHN/THWN insulation.

Splicing insulator shall be an approved re-enterable rigid body splices kit with a non-hardening sealing compound compatible with the wire insulation.

Splice and Connection: Splicing and connection shall be made in the pull box nearest the roadway loop sensor but not exceeding four loops per pull box. All loops included in a detector group as shown on the plans shall be spliced in a single pull box. Each lead and lead-in connector shall be stripped back and spliced using a pressure type wire connector applied with a crimping tool. Multiple loop sensors shall be identified as detailed on the plans.

Lead-in splicing shall be staggered to prevent contact with each other. Each crimped splice shall be soldered and insulated. The insulation material shall be heat-shrunked polyolefin. The shielded lead-in cable outer jacket and shield shall be stripped back sufficiently to ensure that the shield cannot come into contact with the spliced conductors. Follow the instructions of the kit manufacturer for this procedure when installing the re-enterable splice kit.

*NOTE: The above splice shall be done on the day of the loop wire installation to prevent the entrance of any moisture into the plastic tubing.*

The lead-in conductors shall be connected to the appropriate terminals in the controller cabinet, by using crimped or soldered terminal ends. The heat source for soldering shall be electrical not exceeding 30W capacity.

**Testing of Loops:** The following test procedure shall be performed in the presence of the Engineer, before and after the loop sensor is sealed in the pavement as is detailed below. The cost of equipment, labor, and materials to perform such testing and similar re-testing following repairs, replacement, or adjustment of any detector within the project area shall be included in the contract unit price for this Item.



**ITEMS 816.01 and 816.02** (Continued)

After installation of wire loop sensors in the roadway and installation of shielded lead-in connecting the loop sensors to the controller cabinet, each loop sensor and lead-in combination shall be tested (at the controller cabinet) for proper installation. The resistance from lead to lead of the same loop shall not exceed three (3) ohms per one thousand (1000) feet as measured by a high-quality meter suitable for measurements of low resistance in the range of 1 to 6 ohms.

A megohm meter test at 500 volts DC shall be made between the two leads of a loop/lead-in combination temporarily spliced together, but otherwise disconnected from all terminals, and the shield drain wire and the earth ground connection. These resistances shall be at least one hundred (100) megohms.

A megohm meter test at 500 volts DC shall be made between lead-in shield and the earth ground rod. This resistance shall be at least one hundred (100) megohms.

The meter used for these tests shall be checked for calibration each day of use by using a resistor block of 5% resistors simulating loads of 1 megohm, 20 megohm and 100 megohms. The observed meter reading shall be 10% of the nominal resistor load.

If any loop sensor and lead-in combination fail to pass any one of the four (4) tests, it shall be repaired and then re-tested on two occasions at least two (2) weeks apart and then shall pass on each re-test occasion. If the loop sensor lead-in combination does not pass all these re-tests, a new loop sensor and/or lead-in shall be installed, and shall pass these tests, at no additional cost.

After the above tests have been satisfactorily completed, all loop sensor/shielded lead-in inductance shall be measured, and a written report of the results shall be filed with the Engineer and a copy stored with the "box prints" at the intersection.

**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.

**POSTS AND BASES**

Signal posts shall be steel shafts with octagonal iron bases. Signal base foundations shall not obstruct a sidewalk so that passage by physically challenged persons is impaired.

**MAST ARM POLES AND FOUNDATIONS** (Location No. 1 Only)

Mast arm foundations shall not obstruct a sidewalk so that passage by physically challenged persons is not impaired. Mast arm foundations protruding above sidewalk grade will not be accepted and will be replaced by Contractor at Contractor's expense. Mast arm, poles and foundations shall be fabricated and constructed in conformance with MassDOT's Overhead Signal Structure & Foundation Standard Drawings dated December 2015 and Engineering Directive E-16-001 dated 01/29/2016.



**ITEMS 816.01 and 816.02** (Continued)

All mast arm poles shall be galvanized steel monolevers with shoe bases, unless otherwise directed. Acceptance of Type II mast arm poles shall be contingent upon review and approval of the shop drawings submitted by the Contractor. Longhand design calculations shall be submitted for all Type II Mast Arms. **Note: Contractor shall submit both shop drawings and calculations of the mast arms to the design engineer for review and approval.**

The pole and arm shafts shall be fabricated from commercial quality hot rolled steel. For mast arms that is 40' and shorter in length, the shafts shall have only one (1) longitudinal, automatically, electrically welded joint, and shall have no intermediate horizontal joints or welds. Only one (1) length of steel sheet shall be used, which shall be formed into a continuously tapered shaft, having a taper length of 0.14" per foot. For mast arms that is 45' and greater in length, the arm shaft shall have telescopic field splice and the minimum splice length shall be at least 1.5 times the inside diameter of the exposed end of the female section.

Based on the soil boring logs and the blow counts, the foundations shall be to the depths noted below. During construction of the cored pier foundation (drilled shaft), a temporary casing, that will be removed when concrete is placed, will be required to prevent collapse of the fill and sand.

Drilling for the pier foundation is anticipated to encounter cobbles and possibly boulders. When the drilling operations are complete, concrete should be placed inside the casing as soon as possible. The concrete should be placed using a tremie pipe. It is recommended pouring the pier foundation concrete on the same day that the pier is drilled. See appendix for soil boring logs.

<u>Location No.</u>	<u>Mast Arm</u>	<u>Boring No.</u>	<u>Soil Type</u>	<u>Fdn. Depth</u>	<u>Diameter</u>	<u>Vertical Bars</u>	<u>Tie Bars</u>
Sta 502+84.0, 56.4' RT	45'	MA-1	Clay (Soft to Medium Stiff)	16'-0"	4'-0"	18-#9	#5 @ 6"
Sta 502+70.2, 42.6' LT	40'	MA-2	Clay (Soft to Medium Stiff)	14'-0"	3'-6"	18-#8	#5 @ 8"
Sta 503+96.1, 89.4' LT	30'	MA-3	Clay (Soft to Medium Stiff)	13'-0"	3'-6"	18-#8	#5 @ 12"
Sta 504+30.4, 46.8' RT	20'	MA-4	Clay (Soft to Medium Stiff)	12'-6"	3'-6"	18-#8	#5 @ 12"
Sta 503+78.6, 40.5' LT	40'	MA-5	Clay (Soft to Medium Stiff)	14'-0"	3'-6"	18-#8	#5 @ 8"
Sta 503+76.6, 46.2' RT	45'	MA-6	Clay (Soft to Medium Stiff)	16'-0"	4'-0"	18-#9	#5 @ 6"



**ITEMS 816.01 and 816.02** (Continued)

Foundations for Signal Posts, Mast Arm Poles, Strain Poles and Controller Cabinets foundations shall be constructed using 4000 psi 565 Cement Concrete Masonry conforming to the relevant provisions of Section M4 of the Standard Specifications and the following:

1. Reinforcing steel shall be ASTM A-615, Grade 60.
2. The top forming of cast-in-place units shall extend downward for a minimum of 24" on the side of any foundation. The lower portions of all foundations shall be placed directly against undisturbed earth. No forms or reinforcing for foundations for mast arm poles, span wire poles and control cabinets shall be set, nor shall concrete be placed until the excavation has been inspected by the Engineer and his approval to proceed has been given.
3. Mast arm foundations in sidewalks shall be flush with sidewalk grade. Foundations protruding above sidewalk grade will not be accepted and will be replaced by contractor with no additional compensation.

**SIGN MOUNTING**

Proposed signs on mast arm poles, mast arm supports shall be rigidly mounted on a bracket or bolt mounted through the sign face. Hanging or swinging sign mountings are not allowed. Sign mounts shall be for the same design wind load required for the signal installation.

**SIGNAL HEADS** (Location No. 1 Only)

Signal heads shall be rigid mounted on mast arms, with the bottom of all signals at the same height. All traffic signal lenses shall be 12" in diameter unless otherwise noted on the plans. Solid backplates shall be 5" provided on all signal heads. Backplate shall have a 3-inch yellow micro-prismatic retroreflective sheeting along the outer edge. All signal heads shall be equipped with light emitting diode (L.E.D.) 12" modules as noted on the plans.

Signal heads shall be made of aluminum. Signal heads shall be installed with cut tunnel visors unless otherwise noted on the major items list on the plans.

Prior to activation, contractor shall cover entire signal head, and not just the indications, in a manner consistent with FHWA Interpretation Letter 4(09)-001(I) – Covering Signals Out of Service.

**TRAFFIC SIGNAL LED MODULES**

The LED module shall be an approved item from MassDOT's Qualified Traffic Control Equipment (QTCE). See the Department website:

<https://www.mass.gov/doc/section-815-traffic-control-signals/download>



**ITEMS 816.01 and 816.02** (Continued)

To prevent the LED module warranty from being voided, the connecting leads on the module shall not be cut. The original LED module leads shall be connected to the signal head terminal block as continuous wire without splices.

The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

1. A failure due to workmanship or material defects within the first 60 months of field operation.
2. A greater than 40 percent light output degradation or a fall below minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation.

**PEDESTRIAN HEADS**

Pedestrian head indications shall be illuminated L.E.D. type displaying the graphical symbols of a walking person and/or upraised hand. The graphical symbols of a walking person and upraised hand shall be solid display. Outlined symbols are no acceptable. All LED indications on the pedestrian signal shall have an automatic dimming circuit for night illumination to reduce long-term degradation to the LEDs. Pedestrian heads shall be made of aluminum.

Each visual pedestrian indication shall be complemented by a time display indication. Each time display indication shall be self-programming and microprocessor based, with red LEDs used in the display. The time display will countdown the amount of time remaining in each flashing don't walk time interval for viewing by the ambulatory public. The countdown numbers shall only be displayed during the flashing don't walk interval. The countdown numbers shall not flash.

**PEDESTRIAN PUSH BUTTONS**

Pedestrian push buttons shall be accessible pedestrian signal (APS) comply with MUTCD Section 4E.09 to Section 4E.13. APS units shall be programmed for full MUTCD compliance.

Pedestrian push button controls shall be raised from or flush with their housings and shall be a minimum of 2" in the smallest dimension. The force required to activate the controls shall be no greater than 5lbs.

Each push button shall be complemented with an audible and vibro-tactile indication with LED confirmation light. Each separately phased pedestrian movement shall have its own distinctive audible emanation in order for visually impaired pedestrians to discriminate which phase is appropriate given his or her destination and/or direction of travel.

The audible emanation shall be a percussion type sound. No buzzer or ringing type sounds will be acceptable. The output level of the audible pedestrian signal shall vary in intensity with significant fluctuations in ambient noise conditions. At a minimum, the output level shall vary in intensity from daytime to nighttime operations.



**ITEMS 816.01 and 816.02** (Continued)

Pedestrian push buttons shall be located as close as practicable to the sidewalk curb ramp serving the controlled crossing and shall permit operation from a clear ground space. If two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian push buttons and/or legends on the pedestrian push button signs should clearly indicate which crosswalk signal is actuated by each pedestrian push button. APS units shall be at least 10' apart. If any units not stated below must be installed less than 10' apart, contact District Traffic Engineering section to determine appropriate audible mode, including speech walk message if needed. The design plans show APS units that are proposed to be less than 10' apart and will require the following speech walk messages:

APS BUTTON – AUDIBLE (SPEECH) MESSAGES		
To be provided during the walk interval of the pedestrian phase as followed:		
Pedestrian Head	Phase #	Speech Walk Message
P2	Ø2	“Dean. Walk sign is on to cross Dean.”
	Ø9	“Walk sign is on for all crossings.”
P4	Ø8	“Dean. Walk sign is on to cross Dean.”
	Ø9	“Walk sign is on for all crossings.”
P5	Ø9	“Walk sign is on for all crossings.”
P6	Ø9	“Walk sign is on for all crossings.”
P7	Ø9	“Walk sign is on for all crossings.”
P12	Ø9	“Walk sign is on for all crossings.”

Note: The contractor is responsible for determining the correct arrow orientation of the R10-3e sign and or pedestrian push button.

Pedestrian push buttons shall be installed in accordance with 521 CMR 21.10.4 with a maximum side reach of 10” and a maximum height of 42” above finished grade.

**PAINTING**

All new traffic signal equipment shall be painted in accordance with the relevant provision of Section 815 of the Standard Specifications and the following:

Controller cabinet	(Exterior)	-	Aluminum
	(Interior)	-	Aluminum
Posts and Bases		-	Standard Yellow
Mast arms & mast arm poles		-	Galvanized
Signal housings	(Back)	-	Standard Yellow
	(Front)	-	Flat Black
Signal housing supports		-	Standard Yellow



**ITEMS 816.01 and 816.02** (Continued)

Visors of signal housing (Outside)	-	Standard Yellow
(Inside)	-	Flat Black
Louvers	-	Flat Black
Meter socket	-	Aluminum

**SOFTWARE**

All local controller, malfunction management unit, video detection system and emergency vehicle preemption software shall be supplied with the latest available revision. Any software upgrades released by the manufacturer shall be supplied at no additional cost to MassDOT District 5 Office for a period of five years after acceptance of the traffic signal installation.

**EXISTING INSTALLATION**

The existing signal installations to be removed under Item 816.81 shall be maintained in operation throughout the construction period and until the new signal system is ready for operation. The contractor may install temporary supports for signal heads as necessary to allow for construction activities. Any temporary installation shall be in conformance with the MUTCD in every case. If an existing signal is to be turned off temporarily to allow controller switchover or requiring temporary turn-off, a police detail shall be used to control traffic at the intersection until stop-and-go operation is restored.

Once construction is completed and the new signal system is in operation, the old signal system shall be completely removed and stacked as directed by the Engineer in accordance with Section 816.81. Old cable and unusable materials shall be disposed of by the Contractor.

**DOCUMENTATION**

Each programmable local hardware component (i.e., controller, malfunction management unit, loop detector amplifier, emergency vehicle preemption phase selector) shall be initially programmed by the Contractor based on information contained on the plans.

Note: Three bound sets of hard copy programming per device shall be supplied to MassDOT District 5 Office by the CONTRACTOR.

Upon final acceptance of the signal by MassDOT, the CONTRACTOR shall supply 8½"x11" or 11"x17" laminated copy of the traffic signal design plan and sequence and timing chart to be left in the cabinet documentation envelope mounted on the inside of the cabinet door.



**ITEMS 816.01 and 816.02** (Continued)**AS-BUILT TRAFFIC LAYOUT PLANS AND SIGNAL PERMIT**

It will be the responsibility of the contractor to provide As-Built traffic signal layout plans and/or Traffic Signal Permit, indicating all signal equipment, detectors, conduits, pull boxes, complete with as-built timing and sequence, major item list, power-pole number and meter number. The Contractor shall provide the final As-Built/Permit Plan in hard copy and electronic AUTOCAD files to MassDOT District 5 Traffic Engineer prior to the Final Acceptance of the signal system. If desired, the Contractor may hire an ENGINEER or the DESIGN ENGINEER for a fee for preparing the As-Built Traffic Signal layout plans and electronic version.

**BASIS OF PAYMENT**

Item 816.01 and Item 816.02 will be paid for at the respective Contract Lump Sum prices, which prices shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for the maintenance of existing signal installations during construction, but all costs in connection therewith shall be included in the Contract unit price bid.

The removal and discarding of all existing traffic signal equipment will be paid for separately under Temporary Traffic Control Signal, Item 816.81.

Conduit will be paid for separately under 3 Inch Electrical Conduit, Item 804.3. Pull boxes shall be paid for separately under Pull Box 12 x 12 Inches, Item 811.31. Electric handholes shall be paid for separately under Electric Handhole – SD2.022, Item 811.22.



**ITEM 816.81****TEMPORARY TRAFFIC CONTROL SIGNAL****LUMP SUM**

Work under this Item shall conform to the relevant provisions of Section 800 of the Standard Specifications, the 2009 Manual on Uniform Traffic Control Devices (MUTCD) and the following:

**CONSTRUCTION**

The work to be done under this item consists of utilizing the existing traffic signal system at Dean Street (Route 44) and Longmeadow Road/Honorable Gordon Owen Riverway to provide traffic control signals during construction. The existing signal installations shall be maintained in operation throughout the construction period as suggested on the Temporary Traffic Control Plans. This may involve maintaining portions of the existing system elements in combination with proposed equipment (i.e., temporary wood pole supports, span wire assemblies, signal heads, vehicle detection, traffic signal cabinet, conduit, handholes, pull boxes). The Contractor shall be required to remove and reset the existing signal heads throughout construction as necessary. The existing traffic controller maybe required to be removed and reset for use during construction. As directed by the Engineer, the contractor may install temporary supports for signal heads as necessary to allow for construction activities. Any temporary installation shall be in conformance with the MUTCD in every case. Various construction stagings are provided in the plans.

The strain poles shall be wooden utility poles of a type and manufacture suitable for use as temporary supports for traffic signals on a span wire. The contractor shall certify that the poles have been secured adequately using guys or other devices to ensure the pole's structural stability for the duration of the project. Such certification shall be provided in writing to the Engineer immediately after installation of the poles.

Contractor has the option to use any method or form of detection. The only requirement is that the detection shall be provided for both vehicles and bicycles and shall be on the current MassDOT's Qualified Traffic Control Equipment (QTCE) list.

The work also includes timing/phasing changes associated with the construction staging and the installation of temporary conduits, temporary traffic signal cable and temporary hand holes/pull boxes (including those that may require heavy duty frames/covers during staging).

As a requirement of this Item, any changes made to the existing signals including relocation of a signal head and or timing changes during construction, Contractor are required to submit and obtain new Traffic Control Signal Regulations from the State Traffic Engineer through MassDOT Boston Headquarters.



**ITEM 816.81** (Continued)**BASIS OF PAYMENT**

Item 816.81 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, and equipment and incidental costs required to install the temporary signal equipment complete and operating as specified.

Once the proposed signals are constructed and ready for operation, the Contractor shall remove the existing signals at no additional cost. No separate payment shall be made for the removal and stacking of any unused existing traffic signal equipment. No separate payment shall be made for supplemental materials required for the operation of the traffic signal.

Contractor shall contact MassDOT District 5 Office at 508-824-6633 for the location of the maintenance facility and to schedule the delivery of the unused equipment. Old cable, all unusable material, existing mast arms/supports, existing span wire supports, and any item rejected by the Engineer for stacking, shall be disposed of legally by the Contractor.



**ITEM 852.11**  
**ITEM 852.12****TEMPORARY PEDESTRIAN BARRICADE**  
**TEMPORARY PEDESTRIAN CURB RAMP****FOOT**  
**EACH**

Work under these items consist of furnishing, deploying, maintaining in proper operating conditions, and removing temporary pedestrian barricades and temporary pedestrian ramps as part of a Temporary Pedestrian Access Route (TPAR) in order to guide pedestrians around a fully-or partially closed sidewalk. These devices are intended to prevent pedestrians from entering the work area and to prevent pedestrians from inadvertently entering the vehicle travel lane by providing visual and physical separation between each space.

**MATERIALS**

The Temporary Pedestrian Barricade shall have a continuous bottom rail or edge no more than two (2) inches above the ground and eight (8) inches in height (minimum) to accommodate cane users, have a smooth and continuous hand railing along the top edge no less than 32 inches above the ground and not obstruct or project into the pedestrian path of travel. Barricade walls shall be nearly vertical and generally within the same plane.

If exposed to traffic, Temporary Pedestrian Barricades shall be crashworthy.

The Temporary Pedestrian Curb Ramp shall provide a 48-inch minimum width, with a firm, stable, and non-slip surface. Protective edging with a two (2) inch minimum height shall be installed when the curb ramp or landing platform has a vertical drop of six (6) inches or greater.

The Temporary Pedestrian Curb Ramp walkway and landing area surface shall be of a solid, continuous, contrasting color abutting up to the existing sidewalk.

If a Temporary Pedestrian Curb Ramp leads to a crosswalk, a detectable warning pad must be used at the base of the ramp; if it leads to a protected path that does not conflict with vehicular traffic then a detectable pad shall not be used.

**CONSTRUCTION METHODS**

The Temporary Pedestrian Barricade shall be placed in an area that will provide pedestrians with a TPAR on a smooth, continuous hard surface for its entirety. The geometry and alignment of the facility shall meet the applicable requirements of the “Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities” and the Massachusetts Architectural Access Board.

The recommended width of the TPAR is 60 inches, but if constraints exist a minimum clear width of 48 inches shall be provided along its entirety. If a 60-inch width cannot be accommodated in full, a 60 inch by 60 inch passing space shall be provided every 200 feet or less along the TPAR.

Turning areas shall be 60 inches by 60 inches minimum.

Lateral joints between any surfaces shall not exceed 0.5 inches. Lateral edges may be vertical up to 0.25 inches high and shall be beveled at 1V:2H between 0.25 inches and 0.5 inches.



**ITEMS 852.11 and 852.12** (Continued)

The TPAR shall be kept clear of debris, snow, and ice and the Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall not obstruct drainage.

Removal and/or resetting of Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall be considered incidental.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Payment for Temporary Pedestrian Barricades will be made at the contract price per foot installed in place, including all incidental items. This price shall include the cost of furnishing, installing, removing and resetting, removal, and maintaining in good working condition.

Payment for Temporary Pedestrian Curb Ramps will be made at the contract price per each unit installed in place, including all incidental items. This price shall include the cost of furnishing, installing, removing and 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 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 853.8****TEMPORARY ILLUMINATION FOR WORK ZONE****DAY**

The work under this Item shall conform to the relevant provisions of Subsection 850 of the Standard Specification and the following:

The work under this item shall include furnishing, deploying and maintaining in proper operating condition a LED balloon diffuser lighting system. These portable light towers shall be used throughout the project area for temporary work zone lighting. The use of unshielded high wattage flood lights shall not be permitted.

These towers shall be used, relocated and adjusted to meet the criteria in Subsection 850 of the Standard Specifications and the following:

The Contractor shall illuminate the following work zone areas:

- Change in direction (i.e., work zone entrances and exits, crossovers, etc.)
- Tapered areas
- Actual area where the construction is being performed

Prior to commencement of work the Contractor shall submit to MassDOT for approval a description of illumination equipment that is proposed to be used on this project, and shall include photometrics that detail the light levels that are to be provided for the particular operation for the type of equipment, level of luminance and height to be installed.

Any potential glare from the lighting system should be considered from each direction and on all approaching roadways and opposing lanes of traffic. Glare from the illumination system should be minimized as much as possible for both workers and motorists in adjacent active travel lanes. If necessary, the Contractor shall provide supplemental hardware, such as, visors, louvers, shields, glare screen and barrier to reduce glare in adjacent active travel lanes.

Equipment mounted lighting may be used to supplement light towers to achieve the required lighting levels for the activity.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 853.8 will be measured and paid for at the Contract unit price per DAY. The cost shall include all labor, materials, equipment, tools and all incidentals required for the design and installation of the work zone lighting system. This shall include, but not be limited to lighting submission preparation, wiring connections, equipment relocations, and include all material and labor incidental for a complete, functional and operational work zone illumination system.

The price of this item shall include the material and labor required to install any supplemental hardware required to reduce glare on all adjacent active travel lanes.

The per day price shall be full compensation for all “Temporary Illumination for Work Zone” regardless of the number of concurrent work areas, amount of equipment concurrently in use or the durations of or changes of the work shifts per day.

Furnishing, Installing, resetting, modifying and removing equipment for work zone illumination shall be incidental to Item 853.8.



**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.



**ITEM 859.1** (Continued)**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 directed by the Engineer.



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<b><u>ITEM 864.31</u></b>	<b><u>SLOTTED PAVEMENT MARKER</u></b>	<b><u>EACH</u></b>
	<b><u>ONE-WAY WHITE</u></b>	
<b><u>ITEM 864.35</u></b>	<b><u>SLOTTED PAVEMENT MARKER</u></b>	<b><u>EACH</u></b>
	<b><u>TWO-WAY YELLOW/YELLOW</u></b>	

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Work under these items shall be done in accordance with the relevant provisions of Subsection 860, the relevant provisions of 1996 Traffic Standard Drawing TR.6.3 "Typical Pavement Markings for Freeways", the construction plans and the following.

The work to be done under these items consists of furnishing and installing one-way white and two-way white/red reflectorized pavement markers (slotted in pavement)

Markers shall be installed along the broken white lane lines (skip lines) at the midway point between successive skip lines at 80 foot intervals on the mainline.

### **CONSTRUCTION METHODS**

The work shall include cutting the tapered pavement slot to the dimensions shown on the typical details for the one-way or two-way markers, 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± inch below the top of the adjacent pavement.

Surface preparation and installation shall be strictly in accordance with the manufacturer's instructions.

### **MATERIALS**

Reflectorized pavement markers shall be 3M Series 290 & 291, Ennis-Flint Stimsonite C80, Rayolite Model 2004 Type G & Type D or an approved equivalent.

### **METHOD OF MEASUREMENT**

The number of one-way white and two-way white/red reflectorized pavement markers (slotted in pavement), completely furnished and installed, will be measured by the Unit Each as a complete installation.

### **BASIS OF PAYMENT**

One-way white and two-way white/red reflectorized pavement markers (slotted in pavement) will be paid at the contract unit price each under Item 864.31 and Item 864.33 respectively, and shall include cutting the tapered pavement slot, furnishing and installation of the reflectorized markers, including all necessary materials, labor, incidentals, and equipment to complete the work.



**ITEM 864.41**      **GREEN COLORIZED PAVEMENT MARKINGS**      **SQUARE FOOT**

The work under this item shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following. Work under this item consist of furnishing and installing Colorized Pavement Markings at the locations shown on the plans or as required by the Engineer.

**MATERIALS**

Colorized Pavement Markings are composed of Epoxy, Methyl Methacrylate (MMA), or Preformed Thermoplastic Materials.

The initial daytime chromaticity coordinates for green colorized pavement shall fall within the area created by the following coordinates:

<b>Initial Daytime Chromaticity Coordinates (Corner Points) for Green Colorized Pavement Markings</b>				
	1	2	3	4
x	0.230	0.266	0.367	0.444
y	0.754	0.460	0.480	0.583

The surface of the Colorized Pavement Markings shall provide a minimum skid resistance value of 55 British Pendulum Number (BPN) when tested in accordance with ASTM E303.

The Contractor shall provide a Certificate of Compliance verifying the product supplied meets the specified daytime chromaticity requirements and friction requirements prior to installation.

**CONSTRUCTION METHODS**

The Contractor shall supply Shop Drawings to the Engineer for approval a minimum of 30 days in advance of installation. Shop Drawings shall include the product manufacturer's instructions, material safety data sheets (MSDS) for all components including any primers and sealers, and all tools, equipment, and procedures to be used for the installation. No work shall commence until the Shop Drawings have been approved.

It shall be the responsibility of the Contractor to prepare the surface prior to the installation of any Colorized Pavement Markings. Any joints or cracks in the pavement shall be pre-treated per the manufacturer's recommendation. The surface shall be clean and dry prior to installation of the system. If additional surface preparation is recommended by the manufacturer, such as the installation of a primer or preheating, it shall be completed per the manufacturer's specifications. All surface preparation shall be considered incidental to the cost of the item.



**ITEM 864.41** (Continued)

Any existing pavement markings that conflict with the Colorized Pavement Markings shall be removed by the Contractor in advance of installation; installation of colorized pavement over pavement markings shall not be allowed. All existing pavement markings that are to remain, castings, curbs, and rumble strips within the vicinity of the colorized pavement application shall be covered and protected by the Contractor. Existing pavement markings damaged by the Colorized Pavement Markings installation shall be removed and replaced by the Contractor at no additional cost.

The Contractor shall follow all installation instructions from the manufacturer, including allowable ranges of temperature and humidity for installation, unless otherwise approved by the Engineer.

Upon completion of installation, a sealer shall be applied if recommended by the manufacturer. The sealer shall be installed per the manufacturer's specification. The application of a sealer shall be considered incidental to the cost of the item.

The Contractor shall maintain protection of the Colorized Pavement Markings installation from vehicle and foot traffic throughout the minimum cure time recommended by the manufacturer.

**METHOD OF MEASUREMENT**

Item 864.41 will be measured by the Square Foot, complete in place.

**BASIS OF PAYMENT**

Item 864.41 will be paid for at the respective contract unit price by the Square Foot. The contract prices shall include all material, labor, equipment, and incidental costs required to complete the work.



**ITEM 874.****STREET NAME SIGN****EACH**

The work under this item shall conform to the relevant provision of Subsection 828 of the Standard Specifications and the following:

The work shall include the furnishing and installation of street name signs at the intersections shown on the plans and/or as directed by the Engineer.

The quantity of street names may be increased or decreased by the Engineer depending upon actual field conditions encountered.

All sign panels shall be aluminum conforming to the requirements of Subsection 828.42 and the Pavement Marking and Signing Plan.

Street name sign shall conform to the latest MassDOT Standard Sign Book. For street name signs that are to be mounted to mast arms at signalized intersection, the 'primary' legend (i.e., Longmeadow) shall be 8" uppercase and lowercase Series D. The 'secondary legend (i.e., Rd) shall be 5.33" uppercase and lowercase Series D as shown in the Traffic Sign Summary Sheet. For ground-mounted street names signs that are to be mounted back-to-back to P5 posts, the 'primary' legend (i.e., Dean) shall be 6" uppercase and lowercase Series D. The 'secondary legend (i.e., St) shall be 4" uppercase and lowercase Series D. The text and border on the sign shall be white with a green background.

Also included under this item are all hardware, brackets, bolts, etc., necessary to attach the panels to P5 posts, the mast arms, mast arm supports, or other street furniture as noted on the plans. For ground mounted street name signs having a width of 42" and over, they shall be mounted to dual P5 posts under Item 848.1. Sign support P5 posts will be supplied for under Item 847.1

**METHOD OF MEASUREMENT**

Item 874. will be measured for payment by the Each street name sign installed, complete in place.

**BASIS OF PAYMENT**

Item 874. will be paid for at the Contract unit price by the Each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.



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**ITEM 874.21**      **MISCELLANEOUS SIGNS REMOVED AND RESET**      **EACH**

The work under this item shall conform to the relevant provisions of Subsection 840 of the Standard Specifications and the following:

**CONSTRUCTION**

The Contractor shall carefully remove all existing signs, attachment hardware and sign support posts as shown on the drawings and as directed by the Engineer. Existing foundations shall be removed to a depth of at least 6 inches below the existing ground and the holes backfilled with gravel. The surface shall be patched with a material to match the existing ground or as directed by the Engineer.

Signs and attachment hardware shall be satisfactorily stored and protected until reset in the proposed work. Sign support posts shall be disposed of in a satisfactory manner. New sign support posts shall be provided as called for under Item 847.1.

Signs and attachment hardware lost, damaged, or otherwise made unsuitable for reuse while being removed, transported, stored or reset shall be replaced with new material at no additional cost. New attachment hardware shall be furnished and installed as necessary to replace any missing or unusable existing hardware.

The sign shall be mounted in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and the 1990 Standard Drawings for Signs and Supports. Sign panels shall be cleaned before being reset.

**METHOD OF MEASUREMENT**

Item 874.21 will be measured for payment by the Each miscellaneous sign, complete in place.

**BASIS OF PAYMENT**

Item 874.21 will be paid for at the Contract unit price by the Each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for dismantling, storing, and resetting of the signs as designated above, the excavation and disposal of the existing foundation, the supplying and placing of compacted gravel backfill where foundations and posts are removed and the patching of the existing surface, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 874.41****TRAFFIC SIGN REMOVED AND DISCARDED****EACH**

The work under this item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following:

The work shall consist of removing and discarding existing regulatory, warning and directional signs and supports not required for reuse on this project.

**CONSTRUCTION**

The supports and existing foundations shall be removed to a depth of at least 6" below the existing ground and the holes backfilled with gravel. The surface shall be patched with a material to match the existing ground or as directed by the Engineer. The signs and supports shall become the property of the Contractor and the Contractor shall legally dispose of the items at a location not on MassDOT Highway Division property.

If signs are attached to existing light poles, utility poles or traffic poles, only the sign and attached hardware shall be removed and discarded.

**METHOD OF MEASUREMENT**

Item 874.41 will be measured for payment by the Each traffic sign removed and discarded.

**BASIS OF PAYMENT**

Item 874.41 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.

No separate payment will be made for dismantling, loading, transporting and discarding of the signs and supports as designated above, the excavation and disposal of the existing foundation and the supplying and placing of compacted gravel backfill where foundations and posts are removed, and the patching of the existing surface, but all costs in connection therewith shall be included in the Contract unit price bid.



<b><u>ITEM 942.181</u></b>	<b><u>W18X192J PILE</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 945.100</u></b>	<b><u>DRILLED SHAFT EXCAVATION 2.5 FOOT DIAMETER</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 945.200</u></b>	<b><u>ROCK SOCKET EXCAVATION 2.5 FOOT DIAMETER</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 945.300</u></b>	<b><u>OBSTRUCTION EXCAVATION 2.5 FOOT DIAMETER</u></b>	<b><u>FOOT</u></b>

The work under these Items is related to Item 996.01 and shall conform to the relevant provisions of Subsections 940 of the Standard Specifications and the following:

### **MATERIALS**

Steel piles shall conform to the requirements of AASHTO M183 Grade 50 and conform to the relevant provisions of Subsection 940 and 960 of the Standard Specifications. All piles shall be galvanized to the limits shown on the plans. All piles to be full length and splicing of the piles is expressly forbidden.

### **CONSTRUCTION**

The piles shall be set to account for anticipated deflection at the top of wall, true to line and grade as shown on the Plans, and/or as required. Piles shall be set by use of a temporary template to ensure that pile spacing and plumbness remain true. The temporary template will remain in place until concrete has set. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed 2% of the height of the wall inward and 1% of the height outward. Temporary supports shall support the soldier piles for at least 5 days before concrete panel installation begins.

The soldier piles shall be installed by placing them in 30-inch diameter predrilled holes located as shown on the Plans or required by the Engineer. Predrilled holes shall be protected when necessary, against cave-ins and displacement of surrounding soil by means of temporary steel casing or use of slurry subject to approval by the Engineer and MassDOT Environmental. Predrilling shall follow the relevant provisions of Subsection 945 and be paid under items 945.100, 945.200 and 945.300.

The soldier piles shall be installed in the drilled holes and shall be encased in 3000 psi concrete and be coated as described on the Plans. Concrete shall be paid under Item 903.

Pile testing, pile shoes and pile driving are not required. Piles are to be placed in the predrilled holes to minimum depths, as shown on the plans.

### **BASIS OF PAYMENT**

Items 942.181, 945.100, 945.200, and 945.300 will be paid for at the respective Contract unit price per Foot, which prices shall include all labor, materials, equipment, excavation and incidental costs required to complete the work.



**ITEM 983.3****RIPRAP REMOVED AND RELAID****CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsection 983 of the Standard Specifications and the following:

The work consists of removing riprap used for the slope of the drainage pipe outlet treatment adjacent to the project. The riprap shall be stockpiled during regrading of the slope of the drainage pipe outlet and then placed back on the slope when regrading is complete. The riprap extents shall be as detailed on the plans.

Contractor shall remove earth and other debris from the riprap prior to resetting.

**METHOD OF MEASUREMENT**

Item 983.3 will be measured for payment by the Cubic Yard, complete in place.

**BASIS OF PAYMENT**

Item 983.3 will be paid for at the Contract unit price per Cubic Yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work.



**ITEM 983.521****STREAMBED MATERIAL****CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsection 983 of the Standard Specifications and the following:

The purpose of this item is to provide for the manufacture and installation of natural streambed substrate adjacent to the concrete box culvert extension (Station 121+37) as shown in the Contract plans. The Contractor shall first obtain the material from existing material stockpiled from excavation of the existing streambed. If additional material is needed, it shall be blended into the existing stockpile to provide a uniform, consistent streambed substrate.

The Contractor shall sample the streambed substrate in the reach upstream of the culvert to determine % particle size. Using the particle size as a guide, the Contractor shall select the material and particle size distribution for use as substrate in the culvert. The result shall be a dense, well-graded bed mix with a percentage and type of fine material (sand, silt, clay) similar to the percentage and type in the reference reach subsurface. The fines are essential to limit infiltration into the need and to help lock the larger pieces together. Type and percentage of fines vary with geology and stream slope, but generally the bed mix should contain at least 5 percent fines. Use the additional guidance below.

- Large particles (D95, D84 and D50) that provide bed structure and buttress finer material should be accurately sized based on the reference reach. In channels where wood controls or influences the channel form, structures composed of angular rock can substitute for wood to simulate channel features in the crossing structure.
- The entire bed mix should be well graded (poorly sorted). A dense, stable bed requires all particle sizes, so no gap in sizes should exist between any classes of material in the design bed mix. Ideally, each class of bed material that makes up the mix will be well graded, so that all sizes within the category are represented. This representation is especially important for the smaller size fractions in a mixture that includes large particle sizes.
- The percentage of sand, silt and clay should approximate the reference reach channel bed subsurface (visually estimated), and should be adequate to limit bed permeability by filling voids between the larger particles. Including sand, silt, and clay in the simulation bed material requires using water during construction to wash the fine material down into voids between the larger particles in the bed.
- Bed material rock should be durable, and it should be at least as angular as in the reference channel. If it is less angular, it may be significantly more mobile than intended. Try to find local material as it will more likely resemble the natural bed material.

The Contractor shall submit the gradation analysis of the existing substrate material and the proposed gradation for review. The goal of the design gradation is to match the existing subsurface particle size distribution, but be a bit coarser overall usually so that it doesn't scour or wash away in the culvert.



**ITEM 983.521** (Continued)**METHOD OF MEASUREMENT**

Item 983.521 will be measured for payment by the Cubic Yard, complete in place.

**BASIS OF PAYMENT**

Item 983.521 will be paid for at the Contract unit price per Cubic Yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for stockpiling, storing, rehandling, providing additional material if the stockpiling is insufficient and disposal of excess material, but all costs in connection therewith shall be included in the Contract unit price bid.



**ITEM 986.5**      **MODIFIED ROCKFILL REMOVED AND RELAID**      **CUBIC YARD**

The work under this item shall conform to the relevant provisions of Subsection 983 of the Standard Specifications and the following:

The work consists of removing stone used as erosion control between a parking lot and back of sidewalk. The stone shall be stockpiled during regrading of the adjacent roadway slope. Once the slope is regraded, the area between the sidewalk and driveway shall be excavated so the stone can be replaced.

Contractor shall remove earth and other debris from the riprap prior to resetting.

**METHOD OF MEASUREMENT**

Item 986.5 will be measured for payment by the Cubic Yard, complete in place.

**BASIS OF PAYMENT**

Item 986.5 will be paid for at the Contract unit price per Cubic Yard, which price shall include all labor, materials, equipment and incidental costs required to complete the work.



**ITEM 991.11****CONTROL OF WATER – STRUCTURES****LUMP SUM**

The work under this Item shall conform to the relevant provisions of Subsection 140.60 of the Standard Specifications and the following:

The work under this Item includes dewatering and stream diversions necessary to accomplish the headwall removal and culvert extension Item 245.04 located at STA. 121+40 LT and the associated headwalls, cut off walls and wing walls. This Item shall also be used for control of water to install outfalls and stone for pipe ends at STA. 101+70 RT and STA. 125+80 RT, the retaining walls at STA. 117+00 TO STA. 118+20 RT and STA. 124+70 TO STA. 134+85 RT and the wetland replication area. Stream diversions and dewatering of excavation shall be conducted to ensure that the construction and placement of the culverts, drainage pipes, headwalls, field stone masonry ends, retaining walls and streambed material are placed “in the dry.”

The Contractor shall furnish all labor, materials and equipment required for completing the work. Furthermore, the operations of Control of Water neither shall cause the accumulation of siltation nor any adverse effect to the water or the environment.

Work under this item shall include all materials, equipment and labor needed to construct and install temporary control of water system. The temporary control of water system includes water flow diversion and sedimentation and erosion control. The temporary control of water system shall be non-permanent which does not harm the ecology of the stream, land under water, and surrounding land, and shall be comprised of a combination of a bypass channel (such as a pipe) sandbag cofferdams, and/or other approved impervious curtains, and dewatering to facilitate construction activities. Operations of Control of Water shall not adversely affect the quality of the required construction.

Work under this Item also includes pumping operations, installation of bypass piping or lined trench, installation of earth berms, sandbags, filter fabrics, weirs, stone, and all other means to collect, settle, and discharge water back into resource areas during construction.

As part of the work under this Item, it is the responsibility of the Contractor to determine the need and extent of sedimentation basins and dewatering techniques and sedimentation controls needed to control water and sediment at the site.

**SUBMITTALS**

Prior to the commencement of any work at the site, the Contractor shall submit to the Engineer and the Conservation Commission for review and approval a detailed plan for water control, including the construction of the water control system, and a culvert and retaining wall work sequence plan with a timetable and details specific to each of the phases of construction. The submittals shall include working drawings and calculations detailing the methods and materials proposed to account for all anticipated loads and construction conditions necessary to permit the work while maintaining a safe work area and protecting property from damage.



**ITEM 991.11** (Continued)

The Water Control Plan shall include a Sedimentation and Erosion Control Plan and a Water Flow Diversion and Containment Plan. The plans shall be adequate in detail to define specifics regarding materials, sizes, connections, and incidental items associated with the work. The furnishing of such plans shall not serve to relieve the Contractor's responsibility for the safety of the work or his responsibility for the successful completion of the project. The proposed plans submitted shall be designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The Contractor's attention is directed to the Order of Conditions included herein for additional information on submittal requirements.

The Contractor shall make his/her own evaluation of existing conditions and water flow, the effects of his proposed temporary works and construction methods and shall provide in his design for all loads and construction conditions necessary to permit construction of the specified structures while maintaining public safety and protecting completed work and all third-party property from damage due to his operations. The Contractor shall also provide a description and details of the intended methods to prevent debris, including airborne particles, from entering resource areas during the entire project duration.

**Sedimentation and Erosion Control Plan:** The Contractor shall submit to the Engineer, plans and details of the intended sedimentation treatment basin system that will be used along with dewatering techniques, and its location at the site. All discharge resulting from dewatering activities shall be directed to temporary sedimentation treatment basins at locations approved by the Engineer. At no time shall said discharge be directly released into the resource area. The proposed plan shall include methods and equipment necessary to discharge water from the sedimentation treatment basins. Sedimentation treatment basins shall be sized appropriately to adequately dewater from the proposed work zone while allowing sufficient time for sediments to settle out of the water, and with a depth such that a minimum of 18 inches of freeboard is maintained throughout its use.

**Water Flow Diversion and Containment Plan:** The Contractor shall submit plans and details along with a complete description showing the proposed cofferdam system for control of water and dewatering plan to the Engineer for his approval prior to the start of the work. The proposed plan shall include methods and equipment necessary to perform the work and shall include water discharge methods and equipment to bring water from the work zone to sedimentation treatment basin.

**CONSTRUCTION METHODS**

The work to be done under this item shall include placing and removing sandbag cofferdams with or without impervious curtains, or an equivalent cofferdam unit, at locations shown on the Contract Drawings. This work shall also include dewatering within the cofferdams, if needed to conduct the work. The dewatering discharge shall be directed to a temporary sedimentation treatment basin. The bags shall not decay nor rip or tear during the installation, its service life within the waterway, or during the cofferdam removal process. The Contractor shall not disturb the stream bed prior to placing the cofferdams in order to avoid migration of silts and sands further downstream. The Contractor is responsible for researching the seasonal flow characteristics of the stream to determine appropriate cofferdam details.



**ITEM 991.11** (Continued)

The contractor is responsible to determine what size water diversion structure is required based on the flow characteristics and seasonal properties of the stream. Approval from the Conservation Commission and the Engineer are required prior to installation of the water control.

Measures to control the discharge of sediment or pollutants into the water resource areas shall include, but not be limited to the following:

1. Site construction areas outside the buffer zones and on relatively flat ground.
2. Schedule the work within the resource areas to avoid periods of anticipated high water (i.e. spring floods) and inclement weather.
3. Management of construction operations involving hazardous materials, such as refueling and maintenance of equipment within the resource areas.
4. Installation and continuous maintenance of water control measures throughout the project.
5. Treatment of all discharge resulting from dewatering activities through a sedimentation/detention basin to control turbidity. At no time shall the discharge from dewatering activities be directly released into a resource area.

The locations of any sandbag dams and sedimentation/retention basins will be determined by the Contractor based on the selected methods of construction. Placement of the basins shall be in an upland area that is within the existing right of way or temporary easements.

All dewatering and related water control work shall be conducted in such a manner as to prevent siltation or contamination of the waterway. At a minimum, the settling basin shall be constructed of an earthen berm lined with geotextile fabric and surrounded by staked hay bales. The basin shall meet or exceed the following criteria:

1. The size and location of the basin shall be determined based on the size of the Contractor's pump and the anticipated flows for the river and the need to perform demolition and construction.
2. The outlet/weir of the dewatering basin shall not cause erosion of the surrounding area. An approved method of controlling erosion, such as an erosion control blanket, stone, etc., shall be used at the outlet of the basin.
3. The Contractor shall not allow any sediment within the settling basin to accumulate to a depth of greater than 12 inches at any point in the basin, nor shall the water level be allowed to rise to a height of more than 24 inches.
4. The sedimentation treatment basin shall be designed with a minimum of 18 inches of freeboard, which must be maintained at all times.



**ITEM 991.11** (Continued)

5. The Contractor shall inspect the settling basin(s) at least twice daily when in operation.
6. Damages shall be repaired immediately.
7. The settling basin outlet shall be cleaned daily.
8. The sediments within the settling basin shall be disposed of as approved by the Engineer.

Upon completion of water control, the materials and equipment used to maintain the cofferdam(s) and sedimentation treatment basin(s) shall become the property of the Contractor and shall be removed by the Contractor from the site. The area affected shall be restored to its natural condition in a manner subject to the Engineer's approval.

The Contractor is advised that the effectiveness of the water control method used will vary based on the field conditions and the time at which the actual excavation work is being performed. The Engineer has the right to order the Contractor to stop all excavation operations when in his judgment the Contractor's water control operations are failing to produce adequate results or are posing a threat to the environment.

**BASIS OF PAYMENT**

Payment for Item 991.11, including design for the stream diversion system and dewatering operations, excavation, sedimentation basins, all necessary equipment, materials and installation and removal, bypass piping, pumping, placing and/or removal of temporary dikes or other retaining structures, straw bales, silt fence and pipes all as outlined above shall be included in the Lump Sum Contract Price for this Item.



**ITEM 996.01****WALL STRUCTURE, WALL NO. 6****LUMP SUM**

The work under this Item shall conform to the relevant provisions Subsection 996 of the Standard Specifications, Item 996.011 for Precast Concrete Bridge Elements and the following:

The work under this Item consists of the construction of a steel soldier pile retaining wall with precast concrete lagging panels and a cast-in-place concrete closure section as specified herein and as indicated on the Plans. The wall shall consist of lagging concrete, reinforcing steel and all incidental work required to construct the wall. Shaft concrete shall be paid for under Item 903. Steel Piles to be paid under Item 942.181. Drilled shaft excavation to be paid under item 945.100. Rock socket excavation to be paid under Item 945.200.

**SUBMITTALS****A. Shop Drawings**

1. Submit shop drawings to the designer and the MassDOT Construction Office at least four (4) weeks before beginning the wall construction.

**B. Submit proposed installation methods and equipment at least four (4) weeks before beginning wall construction, including, but not limited to:**

1. Method and equipment for installing the soldier piles, including templates for maintaining alignment of the soldier piles.
2. Method and equipment for installing and attaching the concrete lagging.
3. Anticipated staging of equipment (and construction surcharge loads).
4. Existing utility facilities, including underground and overhead utilities. After checking locations of utilities by field investigations, determine which utilities affect or potentially may affect the work.

**C. Submit a written plan for monitoring movements of the new soldier pile and lagging wall and the existing mortared granite block wall during construction. The monitoring plan shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The written plan shall include, but is not limited to, the following:**

1. Qualifications of licensed Professional Engineer, including demonstrating at least 5 years of experience in monitoring installation of geotechnical systems or structures.
2. References from at least two projects completed in the last 5 years where monitoring consultant performing the work has satisfactorily monitored construction operations of this type, including location and details of projects, and names and contact information for each reference.
3. Qualifications of personnel involved in installation and use of monitoring system, including demonstrating at least 5 years of experience in this type of work.
4. Locations and types of deformation monitoring points.
5. Equipment, devices, and methods for measuring wall movements, including manufacturer's data demonstrating suitability for the intended use.
6. Calibration and recording/certifying of calibration of equipment and devices.
7. Suitable sketches or drawings describing the location and deployment of the monitoring system.
8. Frequency of measurements, including baseline readings.
9. Reporting of results, including format and frequency of reporting. Reporting shall not be less frequent than daily during the most critical construction operations.
10. Plan of Actions to be implemented in the event any Response Value for deformation, as specified in the Table below, is reached.



**ITEM 996.01** (Continued)

- D. Construction Schedule – The Contractor shall submit a schedule for the construction of Wall No. 6. The schedule will include construction milestones for soil and rock excavation, pile placement, concrete shaft placement, lagging placement, backfilling and compaction, moment slab placement, final grading and paving. The schedule shall provide at least three months duration between completing the compaction of backfill and the commencement of construction of the moment slab, final grading and placement of asphalt pavement.

**TABLE – RESPONSE VALUES**

The following Response Values apply to Wall 6 with W18x192J soldier piles and 2.5' diameter concrete shaft.

Stations 124+69.45 to 131+03.19

<u>GEOMETRY</u>	<u>LENGTH</u>
WALL HEIGHT (LAGGING)	8.0 FEET (MAX) 6.0 FEET (MIN.)
PILE SPACING (O.C.)	8.0 FEET
MIN. PILE LENGTH	43 FEET
MINIMUM EMBEDMENT	35.0 FEET
MINIMUM ROCK SOCKET LENGTH	9.0 FEET
MAXIMUM MOMENT	1029 KIP-FT

<u>MOVEMENT TYPE</u>	<u>THRESHOLD VALUE</u>	<u>LIMITING VALUE</u>
<u>LATERAL DEFLECTION AT TOP OF WALL</u>	1.1 INCH	2.0 INCH
<u>ESTIMATED SETTLEMENT OF BACKFILL BEHIND WALL</u>	1.4 IN. 6-12 MO. 0.1 IN. AFTER 1 YR	1.0 INCH

To avoid exceeding the limiting value for settlement, the Contractor shall place backfill behind the wall in as far in advance as possible prior to final grading and the placement of asphalt pavement to limit post-construction settlement. Moment slab construction, final grading, and paving at the wall shall not take place until at least three months after the wall has been backfilled and compacted.



**ITEM 996.01** (Continued)

Stations 131+03.19 to 134+84.60:

<b><u>GEOMETRY</u></b>	<b><u>LENGTH</u></b>
WALL HEIGHT (LAGGING)	6 FEET
PILE SPACING (O.C.)	10 FEET
MIN. PILE LENGTH	43.5 FEET
MINIMUM EMBEDMENT	38.5 FEET
MINIMUM ROCK SOCKET LENGTH	2.5 FEET
MAXIMUM MOMENT	773 KIP-FT

<b><u>MOVEMENT TYPE</u></b>	<b><u>THRESHOLD VALUE</u></b>	<b><u>LIMITING VALUE</u></b>
<u>LATERAL DEFLECTION AT TOP OF WALL</u>	0.66 INCH	2.0 INCH
<u>ESTIMATED SETTLEMENT OF BACKFILL BEHIND WALL</u>	1.4 IN. 6-12 MO. 0.1 IN. AFTER 1 YR	1.0 INCH

To avoid exceeding the limiting value for settlement, the Contractor shall place backfill behind the wall in as far in advance as possible prior to final grading and the placement of asphalt pavement to limit post-construction settlement. Moment slab construction, final grading, and paving at the wall shall not take place until at least three months after the wall has been backfilled and compacted.

**MATERIALS****3000 PSI – 1.5” – 470 Cement Concrete Shafts**

The work to be done under this heading involves filling the drilled shafts with high-slump flowable concrete to completely encase the steel piles and shall conform to the relevant provisions of Subsection 901 of the Standard and Supplemental Specifications.

**5000 PSI – 3/4” – 705 Cement Concrete Lagging**

The work to be done under this heading is for precast concrete lagging panels and shall conform to the relevant provisions of Subsection 901 of the Supplemental Specifications.



**ITEM 996.01** (Continued)**CONSTRUCTION METHODS**

The retaining wall shall consist of steel soldier piles set inside concrete-filled drill holes with precast concrete lagging panels spanning between the soldier piles. Drainage utilities shall be directed accordingly to avoid the location of the piles and shafts.

Soldier piles shall be installed through all material encountered to the depth required by design and as shown on the Plans, including areas where the proposed soldier pile and lagging wall intersect the existing mortared granite block masonry wall located approximately from Station 130+93 to Station 134+27 along the Taunton River.

Installation equipment shall be capable of removing or drilling through granite blocks, boulders, and any other obstructions, encountered during installation.

The soldier pile and lagging walls are designed to be free draining and shall be constructed to conform to this intent. Weep holes, as shown on the plans, are required in the center of the bottom lagging panel in each bay.

Temporary excavation support may be used as needed to facilitate the installation of the precast panels and shall be considered incidental to this item.

The soldier pile and lagging wall shall be furnished complete in place in accordance with the lines, grades, dimensions, and all appurtenances shown on the Contract Drawings, as required herein, or as required by the Engineer.

Concrete lagging shall have a rectangular cut stone formliner finish. Contractor to submit and have the formliner approved by the Engineer prior to ordering. Panels shall be grey in color similar to the existing grouted granite block masonry wall. The Contractor shall submit the proposed formliner to the Engineer for approval prior to panel fabrication.

**General Requirements**

- A. Install the wall in accordance with the accepted shop drawings, and in such a manner as to prevent movement, settlement, loss of ground, removal of fines from the adjacent ground, and damage to or movement of adjacent structures and utilities. This could include the use of casing or drilling slurry during installation of soldier piles in predrilled holes to maintain stable drill holes and limit the loss of ground outside the drill hole.
- B. Installation of the wall may be performed from the topside adjacent to Dean Street or from barges or other accepted means located in the Taunton River based on work requirements. Access to the Taunton River shall be approved by the Engineer and MassDOT prior to any launching.
- C. Perform field welding by certified welders in accordance with American Welding Society Standards AWS D 1.1, "Structural Welding Code - Steel." Splicing of piles less than 60 feet in length is expressly forbidden.
- D. Implement the Plan(s) of Actions (per SUBMITTALS, herein), if Response Values as specified in the Response Value Table(s) are reached.



**ITEM 996.01** (Continued)

- E. Below-ground obstructions may be encountered. Such obstructions may include, but are not necessarily limited to, granite blocks, boulders and various other demolition and construction debris.
- F. Temporary casings used for drilling holes for soldier piles shall be installed where required to maintain an open hole or limit surrounding ground disturbance, and where required by the Engineer, using rotary drilling techniques over their full depth to limit potential vibration damage to adjacent structures and facilities. Driving and vibratory methods of casing installation are not allowed.

**MONITORING DEFLECTION OF WALL 6**

1. Once the soldier pile is installed to final elevation but before excavation begins, establish deformation-monitoring points on the top of the pile, spaced approximately every 24 feet along the wall. The monitoring points shall consist of painted marks or targets on the steel pile.
2. Perform a baseline survey of each deformation monitoring point before excavation begins. Survey lateral positions.
3. Perform daily survey of each top-of-pile deformation monitoring point from when excavation begins until full excavation depth is reached adjacent to the wall. Thereafter, perform weekly survey of monitoring points until the wall is complete to the bottom of the moment slab or as directed by the Engineer.
4. Monitoring shall continue until the backfill behind the wall shall be completed to the bottom of the moment slab.
5. Make adjustments to survey schedule and monitoring point locations (including the addition of monitoring points) as requested by the Engineer if additional monitoring of wall performance is desired. Extra monitoring points and increases in survey frequency shall be considered incidental to the costs associated with this Section.
6. Survey instruments used for vertical deformation monitoring shall have a minimum accuracy of  $\pm 0.05$  in and a minimum setting accuracy of  $\pm 1.0$  arc seconds. Leveling staffs shall be non-telescopic in design (i.e., 'Chicago' style leveling staff). A bull's eye bubble shall be used to plumb the leveling rod.
7. Survey instruments used for horizontal deformation monitoring shall have a minimum accuracy of  $\pm 3.0$  arc seconds and a minimum display reading less than or equal to the accuracy. Distances less than 30 feet shall be measured with a standardized steel tape used in conjunction with a tension handle. Distances greater than 30 feet shall be measured with an Electro-Optical Distance Measuring Instrument (EDM). Distances between 30 and 100 feet shall be verified with a standardized steel tape in conjunction with a tension handle. Electronic pointing shall be used to minimize error due to possible misalignment of EDM axis and telescope. Centering shall be accomplished using high precision optical plummets or mechanical centering devices.
8. EDM equipment used for lateral deformation monitoring shall, after calibration, have a minimum accuracy of  $\pm 0.02$  in plus 5 parts per million.



**ITEM 996.01** (Continued)

9. The Contractor shall submit the results of the settlement point readings to the Engineer in draft form at the end of each working day. All monitoring data shall be reported to the Engineer within twenty-four (24) hours of measurement in tabular format, allowing comparison of current data to previous data, including baseline, and showing a complete history of movement versus time.

The piles shall be set to account for anticipated deflection at the top of wall, true to line and grade as shown on the Plans.

**PRECAST CONCRETE PANELS****A. General.**

The work under this Heading consists of fabricating, transporting, and installing precast concrete panels 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), and Item 996.011 - Precast Highway Guardrail Transition Units.

**B. Erection.**

Precast concrete panels shall be placed in successive horizontal lifts in the sequence shown on the approved Shop Drawings as backfill placement proceeds. As backfill material is placed behind the panels, the panels shall be maintained in position by means of temporary wedges or bracing according to the wall supplier's recommendations.

**BASIS OF PAYMENT**

Item 996.01 will be paid for at the Contract unit price per lump sum, which price shall include all labor, materials, equipment, excavation and incidental costs required to complete the work.

Obstruction removal and all drilling work, when encountered during excavation will be paid under their respective contract bid Items.

**SCHEDULE OF BASIS FOR PARTIAL PAYMENT**

Within ten (10) days after the Notice to Proceed, the Contractor shall submit on his/her proposal form a schedule of unit prices for the major component Sub-Items that make up Item 996.01 as well as his/her total wall structure Lump Sum cost for Wall Structure, Wall No. 6. The wall 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 wall components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 996.01 and no further compensation will be allowed.



**ITEM 996.01** (Continued)Wall Structure, Wall No. 6

<u>SUB-ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
904.1	<u>5000 PSI, 3/4 IN., 705 CEMENT CONCRETE</u>	<u>120</u>	<u>CY</u>		
910.1	<u>STEEL REINFORCEMENT FOR STRUCTURES – EPOXY COATED</u>	<u>24300</u>	<u>LB</u>		

**Total Lump Sum Price of Item 996.01 =**

The above schedule applies only to the subject Wall Structure, Wall No. 6. Payment for similar materials and construction at locations other than at this wall structure shall not be included under this Item. Sub-Item numbering is presented for information only in accordance with MassDOT Standard Nomenclature.



**ITEM 996.011      PRECAST HIGHWAY GUARDRAIL TRANSITION UNITS      EACH**

The work under this Item consists of fabricating, transporting and installing two precast guardrail transitions at the ends of the moment slab supported by the Wall No. 6 – Soldier Pile and Lagging wall 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.

**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



**ITEM 996.011** (Continued)

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.

**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



**ITEM 996.011** (Continued)**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  $40^\circ\text{F}$  of the ambient temperature surrounding the Precast Concrete Bridge Element.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest  $2^\circ\text{F}$ . 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 996.011** (Continued)**Table 1: Quality Control Sampling and Testing**

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size <sup>(c)</sup>	Sublot Size <sup>(d)</sup>	Frequency	Point of Sampling
Slump (in.) <sup>(a)</sup>	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% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°F				
Compressive Strength (psi)	AASHTO T 22	Stripping Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 80% $f'_c$ at Stripping				
		7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 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 <sup>(b)</sup>				

**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.

**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.



**ITEM 996.011** (Continued)**Documentation.**

At a minimum, the Fabricator shall maintain a filing system for the following QC records and documentation. All QC records and documentation shall be made available to MassDOT upon the request of the Department.

- (a) Current MassDOT Approved Mix Design Sheet(s) and Approval Letter(s)
- (b) PCI or NPCA Certification
- (c) Current Qualifications and Certifications for QC Manager(s) and QC Technician(s)
- (d) Most current set of Approved Shop Drawings
- (e) Approved Placement, Finishing and Curing Plan
- (f) Approved Dunnage Plan
- (g) Fabricator Certificate of Compliance for each fabricated Precast Concrete Bridge Element
- (h) Admixture Manufacturer's Certification of Compliance for each approved Admixture
- (i) Completed QC Inspection Report for each fabricated Precast Concrete Bridge Element
- (j) Identification Number for each fabricated Precast Concrete Bridge Element
- (k) Time and date of casting of each fabricated Precast Concrete Bridge Element
- (l) Date of stripping of each fabricated Precast Concrete Bridge Element
- (m) Batch Ticket Printout reporting the quantity of concrete produced for each batch of concrete produced
- (n) Concrete temperature records for each Precast Concrete Bridge Element fabricated
- (o) QC Test Report Forms for each subplot of concrete produced
- (p) Non-Conformance Reports (NCRs)
- (q) Documentation of Repairs (if applicable)

**Acceptance.**

MassDOT will perform Acceptance inspection, sampling, and testing during fabrication and installation, to evaluate the quality and degree of compliance of the fabricated Precast Concrete Bridge Element to MassDOT specifications. Additionally, MassDOT Inspectors will monitor the Fabricator's Quality Control activities to ensure the Fabricator is properly administering Quality Control in conformance with the Fabricator's NPCA or PCI Certification. Acceptance inspection and test results not meeting MassDOT specifications will result in Non-conformance Reports (NCR) being issued by MassDOT to the Fabricator or Contractor for corrective action. Final Acceptance for the fabricated Precast Concrete Bridge Elements shall be determined by MassDOT.



**ITEM 996.011** (Continued)**1. Inspection.**

A MassDOT MassDOT Inspector will be assigned to perform Acceptance activities during fabrication, which includes the inspection of the materials, work procedures, and Precast Concrete Bridge Elements. At least seven (7) days prior to the scheduled start of fabrication, the Fabricator shall contact the MassDOT Research and Materials Section (RMS) to provide notice of the scheduled fabrication start date. The Fabricator shall complete the following activities prior to notifying MassDOT RMS of the scheduled start date:

- (a) Receive approval for all submitted Fabricator cement concrete mix designs from the MassDOT Research and Materials Section for the current year, as specified under the *Mix Design* section and *Table 3: Trial Batch Sampling Testing for New Mix Designs*. Self-consolidating concrete shall meet the requirements of M4.02.17.
- (b) Receive approval for the submitted Fabricator Placement, Finishing, and Curing Plan from the MassDOT Research and Materials Section, as specified under the *Placement, Finishing, and Curing Plan* section.
- (c) Receive Engineer of Record approved shop drawings from the MassDOT Research and Materials Section as specified under the *Shop Drawings* section.
- (d) Participate in the pre-production meeting, as described under the *Pre-Production Meeting* section (if required).

Prior to the start of fabrication, the Fabricator shall review the fabrication schedule with the MassDOT Inspector. Fabrication shall only proceed when:

- (a) The QC Inspector and MassDOT Inspector are present to inspect the Precast Concrete Bridge Element(s) being fabricated.
- (b) The QC Manager is present at the Fabricator's plant.

The Fabricator shall grant access to all required areas of the Fabricator's plant to the MassDOT Inspector, during the hours of fabrication. Fabrication without MassDOT Inspector access to required areas is prohibited, and will result in the rejection of the fabricated Precast Concrete Bridge Element(s).

Additionally, the MassDOT Inspector will monitor the adequacy of the Fabricator's Quality Control activities. MassDOT Inspector Acceptance activities performed at the Fabricator's plant shall remain independent from the Fabricator, and does not replace the Fabricator's required Quality Control activities.

**2. Sampling and Testing.**

At a minimum, the MassDOT Inspector will perform random Acceptance sampling and testing for each Sublot of concrete produced as specified in *Table 2: Acceptance Sampling and Testing*. The MassDOT Inspector will also perform Acceptance sampling and testing on concrete that has been retempered with admixtures or hold-back water during production. Test Specimens will conform to the requirements of Section M4.02.13 of the MassDOT Standard and Supplemental Specifications and AASHTO R 60.



**ITEM 996.011** (Continued)**Table 2: Acceptance Sampling and Testing**

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size <sup>(c)</sup>	Sublot Size <sup>(d)</sup>	Frequency	Point of Sampling
Slump (in.) <sup>(a)</sup>	AASHTO T 119	Per AASHTO	$\leq 8$ 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 <sup>(b)</sup>				

**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 996.011** (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.



**ITEM 996.011** (Continued)

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.

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).



**ITEM 996.011** (Continued)**Table 3: Trial Batch Sampling and Testing for New Mix Designs**

Quality Characteristic	Test Method	Sample Size	Specification Limit	Performed By
Slump <sup>(a)</sup>	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 <sup>(b)</sup>	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) <sup>(d)</sup>	ASTM C 1567	Per ASTM	M4.02.00	Quality Control
Resistance to Chloride Ion Penetration Chloride Ion Penetration <sup>(e)</sup>	AASHTO T 358 <sup>(f)</sup>	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 <sup>(e)</sup>	AASHTO T 161 (Procedure A)	Per AASHTO	Relative Dynamic Modulus of Elasticity after 300 cycles $\geq 80\%$	Quality Control

**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.



**ITEM 996.011** (Continued)**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).

**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.



**ITEM 996.011** (Continued)

- (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 (7<sup>th</sup> 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*.

**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



**ITEM 996.011** (Continued)**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.

**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.



**ITEM 996.011** (Continued)**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. 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.



**ITEM 996.011** (Continued)**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.

**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.



**ITEM 996.011** (Continued)**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

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.



**ITEM 996.011** (Continued)**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 <sub>c</sub>

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.

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 <sub>c</sub>

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.



**ITEM 996.011** (Continued)**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.

**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*).



**ITEM 996.011** (Continued)**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 <sub>c</sub>

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.

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 ft<sup>2</sup>/gal., with the first being allowed to become tacky before the second is applied.



**ITEM 996.011** (Continued)

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.

**(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



**ITEM 996.011** (Continued)**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 <sub>c</sub>

**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.

**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<sub>c</sub>) 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:

- Precast Concrete Bridge Elements are protected from precipitation with polyethylene curing covers until 100% f<sub>c</sub> is attained
- Precast Concrete Bridge Elements maintain a minimum concrete temperature of 40°F until 100% f<sub>c</sub> is attained



**ITEM 996.011** (Continued)

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.

**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



**ITEM 996.011** (Continued)

Minor defects shall be repaired according to PCINE-18-RNPCBE. Cracks shall be sealed according to the PCI Repair Procedure #14 in PCINE-18-RNPCBE.

**3. Category 3, Major Defects.**

For Category 3 defects, the Fabricator shall prepare an NCR that documents the defect and describes the proposed repair procedure. The NCR shall be submitted to MassDOT for approval prior to performing the repair. Major defects are defined as the following:

- (a) Spalls, honeycombing and surface voids that are deeper than 2 inches or have any dimension greater than 12 inches, when measured along a straight line
- (b) Concentrated area of defects consisting of four or more Category 2 Defects within a 4-square foot area.
- (c) Exposed reinforcing steel
- (d) Cracks greater than 0.016 inches and less than or equal to 0.060 inches in width that will not receive a concrete overlay
- (e) Bearing area spalls with dimensions not exceeding 3 inches
- (f) Cracks, spalls and honeycombing that will be encased in cast in place concrete need not be repaired, but the limits and location of the defects shall be documented with an NCR

Upon MassDOT approval, defects and cracks shall be repaired according to PCINE-18-RNPCBE and this specification. All repairs shall be completed at the expense of the Contractor.

**4. Category 4, Rejectable Defects.**

Rejectable defects as determined by the MassDOT Inspector, RMS, and Engineer may be cause for rejection. Fabricator may submit an NCR with a proposed repair procedure, requesting approval. Some rejectable defects are defined as the following:

- (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.



**ITEM 996.011** (Continued)**Shipping.**

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

- (a) Precast Concrete Bridge Elements shall remain at the Fabricator's plant for a minimum of 7 days after cast date.
- (b) QC Inspection Reports shall be signed by the Quality Control Manager and provided to the MassDOT Plant Inspector.
- (c) QC Compressive Strength Test Report Forms attaining Design Strength,  $f'_c$  for the Precast Concrete Bridge Element's representative Sublot shall be generated by the Fabricator and provided to the MassDOT Plant Inspector.
- (d) Certificate of Compliance shall be generated by the Fabricator as described under the Fabricator Quality Control section and provided to the MassDOT Plant Inspector.
- (e) All MassDOT RMS approved Corrective Actions submitted on the Non-Conformance Reports (NCR), shall be verified to have been completed by the MassDOT Plant Inspector and Quality Control Manager.
- (f) All NCRs shall be signed off by the Quality Control Manager, MassDOT Inspector and MassDOT RMS.

**Delivery.**

Upon Delivery, the following documentation shall be provided to the MassDOT Resident Engineer or designee:

- (a) QC Compressive Strength Test Report Forms attaining Design Strength,  $f'_c$  for the Precast Concrete Bridge Element's representative 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.



**ITEM 996.011** (Continued)

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:

**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.



**ITEM 996.011** (Continued)

If the joints or voids are not filled within five days after the Precast Bridge Elements are erected, the Contractor shall cover and protect the openings from weather and debris until they are filled.

**Survey and Layout.**

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. MassDOT reserves the right to perform additional independent survey. If discrepancies are found, the Contractor may be required to verify previous survey data.

**Preparation of Closure Pour Keyways.**

Immediately prior to erecting the Precast Concrete Bridge Elements, the closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the precast concrete shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer. The surfaces of the shear keys shall be wetted so that the surfaces shall have a Saturated Surface Dry (SSD) condition for at least 24 hours prior to the placement of the closure pour concrete.

**Erection.**

The elements shall be placed in the sequence and according to the methods outlined in the Erection Procedure. As the erection proceeds, the Contractor shall constantly monitor the assembly to ensure that the precast concrete bridge element is within proper horizontal and vertical location and tolerances prior to releasing it from the crane and setting the next unit. The Contractor may use shims to maintain proper setting tolerances.

The concrete elements shall be lifted only by the lifting devices, and the utmost care shall be taken to prevent distortion of the elements during handling, transportation or storage.

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.



**ITEM 996.011** (Continued)**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 for support of the formwork shall be filled with a grout of the same color as that of the precast concrete.

**METHOD OF MEASUREMENT**

Item 996.011 will be measured for payment by the Each, complete in place.

**BASIS OF PAYMENT**

The furnishing, fabricating, and erecting of all Precast Highway Guardrail Transition Units shall be paid for at the contract unit price EACH, complete in place.

**END OF DOCUMENT**

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DOCUMENT A00802

# DETAIL SHEETS



THE COMMONWEALTH OF MASSACHUSETTS  
MassDOT - HIGHWAY DIVISION  
TEN PARK PLAZA, BOSTON, MA

**PRELIMINARY ESTIMATE OF QUANTITIES - DETAIL SHEETS**

CITY/TOWN: Taunton  
STA. 100+26 to 137+50

YEAR: Federal Fiscal Year 2022  
ROAD: Dean Street/Longmeadow  
CLASS: Rural or Urban Arterial  
DATE: August 26, 2022

TYPE OF PROJECT: Reconstruction of Route 44 (Dean Street)

Earth Excavation	18,750 CY	Test Pit for Exploration	200 CY
Class A Rock Excavation	50 CY	Class A Trench Excavation	1,800 CY
Special Borrow	100 CY	Class B Trench Excavation	1,100 CY
Gravel Borrow	10,500 CY	Channel Excavation	20 CY
Sand Borrow	1 CY	Class B Rock Excavation	50 CY
Crushed Stone	500 TON		

**FULL DEPTH HMA CONSTRUCTION**

**AREA = 16,231 SY**

SURFACE: 1-3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER  
2-1/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER  
4-1/2" SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER

BASE: 4" DENSE GRADED CRUSHED STONE OVER

SUBBASE: 14" GRAVEL BORROW (M1.03.0 TYPE B) (OR SUITABLE  
EXISTING MATERIAL)

**FULL DEPTH HMA CONSTRUCTION LESS THAN 4 FEET**

**AREA = 134 SY**

SURFACE: 1-3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER  
2-1/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER

BASE: 6" HIGH-EARLY-STRENGTH CEMENT CONCRETE BASE  
COURSE OVER

SUBBASE: 14" GRAVEL BORROW

**PAVEMENT FINE MILLING W/ HMA OVERLAY**

**AREA = 11,586 SY**

SURFACE: 1-3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)  
2-1/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

SURFACE MILLING: 1 3/4" MIN. TO 4" MAX. PAVEMENT FINE MILLING TO BE  
USED ON THE EXISTING PAVEMENT SURFACE TO  
ACHIEVE DESIRED CROSS-SLOPE



**HOT MIX ASPHALT DRIVEWAYS****AREA = 1,980 SY**

SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER  
2-1/2" SUPERPAVE SURFACE COURSE 12.5 (SIC-12.5) OVER

SUBBASE: 8" GRAVEL BORROW TYPE "B" (OR SUITABLE EXISTING  
MATERIAL)

**HOT MIX ASPHALT SIDEWALK AT DRIVEWAYS****AREA = 187 SY**

SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER  
2-1/2" SUPERPAVE SURFACE COURSE 12.5 (SIC-12.5) OVER

SUBBASE: 8" GRAVEL BORROW TYPE "B" (OR SUITABLE EXISTING  
MATERIAL)

**CEMENT CONCRETE ISLANDS, MEDIAN, SIDEWALKS,  
SIDEWALKS AT DRIVEWAYS, PEDESTRIAN CURB RAMPS  
AND WALKWAYS****AREA = 888 SY**

SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, 3/4",  
610) OVER

SUBBASE: 8" GRAVEL BORROW TYPE "B" (OR SUITABLE EXISTING  
MATERIAL)

**HOT MIX ASPHALT SIDEWALK****AREA = 2,557 SY**

SURFACE: 1-1/4" SUPERPAVE SURFACE COURSE (SSC-9.5) OVER  
1-3/4" SUPERPAVE SURFACE COURSE (SIC-12.5) OVER

SUBBASE: 8" GRAVEL BORROW TYPE "B"



**ITEM 101. CLEARING AND GRUBBING**

<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
101+80	RT	114+11	RT	Route 44
116+79	RT	119+16	RT	Route 44
117+20	LT	117+85	LT	Route 44
120+57	RT	121+43	RT	Route 44
121+14	LT	122+25	LT	Route 44
124+15	RT	131+08	RT	Route 44
133+89	RT	134+86	RT	Route 44
503+83	RT	506+04	RT	Longmeadow
504+06	LT	506+17	LT	Longmeadow

**ITEM 102.2 TREE TRIMMING**

To be used during construction for the utility relocations work as required by the Engineer.

**ITEM 102.3 HERBICIDE TREATMENT FOR INVASIVE PLANTS**  
**ITEM 102.33 INVASIVE PLANT MANAGEMENT STRATEGY**

To be used within the project limits and Offsite Riverfront Mitigation Area at the discretion of the Engineer.

**ITEM 102.521 TREE AND PLANT PROTECTION FENCE**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
134+02	LT	Route 44	134+75	LT	Route 44
501+65	RT	Longmeadow	501+80	RT	Longmeadow

**ITEM 102.531 TREE CARE - PRUNING**

For the locations listed below and additional locations as required by the Engineer.

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
122+47	46'	LT	Route 44



**ITEM 102.55**      **ARBORIST**

For use with Tree Care - Pruning.

**ITEM 103.**      **TREE REMOVED – DIAMETER UNDER 24 INCHES**

For the locations listed below and additional locations as required by the Engineer.

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>	<u>Size</u>
102+66	25.31'	LT	Route 44	14"
129+50	50.00'	LT	Route 44	10"
132+28	35.48'	LT	Route 44	12"
133+39	54.54'	LT	Route 44	18"
501+07	18.95'	LT	Longmeadow	10"
501+20	16.87'	LT	Longmeadow	12"
501+35	19.40'	LT	Longmeadow	10"
501+69	29.19'	LT	Longmeadow	12"

**ITEM 104.**      **TREE REMOVED – DIAMETER 24 INCHES AND OVER**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>	<u>Size</u>
102+21	40.06'	LT	Route 44	36"
103+52	34.56'	LT	Route 44	42"
104+68	38.24'	LT	Route 44	42"
116+63	56.00'	LT	Route 44	30"
126+65	44.53'	LT	Route 44	42"
127+14	38.60'	LT	Route 44	30"
132+08	39.86'	LT	Route 44	32"
134+08	30.01'	LT	Route 44	38"
498+26	26.68'	RT	Longmeadow	28"

**ITEM 105.**      **STUMP REMOVED**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>	<u>Size</u>
502+25	23.99'	LT	Longmeadow	16"
502+28	22.44'	LT	Longmeadow	16"
501+35	34.85'	RT	Longmeadow	50"
500+84	21.04'	LT	Longmeadow	50"

**ITEM 120.**      **EARTH EXCAVATION**

For use with excavation required for the project, reshaping an existing basin and for debris removal from riverfront mitigation Area.



**ITEM 123.**      **MUCK EXCAVATION**

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
116+88	118+50	RT	Route 44
121+32	121+64	LT	Route 44

**ITEM 127.1**      **REINFORCED CONCRETE EXCAVATION**

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
102+31	115+17	RT/LT	Route 44
115+17	115+23	RT	Route 44
116+12	118+75	RT/LT	Route 44
118+76	121+29	RT	Route 44
121+34	122+09	RT/LT	Route 44
124+90	127+92	RT/LT	Route 44
127+92	128+65	RT/LT	Route 44
128+65	135+50	RT/LT	Route 44

**ITEM 141.**      **CLASS A TRENCH EXCAVATION**

To be used with Retaining Walls, Stone Masonry Walls, Cement Concrete Walls Excavations.

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
116+88	118+50	RT	Route 44
118+00	118+72	LT	Route 44
119+04	120+49	LT	Route 44
120+84	121+15	LT	Route 44
121+32	121+64	LT	Route 44
131+31	133+07	LT	Route 44
133+70	134+82	LT	Route 44

Subtract quantity for Item 123. - Muck excavation.

In the construction, widening, straightening, or deepening of drainage ditches in connection with pipes or structures have clear span less than 8 ft.

<u>From</u>	<u>Baseline</u>	<u>To</u>	<u>Pipe Dia. (")</u>
DMH-118	Route 44	EX. CB-118	18
EX. CB-118	Route 44	FES-306	18
EX. DMH-128	Longmeadow	OUTLET	24

And for use with Box Culvert extension

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
121+36	121+39	LT	Route 44



**ITEM 143.**      **CHANNEL EXCAVATION**

To be used adjacent to the proposed culvert extension at Sta. 121+39.

**ITEM 145.**      **DRAINAGE STRUCTURE ABANDONED**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>
120+81	RT	Route 44	CB
502+35	RT	Longmeadow	CB

**ITEM 146.**      **DRAINAGE STRUCTURE REMOVED**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>
101+71	RT	Route 44	CB
103+27	LT	Route 44	CB
103+30	RT	Route 44	CB
105+07	LT	Route 44	CB
106+93	LT	Route 44	CB
111+24	RT	Route 44	DMH
111+28	LT	Route 44	DMH
111+45	RT	Route 44	CB
111+45	RT	Route 44	CB
111+46	LT	Route 44	CB
111+96	LT	Route 44	CB
114+91	RT	Route 44	CB
114+97	LT	Route 44	CB
115+66	RT	Route 44	CB
116+29	RT	Route 44	CB
116+38	LT	Route 44	CB
118+62	LT	Route 44	DMH
118+87	LT	Route 44	TRENCH DRAIN
119+19	RT	Route 44	CB
119+25	RT	Route 44	DMH
120+51	LT	Route 44	CB
120+81	LT	Route 44	CB
122+38	LT	Route 44	CB
122+58	RT	Route 44	CB
136+88	LT	Route 44	CI
499+48	RT	Longmeadow	CB
505+50	LT	Longmeadow	CB
502+67	LT	Longmeadow	CB
502+86	LT	Longmeadow	CB

**ITEM 150.1**      **SPECIAL BORROW**

To be used if existing fill is not suitable for re-use as special borrow.



**ITEM 151.**      **GRAVEL BORROW**

To be used as subbase for roadway work, below the footing of the retaining walls and below the culvert extension if the existing excavated material is not suitable for re-use as gravel borrow.

**ITEM 151.2**      **GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES**

To be used when suitable backfilling materials cannot be obtained from excavation, the material shall consist of satisfactory borrow.

To be used for backfilling associated with retaining walls and culvert.

<u>Station</u>	<u>Station</u>	<u>Baseline</u>	<u>Side</u>
116+88	118+50	Route 44	RT
118+00	118+72	Route 44	LT
119+04	120+49	Route 44	LT
120+84	121+15	Route 44	LT
121+36	121+39	Route 44	LT
131+31	131+67	Route 44	LT
131+72	133+07	Route 44	LT
133+70	134+72	Route 44	LT

**ITEM 151.6**      **LIGHTWEIGHT FILL**

To be used behind the headwall at culvert extension.

<u>Station</u>	<u>Station</u>	<u>Baseline</u>	<u>Side</u>
121+32	121+64	Route 44	LT

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

To be used with shallow existing telephone duct and additional for utility conflicts as required.

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
118+87	122+11	LT	Route 44



**ITEM 154. SAND BORROW**

To be used with encased post for shallow mount.

<u>Station</u>	<u>Baseline</u>	<u>Side</u>	<u>Offset</u>
101+72	Route 44	RT	21.00'
103+27	Route 44	RT	21.00'
106+97	Route 44	RT	21.00'
111+24	Route 44	RT	40.64'
118+14 TO 118+40	Route 44	LT	46.17'
505+70	Longmeadow	RT	29.20'

**ITEM 156. CRUSHED STONE**

For drainage and sewer pipes, guardrail posts at headwall, walls and structures bedding if unsuitable material is encountered. If wet, clay, or spongy material is encountered the Engineer shall direct to remove and replace with clean gravel, or crushed stone and as determined by the Engineer.

**ITEM 181.11 DISPOSAL OF UNREGULATED SOIL**

Excavation for drainage pipes (installed in potential contamination area)

<u>From</u>	<u>To</u>	<u>Baseline</u>	<u>Pipe Dia.</u>
CBCI-149	DMH-143	Route 44	12"
CB-148	DMH-143	Route 44	12"
CB-194	DMH-143	Route 44	12"
DMH-146	DMH-143	Route 44	12"

Excavation for drainage structures (installed in potential contamination area)

<u>Structure ID</u>	<u>Dia.</u>
CBCI-149	4.83'
CB Removed at 122+58 RT	4.83'
CB-148	4.83'
CB-194	4.83'
DMH-143	4.83'

**ITEM 181.12 DISPOSAL OF REGULATED SOIL – IN-STATE FACILITY**

To be used in areas that are potentially contaminated and the material needs to be disposed of 50% at an in-state facility.

For soil disposal generated from Item 181.11



**ITEM 181.13**      **DISPOSAL OF REGULATED SOIL – OUT-OF-STATE FACILITY**

To be used in areas that are potentially contaminated and the material needs to be disposed of 50% at an out-of-state facility.

For soil disposal generated from Item 181.11

**ITEM 184.1**      **DISPOSAL OF TREATED WOOD PRODUCTS**

For removal of existing wood post & offset blocks.

**ITEM 201.**      **CATCH BASIN**

Catch basin locations with various depths shown below.

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
CBCI-101	101+71	19.00'	RT	Route 44
CBCI-102	103+18	19.00'	RT	Route 44
CBCI-103	103+18	19.00'	LT	Route 44
CBCI-180	104+65	19.00'	RT	Route 44
CB-195	105+17	40.23'	LT	Route 44
CBCI-179	105+49	25.17'	LT	Route 44
CB-192	105+90	40.59'	LT	Route 44
CBCI-109	106+78	25.85'	LT	Route 44
CBCI-111	106+86	19.00'	RT	Route 44
CBCI-181	109+50	26.76'	RT	Route 44
CBCI-112	109+75	29.52'	LT	Route 44
CBCI-119	111+15	38.22'	RT	Route 44
CBCI-121	111+54	39.73'	RT	Route 44
CBCI-116	111+54	32.11'	LT	Route 44
CBCI-117	111+79	32.47'	LT	Route 44
CBCI-122	111+79	40.38'	RT	Route 44
CBCI-124	113+50	43.95'	LT	Route 44
CBCI-127	114+80	49.90'	RT	Route 44
CBCI-125	114+93	34.70'	LT	Route 44
CB-130	116+29	61.13'	RT	Route 44
CBCI-131	116+40	34.57'	LT	Route 44
CBCI-137	118+11	48.39'	RT	Route 44
CBCI-139	119+13	33.99	RT	Route 44
CBCI-182	120+31	33.46'	LT	Route 44
CB-141	120+53	60.54'	LT	Route 44
CB-142	120+81	58.26'	LT	Route 44
CB-194	121+78	26.00'	RT	Route 44
CB-148	121+98	26.00'	RT	Route 44
CBCI-144	121+68	28.91'	LT	Route 44
CBCI-145	121+98	28.10'	LT	Route 44
CBCI-149	123+10	26.00'	RT	Route 44



**ITEM 201.** (Continued)

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
CBCI-188	124+68	26.00'	LT	Route 44
CBCI-156	125+87	26.00'	LT	Route 44
CB-158	125+88	25.17'	RT	Route 44
CBCI-162	132+99	26.00'	LT	Route 44
CB-164	133+23	25.17'	RT	Route 44
CBCI-185	135+56	26.00'	RT	Route 44
CBCI-174	136+96	26.00'	LT	Route 44
CBCI-135	502+51	20.86'	RT	Longmeadow
CBCI-134	502+55	27.45'	LT	Longmeadow
CB-132	502+75	35.53'	LT	Longmeadow
CBCI-203	499+48	16.83'	RT	Longmeadow
CBCI-200	499+51	20.34'	LT	Longmeadow
CBCI-204	505+50	23.63'	LT	Longmeadow
CBCI-206	505+36	22.44'	RT	Longmeadow

**ITEM 202.** **MANHOLE**

Manhole locations with various depths shown below.

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
DMH-178	105+01	17.00'	RT	Route 44
DMH-106	105+06	17.84'	LT	Route 44
DMH-110	106+98	17.00'	RT	Route 44
DMH-118	111+25	37.15'	RT	Route 44
DMH-114	111+28	0.77'	LT	Route 44
DMH-115	111+54	20.71'	LT	Route 44
DMH-120	111+54	29.34'	RT	Route 44
DMH-138	118+12	30.49'	RT	Route 44
DMH-196	118+62	49.77'	LT	Route 44
DMH-140	119+25	27.69'	RT	Route 44
DMH-146	121+98	15.57'	LT	Route 44
DMH-187	124+58	17.13'	LT	Route 44
DMH-199	124+87	17.42'	RT	Route 44
DMH-157	125+80	16.50'	RT	Route 44
DMH-197	133+26	41.48'	LT	Route 44
DMH-165	133+32	16.50'	RT	Route 44
DMH-133	502+67	26.30'	LT	Longmeadow

**ITEM 202.05** **MANHOLE 5 FEET ID**

Manhole locations with various depths shown below.

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
DMH-143	121+88	20.98'	RT	Route 44



**ITEM 202.2**      **MANHOLE (9 TO 14 FOOT DEPTH)**

Manhole locations with various depths shown below.

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
DMH-183	103+26	17.00'	RT	Route 44
DMH-193	129+92	16.50'	RT	Route 44

**ITEM 203.**      **SPECIAL MANHOLE**

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
DMH-198	121+37	26.89'	LT	Route 44

**ITEM 204.**      **GUTTER INLET**

To be used if a shallow inlet is needed due to an underground obstruction, etc.

**ITEM 210.02**      **SANITARY SEWER MANHOLE REMOVED**

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
SMH	120+60	21.10'	LT	Route 44
SMH	122+39	30.76'	LT	Route 44

**ITEM 210.1**      **SANITARY SEWER MANHOLE MUNICIPAL STANDARD**

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
SMH-104	120+60	21.10'	LT	Route 44
SMH-103	121+03	35.23'	LT	Route 44
SMH-102	121+52	34.17'	LT	Route 44
SMH-101	122+39	30.76'	LT	Route 44

**ITEM 220.**      **DRAINAGE STRUCTURE ADJUSTED**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Type</u>	<u>Baseline</u>
100+25	10.59'	RT	DMH-100	Route 44
103+27	23.16'	LT	DMH-104	Route 44
103+87	29.00'	LT	DMH-105	Route 44
106+30	22.98'	LT	DMH-107	Route 44
107+05	13.68'	LT	DMH-108	Route 44
111+21	87.56'	RT	EX. CB-118	Route 44
115+31	52.26'	RT	DMH-128	Route 44
502+68	16.00'	RT	DMH-136	Longmeadow
122+63	53.74'	LT	CB-151	Route 44
122+88	42.93'	LT	CB-152	Route 44



**ITEM 220.** (Continued)

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Type</u>	<u>Baseline</u>
124+04	40.10'	LT	CB-153	Route 44
124+37	40.75'	LT	CB-154	Route 44
129+69	32.16'	LT	DMH-159	Route 44
130+17	30.77'	LT	DMH-161	Route 44
133+51	35.43'	LT	DMH-168	Route 44
133+59	19.44'	LT	DMH-167	Route 44
133+60	3.67'	LT	DMH-166	Route 44
133+69	35.74'	LT	DMH-169	Route 44
135+11	52.12'	LT	CB-170	Route 44
136+22	17.53'	RT	DMH-173	Route 44
136+30	38.33'	LT	CB-172	Route 44
136+85	38.82'	LT	DMH-175	Route 44
137+01	23.86'	RT	DMH-189	Route 44
137+42	21.24'	RT	DMH-190	Route 44
499+27	10.68'	RT	DMH-202	Longmeadow

The use as also applicable to proposed, rebuilt, CIT and remodeled structures.

**ITEM 220.3****DRAINAGE STRUCTURE CHANGE IN TYPE**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Type</u>	<u>Baseline</u>	<u>Structure</u>
109+75	19.58'	LT	CB to DMH	Route 44	CIT-113
113+46	2.52'	LT	CB to DMH	Route 44	CIT-123
116+20	3.20'	LT	CB to DMH	Route 44	CIT-186
133+32	20.18'	LT	CB to DMH	Route 44	CIT-163
499+50	11.20'	LT	CB to DMH	Longmeadow	CIT-201
505+51	22.33'	RT	CB to DMH	Longmeadow	CIT-205

**ITEM 220.5****DRAINAGE STRUCTURE REMODELED**

For use with the remodeling of existing drainage structures, to be used as directed by the Engineer.

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Type</u>	<u>Baseline</u>
115+12	9.95'	LT	DMH-126	Route 44
116+10	47.21'	RT	DMH-129	Route 44
125+79	26.39'	LT	DMH-155	Route 44
130+17	26.64'	LT	CB-160	Route 44
136+14	30.66'	LT	DMH-171	Route 44
505+51	22.33'	RT	CIT-205	Route 44



**ITEM 220.7**      **SANITARY STRUCTURE ADJUSTED**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Type</u>	<u>Baseline</u>
100+25	20.22'	RT	SMH	Route 44
106+94	40.12'	RT	SMH	Route 44
111+74	40.09'	LT	SMH	Route 44
115+18	28.30'	LT	SMH	Route 44
115+44	32.40'	RT	SMH	Route 44
501+88	0.84'	LT	SMH	Longmeadow
119+64	12.20'	RT	SMH	Route 44
122+29	29.59'	RT	SMH	Route 44
122+84	7.58'	LT	SMH	Route 44
124+32	9.12'	LT	SMH	Route 44
128+56	20.86'	LT	SMH	Route 44
129+97	16.24'	LT	SMH	Route 44
131+73	8.63'	LT	SMH	Route 44
133+39	4.32'	LT	SMH	Route 44
136+85	22.61'	LT	SMH	Route 44
137+07	33.50'	RT	SMH	Route 44
498+66	4.54'	LT	SMH	Longmeadow
505+43	27.25'	RT	SMH	Longmeadow
505+78	24.55'	RT	SMH	Longmeadow

**ITEM 220.8**      **SANITARY STRUCTURE REMODELED**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Type</u>	<u>Baseline</u>
108+13	28.20'	LT	SMH	Route 44
135+47	34.60'	LT	SMH	Route 44

**ITEM 221.**      **FRAME AND COVER**

For use with all new and retained Drainage Manholes and Sewer Manholes within the State Highway Layout.

**ITEM 222.1**      **FRAME AND GRATE - MASSDOT CASCADE TYPE**

For use with all new and retained Catch Basins within the State Highway Layout.

**ITEM 222.3**      **FRAME AND GRATE (OR COVER) MUNICIPAL STANDARD**

For use with all new and retained Catch Basins, Drain Manholes and Sewer Manholes within the City layout.



**ITEM 223.2**      **FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED**

For use with all existing drainage structures and sewer manholes to be removed or retained.

**ITEM 224.10**      **10 INCH HOOD**

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
CB-195	105+17	40.23'	LT	Route 44
CBCI-179	105+49	25.17'	LT	Route 44
CB-192	10590.1	40.59'	LT	Route 44
CBCI-124	113+50	43.95'	LT	Route 44
CBCI-131	116+40	34.57'	LT	Route 44
CBCI-200	499+51	20.34'	LT	Longmeadow
CBCI-206	505+36	22.44'	RT	Longmeadow

**ITEM 224.12**      **12 INCH HOOD**

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
CBCI-101	101+71	19.00'	RT	Route 44
CBCI-102	103+18	19.00'	RT	Route 44
CBCI-103	103+18	19.00'	LT	Route 44
CBCI-180	104+65	19.00'	RT	Route 44
CBCI-109	106+78	25.85'	LT	Route 44
CBCI-111	106+86	19.00'	RT	Route 44
CBCI-181	109+50	26.76'	RT	Route 44
CBCI-112	109+75	29.52'	LT	Route 44
CBCI-119	111+15	38.22'	RT	Route 44
CBCI-121	111+54	39.73'	RT	Route 44
CBCI-116	111+54	32.11'	LT	Route 44
CBCI-117	111+79	32.47'	LT	Route 44
CBCI-122	111+79	40.38'	RT	Route 44
CBCI-127	114+80	49.90'	RT	Route 44
CBCI-125	114+93	34.70'	LT	Route 44
CB-130	116+29	61.13'	RT	Route 44
CBCI-137	118+11	48.39'	RT	Route 44
CBCI-139	119+13	33.99	RT	Route 44
CBCI-182	120+31	33.46'	LT	Route 44
CB-141	120+53	60.54'	LT	Route 44
CB-142	120+81	58.26'	LT	Route 44
CB-194	121+78	26.00'	RT	Route 44
CB-148	121+98	26.00'	RT	Route 44
CBCI-144	121+68	28.91'	LT	Route 44
CBCI-145	121+98	28.10'	LT	Route 44
CBCI-149	123+10	26.00'	RT	Route 44
CBCI-188	124+68	26.00'	LT	Route 44
CBCI-156	125+87	26.00'	LT	Route 44



**ITEM 224.12** (Continued)

<u>Structure ID</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
CB-158	125+88	25.17'	RT	Route 44
CBCI-162	132+99	26.00'	LT	Route 44
CB-164	133+23	25.17'	RT	Route 44
CBCI-185	135+56	26.00'	RT	Route 44
CBCI-174	136+96	26.00'	LT	Route 44
CBCI-135	502+51	20.86'	RT	Longmeadow
CBCI-134	502+55	27.45'	LT	Longmeadow
CB-132	502+75	35.53'	LT	Longmeadow
CBCI-203	499+48	16.83'	RT	Longmeadow
CBCI-204	505+50	23.63'	LT	Longmeadow

**ITEM 227.3**      **REMOVAL OF DRAINAGE STRUCTURE SEDIMENT**

For use removing sediment from all catch basins, gutter inlets and drop inlets to be abandoned or removed. Also, for use cleaning existing structures to which proposed drainage discharges.

**ITEM 227.31**      **REMOVAL OF DRAINAGE PIPE SEDIMENT**

For use removing sediment from all drainage pipes within the limits of work.

**ITEM 227.4**      **MASONRY PLUG**

For use of plugging pipes of structure to be removed, and at all active structures with pipes from/to abandoned or removed structures and at other locations as required by the Engineer.

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
105+01	28.38'	LT	Route 44
105+12	28.94'	LT	Route 44
111+30	4.52'	LT	Route 44
111+32	0.96'	RT	Route 44
111+42	5.25'	RT	Route 44
111+45	26.03'	LT	Route 44
111+59	28.96'	LT	Route 44
111+90	30.50'	LT	Route 44
114+98	39.83'	LT	Route 44
115+08	18.57'	LT	Route 44
115+34	51.42'	RT	Route 44
115+63	42.79'	RT	Route 44
120+69	21.79'	LT	Route 44
122+12	29.79'	LT	Route 44
122+41	12.50'	LT	Route 44



**ITEM 227.4** (Continued)

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
122+57	18.29'	RT	Route 44
133+27	38.01'	LT	Route 44
133+31	23.59'	LT	Route 44
133+35	20.05'	LT	Route 44
133+56	19.50'	LT	Route 44
502+37	25.31'	RT	Longmeadow
502+47	22.23'	RT	Longmeadow

**ITEM 234.12 12 INCH DRAINAGE PIPE - OPTION**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
CBCI-101	101+71	RT	Route 44	FES-301	101+73	RT	Route 44
CBCI-102	103+18	RT	Route 44	DMH-183	103+26	RT	Route 44
DMH-183	103+26	RT	Route 44	FES-302	103+32	RT	Route 44
CBCI-103	103+18	LT	Route 44	EX. DMH-104	103+27	LT	Route 44
CBCI-180	104+67	RT	Route 44	DMH-178	104+99	RT	Route 44
CBCI-109	106+80	LT	Route 44	DMH-108	107+04	LT	Route 44
CBCI-111	106+89	RT	Route 44	DMH-110	106+96	RT	Route 44
CBCI-181	109+51	RT	Route 44	CIT-113	109+74	LT	Route 44
CBCI-112	109+75	LT	Route 44	CIT-113	109+75	LT	Route 44
CBCI-119	111+17	RT	Route 44	DMH-118	111+22	RT	Route 44
DMH-120	111+52	RT	Route 44	DMH-118	111+27	RT	Route 44
CBCI-121	111+54	RT	Route 44	DMH-120	111+54	RT	Route 44
CBCI-122	111+77	RT	Route 44	DMH-120	111+56	RT	Route 44
DMH-115	111+52	LT	Route 44	DMH-114	111+29	LT	Route 44
CBCI-116	111+54	LT	Route 44	DMH-115	111+54	LT	Route 44
CBCI-117	111+77	LT	Route 44	DMH-115	111+57	LT	Route 44
CBCI-127	114+82	RT	Route 44	RCP	114+92	RT	Route 44
CBCI-125	114+93	LT	Route 44	EX. DMH-126	115+12	LT	Route 44
CBCI-134	502+58	LT	Longmeadow	DMH-133	502+67	LT	Longmeadow
DMH-133	502+67	LT	Longmeadow	DMH-136	502+68	RT	Longmeadow
CB-132	502+75	LT	Longmeadow	DMH-133	502+67	LT	Longmeadow
CBCI-137	118+11	RT	Route 44	DMH-138	118+12	RT	Route 44
DMH-138	118+15	RT	Route 44	DMH-140	119+24	RT	Route 44
CBCI-139	119+15	RT	Route 44	DMH-140	119+24	RT	Route 44
CBCI-182	120+31	LT	Route 44	DMH-198	121+35	LT	Route 44
DMH-140	119+26	RT	Route 44	CULVERT	121+29	RT	Route 44
CB-141	120+53	LT	Route 44	CB-142	120+81	LT	Route 44
CB-142	120+81	LT	Route 44	FES-305	121+07	LT	Route 44
CBCI-144	121+68	LT	Route 44	DMH-146	121+88	LT	Route 44
CBCI-145	121+98	LT	Route 44	DMH-146	121+88	LT	Route 44
DMH-146	121+98	LT	Route 44	DMH-143	121+88	RT	Route 44
CBCI-149	123+08	RT	Route 44	DMH-143	121+91	RT	Route 44
CB-148	121+96	RT	Route 44	DMH-143	121+91	RT	Route 44
CB-194	121+81	RT	Route 44	DMH-143	121+86	RT	Route 44



**ITEM 234.12 (Continued)**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
DMH-143	121+86	RT	Route 44	CULVERT	121+33	RT	Route 44
CBCI-188	124+66	LT	Route 44	DMH-187	124+59	LT	Route 44
CBCI-156	125+84	LT	Route 44	DMH-155	125+80	LT	Route 44
CB-158	125+88	RT	Route 44	DMH-157	125+80	RT	Route 44
DMH-157	125+80	RT	Route 44	OUTLET	125+80	RT	Route 44
CBCI-162	133+01	LT	Route 44	CIT-163	133+29	LT	Route 44
DMH-197	133+26	LT	Route 44	EX. DMH-168	133+51	LT	Route 44
CB-164	133+23	RT	Route 44	DMH-165	133+32	RT	Route 44
DMH-165	133+32	RT	Route 44	OUTLET	133+32	RT	Route 44
CBCI-185	135+58	RT	Route 44	DMH-173	136+21	RT	Route 44
CBCI-174	136+95	LT	Route 44	DMH-175	136+86	LT	Route 44
CBCI-204	505+50	LT	Longmeadow	RCP	505+50	LT	Longmeadow

**ITEM 234.15      15 INCH DRAINAGE PIPE - OPTION**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
DMH-143	121+86	RT	Route 44	CULVERT	121+33	RT	Route 44

**ITEM 234.18      18 INCH DRAINAGE PIPE - OPTION**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
DMH-114	111+28	LT	Route 44	DMH-118	111+25	RT	Route 44
DMH-118	111+25	RT	Route 44	EX. CB-118	111+21	RT	Route 44
EX. CB-118	111+21	RT	Route 44	FES-306	111+09	RT	Route 44
DMH-126	115+13	LT	Route 44	DMH-128	503+83	RT	Longmeadow
DMH-199	124+87	RT	Route 44	HEADWALL	124+98	RT	Route 44

**ITEM 234.24      24 INCH DRAINAGE PIPE - OPTION**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
DMH-193	129+92	RT	Route 44	OUTLET	129+94	RT	Route 44
RCP	133+61	RT	Route 44	OUTLET	133+62	RT	Route 44
DMH-128	503+86	RT	Longmeadow	OUTLET	505+82	RT	Longmeadow



**ITEM 238.10 10 INCH DUCTILE IRON PIPE**

For use in the event pipe cover is too shallow at the direction of the engineer.

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
CB-195	105+17	LT	Route 44	DMH-106	105+06	LT	Route 44
CBCI-179	105+49	LT	Route 44	DMH-106	105+06	LT	Route 44
CB-192	105+90	LT	Route 44	CB-195	105+17	LT	Route 44
CBCI-124	113+50	LT	Route 44	CIT-123	113+46	LT	Route 44
CBCI-131	116+40	LT	Route 44	CIT-186	116+20	LT	Route 44
CBCI-200	499+50	LT	Longmeadow	CIT-201	499+50	LT	Longmeadow
CBCI-206	505+36	RT	Longmeadow	CIT-205	505+51	RT	Longmeadow

**ITEM 242.12 12 INCH REINFORCED CONCRETE PIPE FLARED END**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Structure</u>	<u>Baseline</u>
101+73	34.74'	RT	FES-301	Route 44
103+32	39.93'	RT	FES-302	Route 44
121+07	56.78'	LT	FES-305	Route 44

**ITEM 242.18 18 INCH REINFORCED CONCRETE PIPE FLARED END**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Structure</u>	<u>Baseline</u>
111+09	200.20'	RT	FES-306	Route 44

**ITEM 245.04 4 FOOT X 4 FOOT REINFORCED CONCRETE BOX CULVERT**

<u>Station</u>	<u>Side</u>	<u>Structure</u>	<u>To Station</u>	<u>Side</u>	<u>To Structure</u>	<u>Baseline</u>
121+36	LT	Ex. Culvert	121+37	LT	DMH-198	Route 44
121+37	LT	DMH-198	121+39	LT	Prop. Headwall	Route 44

**ITEM 247.18 23 INCH X 14 INCH ELLIPTICAL REINFORCED CONCRETE SANITARY SEWER PIPE**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
SMH-103	121+03	LT	Route 44	SMH-102	121+52	LT	Route 44

**ITEM 248.001 SEWER SERVICE RELOCATION**

To be used for any services disrupted during drainage installation.



**ITEM 249.001     SANITARY SEWER BYPASS PUMPING**

The work of this item is to provide for the maintenance of existing sewer flows during the re-routing of the proposed sewer main in the vicinity of the 4'x4' culvert extension.

**ITEM 250.18     18 INCH POLYVINYLCHLORIDE SANITARY SEWER PIPE**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
EX. SMH-105	119+64	RT	Route 44	SMH-104	120+60	LT	Route 44
SMH-104	120+60	LT	Route 44	SMH-103	121+03	LT	Route 44
SMH-102	121+52	LT	Route 44	SMH-101	122+39	LT	Route 44
SMH-101	122+39	LT	Route 44	EX. SMH-100	122+84	LT	Route 44

**ITEM 251.10     10 INCH CURED IN PLACE PIPE**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
EX. SMH	496+95	LT	Longmeadow	EX. SMH	498+66	LT	Longmeadow
EX. SMH	498+66	LT	Longmeadow	EX. SMH	501+88	LT	Longmeadow
EX. SMH	501+88	LT	Longmeadow	EX. SMH	503+03	RT	Longmeadow

**ITEM 251.15     15 INCH CURED IN PLACE PIPE**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
EX. SMH	99+56	RT	Route 44	EX. SMH	100+25	RT	Route 44
EX. SMH	100+25	RT	Route 44	EX. SMH	102+83	RT	Route 44
EX. SMH	102+83	RT	Route 44	EX. SMH	105+36	RT	Route 44
EX. SMH	105+36	RT	Route 44	EX. SMH	106+94	RT	Route 44
EX. SMH	137+07	RT	Route 44	EX. SMH	139+12	RT	Route 44

**ITEM 251.18     18 INCH CURED IN PLACE PIPE**

<u>From Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Structure</u>	<u>Station</u>	<u>Side</u>	<u>Baseline</u>
EX. SMH	106+94	RT	Route 44	EX. SMH	108+12	LT	Route 44
EX. SMH	108+12	LT	Route 44	EX. SMH	111+74	LT	Route 44
EX. SMH	111+74	LT	Route 44	EX. SMH	115+18	LT	Route 44
EX. SMH	115+18	LT	Route 44	EX. SMH-105	119+64	RT	Route 44
EX. SMH-100	122+84	LT	Route 44	EX. SMH	124+32	LT	Route 44
EX. SMH	124+32	LT	Route 44	EX. SMH	128+56	LT	Route 44
EX. SMH	128+56	LT	Route 44	EX. SMH	129+97	LT	Route 44
EX. SMH	129+97	LT	Route 44	EX. SMH	131+73	LT	Route 44
EX. SMH	131+73	LT	Route 44	EX. SMH	133+39	LT	Route 44
EX. SMH	133+39	LT	Route 44	EX. SMH	136+85	LT	Route 44
EX. SMH	136+85	LT	Route 44	EX. SMH	137+07	RT	Route 44



**ITEM 258.**      **STONE FOR PIPE ENDS**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
101+74	41.42'	RT	Route 44
103+26	46.73'	RT	Route 44
104+99	38.92'	RT	Route 44
106+92	44.74'	RT	Route 44
111+09	208.77'	RT	Route 44
121+14	56.41'	LT	Route 44
124+98	30.63'	RT	Route 44
125+80	29.10'	RT	Route 44
129+98	29.00'	RT	Route 44

**ITEM 272.12**      **12 INCH AND UNDER PIPE REMOVED AND DISCARDED**

For use with the poor pipe conditions or as directed by the Engineer.

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>
103+26	RT	Route 44	103+26	RT	Route 44	Drain
103+29	RT	Route 44	103+30	RT	Route 44	Drain
111+25	RT	Route 44	111+44	RT	Route 44	Drain
118+73	LT	Route 44	119+00	LT	Route 44	Drain
120+51	LT	Route 44	120+81	LT	Route 44	Drain
120+82	LT	Route 44	121+07	LT	Route 44	Drain
136+86	LT	Route 44	136+88	LT	Route 44	Drain
136+86	LT	Route 44	136+89	LT	Route 44	Drain
502+78	LT	Longmeadow	502+84	LT	Longmeadow	Drain

**ITEM 272.18**      **18 INCH AND UNDER PIPE REMOVED AND DISCARDED**

For use with the poor pipe conditions or as directed by the Engineer.

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>
103+26	RT	Route 44	103+26	RT	Route 44	Drain

**ITEM 272.24**      **24 INCH AND UNDER PIPE REMOVED AND DISCARDED**

For use with the poor pipe conditions or as directed by the Engineer.

**ITEM 272.30**      **30 INCH AND UNDER PIPE REMOVED AND DISCARDED**

For use with the poor pipe conditions or as directed by the Engineer.

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>
106+92	RT	Route 44	106+91	RT	Route 44	Drain



**ITEM 292.1**      **TRENCH DRAIN**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>
118+75	LT	Route 44	119+00	LT	Route 44	Drain

**ITEM 303.06**      **6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**

<u>From Station</u>	<u>Offset</u>	<u>Side</u>	<u>To Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
502+45	24'	LT	502+45	28'	LT	Longmeadow
122+99	38'	LT	122+98	43'	LT	Route 44
128+13	33'	LT	12+13	37'	LT	Route 44

**ITEM 309.**      **DUCTILE IRON FITTINGS FOR WATER PIPE**

To be used where existing 6" water pipes require reconfiguration to install reset hydrants

**ITEM 347.1**      **1 INCH COPPER TUBING TYPE K**

<u>From Station</u>	<u>Offset</u>	<u>Side</u>	<u>To Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
500+04	13'	LT	500+05	24'	LT	Longmeadow
501+07	15'	LT	501+07	23'	LT	Longmeadow
131+50	24'	LT	131+50	35'	LT	Route 44
132+82	18'	LT	132+82	34'	LT	Route 44

**ITEM 350.06**      **6 INCH GATE AND GATE BOX**

For use in the event an existing gate and gate box needs to be replaced.

**ITEM 357.20**      **20 INCH GATE BOX**

For use in the event an existing gate box needs to be replaced.



**ITEM 358.**      **GATE BOX ADJUSTED**

For the locations listed below and additional locations as required by the Engineer.

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
100+41	15.30'	LT	Route 44
104+62	30.33'	LT	Route 44
115+81	36.71'	LT	Route 44
115+91	41.41'	LT	Route 44
121+24	6.09'	RT	Route 44
122+80	28.42'	RT	Route 44
122+85	17.21'	LT	Route 44
128+13	27.15'	LT	Route 44
129+80	24.51'	LT	Route 44
133+40	18.18'	LT	Route 44
133+57	23.10'	LT	Route 44
133+61	24.42'	LT	Route 44
134+89	33.79'	LT	Route 44
135+15	15.15'	RT	Route 44
135+16	21.72'	RT	Route 44
135+18	7.71'	RT	Route 44
136+53	40.38'	LT	Route 44
136+56	11.00'	LT	Route 44
501+82	14.57'	RT	Longmeadow
502.+47	12.86'	LT	Longmeadow
502+73	10.23'	RT	Longmeadow
502+73	10.23'	RT	Longmeadow

**ITEM 363.1**      **1 INCH CORPORATION COCK**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
500+05	LT	Longmeadow
501+07	LT	Longmeadow
131+50	LT	Route 44
132+82	LT	Route 44

**ITEM 376.2**      **HYDRANT – REMOVED AND RESET**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
502+45	27	LT	Longmeadow
128+12	37	LT	Route 44
122+98	43	LT	Route 44



**ITEM 376.5**      **HYDRANT – ADJUSTED**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
104+62	32	LT	Route 44

**ITEM 381.**      **SERVICE BOX**

To be used where the contractor encounters a service box that is unable to be reset.

**ITEM 381.1**      **SERVICE BOX REMOVED AND RESET**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
131+50	23'	LT	Route 44
132+82	18'	LT	Route 44
500+04	13'	LT	Longmeadow
501+07	15'	LT	Longmeadow

**ITEM 381.3**      **SERVICE BOX ADJUSTED**

For the locations listed below and additional locations as required by the Engineer.

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
102+23	26.75'	LT	Route 44
501+42	28.33'	RT	Longmeadow
126+08	30.90'	LT	Route 44
127+02	30.41'	LT	Route 44
128+60	30.98'	LT	Route 44
499+73	20.89'	RT	Longmeadow

**ITEM 384.**      **CURB STOP**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
500+05	24'	LT	Longmeadow
501+07	23'	LT	Longmeadow
131+50	35'	LT	Route 44
132+82	34'	LT	Route 44

**ITEM 385.2**      **MONITORING WELL ADJUSTED**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
123+10	36'	RT	Route 44



**ITEM 431. HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE**

For use with existing concrete slab repair in areas of milling and pavement overlay and full depth pavement reconstruction.

**ITEM 470. HOT MIX ASPHALT BERM**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	RT	Route 44	134+85	RT	Route 44

**ITEM 470.2 HOT MIX ASPHALT BERM, TYPE A - MODIFIED**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
118+13	LT	Route 44	118+55	LT	Route 44
119+03	LT	Route 44	119+26	LT	Route 44
120+35	LT	Route 44	120+48	LT	Route 44
120+84	LT	Route 44	120+98	LT	Route 44
124+12	RT	Route 44	124+35	RT	Route 44

**ITEM 482.31 SAWING & SEALING JOINTS IN ASPHALT PAVEMENT AT BRIDGES**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
506+04	RT	Longmeadow	506+18	LT	Longmeadow

**ITEM 482.32 SAWING & SEALING JOINTS IN ASPHALT PAVEMENT**

For use with along concrete slab.

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
115+17	LT	Route 44	115+17	RT	Route 44
116+12	LT	Route 44	116+12	RT	Route 44
118+76	LT	Route 44	118+76	RT	Route 44
118+76	RT	Route 44	122+04	RT	Route 44
124+90	LT	Route 44	124+90	RT	Route 44
135+50	LT	Route 44	135+50	RT	Route 44
135+50	RT	Route 44	136+35	RT	Route 44



**ITEM 482.5**      **SAWCUTTING ASPHALT PAVEMENT FOR BOX WIDENING**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
111+84	LT	Route 44	115+28	RT	Route 44
113+28	LT	Route 44	114+59	LT	Route 44
115+91	RT	Route 44	124+90	RT	Route 44
117+11	LT	Route 44	124+90	LT	Route 44
128+22	LT	Route 44	128+65	LT	Route 44
130+21	LT	Route 44	134+21	LT	Route 44
135+50	LT	Route 44	136+21	LT	Route 44
135+50	RT	Route 44	136+34	RT	Route 44
498+35	LT	Longmeadow	116+07	LT	Route 44
502+47	RT	Longmeadow	502+81	RT	Longmeadow
503+85	CTR	Longmeadow	505+03	CTR	Longmeadow
504+03	LT	Longmeadow	506+18	LT	Longmeadow
505+23	RT	Longmeadow	506+04	RT	Longmeadow

**ITEM 504.**      **GRANITE CURB TYPE VA4 - STRAIGHT**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
124+35	RT	Route 44	124+64	RT	Route 44
505+88	LT	Longmeadow	506+05	LT	Longmeadow
505+68	RT	Longmeadow	505+84	RT	Longmeadow

**ITEM 504.2**      **GRANITE CURB TYPE VA4 – SPLAYED END**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
135+39	RT	Route 44
498+41	LT	Longmeadow

**ITEM 506.**      **GRANITE CURB TYPE VB – STRAIGHT**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
100+17	RT	Route 44	100+50	RT	Route 44
100+37	LT	Route 44	101+22	LT	Route 44
100+50	RT	Route 44	101+92	RT	Route 44
101+55	LT	Route 44	102+08	LT	Route 44
101+92	RT	Route 44	104+27	RT	Route 44
102+45	LT	Route 44	102+58	LT	Route 44
103+01	LT	Route 44	103+42	LT	Route 44
103+96	LT	Route 44	104+91	LT	Route 44
104+27	RT	Route 44	108+15	RT	Route 44
105+46	LT	Route 44	105+77	LT	Route 44
106+15	LT	Route 44	106+96	LT	Route 44
107+41	LT	Route 44	109+20	LT	Route 44
108+15	RT	Route 44	110+18	RT	Route 44



**ITEM 506.** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
109+68	LT	Route 44	110+75	LT	Route 44
110+18	RT	Route 44	112+92	RT	Route 44
111+10	LT	Route 44	112+60	LT	Route 44
111+22	RT	Route 44	111+51	RT	Route 44
111+23	LT	Route 44	114+87	LT	Route 44
111+51	RT	Route 44	112+10	RT	Route 44
112+10	RT	Route 44	112+68	RT	Route 44
112+68	RT	Route 44	113+36	RT	Route 44
112+92	RT	Route 44	114+29	RT	Route 44
113+08	LT	Route 44	113+20	LT	Route 44
113+31	LT	Route 44	113+47	LT	Route 44
113+36	LT	Route 44	113+80	LT	Route 44
113+57	LT	Route 44	114+17	LT	Route 44
113+80	LT	Route 44	114+87	LT	Route 44
114+27	LT	Route 44	114+78	LT	Route 44
114+29	RT	Route 44	115+01	RT	Route 44
114+87	LT	Route 44	115+08	LT	Route 44
114+87	LT	Route 44	115+08	LT	Route 44
115+03	RT	Route 44	115+15	RT	Route 44
115+04	RT	Route 44	115+16	RT	Route 44
115+28	RT	Route 44	115+39	RT	Route 44
115+34	RT	Route 44	115+38	RT	Route 44
115+40	RT	Route 44	115+40	RT	Route 44
115+41	RT	Route 44	115+42	RT	Route 44
115+88	RT	Route 44	115+88	RT	Route 44
115+88	RT	Route 44	115+89	RT	Route 44
115+90	RT	Route 44	115+93	RT	Route 44
115+93	RT	Route 44	116+01	RT	Route 44
116+11	RT	Route 44	116+17	RT	Route 44
116+12	RT	Route 44	116+18	RT	Route 44
116+19	RT	Route 44	117+84	RT	Route 44
116+19	RT	Route 44	117+84	RT	Route 44
116+43	LT	Route 44	118+60	LT	Route 44
116+98	RT	Route 44	117+45	RT	Route 44
117+56	RT	Route 44	118+14	RT	Route 44
118+13	LT	Route 44	118+38	LT	Route 44
118+23	RT	Route 44	118+58	RT	Route 44
118+38	LT	Route 44	118+38	LT	Route 44
118+41	LT	Route 44	118+55	LT	Route 44
118+66	LT	Route 44	118+74	LT	Route 44
118+66	RT	Route 44	119+22	RT	Route 44
118+75	LT	Route 44	118+75	LT	Route 44
119+00	LT	Route 44	119+01	LT	Route 44
119+03	LT	Route 44	119+07	LT	Route 44
119+08	LT	Route 44	119+26	LT	Route 44
119+16	LT	Route 44	119+70	LT	Route 44



**ITEM 506.** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
119+26	LT	Route 44	120+35	LT	Route 44
119+52	RT	Route 44	120+38	RT	Route 44
119+70	LT	Route 44	120+36	LT	Route 44
120+20	LT	Route 44	120+35	LT	Route 44
120+22	LT	Route 44	120+50	LT	Route 44
120+51	LT	Route 44	120+51	LT	Route 44
120+75	RT	Route 44	121+47	RT	Route 44
120+81	LT	Route 44	120+82	LT	Route 44
120+84	LT	Route 44	120+98	LT	Route 44
120+96	LT	Route 44	122+30	LT	Route 44
122+33	RT	Route 44	122+38	RT	Route 44
122+59	LT	Route 44	122+63	LT	Route 44
122+92	LT	Route 44	122+92	LT	Route 44
122+97	RT	Route 44	123+24	RT	Route 44
122+97	RT	Route 44	124+08	RT	Route 44
123+23	LT	Route 44	123+78	LT	Route 44
123+24	RT	Route 44	124+08	RT	Route 44
124+33	LT	Route 44	124+33	LT	Route 44
124+65	LT	Route 44	125+38	LT	Route 44
125+38	LT	Route 44	127+50	LT	Route 44
128+09	LT	Route 44	128+67	LT	Route 44
128+22	LT	Route 44	129+55	LT	Route 44
128+72	LT	Route 44	128+86	LT	Route 44
130+21	LT	Route 44	130+97	LT	Route 44
131+31	LT	Route 44	133+04	LT	Route 44
133+09	LT	Route 44	133+14	LT	Route 44
133+67	LT	Route 44	133+73	LT	Route 44
133+85	LT	Route 44	134+21	LT	Route 44
134+21	LT	Route 44	134+45	LT	Route 44
134+60	LT	Route 44	134+70	LT	Route 44
134+81	LT	Route 44	134+96	LT	Route 44
135+45	RT	Route 44	135+69	RT	Route 44
135+61	LT	Route 44	136+06	LT	Route 44
136+19	RT	Route 44	137+21	RT	Route 44
136+21	RT	Route 44	136+34	RT	Route 44
136+34	RT	Route 44	137+07	RT	Route 44
136+68	LT	Route 44	136+68	LT	Route 44
136+94	LT	Route 44	137+21	LT	Route 44
137+07	RT	Route 44	137+21	RT	Route 44
137+41	RT	Route 44	137+50	RT	Route 44



**ITEM 506.** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
498+35	RT	Longmeadow	498+45	RT	Longmeadow
498+41	LT	Longmeadow	499+01	LT	Longmeadow
498+92	RT	Longmeadow	499+76	RT	Longmeadow
499+23	LT	Longmeadow	499+70	LT	Longmeadow
499+91	LT	Longmeadow	500+59	LT	Longmeadow
500+09	RT	Longmeadow	500+67	RT	Longmeadow
500+81	LT	Longmeadow	502+10	LT	Longmeadow
501+11	RT	Longmeadow	501+85	RT	Longmeadow
502+10	LT	Longmeadow	502+58	LT	Longmeadow
502+23	RT	Longmeadow	502+45	RT	Longmeadow
504+11	RT	Longmeadow	504+74	RT	Longmeadow
504+65	LT	Longmeadow	504+71	LT	Longmeadow
504+74	RT	Longmeadow	505+84	RT	Longmeadow
504+83	LT	Longmeadow	505+70	LT	Longmeadow
505+70	LT	Longmeadow	505+83	LT	Longmeadow
505+83	LT	Longmeadow	506+05	LT	Longmeadow

**ITEM 506.1****GRANITE CURB TYPE VB – CURVED**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
104+91	LT	Route 44	104+94	LT	Route 44
106+96	LT	Route 44	106+97	LT	Route 44
107+39	LT	Route 44	107+41	LT	Route 44
109+20	LT	Route 44	109+20	LT	Route 44
109+66	LT	Route 44	109+68	LT	Route 44
110+75	LT	Route 44	110+75	LT	Route 44
111+22	LT	Route 44	111+23	LT	Route 44
112+60	LT	Route 44	112+62	LT	Route 44
113+20	LT	Route 44	113+31	LT	Route 44
113+47	LT	Route 44	113+57	LT	Route 44
114+17	LT	Route 44	114+27	LT	Route 44
114+78	LT	Route 44	115+12	LT	Route 44
115+03	RT	Route 44	115+04	RT	Route 44
115+08	LT	Route 44	115+08	LT	Route 44
115+26	LT	Route 44	115+30	LT	Route 44
115+38	RT	Route 44	115+40	RT	Route 44
115+38	LT	Route 44	115+39	LT	Route 44
115+39	RT	Route 44	115+42	RT	Route 44
115+88	RT	Route 44	115+90	RT	Route 44
115+89	RT	Route 44	115+93	RT	Route 44
116+01	LT	Route 44	116+07	LT	Route 44
116+04	RT	Route 44	116+04	RT	Route 44
116+04	RT	Route 44	116+15	RT	Route 44
116+17	RT	Route 44	116+18	RT	Route 44
116+19	RT	Route 44	116+19	RT	Route 44



**ITEM 506.1** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
116+23	LT	Route 44	116+43	LT	Route 44
116+31	RT	Route 44	116+85	RT	Route 44
116+85	RT	Route 44	116+98	RT	Route 44
117+45	RT	Route 44	117+56	RT	Route 44
117+84	RT	Route 44	117+84	RT	Route 44
118+14	RT	Route 44	118+23	RT	Route 44
118+38	LT	Route 44	118+41	LT	Route 44
118+58	RT	Route 44	118+66	RT	Route 44
118+60	LT	Route 44	118+61	LT	Route 44
118+74	LT	Route 44	118+75	LT	Route 44
118+75	LT	Route 44	118+75	LT	Route 44
119+00	LT	Route 44	119+01	LT	Route 44
119+01	LT	Route 44	119+03	LT	Route 44
119+07	LT	Route 44	119+08	LT	Route 44
119+14	LT	Route 44	119+16	LT	Route 44
119+22	RT	Route 44	119+32	RT	Route 44
120+20	LT	Route 44	120+22	LT	Route 44
120+36	LT	Route 44	120+36	LT	Route 44
120+38	RT	Route 44	120+40	RT	Route 44
120+50	LT	Route 44	120+51	LT	Route 44
120+51	LT	Route 44	120+51	LT	Route 44
120+62	RT	Route 44	120+75	RT	Route 44
120+81	LT	Route 44	120+81	LT	Route 44
120+82	LT	Route 44	120+84	LT	Route 44
120+94	LT	Route 44	120+96	LT	Route 44
121+47	RT	Route 44	121+61	RT	Route 44
122+21	RT	Route 44	122+33	RT	Route 44
122+30	LT	Route 44	122+36	LT	Route 44
122+38	RT	Route 44	122+52	RT	Route 44
122+54	LT	Route 44	122+59	LT	Route 44
122+92	LT	Route 44	123+00	LT	Route 44
122+97	RT	Route 44	122+97	RT	Route 44
123+18	LT	Route 44	123+23	LT	Route 44
123+78	LT	Route 44	123+83	LT	Route 44
124+01	LT	Route 44	124+08	LT	Route 44
124+08	RT	Route 44	124+08	RT	Route 44
124+33	LT	Route 44	124+39	LT	Route 44
124+56	LT	Route 44	124+65	LT	Route 44
127+50	LT	Route 44	127+51	LT	Route 44
128+22	LT	Route 44	128+22	LT	Route 44
129+55	LT	Route 44	129+57	LT	Route 44
130+18	LT	Route 44	130+21	LT	Route 44
133+04	LT	Route 44	133+09	LT	Route 44
134+45	LT	Route 44	134+60	LT	Route 44
134+70	LT	Route 44	134+81	LT	Route 44
135+59	LT	Route 44	135+61	LT	Route 44



**ITEM 506.1** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
135+69	RT	Route 44	135+69	RT	Route 44
136+06	LT	Route 44	136+14	LT	Route 44
136+19	RT	Route 44	136+21	RT	Route 44
136+30	LT	Route 44	136+33	LT	Route 44
136+68	LT	Route 44	136+70	LT	Route 44
136+85	LT	Route 44	136+94	LT	Route 44
137+21	LT	Route 44	137+23	LT	Route 44
137+41	LT	Route 44	137+48	LT	Route 44

**ITEM 509. GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS – STRAIGHT**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	
101+22	LT	Route 44	101+29	LT	Route 44	
101+49	LT	Route 44	101+55	LT	Route 44	
102+08	LT	Route 44	102+16	LT	Route 44	
102+38	LT	Route 44	102+45	LT	Route 44	
102+58	LT	Route 44	102+66	LT	Route 44	
102+94	LT	Route 44	103+01	LT	Route 44	
103+42	LT	Route 44	103+50	LT	Route 44	
103+90	LT	Route 44	103+96	LT	Route 44	
105+39	LT	Route 44	105+46	LT	Route 44	
105+77	LT	Route 44	105+85	LT	Route 44	
106+08	LT	Route 44	106+11	LT	Route 44	
106+13	LT	Route 44	106+15	LT	Route 44	
111+09	LT	Route 44	111+10	LT	Route 44	
113+07	LT	Route 44	113+08	LT	Route 44	
115+01	RT	Route 44	115+07	RT	Route 44	
115+10	RT	Route 44	115+18	RT	Route 44	
115+15	RT	Route 44	115+20	RT	Route 44	***
115+16	RT	Route 44	115+23	RT	Route 44	***
115+24	RT	Route 44	115+28	RT	Route 44	***
115+28	RT	Route 44	115+34	RT	Route 44	***
115+40	RT	Route 44	115+41	RT	Route 44	***
115+41	RT	Route 44	115+41	RT	Route 44	***
115+88	RT	Route 44	115+88	RT	Route 44	***
115+88	RT	Route 44	115+88	RT	Route 44	***
115+92	LT	Route 44	115+96	LT	Route 44	
115+93	RT	Route 44	116+00	RT	Route 44	***
116+01	RT	Route 44	116+05	RT	Route 44	***
116+05	RT	Route 44	116+11	RT	Route 44	***
116+08	RT	Route 44	116+12	RT	Route 44	***
130+97	LT	Route 44	131+04	LT	Route 44	
131+24	LT	Route 44	131+31	LT	Route 44	
133+04	LT	Route 44	133+05	LT	Route 44	



**ITEM 509.** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
133+73	LT	Route 44	133+76	LT	Route 44
136+13	RT	Route 44	136+19	RT	Route 44
137+21	RT	Route 44	137+29	RT	Route 44
137+21	RT	Route 44	137+29	RT	Route 44
137+34	RT	Route 44	137+41	RT	Route 44
498+45	RT	Longmeadow	498+52	RT	Longmeadow
498+85	RT	Longmeadow	498+92	RT	Longmeadow
499+76	RT	Longmeadow	499+83	RT	Longmeadow
500+03	RT	Longmeadow	500+09	RT	Longmeadow
500+67	RT	Longmeadow	500+76	RT	Longmeadow
501+05	RT	Longmeadow	501+11	RT	Longmeadow
501+85	RT	Longmeadow	501+96	RT	Longmeadow
502+16	RT	Longmeadow	502+23	RT	Longmeadow

\*\*=3" Reveal

\*\*\*=4" Reveal

**ITEM 509.1****GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS –  
CURVED**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	
106+97	LT	Route 44	107+05	LT	Route 44	
107+32	LT	Route 44	107+39	LT	Route 44	
109+20	LT	Route 44	109+28	LT	Route 44	
109+60	LT	Route 44	109+66	LT	Route 44	
110+75	LT	Route 44	110+84	LT	Route 44	
111+03	LT	Route 44	111+09	LT	Route 44	
112+62	LT	Route 44	112+69	LT	Route 44	
113+00	LT	Route 44	113+07	LT	Route 44	
113+20	LT	Route 44	113+31	LT	Route 44	
113+47	LT	Route 44	113+57	LT	Route 44	
114+17	LT	Route 44	114+27	LT	Route 44	
115+12	LT	Route 44	115+19	LT	Route 44	
115+23	LT	Route 44	115+26	LT	Route 44	**
115+30	LT	Route 44	115+32	LT	Route 44	**
115+34	LT	Route 44	115+38	LT	Route 44	
115+98	LT	Route 44	116+01	LT	Route 44	**
116+07	LT	Route 44	116+10	LT	Route 44	**
116+15	LT	Route 44	116+23	LT	Route 44	
116+15	RT	Route 44	116+23	RT	Route 44	
116+26	RT	Route 44	116+31	RT	Route 44	
118+61	LT	Route 44	118+69	LT	Route 44	
119+07	LT	Route 44	119+14	LT	Route 44	
120+36	LT	Route 44	120+44	LT	Route 44	
120+87	LT	Route 44	120+94	LT	Route 44	



**ITEM 509.1** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	
122+36	LT	Route 44	122+42	LT	Route 44	
122+49	LT	Route 44	122+54	LT	Route 44	
123+00	LT	Route 44	123+04	LT	Route 44	
123+10	LT	Route 44	123+18	LT	Route 44	
123+83	LT	Route 44	123+90	LT	Route 44	
123+96	LT	Route 44	124+01	LT	Route 44	
124+39	LT	Route 44	124+43	LT	Route 44	
124+48	LT	Route 44	124+56	LT	Route 44	
127+51	LT	Route 44	127+58	LT	Route 44	
128+14	LT	Route 44	128+22	LT	Route 44	
129+57	LT	Route 44	129+65	LT	Route 44	
130+12	LT	Route 44	130+18	LT	Route 44	
133+05	LT	Route 44	133+11	LT	Route 44	
133+79	LT	Route 44	133+85	LT	Route 44	
134+96	LT	Route 44	135+04	LT	Route 44	
135+52	LT	Route 44	135+59	LT	Route 44	
135+69	RT	Route 44	135+77	RT	Route 44	
136+13	RT	Route 44	136+19	RT	Route 44	
136+14	LT	Route 44	136+22	LT	Route 44	
136+26	LT	Route 44	136+30	LT	Route 44	
136+70	LT	Route 44	136+74	LT	Route 44	
136+78	LT	Route 44	136+85	LT	Route 44	
137+23	LT	Route 44	137+30	LT	Route 44	
137+35	LT	Route 44	137+41	LT	Route 44	***

\*\*=3" Reveal

\*\*\*=4" Reveal

**ITEM 510. GRANITE EDGING TYPE SA**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
121+86	RT	Route 44	121+86	RT	Route 44
122+01	RT	Route 44	122+01	RT	Route 44
134+90	RT	Route 44	134+96	RT	Route 44
134+96	RT	Route 44	135+21	RT	Route 44
135+21	RT	Route 44	135+39	RT	Route 44

**ITEM 510.1 GRANITE EDGING TYPE SA (RADIUS 10 FEET OR LESS)**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
121+86	RT	Route 44	122+01	RT	Route 44



**ITEM 514. GRANITE CURB INLET – STRAIGHT**

To be used with all CBCI's and GICI's located on a curb with radius greater than 160'.

For the locations listed below, less the quantity of Item 581. - Granite Curb Inlet Removed and Reset..”

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Structure</u>
103+18	LT	Route 44	CBCI-103
104+65	RT	Route 44	CBCI-180
105+49	LT	Route 44	CBCI-179
106+78	LT	Route 44	CBCI-109
106+86	RT	Route 44	CBCI-111
109+50	RT	Route 44	CBCI-181
109+75	LT	Route 44	CBCI-112
111+15	RT	Route 44	CBCI-119
111+54	RT	Route 44	CBCI-121
111+54	LT	Route 44	CBCI-116
111+79	LT	Route 44	CBCI-117
111+79	RT	Route 44	CBCI-122
118+11	RT	Route 44	CBCI-137
119+13	RT	Route 44	CBCI-139
120+31	LT	Route 44	CBCI-182
121+68	LT	Route 44	CBCI-144
121+98	LT	Route 44	CBCI-145
123+10	RT	Route 44	CBCI-149
124+68	LT	Route 44	CBCI-188
125+87	LT	Route 44	CBCI-156
132+99	LT	Route 44	CBCI-162
135+56	RT	Route 44	CBCI-185
136+96	LT	Route 44	CBCI-174
499+51	LT	Longmeadow	GICI-200
505+50	LT	Longmeadow	CBCI-204
505+36	RT	Longmeadow	CBCI-206

**ITEM 515. GRANITE CURB INLET – CURVED**

To be used with all CBCI's and GICI's located on a curb with radius less than or equal to 160'.

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Structure</u>
113+50	LT	Route 44	CBCI-124
114+93	LT	Route 44	CBCI-125
114+80	RT	Route 44	CBCI-127
116+40	LT	Route 44	CBCI-131
502+51	RT	Longmeadow	CBCI-135
502+55	LT	Longmeadow	CBCI-134



**ITEM 580. CURB REMOVED AND RESET**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
100+17	19 RT	Route 44	100+35	19 RT	Route 44
100+35	19 RT	Route 44	100+92	19 RT	Route 44
100+35	21 LT	Route 44	100+92	21 LT	Route 44
100+92	21 LT	Route 44	101+31	20 LT	Route 44
100+92	19 RT	Route 44	105+41	20 RT	Route 44
101+49	20 LT	Route 44	102+16	20 LT	Route 44
102+38	20 LT	Route 44	102+66	20 LT	Route 44
102+94	20 LT	Route 44	103+50	20 LT	Route 44
103+90	20 LT	Route 44	104+87	20 LT	Route 44
105+38	20 LT	Route 44	105+85	20 LT	Route 44
105+41	20 RT	Route 44	106+05	20 RT	Route 44
106+05	20 RT	Route 44	110+93	32 RT	Route 44
106+26	20 LT	Route 44	107+03	20 LT	Route 44
107+41	20 LT	Route 44	109+24	20 LT	Route 44
109+70	21 LT	Route 44	110+69	26 LT	Route 44
110+93	32 RT	Route 44	111+19	33 RT	Route 44
111+04	28 LT	Route 44	112+63	36 LT	Route 44
111+19	33 RT	Route 44	114+46	34 RT	Route 44
113+10	37 LT	Route 44	114+88	42 LT	Route 44
115+20	47 RT	Route 44	115+24	33 RT	Route 44
115+23	50 RT	Route 44	115+39	51 RT	Route 44
115+30	33 RT	Route 44	115+38	46 RT	Route 44
115+93	48 RT	Route 44	116+17	44 RT	Route 44
115+93	43 RT	Route 44	116+00	32 RT	Route 44
116+05	32 RT	Route 44	116+20	41 RT	Route 44
116+30	41 LT	Route 44	117+11	36 LT	Route 44
116+80	36 RT	Route 44	117+02	35 RT	Route 44
117+02	35 RT	Route 44	117+21	35 RT	Route 44
117+11	36 LT	Route 44	117+31	34 LT	Route 44
117+21	35 RT	Route 44	119+27	30 RT	Route 44
117+31	34 LT	Route 44	118+52	24 LT	Route 44
119+19	19 LT	Route 44	120+34	15 LT	Route 44
119+52	31 RT	Route 44	120+46	29 RT	Route 44
121+03	14 LT	Route 44	122+32	19 LT	Route 44
123+25	21 LT	Route 44	123+73	22 LT	Route 44
124+67	23 LT	Route 44	126+50	25 LT	Route 44
126+62	25 LT	Route 44	127+64	28 LT	Route 44
128+08	29 LT	Route 44	129+65	30 LT	Route 44
130+08	28 LT	Route 44	131+05	24 LT	Route 44
131+25	23 LT	Route 44	131+98	19 LT	Route 44
131+98	19 LT	Route 44	132+01	19 LT	Route 44
132+01	19 LT	Route 44	133+18	18 LT	Route 44
133+92	19 LT	Route 44	134+54	21 LT	Route 44
135+68	25 LT	Route 44	136+01	26 LT	Route 44
136+35	27 RT	Route 44	137+50	32 RT	Route 44
136+85	32 LT	Route 44	137+50	34 LT	Route 44



**ITEM 580.** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
499+46	18 RT	Longmeadow	499+50	18 RT	Longmeadow
500+84	10 LT	Longmeadow	502+39	19 LT	Longmeadow
501+13	23 RT	Longmeadow	501+95	26 RT	Longmeadow
502+17	26 RT	Longmeadow	502+38	26 RT	Longmeadow
504+35	37 RT	Longmeadow	504+73	29 RT	Longmeadow
504+35	37 LT	Longmeadow	504+62	30 LT	Longmeadow
504+62	30 LT	Longmeadow	506+18	22 LT	Longmeadow
504+73	29 RT	Longmeadow	506+04	23 RT	Longmeadow
506+04	23 RT	Longmeadow	506+04	23 RT	Longmeadow

Less curb determined to be unsuitable under Item 594.

**ITEM 581.** **CURB INLET REMOVED AND RESET**

For the locations listed below, less 75% of curb inlets determined to be unsuitable for reuse. Existing curb inlets unsuitable for reuse will be discarded under Item 595

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
101+71	RT	Route 44
103+27	LT	Route 44
103+30	RT	Route 44
105+07	LT	Route 44
106+93	LT	Route 44
111+45	RT	Route 44
111+46	LT	Route 44
111+97	LT	Route 44
114+91	RT	Route 44
114+97	LT	Route 44
116+29	RT	Route 44
119+19	RT	Route 44
130+17	LT	Route 44
136+88	LT	Route 44
499+48	RT	Longmeadow
502+35	RT	Longmeadow
502+67	LT	Longmeadow
505+50	LT	Longmeadow
505+51	RT	Longmeadow

Less curb determined to be unsuitable under Item 595.



**ITEM 594.****CURB REMOVED AND DISCARDED**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
105+00	25 LT	Route 44	105+07	30 LT	Route 44
105+07	30 LT	Route 44	105+09	32 LT	Route 44
105+34	26 LT	Route 44	105+37	31 LT	Route 44
105+88	32 LT	Route 44	105+89	31 LT	Route 44
105+89	31 LT	Route 44	105+92	25 LT	Route 44
106+05	32 LT	Route 44	106+14	26 LT	Route 44
107+08	25 LT	Route 44	107+12	31 LT	Route 44
107+11	31 LT	Route 44	107+12	42 LT	Route 44
107+26	41 LT	Route 44	107+29	31 LT	Route 44
107+29	31 LT	Route 44	107+33	26 LT	Route 44
109+32	24 LT	Route 44	109+34	34 LT	Route 44
109+57	34 LT	Route 44	109+64	26 LT	Route 44
110+81	32 LT	Route 44	110+90	46 LT	Route 44
111+01	39 LT	Route 44	111+01	32 LT	Route 44
112+72	42 LT	Route 44	112+75	47 LT	Route 44
112+90	51 LT	Route 44	112+98	43 LT	Route 44
114+46	34 RT	Route 44	115+05	63 RT	Route 44
114+88	42 LT	Route 44	115+10	49 LT	Route 44
116+12	47 LT	Route 44	116+30	41 LT	Route 44
116+35	57 RT	Route 44	116+80	36 RT	Route 44
118+60	28 LT	Route 44	118+68	35 LT	Route 44
118+68	35 LT	Route 44	118+75	51 LT	Route 44
119+00	44 LT	Route 44	119+05	31 LT	Route 44
119+05	31 LT	Route 44	119+11	25 LT	Route 44
120+38	19 LT	Route 44	120+42	24 LT	Route 44
120+42	24 LT	Route 44	120+48	49 LT	Route 44
120+85	48 LT	Route 44	120+94	27 LT	Route 44
120+97	25 LT	Route 44	120+98	19 LT	Route 44
122+42	24 LT	Route 44	122+53	35 LT	Route 44
122+53	35 LT	Route 44	122+61	52 LT	Route 44
122+63	57 LT	Route 44	122+63	58 LT	Route 44
122+92	58 LT	Route 44	123+04	33 LT	Route 44
123+04	33 LT	Route 44	123+13	26 LT	Route 44
123+88	26 LT	Route 44	123+94	31 LT	Route 44
123+94	31 LT	Route 44	124+08	57 LT	Route 44
124+46	32 LT	Route 44	124+53	27 LT	Route 44
133+17	35 LT	Route 44	133+18	26 LT	Route 44
135+44	40 LT	Route 44	135+68	25 LT	Route 44
136+01	26 LT	Route 44	136+26	36 LT	Route 44
136+24	31 RT	Route 44	136+35	27 RT	Route 44
136+26	36 LT	Route 44	136+33	45 LT	Route 44
136+68	45 LT	Route 44	136+77	35 LT	Route 44
136+80	33 LT	Route 44	136+85	32 LT	Route 44



**ITEM 594.** (Continued)

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
502+39	19 LT	Longmeadow	502+86	45 LT	Longmeadow
502+46	27 RT	Longmeadow	502+80	48 RT	Longmeadow
503+96	60 RT	Longmeadow	504+35	37 RT	Longmeadow
503+98	65 LT	Longmeadow	504+35	37 LT	Longmeadow

Add curb determined to be unsuitable from Item 580. Curb Removed and Reset.

**ITEM 595.** **CURB INLET REMOVED AND DISCARDED**

75% determined to be unsuitable from Item 581. CURB INLET REMOVED AND RESET

**ITEM 596.** **CURB CORNER REMOVED AND DISCARDED**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
119+53	RT	Route 44
120+45	RT	Route 44
120+93	LT	Route 44
120+96	LT	Route 44

**ITEM 597.** **EDGING REMOVED AND DISCARDED**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
111+16	1 LT	Route 44	111+16	1 LT	Route 44
117+07	2 RT	Route 44	117+10	7 RT	Route 44
117+07	2 RT	Route 44	117+10	7 RT	Route 44
498+35	14 RT	Longmeadow	498+54	15 RT	Longmeadow
498+85	16 RT	Longmeadow	499+46	18 RT	Longmeadow
499+50	18 RT	Longmeadow	499+76	19 RT	Longmeadow
500+07	20 RT	Longmeadow	500+78	23 RT	Longmeadow

**ITEM 601.2** **TIMBER GUARDRAIL**

<u>From Station</u>	<u>To Station</u>	<u>Baseline</u>	<u>Side</u>
118+14	118+40	Route 44	LT
134+69	135+06	Route 44	LT



**ITEM 620.12 GUARDRAIL, TL-2 (SINGLE FACED)**

<u>From Sta.</u>	<u>Baseline</u>	<u>To Sta.</u>	<u>Baseline</u>	<u>Side</u>
100+54	Route 44	114+14	Route 44	RT
504+84	Longmeadow	505+57	Longmeadow	RT
504+65	Longmeadow	505+77	Longmeadow	LT
116+89	Route 44	117+43	Route 44	RT
117+56	Route 44	117+88	Route 44	RT
118+28	Route 44	118+57	Route 44	RT
118+65	Route 44	118+95	Route 44	RT
120+91	Route 44	121+29	Route 44	RT
121+29	Route 44	122+34	Route 44	LT
124+21	Route 44	124+24	Route 44	RT

**ITEM 620.32 GUARDRAIL - CURVED, TL-2 (SINGLE FACED)**

<u>From Sta.</u>	<u>Baseline</u>	<u>Side</u>	<u>To Sta.</u>	<u>Baseline</u>	<u>Side</u>
114+14	Route 44	RT	504+84	Longmeadow	RT
504+65	Longmeadow	LT	116+89	Route 44	RT
117+43	Route 44	RT	117+56	Route 44	RT
118+21	Route 44	RT	118+28	Route 44	RT
118+57	Route 44	RT	118+65	Route 44	RT
124+12	Route 44	RT	124+21	Route 44	RT
124+24	Route 44	RT	124+35	Route 44	RT

**ITEM 627.1 TRAILING ANCHORAGE**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
117+88	RT	Route 44
118+21	RT	Route 44
118+95	RT	Route 44
121+29	RT	Route 44
121+29	LT	Route 44

**ITEM 627.82 GUARDRAIL TANGENT END TREATMENT, TL-2**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
120+79	RT	Route 44	120+91	RT	Route 44
122+34	LT	Route 44	122+47	LT	Route 44

**ITEM 628.21 TRANSITION TO NCHRP 350 GUARDRAIL**

<u>From Station</u>	<u>Side</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
100+18	RT	100+54	RT	Route 44



**ITEM 628.24**      **TRANSITION TO BRIDGE RAIL**

<u>Station</u>	<u>Baseline</u>	<u>Side</u>
505+57	Longmeadow	RT
505+77	Longmeadow	LT
124+35	Route 44	RT

**ITEM 628.314**      **TEMPORARY IMPACT ATTENUATOR, REDIRECTIVE, TL-2**

For use with culvert, wall, and headwall construction.

**ITEM 628.4**      **TEMPORARY IMPACT ATTENUATOR, REMOVED AND RESET**

For use with culvert, wall, and headwall construction.

**ITEM 630.2**      **HIGHWAY GUARD REMOVED AND DISCARDED**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Baseline</u>
100+00	RT	Route 44	505+85	Longmeadow
506+05	LT	Longmeadow	119+07	Route 44
120+79	RT	Route 44	121+39	Route 44
124+17	RT	Route 44	127+48	Route 44
127+65	RT	Route 44	134+43	Route 44
134+76	LT	Route 44	135+06	Route 44

**ITEM 645.148**      **48 INCH CHAIN LINK FENCE (PIPE TOP RAIL) VINYL COATED (LINE POST OPTION)**

<u>From Station</u>	<u>Side</u>	<u>Baseline</u>	<u>To Station</u>	<u>Baseline</u>
116+88	RT	Route 44	118+50	Route 44
119+14	LT	Route 44	120+42	Route 44

**ITEM 652.048**      **48 INCH CHAIN LINK FENCE END POST**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
116+88	RT	Route 44
118+50	RT	Route 44
119+14	LT	Route 44
120+42	LT	Route 44



**ITEM 655.2**      **ORNAMENTAL HAND RAIL**

<u>Station</u>	<u>Side</u>	<u>Offset</u>	<u>Baseline</u>
128+67	LT	35'	Route 44
128+71	LT	35'	Route 44
131+67	LT	37'	Route 44
131+71	LT	37'	Route 44

**ITEM 669.**      **FENCE REMOVED AND STACKED**

<u>From Sta.</u>	<u>Side</u>	<u>Baseline</u>	<u>To Sta.</u>	<u>Baseline</u>
115+93	LT	Route 44	116+13	Route 44

**ITEM 685.**      **STONE MASONRY WALL IN CEMENT MORTAR**

<u>From Station</u>	<u>Side</u>	<u>To Station</u>	<u>Baseline</u>
116+88	RT	118+50	Route 44
118+00	LT	118+72	Route 44
119+04	LT	120+49	Route 44
120+84	LT	121+15	Route 44
121+32	LT	121+64	Route 44

**ITEM 690.**      **STONE MASONRY WALL REMOVED AND REBUILT IN CEMENT MORTAR**

<u>From Station</u>	<u>Side</u>	<u>To Station</u>	<u>Baseline</u>
131+31	LT	131+67	Route 44
131+72	LT	133+07	Route 44
131+70	LT	134+72	Route 44

**ITEM 690.2**      **STONE MASONRY WALL REMOVED AND STACKED**

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
119+19	119+31	RT	Route 44
119+51	119+55	RT	Route 44
130+92	131+31	RT	Route 44
135+54	135+60	RT	Route 44
500+04	500+44	RT	Longmeadow Rd.

**ITEM 694.5**      **STONE MASONRY WALL REMOVED AND STACKED**

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
129+28	129+58	RT	Route 44
131+19	131+35	RT	Route 44



**ITEM 697.**      **SEDIMENTATION FENCE**

To be used as a contingency at the discretion of the engineer.

**ITEM 697.2**      **FLOATING SILT FENCE**

To be used in areas where the sediment control barrier will be located within the river.

<u>From Sta.</u>	<u>Side</u>	<u>Baseline</u>	<u>To Sta.</u>	<u>Baseline</u>
125+77	LT	Route 44	125+82	Route 44
129+89	LT	Route 44	130+09	Route 44
131+00	LT	Route 44	131+80	Route 44

**ITEM 698.3**      **GEOTEXTILE FABRIC FOR SEPARATION**

For use with modified rockfill R&R and stone for pipe ends as shown on Construction plans and use with Box Culverts.

**ITEM 705.1**      **FLAGSTONE WALK REMOVED AND RESET**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
131+69	LT	Route 44

**ITEM 706.3**      **BLUESTONE STEPS**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
131+69	38	LT	Route 44

**ITEM 706.41**      **GRANITE STEPS**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
128+69	36	LT	Route 44



**ITEM 710.3**      **BOUND – LETTERED GRANITE**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
102+17	26'	LT	Route 44
103+00	26'	LT	Route 44
116+89	45'	RT	Route 44
117+42	42'	LT	Route 44
117+49	58'	RT	Route 44
118+01	58'	RT	Route 44
118+01	68'	RT	Route 44
118+23	52'	RT	Route 44
118+23	68'	RT	Route 44
118+49	44'	RT	Route 44
120+86	39'	LT	Route 44
123+43	33'	LT	Route 44
125+38	35'	LT	Route 44
126+79	35'	LT	Route 44
130+33	35'	LT	Route 44
133+07	35'	LT	Route 44
134+51	40'	LT	Route 44
134+81	35'	LT	Route 44
499+36	23'	LT	Longmeadow Road
500+01	26'	LT	Longmeadow Road
502+56	35'	LT	Longmeadow Road
502+57	33'	LT	Longmeadow Road
502+78	56'	LT	Longmeadow Road

**ITEM 711.**      **BOUND REMOVED AND RESET**

<u>Station</u>	<u>Offset</u>	<u>Baseline</u>
109+28	48.93' RT	Route 44
113+71	47.60' RT	Route 44
400+97	34.19' RT	Longmeadow

**ITEM 715.**      **RURAL MAIL BOX REMOVED AND RESET**

<u>Station</u>	<u>Offset</u>	<u>Baseline</u>
131+23	36.50' LT	Route 44
499+08	17.85' RT	Longmeadow

**ITEM 718.2**      **FLAGPOLE REMOVED AND STACKED**

<u>Station</u>	<u>Offset</u>	<u>Baseline</u>
106+04	33.99' LT	Route 44



**ITEM 745.3**      **PEDESTRIAN BUS SHELTER (INSTALLATION ONLY)**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
113+64	LT	Route 44
118+08	RT	Route 44

**ITEM 754.24**      **ATLANTIC STURGEON PROTECTION PLAN**

To be used with the monitoring and protection of Atlantic Sturgeon during work in the water of the Taunton River or other areas designated by the Engineer.

**ITEM 755.35**      **INLAND WETLAND REPLICATION AREA**

<u>Flag Series</u>	<u>Station</u>
WF1	118+24-118+64 RT

**ITEM 755.45**      **WETLAND RESTORATION**

<u>Flag Series</u>	<u>Sta.</u>
WF1	116+94-118+24 RT
WF6, B8	121+33-121+44 LT
B7	121+51-121+63 LT

**ITEM 755.75**      **WETLAND SPECIALIST**

For use with the specialist who is responsible for coordinating and overseeing wetland construction within project limits and Offsite Riverfront Mitigation Area.

**ITEM 755.76**      **WETLAND MONITORING REPORTS**

For use with the completion of reports by the wetland specialist.

**ITEM 765.21**      **ANNUAL COVER CROP FOR NATIVE SEEDING**

As shown on plans for use in areas of Riverbank Seed Mix, over Loam for Roadsides, Offsite Riverfront Mitigation Area and as directed by the Engineer.



**ITEM 765.442**    **SEEDING – RIVERBANK MIX - PART SHADE**

As shown on plans for use in areas of Riverbank Seed Mix, areas steeper than 3:1, Offsite Riverfront Mitigation Area and as directed by the Engineer.

**ITEM 765.635**    **NATIVE SEEDING AND ESTABLISHMENT**

For use in areas with Riverbank Seed Mix and Offsite Riverfront Mitigation Area.

**ITEM 767.121**    **SEDIMENT CONTROL BARRIER**

<u>From Sta.</u>	<u>Side</u>	<u>Baseline</u>	<u>To Sta.</u>	<u>Side</u>	<u>Baseline</u>
100+13	RT	Route 44	114+92	RT	Route 44
101+94	RT	Route 44	114+10	RT	Route 44
504+01	RT	Longmeadow	505+99	RT	Route 44
506+05	LT	Longmeadow	119+25	RT	Route 44
120+59	RT	Route 44	121+13	RT	Route 44
120+99	LT	Route 44	121+34	LT	Route 44
121+63	LT	Route 44	122+62	LT	Route 44
124+20	RT	Route 44	134+89	RT	Route 44
134+84	RT	Route 44	134+97	RT	Route 44
135+36	RT	Route 44	135+83	RT	Route 44

Plus to be use with Offsite Riverfront Mitigation Area.

Subtract quantity for Item 697.2 – Floating Silt Fence.

**ITEM 767.2**    **HAY MULCH**

For use with 10% of the area for loam & seed. To be placed on all disturbed slopes if the season prevents establishment of a vegetative cover.

**ITEM 767.6**    **AGED PINE BARK MULCH**

For use in areas with plantings needing mulch.

**ITEM 769.**    **PAVEMENT MILLING MULCH UNDER GUARD RAIL**

To be used under all proposed guard rail.



**ITEM 804.3      3 INCH ELECTRICAL CONDUIT TYPE NM – PLASTIC – (UL)**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Type</u>	
502+70	RT	Longmeadow	UP #25	502+75	RT	Longmeadow	Cabinet	2 x
502+75	RT	Longmeadow	Cabinet	502+84	RT	Longmeadow	45' M.A.	
502+75	RT	Longmeadow	Cabinet	502+80	RT	Longmeadow	8' Post	
502+75	RT	Longmeadow	Cabinet	502+66	RT	Longmeadow	10' Post	
502+75	RT	Longmeadow	Cabinet	502+76	LT	Longmeadow	E.H.H.	
502+75	RT	Longmeadow	Cabinet	503+79	RT	Longmeadow	E.H.H.	2x
502+76	LT	Longmeadow	E.H.H.	502+66	LT	Longmeadow	4' Post	
502+76	LT	Longmeadow	Pull Box	502+66	LT	Longmeadow	40' M. A.	
502+76	LT	Longmeadow	Pull Box	502+84	LT	Longmeadow	10' Post	
503+79	RT	Longmeadow	E.H.H.	503+74	RT	Longmeadow	45' M.A.	
503+79	RT	Longmeadow	E.H.H.	503+80	RT	Longmeadow	8' Post	
503+79	RT	Longmeadow	E.H.H.	503+89	RT	Longmeadow	E.H.H.	2x
503+89	RT	Longmeadow	E.H.H.	503+88	RT	Longmeadow	8' Post	
503+89	RT	Longmeadow	E.H.H.	504+13	RT	Longmeadow	Pull Box	
504+13	RT	Longmeadow	Pull Box	504+05	RT	Longmeadow	8' Post	
504+13	RT	Longmeadow	Pull Box	504+30	RT	Longmeadow	20' M. A.	
503+89	RT	Longmeadow	Pull Box	503+90	LT	Longmeadow	Pull Box	
503+90	LT	Longmeadow	Pull Box	503+89	LT	Longmeadow	8' Post	
503+90	LT	Longmeadow	Pull Box	503+81	LT	Longmeadow	Pull Box	
503+81	LT	Longmeadow	Pull Box	503+82	LT	Longmeadow	10' M. A.	
503+81	LT	Longmeadow	Pull Box	503+77	LT	Longmeadow	40' M. A.	
503+81	LT	Longmeadow	Pull Box	503+99	LT	Longmeadow	Pull Box	
503+99	LT	Longmeadow	Pull Box	503+96	LT	Longmeadow	30' M.A.	
503+99	LT	Longmeadow	Pull Box	504+07	LT	Longmeadow	8' Post	
135+28	RT	Route 44	Pull Box	136+31	RT	Route 44	Exist. PB	
137+35	RT	Route 44	Exist. PB	137+35	RT	Route 44	8' Post	
137+28	LT	Route 44	Exist. Ctrlr	137+33	LT	Route 44	8' Post	

**ITEM 811.22      ELECTRIC HANDHOLE - SD2.022**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
502+76	LT	Longmeadow
503+79	RT	Longmeadow
503+89	RT	Longmeadow

**ITEM 811.31      PULL BOX 12 X 12 INCHES - SD2.031**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
504+13	RT	Longmeadow
503+81	LT	Longmeadow
503+90	LT	Longmeadow
503+99	LT	Longmeadow
137+28	LT	Route 44



**ITEM 816.01**      **TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1**

For use with the signalization of Route 44 (Dean Street) at Longmeadow/Hon. Gordon M. Owen Riverway.

**ITEM 816.02**      **TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2**

For use with the signalization of Route 44 (Dean Street) at Route 104 (Dean Street).

**ITEM 816.81**      **TEMPORARY TRAFFIC CONTROL SIGNAL**

For use with temporary traffic signal control at Route 44 (Dean Street) & Longmeadow/ Hon. Gordon M. Owen Riverway.

**ITEM 831.**      **ROADSIDE GUIDE SIGN (D6/D8) - ALUMINUM PANEL (TYPE A)**

<u>Identification</u>	<u>Unit Area (SF)</u>
MA-D1-5(1)	20.00
MA-D1-5(2)	20.00
MA-D1-5(3)	20.00
MA-D1-5(4)	20.00
MA-D1-5(5)	20.00
MA-D1-6(1)	27.50
MA-D1-6(2)	27.50
MA-D1-6(3)	27.50
MA-D1-6(4)	27.50
MA-D1-6(5)	27.50

**ITEM 832.**      **WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A)**

<u>Identification</u>	<u>Unit Area (SF)</u>		<u>Supports</u>
R1-1	6.25	2	on P5
R2-1(40)	5.00	1	on P5
R2-1(40)	7.50	1	on P5
R3-2	4.00	2	on P5
R3-4	4.00		3 mnt w/R4-7
R3-8b	10.00	1	on 2-P5
R3-8c	10.00	2	on 2-P5
R3-8d	6.25	1	on P5
R3-8e	7.50	1	on P5
R3-17	3.00	15	on P5
R3-17aP	1.33		1 mnt w/ R3-17
R3-17bP	1.33		4 mnt w/ R3-17



**ITEM 832.** (Continued)

<u>Identification</u>	<u>Unit Area (SF)</u>		<u>Supports</u>
R4-4	7.50	2	on P5
R4-7	5.00	4	on P5
R5-1	6.25		1 mnt on mast arm 1 mnt w/ R3-2
R8-3a	5.00	8	on P5
R8-10L	6.00	1	on P5
R10-11b	6.25		2 mnt on mast arm
MA-R10-12a	7.50		4 mnt on mast arm
MA-R10-12b	7.50		2 mnt on mast arm
W4-2R	9.00	1	on P5
W9-1R	9.00	2	on P5
W10-1	9.00	1	on P5
W14-1	6.25	2	on P5
OM1-1	4.00	2	on P5
MA-D10-4aE(15)		4.50	1 on P5
MA-D10-4aW(15)		4.50	1 mnt btb w/ MA-D10-4aE(15)
D11-20	1.50	2	on P5; 1 mnt on mast arm.; 1 mnt on signal post
D11-20a	1.50	3	on P5; 1 mnt on signal post
M1-4(44)	4.00	4	on P5
MA-M1-5a (104)		5.00	1 on P5
MA-I-13	5.00	1	on P5
MA-I-14	5.00		1 mnt w/ MA-I-13
M2-1	2.19		1 mnt w/ MA-M1-5a(104)
M3-2	2.00		2 mnt w/ M1-4(44)
M3-4	2.00		2 mnt w/ M1-4(44)

**ITEM 841.1**      **SUPPORTS FOR GUIDE SIGN (D6 W/ D8 – 5 INCH TUBULAR POST)**  
**STEEL**

	<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
MA-D1-6(1)/MA-D1-5(1)	134+30	31.5'	RT	Route 44
MA-D1-6(2)/MA-D1-5(2)	137+12	39.0'	RT	Route 44
MA-D1-6(3)/MA-D1-5(3)	509+00	30.0'	LT	Hon. Gordon M. Owen Riverway
MA-D1-6(4)/MA-D1-5(4)	503+92	29.0'	LT	Hon. Gordon M. Owen Riverway
MA-D1-6(5)/MA-D1-5(5)	502+20	28.5'	RT	Longmeadow

**ITEM 847.1**      **SIGN SUP (N/GUIDE)+ROUTE MKR W/1 BRKWAY POST**  
**ASSEMBLY -STEEL**

For use with warning-regulatory and route marker and street signs. To be used with Item 832, Item 874., & Item 874.21



**ITEM 848.1**      **SIGN SUP (N/GUIDE)+ROUTE MKR W/2 BRKWAY POST ASSEMBLIES -STEEL**

For use with warning-regulatory and route marker and street signs. To be used with Item 832. & Item 874.

**ITEM 852.**      **SAFETY SIGNING FOR TRAFFIC MANAGEMENT**

<u>Identification</u>	<u>No. Required</u>	<u>Unit Area (SF)</u>
MA-R2-10a	7	12.00
MA-R2-10e	8	12.00
MA-W20-7b	4	9.00
M4-9bL	6	5.00
M4-9bR	6	5.00
R3-7L	2	6.25
R4-7	8	5.00
R9-9	12	3.75
R9-11aL	2	8.00
R9-11aR	2	8.00
R11-2	2	10.00
W1-4L	4	9.00
W1-4R	4	9.00
W4-2L	1	9.00
W5-1	6	9.00
W8-1	2	9.00
W8-3	2	9.00
W8-8	2	9.00
W8-15	2	9.00
W8-24	2	9.00
W11-2	6	6.25
W13-1p	4	5.00
W16-7pL	6	2.00
W16-9p	2	2.00
W20-1	7	9.00
W20-4	8	9.00
W20-7	4	9.00
W21-5a	2	9.00

**ITEM 853.1**      **PORTABLE BREAKWAY BARRICADE TYPE III**

To be used in conjunction with sidewalk and shoulder closures at the discretion of the Engineer.



**ITEM 853.2**      **TEMPORARY BARRIER (TL-2)**

To be used with the soldier pile and lagging wall construction.

<u>From Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
124+90	134+85	RT	Route 44

**ITEM 853.21**      **TEMPORARY BARRIER REMOVED AND RESET**

For use with culvert, wall, and headwall construction.

**ITEM 853.8**      **TEMPORARY ILLUMINATION FOR WORK ZONE**

Assume 2 units used for the 10 months duration of the project at the discretion of the Engineer.

**ITEM 854.016**      **TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED)**

To be used for center line on binder/milled surface for the length of the project, lane lines at signals and lines on base course.

**ITEM 854.036**      **TEMPORARY PAVING MARKINGS - 6 INCH (TAPE)**

To be used on the final pavement surface as a temporary measure in the event where permanent pavement markings cannot be installed prior to opening to traffic.

**ITEM 854.1**      **PAVEMENT MARKING REMOVAL**

For removal of existing markings that conflict with construction staging and at project limits.

**ITEM 864.02**      **PAVEMENT ARROWS AND LEGENDS - TAPE**

For use with bike lane symbols w/ arrows, two stage bicycle turn boxes, bike detection symbols.



**ITEM 864.04**      **PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC)**

For use with turn arrows, only symbols, combination arrows, bus stop symbols, lane reduction arrows and railway crossing which use reflectORIZED white thermoplastic.

**ITEM 864.31**      **SLOTTED PAVEMENT MARKER ONE-WAY WHITE**

To be used with Route 44 (Dean Street) east bound and west bound.

**ITEM 864.35**      **SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW**

To be used with Route 44 (Dean Street) east bound and west bound.

**ITEM 864.41**      **GREEN COLORIZED PAVEMENT MARKINGS**

<u>Station</u>	<u>Offset</u>	<u>Side</u>	<u>Baseline</u>
114+00.00	32	LT	Route 44
114+64.00	36	RT	Route 44
115+35.00	29	RT	Route 44
117+50.00	35	RT	Route 44
502+85.00	24	RT	Longmeadow
502+91.00	36	LT	Longmeadow
503+75.00	14	LT	Longmeadow
504+47.00	24	RT	Longmeadow
505+22.00	19	LT	Longmeadow

**ITEM 874.**      **STREET NAME SIGN**

For each sign identification listed below the quantity varies.

<u>Identification</u>	<u>Supports</u>
MA-D3-1A      Longmeadow	mnt on Mast Arm
MA-D3-1B      Dean street	mnt on Mast Arm
MA-D3-1C      Dean street	mnt on Mast Arm
MA-D3-1D      Dean street	mnt on Mast Arm
MA-D3-1E      Dean street	mnt on Mast Arm
MA-D3-1F      Disamar Rd/River Rd	1 mnt btb on P5
MA-D3-1G      Disamar Rd	1 mnt btb on 2-P5
MA-D3-1H      River Rd	mnt btb w/MA-D3-1F



**ITEM 874.21 MISCELLANEOUS SIGNS REMOVED AND RESET**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Identification</u>
111+92	RT	Route 44 (Dean Street)	"Hartshorn Little League & Softball Field"
112+32	RT	Route 44 (Dean Street)	"Taunton High School -->"

**ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Description</u>
100+34.00	RT	Route 44	"State Highway Begins"
101+83.00	RT	Route 44	"East"
			"44"
101+88.00	LT	Route 44	"Rail Road Xing"
103+05.00	RT	Route 44	"Speed Limit 40"
103+54.00	RT	Route 44	"No Passing Zone"
105+45.00	RT	Route 44	"Signal Ahead" (Graphic)
110+00.00	LT	Route 44	"Signal Ahead" (Graphic)
111+01.00	RT	Route 44	"Ped Xing" (Graphic)
111+19.00	LT	Route 44	"Keep Right" (Graphic)
113+25.00	LT	Route 44	"West"
			"44"
115+15.00	RT	Route 44	Cluster Reflector
114+98.00	RT	Route 44	"Ped Xing" (Graphic)
115+19.00	RT	Route 44	"Ped Xing" (Graphic)
115+05.00	LT	Route 44	"Left Turn On Green Arrow Only"
			"Keep Right" (Graphic)
502+74.00	RT	Longmeadow	"Keep Right" (Graphic)
503+81.00	RT	Longmeadow	"Keep Right" (Graphic)
503+93.00	RT	Longmeadow	"Yield"
504+11.00	RT	Longmeadow	"Yield"
503+99.00	LT	Longmeadow	Cluster Reflector
504+05.00	LT	Longmeadow	"Ped Xing" (Graphic)
503+86.00	LT	Longmeadow	"Ped Xing" (Graphic)
116+21.00	RT	Route 44	"Yield"
116+23.00	RT	Route 44	"Left Turn On Green Arrow Only"
			"Keep Right" (Graphic)
116+54.00	RT	Route 44	"Yield"
118+07.00	RT	Route 44	"East"
			"44"
118+71.00	RT	Route 44	"Left Lane For Left Turn"
			"Keep Right" (Graphic)
119+04.00	RT	Route 44	"Do Not Pass"
120+35.00	RT	Route 44	"Mile Marker 15"
121+72.00	LT	Route 44	"Ped Xing" (Graphic)
126+94.00	RT	Route 44	"JCT"
			"44"
129+65.00	LT	Route 44	"Disamar Rd"
130+10.00	LT	Route 44	"Dead End"



**ITEM 874.41 (Continued)**

<u>Station</u>	<u>Side</u>	<u>Baseline</u>	<u>Description</u>
133+11.00	RT	Route 44	"Side Road" (Graphic)
133+13.00	LT	Route 44	"River Rd"
133+90.00	RT	Route 44	"104 East Raynham Bridgewater Next Left"
134+59.00	LT	Route 44	"West"
			"44"
136+99.00	LT	Route 44	"Right Lane Ends" (Graphic)
137+46.00	RT	Route 44	"104 East Raynham Bridgewater <--- "
137+47.00	LT	Route 44	"Do Not Enter"
500+28.00	RT	Longmeadow	"School Xing" (Graphic)
500+55.00	LT	Longmeadow	"Speed Limit 40"
501+56.00	RT	Longmeadow	"44"
			"<--->"
502+78.00	LT	Longmeadow	"Longmeadow Rd"
			"Dean St"
504+87.00	LT	Longmeadow	"Ped Xing" (Graphic)
			"Ahead"
505+14.00	LT	Longmeadow	"44"
			"<--->"
			"School Xing"

**ITEM 901. 4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE**

To be used with Moment slab footing.

Moment Slab Footing

Sta. 124+69 to Sta. 134+85 RT

**ITEM 902. 3500 PSI, 1.5 INCH, 520 CEMENT CONCRETE**

To be used for encased post for shallow mount.

<u>Station</u>	<u>Baseline</u>	<u>Side</u>	<u>Offset</u>
101+71	Route 44	RT	21.00'
103+26	Route 44	RT	21.00'
106+97	Route 44	RT	21.00'
111+24	Route 44	RT	40.64'
505+70	Longmeadow	RT	29.20'
118+14 to 118+40	Route 44	LT	46.17'



**ITEM 903.**      **3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE**

To be used for thrust blocks with hydrants, proposed water pipe bends and shaft concrete.

**Thrust Blocks for Hydrants**

<u>Station</u>	<u>Baseline</u>	<u>Type</u>	<u>Pipe Ø</u>
502+45	Longmeadow	Dead End	6
122+98	Route 44	Dead End	6
128+12	Route 44	Dead End	6

**Thrust Blocks for Fittings**

Use as contingency

**Shaft Concrete**

Sta. 124+69 to Sta. 134+85      RT

**ITEM 904.3**      **5000 PSI, 3/4 INCH, 685 HP CEMENT CONCRETE**

To be used with moment slab stem.

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44

**ITEM 910.1**      **STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED**

To be used with moment slab stem, moment slab footing, precast guardrail transition top and precast guardrail transition base.

**ITEM 942.181**      **W18X192J PILE**

To be used with precast lagging wall.

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44

**ITEM 945.100**      **DRILLED SHAFT EXCAVATION 2.5 FOOT DIAMETER**

To be used to provide deep foundation for retaining walls and to support structures with large axial and lateral loads.

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44



**ITEM 945.200**    **ROCK SOCKET EXCAVATION 2.5 FOOT DIAMETER**

To be used to embed a pile into competent bedrock.

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44

**ITEM 945.300**    **OBSTRUCTION EXCAVATION 2.5 FOOT DIAMETER**

To be used with shaft obstructions.

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44

**ITEM 975.1**    **METAL BRIDGE RAILING (3 RAIL), STEEL (TYPE S3-TL4)**

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44

**ITEM 983.3**    **RIPRAP REMOVED AND RELAID**

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
505+95	506+17	RT	Longmeadow Rd

**ITEM 983.521**    **STREAMBED MATERIAL**

To be used for Culvert Extension.

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
121+37	LT	Route 44

**ITEM 986.5**    **MODIFIED ROCKFILL REMOVED AND RELAID**

<u>Station</u>	<u>To Station</u>	<u>Side</u>	<u>Baseline</u>
134+83	135+06	LT	Route 44
135+39	136+03	LT	Route 44

**ITEM 991.11**    **CONTROL OF WATER - STRUCTURES**

For installing and maintaining a temporary water control system in the areas of the box culvert extension, the installation of retaining wall and the installation of outlets and stone for pipe ends.



**ITEM 996.01**      **WALL STRUCTURE, WALL NO. 6**

To be used with soldier pile and lagging wall.

<u>Station</u>	<u>To station</u>	<u>Side</u>	<u>Baseline</u>
124+69	134+85	RT	Route 44

**ITEM 996.011**      **PRECAST GUARDRAIL TRANSITION UNITS**

To be used with soldier pile and lagging wall.

<u>Station</u>	<u>Side</u>	<u>Baseline</u>
124+69	RT	Route 44
134+85	RT	Route 44



DOCUMENT A00804

# **CITY OF TAUNTON STANDARD DETAILS**

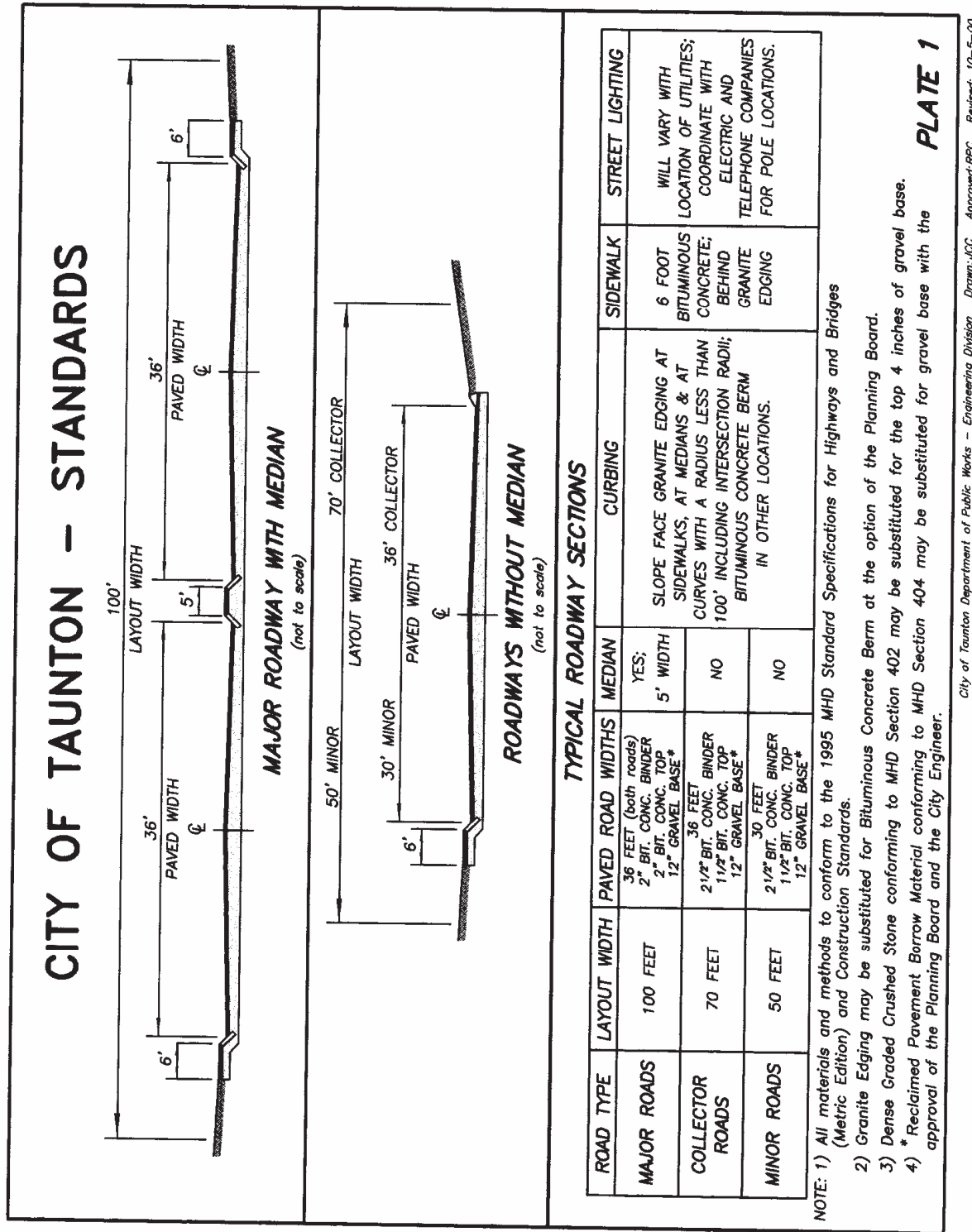


## **APPENDIX A**

### **STANDARD DETAILS**

Details shown in Appendix A are the details in use by the City of Taunton Engineering Department as of January, 2001. The Engineering Department should be contacted to obtain any changes in the standard details

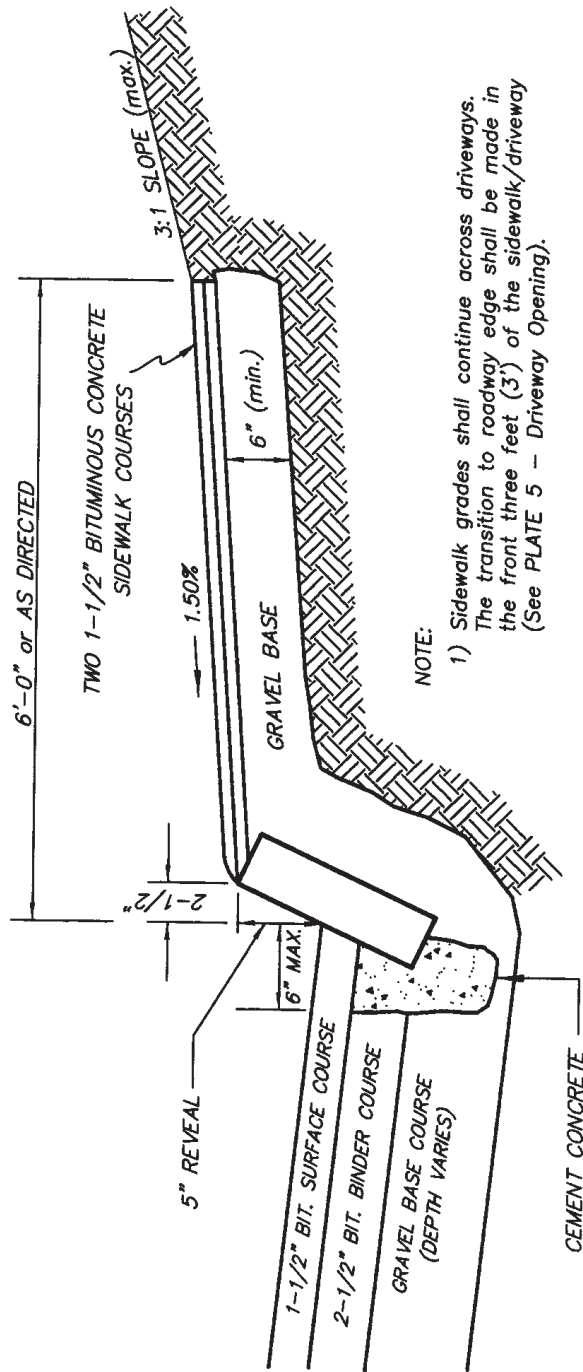




City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-5-00



# CITY OF TAUNTON - STANDARDS



## GRANITE EDGING & BITUMINOUS CONCRETE SIDEWALK (not to scale)

PLATE 2

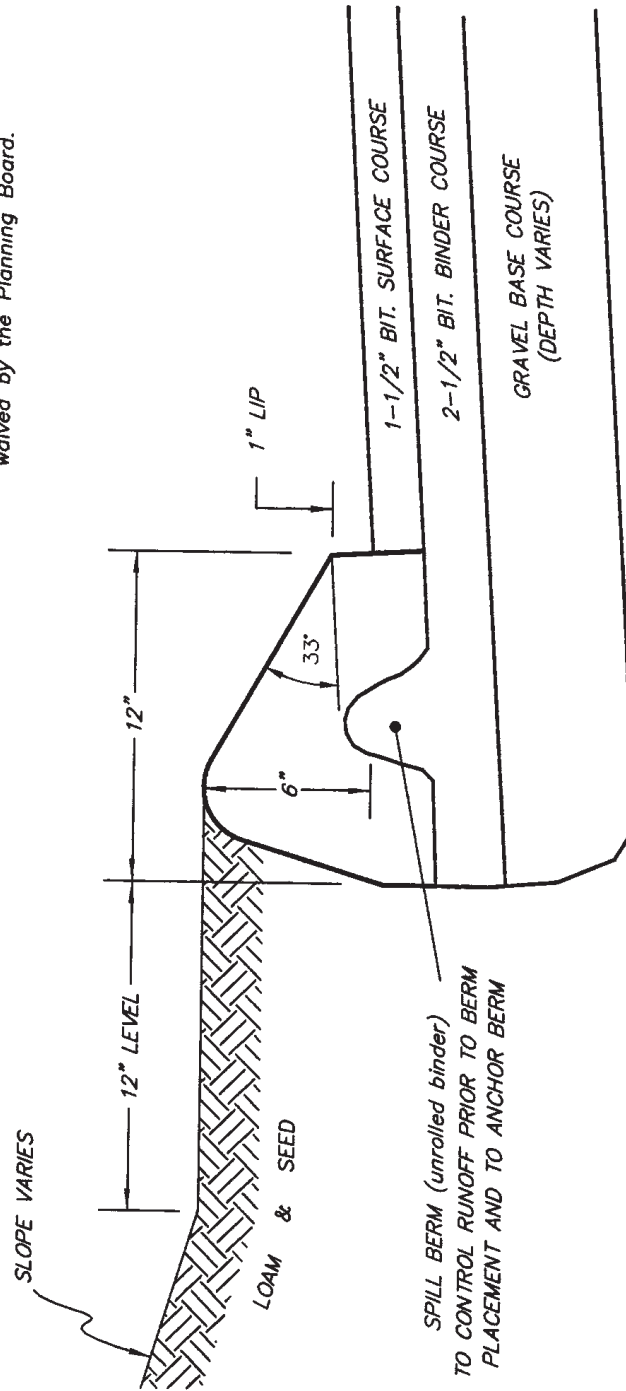
City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-5-00



# CITY OF TAUNTON - STANDARDS

**NOTE:**

- 1) Bituminous Concrete Berm to be used only when sidewalk requirement has been waived by the Planning Board.

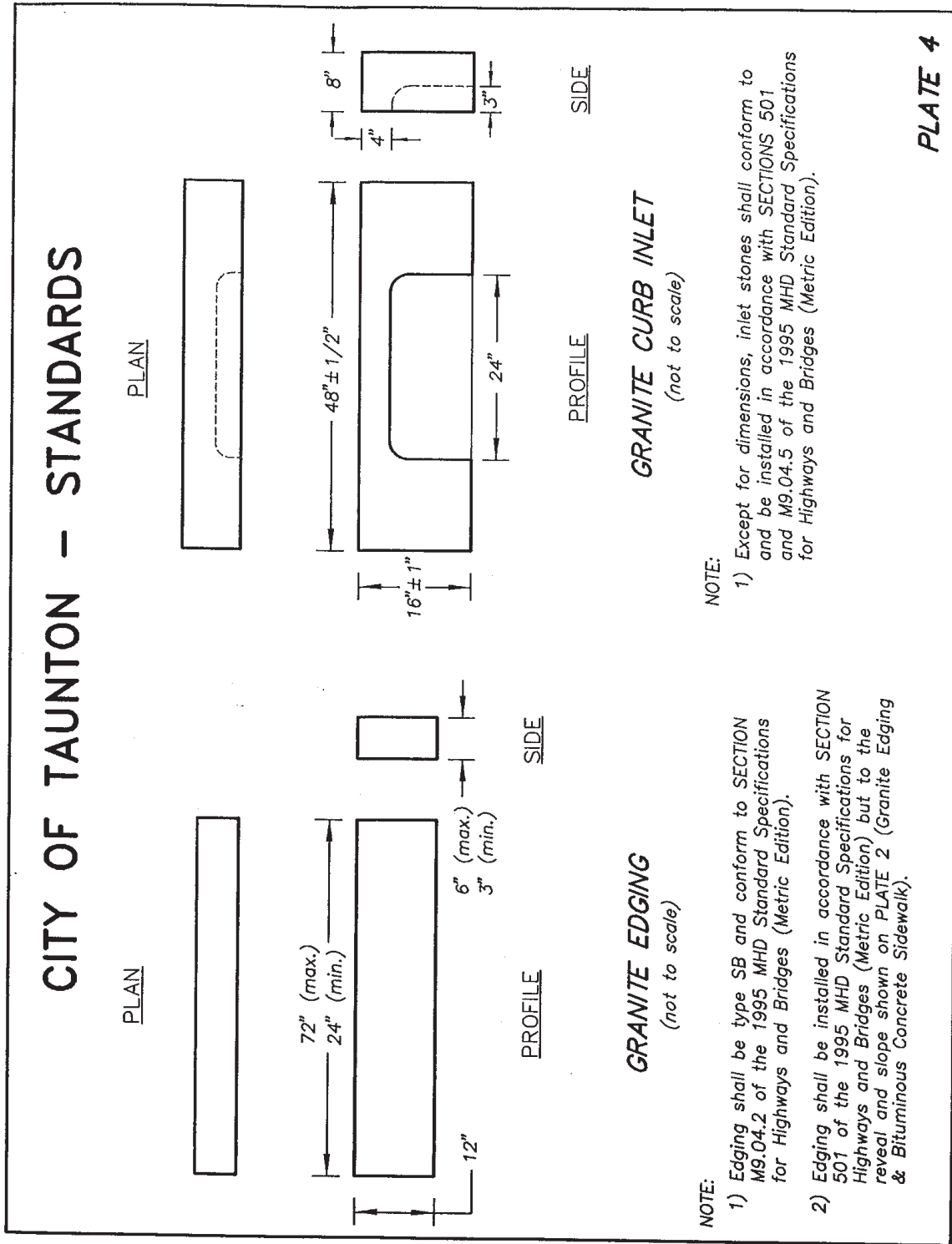


## BITUMINOUS CONCRETE BERM (not to scale)

**PLATE 3**

City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-05-00

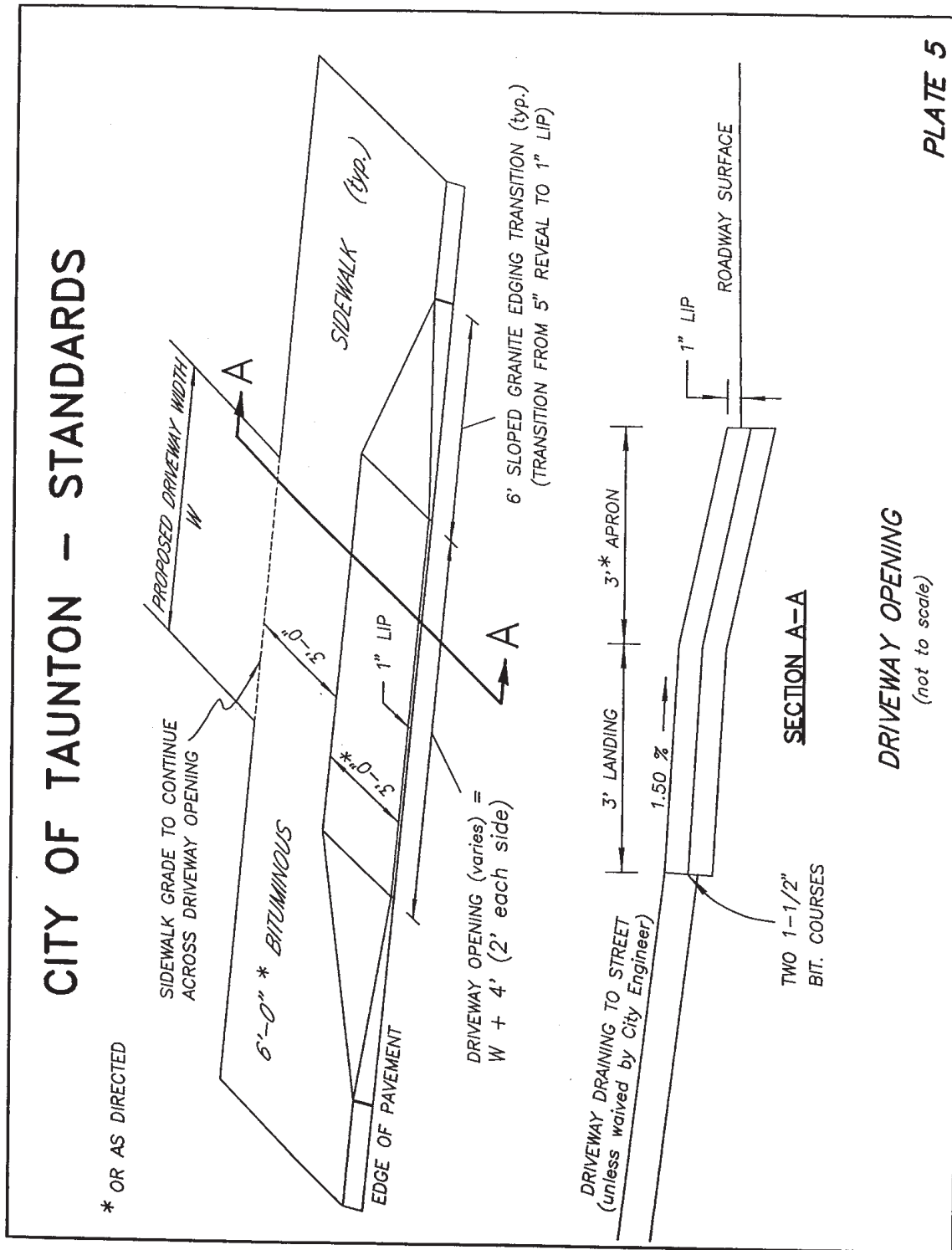




**PLATE 4**

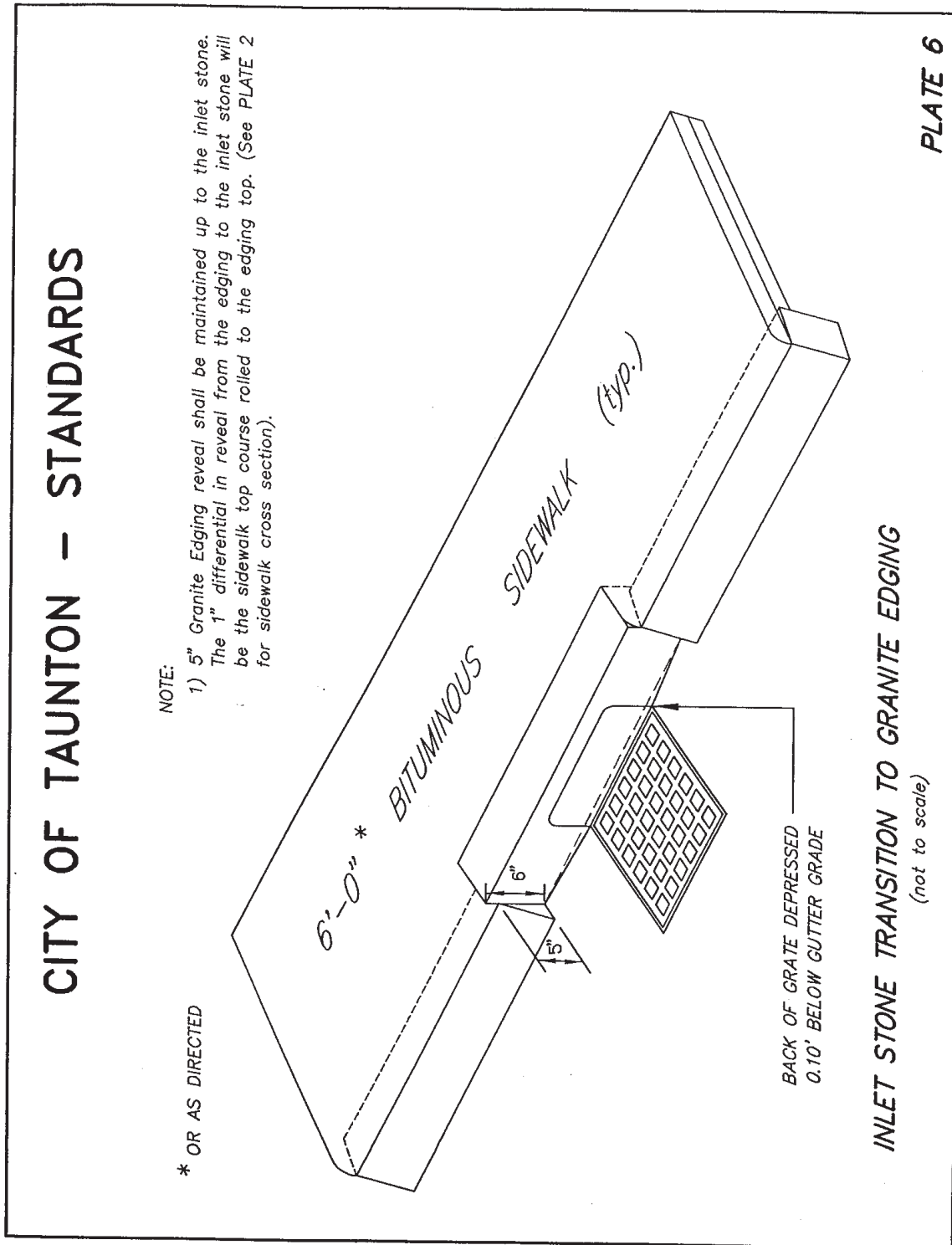
City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: APC Revised: 12-19-97





City of Taunton Department of Public Works - Engineering Division Drm:inc Approved:RPC Revises: 12-19-97





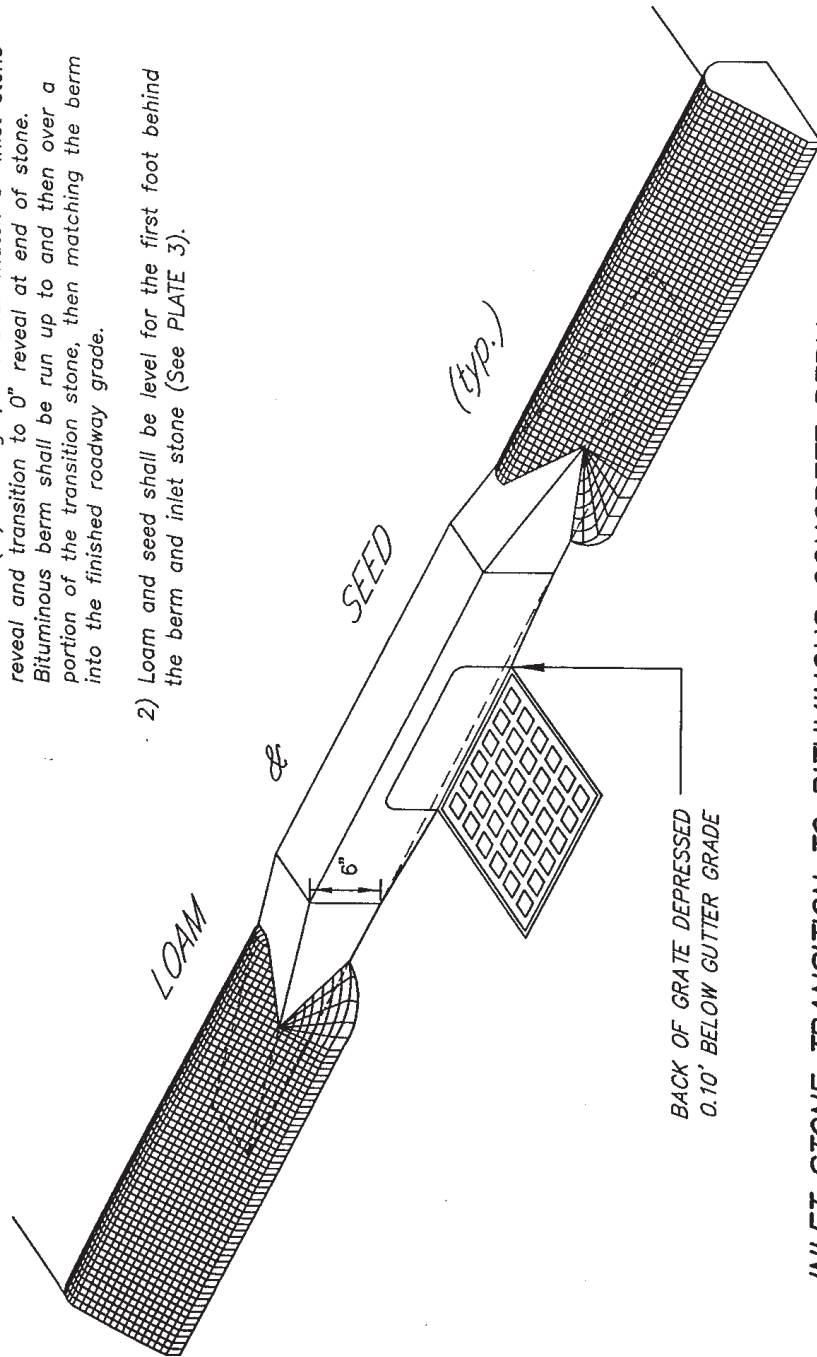
City of Taunton Department of Public Works – Engineering Division Drawn: JPC Approved: JPC Revised: 12-19-97



# CITY OF TAUNTON - STANDARDS

## NOTE:

- 1) Transition stones shall be same width as inlet stone, three feet (3') in length, and shall match 6" inlet stone reveal and transition to 0" reveal at end of stone. Bituminous berm shall be run up to and then over a portion of the transition stone, then matching the berm into the finished roadway grade.
- 2) Loam and seed shall be level for the first foot behind the berm and inlet stone (See PLATE 3).

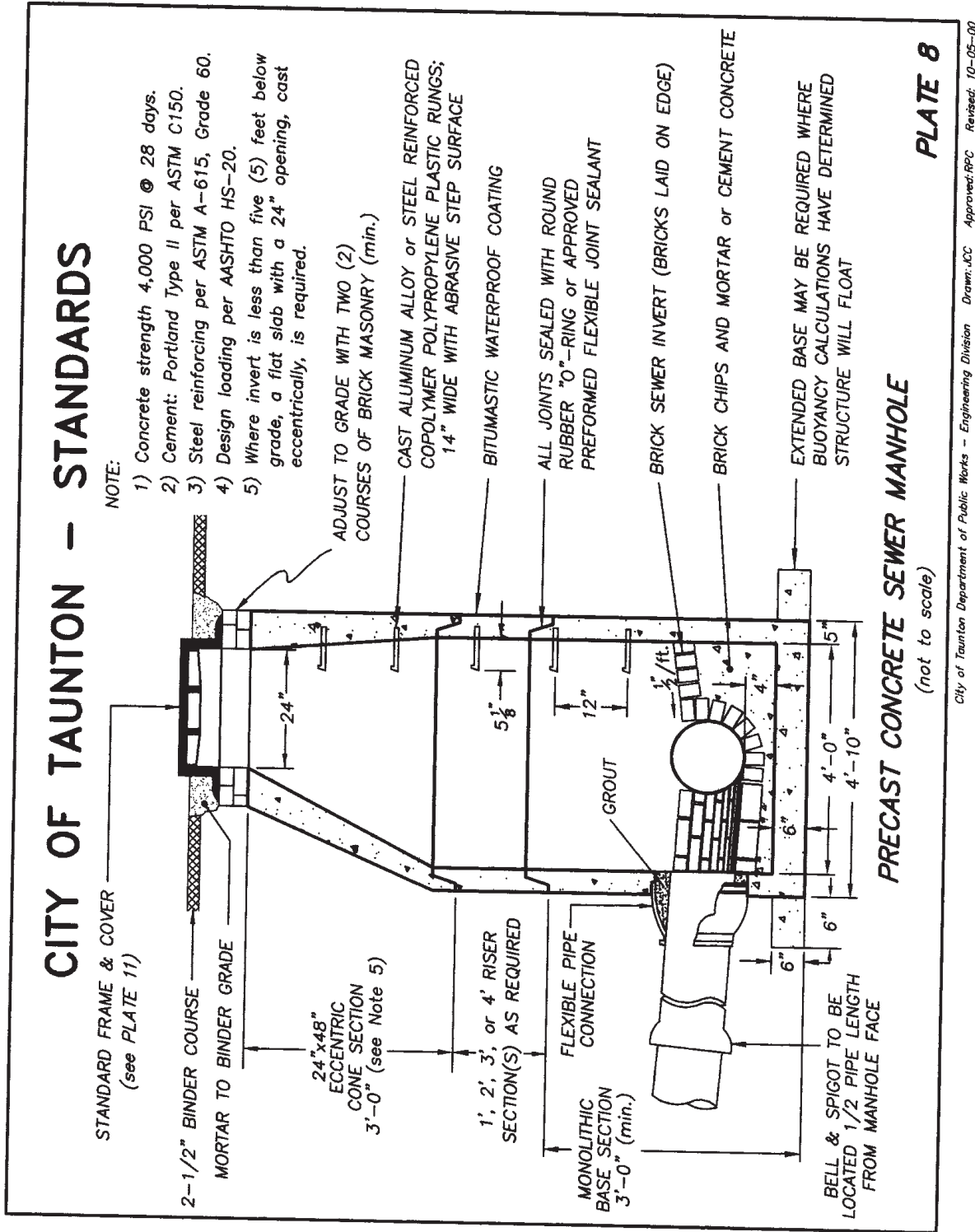


INLET STONE TRANSITION TO BITUMINOUS CONCRETE BERM  
(not to scale)

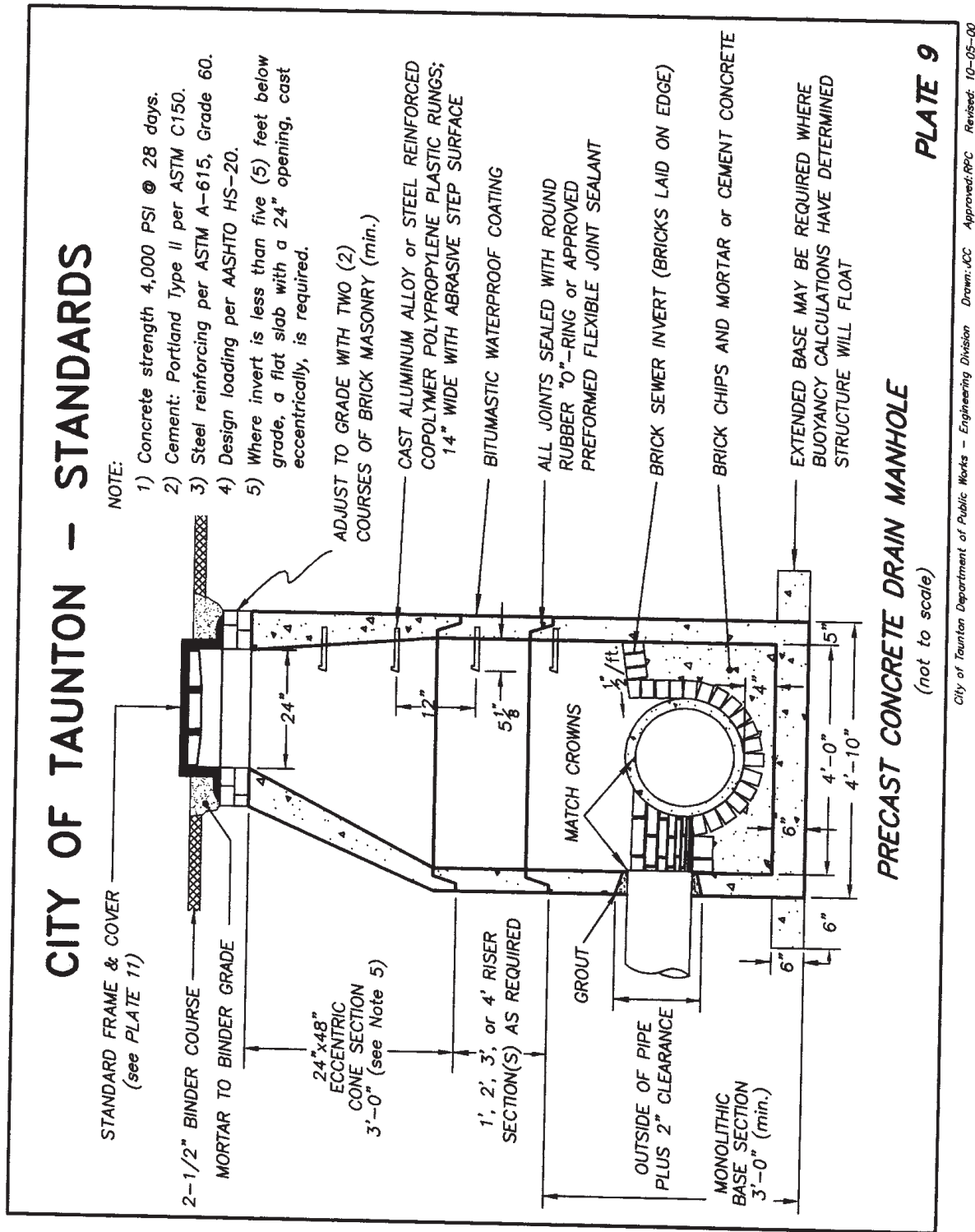
PLATE 7

City of Taunton Department of Public Works - Engineering Division Drawn: JOC Approved: RJC Revised: 12-19-97

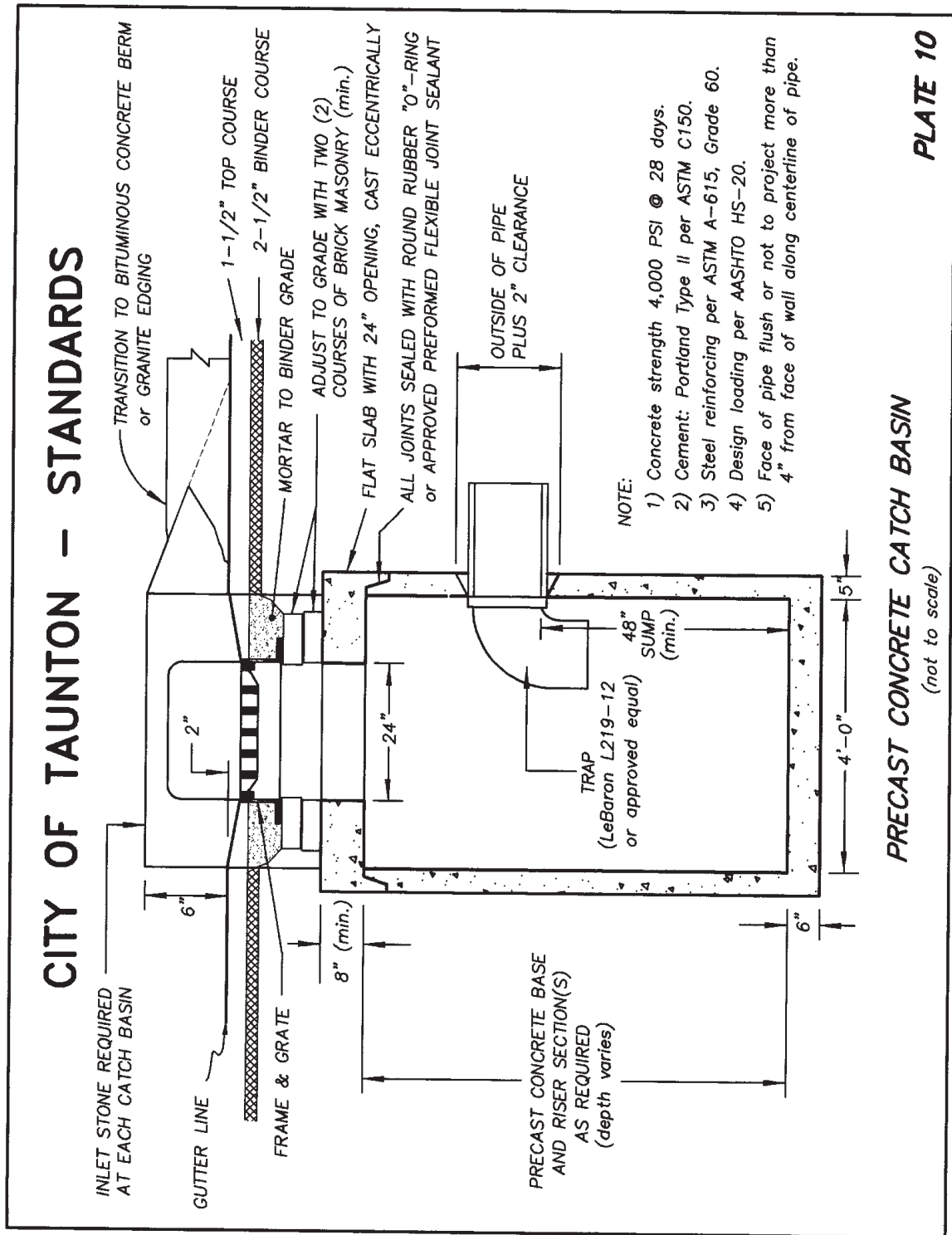








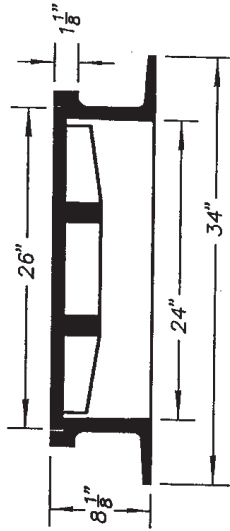




City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-05-00



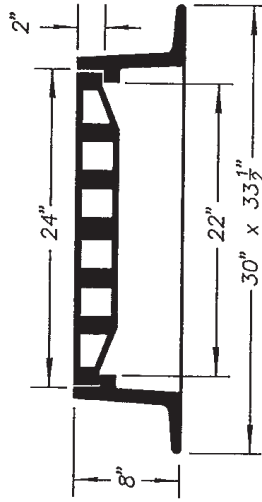
# CITY OF TAUNTON - STANDARDS



NOTE:

- 1) Frame and cover shall be LeBaron LB268-3 or equal approved by the City Engineer.
- 2) Each cover shall read SEWER or DRAIN in 3" lettering according to use.
- 3) Frame and cover shall be set in full bed of mortar on a minimum of two courses of brick.

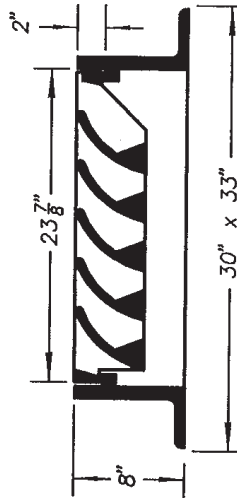
**SEWER/RAIN MANHOLE FRAME & COVER**  
(not to scale)



**STANDARD CATCH BASIN FRAME & GRATE**  
(not to scale)

NOTE:

- 1) Frame and grate shall be LeBaron LF248-2 or equal approved by the City Engineer.
- 2) For use when the gutter grade is less than or equal to 3.00%.
- 3) Frame and cover shall be set in full bed of mortar on a minimum of two courses of brick.



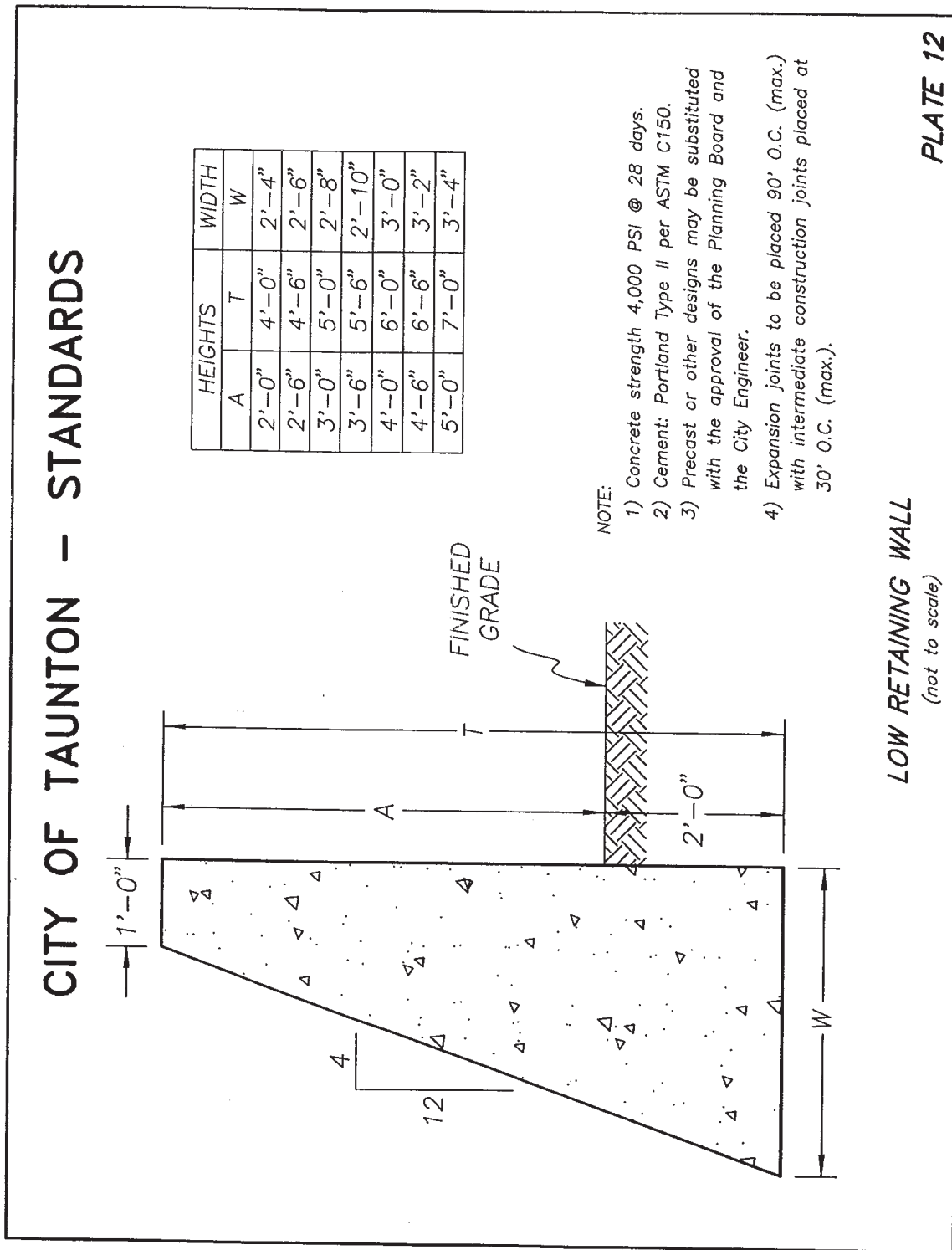
**CASCADE FRAME & GRATE**  
(not to scale)

NOTE:

- 1) Frame and grate shall be LeBaron LK120A or equal approved by the City Engineer.
- 2) For use when the gutter grade exceeds 3.00%.
- 3) Frame and cover shall be set in full bed of mortar on a minimum of two courses of brick.

**PLATE 11**

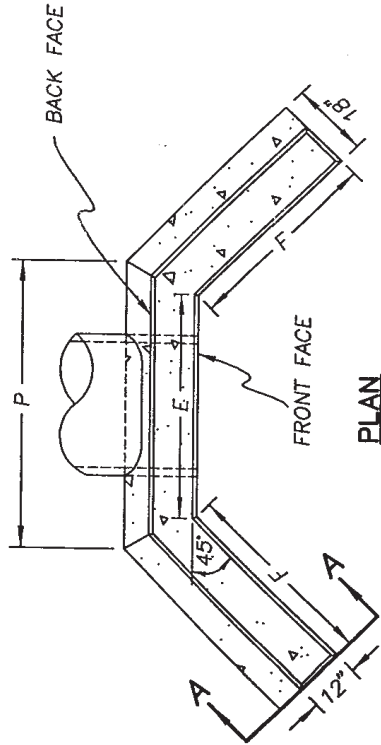




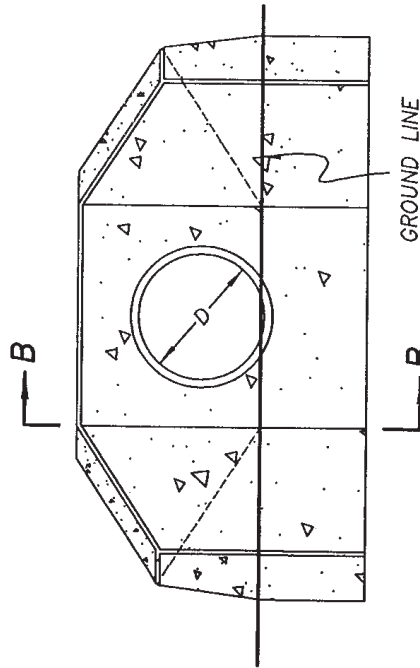
City of Taunton Department of Public Works - Engineering Division Drawn: ICC Approved: RBC Revised: 12-19-97



# CITY OF TAUNTON - STANDARDS

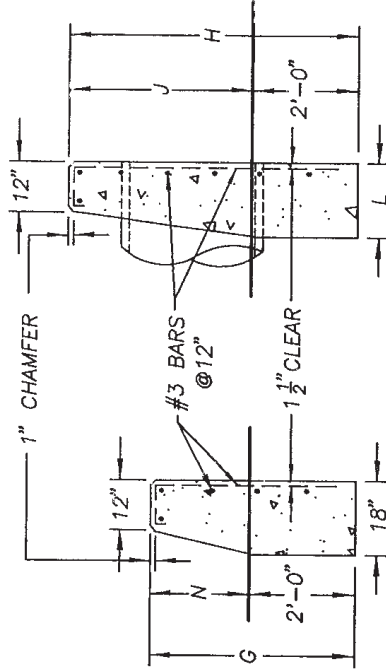


1 1/2:1 SLOPES and 2:1 SLOPES											SLOPE
D	E	G	H	J	L	N	P	F	F	F	2:1
30"	4'-0"	4'-0"	5'-6"	3'-6"	1'-6"	2'-0"	5'-3"	3'-0"	4'-3"		
36"	4'-6"	4'-3"	6'-0"	4'-0"	1'-8"	2'-3"	5'-11"	3'-6"	5'-0"		
42"	5'-0"	4'-6"	6'-6"	4'-6"	1'-10"	2'-6"	6'-6"	4'-0"	5'-9"		
48"	5'-6"	4'-9"	7'-0"	5'-0"	2'-0"	2'-9"	7'-2"	4'-6"	6'-8"		
54"	6'-0"	5'-0"	7'-6"	5'-6"	2'-2"	3'-0"	7'-10"	5'-0"	7'-3"		
60"	6'-6"	5'-3"	8'-0"	6'-0"	2'-4"	3'-3"	8'-5"	5'-6"	8'-0"		
72"	7'-6"	5'-9"	9'-0"	7'-0"	2'-8"	3'-9"	9'-9"	6'-8"	9'-6"		
84"	8'-6"	6'-3"	10'-0"	8'-0"	3'-0"	4'-3"	11'-0"	7'-6"	11'-0"		



ELEVATION

CONCRETE HEADWALL (30" TO 84" PIPE CULVERTS)  
(not to scale)



SECTION B-B

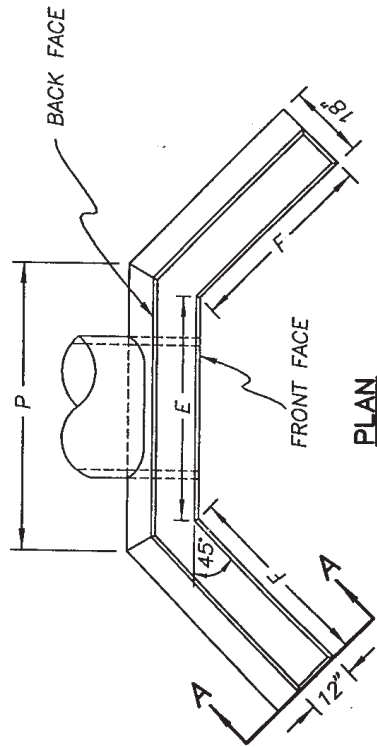
ELEVATION A-A

PLATE 13

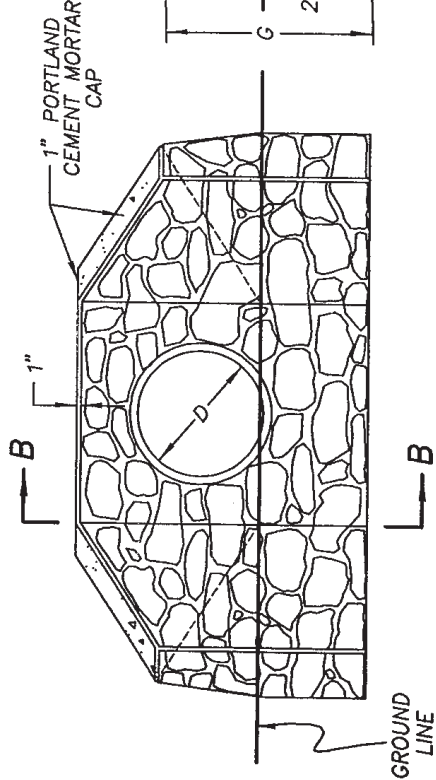
City of Taunton Department of Public Works - Engineering Division Drawn: JPC Approved: JPC Revised: 12-19-97



# CITY OF TAUNTON - STANDARDS



1 1/2" SLOPES and 2:1 SLOPES												SLOPE	
D	E	G	H	J	L	N	P	F	F	F	F	1 1/2":1	2:1
30"	4'-0"	4'-0"	5'-6"	3'-6"	1'-6"	2'-0"	5'-3"	3'-0"	4'-3"	3'-0"	4'-3"		
36"	4'-6"	4'-3"	6'-0"	4'-0"	1'-8"	2'-3"	5'-11"	3'-6"	5'-0"	3'-6"	5'-0"		
42"	5'-0"	4'-6"	6'-6"	4'-6"	1'-10"	2'-6"	6'-6"	4'-0"	5'-8"	4'-0"	5'-8"		
48"	5'-6"	4'-9"	7'-0"	5'-0"	2'-0"	2'-9"	7'-2"	4'-6"	6'-6"	4'-6"	6'-6"		
54"	6'-0"	5'-0"	7'-6"	5'-6"	2'-2"	3'-0"	7'-10"	5'-0"	7'-3"	5'-0"	7'-3"		
60"	6'-6"	5'-3"	8'-0"	6'-0"	2'-4"	3'-3"	8'-5"	5'-6"	8'-0"	5'-6"	8'-0"		
72"	7'-6"	5'-9"	9'-0"	7'-0"	2'-8"	3'-9"	9'-9"	6'-6"	9'-6"	6'-6"	9'-6"		
84"	8'-6"	6'-3"	10'-0"	8'-0"	3'-0"	4'-3"	11'-0"	7'-6"	11'-0"	7'-6"	11'-0"		



ELEVATION

ELEVATION A-A

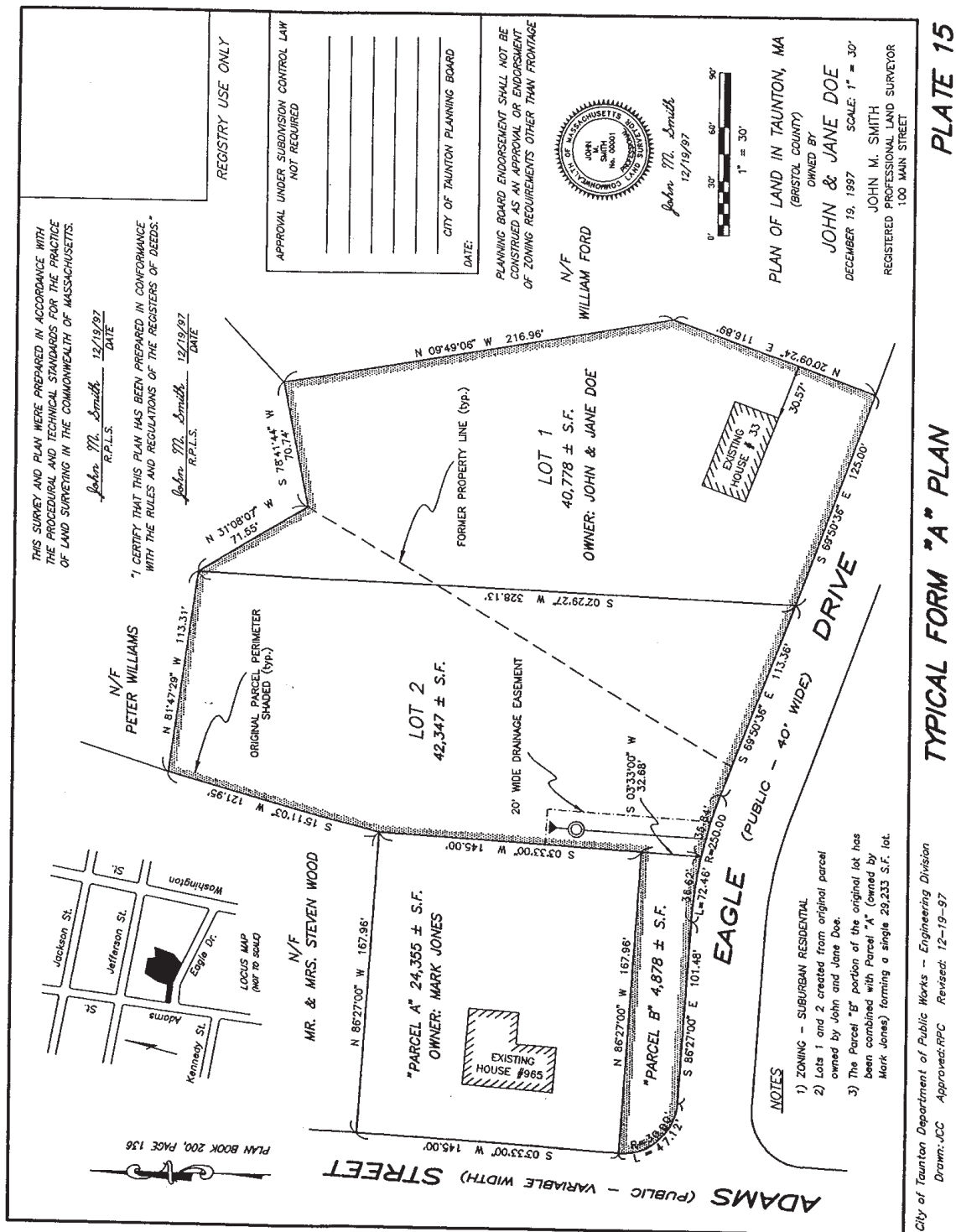
SECTION B-B

FIELD STONE MASONRY HEADWALL (30" TO 84" PIPE CULVERTS)  
(not to scale)

PLATE 14

City of Taunton Department of Public Works - Engineering Division  
Drawing: POC Approved: RBC  
Revised: 12-19-97







ALLOCATION OF TOTAL AREA			
	SMALL 25 UNITS OR LESS	MEDIUM 25 TO 99 UNITS	LARGE 100 UNITS AND UP
PLAY LOT (smaller children)	2,500 to 5,000 SQ. FT.	5,000 to 7,500 SQ. FT.	10,000 SQ. FT. or 1/4 ACRE
APPARATUS AREA (older children)	2,500 to 5,000 SQ. FT.	5,000 to 7,500 SQ. FT.	20,000 SQ. FT. or 1/2 ACRE
OPEN AREA (informal play and group games)	5,000 to 7,500 SQ. FT.	10,000 to 15,000 SQ. FT.	10,000 SQ. FT. or 1/4 ACRE
PAVED MULTIPLE COURT AREA (games, roller skating, etc.)	NOT NEEDED	7,500 SQ. FT.	10,000 SQ. FT. or 1/4 ACRE
OPEN SPACE (undesignated)	BALANCE OF TOTAL AREA		

IT IS SUGGESTED THAT DEVELOPERS BE ENCOURAGED TO LAY OUT AND EQUIP THESE AREAS, WHICH WILL ENHANCE THE VALUE OF THE PROPERTY, AND WILL ALSO AS A DRAWING CARD TO PROSPECTIVE PURCHASERS.

PLATE 16

City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: APC Revised: 12-19-97



DOCUMENT A00805

# SEWER SPECIFICATIONS



## SECTION 02766

### CURED-IN-PLACE PIPE (CIPP) INSTALLATION IN SEWER MAIN

#### PART 1 GENERAL

##### 1.01 SUMMARY

###### A. Section Includes

1. Requirements for reconstruction of pipelines by installation of resin impregnated flexible felt tube either inverted into the existing pipeline utilizing hydrostatic head and curing by circulating hot water to cure the resin composite or pulling the resin impregnated flexible felt tube into the existing pipeline utilizing a winch and cable or other approved method and using steam pressure to cure the resin composite.
2. The resin composite shall be cured into a hard, impermeable, structurally sound, continuous, tight fitting, water tight pipe within a pipe.

###### B. Water for Construction

1. The Owner shall supply all water required by the Contractor for the CIPP curing process. The Contractor must coordinate acceptable supply locations and contact the Owner in advance prior to use of any water for the Project.
2. Drawing water from hydrants shall be coordinated with the **Taunton Water Department**.
  - a. The installation of a backflow preventer and meter is required at the water source. The Contractor shall pay **Taunton Water** directly for water usage.

###### C. Related Sections

1. Section 02149 - Maintaining Existing Flow
2. Section 02610 - Manhole Rehabilitation
3. Section 02763 - Pipeline Cleaning
4. Section 02764 - Television Inspection

##### 1.02 REFERENCES

###### A. American Society for Testing and Materials (ASTM)

1. D790 - Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials.
2. F1216 - Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
3. F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).



### 1.03 DESIGN REQUIREMENTS

- A. The cured-in-place pipe (CIPP) shall be designed for a Fully Deteriorated design condition in which it is assumed that the existing host pipe provides no structural support. The CIPP shall be designed to carry soil, groundwater, and other superimposed loads.
- B. The CIPP thickness shall be designed in accordance with ASTM F1216 under the following conditions:
  - 1. Fully deteriorated gravity pipe: Pipe diameters and material type per Contract Drawings
  - 2. Height of ground water above invert: Assume at ground surface level
  - 3. Height of soil above top of pipe: Per Contract Drawings
  - 4. Live load: AASHTO HS-20
  - 5. Soil Density: 120 lbs/cubic foot
  - 6. Ovality: 2% to 8%, as applicable per Contract application
- C. The CIPP design will assume no bonding to the original pipe.
- D. Hydraulic Capacity - The hydraulic cross-section of the original pipe shall be maintained as much as possible. The completed CIPP shall provide a minimum of the full flow capacity of the original pipe before rehabilitation.

### 1.04 SUBMITTALS

- A. Shop Drawings
  - 1. Submit in accordance with Specification Section 01300
    - a. Description of materials.
    - b. Installation process.
    - c. Long term creep data, testing duration 10,000 hours minimum.
    - d. Wall thickness design calculations prepared by a professional engineer.
    - e. Bypass pumping plan.
    - f. Installer's qualifications and relative experience.
- B. Samples
  - 1. Product samples which indicate conformance with this specification as requested by the Owner/Engineer

### 1.05 SAFETY REQUIREMENTS

- A. Perform all work in strict accordance with applicable OSHA standards. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.

### 1.06 SCHEDULING

- A. Notification
  - 1. Notify all wastewater generators serviced by the sewer main being lined and when the sewer will be off line.



2. Notification to such generators shall be done one week and again at 24-hours prior to the scheduled installation of the liner.
3. Notification shall be done in writing and include contact telephone number.
4. Coordinate schedule with the Owner/Engineer.

#### 1.07 WARRANTY

- A. During the one (1) year Warrantee Period any defects, which may or has affected the integrity and/or strength of the pipe shall be fully repaired at the Contractor's expense, in a manner approved by the Owner/Engineer.

#### 1.08 QUALITY ASSURANCE

- A. Products must have been used in five (5) successful wastewater collection system projects of similar size and scope of the Work and be documented to the satisfaction of the Owner/Engineer.
- B. Furnish reports to the Engineer of third party test data for chemical resistance, physical properties, structural capabilities, performance (both short-term and long-term), and flow coefficient properties.
- C. Installers to be licensed by the patent holder/manufacturer of the cured-in-place inversion and/or pull-in-place process as appropriate, with a minimum of five (5) active years of experience in installing similar size CIPP. Furnish written qualifications of licensed installers.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Inversion or pull-in-place process and materials shall be by Insituform Technologies, Inc., Memphis, TN; Inliner USA, Inc., Houston, TX; Pipeline Products, Mamaroneck, NY. ; or approved equal.

#### 2.02 MATERIALS

- A. CIPP shall conform to the following:

<u>Physical Property</u>	<u>Standard</u>	<u>Minimum Results</u>
Flexural Stress	(Modified ASTM D790)	4,500 psi
Flexural Modulus of Elasticity	(Modified ASTM D790)	250,000 psi

1. Values are for commonly used polyester resins in the United States. Values for non-typical polyesters, vinyl esters and epoxies may be substituted when applicable as approved by the Engineer.
2. Chemically resist internal exposure to domestic sewage in accordance with ASTM F1216 Appendix X.
3. Wall thickness shall be not less than the minimum required by ASTM F1216, Appendix XI.



4. No materials to be included in the tube that may cause de-lamination in cured CIPP.
5. Homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers.
6. No dry or unsaturated layers shall be evident.
7. The CIPP shall not contain fiberglass.
8. Provide uniformed wall thickness during wet-out process that when compressed at installation pressures will meet or exceed the calculated minimum design thickness.

## 2.03 COMPONENTS

A. In accordance with ASTM F1216 or ASTM F1743 as appropriate.

### B. Felt Tube

1. Sized to tightly fit internal dimensions and overall length of original host pipe when installed.
2. Manufactured to withstand installation pressures.
3. Overlapping layers of felt in longitudinal seams that may cause lumps in the final product shall not be utilized.
4. Allow for circumferential stretching during installation including those necessary to accommodate and fit irregular pipe sections.
5. Provide tube length required to span distance between access points.
6. Have sufficient strength and capability to bridge areas of missing pipe or portions thereof.
7. Resin and catalyst system compatible with the inversion or pull-in-place process.
8. Outside layer of Tube to be coated with impermeable, flexible membrane that will contain resin.
9. Interior wall color of tube to be light to allow clear detailed examination by closed circuit television (CCTV)

### C. Resin

1. Corrosion resistant polyester or vinyl ester system including all required catalysts, initiators that when cured within the tube create a composition that satisfies the requirements of ASTM F1216 and ASTM F1743, the physical properties specified herein.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify all lengths between manholes, sewer depths and service connection locations prior to insertion of the liner.
- B. TV inspection logs are provided in Appendix **[insert appendix letter]** of these Specifications. The TV inspection logs are provided for information and convenience only and their accuracy is not guaranteed.



### 3.02 PREPARATION

- A. Cleaning Pipelines shall be in accordance with Specification Section 02763 with the following additional requirements.
  1. Remove all internal debris from the pipe line prior to inserting the liner utilizing any one or combination of rodding machines, high velocity water jet machines, hydraulically propelled machines, etc.
  2. Selection of the equipment used shall be based on the condition of the existing pipeline at the time the work commences.
  3. Methods to be approved by the Owner/Engineer.
  4. Debris resulting from the cleaning operation shall be removed from the downstream manhole of the section being cleaned.
  5. Passing debris from one manhole section to another will not be permitted.
  6. The Contractor shall remove all debris from site during the cleaning operation.
  7. Based on closed circuit television inspection, the Owner/Engineer shall be the sole judge for any final acceptance of the completed pipeline cleaning. Specific areas of pipeline, which have not been cleaned to the satisfaction of the Owner/Engineer shall be re-cleaned and re-inspected as necessary at the Contractor's expense.
- B. Inspection shall be in accordance with Specification Section 02764 with the following additional requirements.
  1. Using a "pan & tilt" camera, closed circuit television inspections shall be performed by experienced personnel trained in locating breaks, obstacles and service connections, using equipment specifically designed for this purpose.
  2. Perform a "Before" CIPP liner installation inspection of the pipeline to locate any conditions which may prevent proper CIPP installation into the existing pipeline, and locate and document all existing sewer service lateral connections for future reinstatement.
  3. Perform an "After" CIPP liner installation inspection to inspect the final pipeline condition and confirm the reestablishment of all sewer service connections. Log the location of conditions requiring correction.
  4. Provide Two (2) copies of the DVD's and TV inspection logs to the Owner and the Engineer for record and future reference.
- C. Pumping and flow bypassing
  1. Supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the pipeline section in which work is to be performed.
  2. Handling existing sewage flows and bypass pumping shall be in accordance with Specification Section 02149.
- D. Flow Control Precautions
  1. Whenever flows in a sewer line are blocked, plugged or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might be inflicted by excessive sewer surcharging.



2. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.
3. Coordination with private property owners is required.

E. Line Obstructions

1. Clear lines of obstructions such as solids, dropped debris, protruding service connections, pieces of pipe, or other obstructions that may prevent normal installation at no additional cost to the Owner.

3.03 INSTALLATION

A. Staging Area

1. Designate location where the tube will be resin impregnated prior to installation.

B. Inspection

1. Allow Owner/Engineer to inspect materials, wet-out procedures and all operations involved with television inspections, as well as installing and curing the liner.

C. Installation

1. In accordance with ASTM F1216 or ASTM 1743 as applicable.

D. Curing

1. After installation is complete, apply steam or heated water for the curing process.
2. Fit the heat source with suitable sensors to monitor the temperature of the curing medium. Fit another sensor between the impregnated tube and the pipe invert at the termination to monitor curing temperature.
3. Uniformly raise the temperature to a level required to effectively cure the resin as determined by the resin/catalyst system employed.
4. Maintain temperature of the curing medium in tube to the temperature required in accordance to the resin manufacturer's instructions.
5. Initial cure deemed complete when inspection shows exposed portions of the tube to be hard and sound and remote temperature sensor indicates temperature is of a magnitude to realize a cure in the resin.
6. Continue cure period as recommended by the resin manufacturer, as modified for the installation process.

E. Cool Down

1. Cool hardened pipe in accordance with resin manufacturer's requirements.
2. The inversion/cooling water cannot be discharged into any river, stream or wetland.

F. Finish

1. Cut new pipe at suitable location in manhole.



2. The finished pipe shall be continuous and watertight over the total length of the run, and be free from defects, foreign inclusions, dry spots, pin holes, lifts and de-laminations.
3. Remove and replace defective areas.

G. Sealing Pipe at Manhole

1. If due to existing broken or misaligned pipe at the manhole wall, the new pipe fails to make a tight seal, a seal shall be applied using a resin mixture compatible with the pipe.
2. The materials being used in the above paragraph must be compatible with materials specified in Specification Section 02610.

3.04 SEWER SERVICE LATERAL CONNECTIONS

- A. After the new pipe has been cured-in-place, reestablish all existing active service lateral connections to no less than 95% of the existing pipe diameter at the locations recorded on the DVD's and TV inspection logs.
- B. Reestablish service lateral connections without excavation, and in the case of non man entry pipes, from the interior of the pipe by means of a television camera and remote controlled cutter specifically designed for this purpose.
- C. Openings shall be rough cut then edges ground smooth, conforming to the existing opening.
- D. After reestablishing the service lateral connection, the end of the service lateral connection shall be sealed to prevent infiltration from the edge of the newly lined sewer to a minimum distance of twelve (12) inches up the service lateral connection utilizing a lateral packer and an acrylamide base gel chemical sealing material compatible with the liner and the existing pipe.
  1. Seal all service lateral connections unless directed otherwise by the Engineer after review of the post lining television inspection recordings.
  2. Lateral packer shall be 2001L Lateral Packer by Logiball, Inc. or a product deemed equal by the Engineer.
  3. Chemical sealing material shall be AV100 Grout by Avanti International, Webster, TX, or a product deemed equal by the Engineer.

3.05 FIELD QUALITY CONTROL

A. Site Tests

1. The water-tightness of the pipe shall be gauged while curing under positive head, or other method approved by the Engineer.
2. Provide samples and testing of physical properties in accordance with ASTM F1216 and ASTM F1743.
3. Additional testing if required will be by the Owner.

B. Final Inspection and Acceptance

1. Provide the Owner and Engineer each with two (2) properly labeled DVD's and corresponding TV inspection logs containing a complete record of the televised internal



pipe inspection demonstrating Contract compliance of the completed work, corrected conditions and reestablished sewer service lateral connections.

3.06 CLEANING AND SITE RESTORATION

- A. Upon acceptance of the CIPP installation and any testing associated therewith, restore the project area affected during the operation to a condition at least equal to that which existing prior to the work.

END OF SECTION



## SECTION 02763

### PIPELINE CLEANING

#### PART 1 GENERAL

##### 1.01 SUMMARY

###### A. Section Includes

1. Requirements for cleaning in preparation for TV inspection and CIPP lining of sewer pipes.

###### B. Related Sections

1. Section 02149 - Maintaining Existing Flow
2. Section 02764 - Television Inspection
3. Section 02767 – Disposal of Materials

##### 1.02 REFERENCES

###### A. National Association of Sewer Service Companies

1. NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

##### 1.03 CLEANING AND DISPOSAL REQUIREMENTS

- A. The Contractor's attention is directed to the requirements set forth by the Commonwealth of Massachusetts, Department of Environmental Protection (MADEP) regarding "Special Wastes" and the proper disposal thereof. All waste materials and debris, as designated by the Owner and/or Engineer including but not limited to any pump station, sewers and associated structures, or any portions thereof, including but not limited to sludge, grit sediment, dirt, sand, rock, grease, roots and other liquid, solid or slime-solid material contained therein, shall be considered, "Special Wastes".
- B. Remove dirt, grease, rocks, sand, iron tuberculation and other materials and obstructions from the pipeline.
- C. Pipeline Cleaning shall be performed by hydraulically propelled or high velocity jet cleaning equipment. Selection of equipment shall be based on such field conditions as access availability and type of debris to be removed.
- D. Clean pipeline to restore a minimum of 95 percent of the original carrying capacity of the pipe, and suitably to permit lining of the pipeline.
- E. The Contractor is required to test and dispose of any waste material removed from the pipeline in accordance with State and Federal requirements. Testing of waste material will be at the Contractor's expense.



- F. The Contractor shall notify the Engineer of the proposed disposal location and requirements of that disposal facility to allow disposal of waste material.
- G. The Contractor is required to store any waste material until all testing requirements of the proposed facility have been met and shall submit copies of all test results to the Engineer.

#### 1.04 SUBMITTALS

- A. Submit in accordance with Specification Section 01300.

- 1. Provide detailed plans and descriptions outlining cleaning and television inspection procedures and all provisions and precautions regarding the handling of existing sewage flows.

#### 1.05 QUALITY ASSURANCE

- A. Perform general work in accordance with NASSCO recommended specifications for sewer collection system rehabilitation.

#### 1.06 QUALIFICATIONS

- A. Company specializing in performing the work of this section with minimum of three (3) years experience.

#### 1.07 TRAFFIC CONTROL

- A. In accordance with Specification Section 01570.

### PART 2 PRODUCTS NOT USED

### PART 3 EXECUTION

#### 3.01 CLEANING PROCEDURES

- A. Sewer Cleaning

- 1. The designated pipelines shall be cleaned using hydraulically propelled or high velocity jet cleaning equipment.
  - 2. Selection of the equipment used shall be based on the conditions of the lines at the time the work commences.
  - 3. Equipment and methods selected shall be satisfactory to the Engineer.
  - 4. Equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, iron tuberculation and other deleterious materials and obstruction from the pipelines.

- B. Material Removal



1. Sludge, dirt, sand rocks, grease and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section which could cause line stoppages.

C. Disposal of Materials

1. Solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed in accordance with Specification Section 02767.

D. Cleaning Precautions

1. During all pipeline cleaning operations, satisfactory precautions shall be taken to protect the pipelines from damage that might be inflicted by the improper use of cleaning equipment.
2. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force or any tools which retard the flow of water in the pipeline are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property.
3. The flow of sewage in the sewer lines shall be utilized to provide necessary pressures by hydraulic cleaning devices whenever possible.
4. When additional quantities of water from fire hydrants are necessary to avoid delay in normal working procedures, the water shall be conserved and not used unnecessarily.
5. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant nor shall a hydrant be used for the purpose described unless a vacuum break is provided.

E. Root Removal:

1. Any visible roots shall be removed as required by the Engineer.
2. Roots shall be removed in all sections by mechanical methods.
3. Chemical root treatment shall also be used as approved by the Engineer.
  - a. Herbicide to be EPA approved.
  - b. Herbicide must be integral part of chemical sealant material.
  - c. Application to be done in accordance with manufacturers written instructions.
  - d. Any surrounding vegetation damaged due to Contractors operation shall be replaced at no expense to the Owner.

F. Pumping and flow bypassing

1. The Contractor shall supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the pipeline section in which work is to be performed.
2. Handling existing sewage flows and bypass pumping shall be in accordance with Specification Section 02149.

G. Flow Control Precautions



1. Whenever flows in a sewer line are blocked, plugged or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might be inflicted by excessive sewer surcharging.
2. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.
3. Coordination with private property owners is required.

3.02 FIELD QUALITY CONTROL

- A. After cleaning, the sewer pipes shall be visually inspected by means of closed-circuit television. The inspection shall be recorded on DVD's and printed TV inspection logs in accordance with Specification Section 02764.
- B. After videotaping the cleaned pipeline any pipe not sufficiently cleaned shall be cleaned again to obtain satisfactory results at no additional cost to the Owner.
- C. Provide two digital video disks (DVDs), one original and one copy to document conditions following completion of the cleaning process.

END OF SECTION



SECTION 02149

MAINTAINING EXISTING FLOW

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements to maintain existing flow and implement and complete all flow diversions and/or bypass pumping required to complete the Work indicated on the Drawings.

1.02 PERFORMANCE REQUIREMENTS

- A. It is essential to the operation of the existing sewerage system that there be no interruption of the wastewater flow throughout the duration of this project. An interruption shall be considered, but may not be limited to, any condition that in the sole opinion of the Engineer adversely affects or alters operation of the existing sewage system and/or any other portion or component of the existing collection system including the associated flows; allows the level of sewage flow to increase, rise, collect, surcharge and/or overflow existing facilities in any manner; or results in any operational or permit violations being issued to the Owner.
- B. The Contractor shall provide, maintain, and operate temporary facilities such as dams, bulkheads, pumping equipment (both primary and backup units as required) conduits, electrical power, and all other labor and equipment to intercept and maintain the existing sewage flow before it reaches the point where it would interfere with his work, carry it past his work, and return it to the existing facilities beyond his work.
- C. The Contractor's attention is directed to the fact that the existing wastewater flow may be affected by high groundwater and rainfall. Increases in normal flow should be expected during periods of wet weather. The Contractor shall therefore take all precautions necessary including monitoring weather forecasts to fully accommodate, control and sufficiently handle the increases in flow during periods of wet weather and/or storms as well as periods of normal flow.
- D. The Engineer may prohibit the carrying out of any work at any time when in his sole judgment, increased flow conditions are unfavorable or not suitable, or at any time, regardless of the existing flows, when proper precautions are not being taken to safeguard the existing sewerage system, previously constructed work, work in progress and/or the general public.
- E. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Owner may require, at no additional expense to the Owner.
- F. The Contractor shall provide a system capable of bypassing a minimum of Four (4) MGD (million gallons per day).



### 1.03 SUBMITTALS

- A. In accordance with SECTION 01300 submit the following:
  - 1. Detailed plans and descriptions outlining all provisions and precautions to be taken regarding the control and handling of existing sewage flows.
  - 2. Include such items as schedules, locations, elevations, capacities of equipment, materials, traffic maintenance plans, and all other incidental items necessary and/or required by the Owner to ensure proper protection of the facilities and compliance with the requirements herein specified.
  - 3. Qualifications as described herein.
  - 4. Detailed proposal for noise prevention measures for review.
  - 5. Shop drawings for all pumping, piping, and appurtenances for type and size of equipment required to perform the flow diversion and/or bypass pumping work as required herein.
- B. The Engineer reserves the right to limit and/or otherwise restrict the Contractor's overall proposal and/or operations without claim from the Contractor should the Engineer deem it to be in the Owner's or public's best interest to do so.

### 1.04 QUALITY ASSURANCE

- A. Qualifications
  - 1. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the Engineer that he specializes in the design and operation of temporary bypass pumping systems. The vendor shall provide at least five (5) references of projects of similar size and complexity in wastewater applications performed by his firm within the past three years within New England. The bypass system shall meet the requirements of codes and regulatory agencies having jurisdiction.
  - 2. The vendor shall demonstrate the bypass pumping equipment is automated and is capable of functioning without the assistance of an operator.
  - 3. The vendor shall demonstrate the pumping equipment can operate for an extended period of time running dry. After this period of time, the pump shall have the capability of pulling a 25" Hg vacuum without adjustment or repair.
  - 4. The vendor shall demonstrate sufficient service resources and repair parts in stock to fulfill service or repair of rental equipment within one hour of a service call, twenty-four hours per day, seven days per week.
  - 5. Temporary components of the bypass system including pumps, pipe, hose, valves, and fittings shall be provided by one bypass vendor. Hydraulic calculations and drawings required by the submittals shall be provided by the bypass vendor and stamped and certified by a Professional Engineer licensed in the State of the installation.
- B. Pre-Installation Meeting
  - 1. Contractor to schedule and attend a pre-installation meeting with the vendor, Owner and Engineer prior to installation of by-pass system.



## PART 2 PRODUCTS

## 2.01 EQUIPMENT

- A. At a minimum, all equipment shall be supplied in duplicate for emergency situations. Provide adequate on-line backup facilities so that no interruption in service is encountered. Equipment and installation are subject to the approval of the Owner and the Engineer.
- B. Pumping System(s)
  - 1. All pumping units (primary and secondary) and appurtenances shall be sized properly to handle the flows encountered including increased flows due to wet weather.
  - 2. Pumps shall be centrifugal, end suction, fully automatic self-priming pumps that do not require the use of foot-valves, vacuum pumps, diaphragm pumps, or isolation valves in the priming system. The pumps may be electric or diesel powered. Pumps must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows and shall immediately develop 25" Hg vacuum without adjustment or repair or employ level control devices to regulate on/off or variable speed of the pump. Pumps shall be CD low noise units as manufactured by Godwin Pump of America, Inc, or approved equal. All pumping units and appurtenances shall be sized in accordance with the design parameters provided. Pumps shall not be connected by a common suction manifold.
  - 3. Seals shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding suction pressures to 100 psi running. The mechanical seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for extended periods of time. All metal parts shall be of stainless steel. Elastomers shall be Viton.
  - 4. The Contractor shall provide the necessary start/stop controls for each pump.
  - 5. The Contractor shall be responsible to meet noise requirements in specified elsewhere in this section. All diesel driven primary and standby pumps shall be sound attenuated. The use of Critical Silenced Canopy pumps or acoustical Whisper Pac enclosures for sound attenuation are required.
- C. Piping System(s)
  - 1. All piping systems (primary and secondary) and appurtenance shall be sized properly to handle the flows encountered including increased flows due to wet weather.
- D. Power Generating Facilities
  - 1. Include power generating facilities capable of providing all power necessary to operate any primary and secondary pumping systems.
  - 2. Maintain facility to be ready for use if required.
- E. Noise Prevention
  - 1. Noise prevention measures for all equipment shall be used to insure minimum noise impact or surrounding areas.
  - 2. Measures may include but shall not be limited to enclosures, insulation, electric pumping units, and hospital grade silencers or mufflers.
  - 3. Noise levels shall be maintained such that increase shall not exceed 10 dBA over background at the nearest property line.
  - 4. Should at any time prior to or during the performance of above mentioned work, the Engineer determines the noise prevention measures being used are not adequate, the



Contractor shall at no additional cost to the Owner suspend all work until acceptable measures are incorporated.

### PART 3 EXECUTION

#### 3.01 PUBLIC SAFETY AND CONVENIENCE

##### A. General

1. The Contractor shall at all times keep the streets, highways, roads, driveways, parking lots, private walks, and public sidewalks open for pedestrian and vehicular traffic unless otherwise authorized by the Owner/Engineer.

##### B. Public Travel Ways

1. Any authorized temporary closure of any streets, highways or roads shall be coordinated with the local Fire, Police and/or Department of Public Works as required by the municipality.

##### C. Municipal, Commercial and Private Property

1. Any authorized, temporary closure of any municipal, commercial or private driveway or access route will require the Contractor provide 48 hour notice to abutters of the temporary restriction of access to their property. The Contractor will make every attempt to schedule his work with as little inconvenience to the property owner as possible

#### 3.02 INSTALLATION

- A. Keep the Engineer advised at all times of any changes made to the overall operation(s) to accommodate field conditions.
- B. Flow diversions and/or bypass pumping shall be maintained at all times as long as it is necessary to maintain the flow through the limits of the project during construction.
- C. Maintain auxiliary and/or emergency equipment at the site to continue flow division and/or by-pass pumping operations in the event of a breakdown and/or loss of normal power.
- D. The Contractor shall be responsible for the proper functioning and operation of the backup pumping units. Back-up pump(s) shall be on-line, isolated from the primary system by a valve.
- E. No work shall begin until all provisions and requirements of this Section have been reviewed and approved by the Engineer.
- F. The Engineer reserves the right to limit and/or otherwise restrict the Contractor's overall activities and/or operations at any time without claim should the Engineer deem it to be in the Owner's or public's best interest to do so.

END OF SECTION



## SECTION 02764

### TELEVISION INSPECTION

#### PART 1 GENERAL

##### 1.01 SUMMARY

###### A. Section Includes

1. Requirements for television inspection of pipelines.

###### B. Related Sections

1. Section 01570 - Traffic Regulations
2. Section 02149 - Maintaining Existing Sewage Flow
3. Section 02763 – Pipeline Cleaning

##### 1.02 REFERENCES

###### A. National Association of Sewer Service Companies

1. NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

##### 1.03 SUBMITTALS

###### A. In accordance with Specification Section 01300, submit the following:

1. Outline of the procedures proposed to accomplish the work. Include a detailed description of the methods and equipment to be used for each operation. Outline TV inspection procedures and all provisions and precautions regarding the handling of existing sewage flows.

##### 1.04 QUALIFICATIONS

###### A. Company specializing in performing the work of this section with minimum five (5) years documented experience.

#### PART 2 PRODUCTS

###### A. TV Inspection Logs:

1. Printed location records clearly showing the location, in relation to an adjacent manhole of each infiltration point observed during inspection and other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, deposits, and other discernible features.

###### B. DVD Recordings:

1. Color video and audio record documenting TV inspection of conditions subsequent to cleaning.



2. The purpose of recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed.
3. Video recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor.
4. Title to the recording shall remain with the Contractor; however, the Owner reserves the right to purchase any additional DVD's at the completion of the project.
5. Provide two (2) sets of DVD's complete in the required format.

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Control traffic in accordance with Specification Section 01570.
- B. Bypass sewage flow to allow performance of work. Handling existing sewage flows and bypass pumping shall be as specified in Specification Section 02149.
- C. Clean sewer lines in accordance with Specification Section 02763.

### 3.02 TV INSPECTION

- A. TV inspect sewer pipes following initial cleaning and following rehabilitation work prior to putting the line back in service.
- B. After cleaning, the sewer pipes shall be visually inspected by means of color closed-circuit television. The inspection shall be recorded on DVD and printed TV inspection logs.
- C. Equipment:
  1. Television Camera to be specifically designed and constructed for such inspection; equipped with a light to allow a clear picture of the entire periphery of the pipe; operative in 100 percent humidity conditions; and equipped with manual or power winch, TV cable, powered rewinds or other devices that do not obstruct the camera view to move the camera through the line.
  2. Camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. At areas of interest, the camera shall be capable of rotating its lens 360-degrees to obtain a clearer, more direct viewing angle. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.



3. Camera, television monitor, recording device and all other components of the video system shall be capable of producing picture quality acceptable to the Engineer.
  4. TV inspection equipment shall be equipped with a meter device to locate defects by measurement. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Accuracy of the distance meter shall be acceptable to the Engineer.
  5. When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to ensure good communication between members of the crew.
- D. If, during the inspection operation, the television camera will not pass through the entire manhole section, set up equipment so that the inspection can be performed from the opposite manhole.

### 3.03 FIELD QUALITY CONTROL

#### A. TV Inspection Records

1. Complete records shall be kept of TV inspection performed in each manhole section. The records shall identify the following information:
  - a. Identification of the manhole section tested.
  - b. Location (footage) of problem.
2. Record on DVD all footage inside the sewer pipe. All DVD's and necessary playback equipment shall be readily accessible for review by the Engineer during the project.

END OF SECTION



## SECTION 02610

### MANHOLE REHABILITATION

#### PART 1 GENERAL

##### 1.01 SUMMARY

###### A. Section Includes

1. Requirements for the following work.
  - a. Replacing missing, loose, or broken brick masonry and mortar joints, and patching all holes, voids, and spalled areas.
  - b. Replacing all unsound, damaged, or missing manhole steps, as directed.
  - c. Sealing of the manhole to eliminate infiltration.
  - d. Replacing manhole frame and cover, as directed.
  - e. Applying coating materials.

###### B. Related Sections

1. Section 02149 Maintaining Existing Flows
2. Section 02611 Epoxy Lining System

##### 1.02 REFERENCES

###### A. American Association of State Highway and Transportation Officials (ASSHTO)

1. AASHTO M91 - Red Sewer Brick Only Grade SS.

###### B. American Society for Testing and Materials (ASTM)

1. ASTM C32 - Specification for Sewer and Manhole Brick (Made from clay or shale). Grade SS
2. ASTM C94 - Specification for Ready-Mixed Concrete.
3. ASTM C109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch or 50-mm Cube Specimens).
4. ASTM C144 - Specification for Aggregate for Masonry Mortar.
5. ASTM C150 - Specification for Portland Cement.
6. ASTM C207 - Specification for Hydrated Lime for Masonry Purposes.
7. ASTM C267 - Test Method for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes.
8. ASTM C293 - Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)
9. ASTM C321 - Test Method for Bond Strength of Chemical-Resistant Mortars.



10. ASTM C496 - Test Method for Splitting Tensile strength of Cylindrical Concrete Specimens.
11. ASTM C596 - Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement.
12. ASTM C666 - Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
13. ASTM C827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
14. ASTM C882 - Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.

C. National Association of Sewer Service Companies (NASSCO)

1. NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

1.03 SUBMITTALS

A. Submit in shop drawings accordance with Specification Section 01300.

1. Product Data: Provide data on grouting, plugging, patching, coating and lining materials; manhole steps; mortar components; manhole frames and covers, as applicable; and sewer brick.
2. Mortar design mix.
3. Manufacturer's preparation/mixing/installation/application instructions for grouting, plugging, patching, coating and lining materials.
4. Outline of the procedures proposed for the accomplishment of work. Include a detailed description of the means and methods, and equipment to be used for each operation.

1.04 QUALITY ASSURANCE

- A. The materials used to plug, patch, coat and line manholes shall comprise of a system specifically recommended by the manufacturer for sanitary sewer manhole rehabilitation.
- B. Perform general work in accordance with NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

1.05 QUALIFICATIONS

- A. Installer: Company specializing in performing the work described in this Section shall demonstrate by documentation to the Engineer a minimum of three (3) years documented experience. The installer shall be a fully licensed applicator by the applicable manufacturer. The installer shall also be required to furnish a minimum of five (5) references where selected products have been successfully utilized under similar conditions.



## 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600 and in strict accordance with the manufacturer's recommendations/instructions.
- B. Maintain packaged materials clean, dry and protected against dampness, freezing, foreign matter and/or any other compromising conditions.

## PART 2 PRODUCTS

### 2.01 MATERIALS

#### A. Brick

- 1. Sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Brick shall comply with ASTM C32 and AASHTO M91 for sewer brick type S.S.
- 2. Rejected brick shall be immediately removed from the work.

#### B. Mortar for Brickwork

- 1. Composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volume of cement and lime. The proportions of cement and lime shall be 4:1.
- 2. Cement shall be Type II Portland cement conforming to ASTM C150.
- 3. Hydrated lime shall be Type S conforming to ASTM C207. Hydrated lime shall be "Mortaseal" manufactured by US Gypsum, "4X Hydrate" manufactured by the New England Lime Company or an acceptable equivalent product.
- 4. Sand shall conform to ASTM C144.

#### C. Manhole Steps

- 1. Steel reinforced copolymer, polypropylene plastic with flexible "fins" designed to flex on insertion into manhole wall but to catch and hold upon any attempt to pull them out. Manhole steps shall be as manufactured by M.A. Industries Inc., Peachtree City, GA or an acceptable equivalent product.

#### D. Manhole Frames and Covers

- 1. Owners standard or as detailed on the Drawings.

#### E. Patching Material

- 1. Patching material shall be a rapid-setting, fiber reinforced, high-early-strength, corrosion/sulfate resistant calcium aluminate based cementitious material shall be used as a patching material for making repairs in concrete, brick, or other masonry constructed structures. Material shall be mixed and applied in strict accordance with the manufacturer's recommendations and shall have the following minimum requirements:



- a. Compressive Strength, ASTM C109: 1400 psi @ 6 hours
- b. Bond, ASTM C321: 140 psi @ 28 days
- c. Cement: Calcium Aluminate Cement  
Sulfate Resistant
- d. Applied Density: 105 ± 5 lbs per cubic foot
- e. Shrinkage, ASTM C596: 0% @ 90% relative humidity

- 2. Patching material shall be Strong-Seal® QSR as manufactured by Strong Seal Systems Corporation, Pine Bluff, AK or an acceptable equivalent.

#### F. Infiltration Control Material

- 1. Infiltration control material shall be a rapid-setting, high-early-strength, cementitious material specifically formulated for leak control applications, stopping infiltrating groundwater and making repairs in concrete, brick, or other masonry constructed structures. Material shall be mixed and applied in strict accordance with the manufacturer's recommendations and shall have the following minimum requirements:

- a. Compressive Strength, ASTM C109: 400 to 600 psi @1-hour  
1,800 to 2400 psi @ 24-hours
- b. Expansion, ASTM C827: 0.10-percent
- c. Sulfate Resistance, ASTM C267: No weight loss after 15-cycles;  
2,000 ppm
- d. Freeze/Thaw Resistance, ASTM  
C666, Method A: 100 cycles
- e. Placement time: Less than 1 minute

- 2. Infiltration control material shall be Strong-Plug® as manufactured by Strong Seal Systems Corporation, Pine Bluff, AK or an acceptable equivalent.

#### G. Grouting Material

- 1. Chemical Sealing Materials shall be made of Acrylamide base gel and shall meet or exceed the following requirements:
  - a. A minimum of 10% acrylamide base material by weight in the total sealant mix, higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution during injection.
  - b. The ability to tolerate some dilution and react in moving water during injection.
  - c. A viscosity of approximately 2 centipose, which can be increased with additives.
  - d. A constant viscosity during reaction period.
  - e. A controllable reaction time from 10 seconds to 1 hour.
  - f. A reaction (curing), which produces a homogeneous, chemically non biodegradable gel.
  - g. The ability to increase mix viscosity, density and gel strength by the use of additives.



2. The Chemical sealing materials shall be AV100 Grout by Avanti International, Webster, TX, or an acceptable equivalent product.

#### H. Liner Material

1. Liner material shall be an epoxy system in accordance with Specification Section 02611.

### PART 3 EXECUTION

#### 3.01 REHABILITATION WORK

- A. Rehabilitate manholes as indicated and as specified herein.
- B. Rehabilitation includes sealing manholes to eliminate infiltration.
- C. Manhole sealing includes the following:
  1. Cleaning; surface preparation; stopping active leaks, applying patching/grouting materials as applicable to all holes or voids around steps, joints, or pipes and all spalled areas; and replacing missing bricks and re-pointing all missing and loose mortar joints.
  2. Applying coating/liner compounds and cementitious coating system to invert, bench, walls cone, corbel and chimney.

#### 3.02 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means acceptance of existing surfaces.

#### 3.03 PREPARATION

- A. Bypass sewage flow to allow performance of the work. Provide the necessary pumps, conduits, and other equipment to divert the flow of sewage around the manhole in which work is to be performed. Handling existing sewage flows and bypass pumping shall be in accordance with Specification Section 02149.
- B. Prepare surfaces in accordance with mortar and coating manufacturer's instructions.
- C. Clean all concrete and masonry surfaces to be rehabilitated. Completely remove all sewage residue, grease, oil, laitance, coatings, loose bricks, mortar, unsound concrete and other foreign materials. Remove all cracked or disintegrated material to expose a sound subbase.
- D. All cracks not subject to movement and greater than 1/16 inch wide shall be routed out to a minimum width and depth of 1/2 inch.
- E. Remove and dispose of all solids and semi-solids resulting from the preparation operations in accordance with Specification Section 00700, 1.24, B.



- F. The primary means of cleaning the manhole shall be water blasting using high-pressure water only. Other methods such as dry sandblasting, acid-wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. All surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.
- G. Water blast equipment shall utilize a minimum pressure of 5,000 psi and be capable of providing up to 10,000 psi of pressure when required. Muriatic acid (hydrochloric acid) solution, if used, shall be one part acid to ten parts water and shall be applied by spraying from above the manhole.
- H. After surface preparation and prior to application of mortars and coatings, infiltration shall be stopped by either plugging, chemical grout sealing, or channeled through "bleed" pipes installed at the bottom of the manhole.

### 3.04 CHEMICAL GROUT SEALING

- A. At each point of leakage within the manhole structure a hole shall be drilled from within the manhole and shall extend through the entire wall. In cases where there are multiple leaks around the circumference of the manhole, fewer holes may be drilled, providing all leakage is stopped from these holes.
- B. Install grout ports or sealant injection devices in these previously drilled holes in such a way as to provide a watertight seal between the holes and the injection device.
- C. Inject chemical grout into the installed ports under pressure using equipment appropriate for the particular application. The injection equipment shall consist of chemical pumps, chemical containers, injection packers, hoses, valves, and all necessary equipment required to seal manholes. The chemical injection pumps shall be equipped with pressure meters that will provide for monitoring pressure during injection of the chemical grout.
- D. Continue injection of grout until material refusal is recorded on the pressure gage of the pumping unit.
- E. Care shall be taken during the pumping operation to avoid excessive pressures that may damage the manhole structure.
- F. Upon completion of the injection remove the ports and fill the remaining holes with patching compound.

### 3.05 BLEED PIPES

- A. Drill holes and install "bleed" pipes around the bottom of the manhole wall to act as relief ports for water to flow from other active leaks to allow performance of the work.
- B. Remove bleed pipes and seal holes after all other manhole sealing work is complete.



3.06 PLUGGING COMPOUND

- A. Apply plugging compound in accordance with manufacturer's instructions.

3.07 PATCHING COMPOUND

- A. All material shall be mixed and applied in accordance with the manufacturers instructions.
- B. Installation to be performed by mechanics skilled in the application of the particular type of system.
- C. Prior to application, dampen area to be patched. Pack material into the area to be patched, troweling the minimum amount required to achieve a level finish. Allow adequate curing time.

3.08 BRICKWORK

- A. Only clean bricks shall be used. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
- B. Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded as directed.

3.09 MANHOLE STEPS

- A. Remove all unsound and damaged steps as directed by the Engineer.
- B. Drill holes to allow minimum of 3-inch embedment into the manhole wall or until the fins designed to catch are fully embedded.
- C. Clean holes by suitable means to remove all foreign matter such as dirt, oil, and grease.
- D. Fill all holes and voids with non-shrink grout. Work grout into space to eliminate voids.

3.10 MANHOLE FRAMES AND COVERS

- A. Remove and dispose of the cast-in-place concrete collar around the existing frame. Material in the exposed area shall be dug out to a depth sufficient to permit the required repairs.
- B. Remove the existing manhole frame and cover, dispose of the existing frame, and deliver cover to the Taunton Wastewater Treatment Facility. It shall be the responsibility of the Contractor, at no additional cost to the Owner, to repair any damage to the manhole chimney or corbel caused by the removal of the existing manhole frame and the reinstallation/replacement of the same.
- C. Frames shall be set concentric with the top of the masonry and fastened as indicated. A thick ring of mortar extending to the outer edge of the masonry shall be placed all



around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

- D. Manhole covers shall be left in-place within the installed frames on completion of other work at the manholes.

### 3.11 INVERT REPAIR

- A. After preparation has been completed, remove all loose material and wash wall again.
- B. Any bench, invert or service line repairs shall be made at this time using the quick setting patching material (article 2.01) and shall be used per manufacturer's recommendations.
- C. Invert repair shall be performed on all inverts with visible damage or infiltration. After blocking flow through the manhole and thoroughly cleaning the invert, the quick setting patch material (article 2.01) shall be applied to the invert in an expeditious manner. The mix shall be troweled uniformly onto the invert at a minimum thickness of ½ inch, extending out onto the bench sufficiently to tie into the monolithic liner to be spray applied. The finished invert shall be smooth and free of ridges. The flow may be re-established in the manhole within 30 minutes after placement of the material.

### 3.12 LINER

- A. All material shall be mixed and applied in accordance with the manufacturers instructions.
- B. Installation to be performed by mechanics skilled and licensed by the manufacturer in the application of the particular type of system.
- C. Application of the liner shall be according to the manufacturers recommendations and as approved by the Engineer.

### 3.13 FINAL ACCEPTANCE

- A. After the specified types of rehabilitation work have been completed, visually inspect each manhole in the presence of the Engineer for full compliance with the Specifications including watertightness against leakage. Repair all visible leaks and defects observed during inspection. Final acceptance of the completed work shall be determined solely on an acceptable concurrence by the Owner/Engineer.
- B. The Owner/Engineer reserves the right to re-inspect the rehabilitated manholes at any time during the warranty period. During such inspections should there be any leakage and/or other defects found in the work the Contractor shall fully correct the elements of work in question as determined by the Owner/Engineer within thirty (30) days at no additional cost to the Owner.

END OF SECTION



## SECTION 02611

### MANHOLE EPOXY LINING

#### PART 1 GENERAL

##### 1.01 SUMMARY

###### A. Section Includes:

1. Requirements for work, materials, equipment, tools, and application equipment for installation and testing of a monolithic lining system.
2. Requirements for specialized application equipment and rigorous surface preparation requirements used to apply the surfacing system without the use of solvents.
3. Product application requirements and procedures, including surface preparation, mixing, application, material handling and storage, qualification of Application Contractor and application quality control.

###### B. Related Sections:

1. Section 02149 - Maintaining Existing Flow
2. Section 02610 - Manhole Rehabilitation

##### 1.02 REFERENCES

###### A. American Society for Testing and Materials (ASTM)

1. D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
2. D638 - Standard Test Method for Tensile Properties of Plastics.
3. D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
4. D790 - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
5. D2240 - Standard Test Method for Rubber Property - Durometer Hardness, Type D.
6. D2584 - Standard Test Method for Ignition Loss of Cured Reinforced Resins.
7. D4414 - Standard Practice for Measurement of Wet Film Thickness by Notch Gages
8. D4541 - Standard Test Method for Pull-off Strength of Coatings Using a Portable Adhesion Tester.

###### B. NACE - The published standards of National Association of Corrosion Engineers (NACE International), Houston, TX.

##### 1.03 SUBMITTALS

###### A. In accordance with Section 01300, submit the following:

1. Product data and manufacturer's application instructions.



2. Samples
  - a. Colors as required.
3. Quality Assurance Submittal:
  - a. Submit documentation stating the Application Contractor is an approved installer and licensed by the epoxy system manufacturer and specialized equipment supplier.
  - b. Submit documentation stating the Application Contractor's experience, listing at least 5 past clients to verify previous satisfactory performance on projects of similar or greater size and difficulty factor. Submitted documentation shall include the project type, total value of the contract, date of project completion, as well as Owner and Engineer contact information, including names, addresses, and telephone numbers.
  - c. Submit documentation from the monolithic surfacing manufacturer listing at least 5 previous installations of the product including installation dates, description of work performed, contact names and telephone numbers.

#### 1.04 QUALITY ASSURANCE

- A. Application Contractor must be established in the epoxy lining industry, have at least 5 years of experience in the epoxy lining of structures, and have coated a minimum of 6,000 structures. The Application Contractor cannot share the experience of the manufacturer.
- B. Application Contractor shall initiate and enforce quality control procedures consistent with applicable ASTM and NACE standards together with pull testing and vacuum testing to assure a high quality project.
- C. Application Contractor shall use an adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts. These workmen shall be completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. The supervisor and foreman must have a minimum of 5 years experience in epoxy restoration via plural component spray application with 100% solid epoxy.
- D. Application Contractor shall use approved specialty equipment adequate in size, capacity and number sufficient to accomplish the work of this Section in a timely manner.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading
  1. In accordance with manufacturer's recommendations.
  2. Protective coating materials are to be handled according to their material safety data sheets.
- B. Acceptance at Site
  1. Products to be delivered to site in sealed, labeled and unopened containers.



2. Labels to include Name, type, code, coverage, surface preparation, drying time, color, clean up procedure, and mixing and reducing instructions.
3. Remove unacceptable products immediately.

C. Storage and Protection

1. Materials are to be kept dry, protected from weather, stored under cover, and stored between 50 deg F and 90 deg F. Do not store near flame, heat or strong oxidants.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS AND EQUIPMENT SUPPLIERS

- A. Epoxy lining materials and appropriate application equipment shall be by Warren Environmental, Inc., Carver, MA or approved equal.

### 2.02 REPAIR MATERIALS

- A. Repair materials must be accepted and approved by the specifying engineer and must be compatible with the specified epoxy system. No cementitious repair materials will be allowed. Only 100% solids epoxy mastic repair materials shall be used to profile or build out deteriorated walls.

### 2.03 STRUCTURAL EPOXY LINING AND REPAIR SYSTEM

- A. A non-toxic, 100% solids, solventless epoxy resin system as applied according to the manufacturer's requirements, and a non-toxic, 100% solids epoxy mastic repair resin system applied by hand and/or trowel, exhibiting the following characteristics:

Product	Structural Epoxy
Product type	cycloaliphatic cured novalac-epoxy resin
Color	White (resin coating) / Light Grey (mastic)
Solids Content (vol %)	100%
Compressive Strength	ASTM D695 11,000 p.s.i.
Flatwise Tensile Strength	
Of Sandwich Constructions	ASTM C297 2,608 p.s.i.
Tensile Strength	ASTM D638 6,000 p.s.i.
Tensile Elongation	ASTM D638 4%
Flexural Strength	ASTM D790 11,000 p.s.i.
Flexural Modulus	ASTM D790 500,000 p.s.i.
Bond Strength – Concrete	ASTM D4541 Concrete Failure
Chemical Resistance to:	
Sulfuric Acid, 70%	ASTM D543 Immersion Service
Sodium Hydroxide, 20%	ASTM D543 Immersion Service

- B. The monolithic lining system shall be continuously bonded to all brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the structure according to ASTM D4541. Coating thickness shall be designed for application intended as indicated on the Drawings



- C. The cured epoxy will be monolithic with proper sealing to all internal connections and shall be placed and cured in 1 or 2 applications in conformance with the recommendations of the structural epoxy system manufacturer. Recommended thickness of the applied epoxy can vary due to substrate conditions and will be applied per the recommendations of the coating manufacturer as approved by the Engineer.
- D. When cured, the system shall form a continuous, tight-fitting, hard, impermeable surfacing that is suitable for sewer system service and chemically resistant to any chemicals, bacteria or vapors normally found in domestic or industrial sewage
- E. The system shall effectively seal the interior surfaces of the structure and prevent any penetration or leakage of groundwater (infiltration).
- F. The system shall be compatible with the thermal conditions of the existing sewer structure.

## 2.04 STRUCTURAL EPOXY APPLICATION EQUIPMENT

- A. Heated, plural component, specially designed equipment for use in the spray or spincast application of the specified system approved for use and as designed and developed by the structural epoxy manufacturer. The product may also be hand troweled.

## PART 3 EXECUTION

### 3.01 PRE-COAT INSPECTION

- A. All structures to be coated shall be readily accessible to the Application Contractor.
- B. Appropriate actions shall be taken to comply with local, state and federal regulatory and other applicable agencies with regard to environment, health and safety.
- C. Active flows shall be diverted with flow through plugs or bypass pumped, in accordance with Section 02149 of the Specifications, as required to ensure that the liquid flow is maintained off the surfaces to be lined.
- D. Installation of the protective coating shall not commence until the concrete substrate has properly cured a minimum cure of 28 days for new concrete.

### 3.02 SURFACE PREPARATION

- A. Application Contractor shall inspect all surfaces specified to receive the monolithic surfacing system prior to surface preparation. Application Contractor shall notify Engineer of any noticeable disparity in the surfaces that may interfere with the proper preparation or application of the monolithic surfacing system.



- B. All concrete that is not sound or has been damaged by chemical exposure shall be removed to a sound concrete surface. All contaminants including: oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants must be removed.
- C. Surface preparation method(s) shall be based upon the conditions of the substrate and the requirements of the monolithic surfacing system to be applied.
- D. Quick setting high strength concrete with latex or curing agent additives cannot be used to re-profile the surface to be epoxy lined. Proper surface preparation procedures must be followed to ensure adequate bond strength to any surface to be coated. New cement must cure at least 30 days prior to coating.
- E. Existing coatings should be removed or thoroughly abraded to provide adequate surface profile for mechanical bond by the new system. Application Contractor is to maintain strict adherence to the monolithic surfacing system manufacturer's recommendations with regard to proper surface preparation and compatibility with restoration and structural liner materials.
- F. Surfaces to receive protective coating shall be cleaned and abraded to produce a sound surface with adequate profile and porosity to provide a strong bond between the epoxy surfacing system and the substrate. The first procedure upon entering each structure will be to blast all specified surfaces by low pressure water cleaning. When all loose and /or contaminated debris has been removed, the surface shall be water blasted by the use of a hand held wand again. The wash water shall include a dilute solution of chlorine to diminish bacterial growth and to kill any bacteria residing on or in the surface. The surface will be tested at this point to ensure that the pH is within acceptable limits (not to exceed 8.5). These tests will be performed with litmus paper on various areas within the structure.
- G. Surfaces that require additional cleaning or profiling will be prepared by abrasive blast or water blasting at 4,000 to 10,000 psi in order to rough the surface sufficient to obtain and ensure adequate bonding of the system. A minimum surface profile of 8-10 mils must be achieved to assure proper adhesion. Detergent water cleaning and hot water blasting may be necessary to remove oils and grease from the concrete or brick. Whichever methods are used, they shall be performed in a manner that provides a uniform, sound clean surface that is not excessively damaged.
- H. Active water infiltration shall be stopped by using approved cementitious water plug or hydroactive grout that is compatible and suitable for topcoating with the specified epoxy surfacing system. Latex base products cannot be used, - NO exception.
- I. All surfaces shall be inspected during and after preparation and prior to application of the monolithic surfacing system. Any evidence of remaining contamination or residuals shall be removed by additional water or abrasive blast, or other approved method before proceeding with application of the monolithic surfacing system.



### 3.03 APPLICATION OF REPAIR MATERIALS

- A. Areas where reinforcing steel has been exposed or removed shall be repaired by replacing spent rebar with new rebar to match existing. All new rebar will be embedded in 1 ½ inch of epoxy mastic.
- B. Repair materials shall meet the specifications of this Section. The materials shall be trowel or spray applied utilizing proper equipment on to specified surfaces. The material thickness shall be specified by the Engineer according to Owner's requirements and manufacturer's recommendations.
- C. All surfaces shall be inspected during and after preparation and prior to application of the monolithic surfacing system. Any evidence of remaining contamination or latence shall be removed by additional water or abrasive blast, or other approved method before proceeding with application of the monolithic surfacing system.
- D. Approved repair materials, shall be trowelled to provide a smooth surface with an average profile equivalent to coarse sandpaper to receive the protective coating. No bugholes or honeycomb surfaces should remain after the final trowel procedure of the repair epoxy mortar.
- E. The repair materials shall be permitted to cure according to manufacturer recommendations. Curing compounds may not be used unless approved by the monolithic surfacing system manufacturer for compatibility with the specified system.
- F. Application procedure of the repair materials, if not performed by the monolithic surfacing system applicator, should be observed by the Applicator's representative to ensure proper finishing for suitability to receive the specified epoxy liner.
- G. All surfaces shall be sufficiently smooth and even, to ensure good flow handling characteristics when coated with epoxy materials.

### 3.04 STRUCTURAL EPOXY REHABILITATION SYSTEM

- A. Application procedures shall conform to the recommendations of the structural epoxy manufacturer, including material handling, mixing, and environmental controls during application, safety, and equipment.
- B. The equipment shall be specially designed to accurately ratio and apply the specified materials and shall be regularly maintained and in proper working order.
- C. The specified materials must be applied by an approved installer.
- D. All specified surfaces will be lined with the structural epoxy system to provide a minimum total thickness of 250 mils for rehab structures and 125 mils for new concrete. The epoxy liner shall be monolithic with proper sealing of connections to all unsurfaced areas and shall be placed and cured in one to two applications, depending on the existing structure's conditions.



### 3.05 TESTING AND INSPECTION

- A. A wet film thickness gauge, such as those available through Paul N. Gardner Company, Inc. meeting ASTM D4414, shall be used to ensure a monolithic coating and uniform thickness during application.
- B. After the system has set hard to the touch it shall be inspected by the Engineer verifying the following:
  - 1. The Engineer will measure the system-cured thickness from a specimen retrieved by the Application Contractor. Retrieval can be made by physically cutting through the epoxy liner (by drilling or coring) or a suitable non-destructive type of thickness measurement may also be used, (e.g. ultrasonic).
  - 2. Groundwater infiltration of the system shall be zero.
  - 3. All pipe connections shall be open and clear.
  - 4. No cracks, voids, pinholes, uncured spots, dry spots, lifts, delamination or other type defects shall be evident in the system.
- C. All lined surfaces will be tested with high-voltage holiday detection equipment. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the pinhole. All detected pinholes shall be marked and repaired by abrading the lined surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional system material can be hand applied to the repair area. All touch-up/repair procedures shall follow the monolithic surfacing system manufacturer's recommendations.
- D. Measurement of bond strength of the system to the substrate can be made at regular intervals and along different sections of the structure (i.e. corbel, wall, and bench). Bond strength can be measured in accordance with ASTM D4541. Any areas detected to have inadequate (less than 300 p.s.i. or 80% substrate failure to concrete) bond strength shall be evaluated by the Engineer. Further bond tests may be performed in that area to determine the extent of potentially deficient bonded area and repairs shall be made by the Application Contractor in strict accordance with the manufacturer's recommendations.
- E. A final visual inspection shall be made by the Engineer and the Application Contractor. Any deficiencies in the finished system shall be marked and repaired according to the procedures set forth herein by the Application Contractor.
- F. The system may be put back into operational service as soon as the final inspection has taken place.
- G. After two days cure time, the structures can be vacuum tested and repaired, if necessary, at the contractor's expense.



### 3.06 CLEANING

- A. Trash and loose debris shall not be permitted to accumulate at the project site. All items shall be regularly removed and disposed of at an approved site in accordance with applicable regulatory agencies.

END OF SECTION



DOCUMENT A00808

# PROJECT UTILITY COORDINATION FORM





## CONTACTS AND GENERAL UTILITY INFORMATION

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## Utility Relocation Notes for MassDOT Contractor

Unless otherwise noted by Contract, 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 (for DB contracts). Note: The durations included below do not include these lead times. See Additional Important Basis notes for Contractor - on last PUC Form page.

Additional notes:

**Suggested Sequence of Relocation / Based on Consultant proposed construction staging)**



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 Restrain & Limitations of Operations Notes	
		Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	Contractor Off-site	Contractor Concurrent	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.	Potential Access Restraint (Yes/No)	Should an AR be considered for the Contractor ?	Reason/Note (optional)
C = Contractor U = Utility Co.									
Stage 1	> Contractor to notify all utilities 60 days prior to start of any work. > Contractor to build retaining walls along the north side of Route 44 before UP's can be relocated. > Contractor to perform slope work and clearing/grubbing.								
Task 1	<b>Overhead</b> TMIP - Installing wood poles and anchors. TMIP - Mino/incidental tree trimming to make room for installation of new electric overhead lines. TMIP - Installing overhead lines and equipment on new poles. TMIP - Excavation and construction of underground conduits from old poles to new riser poles. TMIP - Installing underground primary and secondary cables and equipment from manholes to new riser poles. TMIP - Transferring/installing overhead transformers and equipment on new poles. TMIP - Removal of old underground conduits from old poles to new riser poles.	40	X		X				
		10	X		X				
		80	X		X				
		5	X		X				
		15	X		X				
		38	X		X				
		3	X		X				
		<b>Sub-Total</b>	<b>196</b>						
Task 2	Comcast - Build new strand and cable to new pole line. Comcast - Splice in new equipment and activate. Comcast - Delash fibers and transfer to new pole line and relash to new strand. Comcast - Wreckout old strand and cable.	10	X		X				
		2	X		X				
		5	X		X				
		3	X		X				
		<b>Sub-Total</b>	<b>20</b>						
Task 3	Verizon - Place conduit. Verizon - Place all aerial strand & guying. Verizon - Place all aerial and underground connection fiber cable. Verizon - Splice all aerial and underground connection fiber cable. Verizon - Cut over all working lines. Verizon - Cut off all cable to be removed. Verizon - Remove all cable to be removed. Verizon - Remove guying.	15	X		X				
		18	X		X				
		38	X		X				
		58	X		X				
		6	X		X				
		42	X		X				
		62	X		X				
		1	X		X				
		<b>Sub-Total</b>	<b>240</b>						
Task 4	TMIP - Removal of old poles and anchors. TMIP - Fill in removed poles and anchor holes.	20	X		X				
		15	X		X				
		<b>Sub-Total</b>	<b>35</b>						
Task 5	<b>UTILITY OPERATIONS - Underground</b> Eversource-Gas - Relocate 50' of 6" CSHP gas main with 8" PHHP due to roadway reconstruction. Eversource-Gas - Relocate 150' of 8" CSHP gas main with 8" PHHP due to roadway reconstruction. Eversource-Gas - Relocate 400' of 6" and 8" CSHP gas main with 8" PHHP due to roadway reconstruction.	8	X		X				
		10	X		X				
		20	X		X				
		<b>Sub-Total</b>	<b>38</b>						



RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities				Estimated Duration (Work Days) by Utilities (Lead time not included)				Access Restraint & Limitations of Operations Notes	
C = Contractor U = Utility Co.						<b>Concurrent / Exclusive Utility Work</b> <small>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.</small>				<small>Should an AR be considered for the Contractor?</small>	
		Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility Contractor and Utility are working on-site - but NOT in the same vicinity)	Contractor Off-Site	Contractor Concurrent	Potential Access Restraint (Yes/No)	Reason/Note (optional)			
<b>IMPORTANT BASIS NOTES - FOR CONTRACTOR</b>											
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</i> access 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).										
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	** Assumed duration not provided by the Utility.										



DOCUMENT A00810

# MassDOT Herbicide Use Report



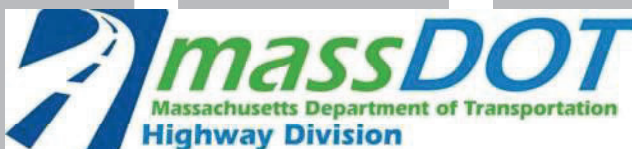
**MassDOT Herbicide Use Report**Date Submitted: *Use multiple sheets for multiple application techniques or sites as needed.***Contractor  
Performing Work:****Project or Contract No:****Town/s:****Associated Route:****Project  
Description:****Treatment  
Description:****Area Treated (as applicable)****Acres:****Sq Yds:****Miles:****Weeds  
Targeted:****Gallons Formula Used:****Date/Time Began:****Application  
Method:****Date/Time End:****Product Used:**

Name: _____	Name: _____	Name: _____
EPA Reg. No: _____	EPA Reg. No: _____	EPA Reg. No: _____
% Active Ingredient	% Active Ingredient	% Active Ingredient
Dry: _____	Dry: _____	Dry: _____
Liquid: _____	Liquid: _____	Liquid: _____
Formulation (dilution rate): _____	Formulation (dilution rate): _____	Formulation (dilution rate): _____

**Additional products used (surfactants, etc.) or other information:****Applicators:**  
  
  
**License Numbers:**  
  
  

Upon completion, please submit form to MassDOT District Engineer and Landscape Design Section in Boston office.  
11-16-2017





# WORK ZONE SAFETY

## *Temporary Traffic Control*

*Typical Details and  
Massachusetts Guidelines  
for MassDOT, Municipalities,  
Utilities, and Contractors*



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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.



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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 ( $\leq 40$ 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 ( $\geq 45$ 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 ( $\leq 40$ 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 ( $\geq 45$ 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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Work Zone Safety  
Standard Details  
and Drawings

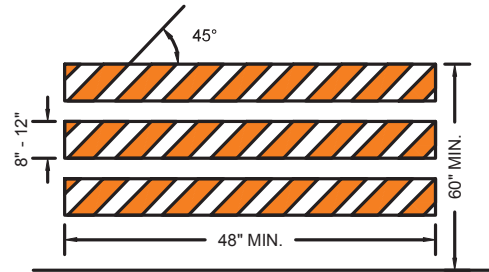
FIGURE 1  
TYPICAL TRAFFIC CONTROL DEVICES  
NOT TO SCALE



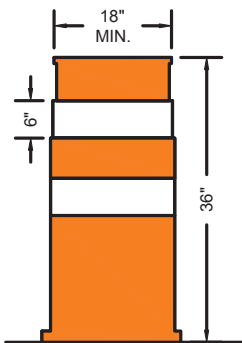
**SIGN**



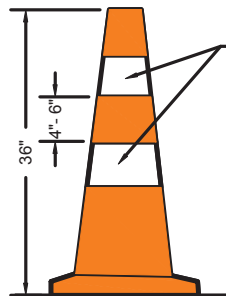
**PORTABLE CHANGEABLE  
MESSAGE SIGN (PCMS)**



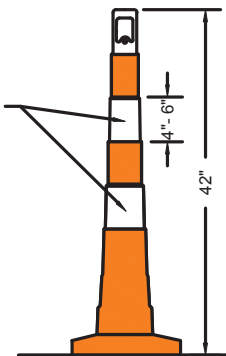
**TYPE III BARRICADE**



**DRUM**



RETROFLECTIVE  
BANDS



**CONES**

Cones may be used for all daytime operations. For night work, drums should be used to form the taper(s) and cones can be used along the tangent section of the work setup.



**LEFT**



**CAUTION**



**RIGHT**

**ARROW BOARD (WITH MODE)**



**TRUCK MOUNTED ATTENUATORS**

Truck Mounted Attenuators (TMA) shall be positioned between the start of the work area and the end of the designated buffer zone. The TMAs are to be positioned in each temporarily closed lane. This includes shoulders ( $\geq 8$  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.

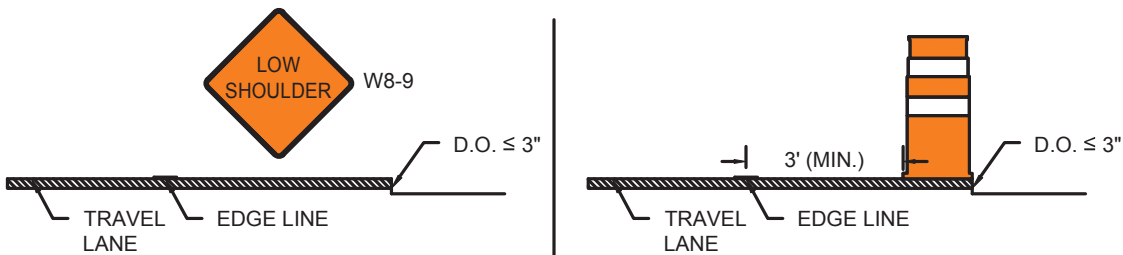


## SHORT-TERM PAVEMENT EDGE DROP-OFFS

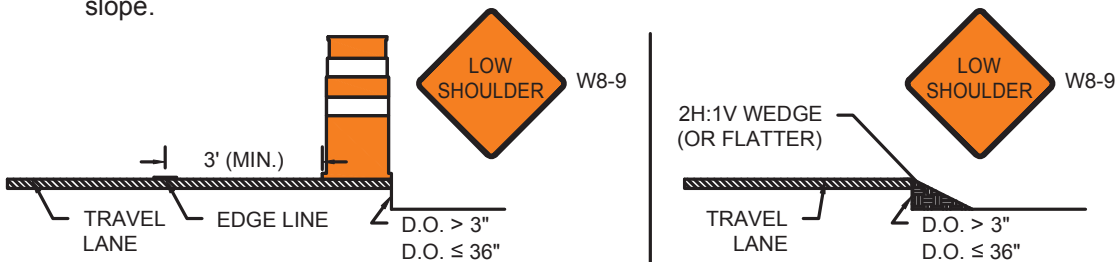
*Note that this guidance is adopted from the Roadside Design Guide, 4th Edition.*

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.

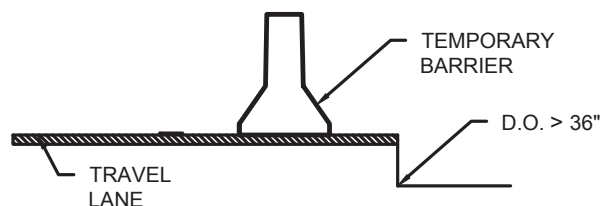
- Shoulder drop-offs 3" or less adjacent to a shoulder or active travel lane should be mitigated by:
  - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment; or
  - ✓ The placement of drums on the traffic side of the drop-off.



- 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

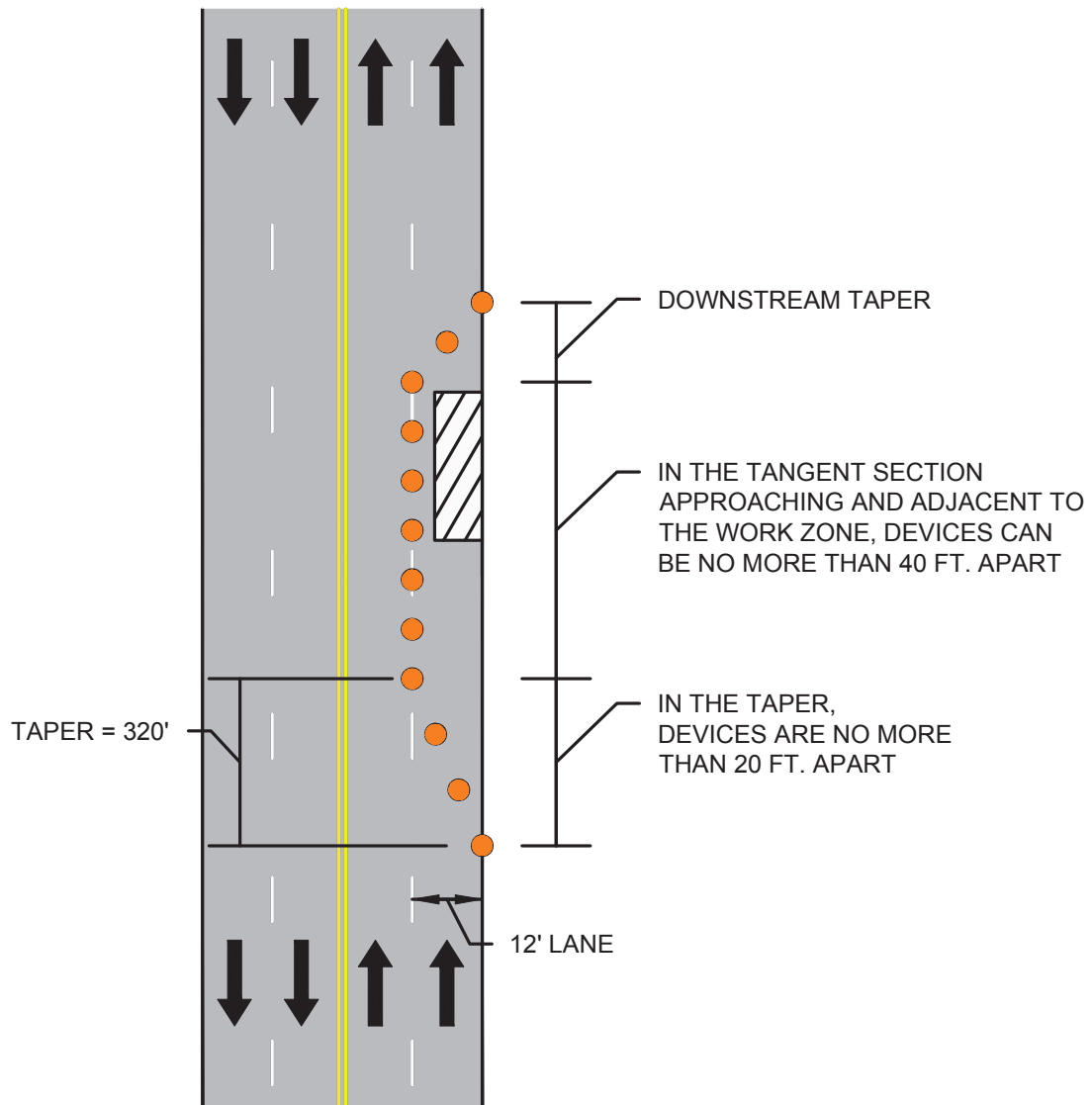
1. 40 FT = 10 FT PAVEMENT MARKING + 30 FT SKIP

### 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  
Standard Details  
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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.

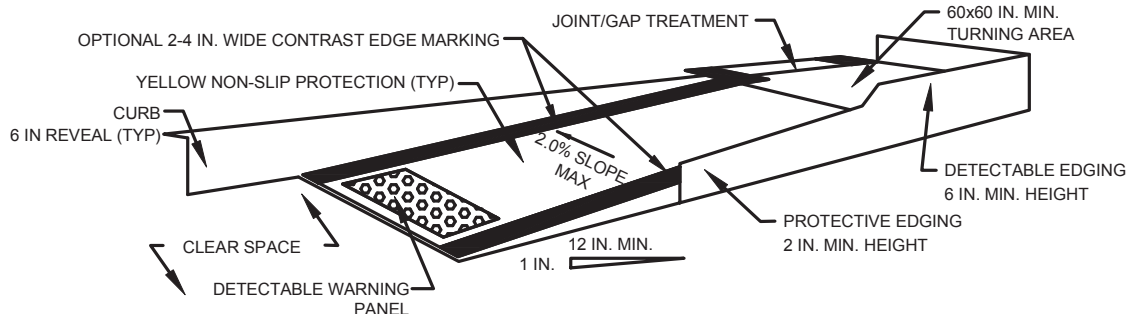




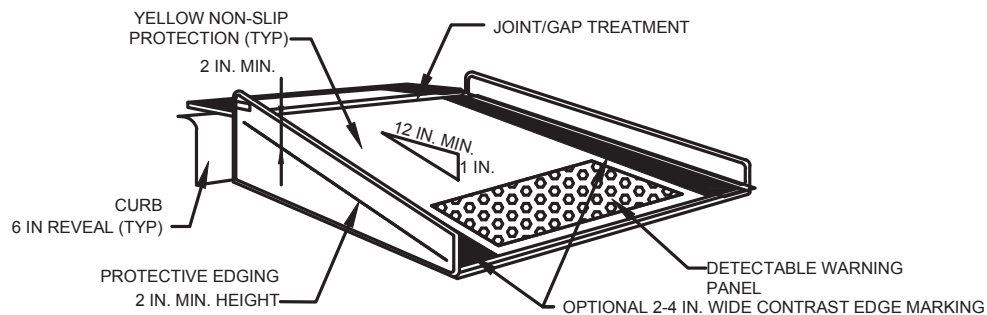
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Work Zone Safety  
Standard Details  
and Drawings

FIGURE 4  
TYPICAL PEDESTRIAN DEVICES  
(1 OF 2)  
NOT TO SCALE



**TEMPORARY CURB RAMP-PARALLEL TO CURB**

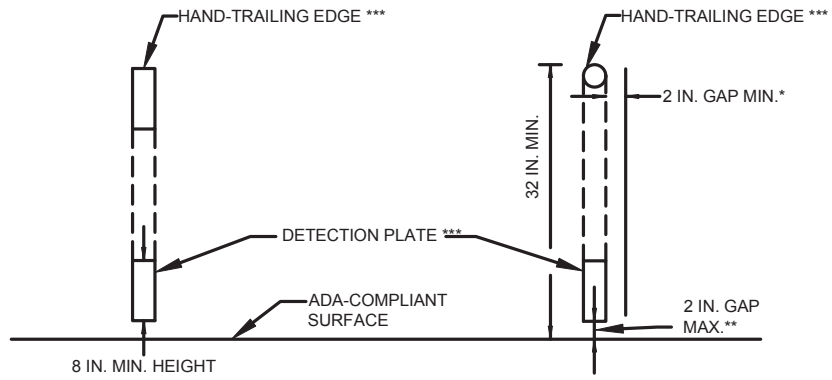


**TEMPORARY CURB RAMP-PERPENDICULAR TO CURB**

**NOTES:**

1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE, AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON 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.

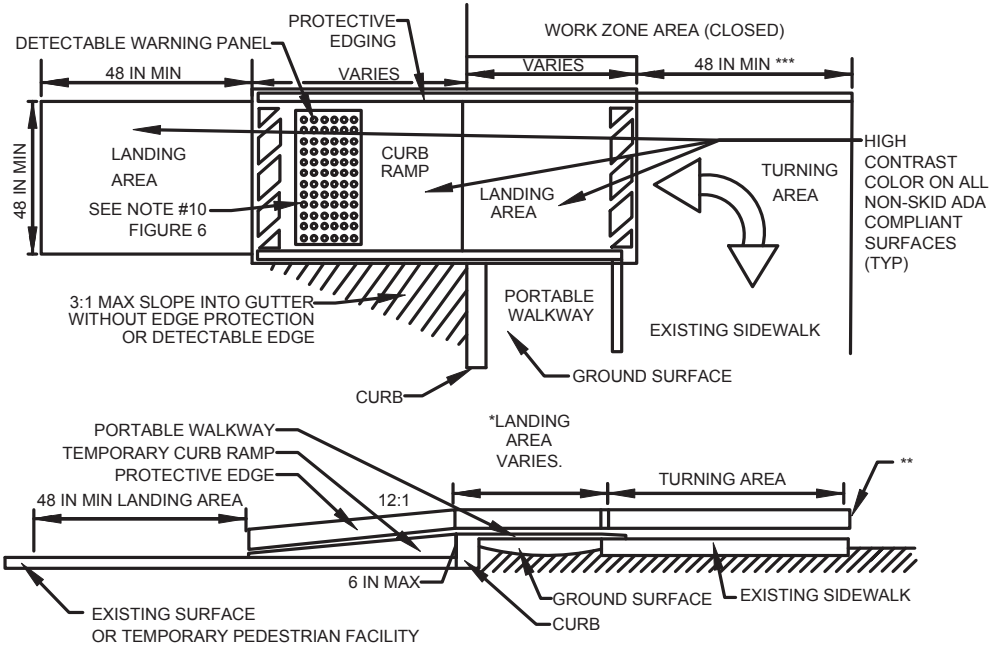




**CROSS SECTION VIEW**

**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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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
TWO LANE UNDIVIDED ROADWAY  
HALF OF ROADWAY CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	50	100	20	30
45-55	500 / 1000 / 1000	100	150	40	20

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED REGULATORY OR WORK ZONE SPEED	SEPARATION BETWEEN RUMBLE STRIPS
36-mph to 55-mph	15-feet
35-mph and under	10-feet

#### NOTES

1. IF POLICE DETAIL/UNIFORMED FLAGGER SUPPORT IS REQUIRED, PROVIDE TWO UNITS.
2. MA-R2-10a LOCATED AT C/2.
3. \*\* OPTIONAL AT THE ENGINEER'S DISCRETION.
4. \*\*\* SHALL BE DEPLOYED IF RUMBLE STRIPS ARE PRESENT.

#### LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER



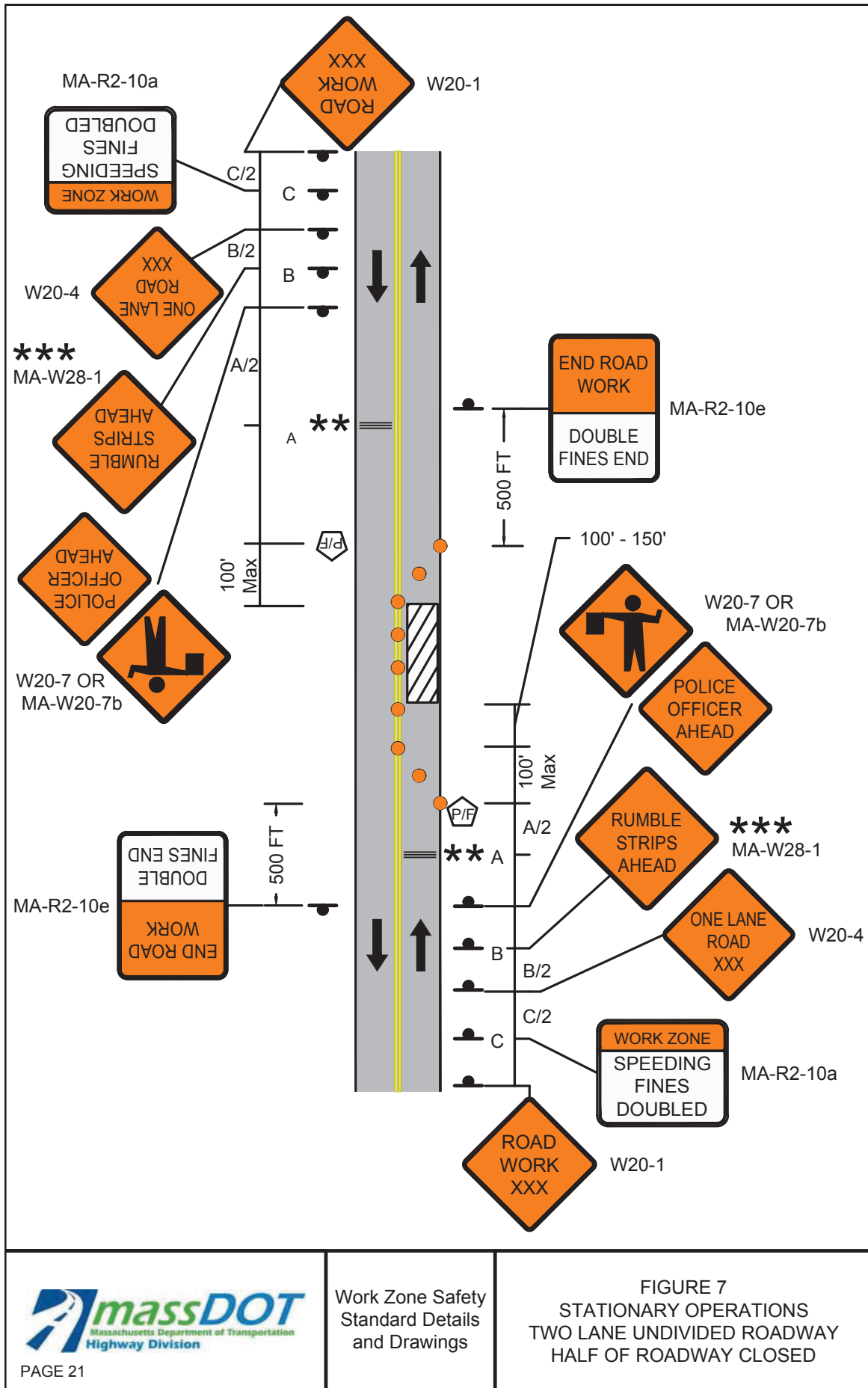
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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Work Zone Safety  
Standard Details  
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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

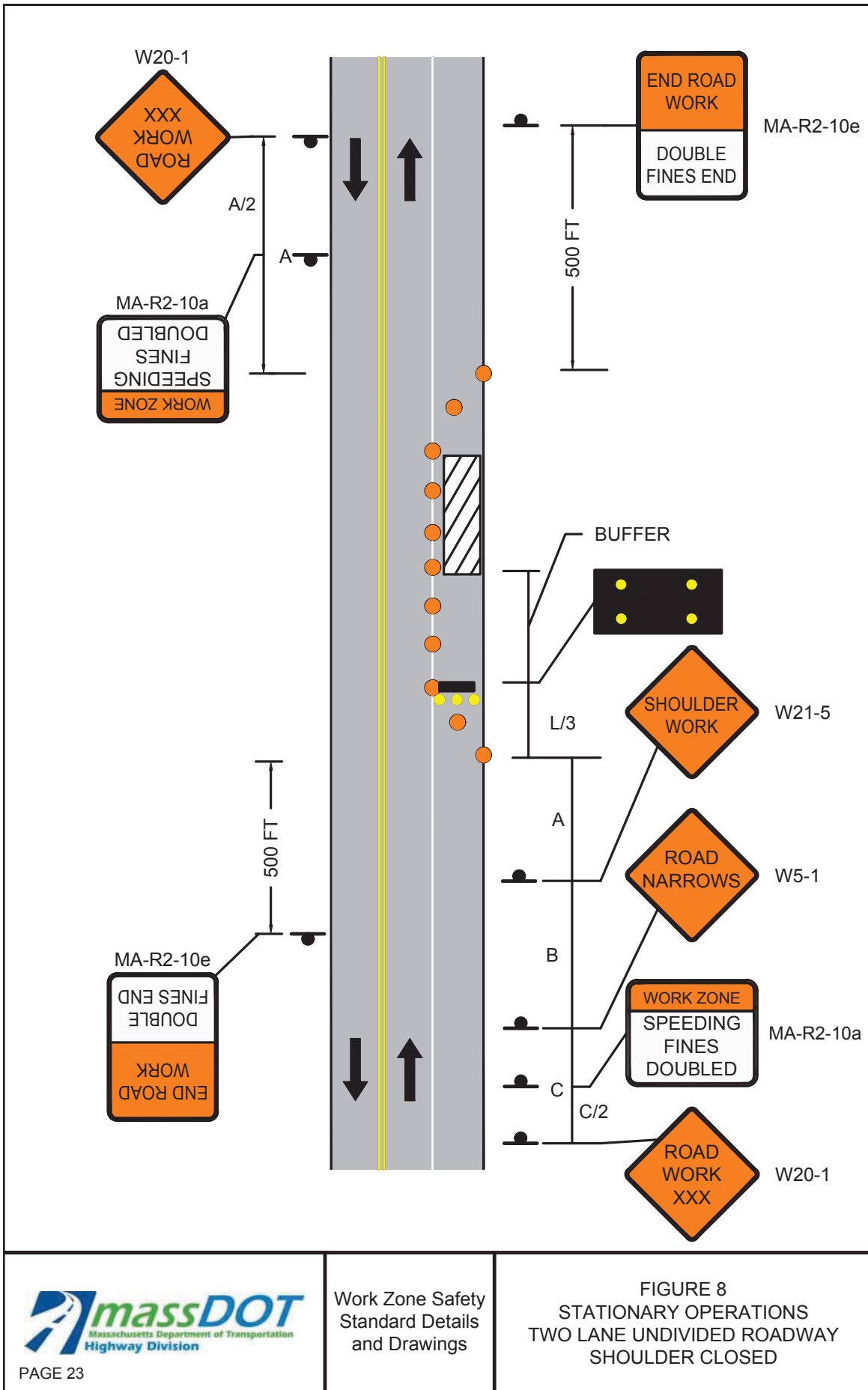
1. MA-R2-10a at C/2 and A/2.

#### 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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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
TWO LANE UNDIVIDED ROADWAY  
WITH TRAVERSABLE SHOULDER  
HALF OF ROADWAY CLOSED  
MAINTAIN TWO-WAY TRAFFIC

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	160	305	20	125
45-55	220	330	495	40	100
60-65	260	390	645	40	115

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

#### NOTES

1. MA-R2-10a LOCATED AT C/2.

#### LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER



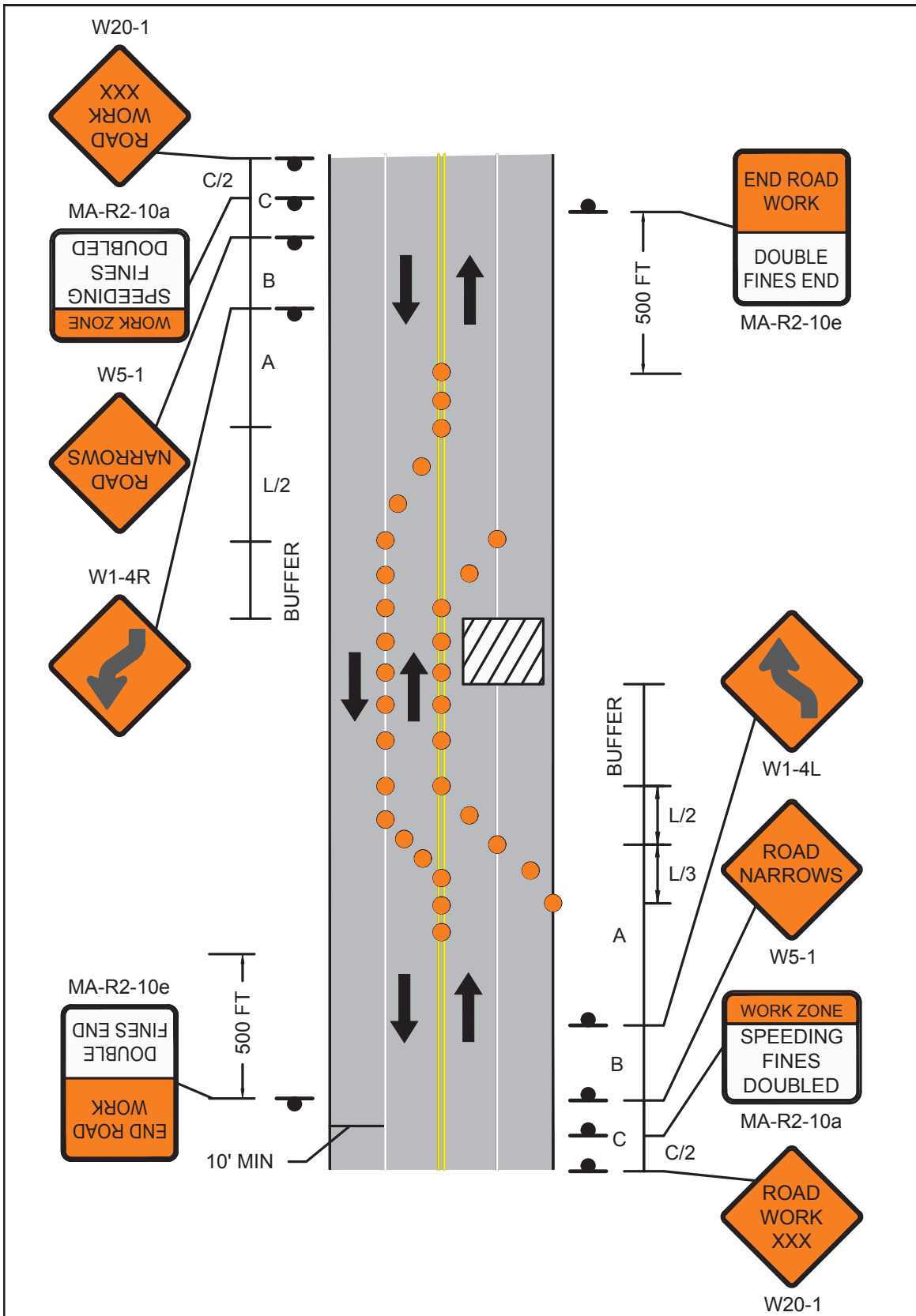
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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Work Zone Safety  
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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



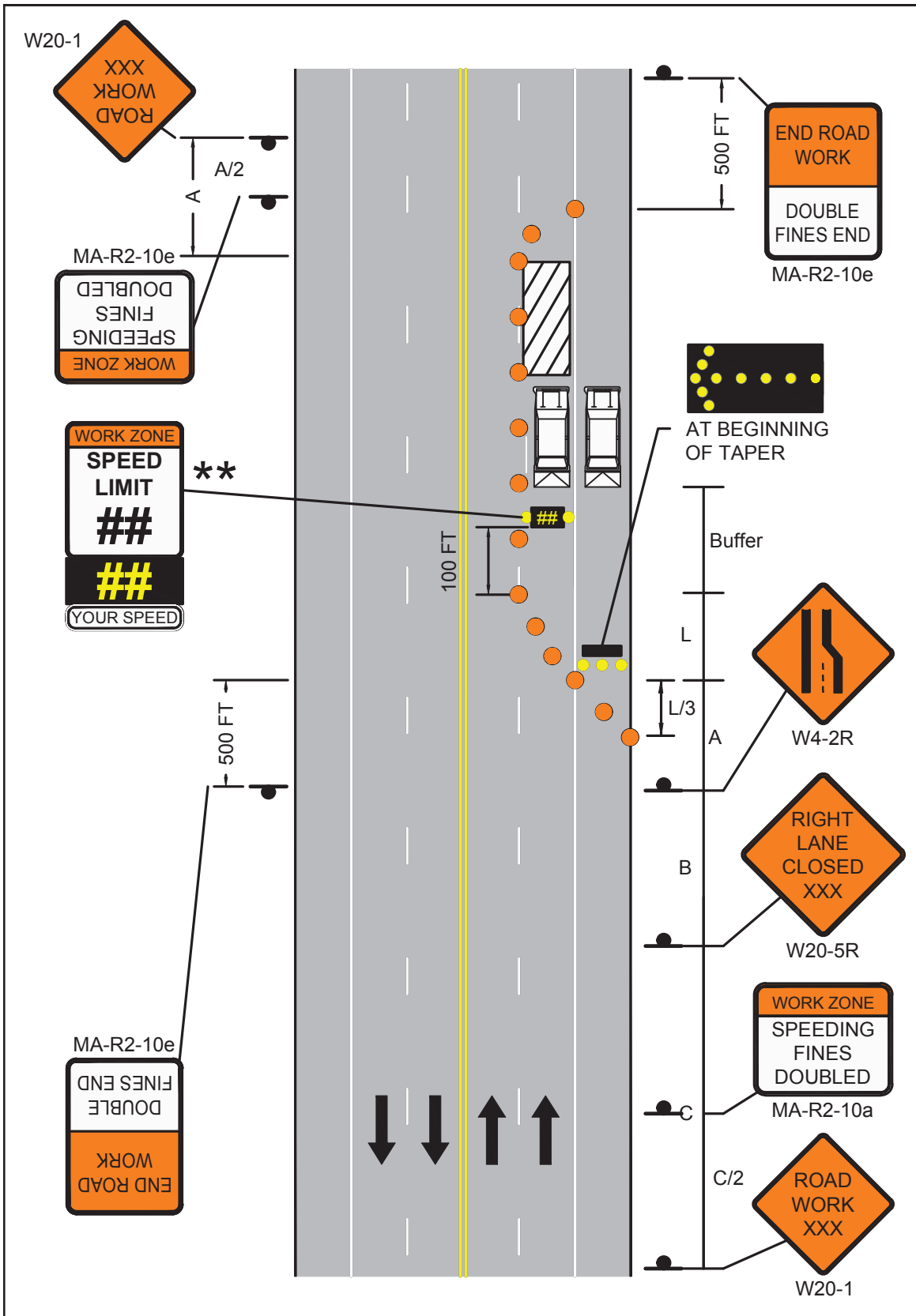
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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Work Zone Safety  
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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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Work Zone Safety  
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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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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
RIGHT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

#### NOTES

1. MA-R2-10a LOCATED AT C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION.

#### LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER



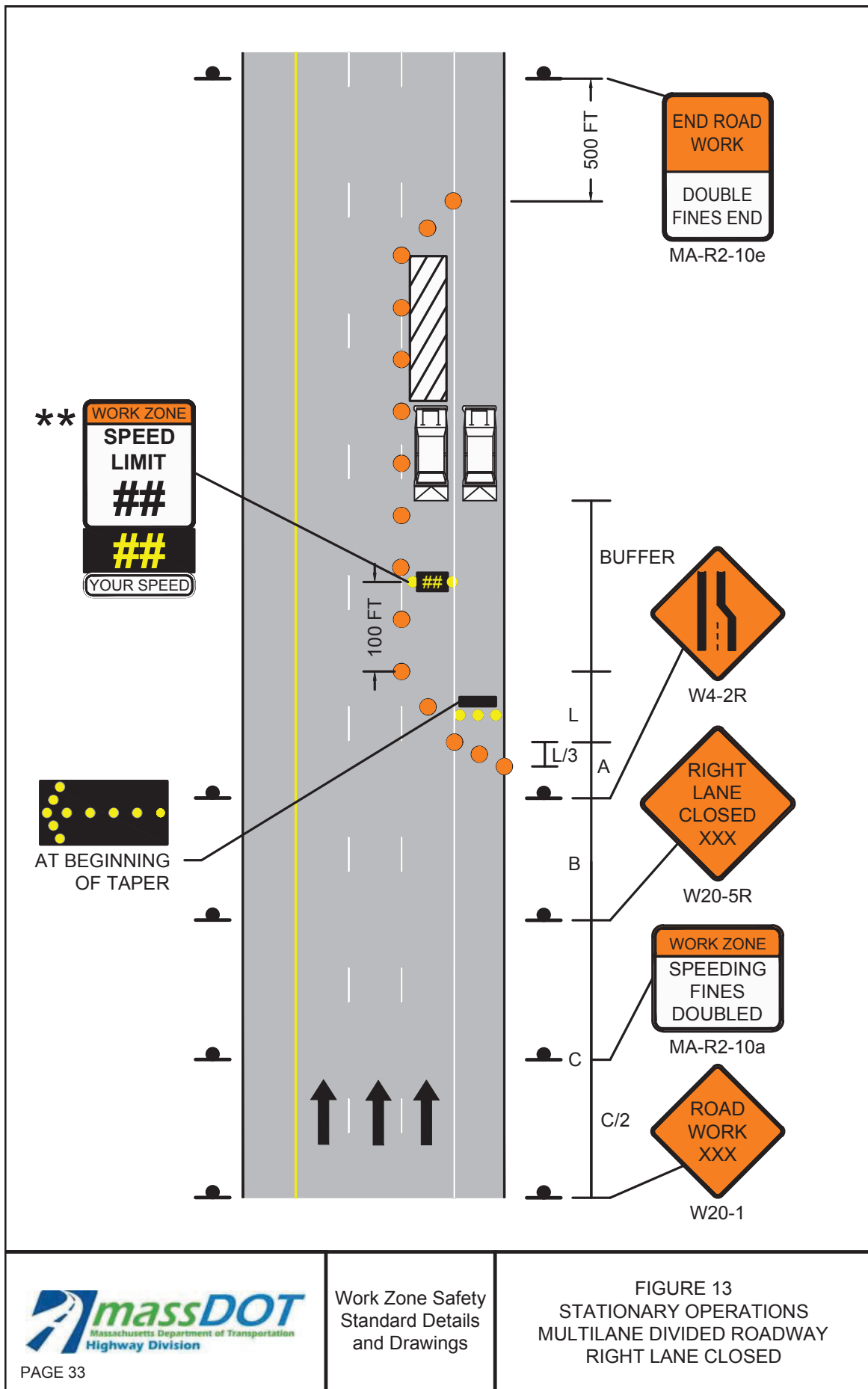
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
LEFT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

#### NOTES

1. MA-R2-10a LOCATED AT C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION.

#### LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER



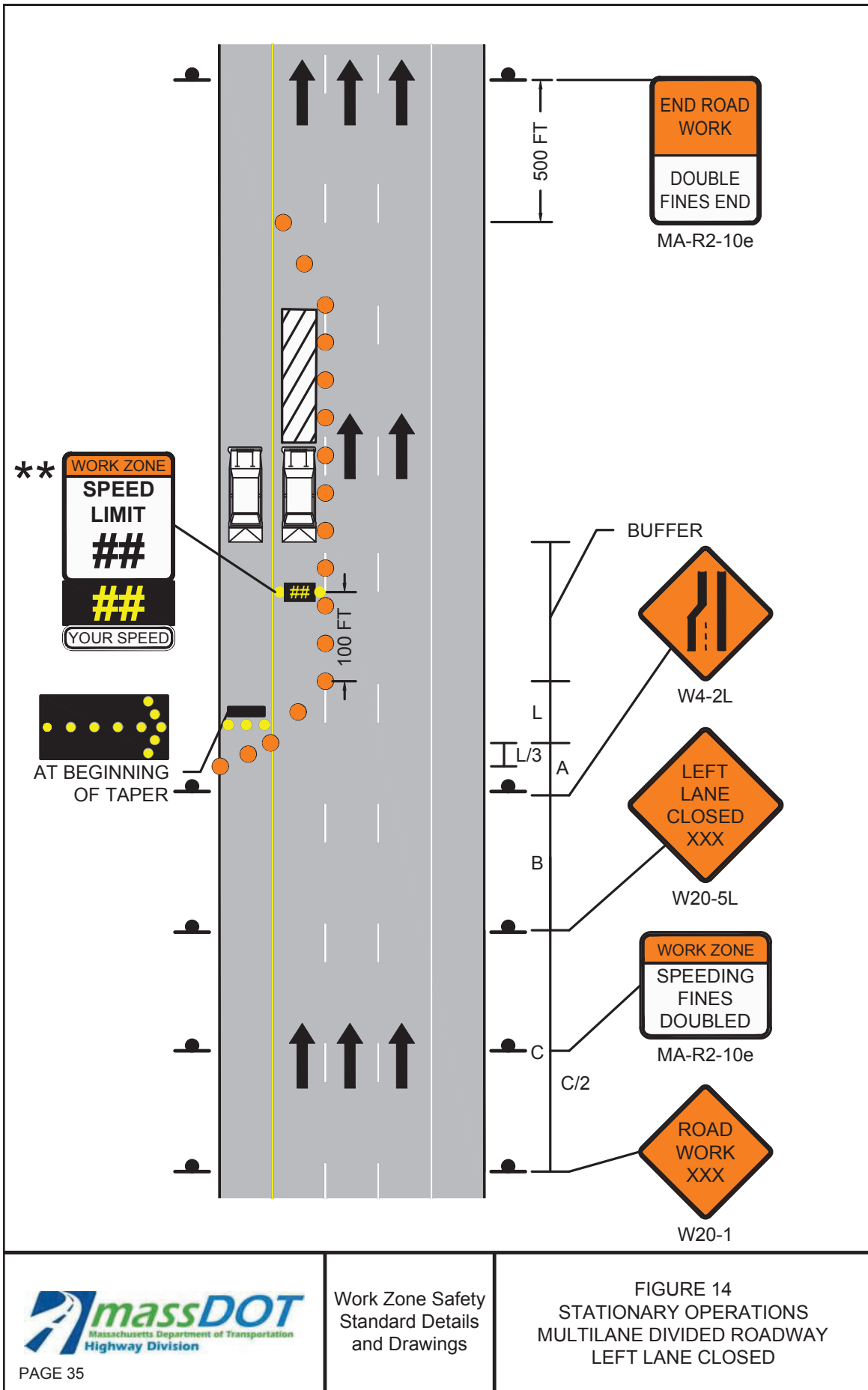
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
CENTER LANE OR RIGHT/CENTER  
LANES CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TANGENT LENGTH BETWEEN TAPERS T (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	640	305	20	110
45-55	220	660	1320	495	40	100
60-65	260	780	1560	645	40	115

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

#### NOTES

1. MA-R2-10a LOCATED AT C/2.
2. \*\*\*OPTIONAL AT THE ENGINEER'S DISCRETION.
3. \*\*\*THIS SET OF SIGNS SHALL BE LOCATED AT T/2.

#### LEGEND



WORK ZONE



CHANNELIZATION DEVICE



FLASHING ARROW BOARD



PORTABLE CHANGEABLE MESSAGE SIGN



TRUCK MOUNTED ATTENUATOR



RADAR SPEED FEEDBACK BOARD



POLICE DETAIL OR UNIFORMED FLAGGER



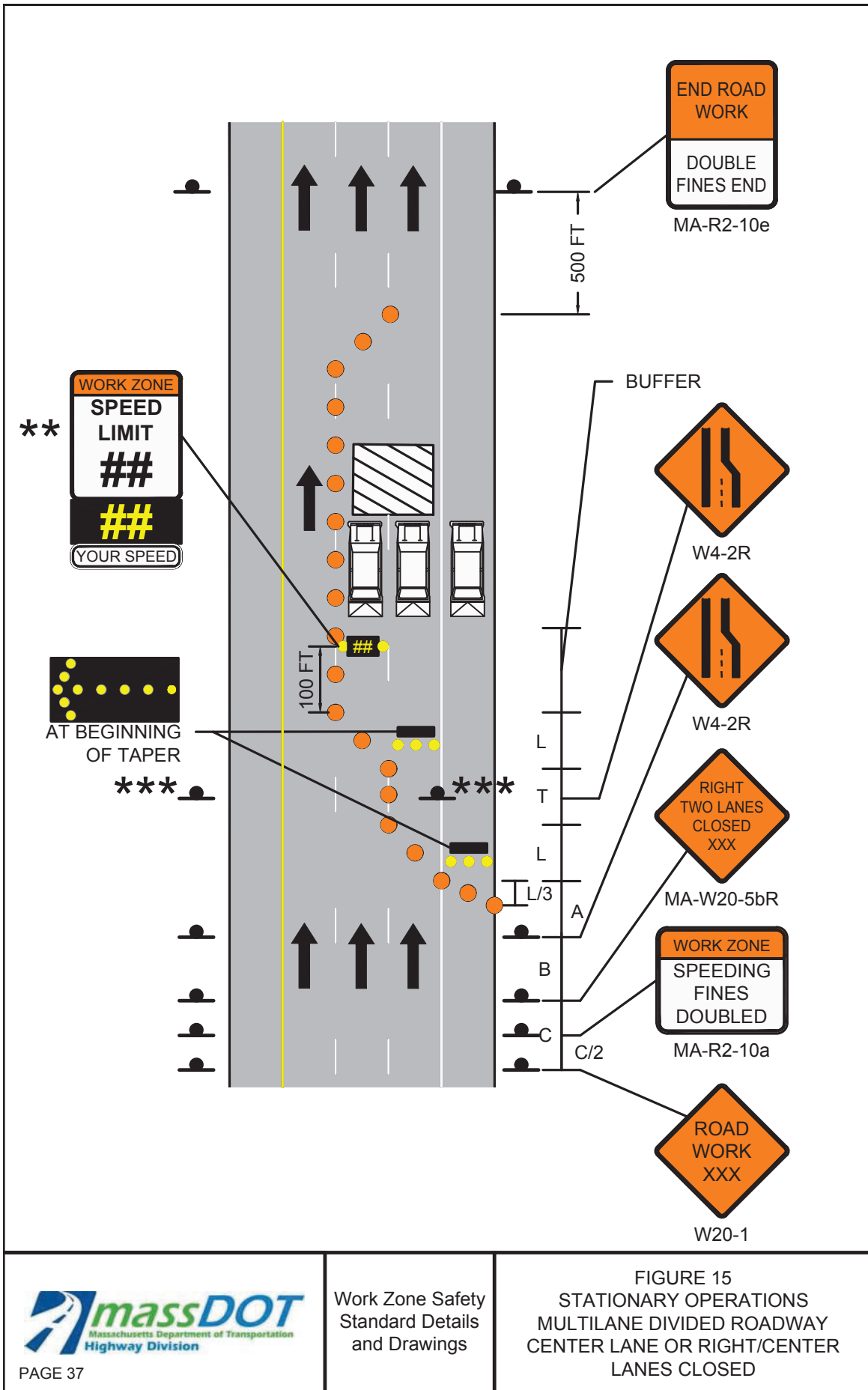
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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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



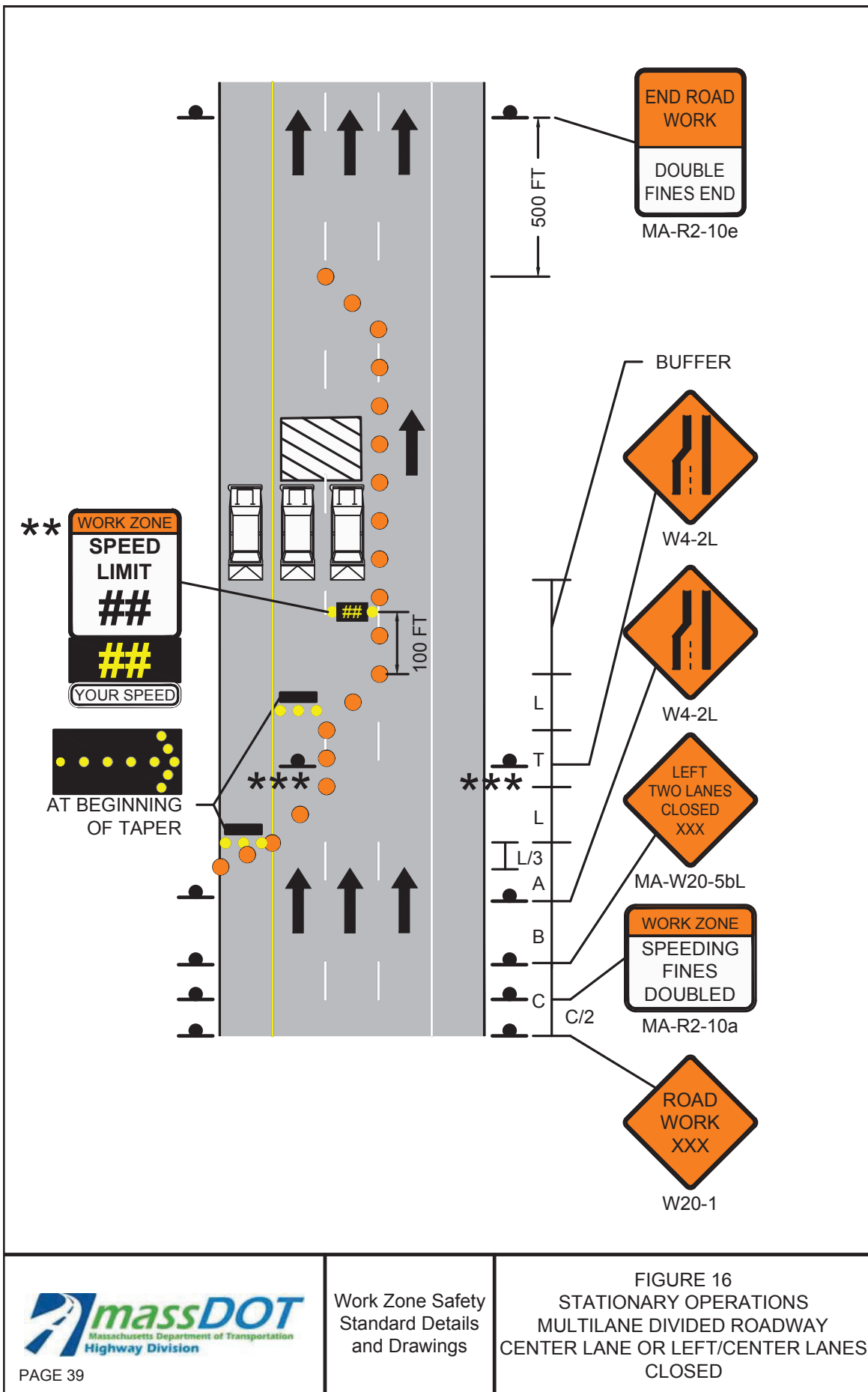
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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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



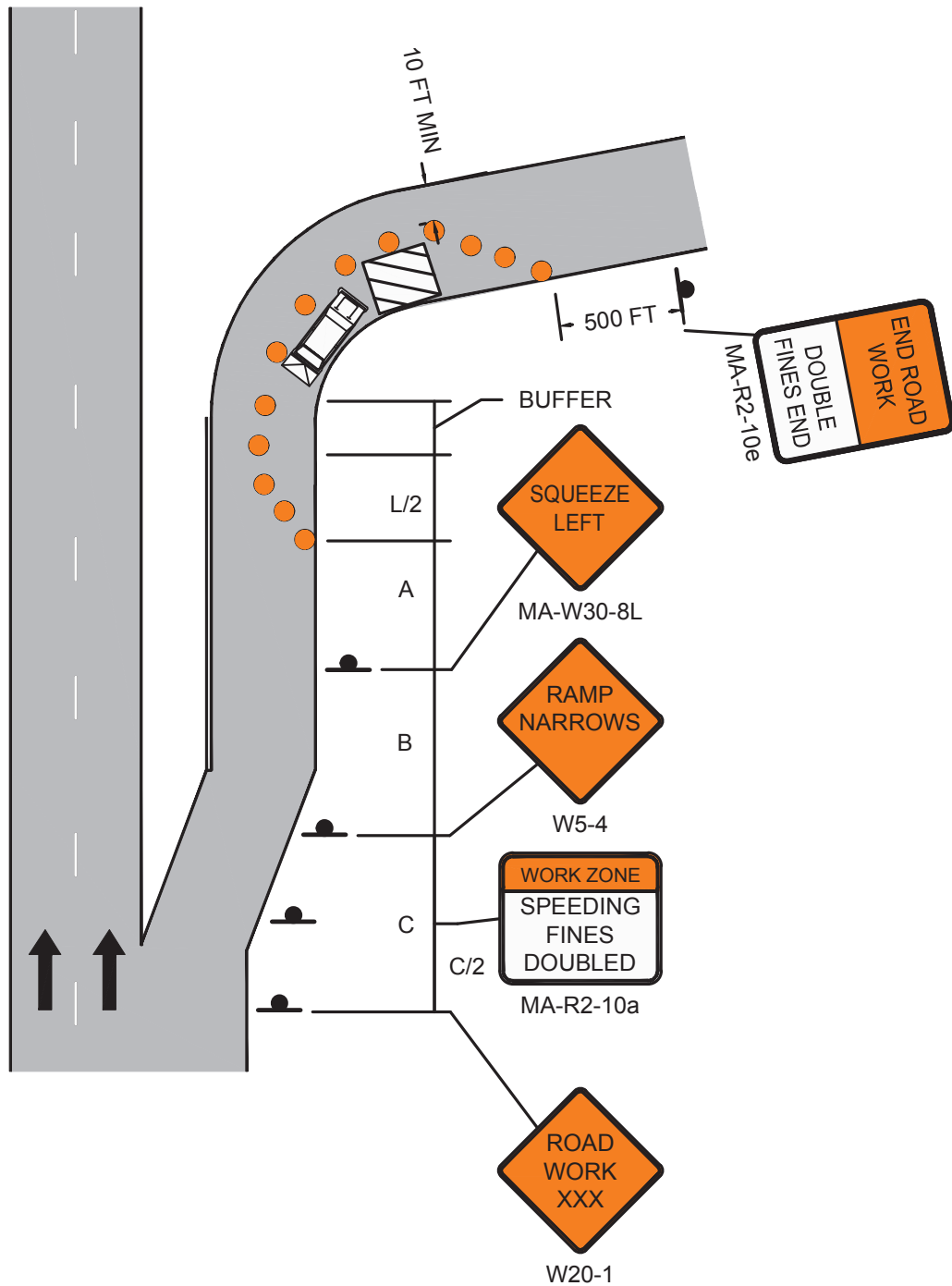
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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and Drawings

STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
LEFT SIDE OF OFF RAMP CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	160	305	20	45
45-55	500 / 1000 / 1000	330	495	40	35

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

#### NOTES

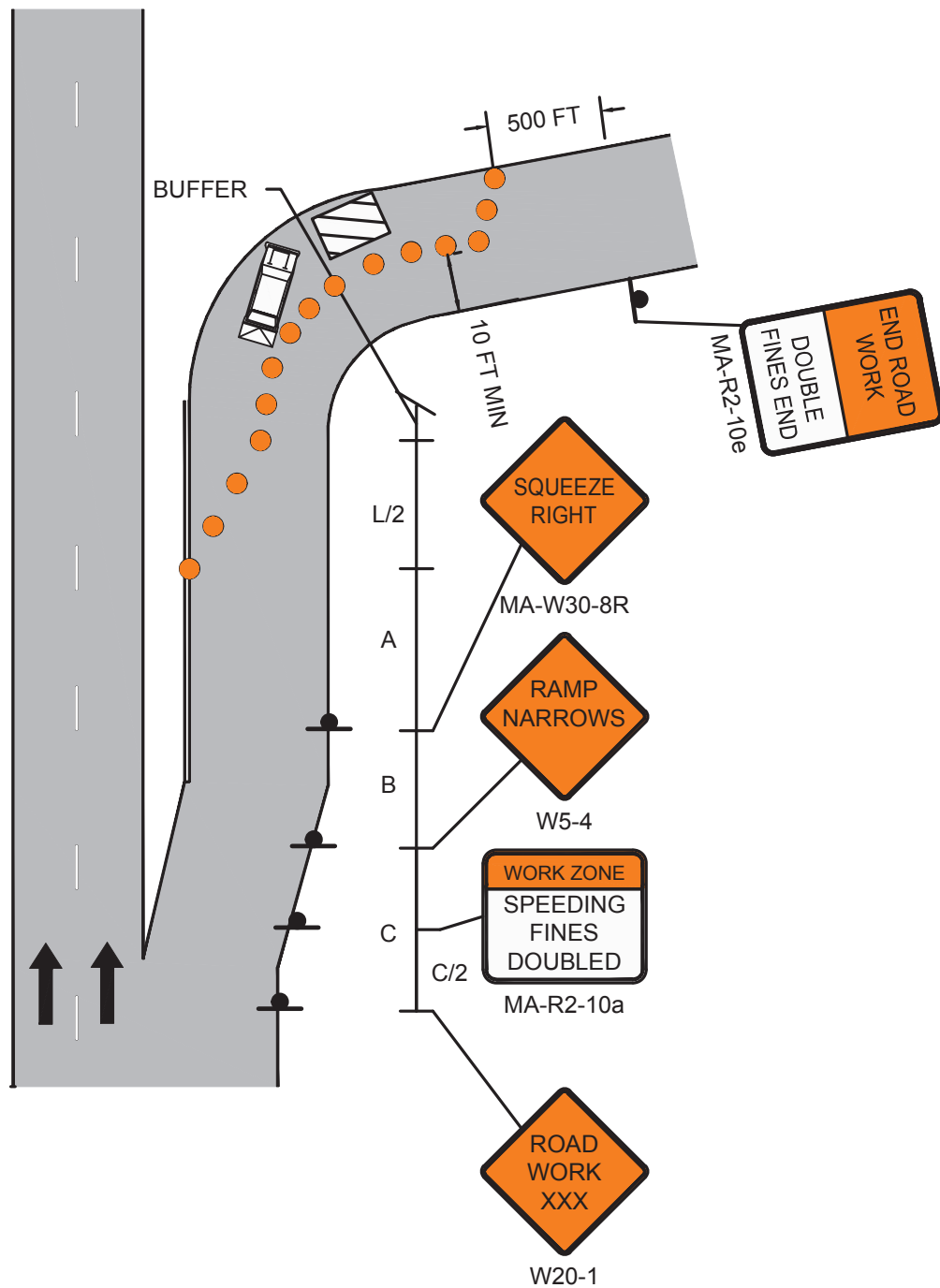
1. MA-R2-10a LOCATED AT C/2.

#### LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE









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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



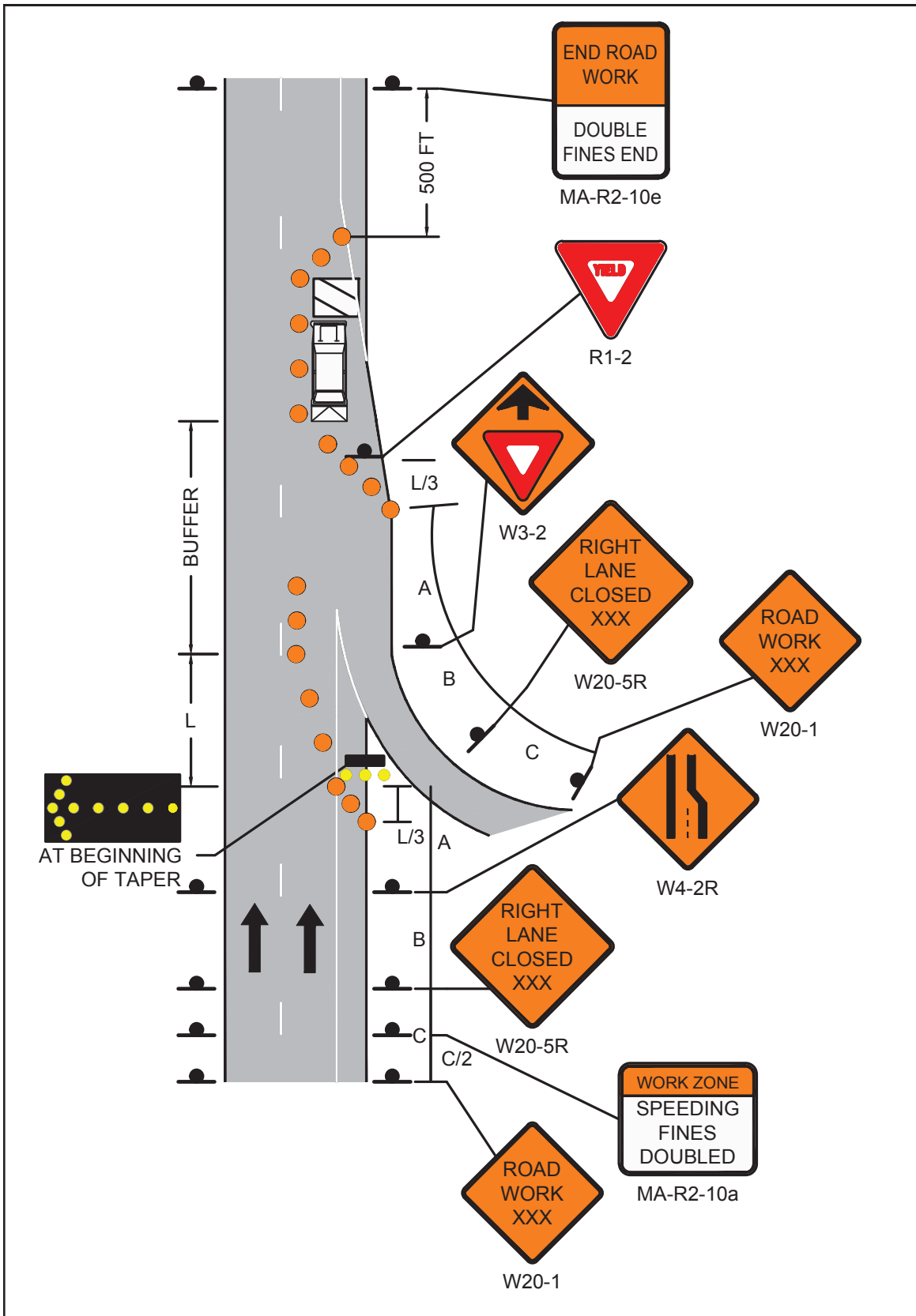
TEMPORARY PORTABLE RUMBLE STRIP



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



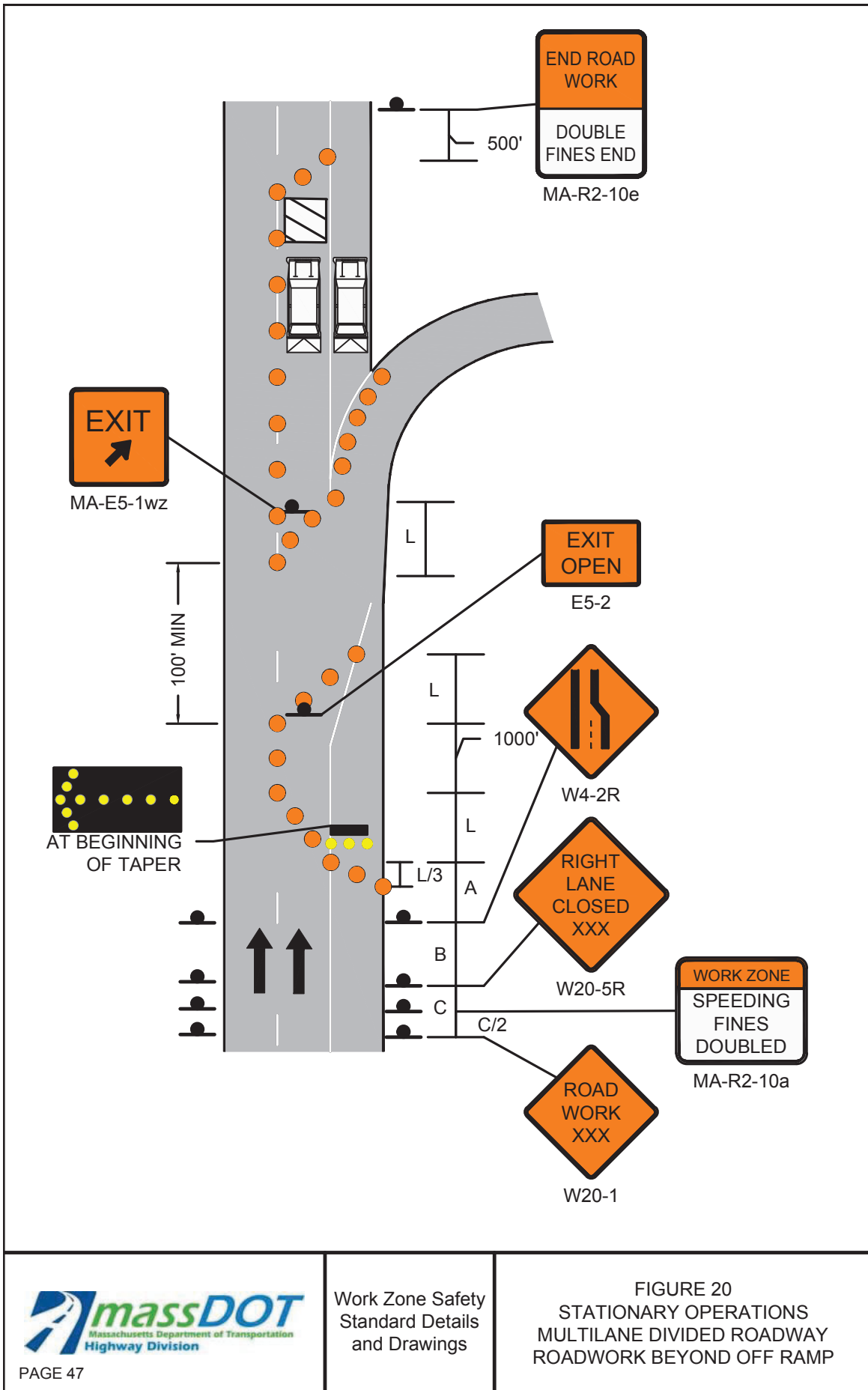
TEMPORARY PORTABLE RUMBLE STRIP



TYPE III BARRICADE

NOT TO SCALE









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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

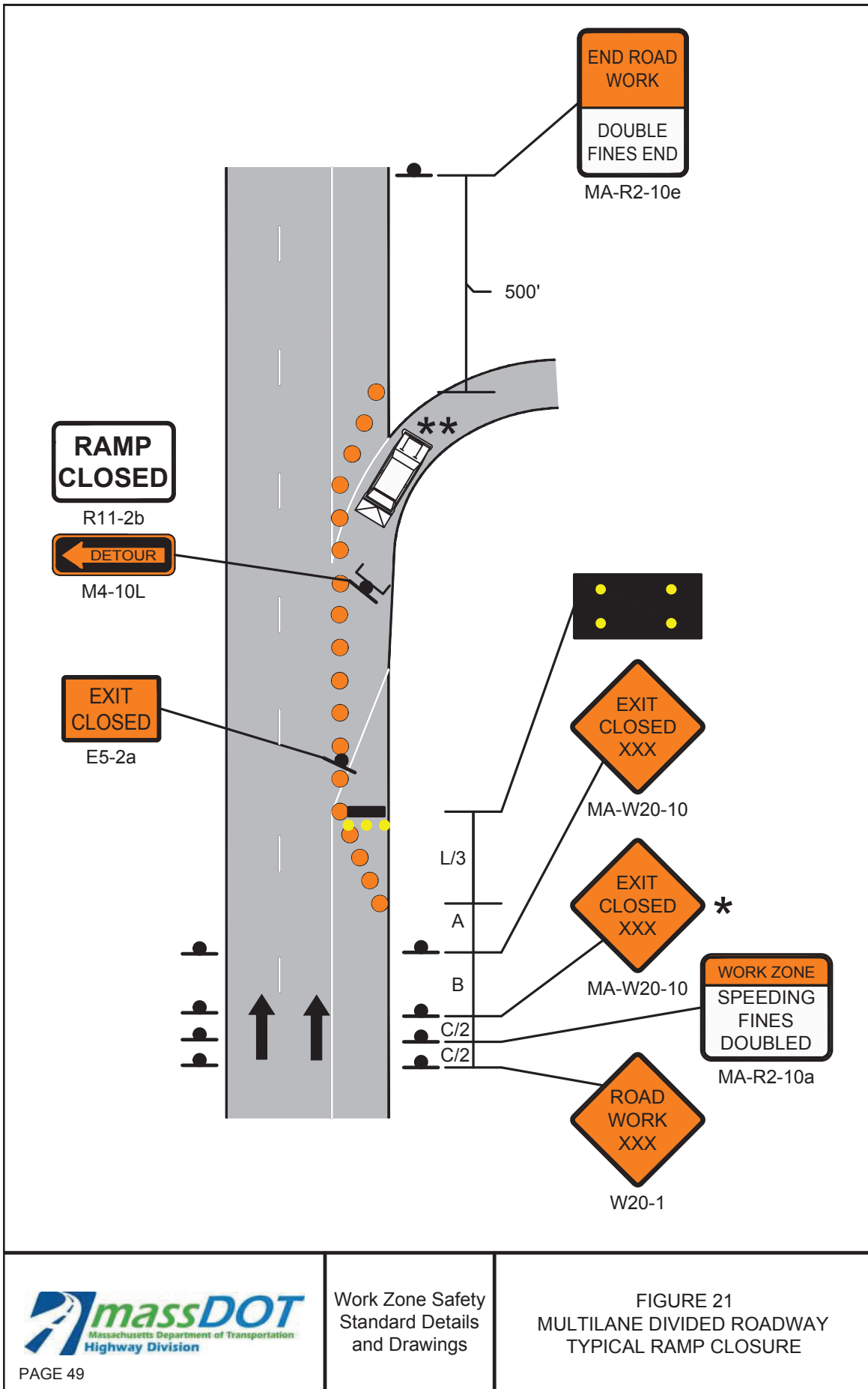
1. MA-R2-10a LOCATED AT C/2.
2. \* NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. \*\* OPTIONAL AT ENGINEER'S DISCRETION.

#### 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

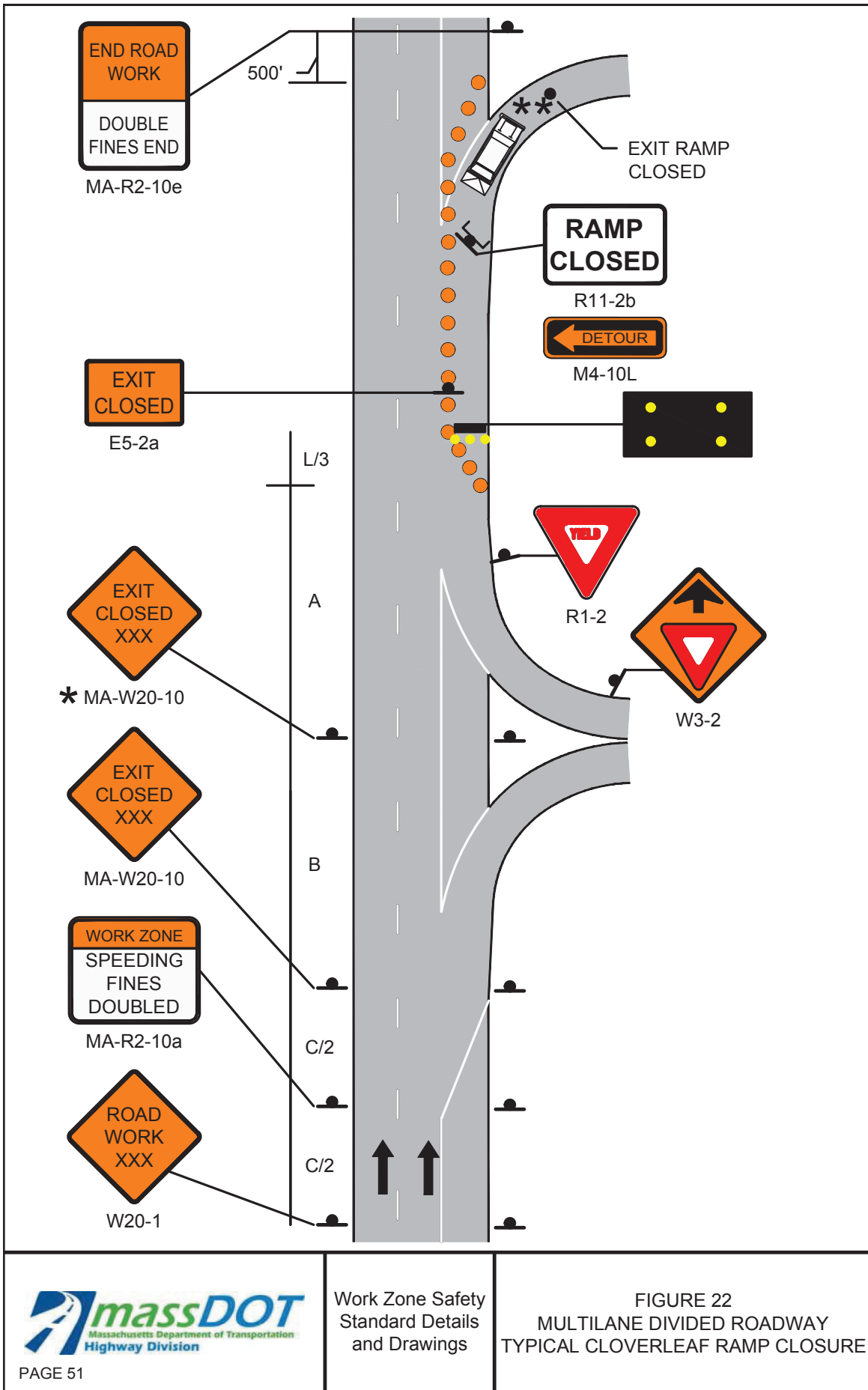
1. MA-R2-10a LOCATED AT C/2.
2. \* NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. \*\* OPTIONAL AT ENGINEER'S DISCRETION.

#### 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

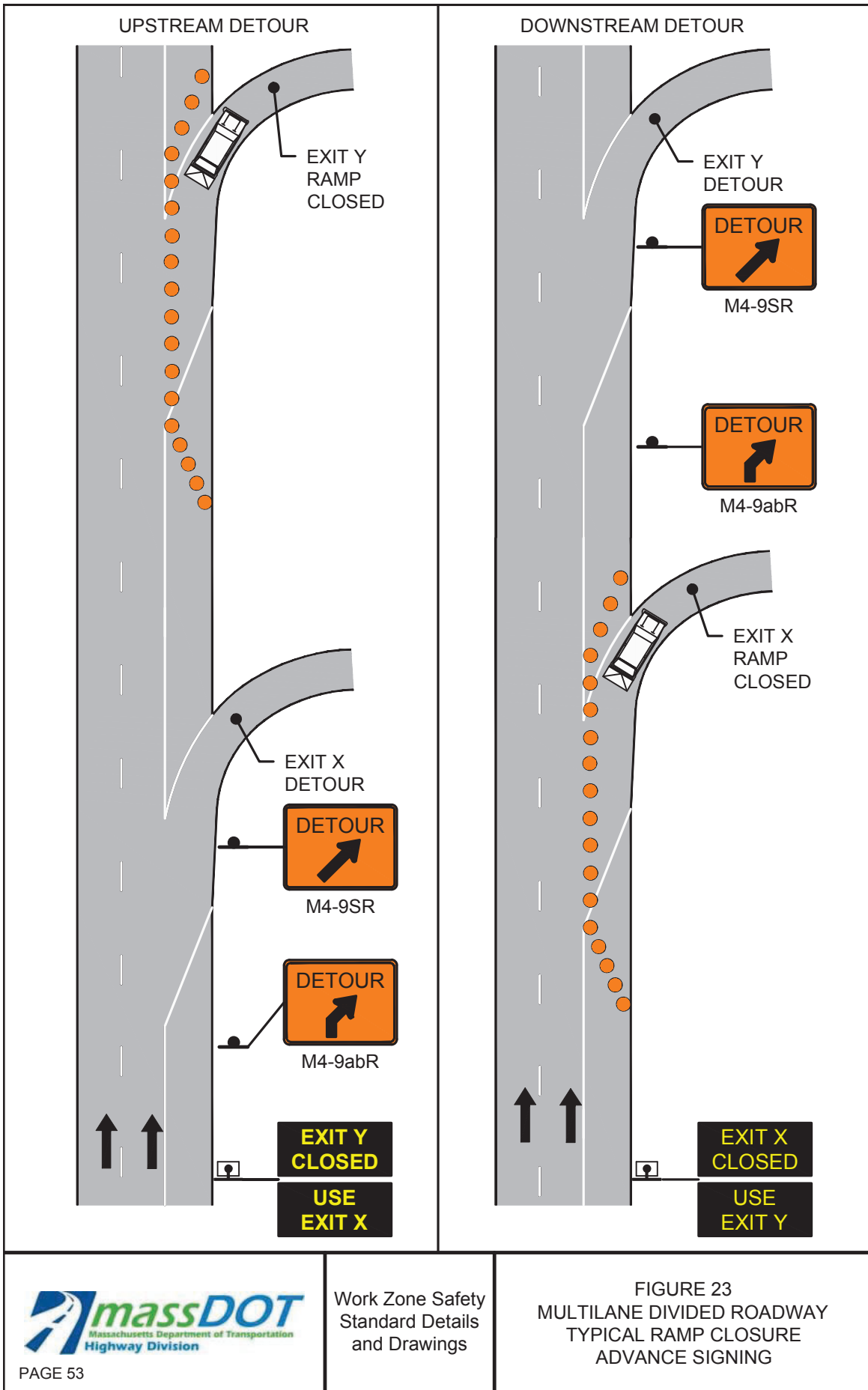
1. IF THE CLOSED RAMP IS LOCATED DOWNSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED AT A SUFFICIENT DISTANCE IN ADVANCE OF THE DETOUR ROUTE/RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.
2. IF THE CLOSED RAMP IS LOCATED UPSTREAM FROM THE PROPOSED 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









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Work Zone Safety  
Standard Details  
and DrawingsFIGURE 24-1  
MULTILANE DIVIDED ROADWAY  
PLACEMENT OF TEMPORARY  
PORTABLE RUMBLE STRIPS  
SHEET 1 OF 2


POSTED REGULATORY OR WORK ZONE SPEED	SEPARATION BETWEEN RUMBLE STRIPS
Above 55-mph	20-feet
36-mph to 55-mph	15-feet
35-mph and under	10-feet

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	TANGENT LENGTH BETWEEN TAPERS (T) (FT)
25-40	500 / 500 / 500	640
45-55	500 / 1000 / 1000	1320
60-65	1000 / 1600 / 2600	1560

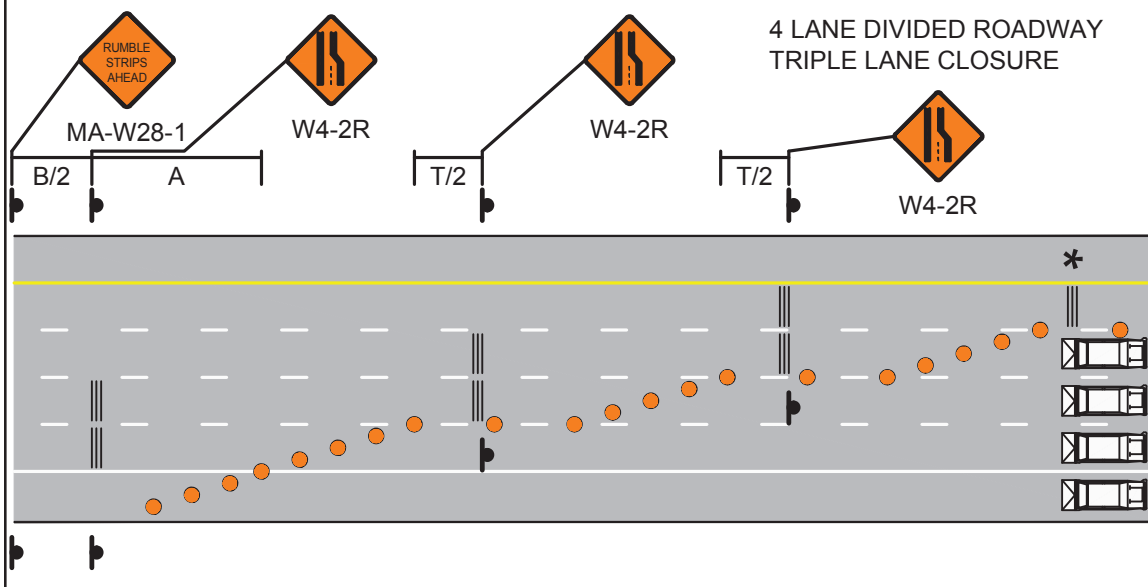
**NOTES**

1. THE INTENTION OF THESE DETAILS IS ONLY TO DEPICT THE PLACEMENT OF TEMPORARY PORTABLE RUMBLE STRIPS (TPRS) IN RELATIONSHIP TO THE TAPER AND THE BUFFER OF A SINGLE- OR MULTI-LANE CLOSURE. THE DEPICTION OF THE NUMBER AND SPACING OF ALL OTHER TRAFFIC CONTROL DEVICES IS NOT TO SCALE. REFER TO OTHER DETAILS FOR LANE CLOSURES FOR THE PLACEMENT AND NUMBER OF ALL OTHER TRAFFIC CONTROL DEVICES.
2. THESE DETAILS ONLY DEPICT RIGHT LANE CLOSURES. LEFT LANE CLOSURES SHOULD UTILIZE A MIRROR IMAGE OF THESE SETUPS, STARTING WITH CLOSURE OF THE LEFTMOST LANE.
3. ★ THIS TPRS ARRAY IS OPTIONAL AT THE ENGINEER'S DISCRETION. IF USED, IT SHOULD BE PLACED ADJACENT TO THE BUFFER.
4. DETAILS SHOW THE MINIMUM NUMBER OF TPRS REQUIRED. ADDITIONAL MAY BE USED IF CONDITIONS WARRANT.

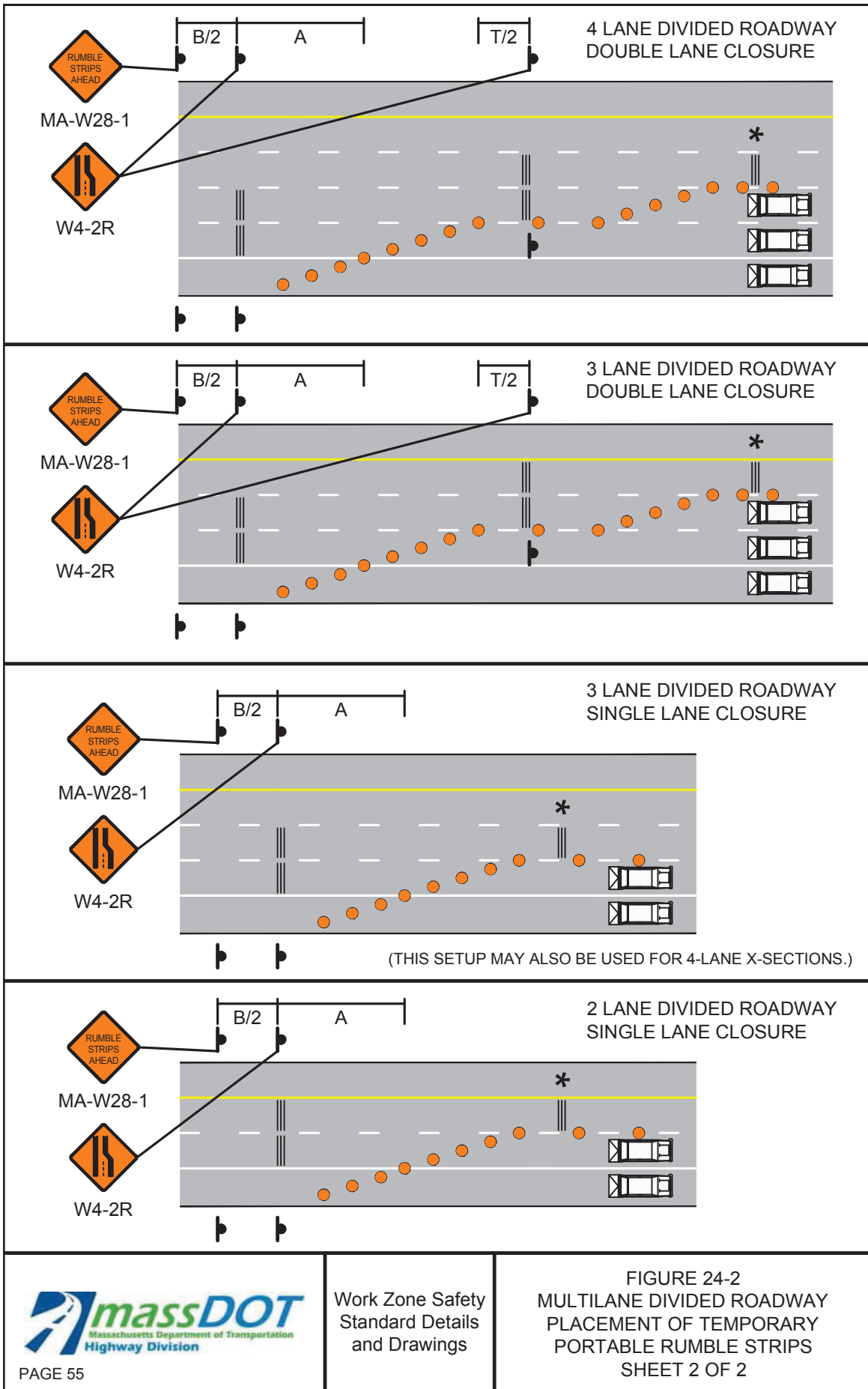
**LEGEND**

- CHANNELIZATION DEVICE
-  TRUCK MOUNTED ATTENUATOR
- ≡≡≡ TEMPORARY PORTABLE RUMBLE STRIP


NOT TO SCALE



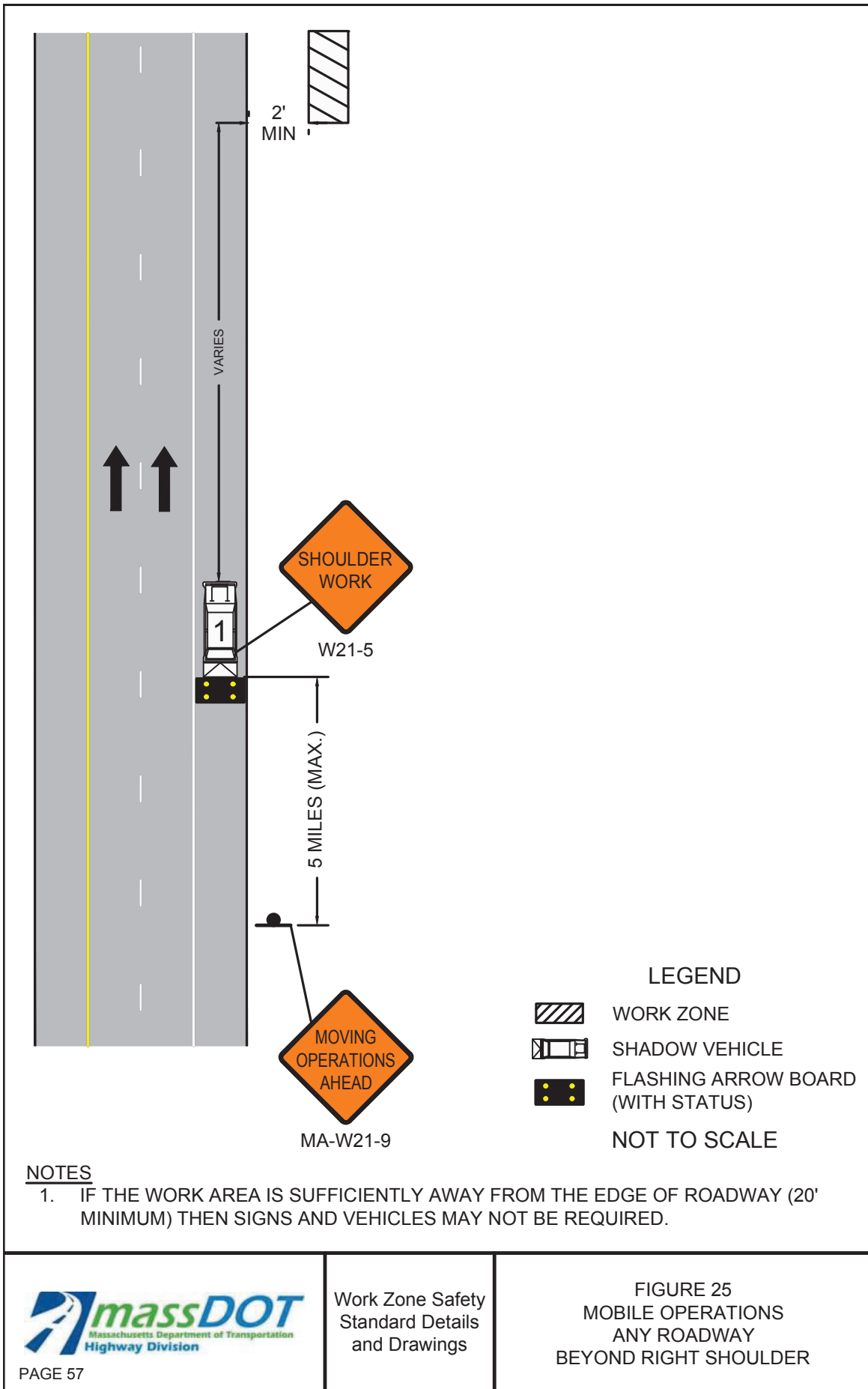






 <p>PAGE 56</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>NOTES FOR MOBILE OPERATIONS</p>
<p style="text-align: center;"><b>Notes for Mobile Operations</b></p> <ul style="list-style-type: none"> <li>• Unless otherwise stated, these notes shall apply to all Mobile Operation setups.</li> <li>• Additional, setup-specific notes may be found on individual sheets.</li> </ul> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. All shadow vehicles shall be equipped with a truck or trailer mounted attenuator (TMA) and a flashing arrow board.</li> <li>6. Signs should be covered or turned from view when work is not in progress.</li> <li>7. Portable changeable message signs may be used in lieu of MA-W21-9 signs and any signs mounted directly to a shadow vehicle.</li> </ol>		





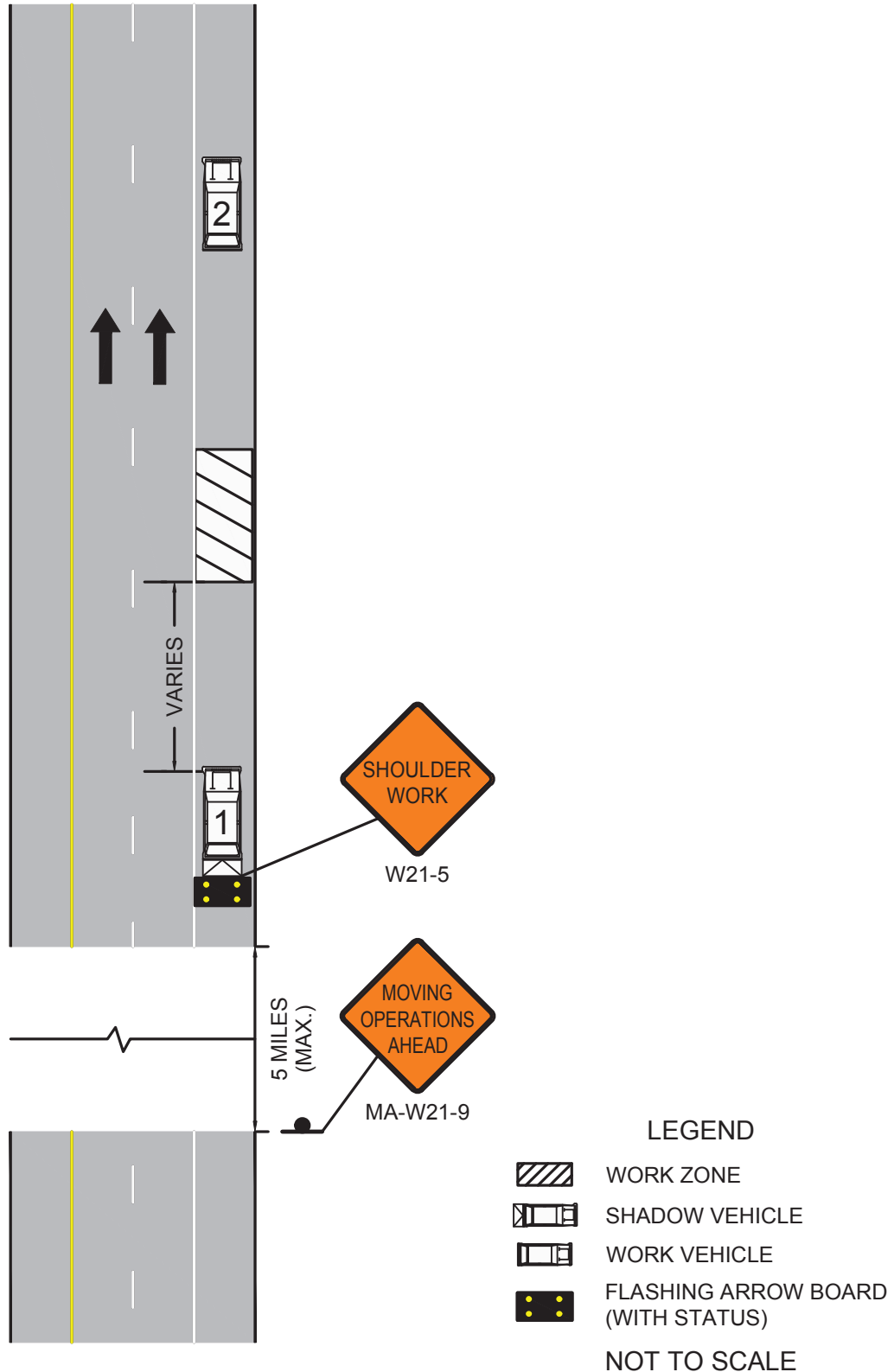




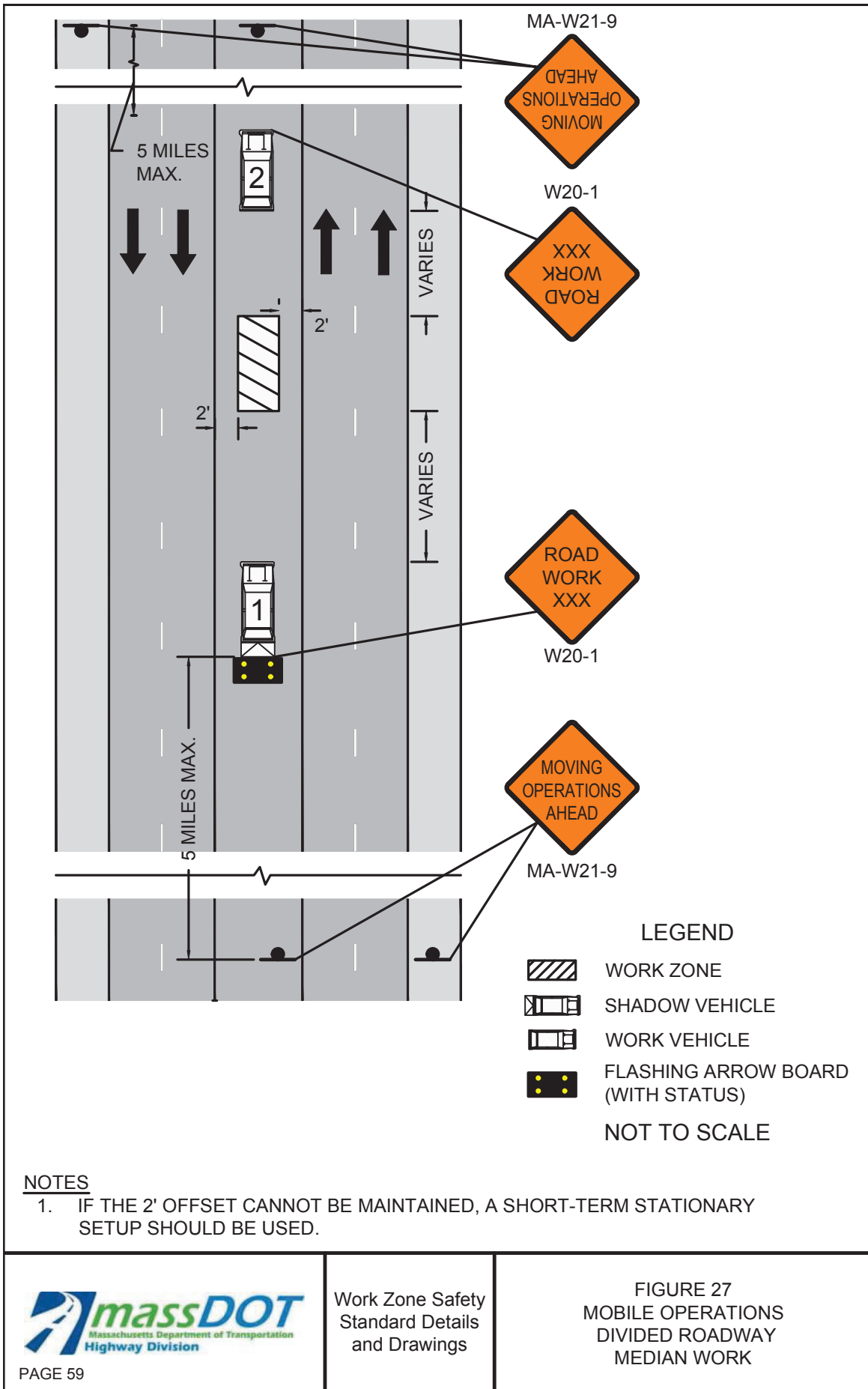
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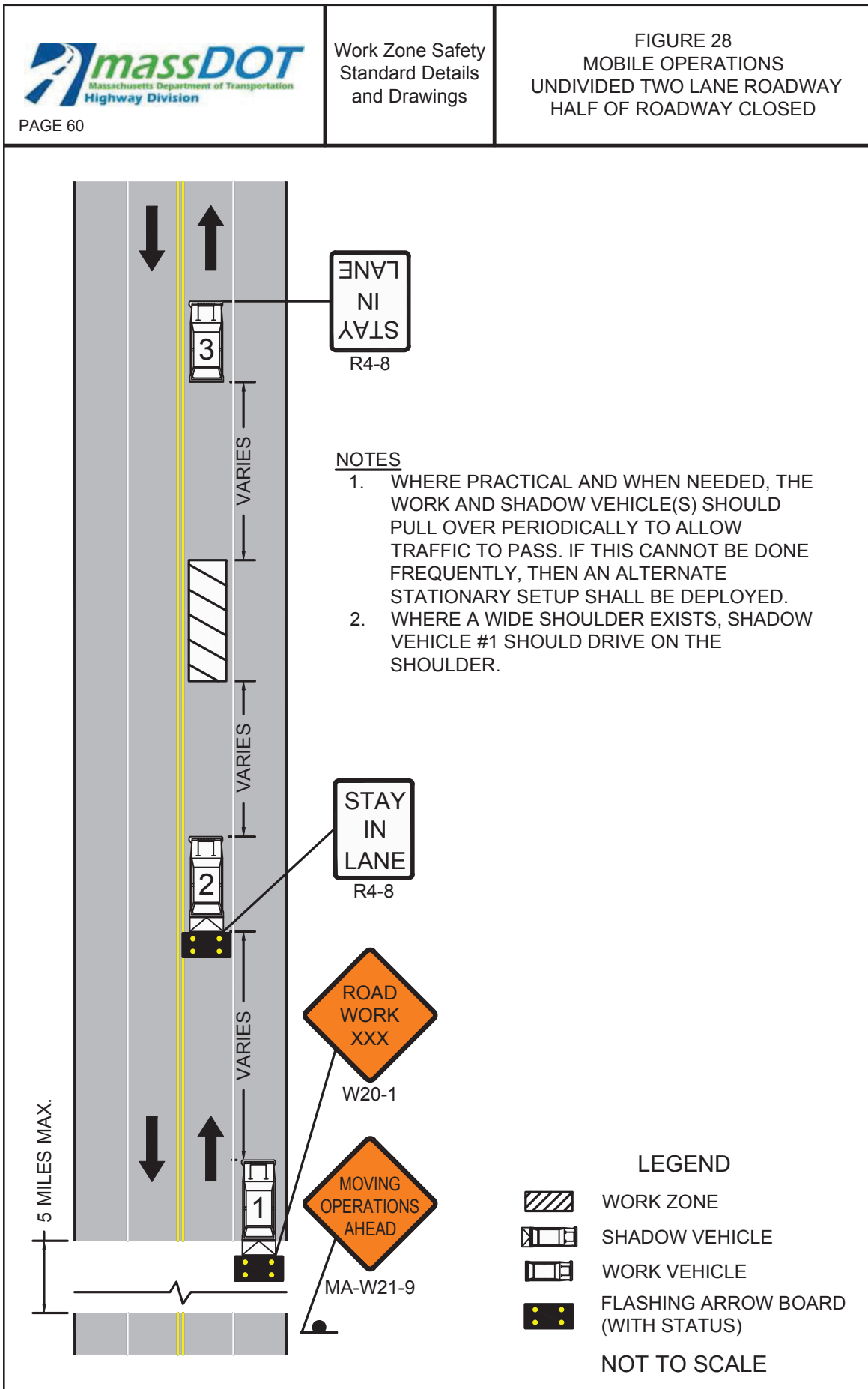
FIGURE 26  
MOBILE OPERATIONS  
ANY ROADWAY SHOULDER



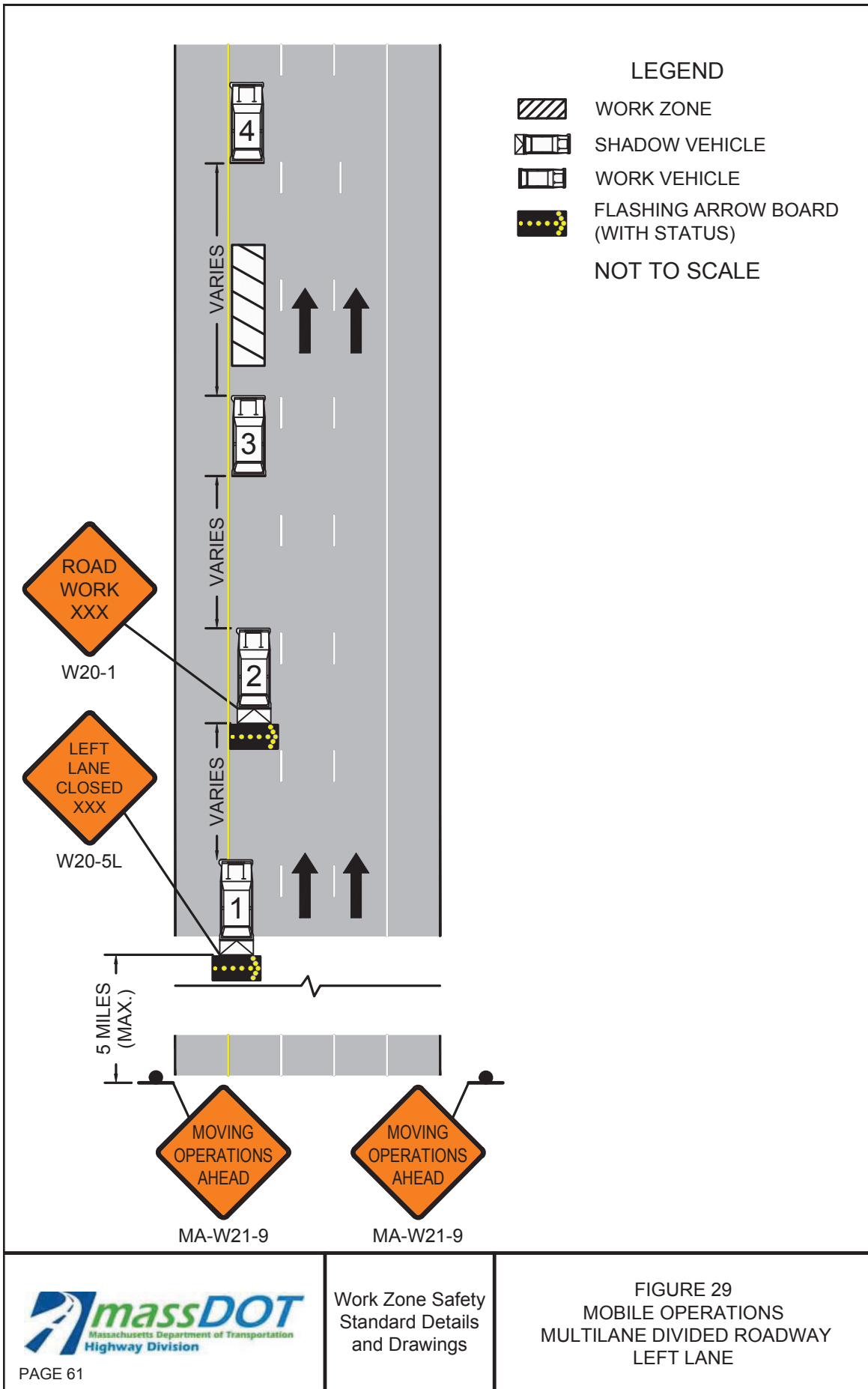












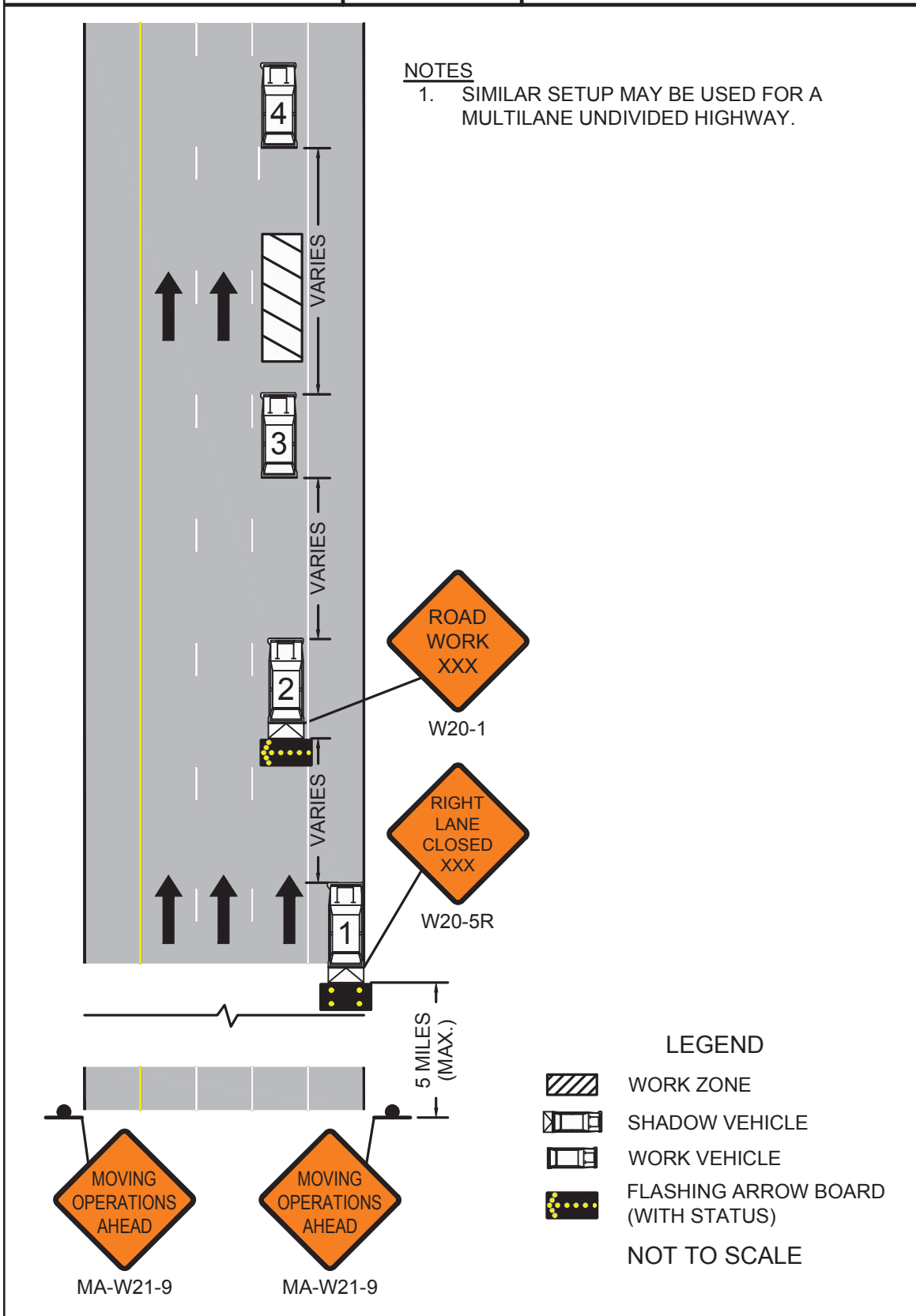




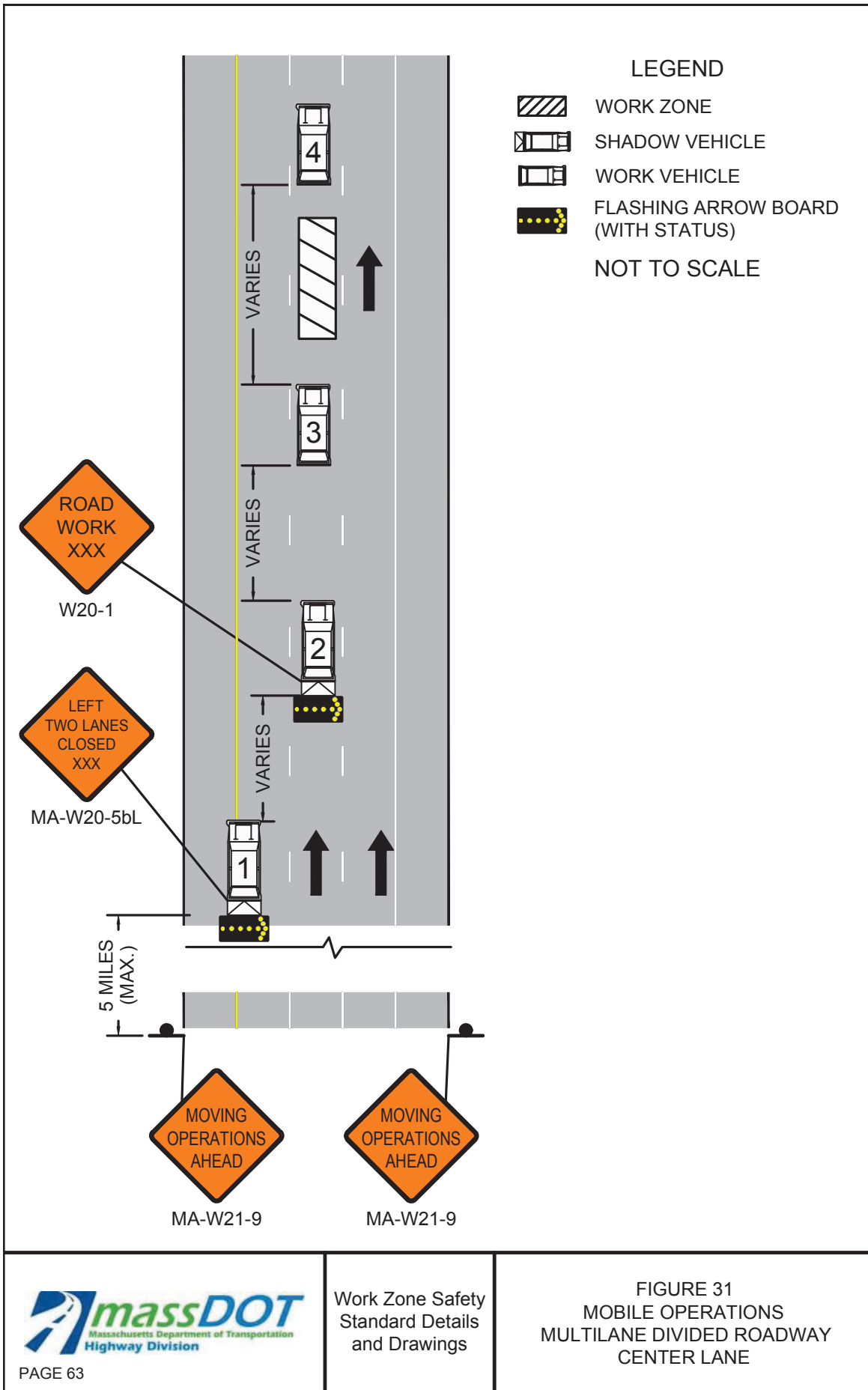
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FIGURE 30  
MOBILE OPERATIONS  
MULTILANE DIVIDED ROADWAY  
RIGHT LANE







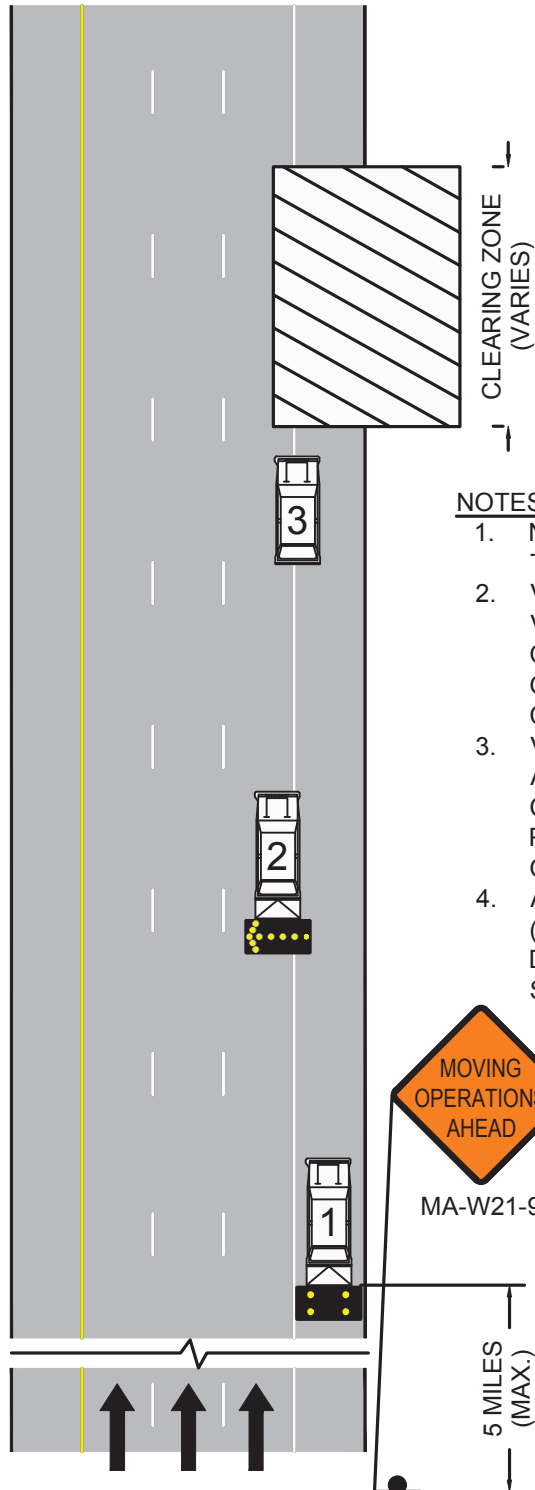




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FIGURE 32  
MOBILE OPERATIONS  
POST-STORM CLEANUP OPERATION



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



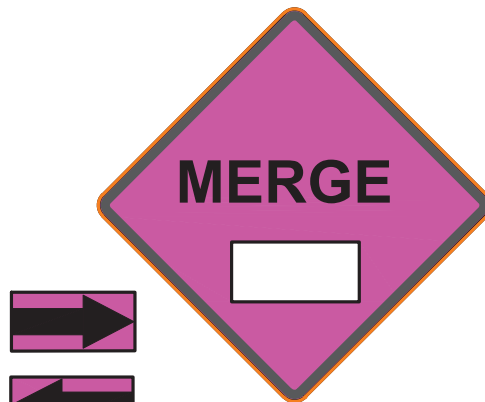
### Notes for Traffic Emergency or Incident Operations

- 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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FIGURE 33  
EMERGENCY RESPONSE  
ANY ROADWAY  
SHOULDER ENCROACHMENT

### LEGEND



EMERGENCY AREA

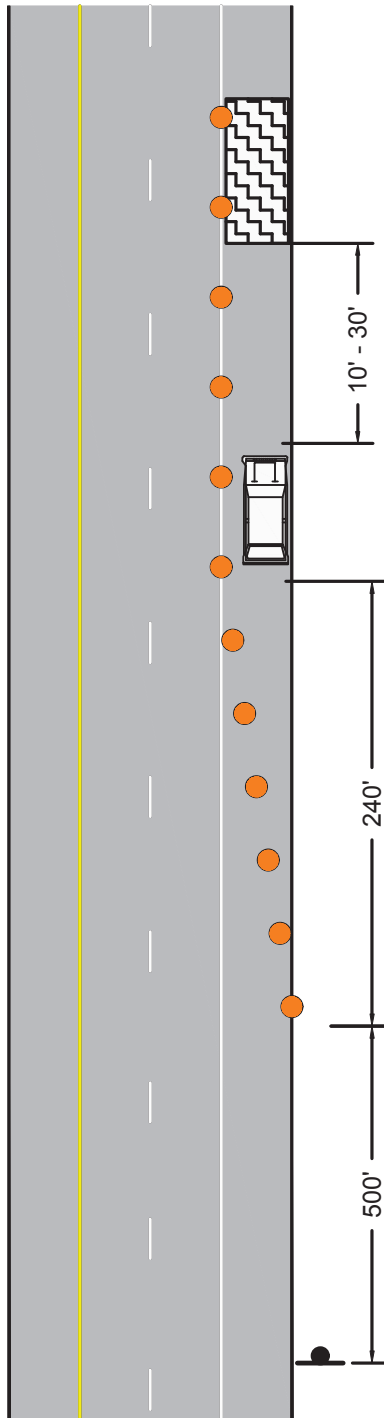


CHANNELIZATION DEVICE



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.

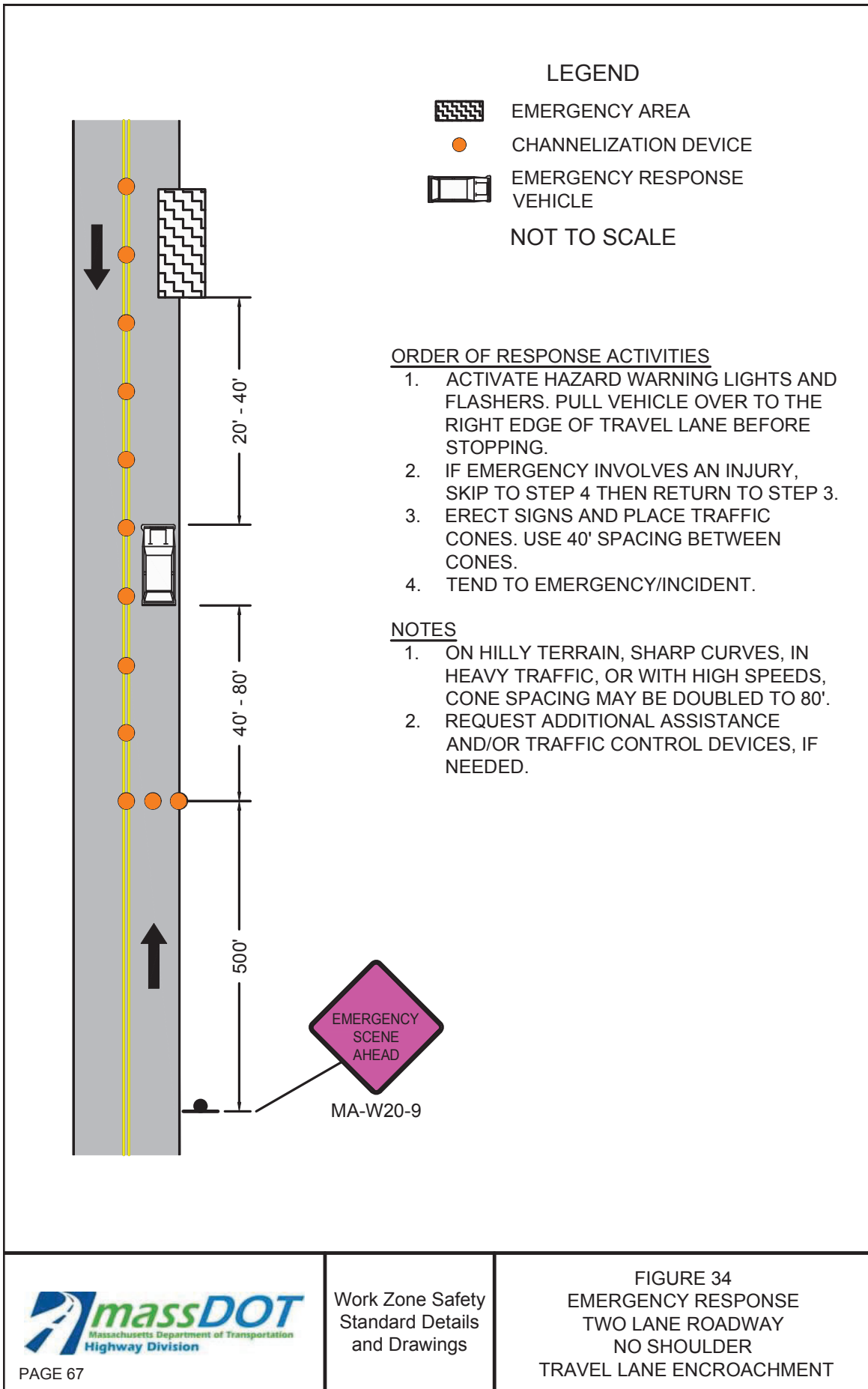
### NOTES

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

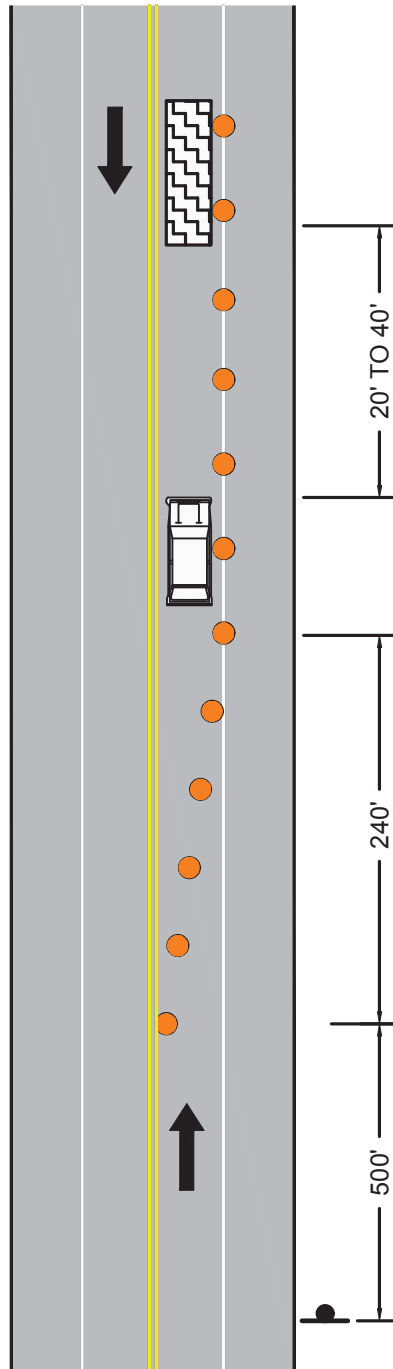


CHANNELIZATION DEVICE



EMERGENCY RESPONSE  
VEHICLE

NOT TO SCALE

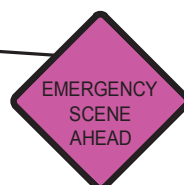


### ORDER OF RESPONSE ACTIVITIES

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.

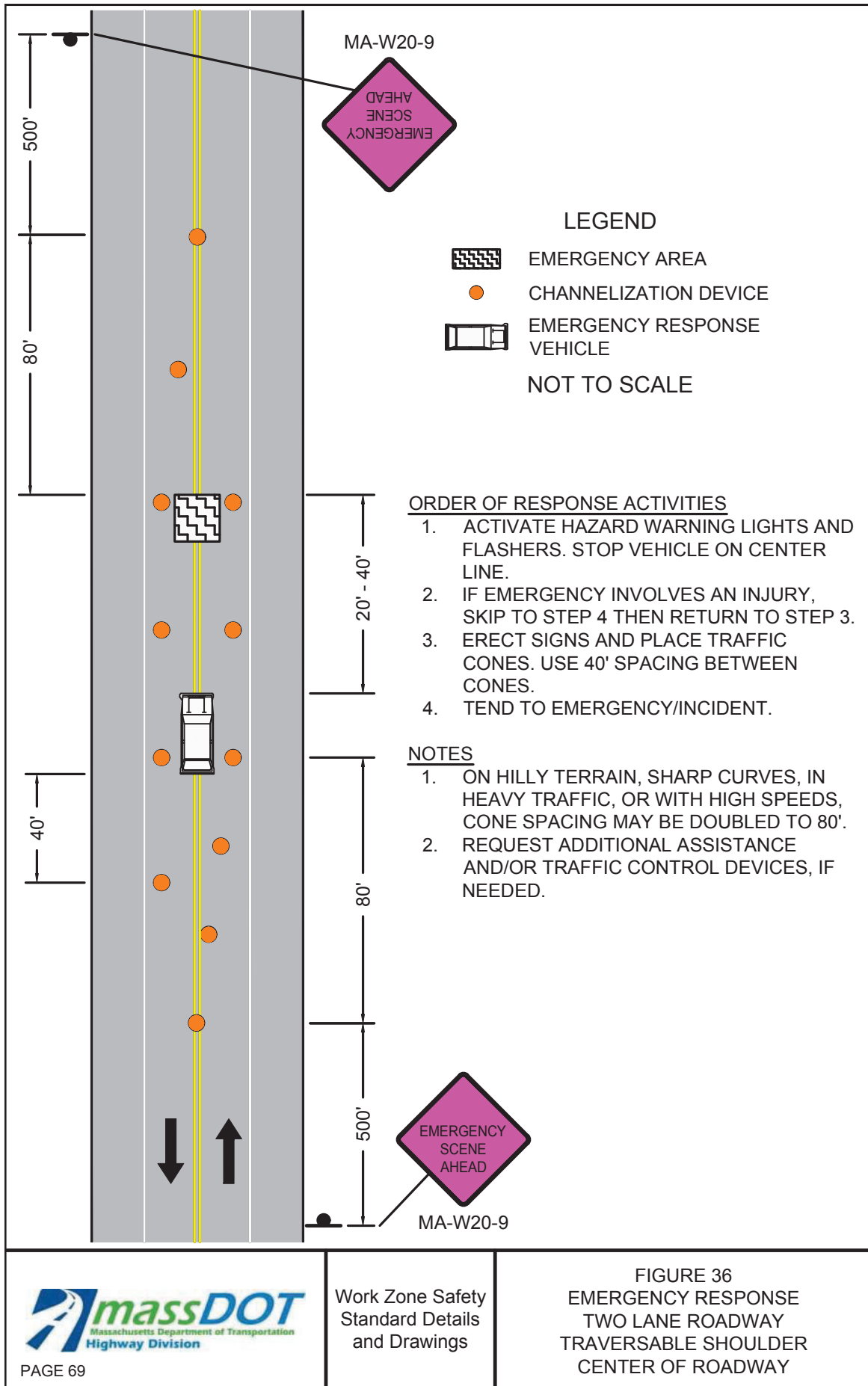
### NOTES

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





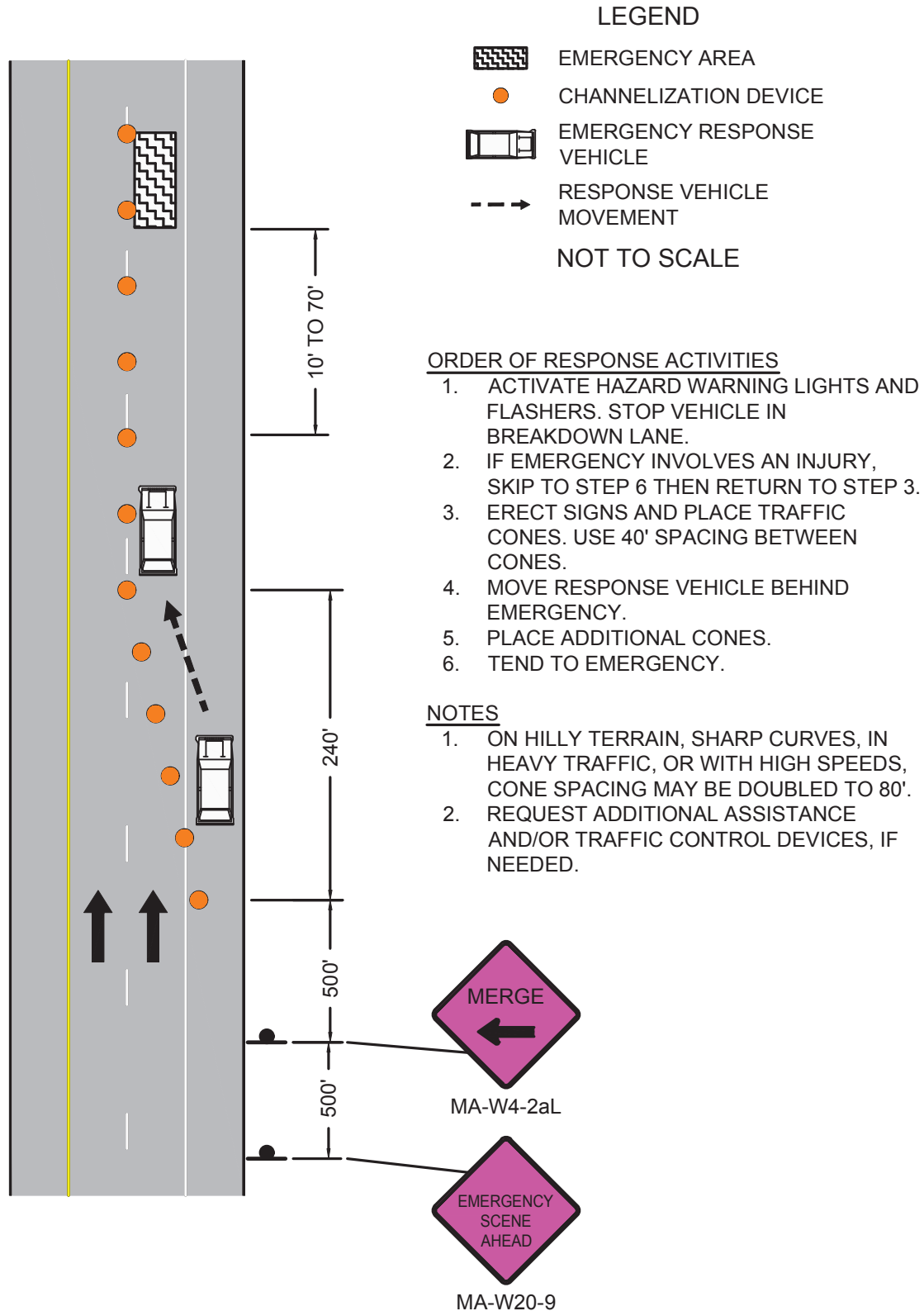




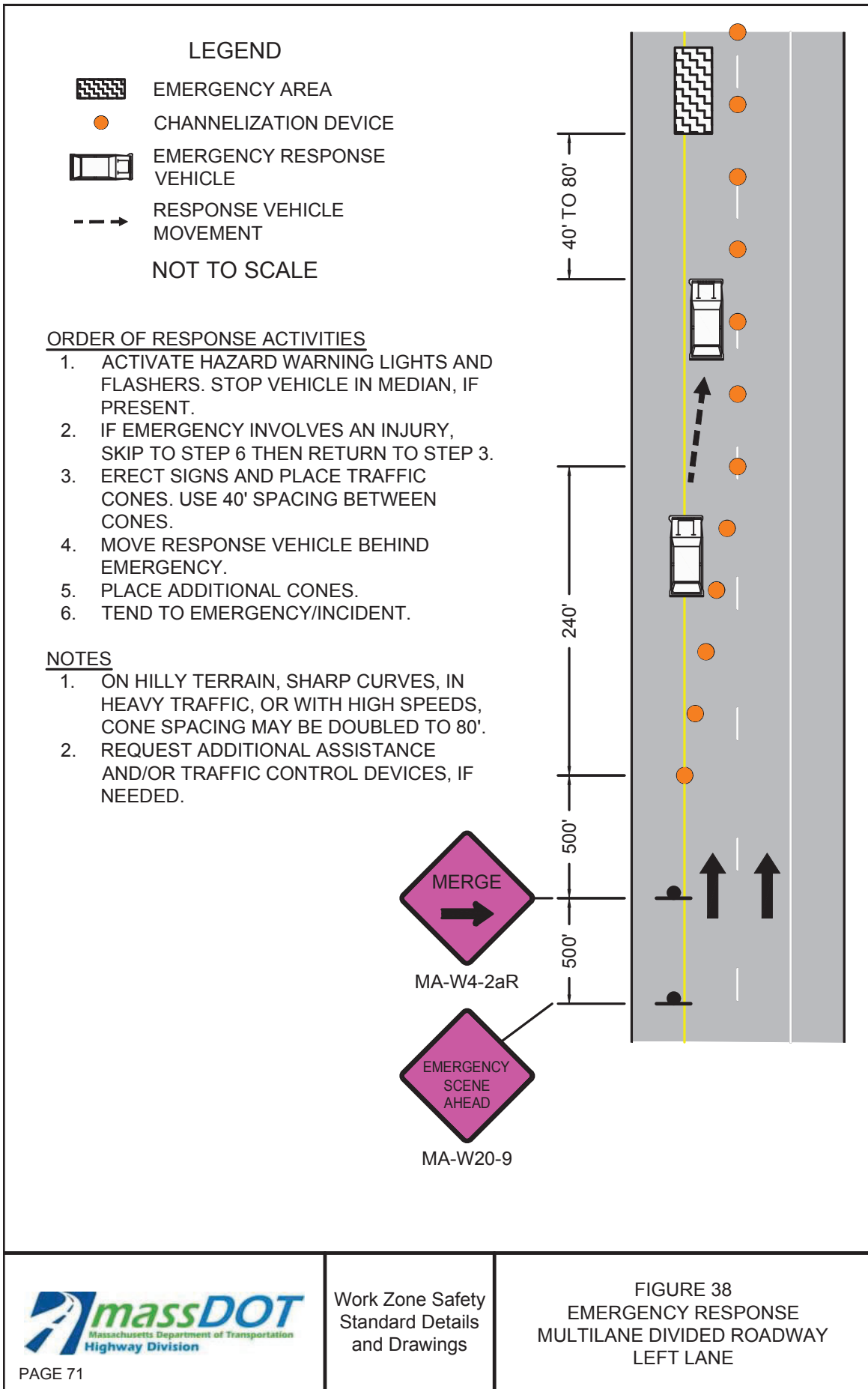
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Work Zone Safety  
Standard Details  
and Drawings

FIGURE 37  
EMERGENCY RESPONSE  
MULTILANE DIVIDED ROADWAY  
RIGHT LANE







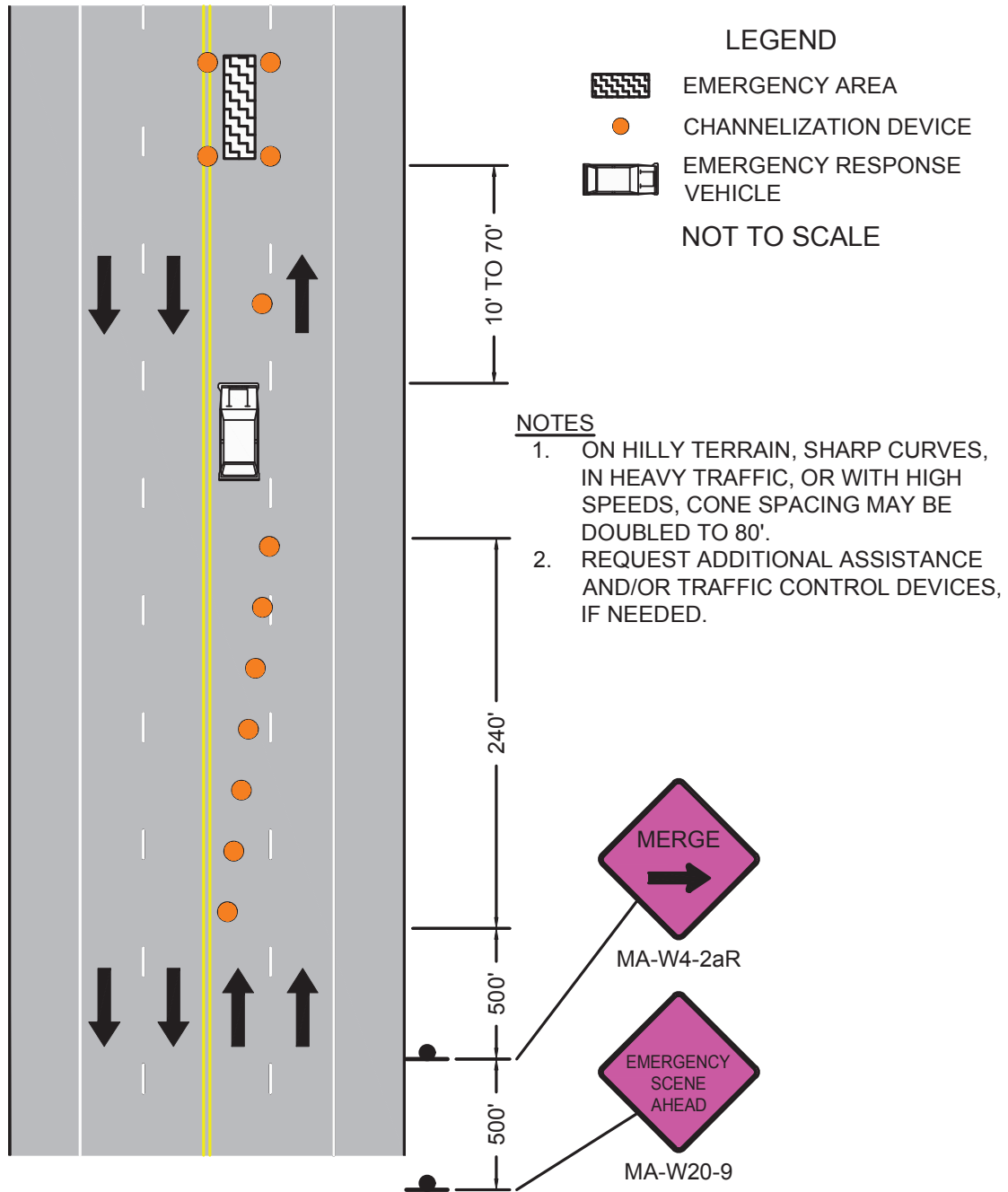




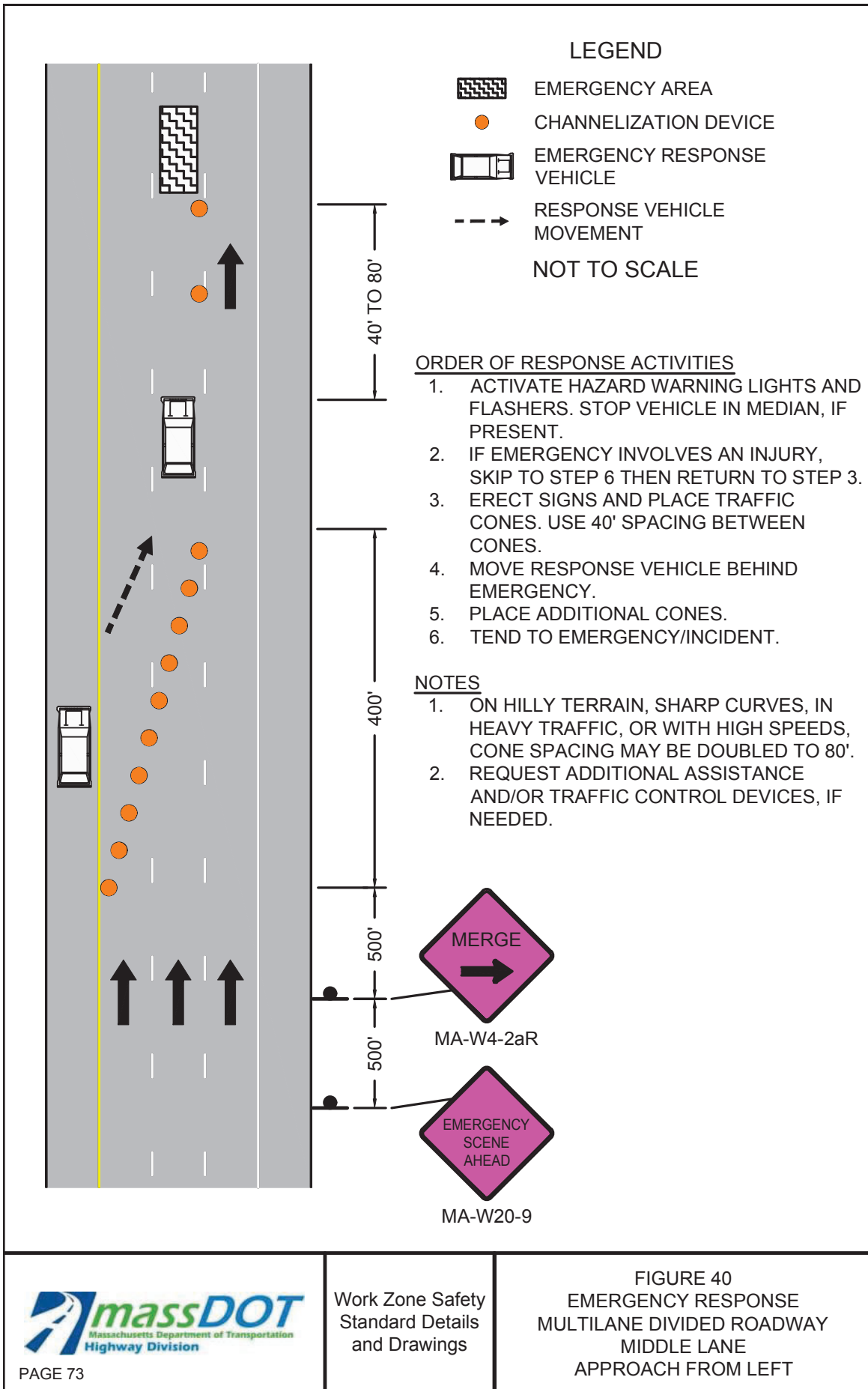
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Work Zone Safety  
Standard Details  
and Drawings

FIGURE 39  
EMERGENCY RESPONSE  
MULTILANE UNDIVIDED  
ROADWAY  
LEFT LANE







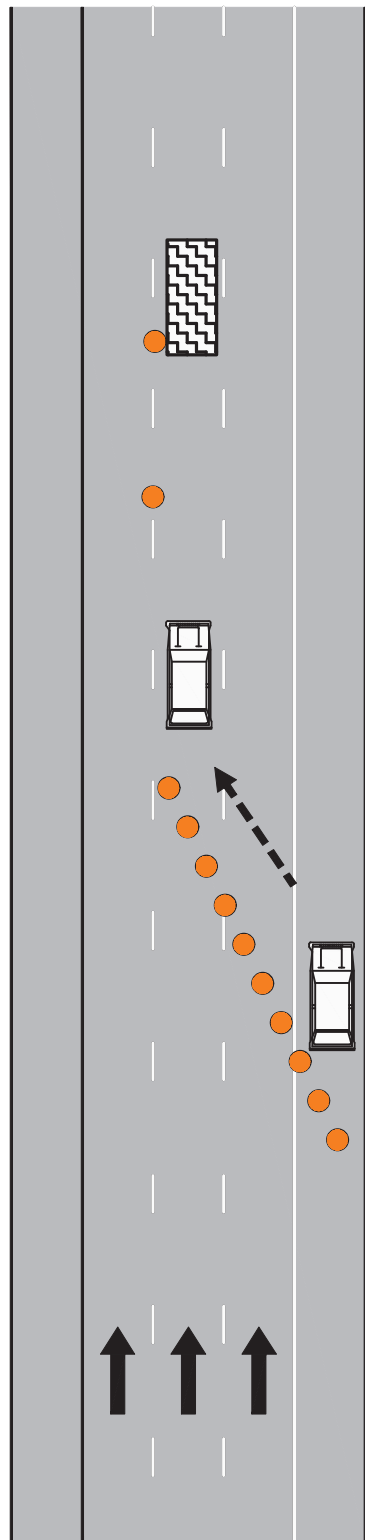








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Work Zone Safety  
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FIGURE 41  
EMERGENCY RESPONSE  
MULTILANE DIVIDED ROADWAY  
MIDDLE LANE  
APPROACH FROM RIGHT



### LEGEND

-  EMERGENCY AREA
-  CHANNELIZATION DEVICE
-  EMERGENCY RESPONSE VEHICLE
-  RESPONSE VEHICLE MOVEMENT

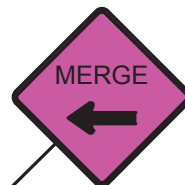
NOT TO SCALE

### 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.

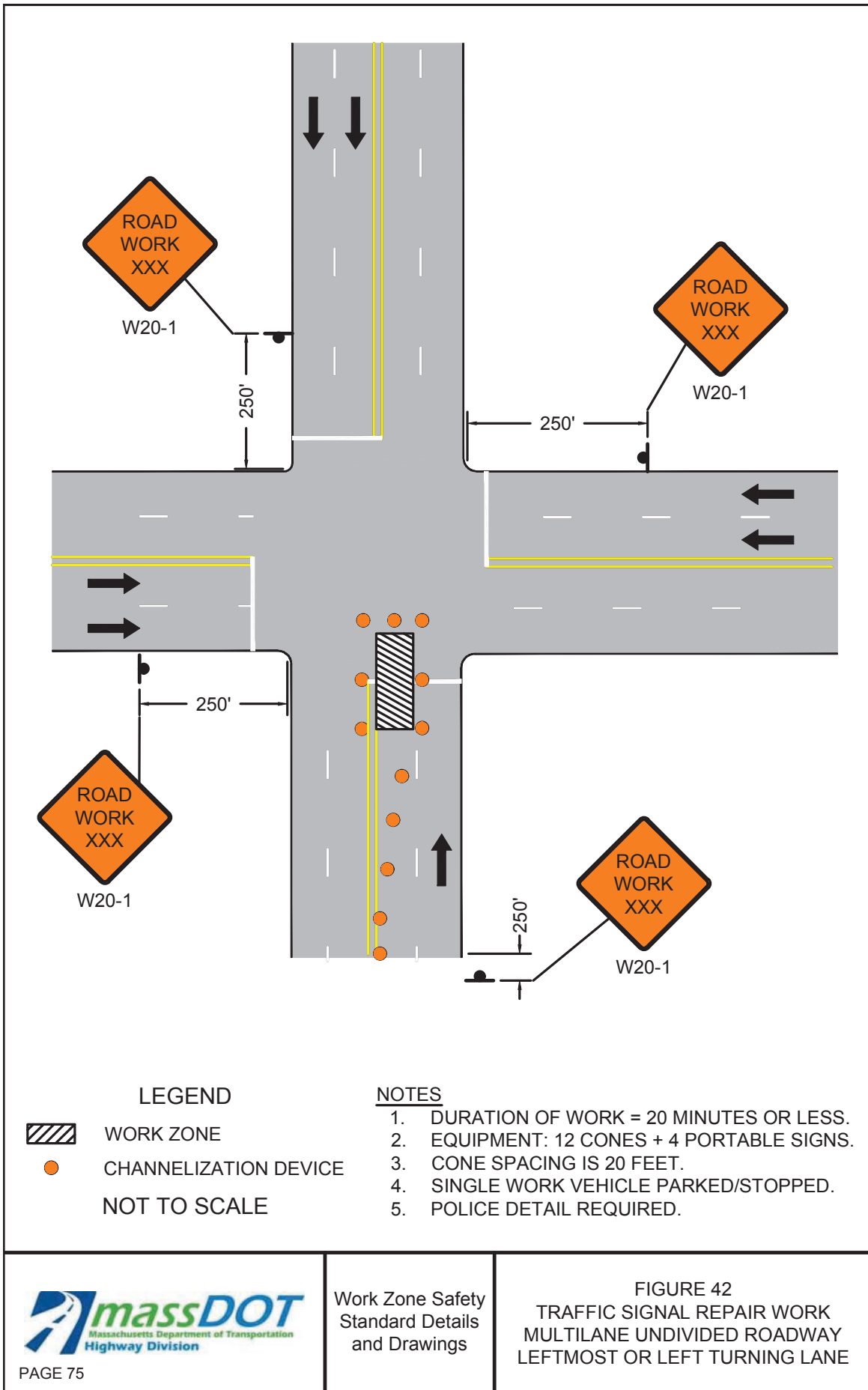


MA-W4-2aL



MA-W20-9





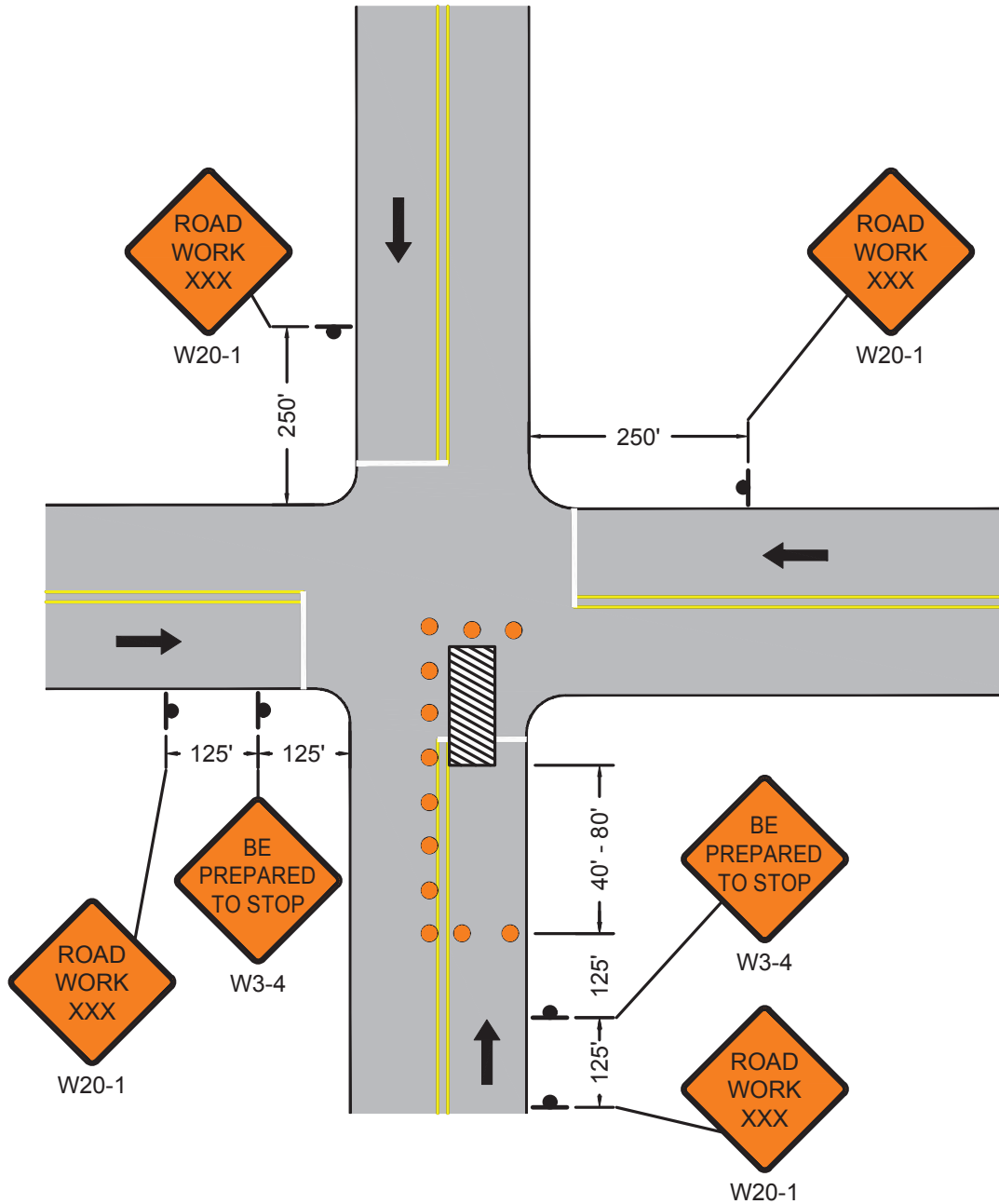




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Work Zone Safety  
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and Drawings

FIGURE 43  
TRAFFIC SIGNAL REPAIR WORK  
TWO LANE UNDIVIDED ROADWAY  
ONE LEG OF INTERSECTION



#### LEGEND



WORK ZONE



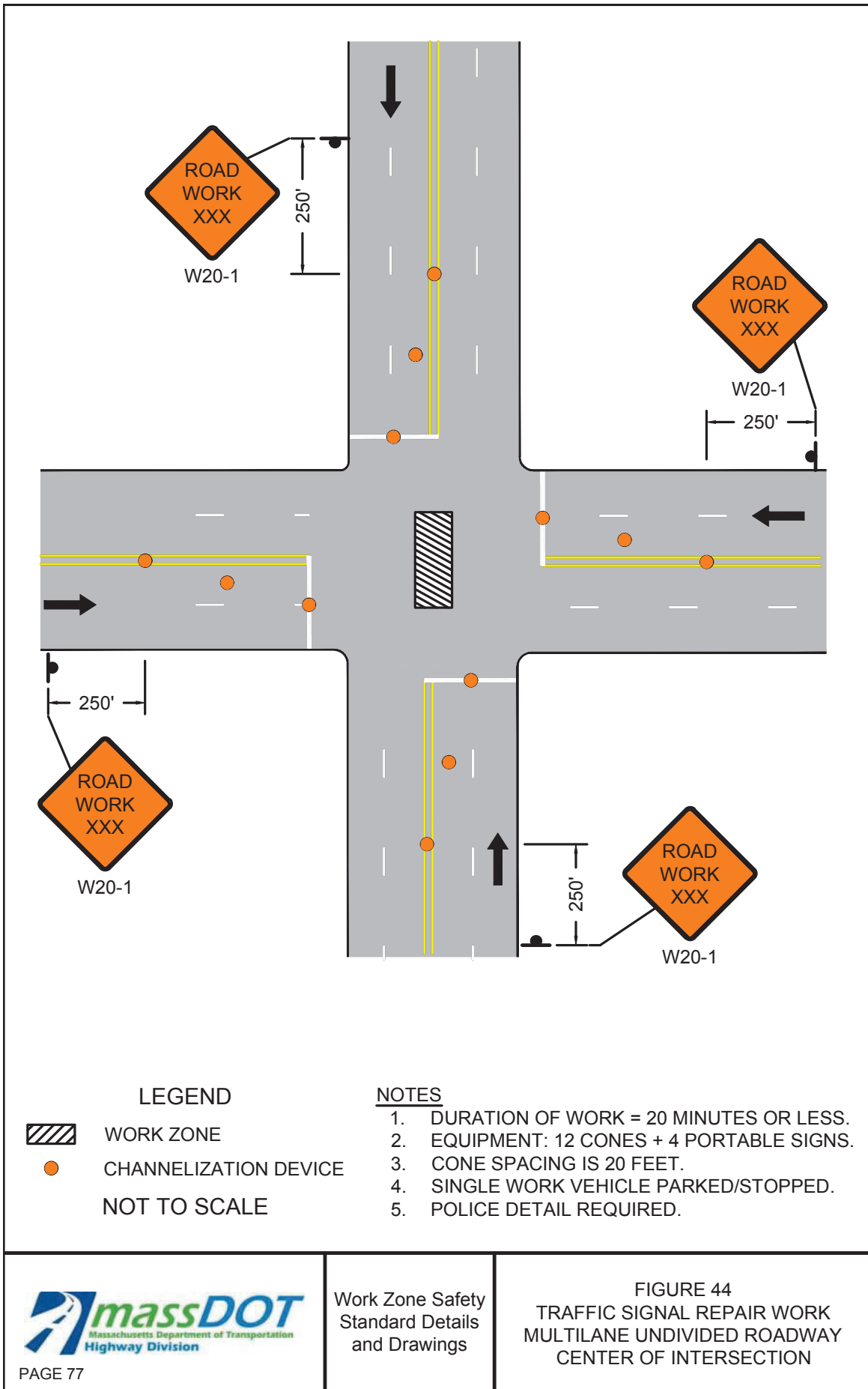
CHANNELIZATION DEVICE

NOT TO SCALE

#### NOTES

1. DURATION OF WORK = 20 MINUTES OR LESS.
2. EQUIPMENT: 12 CONES + 6 PORTABLE SIGNS.
3. CONE SPACING IS 20 FEET.
4. SINGLE WORK VEHICLE PARKED/STOPPED.
5. POLICE DETAIL REQUIRED.





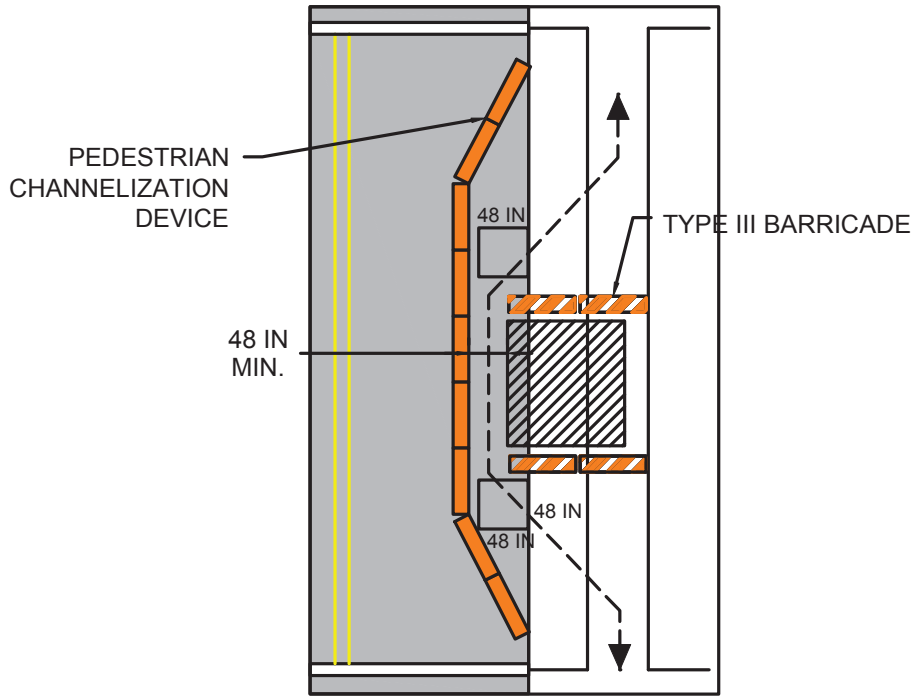




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Work Zone Safety  
Standard Details  
and Drawings

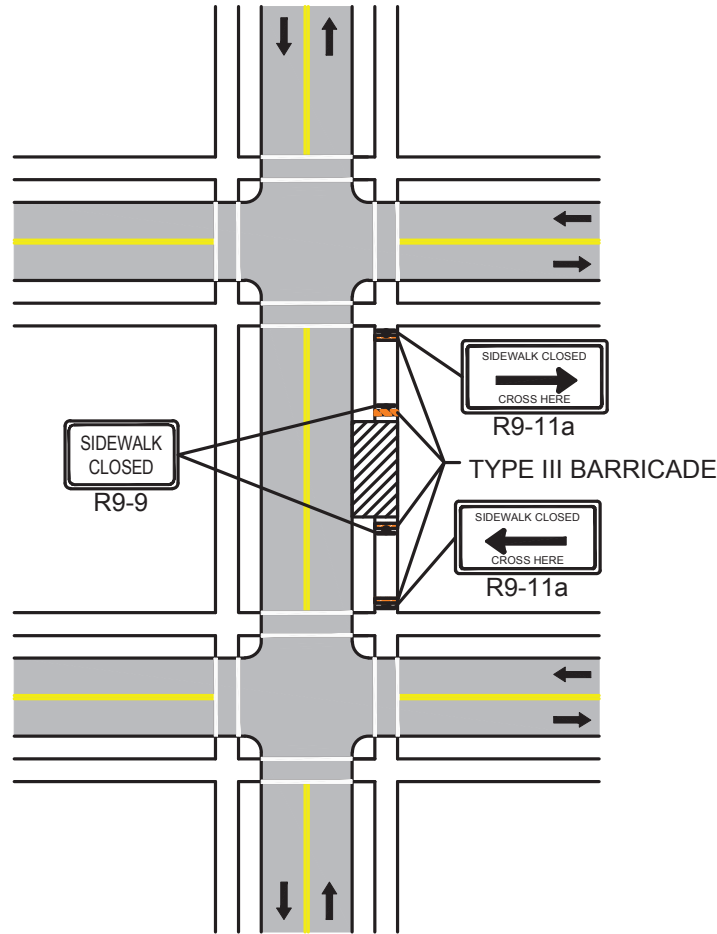
FIGURE 45  
PEDESTRIAN BYPASS



**NOTES:**

1. WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
2. A PEDESTRIAN CHANNELIZATION DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ALONG THE FULL LENGTH OF THE TEMPORARY PEDESTRIAN ROUTE.
3. WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT.
4. THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
5. THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THE SIDEWALK EXCEEDS 200 FEET THEN A 5 FOOT BY 5 FOOT PASSING ZONE SHALL BE PROVIDED NEAR THE MID-POINT OF THE CLOSURE.
6. THE PROTECTIVE REQUIREMENTS OF A TTC WORK ZONE MAY HAVE AN IMPACT IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN PROVIDING PEDESTRIAN DELINEATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
7. ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL TO ASSIST WITH NAVIGATION AROUND THE CLOSURE/WORK AREA MAY BE CONSIDERED AS AN OPTION IN PLACE OF PROVIDING ADA/AAB DEVICES FOR WORK FOR CLOSURES LASTING 4 HOURS OR LESS.
8. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN; VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE. THESE DETAILS ARE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DETERMINED BY THE ENGINEER.





**NOTES:**

1. CLOSURE OF A SIDEWALK FACILITY SHALL CONSTITUTE THE PROVISION FOR MANAGING PEDESTRIAN TRAFFIC AND ACCOMMODATING ALL USERS. IF THE EXISTING PEDESTRIAN ACCESS ROUTE(S) CAN BE TEMPORARILY RELOCATED ALONG THE EXISTING SIDEWALK, AND SAID FACILITY PROVIDES A MINIMUM WIDTH OF 48-INCHES OF SOLID, SMOOTH UNOBSTRUCTED SURFACE, THEN NO DETOURING OF THE ROUTE SHALL BE REQUIRED. DELINEATION OF THE WORK AREA IS STILL REQUIRED.
2. IF IT IS NECESSARY TO DIVERT PEDESTRIAN TRAFFIC TO AN ALTERNATE ROUTE ACROSS THE ROADWAY FROM THE EXISTING FACILITY, THE FIGURE ABOVE SHALL BE FOLLOWED TO PROVIDE ADEQUATE DIRECTION TO PEDESTRIANS. ALTERNATE ROUTE SHALL PROVIDE THE SAME LEVEL OF ACCOMMODATION AS THE FACILITY THAT IS BEING DETOURED AND RETAIN ADA COMPLIANCE IN ITS ENTIRETY.
3. FOR EMERGENCY OR SHORT-DURATION SIDEWALK CLOSURES OF 4-HOURS OR LESS, IT IS OPTIONAL TO HAVE ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL AVAILABLE AT ALL TIMES DURING THE CLOSURE TO ASSIST THOSE MOBILITY CHALLENGED PERSONS WHO REQUIRE ADDITIONAL ASSISTANCE TO SAFELY NAVIGATE AROUND THE WORK AREA IN LIEU OF A FULL DETOUR.





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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
BIKE LANE CLOSURE

POSTED SPEED LIMIT (MPH)	SPACING FOR BIKE ADVANCE WARNING SIGNS (FT) (A,B))	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRANSITION LENGTH (L/3)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	150 / 150	100	305	20	45
45-55	150 / 150	220	495	40	35
60-65	150 / 150	260	645	40	40

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

#### NOTES

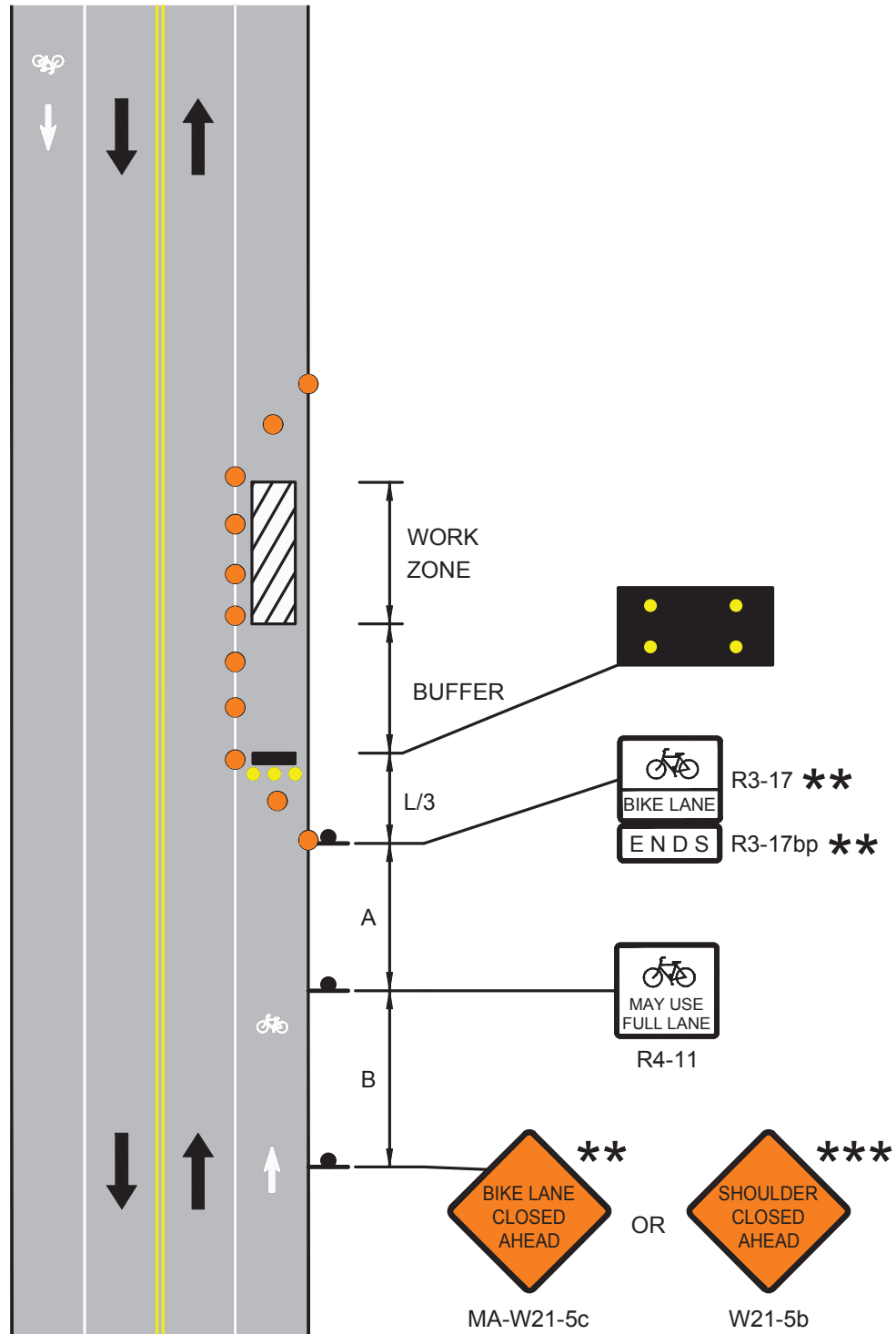
1. DETAIL SHALL BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS. SIGNING SHOWN ONLY FOR BIKE TRAFFIC. FOLLOW ALL OTHER RELEVANT DETAILS FOR TTC DEVICES FOR VEHICULAR TRAFFIC.
2. \*\* SIGN SHALL BE USED ONLY IF THERE IS A MARKED BIKE LANE.
3. \*\*\* SIGN SHALL BE USED ONLY IF THERE IS NO MARKED BIKE LANE.

#### LEGEND

	WORK ZONE
	CHANNELIZATION DEVICE
	FLASHING ARROW BOARD
	PORTABLE CHANGEABLE MESSAGE SIGN
	TRUCK MOUNTED ATTENUATOR
	RADAR SPEED FEEDBACK BOARD
	POLICE DETAIL OR UNIFORMED FLAGGER
	TEMPORARY PORTABLE RUMBLE STRIP
	TYPE III BARRICADE

NOT TO SCALE









Rev. June, 2017



DOCUMENT A00820

**Massachusetts Department of Transportation  
Conditions of Custody****REQUEST FOR RELEASE OF MASSDOT AUTOCAD FILES FORM**

(Only to be used following award of contract)

City/Town: TAUNTONProject File Number: 606024Contract Number: 120178Project Description: Roadway Reconstruction and Related Work (Including Signals)on a Section of Route 44 (Dean Street)

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](mailto:DOTHighwayDesign@dot.state.ma.us)

Attn: AutoCAD Files

Name of person requesting AutoCAD files: \_\_\_\_\_

Affiliation/Company: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone number: \_\_\_\_\_

Email address: \_\_\_\_\_

Signature/Date: \_\_\_\_\_



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DOCUMENT A00830

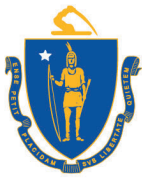
# **ARMY CORPS OF ENGINEERS**

## **Permit Application**



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Charles D. Baker, Governor  
Karyn E. Polito, Lieutenant Governor  
Jamey Tesler, Secretary & CEO  
Jonathan L. Gulliver, Highway Administrator



June 14, 2022

Dan Vasconcelos  
Regulatory Division  
Department of the Army  
New England District, Corps of Engineers  
696 Virginia Road  
Concord, MA 01742

RE: Preconstruction Notification: Reconstruction of Dean Street (Route 44)  
MassDOT Project #606024  
Taunton, MA

The Massachusetts Department of Transportation, Highway Division (MassDOT) is submitting this Application for Pre-Construction Notification authorization under the Massachusetts General Permits (GPs) 10 and 14 for the proposed Reconstruction of Dean Street (Route 44) in the City of Taunton, Massachusetts. The project limits begin east of Arlington Street and extend to a point west of the Route 44 / Route 104 intersection for a total length on Route 44 of 0.71 miles (3,724 feet). The project also extends onto Longmeadow Road for 0.09 miles (464 feet) and Hon. Gordon M. Owen Riverway for 0.1 miles (566 feet). The project has a total length of 0.9 miles (4,754 feet).

The purpose of this project is to improve connectivity between downtown Taunton to the west and Route 24 to the east, provide public transit accommodations, enhance safety conditions, provide pedestrian and bicycle amenities, meet current Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) AAB standards, and improve overall vehicular traffic and intersection operations.

The project generally proposes to widen Route 44 in order to provide consistent four-lane cross section throughout the Route 44 corridor to improve traffic flow, intersection operations, safety, and pedestrian and bicycle access. To facilitate these improvements, the project proposes the removal of an existing granite block retaining wall and construction of a new soldier pile and lagging wall adjacent to / within the Taunton River.

The project requires authorization under Massachusetts GPs 10 and 14 as it will result in approximately 2,854 SF of temporary and permanent impacts to Waters of the United States, 733 LF of temporary and permanent impacts to streambank, and 1,472 SF of temporary and permanent impacts to Vegetated Wetlands. These impacts are detailed in the attached ENG Form 4345 and project narrative and depicted on the attached project plans. The project will also require an Order of Conditions from the Taunton Conservation Commission.

If you require any additional information regarding the project, please contact me at (978) 429-1772 or by email at [melissa.lenker@state.ma.us](mailto:melissa.lenker@state.ma.us).

Ten Park Plaza, Suite 4160, Boston, MA 02116  
Tel: 857-368-4636, TTY: 857-368-0655  
[www.mass.gov/massdot](http://www.mass.gov/massdot)



Sincerely,

A handwritten signature in blue ink that reads "Melissa Lenker". The script is cursive and fluid.

Melissa Lenker  
Wetlands and Water Resources Supervisor  
MassDOT Highway Division, Environmental Services

Cc: Gregory Mischel, MassDOT



# PRECONSTRUCTION NOTIFICATION

## RECONSTRUCTION OF ROUTE 44 MASSDOT PROJECT 606024 TAUNTON, MA

# GPI

### SUBMITTED TO:

U.S. Army Corps of Engineers  
New England District  
696 Virginia Road  
Concord, MA 01742-2751

### Prepared For:



MassDOT Highway Division  
Ten Park Plaza, Suite 4160  
Boston, MA 02116

### Prepared By:



Greenman-Pedersen, Inc. (GPI)  
181 Ballardvale Street, Suite 202  
Wilmington, MA 01887

**MAY 2022**

***Reconstruction of Route 44  
Taunton, Massachusetts  
Preconstruction Notification  
MAY 2022***





## ENG Form 4345

---



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 [whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil](mailto:whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil). 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: <http://dpcl.dod.mil/Privacy/SORNSIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx>

**(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 - <input type="text" value="Melissa"/> Middle - <input type="text"/> Last - <input type="text" value="Lenker"/> Company - <input type="text" value="MassDOT Highway Division"/> E-mail Address - <input type="text" value="melissa.lenker@state.ma.us"/>		8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - <input type="text" value="Samuel"/> Middle - <input type="text"/> Last - <input type="text" value="Campbell"/> Company - <input type="text" value="Greenman-Pedersen, Inc. (GPI)"/> E-mail Address - <input type="text" value="scampbell@gpinet.com"/>	
6. APPLICANT'S ADDRESS: Address- <input type="text" value="10 Park Plaza, Room 7360"/> City - <input type="text" value="Boston"/> State - <input type="text" value="MA"/> Zip - <input type="text" value="02116"/> Country - <input type="text" value="USA"/>		9. AGENT'S ADDRESS: Address- <input type="text" value="181 Ballardvale Street, Suite 202"/> City - <input type="text" value="Wilmington"/> State - <input type="text" value="MA"/> Zip - <input type="text" value="01887"/> Country - <input type="text"/>	
7. APPLICANT'S PHONE NOS. w/AREA CODE a. Residence <input type="text"/> b. Business <input type="text" value="(978) 429-1772"/> c. Fax <input type="text"/>		10. AGENTS PHONE NOS. w/AREA CODE a. Residence <input type="text" value="781-467-9667"/> b. Business <input type="text" value="978-570-2989"/> c. Fax <input type="text" value="978-658-3044"/>	

**STATEMENT OF AUTHORIZATION**

11. I hereby authorize,  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.

  
 SIGNATURE OF APPLICANT

DATE

**NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY**

12. PROJECT NAME OR TITLE (see instructions) <input type="text" value="Reconstruction of Route 44 (Dean Street)"/>	
13. NAME OF WATERBODY, IF KNOWN (if applicable) <input type="text" value="Taunton River"/>	14. PROJECT STREET ADDRESS (if applicable) Address <input type="text" value="Route 44 (Dean Street) from Arlington Street to Route 104 (South Main Street)"/> City - <input type="text" value="Taunton"/> State - <input type="text" value="MA"/> Zip - <input type="text" value="02780"/>
15. LOCATION OF PROJECT Latitude: °N <input type="text" value="Start: 41°54'13.932"/> End: 41°54'21.492" Longitude: °W <input type="text" value="Start: 71°04'53.796"/> End: 71°04'07.104"	
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID <input type="text" value="N/A"/> Municipality <input type="text" value="Taunton"/> Section - <input type="text" value="N/A"/> Township - <input type="text" value="N/A"/> Range - <input type="text" value="N/A"/>	



**17. DIRECTIONS TO THE SITE**

From US Army Corps of Engineers New England District (Concord, MA) - Exit the parking lot onto Virginia Road. Continue onto Old Bedford Road then turn right onto Hanscom Road. From Hanscom Road turn left onto North Great Road (Route 2A). Continue on Route 2A and merge onto I-95 South. Continue on I-95 South to I-93 then take Exit 4 onto Route 24 South. Continue on Route 24 South and take Exit 20 on Route 44. Continue west on Route 44 for approximately 1.5 miles to arrive at the site. Parking is available in the adjacent commercial and on side streets.

**18. Nature of Activity (Description of project, include all features)**

The project generally proposes to widen Route 44 in order to provide consistent four-lane cross section throughout the Route 44 corridor to improve traffic flow, intersection operations, safety, and pedestrian and bicycle access. A new sidewalk will be constructed along the westbound side of Route 44. Bicycle lanes and pavement markings will be installed on the eastbound and westbound sides of Route 44. The geometry of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection will be realigned to provide improved signage and traffic signals, reduce driver discomfort, improve traffic operations, and improve safety for pedestrians and bicyclists. To facilitate these improvements, the project proposes the removal of an existing granite block retaining wall and construction of a new soldier pile and lagging wall adjacent to, and in some areas, within the Taunton River. The project also includes drainage improvements, landscaping, installation of granite curbing and associated roadway work.

**19. Project Purpose (Describe the reason or purpose of the project, see instructions)**

The purpose of this project is to improve connectivity between downtown Taunton to the west and Route 24 to the east, provide public transit accommodations, enhance safety conditions, provide pedestrian and bicycle amenities, meet current Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) AAB standards, and improve overall vehicular traffic and intersection operations.

**USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED****20. Reason(s) for Discharge**

Discharges to Waters of the U.S. from filling associated with retaining wall widening to facilitate roadway widening, the construction of shared use paths and sidewalks, extension of an existing culvert, and drainage improvements.

**21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:**

Type **Soldier Pile & Lagging Wall**  
Amount in Cubic Yards

Type  
Amount in Cubic Yards

Type  
Amount in Cubic Yards

**22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)**

Acres **Waters of the US:** 2,854 sf (689 sf permanent / 2,165 sf temporary) **Vegetated Wetlands:** 1,472 sf (1,029 sf permanent / 443 sf temporary)  
or

Linear Feet **Streambank:** 733 lf (490 lf temporary / 243 lf permanent)

**23. Description of Avoidance, Minimization, and Compensation (see instructions)**

In order to compensate for the proposed VW impacts, the project proposes the construction of 1,272 square feet of VW replication. The replication area has been designed and sited so that it is adjacent and hydrologically connected to the existing wetland. The proposed replication area will be seeded and planted with native species similar to those found in the existing wetland. Proposed plant species include Common Winterberry (*Ilex Verticillata*) both male and female, Swamp White Oak (*Quercus Bicolor*), and Highbush Blueberry (*Vaccinium Corybosum*). All temporarily impacted areas of BW and Bank will be restored in place upon completion of the project using a wetland seed mix. To compensate for the proposed 1,059 cubic yards of fill within the floodplain, the project proposes to construct a 983 cubic yard compensatory flood storage area. Thirty-nine (39) new trees are proposed to compensate for the proposed tree removals.



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 of abutters

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
MEPA	MEPA Certificate	16483	November 2021	December 22, 2021	
Taunton Conservation Commission	WPA Order of Conditions	073-TBD	05/27/2022	TBD	
DEP Waterways	Chapter 91 License	22-WW14-0008-APP	06/6/2022	TBD	

\* 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 Lemker*

SIGNATURE OF APPLICANT

6/14/2022

DATE

*Sue G. Gmell*

SIGNATURE OF AGENT

06/14/2022

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.





## City of Taunton, MA Abutters Report

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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-118-0 SULLIVAN GREGORY W & LISA	189 DEAN STREET	624	SULLIVAN GREGORY W & LISA 1 SOUTH STREET RAYNHAM, MA 02767
55-742-0 TAUNTON GIRLS CLUB	131 ARLINGTON STREET	104776	TAUNTON GIRLS CLUB 131 ARLINGTON STREET TAUNTON, MA 02780
56-109-0 BORGES DENNIS M & LYNN M	9 CAPE ROAD	625	BORGES DENNIS M & LYNN M 157 DEAN STREET TAUNTON, MA 02780
55-759-0 WILLIAM HOOKE LLC	30 WILLIAM HOOKE LANE	575	WILLIAM HOOKE LLC 30 WILLIAM HOOKE LANE TAUNTON, MA 02780
56-43-115 ACHEY MICHAL D & WAGNER MARK S	152 DEAN STREET	620	ACHEY MICHAL D & WAGNER MARK S 152 DEAN STREET TAUNTON, MA 02780
56-43-105 HEALTH PROPERTIES LLC	152 DEAN STREET	610	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-101 HEALTH PROPERTIES LLC	152 DEAN STREET	606	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-112 HEALTH PROPERTIES LLC	152 DEAN STREET	617	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-111 HEALTH PROPERTIES LLC	152 DEAN STREET	616	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-43-104 HEALTH PROPERTIES LLC	152 DEAN STREET	609	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-107 HEALTH PROPERTIES LLC	152 DEAN STREET	612	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-108 HEALTH PROPERTIES LLC	152 DEAN STREET	613	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-1 CONDO MAIN	152-152 DEAN STREET	103140	CONDO MAIN 15 SUMMER STREET TAUNTON, MA 02780
56-43-102 HEALTH PROPERTIES LLC	152 DEAN STREET	607	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-110 HEALTH PROPERTIES LLC	152 DEAN STREET	615	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-109 HEALTH PROPERTIES LLC	152 DEAN STREET	614	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-106 HEALTH PROPERTIES LLC	152 DEAN STREET	611	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-0 CONDO MAIN	152-152 DEAN STREET	103089	CONDO MAIN 15 SUMMER STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-43-103 HEALTH PROPERTIES LLC	152 DEAN STREET	608	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-43-114 HEALTH PROPERTIES LLC	152 DEAN STREET	619	HEALTH PROPERTIES LLC 152 DEAN STREET TAUNTON, MA 02780
56-36-21 FERRINI JANINE M	172 DEAN STREET #21	104677	FERRINI JANINE M 172 DEAN STREET #21 TAUNTON, MA 02780
56-36-1 BOSTIC NICOLE L	172 DEAN STREET #1	104657	BOSTIC NICOLE L 172 DEAN STREET #1 TAUNTON, MA 02780
56-36-2 ANDRADE JORDAN & GUADALUPE RYAN	172 DEAN STREET #2	104658	ANDRADE JORDAN & GUADALUPE RYAN 172 DEAN STREET #2 TAUNTON, MA 02780
56-36-9 FONSECA VALENTINA	172 DEAN STREET #9	104665	FONSECA VALENTINA 172 DEAN STREET UNIT 9 TAUNTON, MA 02780
56-36-602 BRENNAN EDMUND J JR TRS	174 DEAN STREET #B	105629	BRENNAN EDMUND J JR TRS P.O. BOX 488 TAUNTON, MA 02780
56-36-16 O'CONNOR TRACI A	172 DEAN STREET #16	104672	O'CONNOR TRACI A 172 DEAN STREET #16 TAUNTON, MA 02780
56-36-5 ORLANDO PETER	172 DEAN STREET #5	104661	ORLANDO PETER 172 DEAN STREET #5 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-36-604 174 DEAN STREET LLC	174 DEAN STREET #D	105631	174 DEAN STREET LLC 174 DEAN STREET UNIT D TAUNTON, MA 02780
56-36-23 CADOGAN ERLEEN E & JENNIFER	172 DEAN STREET #23	104679	CADOGAN ERLEEN E & JENNIFER 172 DEAN STREET #23 TAUNTON, MA 02780
56-36-601 SILVA MANUEL V	174 DEAN STREET #A	105627	SILVA MANUEL V 174 DEAN STREET #A TAUNTON, MA 02780
56-36-10 KURLANSKY LYNNE	172 DEAN STREET #10	104666	KURLANSKY LYNNE 172 DEAN STREET #10 TAUNTON, MA 02780
56-36-17 WHITE GAIL H	172 DEAN STREET #17	104673	WHITE GAIL H 172 DEAN STREET #17 TAUNTON, MA 02780
56-36-19 MORGAN PHILIP W TRS	172 DEAN STREET #19	104675	MORGAN PHILIP W TRS 88 CLAM PUDDING PLYMOUTH, MA 02360
56-36-14 LAPIERRE BRETT S	172 DEAN STREET #14	104670	LAPIERRE BRETT S 172 DEAN STREET 14 TAUNTON, MA 02780
56-36-0 HAWTHORNE DEVELOPMENT INC	172 DEAN STREET	5017	HAWTHORNE DEVELOPMENT INC ONE CHURCH GREEN TAUNTON, MA 02780
56-36-4 TRIPOLI CAROLYN ROSE MARIE	172 DEAN STREET #4	104660	TRIPOLI CAROLYN ROSE MARIE 172 DEAN STREET #4 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-36-3 MOREAU PAUL L & ALICE M TRS	172 DEAN STREET #3	104659	MOREAU PAUL L & ALICE M TRS 172 DEAN STREET #3 TAUNTON, MA 02780
56-36-8 FORREST STEVEN W	172 DEAN STREET #8	104664	FORREST STEVEN W 172 DEAN ST UNIT 8 TAUNTON, MA 02780
56-36-603 FULLER REALTY DEVELOPMENT	174 DEAN STREET #C	105632	FULLER REALTY DEVELOPMENT 174 DEAN STREET UNIT C TAUNTON, MA 02780
56-36-13 JONES JEFFEREY C	172 DEAN STREET #13	104669	JONES JEFFEREY C 172 DEAN STREET #13 TAUNTON, MA 02780
56-36-6 GRIECO ALYSON	172 DEAN STREET #6	104662	GRIECO ALYSON 172 DEAN STREET #6 TAUNTON, MA 02780
56-36-20 SEMAS ANN	172 DEAN STREET #20	104676	SEMAS ANN 172 DEAN STREET TAUNTON, MA 02780
56-36-24 SULLIVAN DANIEL W	172 DEAN STREET #24	104680	SULLIVAN DANIEL W 172 DEAN STREET #24 TAUNTON, MA 02780
56-36-60 HAWTHORNE DEVELOPMENT	174 DEAN STREET	105628	HAWTHORNE DEVELOPMENT 174 DEAN STREET UNIT C TAUNTON, MA 02780
56-36-15 LEVY RENEL & VANIA	172 DEAN STREET #15	104671	LEVY RENEL & VANIA 172 DEAN STREET 15 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-36-11 THIELEN KENDRA	172 DEAN STREET #11	104667	THIELEN KENDRA 172 DEAN STREET #11 TAUNTON, MA 02780
56-36-7 BUCKLEY PAMELA LYNN TR	172 DEAN STREET #7	104663	BUCKLEY PAMELA LYNN TR 172 DEAN STREET #7 TAUNTON, MA 02780
56-36-22 LANGWAY CHERYL M	172 DEAN STREET #22	104678	LANGWAY CHERYL M 172 DEAN STREET 22 TAUNTON, MA 02780
56-36-18 DONNELLY NICHOLE ELIZABETH	172 DEAN STREET #18	104674	DONNELLY NICHOLE ELIZABETH 172 DEAN STREET 18 TAUNTON, MA 02780
56-36-12 WEINHARDT DAIZE F	172 DEAN STREET #12	104668	WEINHARDT DAIZE F 172 DEAN STREET 12 TAUNTON, MA 02780
56-88-0 PINA JOSEPH C & MICHELLE A	50 DISAMAR ROAD	9197	PINA JOSEPH C & MICHELLE A 50 DISAMAR ROAD TAUNTON, MA 02780
56-12-0 CITY OF TAUNTON	LONGMEADOW ROAD	18332	CITY OF TAUNTON 15 SUMMER ST TAUNTON, MA 02780
56-51-0 LOUBEAU PIERRE KESNY & TAVERNE-LOUBEAU G	55 RIVER ROAD	5040	LOUBEAU PIERRE KESNY & TAVERNE-LOUBEAU G 55 RIVER ROAD TAUNTON, MA 02780
56-32-6604 GARBER MICHAEL D & JULIE B	215 LONGMEADOW ROAD #604	105092	GARBER MICHAEL D & JULIE B 215 LONGMEADOW ROAD 604 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter

Street Address

Account No.

Tax Bill Address

56-32-1103 EMERSON JUDITH A & ROBERT D TRS	215 LONGMEADOW ROAD #103	104334	EMERSON JUDITH A & ROBERT D TRS 215 LONGMEADOW ROAD #103 TAUNTON, MA 02780
56-32-1106 TARDIE FREDERICK II & PAULA TRS	215 LONGMEADOW ROAD #106	104337	TARDIE FREDERICK II & PAULA TRS 215 LONGMEADOW ROAD 1-106 TAUNTON, MA 02780
56-32-3305 TRAINOR SCOTT ALAN TRS	215 LONGMEADOW ROAD #305	104685	TRAINOR SCOTT ALAN TRS 215 LONGMEADOW ROAD 305 TAUNTON, MA 02780
56-32-5501 CORREIA ANN M	215 LONGMEADOW ROAD #501	105083	CORREIA ANN M 20 KING AVENUE TAUNTON, MA 02780
56-32-5502 SILVESTRO KELLI A	215 LONGMEADOW ROAD #502	105084	SILVESTRO KELLI A 215 LONGMEADOW ROAD 502 TAUNTON, MA 02780
56-32-2204 BAGLIO JANET A & JOHN B	215 LONGMEADOW ROAD #204	104355	BAGLIO JANET A & JOHN B 215 LONGMEADOW RD #2-204 TAUNTON, MA 02780
56-32-4402 MACLAY DONNA MARIE	215 LONGMEADOW ROAD #402	104698	MACLAY DONNA MARIE 215 LONGMEADOW ROAD #4401 TAUNTON, MA 02780
56-32-6605 SOUZA FRANK	215 LONGMEADOW ROAD #605	105093	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-32-6601 SOUZA FRANK	215 LONGMEADOW ROAD #601	105089	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780
56-32-4405 REGO COURTNEY A	215 LONGMEADOW ROAD #405	104701	REGO COURTNEY A 215 LONGMEADOW ROAD #4-405 TAUNTON, MA 02780
56-32-2203 KILEY ELIZABETH A	215 LONGMEADOW ROAD #203	104354	KILEY ELIZABETH A 215 LONGMEADOW ROAD #203 TAUNTON, MA 02780
56-32-2206 CERRATO ROSEMARIE F & ROBERT F	215 LONGMEADOW ROAD #206	104357	CERRATO ROSEMARIE F & ROBERT F 215 LONGMEADOW ROAD 206 TAUNTON, MA 02780
56-32-6602 SOUZA FRANK	215 LONGMEADOW ROAD #602	105090	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780
56-32-3301 COTE JAMES R	215 LONGMEADOW ROAD #301	104681	COTE JAMES R 215 LONGMEADOW ROAD #301 TAUNTON, MA 02780
56-32-5505 COULOMBE MICHAEL T	215 LONGMEADOW ROAD #505	105087	COULOMBE MICHAEL T 215 LONGMEADOW ROAD #505 TAUNTON, MA 02780
56-32-4403 ELDREDGE MAUREEN A	215 LONGMEADOW ROAD #403	104699	ELDREDGE MAUREEN A 215 LONGMEADOW ROAD 403 TAUNTON, MA 02780
56-32-6603 SOUZA FRANK	215 LONGMEADOW ROAD #603	105091	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-32-3302 SHEA RICHARD J TRS	215 LONGMEADOW ROAD #302	104682	SHEA RICHARD J TRS 215 LONGMEADOW ROAD 302 TAUNTON, MA 02780
56-32-1102 FAST JEFF ALLEN & KAREN LOUISE GASKO	215 LONGMEADOW ROAD #102	104333	FAST JEFF ALLEN & KAREN LOUISE GASKO 215 LONGMEADOW ROAD 102 TAUNTON, MA 02780
56-32-5503 SOUZA FRANK	215 LONGMEADOW ROAD #503	105085	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780
56-32-4401 NUNES ALBERT W	215 LONGMEADOW ROAD #401	104697	NUNES ALBERT W 215 LONGMEADOW ROAD #4401 TAUNTON, MA 02780
56-32-2205 PERRINE CRAIG A	215 LONGMEADOW ROAD #205	104356	PERRINE CRAIG A 215 LONGMEADOW ROAD 205 TAUNTON, MA 02780
56-32-0 SOUZA FRANCIS A	215 LONGMEADOW ROAD	601	SOUZA FRANCIS A 101 TALL OAK DR MIDDLEBORO, MA 02346
56-32-1104 COSTA RAUL & ISABEL	215 LONGMEADOW ROAD #104	104335	COSTA RAUL & ISABEL 215 LONGMEADOW ROAD #104 TAUNTON, MA 02780
56-32-3304 DIFORMATO JENNIFER	215 LONGMEADOW ROAD #304	104684	DIFORMATO JENNIFER 215 LONGMEADOW ROAD #304 TAUNTON, MA 02780
56-32-4404 MOTA FATIMA	215 LONGMEADOW ROAD #404	104700	MOTA FATIMA 49 HARCOURT AVENUE LAKEVILLE, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-32-3303 PARMA CHRISTINA	215 LONGMEADOW ROAD #303	104683	PARMA CHRISTINA 215 LONGMEADOW ROAD #303 TAUNTON, MA 02780
56-32-5506 SOUZA FRANK	215 LONGMEADOW ROAD #506	105088	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780
56-32-1105 FULGINITI ELIZABETH & LABRECQUE MICHAEL	215 LONGMEADOW ROAD #105	104336	FULGINITI ELIZABETH & LABRECQUE MICHAEL 215 LONGMEADOW ROAD #105 TAUNTON, MA 02780
56-32-2202 KNORR PAULA M	215 LONGMEADOW ROAD #202	104353	KNORR PAULA M 215 LONGMEADOW ROAD 202 TAUNTON, MA 02780
56-32-5504 O'CONNOR KATHERINE F	215 LONGMEADOW ROAD #504	105086	O'CONNOR KATHERINE F 215 LONGMEADOW ROAD 504 TAUNTON, MA 02780
56-32-3306 FOUN ELAINE	215 LONGMEADOW ROAD #306	104686	FOUN ELAINE 215 LONGMEADOW ROAD #306 TAUNTON, MA 02780
56-32-6606 SOUZA FRANK	215 LONGMEADOW ROAD #606	105094	SOUZA FRANK 26 DEAN STREET TAUNTON, MA 02780
56-32-2201 GEORGE LISA D	215 LONGMEADOW ROAD #201	104352	GEORGE LISA D 215 LONGMEADOW ROAD #201 TAUNTON, MA 02780
56-32-4406 COSTA MOLLY A	215 LONGMEADOW ROAD #406	104702	COSTA MOLLY A 215 LONGMEADOW ROAD 406 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-32-1101 MCCANN LINDA S	215 LONGMEADOW ROAD #101	104332	MCCANN LINDA S 215 LONGMEADOW ROAD #101 TAUNTON, MA 02780
67-52-0 SMITH PAUL	87 WILLIAMS STREET	6092	SMITH PAUL 87 WILLIAMS STREET TAUNTON, MA 02780
56-86-0 RODERICK GORDON A & SANDRA M TR	70 DISAMAR ROAD	9193	RODERICK GORDON A & SANDRA M TR 70 DISAMAR ROAD TAUNTON, MA 02780
56-85-0 WELLS FARGO BANK N A TR	80 DISAMAR ROAD	9187	WELLS FARGO BANK N A TR 1525 S BELT LINE ROAD COPELL, TX 75019
55-739-0 NOBREGA RUI TRUSTEE	111 ARLINGTON STREET	573	NOBREGA RUI TRUSTEE 55 DUNBAR STREET TAUNTON, MA 02780
56-30-0 GEBELEIN ROBERT S	LONGMEADOW ROAD	5032	GEBELEIN ROBERT S 18 HAWTHORNE DRIVE DURHAM, NC 27712
66-164-0 FOX HILL FARM TRUST	DEAN STREET	5016	FOX HILL FARM TRUST PO BOX 20 ORLEANS, MA 02653
56-108-0 LE VUI VAN	3 CAPE ROAD	632	LE VUI VAN 50 MANSFIELD AVENUE NORTON, MA 02766
55-758-0 KOSS REATLY TRUST	40 DEAN STREET	574	KOSS REATLY TRUST 630 PARK STREET STOUGHTON, MA 02072





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-22-0 HUTCHINS ROBERT & JOANNE	24 WILLIAMS STREET	5432	HUTCHINS ROBERT & JOANNE 24 WILLIAMS STREET TAUNTON, MA 02780
67-36-0 CREMINS MICHAEL D & MARY M	228 HARRIS STREET	5449	CREMINS MICHAEL D & MARY M 228 HARRIS STREET TAUNTON, MA 02780
56-125-0 RR	0 RR	105879	RR 0 RR TAUNTON, MA 02780
68-1-0 CITY OF TAUNTON WATER WORKS	170 HARRIS STREET	104865	CITY OF TAUNTON WATER WORKS 170 HARRIS STREET TAUNTON, MA 02780
56-115-0 DICENSO-TAUNTON LLC	10 CAPE ROAD	627	DICENSO-TAUNTON LLC 4302 STATION CIRCLE DEDHAM, MA 02026
56-49-0 POIRIER CHERYL	45 RIVER ROAD	5039	POIRIER CHERYL 45 RIVER ROAD TAUNTON, MA 02780
56-117-0 MARTINS CELSO A & ELZIRA V	185 DEAN STREET	5163	MARTINS CELSO A & ELZIRA V 185 DEAN STREET TAUNTON, MA 02780
67-35-0 VARJABEDIAN NICHOLAS & MAGGIE MCMANAMA	222 HARRIS STREET	5448	VARJABEDIAN NICHOLAS & MAGGIE MCMANAMA 222 HARRIS STREET TAUNTON, MA 02780
56-97-31 JEAN DOMINIQUE	110 DEAN STREET #31	5084	JEAN DOMINIQUE 110 DEAN STREET #31 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-22 LOURENCO JOHN T	110 DEAN STREET #22	5075	LOURENCO JOHN T 110 DEAN STREET #22 TAUNTON, MA 02780
56-97-4 ZAKIROV RUSLAN R	110 DEAN STREET #4	5057	ZAKIROV RUSLAN R 110 DEAN STREET UNIT A-4 TAUNTON, MA 02780
56-97-39 MCNEILL JAMES R	110 DEAN STREET #39	5091	MCNEILL JAMES R 110 DEAN ST #39 TAUNTON, MA 02780
56-97-85 CROVELLO SUSAN M	110 DEAN STREET #85	5137	CROVELLO SUSAN M 110 DEAN STREET #85 TAUNTON, MA 02780
56-97-36 JOHNSON KAREN M	110 DEAN STREET #36	5089	JOHNSON KAREN M 110 DEAN ST #36 TAUNTON, MA 02780
56-97-64 MAZUR LEIGH ANN	110 DEAN STREET #64	5116	MAZUR LEIGH ANN 110 DEAN STREET #64 TAUNTON, MA 02780
56-97-34 SHIN SUN YIM	110 DEAN STREET #34	5087	SHIN SUN YIM 110 DEAN STREET #34 TAUNTON, MA 02780
56-97-45 MACAUSLAN KRIS L	110 DEAN STREET #45	5097	MACAUSLAN KRIS L 110 DEAN STREET #45 TAUNTON, MA 02780
56-97-88 BORGES ELISABETH M TRS	110 DEAN STREET #88	5140	BORGES ELISABETH M TRS 110 DEAN STREET 88 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-28 MCMANUS ROBIN ANN & MATTHEW ALEXANDER KOPEZA	110 DEAN STREET #28	5081	MCMANUS ROBIN ANN & MATTHEW ALEXANDER KOPEZA 110 DEAN STREET #28 TAUNTON, MA 02780
56-97-0 CONDO MAIN	110-110 DEAN STREET	103082	CONDO MAIN 15 SUMMER STREET TAUNTON, MA 02780
56-97-55 DONAHUE PATRICIA F	110 DEAN STREET #55	5107	DONAHUE PATRICIA F 110 DEAN ST UNIT 55 TAUNTON, MA 02780
56-97-12 HUNT RYAN	110 DEAN STREET #12	5065	HUNT RYAN 110 DEAN STREET #12 TAUNTON, MA 02780
56-97-58 ROBERTS KEITH C	110 DEAN STREET #58	5110	ROBERTS KEITH C 110 DEAN STREET #58 TAUNTON, MA 02780
56-97-16 CHEW BARRY J	110 DEAN STREET #16	5069	CHEW BARRY J 110 DEAN STREET #16 TAUNTON, MA 02780
56-97-79 BROCKWAY CATHERINE C	110 DEAN STREET #79	5131	BROCKWAY CATHERINE C 110 DEAN ST #79 TAUNTON, MA 02780
56-97-47 PIKE CYNTHIA A	110 DEAN STREET #47	5099	PIKE CYNTHIA A 110 DEAN STREET #47 TAUNTON, MA 02780
56-97-5 SHARPLES HOLLY M	110 DEAN STREET #5	5058	SHARPLES HOLLY M 110 DEAN STREET #5 TAUNTON, MA 02780





## City of Taunton, MA Abutters Report

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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-105 SHUMWAY ALEC J & AMES J MOURA	110 DEAN STREET #105	5157	SHUMWAY ALEC J & AMES J MOURA 1105 DEAN STREET #105 TAUNTON, MA 02780
56-97-104 MCINTYRE CAROL LYNN	110 DEAN STREET #104	5156	MCINTYRE CAROL LYNN 110 DEAN STREET #104 TAUNTON, MA 02780
56-97-29 BARER HOWARD J & ELAINE G	110 DEAN STREET #29	5082	BARER HOWARD J & ELAINE G 110 DEAN ST #29 TAUNTON, MA 02780
56-97-100 BUCZEK KELLIE	110 DEAN STREET #100	5152	BUCZEK KELLIE 110 DEAN STREET UNIT 100 TAUNTON, MA 02780
56-97-2 SILVA CHRISTOPHER E JR	110 DEAN STREET #2	5055	SILVA CHRISTOPHER E JR 110 DEAN STREET 2 TAUNTON, MA 02780
56-97-82 CORMIER MARILYN	110 DEAN STREET #82	5134	CORMIER MARILYN 110 DEAN STREET #82 TAUNTON, MA 02780
56-97-66 FERRIER BEATRIZ TRS	110 DEAN STREET #66	5118	FERRIER BEATRIZ TRS 213 STONY BROOK ROAD RAYNHAM, MA 02767
56-97-107 EVORA FRANCISCO R	110 DEAN STREET #107	5159	EVORA FRANCISCO R 110 DEAN STREET 107 TAUNTON, MA 02780
56-97-96 APONTE JOHN	110 DEAN STREET #96	5148	APONTE JOHN 110 DEAN STREET #96 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-86 DOHERTY JANE E	110 DEAN STREET #86	5138	DOHERTY JANE E 110 DEAN STREET 86 TAUNTON, MA 02780
56-97-53 SIMMONS RICHARD A	110 DEAN STREET #53	5105	SIMMONS RICHARD A 110 DEAN ST # 53 TAUNTON, MA 02780
56-97-52 GRIFFIN JOYCE LI	110 DEAN STREET #52	5104	GRIFFIN JOYCE LI 110 DEAN STREET #52 TAUNTON, MA 02780
56-97-80 WARD STEVEN D & JODI I	110 DEAN STREET #80	5132	WARD STEVEN D & JODI I 110 DEAN STREET #80 TAUNTON, MA 02780
56-97-23 BURGESS NORMA	110 DEAN STREET #23	5076	BURGESS NORMA 110 DEAN STREET #23 TAUNTON, MA 02780
56-97-20 WHELAN RICHALIE BROOKE	110 DEAN STREET #20	5073	WHELAN RICHALIE BROOKE 110 DEAN STREET #20 TAUNTON, MA 02780
56-97-102 YOUNG LINDA E	110 DEAN STREET #102	5154	YOUNG LINDA E 110 DEAN STREET #102 TAUNTON, MA 02780
56-97-95 GUSTAFSON TERESA M	110 DEAN STREET #95	5147	GUSTAFSON TERESA M 110 DEAN STREET 95 TAUNTON, MA 02780
56-97-83 EMERICK CORY M	110 DEAN STREET #83	5135	EMERICK CORY M 110 DEAN STREET 83 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-33 TOSCHES RITA M	110 DEAN STREET #33	5086	TOSCHES RITA M 110 DEAN STREET #33 TAUNTON, MA 02780
56-97-68 KEWER MADELYN	110 DEAN STREET #68	5120	KEWER MADELYN 110 DEAN STREET #68 TAUNTON, MA 02780
56-97-67 EDWARD, JENNIFER E	110 DEAN STREET #67	5119	EDWARD, JENNIFER E 110 DEAN STREET #67 TAUNTON, MA 02780
56-97-38 RODRIGUES JOSE L	110 DEAN STREET #38	5090	RODRIGUES JOSE L 110 DEAN STREET #38 TAUNTON, MA 02780
56-97-26 MARTIN DONALD JOSEPH JR	110 DEAN STREET #26	5079	MARTIN DONALD JOSEPH JR 110 DEAN STREET #26 TAUNTON, MA 02780
56-97-7 MARTIN SANDRA E	110 DEAN STREET #7	5060	MARTIN SANDRA E 110 DEAN STREET #7 TAUNTON, MA 02780
56-97-75 OBRIEN JOSEPH W	110 DEAN STREET #75	5127	OBRIEN JOSEPH W 114 PLEASANT STREET #403 ARLINGTON, MA 02476
56-97-74 BUCKLEY ELIZABETH	110 DEAN STREET #74	5126	BUCKLEY ELIZABETH 110 DEAN STREET #74 TAUNTON, MA 02780
56-97-97 LEONARD STACEY E	110 DEAN STREET #97	5149	LEONARD STACEY E 110 DEAN STREET #97 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-50 CHAPLIN ANNE KENNEY	110 DEAN STREET #50	5102	CHAPLIN ANNE KENNEY 110 DEAN STREET #50 TAUNTON, MA 02780
56-97-71 SHEA KERRY ANN	110 DEAN STREET #71	5123	SHEA KERRY ANN 110 DEAN STREET #71 TAUNTON, MA 02780
56-97-59 MCALPINE DONNA	110 DEAN STREET #59	5111	MCALPINE DONNA 379 ROBINSON STREET RAYNHAM, MA 02767
56-97-84 ABDELAHAD KAREN	110 DEAN STREET #84	5136	ABDELAHAD KAREN 110 DEAN STREET 84 TAUNTON, MA 02780
56-97-101 BRODT CHARLES F	110 DEAN STREET #101	5153	BRODT CHARLES F 110 DEAN ST UNIT 101 TAUNTON, MA 02780
56-97-1 WILLIAMS, DOMINIQUE	110 DEAN STREET #1	5054	WILLIAMS, DOMINIQUE 110 DEAN STREET #1 TAUNTON, MA 02780
56-97-18 PETTEY DAVID A & FINE NATALIE M	110 DEAN STREET #18	5071	PETTEY DAVID A & FINE NATALIE M 110 DEAN STREET #18 TAUNTON, MA 02780
56-97-76 WOLFFE DONALD X JR	110 DEAN STREET #76	5128	WOLFFE DONALD X JR 110 DEAN STREET 76 TAUNTON, MA 02780
56-97-27 MUIR NATHANIEL	110 DEAN STREET #27	5080	MUIR NATHANIEL 110 DEAN STREET 27 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-73 VARANO NICHOLAS C	110 DEAN STREET #73	5125	VARANO NICHOLAS C 110 DEAN STREET #73 TAUNTON, MA 02780
56-97-57 BARROS JANET E & JOHN A	110 DEAN STREET #57	5109	BARROS JANET E & JOHN A 110 DEAN STREET #57 TAUNTON, MA 02780
56-97-65 FERRIER ISABEL E TR	110 DEAN STREET #65	5117	FERRIER ISABEL E TR 208 STONY BROOK ROAD RAYNHAM, MA 02767
56-97-92 DAVIDSON AVIS	110 DEAN STREET #92	5144	DAVIDSON AVIS 110 DEAN ST #92 TAUNTON, MA 02780
56-97-94 MOONEY CHRISTINA M	110 DEAN STREET #94	5146	MOONEY CHRISTINA M 110 DEAN ST #94 TAUNTON, MA 02780
56-97-41 FAHERTY JENNIFER	110 DEAN STREET #41	5093	FAHERTY JENNIFER 110 DEAN STREET #41 TAUNTON, MA 02780
56-97-46 CANNATA RICHARD W	110 DEAN STREET #46	5098	CANNATA RICHARD W 110 DEAN STREET #46 TAUNTON, MA 02780
56-97-3 SOUSA DANIEL V	110 DEAN STREET #3	5056	SOUSA DANIEL V 110 DEAN STREET # 3 TAUNTON, MA 02780
56-97-25 PEREIRA ADILIA TIAGO & TIAGO VIRGILIO CA	110 DEAN STREET #25	5078	PEREIRA ADILIA TIAGO & TIAGO VIRGILIO CA 110 DEAN STREET #25 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-10 SULLIVAN SHEILA	110 DEAN STREET #10	5063	SULLIVAN SHEILA 110 DEAN ST #10 TAUNTON, MA 02780
56-97-77 JOHNSON BRIAN S	110 DEAN STREET #77	5129	JOHNSON BRIAN S 110 DEAN STREET #77 TAUNTON, MA 02780
56-97-51 WOODS ICANDACE S	110 DEAN STREET #51	5103	WOODS ICANDACE S 110 DEAN STREET 51 TAUNTON, MA 02780
56-97-81 RITTENBERG ERIC M & DELORES E	110 DEAN STREET #81	5133	RITTENBERG ERIC M & DELORES E 110 DEAN STREET #81 TAUNTON, MA 02780
56-97-91 CLOONAN SCOTT M	110 DEAN STREET #91	5143	CLOONAN SCOTT M 110 DEAN STREET #91 TAUNTON, MA 02780
56-97-44 ALLEN DEBRA ANN	110 DEAN STREET #44	5096	ALLEN DEBRA ANN 110 DEAN STREET #44 TAUNTON, MA 02780
56-97-62 BLOWERS BETHENY A	110 DEAN STREET #62	5114	BLOWERS BETHENY A 110 DEAN STREET #62 TAUNTON, MA 02780
56-97-87 RICO JOSEPH J & MACLELLAN ELIZABETH A	110 DEAN STREET #87	5139	RICO JOSEPH J & MACLELLAN ELIZABETH A 110 DEAN STREET #87 TAUNTON, MA 02780
56-97-103 KIRKPATRICK GEORGE E JR	110 DEAN STREET #103	5155	KIRKPATRICK GEORGE E JR 110 DEAN ST UNIT 103 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-35 CIVALE CHRISTOPHER J	110 DEAN STREET #35	5088	CIVALE CHRISTOPHER J 180 PARAMOUNT DRIVE, SUITE 2 RAYNHAM, MA 02767
56-97-56 WILLOUGHBY NORMAN	110 DEAN STREET #56	5108	WILLOUGHBY NORMAN 110 DEAN ST UNIT 56 TAUNTON, MA 02780
56-97-72 WRIGHT MARY	110 DEAN STREET #72	5124	WRIGHT MARY 110 DEAN STREET #72 TAUNTON, MA 02780
56-97-11 CARLSON JENNIFER A	110 DEAN STREET #11	5064	CARLSON JENNIFER A 110 DEAN STREET #11 TAUNTON, MA 02780
56-97-54 HARDY EDWARD A	110 DEAN STREET #54	5106	HARDY EDWARD A 110 DEAN STREET #54 TAUNTON, MA 02780
56-97-9 FERGUSON CHRISTA M	110 DEAN STREET #9	5062	FERGUSON CHRISTA M 110 DEAN STREET #9 TAUNTON, MA 02780
56-97-8 TURNER EVA M	110 DEAN STREET #8	5061	TURNER EVA M 110 DEAN STREET #8 TAUNTON, MA 02780
56-97-21 SILVA JOSEPH P	110 DEAN STREET #21	5074	SILVA JOSEPH P 110 DEAN STREET #21 TAUNTON, MA 02780
56-97-6 CUNHA ROBERT J TR	110 DEAN STREET #6	5059	CUNHA ROBERT J TR 110 DEAN STREET #6 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-61 DAVIS JANET	110 DEAN STREET #61	5113	DAVIS JANET 110 DEAN STREET #61 TAUNTON, MA 02780
56-97-24 DE ABREU DANIEL F	110 DEAN STREET #24	5077	DE ABREU DANIEL F 110 DEAN STREET #24 TAUNTON, MA 02780
56-97-14 MCQUESTON WILLIAM F	110 DEAN STREET #14	5067	MCQUESTON WILLIAM F 110 DEAN STREET #14 TAUNTON, MA 02780
56-97-98 MCHUGH DENISE M	110 DEAN STREET #98	5150	MCHUGH DENISE M 110 DEAN STREET #98 TAUNTON, MA 02780
56-97-40 DAVILA ARISTIDES & DARLENE	110 DEAN STREET #40	5092	DAVILA ARISTIDES & DARLENE 110 DEAN STREET 40 TAUNTON, MA 02780
56-97-78 KELLY ROBERT	110 DEAN STREET #78	5130	KELLY ROBERT 110 DEAN STREET 78 TAUNTON, MA 02780
56-97-90 RUDOLPH KRISTIN N	110 DEAN STREET #90	5142	RUDOLPH KRISTIN N 110 DEAN STREET 90 TAUNTON, MA 02780
56-97-60 TIRRELL SANDRA	110 DEAN STREET #60	5112	TIRRELL SANDRA 110 DEAN STREET 60 TAUNTON, MA 02780
56-97-32 CZARN JAMES B & CAROL A	110 DEAN STREET #32	5085	CZARN JAMES B & CAROL A 110 DEAN STREET #32 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-19 VIVEIROS MARK J & SUSAN B	110 DEAN STREET #19	5072	VIVEIROS MARK J & SUSAN B 110 DEAN STREET 19 TAUNTON, MA 02780
56-97-63 VECCHIO NICHOLAS C & JULIETTA C	110 DEAN STREET #63	5115	VECCHIO NICHOLAS C & JULIETTA C 110 DEAN STREET 63 TAUNTON, MA 02780
56-97-37 WALDEN JANICE	110 DEAN STREET #37	5161	WALDEN JANICE 110 DEAN STREET #37 TAUNTON, MA 02780
56-97-93 MONTAGANO KALLIE M	110 DEAN STREET #93	5145	MONTAGANO KALLIE M 110 DEAN STREET #93 TAUNTON, MA 02780
56-97-89 GOFF PATRICIA	110 DEAN STREET #89	5141	GOFF PATRICIA 110 DEAN STREET #89 TAUNTON, MA 02780
56-97-43 FERRARO ENTERPRISES LP	110 DEAN STREET #43	5095	FERRARO ENTERPRISES LP 629 EAST 19TH STREET PATERSON, NJ 07514
56-97-69 GARFINK HARRIET H & ROGER K TR	110 DEAN STREET #69	5121	GARFINK HARRIET H & ROGER K TR 110 DEAN STREET #69 TAUNTON, MA 02780
56-97-15 ANDRADE JOHN R & CHERYL E	110 DEAN STREET #15	5068	ANDRADE JOHN R & CHERYL E 110 DEAN STREET #15 TAUNTON, MA 02780
56-97-17 CHAREST CHARLOTTE E	110 DEAN STREET #17	5070	CHAREST CHARLOTTE E 110 DEAN STREET #17 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-97-48 YU SHENG H	110 DEAN STREET #48	5100	YU SHENG H 14 STRIPER CIRCLE NO DARTMOUTH, MA 02747
56-97-106 GAUDIANO CARL D & JUDITH K	110 DEAN STREET #106	5158	GAUDIANO CARL D & JUDITH K 110 DEAN STREET #106 TAUNTON, MA 02780
56-97-70 STUDLEY SANDRA E	110 DEAN STREET #70	5122	STUDLEY SANDRA E 110 DEAN STREET #70 TAUNTON, MA 02780
56-97-30 PIERCE LINDSEY A	110 DEAN STREET #30	5083	PIERCE LINDSEY A 110 DEAN STREET 30 TAUNTON, MA 02780
56-97-99 HEATH KRISTEN & JOSHUEA GATTEREAU	110 DEAN STREET #99	5151	HEATH KRISTEN & JOSHUEA GATTEREAU 110 DEAN STREET 99 TAUNTON, MA 02780
56-97-13 ANDRADE DIANA L	110 DEAN STREET #13	5066	ANDRADE DIANA L 110 DEAN STREET #13 TAUNTON, MA 02780
56-97-49 SANTOS EVGENIYA	110 DEAN STREET #49	5101	SANTOS EVGENIYA 110 DEAN STREET 49 TAUNTON, MA 02780
56-97-108 JORDAN PAMELA ANN & CROMPTON ANDREW R	110 DEAN STREET #108	5160	JORDAN PAMELA ANN & CROMPTON ANDREW R 110 DEAN STREET #108 TAUNTON, MA 02780
67-87-0 LEVESQUE DANIEL A & TASHA L	53 WILLIAMS STREET	18678	LEVESQUE DANIEL A & TASHA L 53 WILLIAMS STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-47-0 SOARES JORGE A & MARIA A LI	35 RIVER ROAD	5031	SOARES JORGE A & MARIA A LI 35 RIVER ROAD TAUNTON, MA 02780
67-89-0 DEMELLO JASON TR	45 WILLIAMS STREET	5851	DEMELLO JASON TR 45 WILLIAMS STREET TAUNTON, MA 02780
56-63-0 CHABOT GORDON P JR & DIANA M	1 DISAMAR ROAD	9199	CHABOT GORDON P JR & DIANA M 1 DISAMAR ROAD TAUNTON, MA 02780
55-764-0 RR	WILLIAM HOOKE LANE	104787	RR CONSOLIDATED RAIL CORP PHILIDELPHIA, PA 19104
56-92-0 MOUHEEDDINE ABDELHADI	10 DISAMAR ROAD	9184	MOUHEEDDINE ABDELHADI 10 DISAMAR ROAD TAUNTON, MA 02780
56-58-0 MITCHELL CORY M & SHELBI	38 RIVER ROAD	5020	MITCHELL CORY M & SHELBI 38 RIVER ROAD TAUNTON, MA 02780
56-22-0 ELLIS MARY	98 LONGMEADOW ROAD	5012	ELLIS MARY 98 LONGMEADOW ROAD TAUNTON, MA 02780
56-23-0 POPE ANDREW E & KATHRYN M GUARINO-POPE	106 LONGMEADOW ROAD	18501	POPE ANDREW E & KATHRYN M GUARINO-POPE 106 LONGMEADOW ROAD TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-39-0 SHEANON JENNIFER L & MICHAEL E	168 DEAN STREET	5030	SHEANON JENNIFER L & MICHAEL E 168 DEAN STREET TAUNTON, MA 02780
56-50-0 KING JOAN E & WAYNE R CUSHMAN	51 RIVER ROAD	5018	KING JOAN E & WAYNE R CUSHMAN 51 RIVER ROAD TAUNTON, MA 02780
67-33-0 DIVINCENZO JAMES T & DARLENE M	204 HARRIS STREET	5446	DIVINCENZO JAMES T & DARLENE M 204 HARRIS STREET TAUNTON, MA 02780
67-166-0 SISTERS OF SAINT DOROTHY	90 COUNTY STREET	104835	SISTERS OF SAINT DOROTHY 90 COUNTY STREET TAUNTON, MA 02780
67-34-0 POWERS GEORGE R & CAROLYN A	212 HARRIS STREET	5447	POWERS GEORGE R & CAROLYN A 212 HARRIS STREET TAUNTON, MA 02780
56-20-0 54 LONGMEADOW LLC	54 LONGMEADOW ROAD	583	54 LONGMEADOW LLC 15 WINDWARD WAY NO FALMOUTH, MA 02556
67-6-0 CITY OF TAUNTON	GORDON OWEN RIVERWAY	104864	CITY OF TAUNTON 15 SUMMER STREET TAUNTON, MA 02780
55-757-0 KONAKO DEVELOPMENT LLC	DEAN STREET	580	KONAKO DEVELOPMENT LLC 630 PARK STREET STOUGHTON, MA 02072





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
55-761-0 HORTON STREET LLC	WILLIAM HOOKE LANE	576	HORTON STREET LLC 100 FIELD STREET TAUNTON, MA 02780
67-88-0 PATENAUDE MICHAEL F & LAURA A	51 WILLIAMS STREET	18677	PATENAUDE MICHAEL F & LAURA A 51 WILLIAMS ST TAUNTON, MA 02780
56-48-0 ZOPATTI CAROL A LI	39 RIVER ROAD	5038	ZOPATTI CAROL A LI 39 RIVER ROAD TAUNTON, MA 02780
55-740-0 FELIZ ALTAGRACIA	115 ARLINGTON STREET	4969	FELIZ ALTAGRACIA 115 ARLINGTON STREET TAUNTON, MA 02780
67-108-0 COSGROVE DAVID	35 WILLIAMS STREET	5853	COSGROVE DAVID 35 WILLIAMS STREET TAUNTON, MA 02780
67-92-0 CAMARA VICENTE F & ODINA M	43B WILLIAMS STREET	100742	CAMARA VICENTE F & ODINA M 43B WILLIAMS STREET TAUNTON, MA 02780
56-90-0 CAMACHO JONATHAN	30 DISAMAR ROAD	9185	CAMACHO JONATHAN 30 DISAMAR ROAD TAUNTON, MA 02780
56-54-0 HUBERT DOUGLAS E & JULIENNE R	60 RIVER ROAD	5027	HUBERT DOUGLAS E & JULIENNE R 60 RIVER ROAD TAUNTON, MA 02780
55-763-0 RR	WILLIAM HOOKE LANE	104786	RR 15 N 32ED STREET RM 1200 PHILIDELPHIA, PA 19104





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-109-0 DEMELLO JOSE V	WILLIAMS STREET	100251	DEMELLO JOSE V 26 CEDAR STREET TAUNTON, MA 02780
55-741-0 COUTE CHRISTOPHER	117 ARLINGTON STREET	4970	COUTE CHRISTOPHER 117 ARLINGTON STREET TAUNTON, MA 02780
67-39-0 SPEARIN RICHARD C & BEVERLY L	272 HARRIS STREET	5444	SPEARIN RICHARD C & BEVERLY L 272 HARRIS STREET TAUNTON, MA 02780
56-95-1 122 DEAN PARTNERS LLC	122 DEAN STREET	585	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
56-95-3 122 DEAN PARTNERS LLC	122 DEAN STREET	588	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
56-95-5 122 DEAN PARTNERS LLC	122 DEAN STREET	590	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
56-95-8 122 DEAN PARTNERS LLC	122 DEAN STREET	593	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
56-95-0 CONDO MAIN	122 DEAN STREET	103139	CONDO MAIN 15 SUMMER STREET TAUNTON, MA 02780
56-95-4 122 DEAN PARTNERS LLC	122 DEAN STREET	589	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-95-2 122 DEAN PARTNERS LLC	122 DEAN STREET	586	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
56-95-6 122 DEAN PARTNERS LLC	122 DEAN STREET	591	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
56-95-9 122 DEAN PARTNERS LLC	122 DEAN STREET	595	122 DEAN PARTNERS LLC 122 DEAN STREET TAUNTON, MA 02780
67-90-0 SLIVINSKI CHARLOTTE R TRS	WILLIAMS STREET	5850	SLIVINSKI CHARLOTTE R TRS 45 WILLIAMS STREET TAUNTON, MA 02780
67-38-0 BOTELHO KETHYLEEN	250 HARRIS STREET	5451	BOTELHO KETHYLEEN 250 HARRIS STREET TAUNTON, MA 02780
67-168-0 CITY OF TAUNTON	COUNTY STREET	108224	CITY OF TAUNTON 141 OAK STREET TAUNTON, MA 02780
67-91-0 LEANDRO ANDREW & JESSICA	43C WILLIAMS STREET	101142	LEANDRO ANDREW & JESSICA 43C WILLIAMS STREET TAUNTON, MA 02780
56-27-0 CORDEIRO EDUARDO M & MARIA	55 LONGMEADOW ROAD	5051	CORDEIRO EDUARDO M & MARIA PO BOX 403 TAUNTON, MA 02780
67-37-0 FREITAS INGRID B & CATLEY JONATHAN S	238 HARRIS STREET	5450	FREITAS INGRID B & CATLEY JONATHAN S 238 HARRIS STREET TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-85-0 JONES ALINA M	61 WILLIAMS STREET	18680	JONES ALINA M 61 WILLIAMS STREET TAUNTON, MA 02780
67-53-0 CITY OF TAUNTON	81 WILLIAMS STREET	6091	CITY OF TAUNTON 15 SUMMER STREET TAUNTON, MA 02780
67-23-0 FERREIRA STEVEN	26 WILLIAMS STREET	5433	FERREIRA STEVEN 26 WILLIAMS STREET TAUNTON, MA 02780
67-20-0 DUTRA MARLY E & DAVID A	257 GORDON M OWEN RIVERWAY	5442	DUTRA MARLY E & DAVID A 257 GORDON M OWEN RIVERWAY TAUNTON, MA 02780
55-765-0 BATCHELDER KRISTY D	65 BENNETT STREET	5001	BATCHELDER KRISTY D 65 BENNETT STREET TAUNTON, MA 02780
56-26-0 TORRES, VICTORIA PATRICE TRS	49 LONGMEADOW ROAD	5049	TORRES, VICTORIA PATRICE TRS 49 LONGMEADOW ROAD TAUNTON, MA 02780
56-52-0 LOFSTRAND ERIK M & SULLIVAN STEPHANIE	57 RIVER ROAD	18525	LOFSTRAND ERIK M & SULLIVAN STEPHANIE 57 RIVER ROAD TAUNTON, MA 02780
67-82-502 BELL JAIME L	55 WILLIAMS STREET #502	104908	BELL JAIME L 58 TIGER LILY TRAIL REHOBOTH, MA 02769
67-82-204 VALENTE JAMES	55 WILLIAMS STREET #204	104173	VALENTE JAMES 55 WILLIAMS STREET 204 TAUNTON, MA 02780





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at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-82-202 ELIOPOULOS STEPHANIE	55 WILLIAMS STREET #202	104171	ELIOPOULOS STEPHANIE 55 WILLIAMS STREET 202 TAUNTON, MA 02780
67-82-901 FARQUHARSON SCOTT A	55 WILLIAMS STREET #901	107086	FARQUHARSON SCOTT A 55 WILLIAMS STREET #901 TAUNTON, MA 02780
67-82-203 SHEA DOUGLAS J TRS	55 WILLIAMS STREET #203	104172	SHEA DOUGLAS J TRS 55 WILLIAMS STREET #203 TAUNTON, MA 02780
67-82-101 COOK SHARON A	55 WILLIAMS STREET #101	104026	COOK SHARON A 55 WILLIAMS STREET #101 TAUNTON, MA 02780
67-82-303 WIENCEK LAUREN M	55 WILLIAMS STREET #303	104905	WIENCEK LAUREN M 55 WILLIAMS STREET #303 TAUNTON, MA 02780
67-82-702 DURDEN SAMANTHA	55 WILLIAMS STREET #702	104926	DURDEN SAMANTHA 55 WILLIAMS STREET #702 TAUNTON, MA 02780
67-82-703 ELBEGEARM MAHMOUD M & TAGHREED	55 WILLIAMS STREET #703	104927	ELBEGEARM MAHMOUD M & TAGHREED 55 WILLIAMS STREET #703 TAUNTON, MA 02780
67-82-0 MYRIAD DEVELOPMENT CO LLC	55 WILLIAMS STREET	18676	MYRIAD DEVELOPMENT CO LLC 15 SUMMER STREET TAUNTON, MA 02780
67-82-902 CARTER GAIL A	55 WILLIAMS STREET #902	107087	CARTER GAIL A 55 WILLIAMS STREET #902 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-82-301 CARVALHO HORACIO M & EMILIA C	55 WILLIAMS STREET #301	104903	CARVALHO HORACIO M & EMILIA C 55 WILLIAMS STREET #301 TAUNTON, MA 02780
67-82-302 MILLS-ALSPAUGH ROBERT LEE & CHAD A ALSPA	55 WILLIAMS STREET #302	104904	MILLS-ALSPAUGH ROBERT LEE & CHAD A ALSPA 55 WILLIAMS STREET 302 TAUNTON, MA 02780
67-82-602 AZEVEDO CHRISTINE	55 WILLIAMS STREET #602	104910	AZEVEDO CHRISTINE 55 WILLIAMS STREET #602 TAUNTON, MA 02780
67-82-601 MACKINNON BRIGETTE A	55 WILLIAMS STREET #601	104909	MACKINNON BRIGETTE A 55 WILLIAMS STREET #601 TAUNTON, MA 02780
67-82-205 SILVEIRA JON	55 WILLIAMS STREET #205	104174	SILVEIRA JON 11999 WATER RUN ALLEY WINDERMERE, FL 34786
67-82-103 EMUNGU, MARYSE	55 WILLIAMS STREET #103	104028	EMUNGU, MARYSE 55 WILLIAMS STREET #103 TAUNTON, MA 02780
67-82-802 GUOQIANG LI & YONGEI LEI	55 WILLIAMS STREET #802	107090	GUOQIANG LI & YONGEI LEI 55 WILLIAMS STREET #802 TAUNTON, MA 02780
67-82-102 SLATER BRETT I	55 WILLIAMS STREET #102	104027	SLATER BRETT I 55 WILLIAMS STREET #102 TAUNTON, MA 02780
67-82-801 CATRAMBONE MARA B	55 WILLIAMS STREET #801	107089	CATRAMBONE MARA B 55 WILLIAMS STREET #801 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-82-201 NOONE DAVID	55 WILLIAMS STREET #201	104170	NOONE DAVID 55 WILLIAMS STREET 201 TAUNTON, MA 02780
67-82-803 LAPLANT DAVID B & KRISTIE L	55 WILLIAMS STREET #803	107091	LAPLANT DAVID B & KRISTIE L 55 WILLIAMS STREET #802 TAUNTON, MA 02780
67-82-401 CENTEIO MANUEL & LAUDINA	55 WILLIAMS STREET #401	104175	CENTEIO MANUEL & LAUDINA 55 WILLIAMS STREET 401 TAUNTON, MA 02780
67-82-402 CABRAL NUNO	55 WILLIAMS STREET #402	104176	CABRAL NUNO 55 WILLIAMS STREET #402 TAUNTON, MA 02780
67-82-104 BOSSE ROBERT J & CYNTHIA M	55 WILLIAMS STREET #104	104029	BOSSE ROBERT J & CYNTHIA M 55 WILLIAMS STREET # 104 TAUNTON, MA 02780
67-82-903 REYNOLDS KEITH M & MICHELE A	55 WILLIAMS STREET #903	107088	REYNOLDS KEITH M & MICHELE A 55 WILLIAMS STREET #903 TAUNTON, MA 02780
67-82-501 COTTER KATHLEEN S	55 WILLIAMS STREET #501	104907	COTTER KATHLEEN S 55 WILLIAMS STREET 501 TAUNTON, MA 02780
67-82-701 RYAN JUNE A	55 WILLIAMS STREET #701	104925	RYAN JUNE A 55 WILLIAMS STREET #701 TAUNTON, MA 02780
67-82-304 TAVARES, ANA I	55 WILLIAMS STREET #304	104906	TAVARES, ANA I 55 WILLIAMS STREET #304 TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-53-0 GPH TAUNTON LLC	DEAN STREET	596	GPH TAUNTON LLC PO BOX 160488 ALTAMONTE SPRINGS, FL 32716
56-84-0 CATALDO MARK	90 DISAMAR ROAD	9186	CATALDO MARK 90 DISAMAR ROAD TAUNTON, MA 02780
56-59-0 WOOD CHRISTOPHER A	34 RIVER ROAD	5019	WOOD CHRISTOPHER A 34 RIVER ROAD TAUNTON, MA 02780
56-29-0 AMARAL REBECCA E	93 LONGMEADOW ROAD	5028	AMARAL REBECCA E 93 LONGMEADOW ROAD TAUNTON, MA 02780
56-21-0 COSTIGAN GERALDINE	86 LONGMEADOW ROAD	18502	COSTIGAN GERALDINE 86 LONGMEADOW ROAD TAUNTON, MA 02780
56-38-0 THE REDEEMED CHRISTIAN CHURCH OF GOD	170 DEAN STREET	5035	THE REDEEMED CHRISTIAN CHURCH OF GOD 71 KIANA WAY TAUNTON, MA 02780
67-12-0 UNITED STATES OF AMERICA	245 GORDON M OWEN RIVERWAY	100910	UNITED STATES OF AMERICA 696 VIRGINIA ROAD CONCORD, MA 01742
56-44-0 GPH TAUNTON LLC	DEAN STREET	594	GPH TAUNTON LLC P O BOX 160488 ALTAMONTE SPRINGS, FL 32716-0488





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-87-0 SOLIS HUGO L & DELMY J CASTILLO SALDIVAR	60 DISAMAR ROAD	9182	SOLIS HUGO L & DELMY J CASTILLO SALDIVAR 60 DISAMAR ROAD TAUNTON, MA 02780
67-93-0 CONNOLLY PATRICIA J TRS	43 WILLIAMS STREET	5852	CONNOLLY PATRICIA J TRS 26 ANTHONY STREET BERKLEY, MA 02779
67-24-0 MCDERMOTT JAMES F & SANDRA M TRS LI	30 WILLIAMS STREET	5434	MCDERMOTT JAMES F & SANDRA M TRS LI 30 WILLIAMS STREET TAUNTON, MA 02780
56-28-0 MACDONALD ERIC & ARIEL HELEN CHRISTOPHER	79 LONGMEADOW ROAD	18486	MACDONALD ERIC & ARIEL HELEN CHRISTOPHER 79 LONGMEADOW ROAD TAUNTON, MA 02780
67-26-0 AMARAL NORMAN & FRANCES	38 WILLIAMS STREET	5436	AMARAL NORMAN & FRANCES 38 WILLIAMS STREET TAUNTON, MA 02780
67-86-0 DEOLIVEIRA ALAN T	57 WILLIAMS STREET	18679	DEOLIVEIRA ALAN T 57 WILLIAMS STREET TAUNTON, MA 02780
56-37-7A ROSA JOE F	172 DEAN STREET #7A	108937	ROSA JOE F 172 DEAN STREET #7A TAUNTON, MA 02780
56-37-6A MASON MATTHEW D	172 DEAN STREET #6A	108936	MASON MATTHEW D 172 DEAN STREET #6A TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
56-37-0 HAWTHORNE DEVELOPMENT INC	172 6A 7A DEAN STREET	5036	HAWTHORNE DEVELOPMENT INC 174 DEAN STREET UNIT C TAUNTON, MA 02780
56-91-0 GONZAGA GEORGE	20 DISAMAR ROAD	9195	GONZAGA GEORGE 20 DISAMAR ROAD TAUNTON, MA 02780
56-40-0 LEWIS EDITH D, KERI LEWIS & KRISTINE FUL	166 DEAN STREET	5029	LEWIS EDITH D, KERI LEWIS & KRISTINE FUL 711 MIRROR LAKES DRIVE LEHIGH ACRES, FL 33936
67-30-0 MITCHELL ELIZABETH E& NICHOLAS D	182 HARRIS STREET	5453	MITCHELL ELIZABETH E& NICHOLAS D 182 HARRIS STREET TAUNTON, MA 02780
56-82-0 CORR PETER H TR	100 DISAMAR ROAD	9188	CORR PETER H TR 100 DISAMAR ROAD TAUNTON, MA 02780
56-11-0 148 LONGMEADOW LLC	148 LONGMEADOW ROAD	581	148 LONGMEADOW LLC 148 LONGMEADOW ROAD TAUNTON, MA 02780
55-762-0 RR	WILLIAM HOOKE LANE	104782	RR 15 N 32 ST RM 1200 PHILIDELPHIA, PA 19104
56-89-0 PIETNIK NORMA LI	40 DISAMAR ROAD	9196	PIETNIK NORMA LI 40 DISAMAR ROAD TAUNTON, MA 02780





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**100ft. Abutters of Property 56-104-0  
at DEAN STREET**

Abutter	Street Address	Account No.	Tax Bill Address
67-28-0 COMMONWEALTH OF MASS	150 GORDON OWEN RIVERWAY	104861	COMMONWEALTH OF MASS 150 GORDON OWEN RIVERWAY TAUNTON, MA 02780
67-54-0 PETROSKI EDWARD & LUCILLE C	77 WILLIAMS STREET	6094	PETROSKI EDWARD & LUCILLE C 77 WILLIAMS STREET TAUNTON, MA 02780
56-64-0 ABREU NELIO S	11 DISAMAR ROAD	9200	ABREU NELIO S 11 DISAMAR ROAD TAUNTON, MA 02780
67-25-0 MCGRATH KERRI A & RYAN G	34 WILLIAMS STREET	5435	MCGRATH KERRI A & RYAN G 34 WILLIAMS STREET TAUNTON, MA 02780
67-21-0 MARTIN WILLIAM & MARGARET	22 WILLIAMS STREET	5431	MARTIN WILLIAM & MARGARET 22 WILLIAMS STREET TAUNTON, MA 02780





## **Appendix A – Project Narrative**

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## 1.0 **Introduction**

The Massachusetts Department of Transportation – Highway Division (MassDOT) proposes the reconstruction of Dean Street (Route 44) in the City of Taunton. The project limits begin east of Arlington Street and extend to a point west of the Route 44 / Route 104 intersection for a total length on Route 44 of 0.71 miles (3,724 feet). The project also extends onto Longmeadow Road for 0.09 miles (464 feet) and Hon. Gordon M. Owen Riverway for 0.1 miles (566 feet). The project has a total length of 0.9 miles (4,754 feet). A USGS locus map of the project limits is provided in Appendix B.

The purpose of this project is to improve connectivity between downtown Taunton to the west and Route 24 to the east, provide public transit accommodations, enhance safety conditions, provide pedestrian and bicycle amenities, meet current Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) AAB standards, and improve overall vehicular traffic and intersection operations. The project generally proposes to widen Route 44 in order to provide consistent four-lane cross section throughout the Route 44 corridor to improve traffic flow, intersection operations, safety, and pedestrian and bicycle access. A new sidewalk will be constructed along the westbound side of Route 44. Bicycle lanes and pavement markings will be installed on the eastbound and westbound sides of Route 44. The geometry of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection will be realigned to provide improved signage and traffic signals, reduce driver confusion, improve traffic operations, and improve safety for pedestrians and bicyclists.

To facilitate these improvements, the project proposes the removal of an existing granite block retaining wall and construction of a new soldier pile and lagging wall adjacent to, and in some areas, within the Taunton River. The project also includes drainage improvements, landscaping, installation of granite curbing and associated roadway work. The project is a linear transportation project that will result in impacts to vegetated wetlands and Waters of the United and therefore is seeking authorization under Massachusetts GPs 10 and 14. The project also requires authorization under the Massachusetts Wetlands Protection Act, the Massachusetts Environmental Policy Act (MEPA), and the Massachusetts Public Waterfront Act. A Wetlands Protection Act Notice of Intent was filed with the Taunton Conservation Commission in May 2022. The MEPA Certificate for this project was issued on December 22, 2021. A Chapter 91 License Application was submitted to MassDEP in May 2022. This segment of the Taunton River is designated as Wild and Scenic and MassDOT has initiated coordination with the National Park Service. The project is currently undergoing FHWA GARFO review, and it is anticipated that the project will receive a “Not Likely to Adversely Affect (NLAA) determination. No other permits or environmental reviews are required for the proposed work. The Order of Conditions for this project will serve as the Water Quality Certification (WQC) and an individual WQC will not be required.

## 2.0 **Existing Conditions**

### 2.1 **Project Locus**

Within the project limits, Route 44 generally runs in an east-west alignment and is classified as an Urban Principal Arterial under the jurisdiction of MassDOT. Route 44 serves as a major connection between downtown Taunton to the west and Route 24 to the east. Route 44 is



generally 28-feet wide and provides one (1) 12-foot-wide travel lane with a 2-foot-wide shoulder in each direction. Directional flow along much of the roadway is separated by a double-yellow line. Within the vicinity of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection, directional flow is separated by a raised concrete median. Route 44 has a posted speed limit of 40 miles per hour (MPH) in both directions within the project limits and is regulated by MassDOT. A sidewalk is provided along the northerly side of Route 44 throughout the project limits and along the southerly side of the roadway at its intersection with Cape Road (Route 44). Pedestrian accommodations throughout the project limits are inconsistent, in poor condition due to cracking, heaving, and utility obstructions, and do not meet current ADA / Architectural Access Board AAB standards. No bicycle accommodations are provided within the project limits.

## 2.2 Jurisdictional Wetland Resource Areas

In January and February of 2017, a resource area boundary delineation was conducted along Route 44, Longmeadow Road, and Hon. Gordon M. Owen Riverway. These boundaries were confirmed and adjusted as necessary in February 2021. Wetland resource areas were delineated in accordance with the methods developed by the Massachusetts Department of Environmental Protection's (MassDEP) Delineating Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act. Within the project limits Route 44 generally runs parallel to the northern bank of the Taunton River, a perennial stream, and crosses one (1) unnamed, culverted intermittent stream. Jurisdictional wetland resource areas within and adjacent to the project limits include Vegetated Wetlands (VW), Waters of the United States, specifically streambed and stream bank associated with the Taunton River and an unnamed intermittent stream, Bank (to intermittent and perennial streams), and 100-year Floodplain. The locations and characteristics of these resources are described in the following Tables 2.2.1 – 2.2.3, below.

### Waters of the U.S. – Streambank (Perennial Streams & Intermittent Streams)

During the wetland resource delineation, Streambank to perennial streams was identified in four (4) locations, and Streambank to intermittent stream was identified in one (1) location. The delineation locations are detailed in the tables below.

**Table 2.2.1 Streambank (Perennial Stream)**

Flag Series	Notes
<p><i>B1 Series</i></p> <p><i>Flags</i></p> <p><i>B1-100 to B1-178;</i></p> <p><i>B1-289 to B1-353</i></p>	<p>The northern Mean Annual High Water (MAHW)/Bank associated with the Taunton River was delineated along the site, where flow is conveyed westerly along Route 44. In the vicinity of the site, the Taunton River is approximately 110 feet wide, with an unknown depth. Its Bank is generally vegetated with red maple (<i>Acer rubrum</i>), white pine (<i>Pinus strobus</i>), Japanese knotweed (<i>Polygonum cuspidatum</i>), silky dogwood (<i>Cornus amomum</i>), multiflora rose (<i>rosa multiflora</i>), Oriental bittersweet (<i>Celastrus orbiculatus</i>), and goldenrod (<i>Solidago spp.</i>). There are several areas along the Bank that consist of man-made structures, including bridges and retaining walls.</p>
<p><i>B4 Series</i></p>	<p>The southern Mean Annual High Water (MAHW)/Bank associated with the Taunton River was delineated where the Honorable Gordon M. Owen Riverway bridge crosses the River. The southern Bank is generally vegetated with red</p>



<p><i>Flags</i> <i>B4-94 to B4-104</i></p>	<p>maple (<i>Acer rubrum</i>), white pine (<i>Pinus strobus</i>), Japanese knotweed (<i>Polygonum cuspidatum</i>), silky dogwood (<i>Cornus amomum</i>), multiflora rose (<i>rosa multiflora</i>), Oriental bittersweet (<i>Celastrus orbiculatus</i>), and upland grasses. The bridge over the Taunton River is located between Bank Flags B4-99 and B4-100, and the Bank between these flags consists of a sandy un-vegetated slope.</p>
<p><i>B2 &amp; B3 Series</i></p> <p><i>Flags</i> <i>B2-100 to B2-114</i> &amp; <i>B3-100 to B3-115</i></p>	<p>The eastern (<i>Bank 2</i>) and western (<i>Bank 3</i>) Mean Annual High Water (MAHW)/Banks associated with an unnamed perennial tributary to the Taunton River were delineated. Flow from a 24-inch concrete culvert is conveyed southerly within the 15 to 20-foot-wide, 3-foot-deep, channel until joining the Taunton River. The Riverbed has a sandy substrate covered with small to medium rocks. This stream is connected to the <i>Bank B7/B8</i> stream via a 24-inch culvert carrying water beneath Route 44. The banks are generally vegetated with red maple (<i>Acer rubrum</i>), white pine (<i>Pinus strobus</i>), burning bush (<i>Euonymus alatus</i>), silky dogwood (<i>Cornus amomum</i>), multiflora rose (<i>rosa multiflora</i>), Oriental bittersweet (<i>Celastrus orbiculatus</i>), and green brier (<i>Smilax rotundifolia</i>).</p>
<p><i>B7 &amp; B8 Series</i></p> <p><i>Flags</i> <i>B7-100 to B7-105</i> &amp; <i>B8-100 to B8-106</i></p>	<p>The eastern (<i>Bank 7</i>) and western (<i>Bank 8</i>) Mean Annual High Water (MAHW)/Banks associated with an unnamed perennial tributary to the Taunton River were delineated. This segment of the stream flows southerly within a 15-foot-wide, 12-inch-deep, channel to a 24-inch concrete culvert that conveys flow under Route 44. This culvert connects the B7/B8 stream to the B2/B3 stream. The Riverbed has a sandy substrate. The Banks are generally vegetated with American hornbeam (<i>Carpinus caroliniana</i>), speckled alder (<i>Alnus incana</i>), multiflora rose (<i>rosa multiflora</i>), and silky dogwood (<i>Cornus amomum</i>).</p>

Table 2.2.2 Streambank (Intermittent Stream)

Flag Series	Notes
<p><i>B5 &amp; B6 Series</i></p> <p><i>Flags</i> <i>B5-100 to B5-109</i> &amp; <i>B6-100 to B6-108</i></p>	<p>The eastern Bank (<i>Bank 5</i>) and the western Bank (<i>Bank 6</i>) of the unnamed intermittent stream were delineated. A culvert discharges to the stream, which flows within a 6-foot-wide, 2-foot-deep channel until it meets the Taunton River. The Banks are generally vegetated with Japanese knotweed (<i>Polygonum cuspidatum</i>), green brier (<i>Smilax rotundifolia</i>), multiflora rose (<i>rosa multiflora</i>), and silky dogwood (<i>Cornus amomum</i>).</p> <p>A wetland, located greater than 100 feet north of Route 44, appears to have an overflow discharge pipe that may convey water under Route 44 and discharge to this stream. If this is the case, the pipe is an intermittent stream under the Act.</p>



**Table 2.2.3 Vegetated Wetlands (VW)**

Flag Series	Notes
<p><i>WF1 Series</i></p> <p><i>Flags</i></p> <p><i>WF1-100 to WF1-123</i></p>	The VW can be characterized as a broad-leaf deciduous forested floodplain wetland that borders on the northern Bank of the Taunton River. This wetland boundary was established based on evidence of hydrology, including hydric soils, and presence of hydrophytic vegetation.
<p><i>WF2 Series</i></p> <p><i>Flags</i></p> <p><i>WF2-100 to WF2-105</i></p>	The VW can be characterized as a sparsely vegetated low-lying area that borders on a perennial stream. This wetland boundary was established based on evidence of hydrology and presence of hydric soils with a matrix color of 10 YR 4/2 within 5 YR 4/6 concentrations at 6". A formal plot was not analyzed for this wetland due to its size and lack of vegetation.
<p><i>WF3 Series</i></p> <p><i>Flags</i></p> <p><i>WF3-100 to WF3-107</i></p>	The VW is hydraulically connected with the Taunton River via an intermittent stream (that was not delineated) that flows away from the site. The boundary of the wetland is generally coincident with the toe-of-slope associated with the Honorable Gordon M. Owen Riverway roadway. The VW can be characterized as a broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology and presence of hydrophytic vegetation.
<p><i>WF4 Series</i></p> <p><i>Flags</i></p> <p><i>WF4-100 to WF4-114</i></p>	The VW borders on an internal intermittent stream that flows into a concrete culvert, discharging to the Taunton River. It can be described as a scrub-shrub wetland with an internal emergent/aquatic wetland. This wetland boundary was established based on evidence of hydrology, hydric soils, and presence of hydrophytic vegetation.
<p><i>WF5 Series</i></p> <p><i>Flags</i></p> <p><i>WF5-100 to WF5-106</i></p>	The VW borders on <i>Bank B7</i> of the perennial tributary to the Taunton River. The VW can be characterized as broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology, hydric soils, and presence of hydrophytic vegetation.
<p><i>WF6 Series</i></p> <p><i>Flags</i></p> <p><i>WF6-100 to WF6-106</i></p>	The VW borders the <i>Bank B8</i> of the perennial tributary to the Taunton River. The VW can be characterized as a broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology, hydric soils, and presence of hydrophytic vegetation. A formal plot was not analyzed for this wetland due to its similarity to the <i>WF5 Series</i> wetland.
<p><i>WF7 Series</i></p> <p><i>Flags</i></p> <p><i>WF7-100 to WF70110</i></p>	The VW borders the northern Bank of the Taunton River and the <i>B5/B6 Series</i> intermittent stream. The VW can be characterized as a broad-leaf deciduous forested floodplain wetland. Wetland flag <i>WF7-110</i> ties to the Bank of the Taunton River. This wetland boundary was established based on evidence of hydrology, including soil indicators. A formal plot for this wetland series was not analyzed due to its similarity with <i>WF1 Series</i> wetland.
<i>WF8 Series</i>	The VW borders on the northern Bank of the Taunton River and the <i>B5/B6 Series</i> intermittent stream. The VW can be



<p><i>Flags</i> <i>WF8-100 to WF8-109</i></p>	<p>characterized as a broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology, including soil indicators. A formal plot was not analyzed for this wetland due to its similarity to the <i>WF1 Series</i> wetland.</p>
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### 100-year Floodplain

According to the July 16, 2015, FEMA Flood Insurance Rate Map (FIRM) Number 25005C0164G, portions of the project are located within either FEMA Flood Zone AE, with base flood elevations (BFE) ranging from 12 to 13 feet NAVD. Portions of the proposed work are also located with the Regulatory Floodway associated with the Taunton River.

### 3.0 Work Description

The primary improvements proposed by this project include:

#### Dean Street (Route 44) Corridor

- Slightly widen and reconstruct Route 44 to provide a two-lane roadway with 12-foot vehicle lanes and 8-foot buffered bicycle lanes between the MBTA Railroad crossing and a point approximately 850 feet west of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection
- Slightly widen and reconstruct Route 44 to provide a 22-foot-wide travel lane with transition arrows and a 5-foot bicycle lane, for approximately 500-feet, to merge into a single 12-foot vehicle travel lane heading westbound. This transition occurs approximately 250 feet west of the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection.
- Slightly widen and reconstruct Route 44 to provide two 11-foot-wide travel lanes with a 5-foot bicycle lane, for approximately 300-feet, to diverge from a single 12-foot vehicle travel lane heading eastbound. This transition occurs approximately 850 feet west of the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection.
- Slightly widen and reconstruct Route 44 to provide a four-lane roadway with 11-foot vehicle lanes and 5-foot bicycle lanes between the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway and Dean Street (US Route 44) / Cape Road (US Route 44) / Dean Street (Route 104) intersections.
- Roadway reconstruction will consist of a combination of full-depth hot-mix roadway construction, pavement micromilling and hot-mix asphalt overlay depending on degree of disrepair and roadway widening. The full-depth reconstruction will address the sub-surface damage due to erosion.
- Roadway reconstruction for pavement design, horizontal and vertical curvature are factored for the design speed of 40 mph for US Route 44 within the Project limits.
- Relocation, rehabilitation, or abandonment of existing roadway utilities as needed to match new roadway cross-slope and edge of roadway.



- Construct / reconstruct a 6-foot hot-mix asphalt sidewalk with 6-inch vertical granite curbing along the northerly side of Route 44 for the limits of the Project. Existing vertical granite curbing will be removed and reset whenever possible.
- Construct / reconstruct a 5.5-foot hot-mix asphalt sidewalk with 6-inch vertical granite curbing along both sides of Longmeadow Road and Hon. Gordon M. Owen Riverway within the Project limits.
- Construct a bus pull out and shelter on the eastbound side of Route 44 east of the intersection.
- Construct a bus shelter on the westbound side of Route 44 east of the intersection.
- Construct ADA/AAB-compliant ramps at all pedestrian access ramps within the Project limits.
- Reconstruct affected private driveways and side street approaches with full-depth hot-mix asphalt to match reconstructed curb line and roadway cross-slope.
- Construct retaining walls along the westerly side of Longmeadow Road as well as the northerly and southerly sides of Route 44 as needed in order to reduce impact to private property and fill within the adjacent wetlands to reinforce the roadway. Steel guardrails will be installed along the southerly side of Route 44 behind the proposed and existing sidewalk as needed.
- Install MUTCD-compliant regulatory and warning signage.
- Retime traffic signal phases and provide pedestrian signal improvements at the Dean Street (US Route 44) / Cape Road (US Route 44) / Dean Street (Route 104) intersection; and
- Proposed tree protection, replacement of loam and seed affected by construction easements, and runoff protection will be provided throughout the Project to limit construction impacts.
- Construct a wetland replication area west of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection. The wetland replication area will be constructed south of Route 44, adjacent to the existing wetland and will be planted with native species including Common Winterberry (*Ilex verticillate*), Swamp White Oak (*Quercus bicolor*), and Highbush Blueberry (*Vaccinium corybosum*).
- Construct compensatory flood storage area, including excavation and grading, adjacent to the western project limits. Compensatory flood storage area will be planted with live stakes and seeded to ensure appropriate stabilization.
- Install landscape features including tree and shrub plantings, seeding of disturbed slopes with a native riverbank seed mix, and installation of construction phase tree protection fencing.
- Relocate and stabilize existing outfall locations to provide stone pads for velocity dissipation / scour protection and a vegetated setback from the adjacent wetlands and Waters of the US.



- Install new deep sump catch basins to provide an opportunity for suspended solids to settle out of stormwater runoff prior to discharge.
- Repair, replace, adjust, or clean of sediment as necessary existing drainage pipes within the project limits.

#### Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway

- Widen Dean Street (US Route 44) to provide an 11-foot exclusive left-turn lane, a through lane, a shared through/right-turn lane, and a 5-foot bicycle lane in each direction. A channelized right-turn movement will be provided on the eastbound approach, which will be signalized.
- Reconstruct the Hon. Gordon M. Owen Riverway northbound approach to provide an exclusive left-turn lane, a through lane, a 5-foot bicycle lane, and a channelized right-turn lane, which will be signalized.
- Reconstruct the Longmeadow Road southbound approach to provide an exclusive left-turn lane, a shared through/right-turn lane and a 5-foot bicycle lane.
- Replace existing traffic signal equipment, signal posts, mast arms, emergency vehicle preemption, with a fully actuated traffic signal including the channelized right-turn lanes which are MUTCD- and ADA-compliant.
- Removal of existing traffic signals and reconstruct raised medians along Route 44.
- Implement leading protected-permitted left-turn phases on all approaches to formalize current side street turning movements and improve safety. Provide a protected overlap phase for the northbound channelized right-turn lane.
- Modify the vehicle and pedestrian clearance intervals to meet MUTCD guidelines.
- Install vehicle and bicycle video detection cameras at all approaches including advanced detection zones along US Route 44 eastbound and westbound.
- Install painted green bicycle boxes and transition areas to provide cyclists a safe place to execute left-turn movements at the signalized intersection.
- Install thermo-plastic pavement markings imbedded into the surface course for lane striping and MUTCD-compliant designation arrows in advance of and at the intersection approaches.
- Install MUTCD-compliant regulatory and warning signage; and
- Install new crosswalks with ADA-compliant curb ramps with tactile warning devices and MUTCD-compliant striping and signage at all crosswalks.

#### Dean Street (US Route 44) / Dean Street (Route 104) / Cape Highway (US Route 44)

- Modify traffic signal phase timings as well as vehicle and pedestrian clearance intervals to meet MUTCD guidelines.



- Install vehicle detection loops in the roadway with new service connections into existing pull boxes along US Route 44 eastbound.

### Retaining Wall Construction

The project proposes to construct a new, soldier pile retaining wall with precast form liner finish on the lagging that will begin at a point approximately 1000 feet east of the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection and be constructed to an elevation of 11 to 12 feet. The wall will extend approximately 1000 feet east, terminating at the abandoned Harris Street Bridge. The proposed retaining wall is necessary to accommodate the widening that will result from the proposed roadway improvements and construction of pedestrian and bicycle accommodations. The soils below the existing roadway primarily consists of clay and fine sands. These conditions are resulting in the existing roadway and retaining wall sinking or slumping towards the Taunton River. This settling has caused pavement cracking and deterioration resulting in poor travel conditions and a need for increased maintenance. This proposed retaining wall will not only accommodate the proposed roadway improvements but also resolve these structural issues. The proposed retaining wall will be a soldier pile and lagging wall supported on H-piles and will feature tiebacks anchored into bedrock to provide lateral support. Temporary dewatering will be necessary to facilitate the construction of the proposed retaining walls, specifically in areas where the proposed wall intersects the existing granite block masonry wall. The intent is to leave as much of the existing wall in place to minimize impacts within and adjacent to the Taunton River. The limits of both the proposed retaining wall and dewatering are shown on the attached plans.

### **3.1 Work in Jurisdictional Resource Areas**

Work within jurisdictional resource areas is generally related to roadway widening, construction of sidewalks and transit accommodations, grading, installation of erosion and runoff control measures, installation of retaining walls, and construction phase site access. Proposed work within resource areas is described below. The specific equipment and materials used during demolition and construction will be determined by the contractor, however, no equipment or materials will be stockpiled within any wetland resource areas.

#### ***Vegetated Wetlands (VW)***

The project will result in impacts to VW totaling 1,472 square feet (1,029 square feet permanent / 443 square feet temporary). Permanent impacts are a result of the widening and retaining wall construction necessary to provide a four-lane roadway cross-section on Route 44 and public transit accommodations in the vicinity of the Route 44 / Hon/ Gordon M. Owen Riverway / Longmeadow Road intersection as well as the extension of the existing culvert that conveys an unnamed intermittent stream beneath Route 44. Temporary impacts are a result of construction phase site access, drainage improvements, and the installation of erosion and sedimentation control measures.

Station	Flag Series	Temporary (sf)	Permanent (sf)
105+50	WF7	4	0
117+00 – 118+25	WF1	399	955
125+00	WF6	40	74
<b>TOTALS</b>		443	1,029



### ***Waters of the U.S. – Streambank***

The project will result in impacts to Bank totaling 733 linear feet (243 linear feet permanent / 490 linear feet temporary). Permanent impacts are a result of roadway widening, retaining wall construction, grading, and culvert extensions. Temporary impacts are a result of construction phase site access, drainage upgrades, and the installation of erosion and sedimentation control measures. The below table summarizes the locations and lengths of the project's proposed impacts on Streambank.

Station	Flag Series	Temporary (lf)	Permanent (lf)
101+75	B1	4	5
103+15	B1	4	9
104+00	B1	4	2
107+00	B1	6	0
111+15	B1	4	5
125+00 – 126+00	B1	83	33
126+50 – 127+50	B1	139	0
128+00 – 129+75	B1	130	62
130+00	B1	12	11
130+25 – 131+25	B1	32	60
134+00 – 134+50	B1	52	5
121+50	B7 / B8	13	46
506+00	B1	7	5
<b>TOTALS</b>		<b>490</b>	<b>243</b>

Temporarily impacted areas of Streambank will be restored in place upon completion of the project using a native seed mix and plantings.

### ***Waters of the U.S. – Streambed***

The project will result in impacts to Waters of the U.S. – Streambed totaling 2,854 square feet (689 square feet permanent / 2,165 square feet temporary). Permanent impacts are a result of retaining wall construction within the Taunton River, roadway widening, and culvert extensions. Temporary impacts are a result of temporary dewatering and the installation of erosion and sedimentation control measures. Temporarily impacted areas will be restored in place following the guidance for streambed creation outlined in the Massachusetts River and Stream Crossing Standards using materials removed from the streambed during construction if possible or other compatible material.

### ***100-Year Floodplain and Regulatory Floodway***

The majority of the project is located within the 100-Year Floodplain and results in 52,634 sf of total impacts (21,430 sf permanent / 31,204 sf temporary). The project will result in 57,318 cubic feet of fill within BLSF and 63,659 cubic feet of cut. Upon completion of the grading activities, temporarily impacted areas within the Floodplain will be restored through placement of loam and spreading of a native seed mix, as shown on the landscaping plans.

The proposed construction of the retaining wall adjacent to and within the Taunton River will result in fill within the Regulatory Floodway. A hydraulic analysis completed for the project demonstrated that the work would result in “no rise” in the Base Flood Elevation (BFE – 100-year floodplain) associated with the Taunton River and that the project will result in no impact to the effective NFIP BFE profile or regulatory floodway delineation.



The proposed cut and fill within the Floodplain will result in a net cut of 6,341 cubic feet. A Cut / Fill Analysis Summary Table is provided below.

Cut / Fill Analysis Summary Table				
Bottom Elevation	Top Elevation	Cut (CY)	Fill (CY)	Net Volume (CY)
11	12	580.30	711.36	(131.06)
10	11	616.56	613.33	3.23
9	10	528.21	512.76	15.45
8	9	239.82	168.78	71.05
7	8	268.12	85.39	182.73
6	7	90.02	6.43	83.59
5	6	34.59	4.70	29.89
4	5	0	4.70	(4.70)
3	4	0	4.70	(4.70)
2	3	0	4.70	(4.70)
1	2	0	4.61	(4.61)
0	1	0.13	1.43	(1.30)
Total		<b>2,357.76</b>	<b>2,122.9</b>	<b>234.86</b>
Total (ft <sup>3</sup> )		<b>63,659.52</b>	<b>57,318.3</b>	<b>6,341.22</b>

\*Note: Net volumes in red above indicate where there is a net fill for a given interval and net volumes in black indicate intervals for which there is a net cut.

#### 4.0 Mitigation Measures

The reconstruction of Dean Street (Route 44) was designed and developed with an interest to avoid, minimize, and mitigate impacts to wetland resource areas, wildlife habitat, and other environmentally sensitive areas.

#### 4.1 Wetland Resource Area Replacement and Restoration

In order to compensate for the proposed 1,029 sf of permanent VW impacts, the project proposes the construction 1,272 sf of VW replication. The replication area has been designed and sited so that it is adjacent and hydrologically connected to the existing wetland. The proposed replication area will be seeded and planted with native species similar to those found in the existing wetland. Please reference the table below for a summary of the proposed plantings.

Wetland Replication Planting Schedule			
Cover Type	Quantity	Botanical Name	Common Name
Tree	1	<i>Quercus Bicolor</i>	Swamp White Oak
Shrub	4	<i>Cephalanthus occidentalis</i>	Common buttonbush
Shrub	7	<i>Ilex verticillata</i>	Common winterberry
Shrub	7	<i>Vaccinium corymbosum</i>	Highbush blueberry
Shrub	4	<i>Azalea viscosum</i>	Swamp Azalea

The clearing, grading, and planting necessary for the construction of the wetland replication area will be conducted under the supervision of a Wetland Specialist. All temporarily altered areas of VW will be stabilized and restored in place with a wetland seed mix under the supervision of a qualified Wetland Specialist.



## 4.2 Compensatory Flood Storage Area

To compensate for the proposed fill within the floodplain, an area of compensatory flood storage will be constructed along the southern limit of Route 44, generally from Station 102+00 to Station 114+00. The compensatory flood storage area will be planted with native species commonly found within the adjacent floodplain.

## 4.3 Erosion and Sedimentation Control

Erosion and sedimentation controls will be installed and maintained where activities are proposed within 100-feet of wetland resource areas. They will provide a limit of work barrier while preventing silts and sediments from migrating into or towards the wetland resource areas.

Erosion controls shall consist of compost filter tubes and silt fences or approved equivalents. No hay bales shall be used at any time on this project. The erosion and sedimentation control measures will be constructed in accordance with the Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban areas, March 1997 and the USDA SCS's Erosion and Sediment control in the Site Development, Massachusetts Conservation Guide, September – 1983. Best management practices for erosion and sedimentation control will be adhered to for all phases of construction to minimize potential impacts to wetland areas and wildlife habitat.

The contractor will be responsible for obtaining the National Pollution Discharge Elimination System (NPDES) Construction General Permit. A Stormwater Pollution Prevention Plan (SWPPP) will be submitted prior to any land disturbance.

## 4.4 Landscape Improvements and Control of Invasive Plant Species

The project proposes invasive species management throughout the Route 44 (Dean Street) Corridor in order to improve the habitat value of the site, protect proposed landscape restoration, improve future maintenance operations, and attempt to prevent future spread both on-site and to adjacent sites. Invasive species management will consist of mowing, clearing and grubbing, and the selective application of herbicides. All proposed invasive species management will be conducted in accordance with an Invasive Plant Management Strategy by a company pre-approved by MassDOT Landscape. Upon the removal of invasive plants, native canopy and understory species will be planted. Additional details on the Invasive Plant Management Strategy are provided in project Special Provisions included in the Appendix G.

All sloped disturbed by construction and grading activities will be seeded with a native riverbank seed mix to promote stabilization. In order to compensate for proposed tree removal, the project proposes to plant 39 native trees.

## 4.5 Stormwater Management

To off-set the proposed 38,768 sf increase in impervious surface area, the project proposes improvements to the existing stormwater management system. These proposed improvements include the relocation of existing outfalls to provide a setback from the adjacent wetlands and the construction of stone pads at outfall locations to provide velocity dissipation and protection against erosion and scour. The project proposes to install 56 deep sump catch basins in order to capture stormwater runoff from within the project limits and allow for the settling of sediment and suspended solids prior to discharge. The project also proposes to clean via sediment removal, repair, and replace as necessary, any non-functioning or damaged stormwater structures and



pipes along the Route 44 Corridor.

## 5.0 Stream Crossing Standards

The project proposes the extension of, but not the replacement of, one (1) existing stream crossing. The existing stream crossing is generally in good condition and is being extended approximately 15 feet to the north (upstream side) of Route 44 in order to accommodate minor roadway widening and the installation of a sidewalk. The extension has been designed to tie into existing conditions and meets the stream crossing standards to the maximum extent practicable. A summary of the existing structure, its compliance with the Standards, and the work proposed is provided below.

### 5.1 Stream Crossing

At approximately Station 121+50 there is an existing 4'x4' concrete box culvert which connects the WF5 and WF6 wetland areas to the north of Route 44 with the WF2 wetland located south of Route 44. The culvert conveys flow south, and the Banks of the stream are delineated with series B7 and B8 to the north, and B2 and B3 to the south.

#### Standard 1

*Spans (bridges, 3-sided box culverts, open-bottom culverts or arches) that preserve the natural stream channel are strongly preferred.*

The existing crossing consists of a 4-sided concrete box culvert and a 4-sided structure is proposed for the extension. The extension segment will be embedded using natural streambed material, however, the crossing does not meet Standard 1 as it does not span the natural stream channel.

#### Standard 2: *If a culvert, then it should be embedded:*

- *a minimum of 2 feet for all culverts*
- *a minimum of 2 feet and at least 25 percent for round pipe culverts*
- *When embedment material includes elements > 15 inches in diameter, embedment depths should be at least twice the  $D_{84}$  (particle width larger than 84% of particles) of the embedment material*

The proposed 4' x 4' box culvert extension has been designed to match the existing condition and will be embedded to an appropriate depth using a natural bottom substrate. The crossing extension does not meet Standard 2.

#### Standard 3: *Spans channel width (a minimum of 1.2 times the bankfull width).*

The existing crossing structure does not span the channel 1.2 times bankfull width and the crossing extension will be constructed with the same dimensions and therefore the crossing extension does not meet Standard 3.

#### Standard 4: *Natural bottom substrate within the structure.*

The proposed crossing extension has been designed to match the conditions observed in the existing crossing and will be embedded with a natural bottom substrate. The crossing extension meets Standard 4.



**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.*

The proposed crossing extension will be designed with appropriate bed forms and streambed characteristics to ensure that water depths and velocities are comparable to both those within the existing structure and the upstream / downstream segments of the natural stream channel. The crossing meets Standard 5.

**Standard 6:** *Openness > 0.82 feet (0.25 meters).*

The existing crossing does not provide >0.82. The proposed extension will increase the length of the crossing and maintain the same cross-sectional area, therefore the crossing extension does not meet Standard 6.

## 6.0 Anticipated Construction Sequence

A summary of the anticipated construction sequence for the proposed retaining wall, which results in the majority of the proposed in water work, is provided below.

1. Install dewatering measures. Dewatering measures will be Contractor Designed and will most likely consist of either sheet piles or sandbags and plastic. If the proposed dewatering method consists of sheet piles then a “soft start” method will be implemented when the piles are being driven in order to minimize potential noise impacts.
2. Shift vehicular traffic away from the proposed wall location.
3. Establish work zones including any necessary safety barriers, pavement removal, equipment, etc.
4. Mobilize drill rig, crane, and any other required construction equipment. The drill rig and crane may access the wall location from Route 44 or from a barge / floating work platform within the Taunton River. The access method will be determined by the Contractor's assessment of conditions on site at the time of construction.
5. Remove vegetation, rip-rap, and other obstructions to the existing and proposed walls.
6. Temporarily grade areas adjacent to the existing and proposed walls in order to create a level work area.
7. Drill temporary casing down to bedrock for 117 shafts / piles (total length estimate at 1,330 feet).
  - a. Remove soil from within the casing and dispose off-site.
8. Core into bedrock several feet, as required. The depth will vary along the length of the wall though the total distance is an estimated 1,330 feet including the necessary excavation through the existing granite block wall.
  - a. Confirm that casing and bedrock hole have been properly cleaned out.
  - b. Dispose of removed bedrock offsite.
9. Demobilize drill rig.
10. Install H-Piles into drilled holes.
11. Pour concrete to top of shaft / bottom of lagging as temporary casing is removed. Total volume of shaft concrete is estimated at 690 CY.
12. Demobilize crane.
13. Allow 5 days for shaft concrete to cure before installing precast concrete lagging.
14. Grade the area in front of the proposed wall to create a 4-foot-wide shelf.
15. Install precast concrete lagging.
16. Backfill and compact the area behind the lagging wall.



17. Remove dewatering / water control measures.
18. Set moment slab footing forms and reinforcing.
19. Pour cast-in-place moment slab footing and allow 7 days for concrete to cure.
20. Remove forms. Set moment slab stem wall forms and reinforcing.
21. Pour moment slab stem wall. Allow 7 days for concrete to cure.
22. Install proposed drainage structures including catch basins, pipes, outfalls, etc.
23. Install S3-TL4 bridge rail on moment slab stem.
24. Install precast highway guardrail transition at the ends of the wall.
25. Place and grade roadway subbase.
26. Place roadway pavement.
27. Clear work zone.
28. Remove wall construction traffic control measures.
29. Shift traffic onto proposed final alignment.

## 7.0 **Analysis of Alternatives**

As described above, the purpose of this project is to improve the connection between downtown Taunton and Route 24, provide public transit accommodations, enhance safety conditions, provide pedestrian and bicycle amenities, meet current ADA / AAB standards, and improve overall vehicular traffic and intersection operations.

The key deficiencies that this project is intended to address include poor operations due to high traffic volumes, inconsistent geometry resulting in driver confusion and crashes, excessive queueing and delays resulting from a lack of exclusive turn lanes, a lack of consistent pedestrian and bicycle accommodations, and substandard signage, signal equipment, and pavement markings. MassDOT evaluated several alternatives for addressing these deficiencies and they are summarized below.

### **Number of Travel Lanes**

Two (2) roadway cross-sections were evaluated: (1) a three-lane section consisting of one through lane in each direction and a center two-way left-turn lane (TWLTL); and a four-lane cross-section consisting of two (2) through-lanes in either direction. Greenman-Pedersen, Inc. (GPI) conducted an analysis of these options for the project area and recommended the four-lane alternative, based on both safety and operational benefits.

- **Safety:** The Federal Highway Administration (FHWA) has found that three-lane roadway configurations with a center TWLTL result in 19 to 47 percent fewer crashes (*Road Diet Information Guide, FHWA Safety Program, 2014*). An analysis found that the crash rates along the two-lane sections of Route 44 in Taunton were higher than the average for Principal Arterials. Therefore, a three-lane alternative was considered for its safety benefits in reducing rear-end and angle type collisions. A three-lane section with a center TWLTL would provide a refuge for turning vehicles to wait for gaps in traffic outside of the stream of through-lane travel traffic. A three-lane section would also assist vehicles entering from driveways and side streets by eliminating the sight line restrictions that exist in a four-lane section. A center TWLTL also allows vehicles to make a two-stage left turn movement to better utilize available gaps in traffic and focus on only one direction at a time. Despite these benefits, the majority of side street and driveway intersections occur along the northerly side of Route 44 with few opposing driveways on the southerly side of the roadway. The majority of these driveways are residential in nature and have very low traffic volumes. Therefore, it was determined that the safety benefits of a three-lane alternative would not outweigh the capacity benefits of a four-lane alternative. While



separating left turn movement from the through movement can help reduce delays, it is important to ensure that the proposed alternative will provide adequate gaps in opposing traffic to allow vehicles to enter and exit the driveways/side streets. While a three-lane alternative may allow vehicles to more efficiently utilize all available gaps in traffic, a minimum number of gaps must be created for the three-lane alternative to function effectively. When there are not enough gaps of adequate length created by a three-lane alternative, drivers begin attempting to utilize gaps that are too short, causing angle collisions, and queues begin to form in the TWLTL that can extend into the through lanes, resulting in additional rear-end and angle collisions. Therefore, it is critical to consider the capacity of a three-lane alternative in addition to the safety benefits.

- **Capacity:** The FHWA *Road Diet Information Guide* states that a three-lane road operates better than four-lane road for two-way peak hour traffic volumes up to 1,750 vehicles per hour (875 each direction). This operational benefit threshold of 1,750 vehicles per hour is the point where a three-lane roadway and a four-lane roadway provide similar traffic operations or levels of service. However, studies have shown that a three-lane alternative can provide traditionally acceptable levels of service for significantly higher volumes.

The FHWA *Road Diet Information Guide* cites a Road Diet safety assessment completed in 2010 where 45 sites were reviewed in California, Iowa and Washington. The site with the maximum ADT had traffic volumes of 24,000 vehicles with the four-lane configuration, and 26,376 vehicles with the three-lane configuration. Assuming a peak hour volume of ten (10) percent of the ADT, a reasonable maximum threshold of 2,500 vehicles per hour (1,250 each direction) can be assumed for acceptable operations on a three-lane roadway segment. For much of the day, the hourly traffic volumes along Route 44 fall above the operational benefit threshold, indicating that the three-lane alternative will not provide improved operations over a four-lane alternative. Furthermore, the volumes fall far above the maximum capacity threshold for a three-lane alternative, indicating that side street movements will fail with implementation of a three-lane alternative. East of Longmeadow Road, Route 44 has an existing ADT of 47,120 vehicles per day and a maximum peak hour volume of 3,415 vehicles per hour (approximately 2,220 in one direction).

- **Intersection Operations:** Capacity and queue analysis was prepared for both alternatives and it was determined that the four-lane alternative would provide greater operational improvements at the unsignalized intersections along Route 44 by providing more gaps in mainline. This improvement is a result of the greater roadway capacity provide by the four-lane cross section compared to the three-lane alternative.

Based on analysis of the traffic volumes and operations along Route 44, the three-lane alternative is not a viable option as the traffic volumes along the corridor during the peak hours are approximately double the operational benefit threshold of a three-lane alternative and are 36 percent higher than what has been considered the maximum capacity threshold for a three-lane alternative. Due to the heavy volumes along Route 44, a three-lane alternative would not provide sufficient gaps in traffic to allow vehicles to make left-turns entering and exiting side streets and driveways. This lack of sufficient turning gaps causes vehicles to utilize unsafe gaps and results in long queues forming in the TWLTL that may back up into the through lanes. For these reasons, the four-lane alternative was selected as the preferred alternative as it provides greater capacity and safety benefits when compared to the three-lane alternative.

## Roundabouts

A roundabout was considered for the existing signalized Route 44 / Longmeadow Road / Hon.



Gordon M. Owen Riverway intersection. The existing traffic volumes on Route 44 would require the implementation of a double-lane roundabout. Accommodating a double-lane roundabout would involve significant right-of way acquisitions and would have a significant impact on wetlands, the adjacent residential and commercial developments, and historic properties. In addition to these concerns, it was analysis of the benefits that a double-lane roundabout determined that it would not help improve traffic operations over a signalized alternative. For these reasons, a roundabout was not selected for the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection.

### **Configuration of Route 44 / Longmeadow Rd. / Hon. Gordon M. Owen Riverway Intersection**

The RSA conducted for this intersection recommended that consideration be given to providing designated turning lanes for the Longmeadow southbound approach and confirm existing turning lane designations for the rest of the intersection approaches as a part of long-term reconstruction efforts. Other recommendations contained in the RSA have been incorporated into the intersection design including intersection geometry upgrades, signal and pavement marking upgrades, incorporation of pedestrian and bicycle amenities, and drainage upgrades.

### **Bicycle Accommodations**

Both conventional on-street and protected bike lanes were considered for the Route 44 corridor. Several factors supported the selection of on-street bike lanes. The selection of the four-lane roadway eliminated the possibility of utilizing the available right of way for protected or separated bicycle accommodations. Providing separated bicycle facilities would require additional land takings on both sides of Route 44. Separated bicycle facilities would also require additional widening on the south side of Route 44 resulting in additional impacts to the Taunton River and other wetland resource areas including BVW, Bank, Riverfront Area, and Bordering Land Subject to Flooding.

The selected alternative for Route 44 incorporates five (5)- to eight (8)-foot protected bicycle lanes on both sides of the roadway. Eight (8)-foot protected (or buffered) bike lanes are only proposed west of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway, bike lanes along the remainder of the corridor will have a five (5)-foot width. In addition to the accommodations along Route 44, connections to Longmeadow Road and Hon. Gordon M. Owner Riverway via five (5)-foot bike lanes on both sides of the roadways, have been incorporated into the proposed design. These facilities were selected after consideration of the potential right-of-way, cost, traffic, and environmental impacts.

### **Off-Site Alternatives**

Route 44 is a primary commuter route between downtown Taunton to the west and Route 24, as well as Blue Star Memorial Highway (Interstate 495), to the east. Due to Route 44 being an established commuter route that has driven residential and commercial development patterns within the region, there are no feasible off-site alternatives to the proposed improvements. Any new roadway construction intended to bypass Route 44 would have major impacts on private property, environmentally sensitive areas, and regional traffic patterns that would significantly outweigh any potential benefits.

## **8.0 Summary**

The proposed reconstruction of Route 44 (Dean Street) in Taunton, will improve the safety and accessibility of the corridor for pedestrians, bicyclists, and the motoring public. The project has been designed to avoid and minimize impacts to jurisdictional resource areas to the extent





practicable and feasible. Where impacts are unavoidable, they have been appropriately mitigated. The applicant respectfully requests the Army Corps of Engineers find the Pre-Construction Notification and accompanying plans adequate to facilitate the issuance of Massachusetts General Permits 10 and 14.



## **Appendix B – Figures**

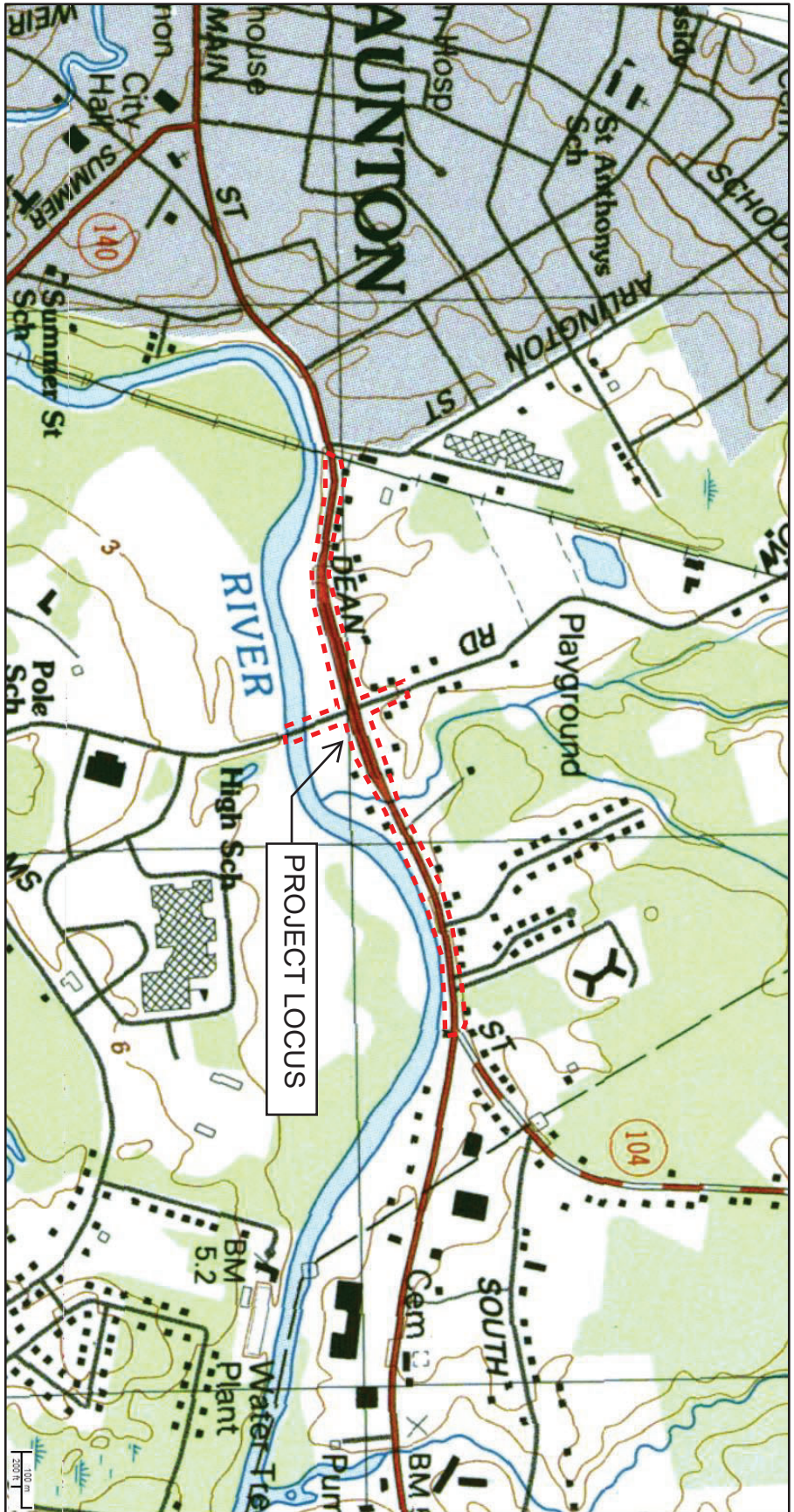
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**Figure 1 – USGS Site Locus Map**

**Figure 2 – Aerial Site Locus Map**

**Figure 3 – FEMA Flood Insurance Rate Map**





Source: MassGIS OLIVER – USGS Topographic Maps, April 2021

## Environmental Notification Form

Reconstruction of Route 44 (Dean Street)



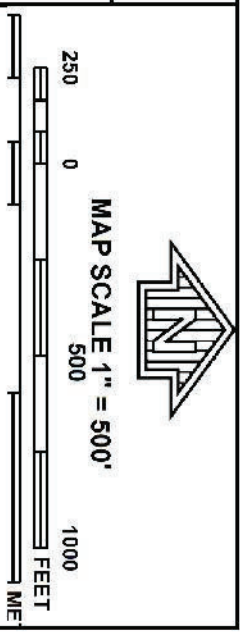
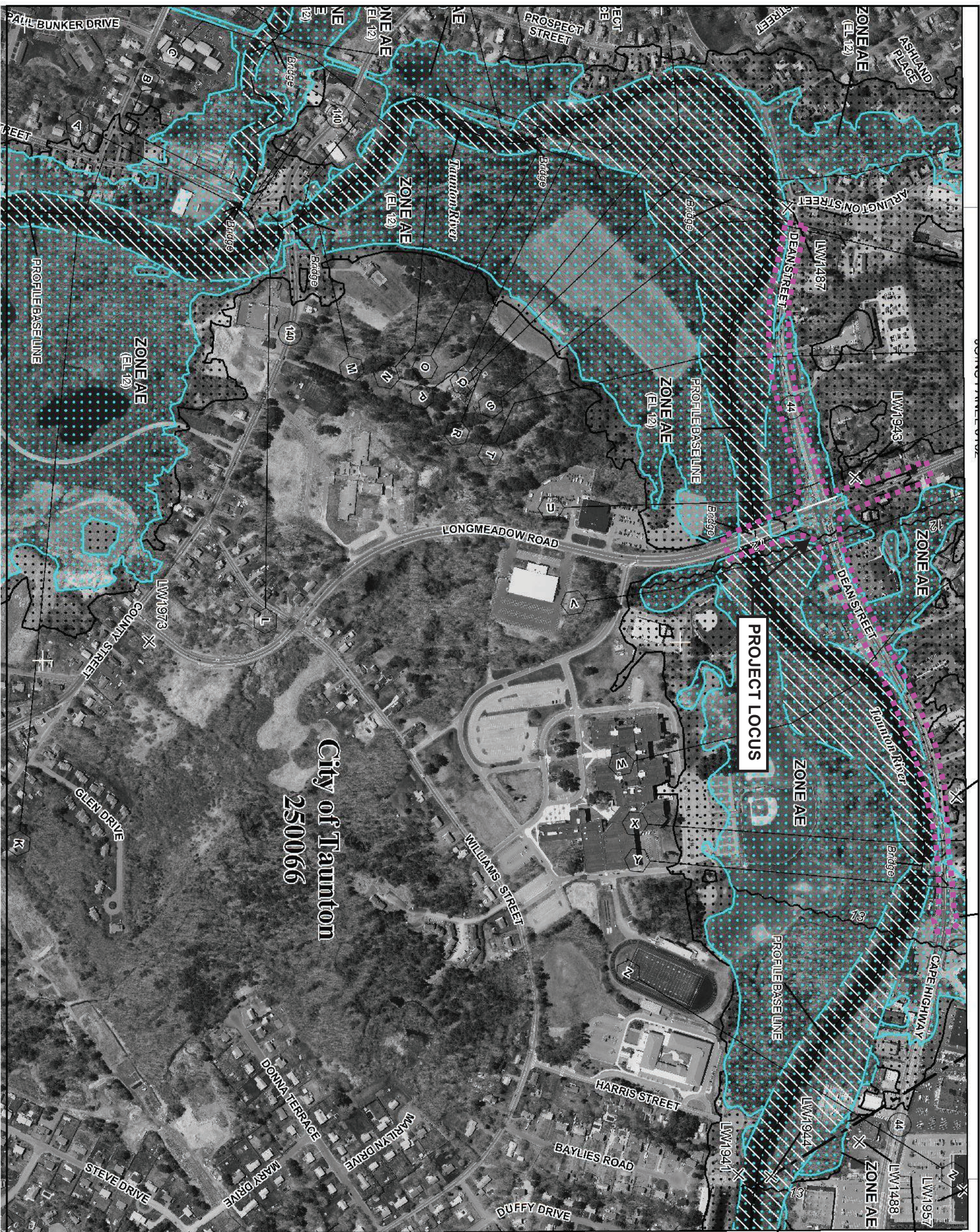
Source: MassGIS OLIVER – 2019 Color Orthos (USGS), April 2021



## Environmental Notification Form

Reconstruction of Route 44 (Dean Street)





21

PANEL 0164G

# FIRM

**FLOOD INSURANCE RATE MAP**  
**Bristol County,**  
**Massachusetts**  
**(ALL JURISDICTIONS)**

**PANEL 164 OF 550**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RAYMOND, TOWN OF	250061	0164	G
TAUNTON, CITY OF	250068	0184	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
25005C0164G  
**MAP REVISED**  
JULY 16, 2015



**Federal Emergency Management Agency**

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.nsc.fema.gov](http://www.nsc.fema.gov)





## **Appendix C – Site Photographs**

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**Photo 1**



Northern Bank (B1 Series) of the Taunton River — facing west.

**Photo 2**



Northern Bank (B1 Series) of the Taunton River — facing north from the southern bank.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 3**



Southern Bank (B4 Series) of the Taunton River — facing east.

**Photo 4**



Southern Bank (B4 Series) of the Taunton River — facing west under the Honorable  
Gordon M. Owen Riverway Bridge.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 5**



The Banks (B2 and B3 Series) of the un-named perennial tributary to the Taunton River —  
facing south from Route 44.

**Photo 6**



The Banks (B5 and B6 Series) of an un-named intermittent stream—  
facing south from Route 44.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 7**



The Banks (B7 and B8 Series) of the un-named perennial tributary to the Taunton River — facing northwest.

**Photo 8**



Wetland Series 1 BVW after a significant flooding event — facing southeast.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 9**



Wetland Series 2 BVW — facing northeast.

**Photo 10**



Wetland Series 3 BVW after a significant flooding event — facing southwest.

**PHOTOGRAPHIC DOCUMENTATION**

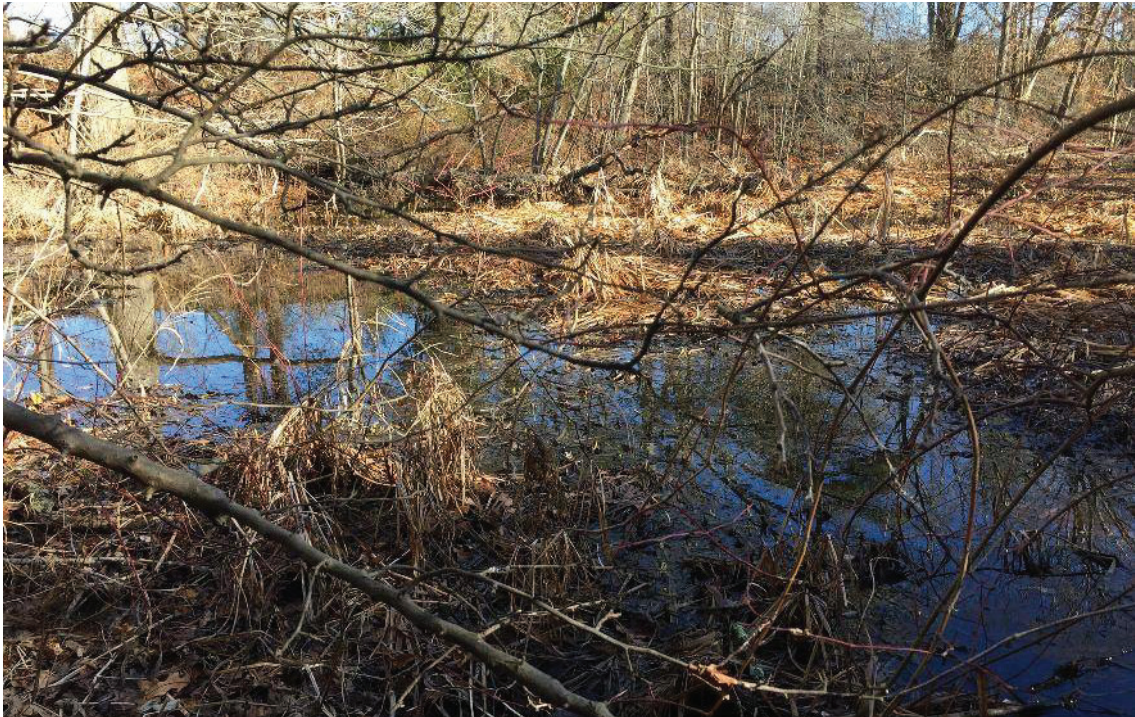
Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 11**



Wetland Series 4 BVW — facing east.

**Photo 12**



Wetland Series 4 BVW — facing north.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 13**



Wetland Series 6 BVW — facing northwest.

**Photo 14**



Wetland Series 7 BVW — facing south.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017



**Photo 15**



Wetland Series 8 BVW — facing southwest.

**PHOTOGRAPHIC DOCUMENTATION**

Dean Street—Route 44

Taunton, Massachusetts

Photographs Documented January 25, January 27 and February 2, 2017





## **Appendix D – Wetland Delineation Report**

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**NOVER-ARMSTRONG ASSOCIATES, INC.**

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 Telephone 508.866.8383  
 Facsimile 508.866.9898

SDO-certified DBE & WBE  
[www.noverarmstrong.com](http://www.noverarmstrong.com)

environmental consultants & engineers

April 12, 2017

James Noyes  
 Vice President/Sr. Project Manager  
 Greenman Pedersen Inc.  
 181 Ballardvale Street, Suite 202  
 Wilmington, MA 01887

Re: Resource Area Boundary Delineation  
**Reconstruction of Dean Street – Route 44**  
**Taunton, Massachusetts**  
 NAA File No: P4205

Dear Mr. Noyes:

In January and February of 2017, Nover-Armstrong Associates, Inc. (Nover-Armstrong) conducted resource area boundary delineations along a segment of Dean Street in Taunton, Massachusetts (the Site). This report describes wetland resource areas Subject to Protection under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131 Section 40 - *the Act*), the Taunton Conservation Ordinance (City of Taunton Ordinances Part II §16-30), the federal Clean Water Act CFR (33 U.S.C. §1251 et seq (1972)), and the Massachusetts Clean Waters Act (MGL Chapter 21 Section 26-53), that exist on the site and methodology used to delineate their boundaries.

### **Site Description**

The Site is located on a portion Dean Street/Cape Road (Route 44) near the Taunton-Raynham town-line in Taunton, Massachusetts. The approximate limits of the Site are Arlington Street at the westerly terminus and the Taunton-Raynham town-line at the easterly terminus. This portion of the roadway generally runs along the Taunton River and crosses a number of culverted streams. The Site also includes a 200-foot segment of Longmeadow Road, extending north from its intersection with Dean Street and a 500-foot segment of the Honorable Gordon M. Owen Riverway, extending south from its intersection with Dean Street (Figure 1). The portion of the Honorable Gordon M. Owen Riverway within with Site boundary includes a bridge over the Taunton River. The roadway is generally surrounded to the residential and commercial development and to the south by commercial development with areas of undeveloped forested wetland and upland adjacent to the River.

According to the USDA Natural Resources Conservation Service – Soil Survey, mapped soils on the Site and in the vicinity of the Site are classified as Windsor loamy sand, Scio silt loam, Raynham Silt Loam, and Pipestone loamy fine sand. Our field work generally confirmed the soil types adjacent to the Taunton banks. The *Custom Soil Resource Report for Bristol County, Massachusetts, Northern Part* is attached.

State jurisdictional resource areas identified on the Site include Bordering Vegetated Wetland (BVW); Bank (to perennial stream); Bank (to intermittent stream); Land Under Water (LUW); Bordering Land Subject to Flooding (BLSF); and Riverfront Area (RA). The MassGIS database was used as the initial step in identifying critical areas on or within proximity of the site that would be examined more closely if construction activities are proposed. The table below describes selected environmentally critical categories as determined through MassGIS.



**Table 1. Selected MassGIS Environmental Data Layers**

Mapped Resource On or Within Proximity to Site	Yes	No
Area of Critical Environmental Concern		✓
NHESP Certified Vernal Pool		✓
NHESP Potential Vernal Pool		✓
NHESP Established Habitat of Rare Wildlife		✓
NHESP Priority Habitat of Rare Species		✓
Outstanding Resource Waters		✓
FEMA Flood Zones	✓	
Surface Water Protection Area		✓
Interim Wellhead Protection Area		✓
Zone II Wellhead Protection Area		✓

Source: MassGIS

### Jurisdictional Wetland Resource Areas – Massachusetts Wetlands Protection Act

Site inspections were conducted by Nover-Armstrong's Wetland Scientists on January 25 and 27, 2017 and February 2, 2017 to identify and delineate the boundary of existing wetland resource areas on the Site and in the immediate vicinity of the Site. Resource area boundaries were identified and delineated in accordance with methods developed by the Massachusetts Department of Environmental Protection's *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act*, dated 1995 (the Act), as well as definitions set forth in the Wetland Regulations, 310 CMR 10.00. Several areas subject to protection under the Act exist on the site and are described below.

#### Bank (to perennial stream) – 310 CMR 10.54

Nover Armstrong identified the resource Bank to perennial stream on the Site in association with the Taunton River and a perennial un-named tributary to the Taunton River.

According to 310 CMR 10.54(2), the definition of a Bank is the portion of the land surface which normally abuts and confines a water body, occurring between a water body and a vegetated bordering wetland and adjacent floodplain, or, in the absence of these, it occurs between a water body and an upland. The upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower.

**Table 2: Bank to Perennial Stream Boundary Description**

Flag Series	Location	Description / Notes
<i>B1 Series</i>  <i>Flags</i> <i>B1-100 to B1-178;</i> <i>B1-289 to B1-353</i>	Northern Bank of Taunton River	The northern Mean Annual High Water (MAHW)/Bank associated with the Taunton River was delineated along the Site, where flow is conveyed westerly along Route 44. In the vicinity of the Site, the Taunton River is approximately 110 feet wide, with an unknown depth. Its Bank is generally vegetated with red maple ( <i>Acer rubrum</i> ), white pine ( <i>Pinus strobus</i> ), Japanese knotweed ( <i>Polygonum cuspidatum</i> ), silky dogwood ( <i>Cornus amomum</i> ), multiflora rose ( <i>rosa multiflora</i> ), Oriental bittersweet ( <i>Celastrus orbiculatus</i> ), and goldenrod ( <i>Solidago spp.</i> ). There are several areas along the Bank that consist of man-made structures, including bridges and retaining walls.
<i>B4 Series</i>  <i>Flags</i> <i>B4-94 to B4-104</i>	Southern Bank of Taunton River	The southern Mean Annual High Water (MAHW)/Bank associated with the Taunton River was delineated where the Honorable Gordon M. Owen Riverway bridge crosses the River. The southern Bank is generally vegetated with red maple, white pine, silky dogwood, multiflora rose, Oriental bittersweet, and upland grasses. The bridge over the Taunton River is located between Bank Flags B4-99 and B4-100, and the Bank between these flags Bridge consists of a sandy un-vegetated slope.



Flag Series	Location	Description / Notes
<i>B2 and B3 Series</i>  <i>Flags</i> <i>B2-100 to B2-114</i> <i>and</i> <i>B3-100 to B3-115</i>	Un-named tributary to the Taunton River	The eastern ( <i>Bank 2</i> ) and western ( <i>Bank 3</i> ) Mean Annual High Water (MAHW)/Banks associated with an unnamed perennial tributary to the Taunton River were delineated. Flow from a 24-inch concrete culvert is conveyed southerly within the 15 to 20-foot-wide, 3-foot-deep, channel until joining the Taunton River. The Riverbed has a sandy substrate covered with small to medium rocks. This stream is connected to the <i>Bank B7/B8</i> stream via a 24-inch culvert carrying water beneath Route 44. The banks are generally vegetated with red maple, white pine, burning bush ( <i>Euonymus alatus</i> ), silky dogwood, multiflora rose, Oriental bittersweet, and green brier ( <i>Smilax rotundifolia</i> ).
<i>B7 and B8 Series</i>  <i>Flags</i> <i>B7-100 to B7-105</i> <i>and</i> <i>B8-100 to B8-106</i>	Un-named tributary to the Taunton River	The eastern ( <i>Bank 7</i> ) and western ( <i>Bank 8</i> ) Mean Annual High Water (MAHW)/Banks associated with an unnamed perennial tributary to the Taunton River were delineated. This segment of the stream flows southerly within a 15-foot-wide, 12-inch-deep, channel to a 24-inch concrete culvert that conveys flow under Route 44. This culvert connects the <i>B7/B8</i> stream to the <i>B2/B3</i> stream. The Riverbed has a sandy substrate. The banks are generally vegetated with American hornbeam ( <i>Carpinus caroliniana</i> ), speckled alder ( <i>Alnus incana</i> ), multiflora rose, and silky dogwood.

Bank (to intermittent stream) – 310 CMR 10.54

Nover Armstrong identified the resource Bank to one (1) un-named intermittent stream in proximity to the Site. Bank to the identified intermittent stream, located within 100 feet of the Site, was delineated in the field with blue flagging.

**Table 3: Bank to Intermittent Stream Boundary Description**

Flag Series	Location	Description / Notes
<i>B5 and B6 Series</i>  <i>Flags</i> <i>B5-100 to B5-109</i> <i>and</i> <i>B6-100 to B6-108</i>	Between BVW WF7 and WF8	<p>The Banks of the un-named intermittent stream were delineated as Bank Series <i>B5</i> (eastern bank) and <i>B6</i> (western bank). A culvert discharges to the stream, which flows within a 6-foot-wide, 2-foot-deep channel until it meets the Taunton River. The Banks are generally vegetated with Japanese knotweed, greenbrier, multiflora rose, and silky dogwood.</p> <p>A wetland, located greater than 100 feet north of Route 44, appears to have an overflow discharge pipe that may convey water under Route 44 and discharge to this stream. If this is the case, the pipe is an intermittent stream under the Act.</p>

Bordering Vegetated Wetland – 310 CMR 10.55

Nover-Armstrong identified eight (8) areas of BVW in proximity to the Site. Due to the Site's geomorphic position in low lying areas adjacent to the Taunton River, many of the identified BVW areas possess hydrophytic vegetation and indicators of hydrology typical of floodplain communities. US Army Corps vegetated wetland boundary delineation field data sheets are attached documenting Nover-Armstrong's observations of evidence of hydrology, soils, and hydrophytic vegetation at specific data plots.

According to 310 CMR 10.55(2), the definition of BVW are freshwater wetlands which border on creeks, Rivers, streams, ponds and lakes and are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The boundary of BVW is the line within which 50% or more of the vegetation community consists of wetland indicator plants and saturated or inundated conditions exist.



**Table 4: BVW Boundary Description**

<b>Flag Series</b>	<b>Location</b>	<b>Description / Notes</b>
<i>WF1 Series</i> <i>Flags WF1-100 to WF1-123</i>	Southeast of the intersection of Route 44 and the Honorable Gordon M. Owen Riverway.	The BVW can be characterized as a broad-leaf deciduous forested floodplain wetland that borders on the northern Bank of the Taunton River. This wetland boundary was established based on evidence of hydrology, including hydric soils, and presence of hydrophytic vegetation.
<i>WF2 Series</i> <i>Flags WF2-100 to WF2-105</i>	Borders on the western Bank ( <i>Bank 3</i> ) of the perennial tributary to the Taunton River, just south of Route 44.	The BVW can be characterized as a sparsely vegetated low-lying area that borders on a perennial stream. This wetland boundary was established based on evidence of hydrology and presence of hydric soils with a matrix color of 10 YR 4/2 within 5 YR 4/6 concentrations at 6". A formal plot was not analyzed for this wetland due to its size and lack of vegetation.
<i>WF3 Series</i> <i>Flags WF3-100 to WF3-107</i>	South of the Taunton River, west of Honorable Gordon M. Owen Riverway	The BVW is hydraulically connected with the Taunton River via an intermittent stream (that was not delineated) that flows away from the Site. The boundary of the wetland is generally coincident with the toe-of-slope associated with the Honorable Gordon M. Owen Riverway roadway. The BVW can be characterized as a broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology and presence of hydrophytic vegetation.
<i>WF4 Series</i> <i>Flags WF4-100 to WF4-114</i>	South of the Taunton River, east of the Honorable Gordon M. Owen Riverway	The BVW borders on an internal intermittent stream that flows into a concrete culvert, discharging to the Taunton River. It can be described as a scrub-shrub wetland with an internal emergent/aquatic wetland. This wetland boundary was established based on evidence of hydrology, hydric soils, and presence of hydrophytic vegetation.
<i>WF5 Series</i> <i>Flags WF5-10 to WF5-106</i>	North of Route 44, bordering on the eastern bank ( <i>B7 Series</i> ) of the perennial tributary to the Taunton River	The BVW borders on <i>Bank B7</i> of the perennial tributary to the Taunton River. The BVW can be characterized as broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology, hydric soils, and presence of hydrophytic vegetation.
<i>WF6 Series</i> <i>Flags WF6-100 to WF6-106</i>	North of Route 44, bordering on the western bank ( <i>B8 Series</i> ) of the perennial tributary to the Taunton River	The BVW borders on <i>Bank B8</i> of the perennial tributary to the Taunton River. The BVW can be characterized as a broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology, hydric soils, and presence of hydrophytic vegetation. A formal plot was not analyzed for this wetland due to its similarity to the <i>WF5 Series</i> wetland.
<i>WF7 Series</i> <i>Flags WF7-100 and WF7-110</i>	South of Route 44, bordering on the Taunton River and the <i>B6 Series</i> intermittent stream	The BVW borders on the northern bank of the Taunton River and the <i>B5/B6 Series</i> intermittent stream. The BVW can be characterized as a broad-leaf deciduous forested floodplain wetland. Wetland flag WF7-110 ties to the bank of the Taunton River. This wetland boundary was established based on evidence of hydrology, including soil indicators. A formal plot was not analyzed for this wetland due to its similarity to the <i>WF1 Series</i> wetland.



Flag Series	Location	Description / Notes
<i>WF8 Series</i> <i>Flags WF8-100 to WF8-109</i>	South of Route 44, bordering on the Taunton River and the <i>B5 Series</i> intermittent stream	The BVW borders on the northern bank of the Taunton River and the <i>B5/B6 Series</i> intermittent stream. The BVW can be characterized as a broad-leaf deciduous forested floodplain wetland. This wetland boundary was established based on evidence of hydrology, including soil indicators. A formal plot was not analyzed for this wetland due to its similarity to the <i>WF1 Series</i> wetland.

#### Land Under Water – 310 CMR 10.56

According to 310 CMR 10.56(2), the definition of LUW is the land beneath any creek, river, stream, pond or lake and may be composed of organic muck or peat, fine sediments, rocks or bedrock. LUW exists between the Bank boundaries below the mean annual low water levels of the Taunton River, the perennial tributary to the Taunton River, and all flagged un-named intermittent streams. The boundary of LUW is the mean annual low water level.

#### Bordering Land Subject to Flooding– 310 CMR 10.57

According to the July 16, 2015 FEMA Flood Insurance Rate Map (FIRM) Number 25005C0164G, portions of the Site are located within either FEMA Flood Zone AE, with base flood elevations (BFE) ranging from 12 to 13. Work conducted below the BFE is Subject to Jurisdiction under the Act.

#### Riverfront Area – 310 CMR 10.58

According to its definition at 310 CMR 10.58(3), the boundary of RA is the area of land between a River's mean annual high-water line measured horizontally outward from the River and a parallel line located 200 feet away.

The Taunton River and the unnamed tributary are perennial streams (Rivers), as defined under the Act, with an associated 200 foot RA from the MAHW boundary. A River is any natural flowing body of water that empties to any ocean, lake, pond, or other River flowing throughout the year and is shown as perennial on the current United States Geological Survey or more recent map provided by the Department. The MAHW boundary on the Site is coincident with the bank boundary and therefore, RA should be measured 200 feet horizontally from the bank flags, where adjacent to the rivers.

#### **Jurisdictional Wetland Resource Areas – City of Taunton**

The City of Taunton Wetlands Protection Ordinance protects additional wetland resource areas, including all vegetated wetlands and vernal pools, regardless of their certification status and location with respect to Areas Subject to Protection under *the Act*.

No isolated vegetated wetlands or potential vernal pools were observed within 100 feet of the Site, therefore no additional resource areas only protected under the Ordinance affect the jurisdictional areas on the Site.

#### **Jurisdictional Wetland Resource Areas – Federal Clean Water Act (Section 404)**

The wetlands, intermittent streams, and perennial streams located on the Site are “waters of the United States,” and are therefore subject to the federal Clean Water Act, 33 U.S.C. §1251 et seq (1972). The boundary to “waters of the United States” is the vegetated wetlands boundary, or, in the absence of vegetated wetlands, is the Ordinary High Water Mark (OHWM) for non-tidal rivers and streams, as specified at 33 CFR §328.4.

According to 33 CFR §328.3(c)(4), vegetated wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” The wetland boundaries previously described in this report were delineated in accordance



with this definition. US Army Corps vegetated wetland boundary delineation field data sheets are attached documenting Nover-Armstrong's observations of evidence of hydrology, soils, and hydrophytic vegetation at specific data plots. The OHWM, as defined at 33 CFR §328.3(c)(6), is not delineated in the field at this time.

Work conducted below the boundary of vegetated wetlands or OHWM is Subject to Jurisdiction under Section 404 of the Clean Water Act.

#### **Jurisdictional Wetland Resource Areas – Massachusetts Clean Waters Act (Section 401)**

The limit of jurisdiction under Massachusetts Clean Waters Act (Section 401), as specified in 314 CMR 9.00, is the limit of Section 404 jurisdiction under the federal Clean Water Act. Exceedances of the jurisdictional threshold under 314 CMR 9.00 require filing for a Water Quality Certification under Section 401.

#### **Findings and Recommendations**

Nover-Armstrong has identified areas Subject to Protection and/or Jurisdiction under the Massachusetts Wetlands Protection Act, the Taunton Conservation Ordinance, the federal Clean Water Act, and the Massachusetts Clean Waters Act, on or within 100 feet of the Site and have delineated the boundaries of Bank and BVW that exist on the Site. In order to definitely determine the extent of Conservation Commission jurisdiction, Army Corps jurisdiction, and MassDEP jurisdiction, the boundary flags would need to be located by instrument survey and depicted on a to-scale plan of the site.

We appreciate the opportunity to provide you with expert wetland services. If you have any questions or need further assistance, please do not hesitate to call us.

Sincerely

**Nover-Armstrong Associates, Inc.**



Laura Krause  
Environmental Scientist



Ruth M. Geoffroy  
Dir. of Environmental Permitting and Planning

Attachments:           Figure 1 - Site Locus  
                                Figure 2 - Environmental Resources Map  
                                Figure 3 - FEMA FIRMette  
                                Photographic Documentation  
                                USACE Bordering Vegetated Wetland Delineation Field Data Forms  
                                Custom Soil Report for Bristol County, Massachusetts, Northern Part





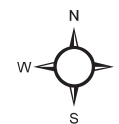
NOVER-ARMSTRONG ASSOCIATES, INC.



**Figure 1**  
**Site Locus**

**Legend**

 **Approximate Site Locus**

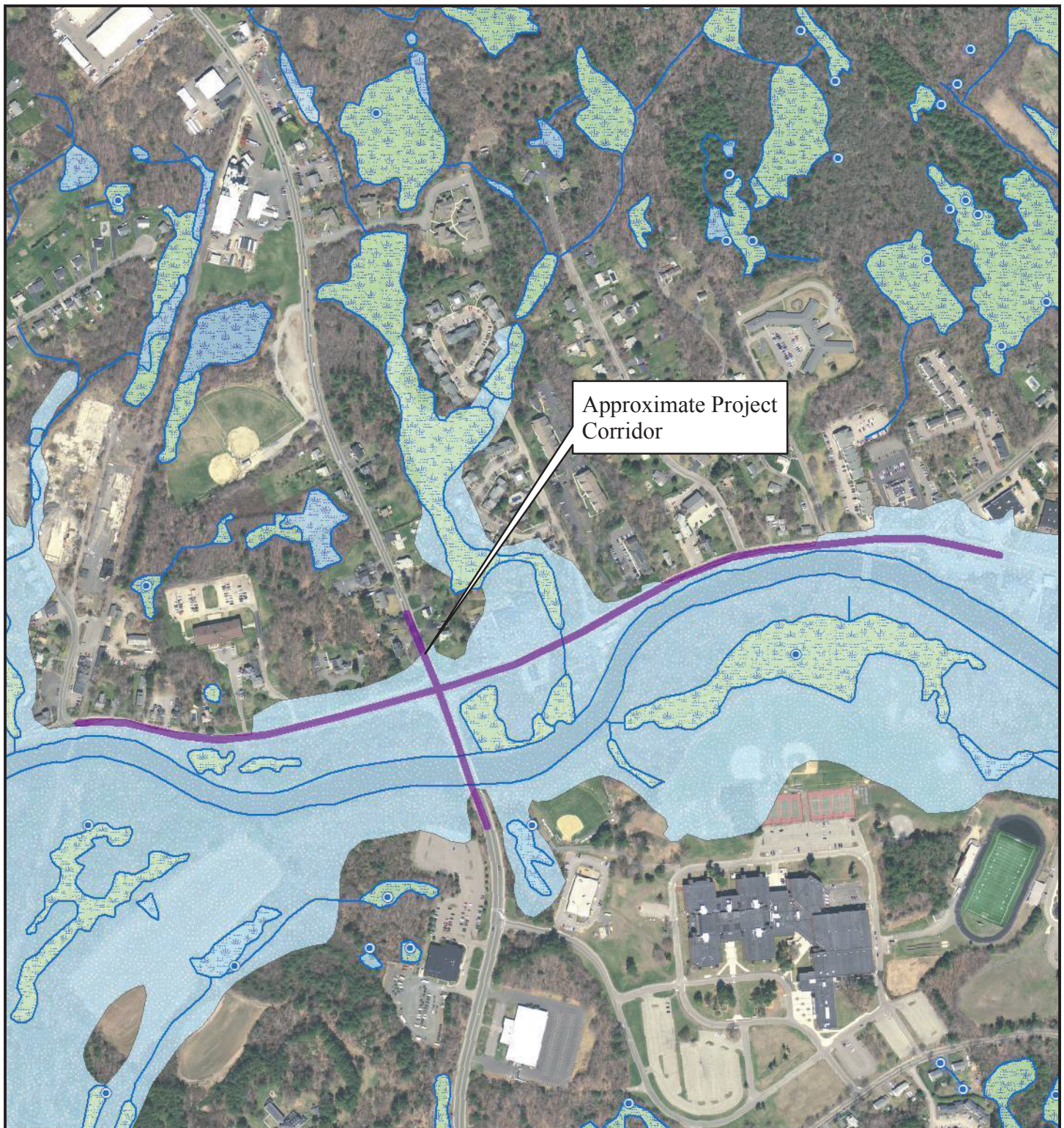


0 1,000 2,000  
Feet

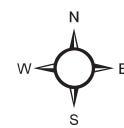
1 inch = 1,000 feet

Data Source: MassGIS USGS Topographic Maps (2009)





NOVER-ARMSTRONG ASSOCIATES, INC.



0 600 1,200  
Feet

1 inch = 600 feet

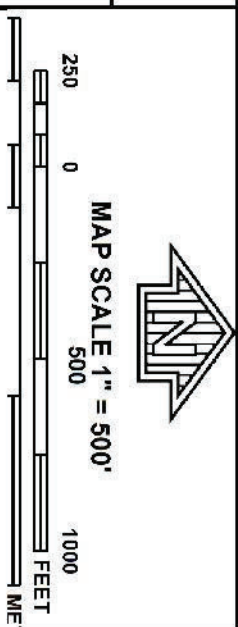
**Figure 2**  
**Wetland Resources**

**Legend**

- Approximate Project Corridor
- MassDEP Hydrologic Feature
- Marsh/Bog
- Wooded marsh
- NHESP Potential Vernal Pool
- NHESP Certified Vernal Pool
- NHESP Priority Habitat of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- Area of Critical Environmental Concern (ACEC)
- National Flood Hazard Layer Flood Zones
- AE; A

Data Source: MassGIS USGS Color Ortho Imagery (2014), MassDEP Wetlands (1:12000) (2009), NHESP Potential Vernal Pools (2000), NHESP Certified Vernal Pools, NHESP Priority Habitats of Rare Species (2008), NHESP Estimated Habitats of Rare Species (2008), Areas of Critical Environmental Concern (2009), FEMA National Flood Hazard Layer (2014).





**NEP**

PANEL 0164G

**FIRM**

**FLOOD INSURANCE RATE MAP**  
**Bristol County,**  
**Massachusetts**  
**(ALL JURISDICTIONS)**

**PANEL 164 OF 550**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RAYNHAM, TOWN OF	250061	0184	G
TAUNTON, CITY OF	250088	0184	G

**Notice to User:** The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

U.S. DEPARTMENT OF  
HOMELAND SECURITY



MAP NUMBER  
25005C0164G  
MAP REVISED  
JULY 16, 2015



**Federal Emergency Management Agency**

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton - Dean Street (Rt 44) City/County: Taunton Sampling Date: 1/25/2017  
 Applicant/Owner: GPI / MassDOT State: MA Sampling Point: WFI-109  
 Investigator(s): Laura Krause, Caitlin Nover Section, Township, Range: Bristol County  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none):  
 Slope (%): \_\_\_\_\_ Lat: 41.90396°N Long: 71.67560°W Datum: NAD83  
 Soil Map Unit Name: Raynham silt loam, 0 to 3 % slopes NWI classification: PFO1/4B  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Hydric Soil Present? Yes _____ No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
This wetland is hydraulically connected to the Taunton River. The northern portion of the WFI series BW (adjacent to Rt. 44) appears to flood regularly and was inundated during this investigation.

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators (minimum of one is required; check all that apply)</b> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input checked="" type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>4"</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: <u>This wetland series may contain a vernal pool, however, the area appears to flood regularly, which may make the area not viable as a vernal pool.</u>		



WFI-109

**VEGETATION** – Use scientific names of plants.Sampling Point: Wetland

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>red maple (Acer rubrum)</u>	<u>63.0</u>	<u>yes</u>	<u>FAC</u>
2. <u>white pine (Pinus strobus)</u>	<u>3.0</u>	<u>no</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>69.0</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>highbush blueberry (Vaccinium corymbosum)</u>	<u>10.5</u>	<u>no</u>	<u>FACW</u>
2. <u>spicebush (Lindera benzoin)</u>	<u>38.0</u>	<u>yes</u>	<u>FACU</u>
3. <u>multiflora rose (Rosa multiflora)</u>	<u>10.5</u>	<u>no</u>	<u>FACU</u>
4. <u>red maple (Acer rubrum)</u>	<u>10.5</u>	<u>no</u>	<u>FAC</u>
5. <u>burning bush (Euonymus alatus)</u>	<u>3.0</u>	<u>no</u>	<u>UPL</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>72.5</u> = Total Cover			
Herb Stratum (Plot size: <u>5 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>cinnamon fern (Osmunda cinnamomea)</u>	<u>20.5</u>	<u>yes</u>	<u>FACW</u>
2. <u>sensitive fern (Onoclea sensibilis)</u>	<u>3.0</u>	<u>no</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
<u>23.5</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>poison ivy (Toxicodendron radicans)</u>	<u>3.0</u>	<u>yes</u>	<u>FAC</u>
2. <u>oriental bittersweet (Celastrus orbiculatus)</u>	<u>10.5</u>	<u>yes</u>	<u>UPL</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>13.5</u> = Total Cover			

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

\_\_\_\_ Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is >50%

\_\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No \_\_\_\_\_







## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton, Dean Street (Rt. 44) City/County: Taunton Sampling Date: 11/25/2017  
 Applicant/Owner: GPI / Mass DOT State: MA Sampling Point: WFI-109 *upland*  
 Investigator(s): Laura Krause, Caitlin Dover Section, Township, Range: Bristol County  
 Landform (hillslope, terrace, etc.): Roadway right-of-way Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90396°N Long: 71.07560°W Datum: WGS 84  
 Soil Map Unit Name: Scio silt loam, 0 to 3% slopes NWI classification: N1A  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No ☒  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
wetland series 1 boundary follows the toe-of-slope of Route 44. The roadway appears to alter hydrology in the area and vegetation within the roadway layout appears to be maintained

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		<b>Secondary Indicators (minimum of two required)</b>	
<u>Primary Indicators (minimum of one is required; check all that apply)</u>			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

<b>Field Observations:</b>		<b>Wetland Hydrology Present?</b> Yes _____ No <input checked="" type="checkbox"/>
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water Table Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION** – Use scientific names of plants.Sampling Point: WFI-109  
upland

Tree Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>red maple (Acer rubrum)</u>	<u>38.0</u>	<u>yes</u>	<u>FACW</u>
2. <u>white oak (Quercus alba)</u>	<u>38.0</u>	<u>yes</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

76.0 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>burning bush (Euonymus alatus)</u>	<u>38.0</u>	<u>yes</u>	<u>UPL</u>
2. <u>silky dogwood (Cornus amomum)</u>	<u>10.5</u>	<u>no</u>	<u>FACW</u>
3. <u>multiflora rose (Rosa multiflora)</u>	<u>20.5</u>	<u>yes</u>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

69.0 = Total Cover

Herb Stratum (Plot size: <u>5 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>upland grasses</u>	<u>3.0</u>	<u>yes</u>	<u>UPL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

3.0 = Total Cover

Woody Vine Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>oriental bittersweet (Celastrus orbiculatum)</u>	<u>38.0</u>	<u>yes</u>	<u>UPL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

38.0 = Total Cover

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 16.6% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

\_\_\_ Rapid Test for Hydrophytic Vegetation

\_\_\_ Dominance Test is >50%

\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Most ground vegetation was maintained. The groundcover primarily consisted of leaf + twig material







## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton, Dean St (Rt. 44) City/County: Taunton Sampling Date: 1/25/2017  
 Applicant/Owner: GPT / Mass DOT State: MA Sampling Point: WF3-107  
 Investigator(s): Laura Krause, Caitlin Nover Section, Township, Range: Bristol county wetland  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90275° N Long: 71.07579° W Datum: WGS84  
 Soil Map Unit Name: Pipestone loamy fine sand, 0 to 3% slopes NWI classification: Not mapped  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation ☒, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No ☒  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

This wetland was sparsely vegetated with many dead trees. Live vegetation consisted mostly of vine vegetation

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>3"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>3"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



## VEGETATION – Use scientific names of plants.

WF3-107  
Sampling Point: Wetland

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u># See remarks</u>			
2.			
3.			
4.			
5.			
6.			
7.			
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>multiflora rose (Rosa multiflora)</u>	<u>20.5</u>	<u>yes</u>	<u>FACU</u>
2.			
3.			
4.			
5.			
6.			
7.			
_____ = Total Cover			
Herb Stratum (Plot size: <u>5 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>green brier (Smilax rotundifolia)</u>	<u>10.5</u>	<u>yes</u>	<u>FAC</u>
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>green brier (Smilax rotundifolia)</u>	<u>38.0</u>	<u>yes</u>	<u>FAC</u>
2. <u>riverbank grape (Vitis riparia)</u>	<u>20.5</u>	<u>yes</u>	<u>FAC</u>
3.			
4.			
_____ = Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

\_\_\_\_ Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is >50%

\_\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

Trees within the wetland were primarily dead.



WF3-107  
Sampling Point: Wetland

[illegible]



## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton - Route 44 (Dean St) City/County: Taunton Sampling Date: 11/25/2017  
 Applicant/Owner: GPI / MassDOT State: MA Sampling Point: WF3-107 upland  
 Investigator(s): Laura Krause, Caitlin Nover Section, Township, Range: Bristol County  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90275° N Long: 71.07579° W Datum: WGS 84  
 Soil Map Unit Name: Pipestone loamy fine sand, 0 to 37% slopes NWI classification: n1a  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No ☒  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) The upland plot is located within the roadway layout, so the soil and vegetation were significantly disturbed. The roadway at Aug 3-107 was ~ 10 feet higher in elevation than the wetland boundary.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		<b>Secondary Indicators (minimum of two required)</b>	
<b>Primary Indicators (minimum of one is required; check all that apply)</b>			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	
<b>Field Observations:</b>			
Surface Water Present? Yes _____ No _____	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes _____ No <input checked="" type="checkbox"/>	
Water Table Present? Yes _____ No _____	Depth (inches): _____		
Saturation Present? Yes _____ No _____	Depth (inches): _____		
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			



**VEGETATION – Use scientific names of plants.**Sampling Point: WF3-107  
upland

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
				_____ = Total Cover
<b>Sapling/Shrub Stratum</b> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
				_____ = Total Cover
<b>Herb Stratum</b> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
				_____ = Total Cover
<b>Woody Vine Stratum</b> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
				_____ = Total Cover

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: \_\_\_\_\_ (A)

Total Number of Dominant Species Across All Strata: \_\_\_\_\_ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: \_\_\_\_\_ (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

**Hydrophytic Vegetation Indicators:**

\_\_\_ Rapid Test for Hydrophytic Vegetation

\_\_\_ Dominance Test is >50%

\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation was not observed within the upland plot







## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton, Dean Street (Rt 44) City/County: Taunton Sampling Date: 1/25/2017  
 Applicant/Owner: Greenman-Pedersen, Inc. / MassDOT State: MA Sampling Point: WF4-112  
 Investigator(s): Laura Krause, Caitlin Nover Section, Township, Range: Bristol County Wetland  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90251°N Long: 71.07492°W Datum: WGS 84  
 Soil Map Unit Name: Ripstone loamy fine sand, 0 to 3 % slopes NWI classification: PEM1E  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
 wetland 4 can generally be described as a palustrine emergent wetland with a scrub-shrub fringe. This wetland is hydraulically connected to the Taunton River via an 18" culvert. This wetland borders an internal intermittent stream that was not flagged in the field. It should be noted that the culvert connecting the I.S. to the Taunton River is a stream per the WPA.

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators (minimum of one is required; check all that apply)</b> _____ Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ High Water Table (A2) <input checked="" type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Marl Deposits (B15) <input checked="" type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) <input checked="" type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) <input checked="" type="checkbox"/> Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		<b>Secondary Indicators (minimum of two required)</b> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: A stream flows through this wetland series.		



## VEGETATION – Use scientific names of plants.

WF4-11Z  
Sampling Point: Wetland

Tree Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>red maple (Acer rubrum)</u>	<u>38.0</u>	<u>yes</u>	<u>FAC</u>
2. <u>white pine (Pinus strobus)</u>	<u>10.5</u>	<u>yes</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>48.5</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>sweet pepperbush (Clethra alnifolia)</u>	<u>63.0</u>	<u>yes</u>	<u>FAC</u>
2. <u>spicebush (Lindera benzoin)</u>	<u>38.0</u>	<u>yes</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>101.0</u> = Total Cover			
Herb Stratum (Plot size: <u>5 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>cinnamon fern (Osmunda cinnamomea)</u>	<u>10.5</u>	<u>yes</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
<u>10.5</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>green briar (Smilax rotundifolia)</u>	<u>10.5</u>	<u>yes</u>	<u>FAC</u>
2. <u>oriental bittersweet (Celastrus orbiculatus)</u>	<u>3.0</u>	<u>yes</u>	<u>UPL</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>13.5</u> = Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

\_\_\_\_ Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is >50%

\_\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)







## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton, Dean Street (Rt. 44) City/County: Taunton Sampling Date: 1/25/2017  
 Applicant/Owner: GPI / MassDOT State: MA Sampling Point: W F4-112 upland  
 Investigator(s): Laura Krause, Caitlin Naver Section, Township, Range: Bristol County  
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90251° N Long: 71.07492° W Datum: WGS 84  
 Soil Map Unit Name: Pipestone loamy fine sand, 0 to 3% slopes NWI classification: n/a  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No ☒  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>upland plot is located on the slope up to the roadway.</u>	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		<b>Secondary Indicators (minimum of two required)</b>
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b>		
Surface Water Present? Yes _____ No _____ Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Water Table Present? Yes _____ No _____ Depth (inches): _____		
Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



WF4-112

**VEGETATION** – Use scientific names of plants.Sampling Point: upland

Tree Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>red oak (Quercus rubra)</u>	<u>20.5</u>	<u>yes</u>	<u>FACU</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>7</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>42.8 %</u> (A/B)
2. <u>red maple (Acer rubrum)</u>	<u>38.0</u>	<u>yes</u>	<u>FAC</u>	
3. <u>white pine (Pinus strobus)</u>	<u>20.5</u>	<u>yes</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>79.0</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>15 feet</u>)</b>				
1. <u>spice bush (Lindera benzoin)</u>	<u>20.5</u>	_____	<u>FACW</u>	
2. <u>silky dogwood (Cornus amomum)</u>	<u>10.5</u>	_____	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>31.0</u> = Total Cover				
<b>Herb Stratum (Plot size: <u>5 feet</u>)</b>				
1. <u>white pine (Pinus strobus)</u>	<u>10.5</u>	<u>yes</u>	<u>FACU</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>10.5</u> = Total Cover				
<b>Woody Vine Stratum (Plot size: <u>30 feet</u>)</b>				
1. <u>oriental bittersweet (celastrum orbiculatus)</u>	<u>38.0</u>	<u>yes</u>	<u>UPL</u>	<b>Definitions of Vegetation Strata:</b>  <b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>38.0</u> = Total Cover				
<b>Hydrophytic Vegetation Present?</b> Yes _____ No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				







## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton - Dean Street (Rt. 44) City/County: Taunton Sampling Date: 11/27/2017  
 Applicant/Owner: GPT / MassDOT State: MA Sampling Point: WF5-101  
 Investigator(s): Laura Krause, Caitlin Nover Section, Township, Range: Bristol county  
 Landform (hillslope, terrace, etc.): roadside Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90514° N Long: 71.07416° W Datum: WGS84  
 Soil Map Unit Name: Raynham silt loam, 0 to 3 to slopes NWI classification: PF01C  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
wetland 5 is generally a forested wetland bordering on a perennial tributary to the Taunton River. wetland 5 borders on the B7 Bank series.

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		<b>Secondary Indicators (minimum of two required)</b>
<b>Primary Indicators (minimum of one is required; check all that apply)</b>		
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b>		
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water Table Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0"</u>	
(includes capillary fringe)		<b>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</b>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



## VEGETATION – Use scientific names of plants.

Sampling Point: WF5-101  
Wetland

Tree Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>silver maple (Acer saccharinum)</u>	<u>38.0</u>	<u>yes</u>	<u>FACW</u>
2. <u>red maple (Acer rubrum)</u>	<u>10.5</u>	<u>yes</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>48.5</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>elderberry (Sambucus nigra)</u>	<u>20.5</u>	<u>no</u>	<u>FACW</u>
2. <u>silky dogwood (Cornus amomum)</u>	<u>85.0</u>	<u>yes</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>105.5</u> = Total Cover			
Herb Stratum (Plot size: <u>5 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>sensitive fern (Onoclea sensibilis)</u>	<u>20.5</u>	<u>yes</u>	<u>FACW</u>
2. <u>common rush (Juncus effusus)</u>	<u>20.5</u>	<u>yes</u>	<u>OBL</u>
3. <u>sphagnum moss</u>	<u>10.5</u>	<u>yes</u>	<u>OBL</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
<u>51.5</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>grape (Vitis riparia)</u>	<u>10.5</u>	<u>yes</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>10.5</u> = Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

**Hydrophytic Vegetation Indicators:**

\_\_\_\_ Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is >50%

\_\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)







## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Taunton- Dean Street (Rt. 44) City/County: Taunton Sampling Date: 1/27/2017  
 Applicant/Owner: GPI / Mass DOT State: MA Sampling Point: WF5-101 upland  
 Investigator(s): Laura Krause, Caitlin Nover Section, Township, Range: Bristol County  
 Landform (hillslope, terrace, etc.): Roadside w/in floodplain Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.90511°N Long: 71.67397°W Datum: WGS 84  
 Soil Map Unit Name: Scio silt loam, 0 to 3% slopes NWI classification: n/a  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation ☒, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No ☒  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Hydric Soil Present? Yes _____ No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No _____	
Remarks: (Explain alternative procedures here or in a separate report.) <u>The wetland series 5 upland plot is located adjacent to the roadway layout. Some vegetation maintenance has been performed in the area.</u>	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		<b>Secondary Indicators (minimum of two required)</b>
<b>Primary Indicators (minimum of one is required; check all that apply)</b>		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b>		
Surface Water Present? Yes _____ No _____	Depth (inches): _____	
Water Table Present? Yes _____ No _____	Depth (inches): _____	
Saturation Present? Yes _____ No _____	Depth (inches): _____	
(includes capillary fringe)		<b>Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/></b>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



## VEGETATION – Use scientific names of plants.

Sampling Point: WF5-101  
upland

Tree Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>crab apple (Malus coronaria)</u>	<u>20.5</u>	<u>yes</u>	<u>UPL</u>
2. <u>silver maple (Acer saccharinum)</u>	<u>63.0</u>	<u>yes</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>83.5</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>multiflora rose (Rosa multiflora)</u>	<u>38.0</u>	<u>yes</u>	<u>FACU</u>
2. <u>crab apple (Malus coronaria)</u>	<u>20.5</u>	<u>yes</u>	<u>UPL</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>58.5</u> = Total Cover			
Herb Stratum (Plot size: <u>5 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>* none present</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>oriental bittersweet (Celastrus orbiculatus)</u>	<u>63.0</u>	<u>yes</u>	<u>UPL</u>
2. <u>multiflora rose (Rosa multiflora)</u>	<u>10.5</u>	<u>no</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>73.5</u> = Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____
Prevalence Index = B/A = _____	

**Hydrophytic Vegetation Indicators:**

\_\_\_\_ Rapid Test for Hydrophytic Vegetation

\_\_\_\_ Dominance Test is >50%

\_\_\_\_ Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

\* No ground vegetation was present within the plot area. Ground cover consisted of leaf + twig material.









United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for **Bristol County, Massachusetts, Northern Part**



October 18, 2016



# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

---

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the



## Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.



## Soil Map

---

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.























Custom Soil Resource Report  
Soil Map





MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Area of Interest (AOI)		Stony Spot
<b>Soils</b>			Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
<b>Special Point Features</b>		<b>Water Features</b>	
	Blowout		Streams and Canals
	Borrow Pit	<b>Transportation</b>	
	Clay Spot		Rails
	Closed Depression		Interstate Highways
	Gravel Pit		US Routes
	Gravelly Spot		Major Roads
	Landfill		Local Roads
	Lava Flow		Aerial Photography
	Marsh or swamp		
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bristol County, Massachusetts, Northern Part  
Survey Area Data: Version 8, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2011—Apr 8, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Custom Soil Resource Report

## Map Unit Legend

Bristol County, Massachusetts, Northern Part (MA602)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	13.8	6.1%
9A	Birdsall silt loam, 0 to 3 percent slopes	15.7	6.9%
30A	Raynham silt loam, 0 to 3 percent slopes	45.3	19.9%
38A	Pipestone loamy fine sand, 0 to 3 percent slopes	16.3	7.2%
43A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	2.8	1.2%
52A	Freetown muck, 0 to 1 percent slopes	1.6	0.7%
223A	Scio silt loam, 0 to 3 percent slopes	55.8	24.5%
230A	Unadilla very fine sandy loam, 0 to 3 percent slopes	4.2	1.9%
230B	Unadilla very fine sandy loam, 3 to 8 percent slopes	2.7	1.2%
255A	Windsor loamy sand, 0 to 3 percent slopes	16.2	7.1%
255B	Windsor loamy sand, 3 to 8 percent slopes	9.2	4.0%
256A	Deerfield loamy sand, 0 to 3 percent slopes	22.1	9.7%
602	Urban land	21.9	9.6%
<b>Totals for Area of Interest</b>		<b>227.6</b>	<b>100.0%</b>

## 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



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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 given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of



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the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.



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## Bristol County, Massachusetts, Northern Part

### 1—Water

#### Map Unit Setting

*National map unit symbol:* 997q  
*Frost-free period:* 120 to 200 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Water:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### 9A—Birdsall silt loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 997p  
*Mean annual precipitation:* 45 to 54 inches  
*Mean annual air temperature:* 43 to 54 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Birdsall and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Birdsall

##### Setting

*Landform:* Depressions  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Soft coarse-silty lacustrine deposits over hard coarse-silty lacustrine deposits

##### Typical profile

*H1 - 0 to 7 inches:* silt loam  
*H2 - 7 to 21 inches:* silt loam  
*H3 - 21 to 60 inches:* very fine sandy loam

##### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Very poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 0 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent



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*Available water storage in profile:* Very high (about 12.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* C/D

*Hydric soil rating:* Yes

### Minor Components

#### Raynham

*Percent of map unit:* 10 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

#### Swansea

*Percent of map unit:* 10 percent

*Landform:* Bogs

*Hydric soil rating:* Yes

## 30A—Raynham silt loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 998w

*Elevation:* 50 to 500 feet

*Mean annual precipitation:* 45 to 54 inches

*Mean annual air temperature:* 43 to 54 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Raynham and similar soils:* 70 percent

*Minor components:* 30 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Raynham

#### Setting

*Landform:* Depressions

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Coarse-silty lacustrine deposits

#### Typical profile

*H1 - 0 to 4 inches:* silt loam

*H2 - 4 to 23 inches:* silt loam

*H3 - 23 to 60 inches:* silt loam

#### Properties and qualities

*Slope:* 0 to 3 percent



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*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 0 to 24 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Available water storage in profile:* High (about 11.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w  
*Hydrologic Soil Group:* C/D  
*Hydric soil rating:* Yes

### Minor Components

#### Birdsall

*Percent of map unit:* 10 percent  
*Landform:* Depressions  
*Hydric soil rating:* Yes

#### Walpole variant

*Percent of map unit:* 10 percent  
*Landform:* Terraces  
*Hydric soil rating:* Yes

#### Amostown

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

#### Scio

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

## 38A—Pipestone loamy fine sand, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 998t  
*Elevation:* 600 to 1,000 feet  
*Mean annual precipitation:* 45 to 54 inches  
*Mean annual air temperature:* 43 to 54 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Pipestone and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*



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### Description of Pipestone

#### Setting

*Landform:* Terraces

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Loose sandy glaciofluvial deposits

#### Typical profile

*H1 - 0 to 8 inches:* loamy sand

*H2 - 8 to 23 inches:* fine sand

*H3 - 23 to 60 inches:* fine sand

#### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Poorly drained

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (6.00 to 20.00 in/hr)

*Depth to water table:* About 6 to 18 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 4.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* A/D

*Hydric soil rating:* Yes

### Minor Components

#### Deerfield

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

#### Scarboro

*Percent of map unit:* 5 percent

*Landform:* Terraces

*Hydric soil rating:* Yes

#### Wareham

*Percent of map unit:* 5 percent

*Landform:* Terraces

*Hydric soil rating:* Yes



Custom Soil Resource Report

## **43A—Scarboro mucky fine sandy loam, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2svky

*Elevation:* 0 to 1,320 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 250 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Scarboro and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Scarboro**

#### **Setting**

*Landform:* Outwash deltas, depressions, outwash terraces, drainageways

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope, tread, dip

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Sandy glaciofluvial deposits derived from schist and/or sandy glaciofluvial deposits derived from gneiss and/or sandy glaciofluvial deposits derived from granite

#### **Typical profile**

*Oe - 0 to 3 inches:* mucky peat

*A - 3 to 11 inches:* mucky fine sandy loam

*Cg1 - 11 to 21 inches:* sand

*Cg2 - 21 to 65 inches:* gravelly coarse sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Very poorly drained

*Runoff class:* Negligible

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.42 to 14.17 in/hr)

*Depth to water table:* About 0 to 2 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water storage in profile:* Low (about 4.7 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* A/D



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*Hydric soil rating:* Yes

### Minor Components

#### Swansea

*Percent of map unit:* 10 percent

*Landform:* Bogs, swamps

*Landform position (three-dimensional):* Dip

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Wareham

*Percent of map unit:* 5 percent

*Landform:* Depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Walpole

*Percent of map unit:* 5 percent

*Landform:* Depressions, outwash plains, outwash terraces, deltas, depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread, dip, talf

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## 52A—Freetown muck, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* 2t2q9

*Elevation:* 0 to 1,110 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of unique importance

### Map Unit Composition

*Freetown and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Freetown

#### Setting

*Landform:* Bogs, depressions, depressions, kettles, marshes, swamps

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread, dip

*Down-slope shape:* Concave

*Across-slope shape:* Concave



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*Parent material:* Highly decomposed organic material

### Typical profile

*Oe - 0 to 2 inches:* mucky peat

*Oa - 2 to 79 inches:* muck

### Properties and qualities

*Slope:* 0 to 1 percent

*Percent of area covered with surface fragments:* 0.0 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Very poorly drained

*Runoff class:* Negligible

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high  
(0.14 to 14.17 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* Frequent

*Available water storage in profile:* Very high (about 19.2 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* B/D

*Hydric soil rating:* Yes

### Minor Components

#### Scarboro

*Percent of map unit:* 5 percent

*Landform:* Depressions, drainageways

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope, tread, dip

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Whitman

*Percent of map unit:* 5 percent

*Landform:* Depressions, drainageways

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Swansea

*Percent of map unit:* 5 percent

*Landform:* Depressions, kettles, marshes, swamps, bogs, depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Tread, dip

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes



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## **223A—Scio silt loam, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9992

*Elevation:* 100 to 1,000 feet

*Mean annual precipitation:* 45 to 54 inches

*Mean annual air temperature:* 43 to 54 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* All areas are prime farmland

### **Map Unit Composition**

*Scio and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Scio**

#### **Setting**

*Landform:* Lake plains

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Soft coarse-silty glaciolacustrine deposits

#### **Typical profile**

*H1 - 0 to 8 inches:* silt loam

*H2 - 8 to 26 inches:* silt loam

*H3 - 26 to 66 inches:* stratified very gravelly sand to silt loam

#### **Properties and qualities**

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Moderately well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* About 18 to 24 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Moderate (about 8.7 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* B/D

*Hydric soil rating:* No



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**Minor Components**

**Raynham**

*Percent of map unit:* 10 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

**Unadilla**

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

**230A—Unadilla very fine sandy loam, 0 to 3 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 9997

*Elevation:* 600 to 1,800 feet

*Mean annual precipitation:* 45 to 54 inches

*Mean annual air temperature:* 43 to 54 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Unadilla and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Unadilla**

**Setting**

*Landform:* Lake plains

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Soft coarse-silty glaciolacustrine deposits

**Typical profile**

*H1 - 0 to 7 inches:* very fine sandy loam

*H2 - 7 to 28 inches:* very fine sandy loam

*H3 - 28 to 60 inches:* loamy very fine sand

**Properties and qualities**

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None



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*Available water storage in profile:* Moderate (about 7.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 1

*Hydrologic Soil Group:* B

*Hydric soil rating:* No

### Minor Components

#### Scio

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

#### Agawam

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### Amostown

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

## 230B—Unadilla very fine sandy loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 9998

*Elevation:* 600 to 1,800 feet

*Mean annual precipitation:* 45 to 54 inches

*Mean annual air temperature:* 43 to 54 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Unadilla and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Unadilla

#### Setting

*Landform:* Lake plains

*Landform position (two-dimensional):* Shoulder

*Landform position (three-dimensional):* Riser

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Soft coarse-silty glaciolacustrine deposits

#### Typical profile

*H1 - 0 to 7 inches:* very fine sandy loam

*H2 - 7 to 28 inches:* very fine sandy loam

*H3 - 28 to 60 inches:* loamy very fine sand



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### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Moderate (about 7.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2e

*Hydrologic Soil Group:* B

*Hydric soil rating:* No

### Minor Components

#### Agawam

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

#### Amostown

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

#### Scio

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

## 255A—Windsor loamy sand, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 2svkg

*Elevation:* 0 to 990 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Windsor, loamy sand, and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Windsor, Loamy Sand

#### Setting

*Landform:* Outwash plains, outwash terraces, deltas, dunes

*Landform position (three-dimensional):* Tread, riser



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*Down-slope shape:* Linear, convex

*Across-slope shape:* Linear, convex

*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

### Typical profile

*O - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loamy sand

*Bw - 3 to 25 inches:* loamy sand

*C - 25 to 65 inches:* sand

### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water storage in profile:* Low (about 3.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

### Minor Components

#### Deerfield, loamy sand

*Percent of map unit:* 10 percent

*Landform:* Deltas, outwash plains, terraces

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Hinckley, loamy sand

*Percent of map unit:* 5 percent

*Landform:* Eskers, kames, outwash plains, deltas

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, side slope, crest, head slope, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No



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### 255B—Windsor loamy sand, 3 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2svkf

*Elevation:* 0 to 1,210 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Windsor, loamy sand, and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Windsor, Loamy Sand

##### Setting

*Landform:* Deltas, dunes, outwash plains, outwash terraces

*Landform position (three-dimensional):* Riser, tread

*Down-slope shape:* Linear, convex

*Across-slope shape:* Linear, convex

*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

##### Typical profile

*O - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loamy sand

*Bw - 3 to 25 inches:* loamy sand

*C - 25 to 65 inches:* sand

##### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water storage in profile:* Low (about 4.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Hydric soil rating:* No



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### Minor Components

#### **Hinckley, loamy sand**

*Percent of map unit:* 10 percent

*Landform:* Deltas, eskers, kames, outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

#### **Deerfield, loamy sand**

*Percent of map unit:* 5 percent

*Landform:* Terraces, deltas, outwash plains

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

### **256A—Deerfield loamy sand, 0 to 3 percent slopes**

#### **Map Unit Setting**

*National map unit symbol:* 9982

*Elevation:* 0 to 1,000 feet

*Mean annual precipitation:* 45 to 54 inches

*Mean annual air temperature:* 43 to 54 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* Farmland of statewide importance

#### **Map Unit Composition**

*Deerfield and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Deerfield**

##### **Setting**

*Landform:* Outwash plains

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Loose sandy glaciofluvial deposits

##### **Typical profile**

*H1 - 0 to 11 inches:* loamy sand

*H2 - 11 to 26 inches:* sand

*H3 - 26 to 60 inches:* sand



## Custom Soil Resource Report

### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Moderately well drained

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (6.00 to 20.00 in/hr)

*Depth to water table:* About 18 to 36 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 3.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3w

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

### Minor Components

#### Wareham

*Percent of map unit:* 10 percent

*Landform:* Terraces

*Hydric soil rating:* Yes

#### Windsor

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

## 602—Urban land

### Map Unit Setting

*National map unit symbol:* 9999

*Frost-free period:* 120 to 200 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Urban land:* 100 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*



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## Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

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## **Appendix E – SHPO and THPO Correspondence**

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**Shrimpton, Jeffrey P. (DOT)**

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**From:** Shrimpton, Jeffrey P. (DOT)  
**Sent:** Thursday, May 13, 2021 11:55 AM  
**To:** tashtesook@aol.com  
**Cc:** Harwood, Jameson (DOT)  
**Subject:** Taunton, Dean Street (606024)  
**Attachments:** PNF Taunton 606024.pdf; Locus Map 606024.pdf; Plans 606024.pdf

Dear Mr. Brown,

MassDOT is submitting the enclosed project information to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the U. S. Army Corps of Engineers. 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 send comments, questions, or requests for more information by email to [Jameson.Harwood@state.ma.us](mailto: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](mailto:Jeffrey.shrimpton@state.ma.us)



**Shrimpton, Jeffrey P. (DOT)**

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**From:** Shrimpton, Jeffrey P. (DOT)  
**Sent:** Thursday, May 13, 2021 11:54 AM  
**To:** Robinson, David S (EEA)  
**Cc:** Harwood, Jameson (DOT)  
**Subject:** Taunton, Dean Street (606024)  
**Attachments:** PNF Taunton 606024.pdf; Locus Map 606024.pdf; Plans 606024.pdf

Dear Mr. Robinson,

MassDOT is submitting the enclosed project information to the Bureau of Underwater Archaeological Resources to meet the Section 106 consultation requirements of the U. S. Army Corps of Engineers. 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 send comments, questions, or requests for more information by email to [Jameson.Harwood@state.ma.us](mailto: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](mailto:Jeffrey.shrimpton@state.ma.us)





The COMMONWEALTH OF MASSACHUSETTS  
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES  
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS  
251 Causeway Street, Suite 800, Boston, MA 02114-2136

Tel. (617) 626-1014 Fax (617) 626-1240

[www.mass.gov/orgs/board-of-underwater-archaeological-resources](http://www.mass.gov/orgs/board-of-underwater-archaeological-resources)

July 6, 2021

Patricia Leavenworth, P.E.  
MassDOT Chief Engineer  
ATTN: Jameson Harwood (by email attachment)  
Massachusetts Department of Transportation  
10 Park Plaza  
Boston, MA 02116-3973

RE: MassDOT # 606024, Roadway Reconstruction (Dean Street), Taunton

Dear Ms. Leavenworth,

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above-referenced project's Massachusetts Historical Commission (MHC) Project Notification Form (PNF) and its attached maps and plans. We offer the following comments.

The Board has conducted a preliminary review of its files and secondary literature sources to identify known and potential underwater archaeological resources within the proposed project area. No record of any underwater archaeological resources was found within the area. Based on the results of this review, the PNF-described location and nature of the proposed work, and the anticipated project effects to be mostly limited to disturbed areas within the existing State Highway Layout where past roadway, sidewalk, drainage, and utility construction and roadside development have occurred, the Board expects that this project is unlikely to impact submerged cultural resources.

Should heretofore-unknown submerged cultural resources be encountered during the course of the project, the Board expects that the project's sponsor will take steps to limit adverse effects and notify the Board and the Massachusetts Historical Commission, as well as other appropriate agencies, immediately, in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*.

The Board appreciates the opportunity to provide these comments as part of the review process. Should you have any questions regarding this letter, please do not hesitate to contact me at the address above or by email at [david.s.robinson@mass.gov](mailto:david.s.robinson@mass.gov).

Sincerely,

A handwritten signature in blue ink, appearing to read "David S. Robinson".

David S. Robinson  
Director

/dsr

Cc: Brona Simon, MHC  
Bettina Washington, WTGH/A (by email attachment)  
David Weeden, MWT (by email attachment)



**Shrimpton, Jeffrey P. (DOT)**

---

**From:** Shrimpton, Jeffrey P. (DOT)  
**Sent:** Thursday, May 13, 2021 11:53 AM  
**To:** David Weeden  
**Cc:** Harwood, Jameson (DOT)  
**Subject:** Taunton, Dean Street (606024)  
**Attachments:** PNF Taunton 606024.pdf; Locus Map 606024.pdf; Plans 606024.pdf

Dear Mr. Weeden,

MassDOT is submitting the enclosed project information to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the U. S. Army Corps of Engineers. 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 send comments, questions, or requests for more information by email to [Jameson.Harwood@state.ma.us](mailto: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](mailto:Jeffrey.shrimpton@state.ma.us)



**Shrimpton, Jeffrey P. (DOT)**

---

**From:** Shrimpton, Jeffrey P. (DOT)  
**Sent:** Thursday, May 13, 2021 11:53 AM  
**To:** Bettina Washington  
**Cc:** Harwood, Jameson (DOT)  
**Subject:** Taunton, Dean Street (606024)  
**Attachments:** PNF-Taunton 606024.pdf; Locus Map 606024.pdf; Plans 606024.pdf

Dear Ms. Washington,

MassDOT is submitting the enclosed project information to the Tribal Historic Preservation Officer to meet the Section 106 consultation requirements of the U. S. Army Corps of Engineers. 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 send comments, questions, or requests for more information by email to [Jameson.Harwood@state.ma.us](mailto:Jameson.Harwood@state.ma.us).

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## 950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A

## MASSACHUSETTS HISTORICAL COMMISSION

220 MORRISSEY BOULEVARD

BOSTON, MASS. 02125

617-727-8470, FAX: 617-727-5128

**PROJECT NOTIFICATION FORM**

<b>Project Name:</b>	<u>Roadway Reconstruction (606024)</u>
<b>Location /Address:</b>	<u>Dean Street</u>
<b>City/Town:</b>	<u>Taunton</u>
<b>Project Proponent</b>	
<b>Name:</b>	<u>Massachusetts Department of Transportation</u>
<b>Address:</b>	<u>10 Park Plaza, Room 4260</u>
<b>City/Town/Zip/Telephone:</b>	<u>Boston, MA 02116 / T: 857-368-8824 / cell phone: 978-325-2094</u>
Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).	
<b><u>Agency Name</u></b>	<b><u>Type of License or funding (specify)</u></b>
<u>FHWA</u>	<u>Federal Aid Transportation Program</u>
<u>Army Corps of Engineers</u>	<u>General Permit, Section 404 of the Clean Water Act</u>

**Project Description (narrative):**

The Massachusetts Department of Transportation (MassDOT) and the City of Taunton are proposing to reconstruct a 0.75-mile segment of Dean Street (Route 44) from the MBTA right of way just east of Arlington Street easterly to the intersection of Route 104. The project also will include improvements at the four-way intersection of Dean Street/ Longmeadow Road/Hon. Gordon M. Owen Riverway, extending north on Longmeadow Road for approximately 400' and south on Owen Riverway for approximately 400'.

Proposed work will include roadway reconstruction and roadway widening almost entirely within the State Highway Layout to provide consistent travel lane widths and dedicated bicycle lanes on both sides of the roadway. Two minor strip takings within the National Register-eligible historic district will be described below in the 4(f) discussion. New sidewalks will be constructed to replace existing along the northerly side of Dean Street. New guardrail will be installed along the southerly side of Dean Street above the Taunton River to replace existing. New mast arm traffic signals will be installed to replace existing at the intersection of Dean Street/Longmeadow Road/Owen Riverway. New drainpipes and catch basins will be installed within the paved roadway throughout the project area. A wetland replication area (1,379 square feet) will be constructed on the southerly side of Dean Street above the Taunton River just east of Owens Riverway.

**Does the project include demolition?** No.

**Does the project include rehabilitation of any existing buildings?** No.

**Does the project include new construction?** No.



## 950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

## APPENDIX A (continued)

**Are any historic or archaeological properties known to exist within the project's area of potential impact?**

[A review of the Inventory of Historic Assets of the Commonwealth revealed that the project area along Dean Street east of the Longmeadow Road/Hon. Gordon M. Owen Riverway is within the Church Green Local Historic District (TAU.AC), which appears to be eligible for listing in the National Register of Historic Places as a Boundary Extension onto the existing National Register-listed Church Green Historic District (TAU.A) located farther to the west of the project area. The Dean-Hartshorn House (TAU.51) at 68 Dean Street, which is listed individually in the National Register, is adjacent to the project area within the Church Green Local Historic District and would contribute to the potentially National Register-eligible Church Green Historic District Boundary Extension.

A review of the MHC's archaeological maps on MACRIS revealed no recorded sites in the project's direct area of potential effect. The nearest pre-contact site, 19-BR-62 (Burial Site), is recorded approximately 0.2 miles northwesterly of the Dean Street / Arlington Street intersection. The nearest historic site, TAU.HA.59 (Oxbow Farm), is recorded approximately 0.2 miles southeasterly of the Dean Street / Gordon M. Owen Riverway intersection. It is the opinion of the MassDOT Archaeologist that low sensitivity may be ascribed to the project's direct area of potential effect (APE) based on the impacts of past roadway, sidewalk, drainage, and utility construction and roadside development.

**What is the total acreage of the project area?**

Woodland	<u>                    </u>	acres	Productive Resources:		
Wetland	<u>                    </u>	acres	Agriculture	<u>                    </u>	acres
Floodplain	<u>                    </u>	acres	Forestry	<u>                    </u>	acres
Open Space	<u>                    </u>	acres	Mining/Extraction	<u>                    </u>	acres
Developed	<u>                    </u>	acres	Total Project Acreage	<u>                    </u>	Acres

**What is the acreage of the proposed new construction?**N/A acres**What is the present land use of the project area?**

[Residential neighborhood.

**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:** Jeffrey Shrimpton **Date:** May 13, 2021

**Name:** Jeffrey Shrimpton, Cultural Resources Supervisor

**Address:** Massachusetts Department of Transportation, 10 Park Plaza, Room 4260

**City/Town/Zip:** Boston, MA 02116

**Telephone:** ~~857-368-8824~~ cell phone 978-325-2094

**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





Charles D. Baker, Governor  
Karyn E. Polito, Lieutenant Governor  
Jamey Tesler, Acting Secretary & CEO  
Jonathan L. Gulliver, Highway Administrator



RECEIVED

May 12, 2021

MAY 13 2021

Ms. Brona Simon  
State Historic Preservation Officer  
Massachusetts Historical Commission  
220 Morrissey Boulevard  
Boston, MA 02125

CONCURRENCE:

6/11/21

*Brona Simon*  
BRONA SIMON  
STATE HISTORIC  
PRESERVATION OFFICER  
MASSACHUSETTS  
HISTORICAL COMMISSION

MASS. HIST. COM.

RC. 69768

**RE: Taunton – Rehabilitation of Dean Street (Route 44), MassDOT Project #606024**  
**Section 106: No Adverse Effect**  
**Section 4(f): Fee Takings and Permanent Utility Easements – *de minimis***  
**Section 4(f): Temporary Occupancies – No 4(f) Use**

Dear Ms. Simon,

The Massachusetts Department of Transportation (MassDOT) and the City of Taunton are proposing to reconstruct a 0.75-mile segment of Dean Street (Route 44) from the MBTA right of way just east of Arlington Street easterly to the intersection of Route 104. The project also will include improvements at the four-way intersection of Dean Street/ Longmeadow Road/Hon. Gordon M. Owen Riverway, extending north on Longmeadow Road for approximately 400' and south on Owen Riverway for approximately 400'.

The project area extends through the easterly end of **Church Green Local Historic District (TAU.AC)**, which appears to be eligible for listing in the National Register of Historic Places as a boundary extension onto the **National Register-listed Church Green Historic District (TAU.A)**. The **Dean-Hartshorn House (TAU.51)** at 68 Dean Street, which is listed individually in the National Register, is adjacent to the project area within the Church Green Local Historic District and would contribute to the potentially National Register-eligible Church Green Historic District Boundary Extension.

MassDOT has reviewed this project under Section 106 of the National Historic Preservation Act of 1966, as amended [36 CFR 800], and has determined that the project will have **No Adverse Effect** on properties that are listed or eligible for listing in the National Register of Historic Places.

### Project Description

Proposed work will include roadway reconstruction and roadway widening almost entirely within the State Highway Layout to provide consistent travel lane widths and dedicated bicycle lanes on both sides of the roadway. Two minor strip takings within the National Register-eligible historic district will be described below in the 4(f) discussion. New sidewalks will be

Ten Park Plaza, Suite 4160, Boston, MA 02116  
Tel: 857-368-4636, TTY: 857-368-0655  
[www.mass.gov/massdot](http://www.mass.gov/massdot)



constructed to replace existing along the northerly side of Dean Street. New guardrail will be installed along the southerly side of Dean Street above the Taunton River to replace existing. New mast arm traffic signals will be installed to replace existing at the intersection of Dean Street/Longmeadow Road/Owen Riverway. New drainpipes and catch basins will be installed within the paved roadway throughout the project area. A wetland replication area (1,379 square feet) will be constructed on the southerly side of Dean Street above the Taunton River just east of Owens Riverway. Work in water will require a Section 404 permit from the U. S. Army Corps of Engineers.

### **Church Green Historic District**

The National Register-listed Church Green Historic District is bounded by Route 44 on the north, Church Green Street on the south, Prospect Street on the east, and Summer Street on the west. The easterly boundary of the historic district along Prospect Street is approximately 0.25 mile from the westerly limit of the proposed project corridor along Dean Street. The stone First Parish Church, an early example of the Gothic Revival style constructed c. 1829, is the centerpiece of the National Register-listed historic district. The church is situated on a large parcel with a wide lawn, many mature hardwood trees, and a mortared stone perimeter wall. The National Register-listed historic district also includes the 1896 Taunton City Hall (TAU.4) on Summer Street, the c. 1840 Morton Block (TAU.21) commercial building on Main Street (Route 44) at Union Street, Bristol Academy (TAU.7) on Church Green Street, and several high style single-family dwellings dating from 1829 to 1919.

The National Register-listed historic district is located within the larger Church Green Local Historic District, which extends roughly south along Summer Street and east along Route 44, which becomes Dean Street east of Prospect Street. The segment of Dean Street located within the local historic district appears to be eligible for listing in the National Register as a boundary extension onto the existing National Register-listed Church Green Historic District. The segment of Summer Street located within the local historic district also might be eligible for listing in the National Register as a boundary extension but has not been evaluated for this submittal.

Six individually National Register-listed properties are located along or just off Dean Street east of Prospect Street outside of the National Register-listed historic district but within the local historic district. These NR-listed properties would contribute to the potentially National Register-boundary extension. One of those National Register-listed individual properties, the **Dean-Hartshorn House (TAU.51)** at 68 Dean Street, is adjacent to the proposed project corridor. Constructed in 1798, the Dean-Hartshorn House is a federal style mansion with clapboard front and brick end elevations. The property has been converted into a nursing home and a large addition has been constructed onto the rear of the building. Other substantial new construction is located elsewhere on the large parcel occupied by the Dean-Hartshorn House.



Seven additional inventoried properties adjacent to the project corridor along the northerly side of Dean Street are in the local historic district and would contribute to the potentially National Register-eligible boundary extension:

- William and Chester Reed House (TAU.46), 44 Dean Street, constructed 1855, center chimney 1 ½-story wood frame cape.
- Irving Colby-Melton Ferris House (TAU.47), 50 Dean Street, reportedly constructed 1927 but appears to be older, front gable 2 ½-story wood frame, described in MACRIS as Colonial Revival style.
- House at 52 Dean Street (TAU.48), reportedly constructed 1870, 1 ½-story wood frame cape with full dormers on either side of the roof.
- Thorpe-Witherell House (TAU.49), 56 Dean Street, constructed c. 1885, 2 ½-story wood frame Second Empire style with side tower, converted to residential apartments, synthetic siding.
- Crossman House (TAU.50), 60 Dean Street, constructed 1880, two-story wood frame Victorian eclectic style with mansard roof.
- Harriet Newbury House (TAU.52), 80 Dean Street, constructed c. 1920, large two-story wood frame Colonial Revival style with two story additions on either end.
- Dean-Kingman House (TAU.54), 88 Dean Street at Longmeadow Road, constructed c. 1870, 2 ½-story wood frame Italianate style.

Four other individually National Register-listed properties are in the immediate vicinity of the project corridor but outside the project limits and will not be disturbed by the proposed work:

- The westerly limit of the project corridor is adjacent to the National Register-listed **Old Colony Railroad Station (TAU.45)**, which is on the westerly side of the MBTA railroad tracks fronting on Arlington Street.
- The easterly limit of the project area is adjacent to the National Register-listed **Harris Street Bridge (TAU.903)** over the Taunton River, which is closed to all traffic and is not a MassDOT property. The bridge appears to be the property of the Taunton Conservation Commission.
- Two additional National Register-listed properties are located on Dean Street just beyond the easterly limit of the project corridor north of the Cape Road intersection. The **Lloyd Dean House (TAU.276)**, 164 Dean Street, is a dental office building and appears to have been substantially altered. The **Jonathan Dean House (TAU.277)**, 175 Dean Street, appears to have been demolished by others and replaced with a big-box pharmacy with expansive paved parking.

#### **Section 4(f) Evaluation – Fee Takings and Permanent Easements – *de minimis* impact**

The proposed project requires three small fee takings from parcels occupied by contributing properties in the National Register-eligible Church Green Historic District Boundary Extension along Dean Street. The project also requires permanent utility easements (PUEs)



on four parcels occupied by contributing properties in the National Register-eligible historic district boundary extension. The fee takings are highlighted in blue on the enclosed right of way plans and the PUEs in pink.

The three fee takings are located at the back of the existing sidewalk along the north side of Dean Street and are necessary to reconstruct the sidewalks to ADA standards along the same alignment. The fee takings are as follow:

- Parcel X-1 (1 square foot) from the parcel occupied by the 1855 William and Chester Reed House (TAU.46), 44 Dean Street
- Parcel X-2 (42 sf) from the parcel occupied by the 1927 Irving Colby-Melton Ferris House (TAU.47), 50 Dean Street.
- Parcel X-3 (13 sf) from the parcel occupied by the House at 52 Dean Street (TAU.48), reportedly constructed 1870.

PUEs are necessary to allow existing overhead utility lines to be realigned across the front perimeters of four parcels along Dean Street and to accommodate the installation of guy wires for utility poles. The PUEs are as follow:

- X-PUE-1 (4406 sf) and X-PUE-21 (21 sf) on the parcel occupied by the William and Chester Reed House (TAU.46), 44 Dean Street.
- X-PUE-2 (464 sf) and on the parcel occupied by the Irving Colby-Melton Ferris House (TAU.47), 50 Dean Street.
- X-PUE-3 (611 sf) on the parcel occupied by the House at 52 Dean Street (TAU.48).
- X-PUE-4 (537 sf) on the parcel occupied by the Thorpe-Witherell House (TAU.49), 56 Dean Street, constructed c. 1885.

Any taking or easement that results in the permanent incorporation of land from a public or private historic site into a transportation facility is regarded as a transportation use and must be evaluated and approved by the Federal Highway Administration (FHWA) under Section 4(f) of the National Transportation Act of 1966, as amended [23 CFR Part 774].

It is MassDOT's expectation that FHWA will determine that the proposed fee takings and PUEs will meet the criteria for a Section 4(f) *de minimis* finding, pursuant to 23 CFR 774.3(b). This project, therefore, does not require an individual Section 4(f) evaluation. This letter is intended to inform the State Historic Preservation Officer (SHPO) that this project is expected to qualify for a *de minimis* finding under Section 4(f) based on the concurrence of your office with this Section 106 finding of No Adverse Effect, pursuant to 23 CFR 774.5(b)(1)(ii).

#### **Section 4(f) Evaluation – Temporary Occupancies – No 4(f) use**

This project requires temporary occupancies, also known as temporary construction easements, on parcels occupied by contributing properties in the National Register-eligible



Church Green Historic District Boundary Extension along Dean Street. The temporary occupancies are highlighted in yellow on the enclosed ROW plans.

It is MassDOT's opinion that the temporary occupancies will satisfy the following five conditions and thus will not constitute a "use" as defined by Section 4(f), pursuant to 23 CFR 774.13(d):

- (1) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;
- (2) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal;
- (3) There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;
- (4) The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and
- (5) There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

The SHPO is the official with jurisdiction (OWJ) over a historic site for the purposes of Section 4(f), pursuant to 23 CFR 774.17. Your concurrence with this No Adverse Effect finding will signify that the OWJ agrees with MassDOT's assessment that the proposed temporary occupancies do not constitute a "use" under Section 4(f) of the contributing properties in the National Register-eligible Church Green Historic District Boundary Extension along Dean Street and that the conditions listed above have been satisfied, pursuant to Condition 5.

### **Archaeological Assessment**

A review of the MHC's archaeological maps on MACRIS revealed no recorded sites in the project's direct area of potential effect. The nearest pre-contact site, 19-BR-62 (Burial Site), is recorded approximately 0.2 miles northwesterly of the Dean Street / Arlington Street intersection. The nearest historic site, TAU.HA.59 (Oxbow Farm), is recorded approximately 0.2 miles southeasterly of the Dean Street / Gordon M. Owen Riverway intersection.

It is the opinion of the MassDOT Archaeologist that low sensitivity may be ascribed to the project's direct area of potential effect (APE) based on the impacts of past roadway, sidewalk, drainage, and utility construction and roadside development.

### **Early Environmental Coordination and No Adverse Effect Finding**

The City's design consultant, GPI, submitted an early environmental coordination letter dated May 14, 2018 to the Taunton Historic District Commission (THDC). GPI sent a copy of that letter to the SHPO. Neither the THDC nor the SHPO submitted comments to MassDOT in response to GPI's letter. MassDOT will forward a copy of this letter to the THDC to provide an update for this project.



MassDOT solicits your concurrence with our **No Adverse Effect** finding for this project under Section 106 of the National Historic Preservation Act of 1966, as amended. Please feel free to contact me at 978-325-2094 if you have any questions.

Sincerely,



Jeffrey Shrimpton  
Cultural Resources Supervisor  
Environmental Services

CC: Casey Campetti, FHWA  
Taunton Historic District Commission  
ENC: Project plans  
ROW plans  
Locus map  
THDC Notification

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**FOR FHWA USE**

**MassDOT Request for Federal Highway Administration (FHWA) Approval**  
**MassDOT Highway Division requests final approval from FHWA that the proposed "use" of the above-described Section 4(f) resources meets the criteria of a *de minimis* impact, as specified under 23 CFR 774.17.**

\_\_\_\_\_  
Jeffrey H. McEwen, P. E. (or designee)  
Division Administrator  
Federal Highway Administration  
Massachusetts Division

\_\_\_\_\_  
Date



## **Appendix F – NLEB Consultation / GARFO Consultation**

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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  
<http://www.fws.gov/newengland>



In Reply Refer To:

May 10, 2022

Project code: 2022-0041008

Project Name: 606024 -TAUNTON- RECONSTRUCTION OF ROUTE 44, FROM  
ARLINGTON STREET TO ROUTE 104

Subject: Concurrence verification letter for the '606024 -TAUNTON- RECONSTRUCTION OF ROUTE 44, FROM ARLINGTON STREET TO ROUTE 104' 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 May 10, 2022 to verify that the **606024 -TAUNTON- RECONSTRUCTION OF ROUTE 44, FROM ARLINGTON STREET TO ROUTE 104** (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**

606024 -TAUNTON- RECONSTRUCTION OF ROUTE 44, FROM ARLINGTON STREET TO ROUTE 104

### **Description**

606024 -TAUNTON- RECONSTRUCTION OF ROUTE 44 (DEAN STREET), FROM ARLINGTON STREET TO ROUTE 104 (SOUTH MAIN STREET)

Work on this project consists of roadway improvements along Route 44 (Dean Street) just east of Arlington Street and continue easterly to just west of the intersection with Route 104. Also included will be intersection improvements and the replacement of the existing traffic signals at Longmeadow Road / Gordon Owen Parkway, reconstruction of sidewalks, and drainage improvements.

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<sup>[1]</sup>?

[1] See [Indiana bat species profile](#)

**Automatically answered**

No

2. Is the project within the range of the Northern long-eared bat<sup>[1]</sup>?

[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<sup>[1]</sup> 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<sup>[1]</sup>?

[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<sup>[1]</sup>?

[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<sup>[1]</sup> summer habitat for Indiana Bat or NLEB **within** the project action area<sup>[2]</sup>? (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<sup>[1]</sup> 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<sup>[1][2]</sup> been conducted<sup>[3][4]</sup> **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**

- 606024 Taunton Bat survey 1.pdf <https://ipac.ecosphere.fws.gov/project/YOUZDIVRFJC2JHVFFKOYUAGVXM/projectDocuments/112880933>



12. Did the presence/probable absence (P/A) summer surveys detect Indiana bats and/or NLEB<sup>[1]</sup>?

[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<sup>[1]</sup>?

[1] Contact the local Service Field Office for appropriate distance from hibernacula.

No

14. Does the project include activities **within documented NLEB habitat**<sup>[1][2]</sup>?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

No

15. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

Yes

16. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

*C) During both the active and inactive seasons*

17. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

Yes

18. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

No

19. Are *all* trees that are being removed clearly demarcated?

Yes

20. Will the removal of habitat or the removal/trimming of trees involve the use of **temporary** lighting?

Yes



21. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?

No

22. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

Yes

23. Does the project include slash pile burning?

No

24. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

Yes

25. Is there *any* suitable habitat<sup>[1]</sup> 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<sup>[1]</sup> been conducted **within** the last 24 months<sup>[2]</sup> 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<sup>[1]</sup>?

[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<sup>[1][2]</sup> been conducted for this project with at least one survey point **within** suitable habitat and **within** 0.25 miles of the bridge<sup>[3][4]</sup>?

[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**

- 606024 Taunton Bat survey 1.pdf <https://ipac.ecosphere.fws.gov/project/YOUZDIVRFJC2JHVFFKOYUAGVXM/projectDocuments/112880933>

29. Did the presence/probable absence (P/A) summer surveys detect Indiana bats and/or NLEB<sup>[1]</sup>?

[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<sup>[1]</sup> 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?

*No*



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 new or replace existing **permanent** lighting?

No

36. 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?

No

37. 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

38. Will the project raise the road profile **above the tree canopy**?

No

39. 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.*



40. Are the 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 consistent with a No Effect determination in this key?

**Automatically answered**

*Yes, other project activities are limited to actions that DO NOT cause any additional stressors to the bat species as described in the BA/BO*

41. Is the location of this project consistent with a Not Likely to Adversely Affect determination in this key?

**Automatically answered**

*Yes, because no bats were detected during presence/probable absence surveys conducted during the summer survey season and outside of the fall swarming/spring emergence periods. Additionally, all activities were at least 0.5 miles from any hibernaculum.*

42. Is the bridge removal, replacement, or maintenance activities portion of this project consistent with a No Effect determination in this key?

**Automatically answered**

*Yes, because the bridge has been assessed using the criteria documented in the BA and no signs of bats were detected*

43. **General AMM 1**

Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

Yes

## Project Questionnaire

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

N/A

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

N/A

3. How many acres<sup>[1]</sup> 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.

3.32

4. Please describe the proposed bridge work:

*The project generally proposes to widen Route 44 in order to provide consistent four-lane cross section throughout the Route 44 corridor to improve traffic flow, intersection operations, safety, and pedestrian and bicycle access. To facilitate these improvements, the project proposes the removal of an existing granite block retaining wall and construction of a new soldier pile and lagging wall adjacent to / within the Taunton River.*



5. Please state the timing of all proposed bridge work:

*Spring 2023-Spring 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 April 28, 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

State: MA

Zip: 02116

Email: hana.l.isihara@dot.state.ma.us

Phone: 6178964454

**Lead Agency Contact Information**

Lead Agency: Federal Highway Administration



## Appendix A. Verification Form (updated December 10, 2020)

Federal Highway Administration (FHWA) or the applicable state Department of Transportation (DOT) shall submit a signed version of this completed form, together with any project plans, maps, supporting analyses, etc., to NOAA's National Marine Fisheries Service (NMFS), Greater Atlantic Regional Fisheries Office, Protected Resources Division (GARFO PRD) at nmfs.gar.esa.section7@noaa.gov with "FHWA GARFO NLAA Program: [Project Title or Number]" in the subject line. **Note:** project design contractors and/or consultants may assist in preparing the form, but only FHWA/DOT staff shall sign off on it on the final page.

### Project Activity Type (check all that apply to the entire action):

- ☐ 1. Bridge repair, demolition, or replacement project  
☐ 2. Culvert repair or replacement project  
☐ 3. Dock, pier, or waterway access project (includes construction, demolition, and repairs)  
☒ 4. Slope stabilization project

### Transportation Project Information

Name of Project:	Reconstruction of Rt 44 (Dean St.) in Taunton, MA		
Reinitiation (Yes/No):	No		
State DOT/Program:	MassDOT - Highway Division		
DOT ID Code:	606024		
Contact Person:	Timothy Dexter		
Phone:	857-274-8735	Email:	timothy.dexter@state.ma.us
Project Latitude (e.g., 42.625884):	41.904256		
Project Longitude (e.g., -70.646114):	-71.076082		
Maximum Water Depth (m)	3.4		
Anticipated Project Start Date:	July 2024	Anticipated Project End Date:	June 2025
City/Town:	Taunton, MA	Water body:	Taunton River
Project/Action Description and Purpose:	<p>The proposed project is to widen Route 44 and provide a four-lane cross section throughout the Project corridor to improve traffic flow, intersection operations, safety, pedestrian and bicycle access, and inadequate drainage systems. The Project aims to improve the connection between downtown Taunton and Route 24, provide public transit accommodations, and enhance safety conditions. In order to facilitate these improvements, the Project includes construction of a retaining wall adjacent to / within the Taunton River as well as the extension of an existing culvert. In water work consists of removal (including dewatering and excavation) of the existing granite block retaining wall, construction of the proposed soldier pile and lagging retaining wall including the installation of 117 piles (approximately 25 of which are entirely or partial below MHW), and extension of the existing culvert that conveys an unnamed intermittent stream south beneath Route 44. The project proposes to extend the culvert only on the north side of Route 44 and will only result in work within / impacts to the unnamed intermittent stream. There will be 400 sf (0.01 acres) of permanent impacts within the Taunton River resulting from the new retaining wall, including an additional 1,861 sf (0.04 acres) of temporary impacts due to dewatering and construction access. The existing and proposed retaining walls will be accessed via Route 44 and a barge within the Taunton River. The method for dewatering will be selected by the contractor and will most likely consist of either sheet piles or sandbags and plastic. If the selected dewatering is proposed to consist of sheet piles then a "soft start" method will be utilized for their installation. The construction of the retaining wall does not include any driving of</p>		



**ESA-listed species and/or critical habitats in the action area (Check all that apply)**

<input checked="" type="checkbox"/>	Atlantic sturgeon (all DPSs)	<input type="checkbox"/>	Kemp's ridley sea turtle
<input type="checkbox"/>	Atlantic sturgeon critical habitat Indicate which DPS (GOM, NYB, Chesapeake Bay DPSs): <div>Select DPS</div>	<input type="checkbox"/>	Loggerhead sea turtle (Northwest Atlantic DPS)
<input type="checkbox"/>	Shortnose sturgeon	<input type="checkbox"/>	Leatherback sea turtle
<input type="checkbox"/>	Atlantic salmon (GOM DPS)	<input type="checkbox"/>	North Atlantic right whale
<input type="checkbox"/>	Atlantic salmon critical habitat (GOM DPS)	<input type="checkbox"/>	North Atlantic right whale critical habitat
<input type="checkbox"/>	Green sea turtle (North Atlantic DPS)	<input type="checkbox"/>	Fin whale

\* Please consult GARFO PRD's ESA Section 7 Mapper for ESA-listed species and critical habitat information for your action area at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater>.

**The following stressors are applicable to the action:**

- ☒ Underwater Noise
- ☒ Impingement/Entrainment and Entanglement
- ☒ Water Quality/Turbidity
- ☒ Habitat Alteration
- ☒ Vessel Traffic

**Impacts Table**

Habitat Alteration		
	Permanent (acres)	Temporary (acres)
Sand (saline)	0.00	0.00
Silt/Mud/Clay (saline)	0.00	0.00
Hard bottom (saline)	0.00	0.00
Submerged Aquatic Vegetation (SAV) (saline)	0.00	0.00
Sand (freshwater)	0.01	0.04
Silt/Mud/Clay (freshwater)	0.00	0.00
Hard bottom (freshwater)	0.00	0.00
Submerged Aquatic Vegetation (SAV) (freshwater)	0.00	0.00
<b>Total amount of habitat alteration</b>	0.05	
In-water Construction Impacts		
	Amount in meters	
Width of water body in action area (m)	33.0	
Stressor category that extends furthest distance into water body (e.g.; underwater noise, turbidity plume)	Vessel (approx 30' long barge)	
Maximum extent of stressor into the water body (m)	10.0	



**Project Design Criteria (PDC) Checklist**

FHWA/DOT shall incorporate all general PDCs and all applicable PDCs in the appropriate stressor categories. For any PDCs that are not incorporated, additional justification is required for a project to be eligible for the NLAA Program. FHWA/DOT shall check the corresponding box for each PDC that is, or will be, incorporated into the project or indicate if not applicable.

GENERAL PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.	Ensure all operators, employees, and contractors are aware of all FHWA environmental commitments, including these PDC, when working in areas where ESA-listed species may be present or in critical habitat.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2.	No portion of the proposed action will individually or cumulatively have an adverse effect on ESA-listed species or critical habitat.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3.	<p>No portion of the proposed action that may affect the GOM DPS of Atlantic salmon will occur in the tidally influenced portion of rivers/streams where their presence is possible from <u>April 10 through November 7</u>. The range of the GOM DPS only occurs in Maine.</p> <p><b>Note:</b> If the project will occur within the geographic range of the GOM DPS Atlantic salmon but their presence is not expected following the best available commercial scientific data, the work window does not need to be applied. Please attach best available information (i.e. local fisheries biologist correspondence).</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.	<p>No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as spawning grounds as follows:</p> <ul style="list-style-type: none"> <li>i. Gulf of Maine: Apr 1-Aug 31</li> <li>ii. Southern New England/New York Bight: Mar 15-Aug 31</li> <li>iii. Chesapeake Bay: Mar 15-Jul 1 and Sep 15-Nov 1</li> </ul> <p><b>Note:</b> If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.	<p>No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as overwintering grounds where dense aggregations are known to occur as follows:</p> <ul style="list-style-type: none"> <li>i. Gulf of Maine: Oct 15-Apr 30</li> <li>ii. Southern New England/New York Bight: Nov 1-Mar 15</li> <li>iii. Chesapeake Bay: Nov 1-Mar 15</li> </ul> <p><b>Note:</b> If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval.</p>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6.	Within designated critical habitat for Atlantic sturgeon, no work will affect hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand) (PBF 1).
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.	Work will result in no or only temporary/short-term changes in water temperature, water flow, salinity, or dissolved oxygen levels.



Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	If ESA-listed species are (a) likely to pass through the action area at the time of year when project activities occur; and/or (b) the project will create an obstruction to passage when in-water work is completed, then a zone of passage (~50% of water body) with appropriate habitat for ESA-listed species (e.g., depth, water velocity, etc.) must be maintained (i.e., physical or biological stressors such as turbidity and sound pressure must not create barrier to passage).
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9.	The project will not adversely impact any submerged aquatic vegetation (SAV) or oyster reefs.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10.	No blasting or use of explosives will occur.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11.	No in-water work on large dams or tide gates (small dam and tide gate repairs may be permitted with prior review and approval from NMFS).

#### UNDERWATER NOISE PDCs

Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.	<p>If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a “soft start” is required to allow animals an opportunity to leave the project vicinity before sound pressure levels increase. <i>In addition to using a soft start at the beginning of the work day for pile driving, one must also be used at any time following cessation of pile driving for a period of 30 minutes or longer.</i></p> <p><u>For impact pile driving:</u> pile driving will commence with an initial set of three strikes by the hammer at 40% energy, followed by a one minute wait period, then two subsequent three-strike sets at 40% energy, with one-minute waiting periods, before initiating continuous impact driving.</p> <p><u>For vibratory pile installation:</u> pile driving will be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period will be repeated two additional times, followed immediately by pile-driving at full rate and energy.</p>



Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.	<p>If the project includes non-timber piles*, please attach your calculation to this verification form showing that the noise is below the injury thresholds of ESA-listed species in the action area. The GARFO Acoustic Tool can be used as a source, should you not have other information: <a href="https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultation-technical-guidance-greater-atlantic">https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultation-technical-guidance-greater-atlantic</a>.</p> <p>*Effects from timber and steel sheet piles were analyzed in the NLAA programmatic consultation, so no additional information is necessary.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.	Any new pile-supported structure must involve the installation of no more than 50 piles (below MHW).

Pile material (e.g., steel pipe, concrete)	Pile diameter/width (inches)	Number of piles	Installation method (e.g., impact hammer, vibratory start and then impact hammer to depth, drilling)
Steel Pipe	30	117	Cored in place via drilling

IMPINGEMENT/ENTRAINMENT AND ENTANGLEMENT PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.	<p>If excavating or dredging, only mechanical buckets, hydraulic cutterheads, or low volume hopper dredges (e.g., CURRITUCK, ≤300 cubic yard maximum bin capacity) may be used.</p> <p><b>Note:</b> We consider excavating a smaller scale form of mechanical dredging.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16.	<p>No new excavation or dredging in Atlantic sturgeon or salmon critical habitat (excavation in a prior construction footprint or maintenance dredging is permitted, but still must meet all other PDCs). New excavation or dredging outside Atlantic sturgeon or salmon critical habitat is limited to one-time events (e.g., burying a cable or utility line) and minor (≤2 acres) expansions of areas already subject to prior excavation or maintenance dredging. Locating a replacement bridge within 250 feet (centerline to centerline) of an existing bridge and excavation of sediment around bridge piers are considered work in a previous construction footprint.</p> <p><b>Note:</b> We consider excavating a smaller scale form of mechanical dredging.</p>



Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.	Temporary intakes related to construction are prohibited in sturgeon and salmon spawning, rearing, or overwintering habitat during the time of year windows identified in General PDCs 3-5. If utilized outside those areas and times of year and in an area with anticipated sturgeon and salmon presence, temporary intakes must be equipped with 2-millimeter wedge wire mesh screening and must not have greater than 0.5 feet per second intake velocities, to prevent impingement or entrainment of juvenile and early life stages of these species.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.	Work behind cofferdams, turbidity curtains, or other instruments that prevent access of animals to the project area is required when ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, access control measures are not necessary). Once constructed, work inside a cofferdam at any time of year may be permitted with NMFS approval, provided the cofferdam is installed/removed outside the time-restricted period.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19.	No new permanent surface water withdrawal, water intakes, or water diversions.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20.	Turbidity control measures, including cofferdams, must be designed to not entangle or entrap ESA-listed species.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	21.	Any in-water lines, ropes, or chains must be made of materials and installed in a manner to minimize or avoid the risk of entanglement by using thick, heavy, and taut lines that do not loop or entangle. Lines can be enclosed in a rigid sleeve.

#### WATER QUALITY/TURBIDITY PDCs

Yes	N/A	PDC #	PDC Description
<input type="checkbox"/>	<input checked="" type="checkbox"/>	22.	In-water offshore disposal may only occur at designated disposal sites that have already been the subject of ESA section 7 consultation with NMFS and where a valid consultation is in place.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	23.	Any temporary discharges must meet state water quality standards (e.g., no discharges of substances in concentrations that may cause acute or chronic adverse reactions, as defined by EPA water quality standards criteria).
<input checked="" type="checkbox"/>	<input type="checkbox"/>	24.	Only repair, upgrades, relocations, and improvements of existing discharge pipes or replacement in-kind are allowed; no new construction of untreated discharges.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	25.	Work behind cofferdams, turbidity curtains, or other instruments to control turbidity is required when operationally feasible and ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, turbidity control methods are not necessary).



HABITAT ALTERATION PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	26.	Minimize all new waterward encroachment and permanent fill.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	27.	In Atlantic salmon critical habitat, stream simulation design with a minimum span of 1.2 bankfull width will be used in areas with minimal tidal influence. In tidal areas, a design that allows for unimpeded flow will be used (no delay in water entering or exiting the area upstream of the crossing).
<input type="checkbox"/>	<input checked="" type="checkbox"/>	28.	In Atlantic salmon critical habitat, no culvert end extensions, invert line culvert rehabilitation, or slipline culvert rehabilitation may occur.

VESSEL TRAFFIC PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	29.	Maintain project (i.e., construction) vessels operating within the action area to speed limits below 10 knots and dredge vessels to speeds of 4 knots maximum, while dredging.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	30.	Maintain a 1,500-foot buffer between project (i.e., construction) vessels and ESA-listed whales and a 300-foot buffer between project vessels and sea turtles. This also applies to dredge vessels.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	31.	The number of project (construction) vessels must be limited to the greatest extent possible, as appropriate to size and scale of project.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	32.	The project must not result in the permanent net increase of commercial vessels.

### Justification for NLAA Determination if not Incorporating All PDC

If the project is not in compliance with all of the general and stressor-based PDCs, but you can provide justification and/or special conditions to demonstrate why the project still meets the NLAA determination and is consistent with the aggregate effects considered in the programmatic consultation, you may still certify your project through the NLAA program using this verification form. Please identify which PDCs your project does not meet (e.g., PDC 9, PDC 15, PDC 22, etc.) and provide your rationale and justification for why the project is still eligible for the verification form. Project modifications must not result in different effects not already considered.

To demonstrate that the project is still NLAA, you must explain why the effects on ESA-listed species or critical habitat are **insignificant** (i.e., too small to be meaningfully measured or detected) or **discountable** (i.e., extremely unlikely to occur). **Please use this language in your justification.**



PDC#	Justification



**FHWA/DOT Verification of Determination (To be filled out by FHWA/DOT staff only)**

By submitting this Verification Form, FHWA, or the state DOT as FHWA's designated non-federal representative, indicates that they determined that the proposed activity described above is not likely to adversely affect (NLAA) ESA-listed species or designated critical habitat under NMFS jurisdiction in accordance with the Program, and all effects (direct, indirect, interrelated, and interdependent) are either insignificant (so small they cannot meaningfully be measured, detected, or evaluated) or discountable (extremely unlikely to occur).

<input checked="" type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, we have determined that the action complies with all applicable PDCs and is not likely to adversely affect listed species.
<input type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, we have determined that the action is not likely to adversely affect listed species per the justifications and/or special conditions provided above.
FHWA/DOT Signature:	
Date:	
06/07/2022	

By providing your determination and signature, you are certifying that to the best of your knowledge the information provided in this form is accurate and based upon the best available scientific information. This form must be filled out and signed by FHWA or state DOT staff, as an officially designated non-federal representative.

**GARFO PRD Concurrence (To be filled out by GARFO PRD)**

After receiving the Verification Form, GARFO PRD will contact FHWA/DOT with any concerns and indicate whether GARFO PRD concurs with FHWA/DOT's determination.

<input checked="" type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, GARFO PRD concurs with FHWA/DOT's determination that the action complies with all applicable PDCs and is not likely to adversely affect listed species or critical habitat.
<input type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, GARFO PRD concurs with FHWA/DOT's determination that the action is not likely to adversely affect listed species or critical habitat per the justifications and/or special conditions provided above.
<input type="checkbox"/>	GARFO PRD does not concur with FHWA/DOT's determination that the action complies with the applicable PDCs (with or without justifications), and recommends an individual Section 7 consultation to be completed independent from the FHWA GARFO NLAA Program.
GARFO PRD Signature:	
Date:	
06/07/2022	





## **Appendix G – Project Specifications**

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## **NORTHERN LONG-EARED BAT PROTECTION**

The U.S. Fish and Wildlife Service (USFWS) has listed the northern long-eared bat 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 Optional Framework to Streamline Section 7 Consultation and is consistent with the Programmatic Biological Opinion under the authority of section 4(d) of the Endangered Species Act and the Final 4(d) Rule published in the Federal Register on January 14, 2016. No conservation measures or time of year restrictions on tree cutting are required. If additional cutting is proposed by the Contractor that is outside the scope of this contract, additional review is required by the MassDOT Highway Division's Environmental Services Section, additional review may be required by the USFWS, and time of year restrictions could apply to such tree cutting.

## **WORK IN COLDWATER FISHERIES**

Best management practices for erosion and sedimentation control must be adhered to for all phases of construction to minimize potential impacts to the fisheries resources. Traditional hay and/or straw bales should be avoided in favor of compost filter tubes. To the greatest extent practicable, all in stream work should be conducted during low flow periods throughout the year. Times of year when stream flow is high due to extended rain and/or snow melt events should be avoided. If at any time during construction fish may become isolated, the District Environmental Engineer should be contacted (name & phone number), and Massachusetts Division of Fisheries and Wildlife (MassWildlife) shall be notified two weeks prior to dewatering to determine if salvage operations are desired and/or feasible. If dewatering is required at any point during construction, heated or sediment laden water should not be allowed to enter the brook directly. If the project will alter the streambed, the existing grade shall be maintained where possible.



## **ENVIRONMENTAL PERMITTING**

If Contractor erection, demolition, storage, or other procedures not originally allowed by existing environmental permits require work to occur in or otherwise impact water or wetland resource areas, the Contractor is advised that no associated work can occur until all required environmental permits have been either amended or obtained allowing such work. The Contractor must notify the District 5 Highway Director and Resident Engineer in writing a minimum of 60 days prior to the desired commencement of the proposed activity. All environmental submittals, including any contact with Local, State, or Federal environmental agencies, must be coordinated through the District 5 Environmental Engineer (name, phone number). The Contractor is expected to fully cooperate with requests for information and provide same in a timely manner. The Contractor is further advised that the Department will not entertain a delay claim due to the time required to modify or obtain the environmental permits.

The Contractor shall be responsible for compliance with all environmental permits, authorizations, and their associated conditions and stipulations. All permits and permit applications can be found in **Appendix ##**, which include: 401 Water Quality Certificate, 404 Army Corps of Engineers General Permit, Wetlands Protection Act Order of Conditions, Chapter 91 License, Section 7 Consultation for Atlantic Sturgeon, and Fish and Wildlife Coordination Act Consultation. All permit condition submittals to permitting agencies shall be prepared by the Contractor and submitted for review to the District 5 Construction and Environmental Offices. Of note, the conditions include, but are not limited to, requirements for: **pre-construction meetings, actions and submittals; the development of means and methods submittals; environmental performance standards; and post construction requirements**. Questions on environmental permit conditions can be directed to District 5 Environmental Engineer **[email address]**.

## **MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION FILE NUMBER SIGN**

This project is subject to Massachusetts General Laws, Chapter 131, Section 40 as amended. Signs shall be in accordance with the latest MassDOT Construction Standards. All costs for the manufacture, erection, maintenance, moving, and removal of the signs shall be absorbed by the contractor with no additional compensation other than the contract unit prices.

For this project the Massachusetts Department of Environmental Protection File Number is **XXX-XX**.



## **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.

## **PRESERVATION OF ROADSIDE GROWTH**

Section 8.08 shall be amended as follows:

The Contractor shall take all necessary care when excavating or working in the vicinity of existing trees so that the root systems, trunks, and branches are not damaged. All precautions shall be taken to ensure that heavy equipment does not damage any roots, including those that lie below the limits of excavation.

Do not store equipment or stockpile materials within drip line of trees or in areas enclosed by tree protection fencing.

Avoid any direct soil contamination in root zone area by petroleum, petroleum products or solvents, salts or any other pollutant during construction.

All cutting or trimming of trees to be preserved shall be performed by a Massachusetts Certified Arborist. The Contractor shall provide the Engineer with a copy of the certification prior to any work on trees.

Individual trees and existing plants adjacent to construction may be protected as a group using temporary tree protection fence as specified under Item 102.521.

Trees that, in the judgment of the Engineer, have been irreparably damaged by the Contractor shall be replaced in kind and in size, or, with a quantity of 2-inch caliper replacement trees (the quantity of which shall be determined by the Engineer) such that the cumulative caliper of the replacement trees will be up to the equivalent of diameter of the lost tree at breast height. Cost of replacement trees shall be paid by the Contractor.

Cost of removal of destroyed tree, including roots and stump, as well as the cost of replacement trees, shall be paid for by the Contractor.

## **ITEM 102.3      HERBICIDE TREATMENT OF INVASIVE PLANTS**

## **HOUR**

*REV. 2022.03.01 (REV. DATE TO BE REMOVED BY CONTRACTS)*

Work under this item consists of herbicide treatment of invasive plants currently existing within the project limits and as directed. An Invasive Plant Management Strategy (IPMS) shall be submitted to the Engineer for review and approval and the IPMS shall be implemented on-site. The IPMS shall be measured and paid for under Item 102.33 Invasive Plant Management Strategy.



Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation items.

Payment is per hour on-site and shall be compensation for a minimum crew of 2 licensed applicators, 2 back-pack sprayers and mist-blowers, a properly equipped spray truck with spray hoses, and a tank with sufficient capacity for a full day of work. If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price. This item is not intended for manual removal of plants.

Management of plants determined to have been introduced to the site via imported loam, compost, mulch, plants, equipment, or other construction activities will be the Contractor's responsibility and at the Contractor's expense.

Herbicide shall be applied during daytime hours only.

Measures to prevent the introduction of invasive plant species to the site and to address introduction due to construction-related activities shall be covered under the Standard Specifications, Division I - Subsections 7.01(D) Plant Pest Control and 7.13 Protection and Restoration of Property as amended in these Special Provisions.

Plant species targeted for management under this item shall be as determined in the field per the site walk and as specified in the IPMS.

The definition of invasive plant species shall be as described by Massachusetts Invasive Plant Advisory Group (MIPAG): "non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems."

Control of invasive plants shall begin immediately with the initiation of construction activities and prior to any clearing or site disturbance. Treatment areas shall include stockpile locations and may, upon approval of the Engineer, extend outside the project limit. Treatment shall be done each consecutive year for the duration of the contract unless specified otherwise in the IPMS or unless directed otherwise by the MassDOT invasive species contact. Work shall be done during the growing season from May – October unless otherwise specified in the IPMS.

Areas identified for vegetation control measures shall be as shown on the plans and as determined in the field by the Engineer and a MassDOT Landscape Architect. Contact at MassDOT Landscape Design Section may be contacted at: [XXXXXX.XXXX@dot.state.ma.us](mailto:XXXXXX.XXXX@dot.state.ma.us).

## **SUBMITTALS**

No work shall begin without approval of the submittals.

Within 15 business days prior to the site walk, the Contractor shall submit all qualifications to the Engineer for approval by MassDOT Landscape Design.

Submittals include the following items.

## **Qualifications**



1. Company must provide proof of qualifications by providing the following:
  - a. Narrative describing company, its expertise and experience with invasive plant control.
  - b. Demonstrate experience with herbicide treatment as part of restorations and in sensitive areas
  - c. Describe company's technical qualifications and past performance.
2. Company must meet licensing requirements:
  - a. All crew applicators must have a Massachusetts Commercial Applicator License (CORE).
  - b. At least one or more applicator must have a ROW certification, if required for work.
  - c. Company must provide name(s) of applicator(s) and Applicator License/Certification number for all contractor crew leaders working on the project.
  - d. Company must provide documentation of any warnings, penalties or fines received in the last three (3) years.
3. Company must provide proof of experience with invasive plant control and include following:
  - a. At least five (5) references from prior invasive plant control work completed in last five (5) years. Provide contact information including address, phone number and email.
  - b. Provide a summary of each of these projects including nature of the problem, specific invasive vegetation treated, dates and period of treatment, methodologies used, and summary of success or not in terms of meeting performance objectives. Include summary of equipment used.
  - c. Photo documentation of these projects.
  - d. GPS coordinates of project locations, if available.
4. Crew leader must have expertise with invasive plant control and provide the following:
  - a. Have held Core license for at least five (5) years.
  - b. Resume listing five (5) or more years of experience applying pesticides with the company or with another company specializing in vegetation management.

The following companies are pre-approved by MassDOT Landscape Design Section:

<b><i>Groundscapes Express, Inc.</i></b> P.O. Box 737 Wrentham, MA 02093 Contact: Butch Goodwin <a href="mailto:butch@groundscapesexpress.com">butch@groundscapesexpress.com</a> Phone: 508-400-5366	<b><i>Solitude Lake Management</i></b> 590 Lake Street Shrewsbury, MA 01545 Contact: Keith Gazaille <a href="mailto:kgazaille@solitudelake.com">kgazaille@solitudelake.com</a> Phone: 508-885-0101
<b><i>Land Stewardship, Inc.</i></b> PO Box 511 Turner Falls, MA 01376 Contact: Chris Polatin <a href="mailto:info@landstewardshipinc.com">info@landstewardshipinc.com</a> Phone: 413-367-5292	<b><i>SWCA Environmental Consultants</i></b> 15 Research Drive Contact: Scott Fisher Phone: 413-658.2056 <a href="mailto:sfisher@swca.com">sfisher@swca.com</a> Amherst, MA 01002



<b><i>Native Habitat Restoration</i></b> P.O. Box 582 Stockbridge, MA 01262 Contact: Jess M. Toro: 413-358-7400 <a href="mailto:nativehabitatrestoration@gmail.com">nativehabitatrestoration@gmail.com</a> Phone: 413-394-0277	<b><i>Vegetation Control Service, Inc.</i></b> 2342 Main St. Athol, MA 01331 Contact: Andrew Powers <a href="mailto:apowers@vegetationcontrol.com">apowers@vegetationcontrol.com</a> Phone: 800-323-7706
<b><i>Ecological Land Management</i></b> 293 High Road Newbury, MA 01950 <a href="mailto:Brian@ecologicalandmanagement.com">Brian@ecologicalandmanagement.com</a> Phone: (978) 358-1423	

### **Invasive Plant Management Strategy (IPMS)**

At least thirty (30) days prior to proposed treatment the IPMS shall be submitted for approval by the Engineer and MassDOT Landscape Architect. All chemicals, methods and work done under this item shall be consistent with the IPMS. The IPMS shall be as described under Item 102.33.

### **Herbicide Use Report**

Within two (2) weeks after each application, the Contractor shall provide to the Engineer a completed and signed MassDOT Herbicide Use Report.

### **Photo Documentation**

Digital photos with date and time of herbicide application work may be required and shall be submitted upon request.

### **MATERIALS**

All proposed herbicides shall be as approved in the IPMS. Herbicides shall be labeled for the method of treatment and shall meet all federal, state and local regulation requirements. Application rates will depend on herbicide proposed and shall be per the manufacturer's label for specific application.

### **METHODS**

All methods used shall be as approved in the IPMS which shall be determined during the Initial Site Walk as described under Item 102.33 Invasive Plant Management Strategy.

The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

The Contractor shall notify the Engineer a minimum of 3 days prior to date of expected herbicide application. Applicators shall notify the Engineer upon arriving on-site.



## **Herbicide Applications**

All herbicide application shall conform to Massachusetts Pesticide Laws and Regulations per the Massachusetts Department of Agricultural Resources (MDAR) Pesticide Bureau.

Mixing, applying and/or disposing of herbicides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. Mixing shall not occur within sensitive areas, wetlands, or buffer zones.

Contractor shall not spray 2 hours prior to precipitation, during rain, or during windy conditions. The Contractor shall be responsible for monitoring weather conditions and adjusting the work schedule as appropriate for the herbicide and application method to be used.

Targeted vegetation shall be identified and marked prior to treatment. Plants treated by foliar spray, injection or glove application or other methods that leave standing vegetation, as opposed to cut-stump application, shall remain clearly marked for identification through the contract period.

Desirable vegetation shall be protected from both spray and other physical damage.

Contractor is responsible for any damage to vegetation not designated for removal or treatment. Vegetation damaged shall be restored. Cost of replacement plants and/or restoration shall be borne by the Contractor.

Contractor shall ensure that the public does not enter a work area while herbicide application or spraying is underway.

## **Disposal Of Invasive Plant Material**

All material to be cleared shall become the property of the Contractor. The satisfactory disposal of all cleared plant material (seeds, roots, woody vegetation, associated soils, etc.) shall be the Contractor's responsibility.

The Contractor shall take measures to prevent viable plant material from leading to further infestations (seeds, roots, woody material, etc.) while stockpiled, in transit, or at final disposal locations. All precautions shall be taken to avoid contamination of natural landscapes with invasive plants or invasive plant material.

Chipping, shredding, or on-site burning of plant material must be approved by the Engineer and included in the IMPS.

For plant material taken to an incinerating facility per the IPMS, a receipt from that facility shall be submitted to the Engineer as proof of disposal.

Where feasible, it is preferable to dispose of plants on-site or to bury them on-site with on-going monitoring for re-sprouting. Disposal locations and methods must be approved and included in the IPMS. Site work such as grading and seeding to stabilize and restore disposal area shall be incidental to this item.



The Contractor shall be responsible for treating or otherwise managing areas of re-growth due to improper disposal. Treatment shall be at the Contractor's expense.

### **Follow-Up Treatment**

Plants and areas shall be re-treated as necessary and as appropriate to the time of year. Treatment shall be for the duration of the contract and per the IPMS.

### **MEASURE OF SUCCESS**

The expectation is a minimum of 85-95 percent control achieved after the first treatment, depending on plants targeted and extent of population, and based on the expectations laid out in the IPMS. The expectation for the contract duration is 95-100% eradication by the end of the treatment period, unless otherwise specified in the IPMS.

### **METHOD OF MEASUREMENT**

Item 102.3 will be measured for payment by the Hour of crew time spent on the project doing actual herbicide application work. A crew shall be defined as a minimum of two licensed applicators each equipped with (at minimum) back-pack sprayer and mist blower. The crew shall also have a properly equipped spray truck with hoses and a tank with sufficient capacity for a full day of work.

### **BASIS OF PAYMENT**

Item 102.3 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment will be based upon time spent on the project doing actual work and shall not include travel time to and from the Contractor's place of business and shall also not include time for investigative field trips.

If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price.

The Invasive Plant Management Strategy will be paid for under Item 102.33.

<b><u>ITEM 102.33</u></b>	<b><u>INVASIVE PLANT MANAGEMENT STRATEGY</u></b>	<b><u>HOURLY</u></b>
<i>REV. 2022.01.01 (REV. DATE TO BE REMOVED BY CONTRACTS)</i>		

This item consists of providing an Invasive Plant Management Strategy (IPMS) for the control of invasive plants currently existing on the project site and/or as directed and shall be coordinated with Item 102.3 Herbicide Treatment of Invasive Plants. The IPMS shall be submitted for review and approval and the IPMS shall be implemented on-site.

Herbicide treatment for invasive plants shall be as described under Item 102.3 Herbicide Treatment of Invasive Plants and shall be compensated per that Item.



Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation as relevant to the project.

Individual attending the site walk and determining the Invasive Plant Management Strategy must demonstrate expertise with vegetation management and invasive plant control and submit qualifications as described below.

## **SUBMITTALS**

### **Task Summary**

For measurement of payment, the contractor shall submit the total sum and a breakdown of hours for the tasks performed. At a minimum, the tasks shall include the Initial Site Walk, the IPMS Written Report, and if necessary to accommodate project or site changes, a Follow-up Site Inspection and accompanying IPMS Amendment.

Interim Site Monitoring Reports and/or a Final Report shall be submitted if requested by the MassDOT Landscape Design contact. The MassDOT Landscape Design contact shall be notified to attend the final walk through when a Final Report has been requested.

### **Qualifications**

Individual shall be from the same company as that providing services for Item 102.3 Herbicide Treatment of Invasive Plants or shall meet the following requirements:

- Submit copy of current Core license.
- Submit a resume listing five (5) or more years of experience managing invasive plants with a company specializing in vegetation management. References shall be submitted if requested.

### **Invasive Plant Management Strategy (IPMS)**

At least thirty (30) days prior to construction activities and/or any proposed treatment, submit a written IPMS proposal for approval by the Engineer and MassDOT Landscape Architect. All chemicals and methods proposed shall be consistent with applicable Massachusetts Wetlands Protection Act Order of Conditions.

The IPMS shall be completed in coordination with the Roadway Contractor and the Engineer and shall include the following as appropriate to the project:

#### **I. Project Information**

- a. Company writing IPMS and performing herbicide application.
- b. Date of site walk
- c. Attendees at site walk
- d. Expected end date of contract and expected last treatment (month/season)

#### **II. Brief Description of Conditions**



- a. Provide a free-hand sketch on construction plans or aerial image showing species, location, and as relevant, show or note extent of population as relevant to Strategy (i.e., population extends off ROW preventing eradication, small population and eradication deemed feasible within contract schedule, etc.).
- III. Coordination with Roadway Contractor regarding other work**
- a. Tree Work: Note coordination to be implemented with tree removal, clearing, and clearing and grubbing as applicable to the project.
  - b. Wetland Mitigation - Include management proposed for wetland mitigation areas in the IPMS, if and as required.
  - c. Planting: If there will be planting in areas proposed for treatment, propose treatment and schedule to avoid herbicide damage to plants.
  - d. Mowing: If coordination is required with state mowers, note need in IPMS.
- IV. Soil Management**
- a. Provide specifics on how soil with invasive plant roots (in particular) or seeds will be handled (i.e., separate stockpiles, plant material will be buried on-site, re-used on-site, disposed off site and if so, where?).
  - b. Show stockpile locations on plan and include treatment schedule.
  - c. Note measures that will be implemented to avoid spread through equipment, including how and where equipment will be cleaned.
- V. Invasive Plant Treatment & Management**
- a. Proposed chemical and methods of treatment for each species or area.
  - b. Time of treatment based on target plant species.
  - c. Submit product label including application methods and rates (entire MSDS information need not be submitted if available online).
  - d. Proposed performance metrics or measure of treatment success if different from that specified under Item 102.3.
  - e. Method for disposing invasive plant material. This includes material that may result in spread (i.e., seeds, roots) and material that has been treated and/or is not viable (foliage, dead wood, etc.). Methods may include grinding in place, stockpiling and treating, and incinerating offsite.
  - f. Expected follow-up treatment for duration of contract.
- VI. Monitoring Schedule** if requested by MassDOT.

Note: The IPMS is critical for identifying pre-construction conditions as well as strategies for minimizing import or spread of invasive plants. Failure to provide an approved IPMS may jeopardize this item, in which case, the contractor will be responsible for management of invasive plants found on-site at no cost to the contract.

### **Photo Documentation**

Digital photos with date and time verification shall be provided with the IPMS and with any follow-up monitoring or reporting.

### **IPMS Follow-up Amendments**

The IPMS may be amended to address additional concerns or adjust to conditions. The amended IPMS shall be submitted to the Engineer and MassDOT Landscape Architect for approval at least fourteen (14) days prior to any proposed treatment.



## **Interim Site Monitoring Inspection Reports**

If required by the MassDOT Landscape Architect and Engineer, Interim Site Monitoring and an accompanying report shall be conducted.

## **Final Report**

A final inspection and report documenting the status of the invasive control may be required for regulatory purposes or for instances where control will be continued by others. The report shall include photo documentation of pre-construction (existing) and post-treatment conditions, notations on a plan or aerial image of area treated, summary of treatment performed, and control achieved.

## **INITIAL SITE WALK**

Prior to any work the Contractor shall walk the site with the Engineer and the MassDOT Landscape Architect to determine the IPMS. During the site walk the Contractor shall identify limits of work and, as necessary, mark locations of areas designated for treatment and individual plants targeted for treatment or removal. The Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

## **METHOD OF MEASUREMENT**

Item 102.33 will be measured for payment by the Hour. The basis for measurement shall be per the completion of tasks as approved under the Task Summary submittal.

## **BASIS OF PAYMENT**

Item 102.33 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools, and all incidentals required to complete the work.

Payment shall not include travel time to and from the Contractor's place of business.

<b><u>ITEM 102.521</u></b>	<b><u>TREE AND PLANT PROTECTION FENCE</u></b>	<b><u>FOOT</u></b>
<i>REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)</i>		

The work under this Item shall conform to the relevant provisions of Sections 644 and 771 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, removing and resetting, maintaining fence in a vertical and effective position at all times, and final removal of temporary fence.

The purpose of the fence is to prevent damage to tree roots, tree trunks, soil, and all other vegetation within a delineated Tree and Plant Protection Zone (TPPZ) as shown on the plans, as directed by the Engineer, and as described herein.

Protection shall be for the duration of the construction activities unless otherwise directed.



## MATERIALS

Temporary Fence shall be such that it provides a minimum 48-inch tall barrier that remains vertical and effective (not sagging) for the duration of period required. Fence shall be plastic orange safety fence (recommended where high visibility is necessary), wooden snow fencing, or other approved material.

Per the Engineer, additional posts, deeper post depths, and/or additional attachments will be used if the fabric or fence sags, leans or otherwise shows signs of failing to create a sufficient barrier to access.

## REFERENCES

If requested, the Contractor shall provide to the Engineer one copy of the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1, Pruning and Part 5, Construction Management Standard. Provision of reference shall be incidental to this item.

## ESTABLISHMENT OF TPPZ

Fencing shall be used for construction areas, staging areas, and stockpile areas as shown on the plans and as directed by the Engineer to establish the Tree and Plant Protection Zone (TPPZ).

Fence shall be located as close to the work zone limit and as far from the trunk as possible to maximize the area to be protected. Fence shall run parallel and adjacent to construction activity to create a barrier between the work zone and the root zone or designated limit of plants and soils to be protected.

When construction activities surround (or have the potential to surround) trees or plants to be protected, a circular enclosure shall be used. In these instances, the TPPZ limit shall be the Drip Line of each tree or as close as possible to the Drip Line, and as shown on the plans and details. The Drip Line is defined as the limit of tree canopy.

The Contractor shall not engage in any construction activity within the TPPZ without the approval of the Engineer, including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets; and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks.

## METHOD OF WORK

Fence shall be installed prior to any construction work or staging activities and shall be installed and maintained in a vertical and effective position at all times.

Fence shall be repositioned where and as necessary for optimum effectiveness. Repositioning shall be incidental to this item. Fence shall not be moved without prior approval by the Engineer.



The TPPZ shall be protected at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves, and roots of all plants; and contamination of the soil with construction materials, debris, silt, fuels, oils, and any chemicals substance.

After construction activities are completed, or when directed by the Engineer, fence, stakes, and other materials shall be removed and disposed off-site by the Contractor.

### **REQUIRED WORK WITHIN THE TPPZ**

In the event that grading, trenching, utility work, or storage is unavoidable within the TPPZ, the Engineer shall be notified. Measures may be required for tree protection and preservations, including air spading, the use of six-inch depth of wood chips or approved matting for root protection, pruning of branches, and/or trunk protection. These protection measures will be paid under applicable items.

Landscaping work specified within the TPPZ shall be accomplished by hand tools. Where hand work is not feasible, with permission of the Engineer, work shall be conducted with the smallest mechanized equipment necessary.

### **TREE AND PLANT DAMAGES OR LOSS**

If the TPPZ is intruded upon, at the discretion of the Engineer, the Contractor will be required to provide a more durable barrier (e.g., Jersey Barriers) to secure the area. Cost of furnishing and installing additional or more durable barrier shall be borne by the Contractor.

If the Contractor intrudes into a TPPZ without approval, soil will be considered compacted and tree root damage will be assumed. Action will be taken as specified below.

In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense obtain an Arborist. The Arborist shall be approved by MassDOT.

In the event of spills, compaction or damage, the Contractor shall take corrective action immediately using methods approved by the Engineer in coordination with the Arborist.

If, based on the recommendations of the Arborist, the Engineer determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering, the damage will be repaired as soon as possible within the appropriate season for such work and according to industry standards.

If the Engineer determines that damages are irreparable, the Contractor shall pay for the damages in the amount of \$500.00 per diameter inch at breast height (DBH) per tree.

Additionally, if the Engineer determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include cleanup of all wood parts, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil.



Shrubs will be replaced with a plant of similar species and equal size or the largest size plants reasonably available. The Engineer will approve the size and quality of the replacement plant. Replacement will include a minimum of one year of watering and care.

## **METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 102.521 will be measured and paid for payment by the foot of Tree and Plant Protection Fence, complete in place. This includes all labor, materials, equipment, maintenance, final removal and disposal of the protective materials, damages repair, and all incidental cost required to complete the work.

Payment of 40 percent of value will be made upon installation of Fence. The remaining 60 percent will be made when protection materials have been removed and disposed off-site.

No separate payment will be made for costs of remedial actions, including addition of more durable barriers, or arborist services, but all costs in connection therewith shall be included in the Contract unit price bid.

In the event of irreparable damage due to lack of proper protective measures being take there will be no compensation in addition to the \$500.00 per diameter inch penalty.

### **ITEM 102.531**

### **TREE CARE - PRUNING**

### **EACH**

*REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)*

The work under this item shall conform to the relevant provisions of Sections 771 and shall be for when specialized or significant limb pruning is required. Pruning shall be to prevent injury to the tree from construction equipment and activities, pruning of dead limbs, and/or pruning for health and balance of the tree to mitigate impacts of construction activities on the root zone.

Trees to be pruned shall be those listed below.

<u>Station</u>	<u>Offset</u>	<u>Baseline</u>
122+47	46' LT	Route 44

## **QUALIFICATIONS**

Individuals performing the work must have, at a minimum, an ISA Certified Tree Worker or demonstrate equivalent training and experience. Certification shall be submitted to the Engineer for approval prior to work.

## **REFERENCES**

If requested, the Contractor shall provide to the Engineer one copy of the latest edition of the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance: Part 1-Pruning and Part 5-Construction Management Standard. Provision of reference shall be incidental to this item.

## **METHODS OF WORK**



Prior to construction activities, the Engineer, the Contractor, and the Arborist shall review trees noted on the plans and listed herein to be pruned. Final decision as to trees pruned shall be per the Engineer.

Pruning of limbs shall conform to the techniques and standards of the most recent ANSI A300 standards.

## METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 102.531 will be measured and paid at the contract unit price per Each. This will include full compensation for all labor, equipment, tools, materials, and incidentals for the satisfactory completion of the work.

Arborist services shall be paid for separately under Arborist, Item 102.55.

### ITEM 102.55

### ARBORIST

### HOURLY

*REV. 2022.01.01 (REV. DATE TO BE REMOVED BY CONTRACTS)*

### DESCRIPTION

The work under this Item is for the services of a Certified Arborist. Arborist shall be an International Society of Arboriculture (ISA) Certified Arborist or a Massachusetts Certified Arborist. The Arborist shall have at least 10 years of experience in tree care, including tree protection during construction, and shall demonstrate a familiarity with the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1 Pruning, Part 5 Construction Management Standards, and Part 9 Tree Risk Assessment.

The Arborist's general responsibilities include protecting high priority trees within and adjacent to the project limits, stating areas, and access routes; recommending removal of diseased, damaged or otherwise unhealthy trees that pose a potential safety hazard; evaluating effects of construction on future health of trees close to proposed work; and recommending and/or overseeing tree work and care.

The Arborist for this item shall not be from the same company as the company responsible for selective clearing or tree removal work.

For projects with multiple phases, projects where construction activities (work or stockpiling) shifts, or when otherwise directed by the Engineer, the Arborist shall re-evaluate conditions and provide follow-up recommendations.

### SUBMITTALS

- ☐ Contractor shall submit to the Engineer for approval by MassDOT Landscape Design the qualifications and experience of the Arborist. Submittal shall include copy of current certification and a resume summarizing specific construction experience (including relevant MassDOT projects) for a minimum of five projects.



- Arborist's Report documenting recommendations shall be submitted to the Engineer and an electronic copy forwarded to MassDOT Landscape Design Section. Report shall include the following:

### SCOPE OF WORK

The Arborist shall be responsible for the following tasks:

- Initial Evaluation and Report
  - recommend and prioritize trees that require removal as appropriate to contract scope, project limits, and project intent;
  - review and modify, if necessary, tree protection measures shown on the drawings
  - review and mark limits of protective fencing for trees and groups of trees to be retained;
  - review and recommend protection measures for high priority trees;
  - submit a marked-up Construction Plan that briefly notes recommendations and decisions made in the field;
  - submit a corresponding report including photo documentation;
- Oversight
  - direct or execute pruning of branches and/or roots, air spading, and/or other tree care operations
- Monitoring and Inspections
  - periodically inspect fencing and ensure root zones are properly protected and clear of equipment and materials as required by the Engineer
  - reevaluate tree protection measures for various phases of a project
  - submit inspection notes with relevant and dated photos to the Engineer.
- Special Care
  - oversee tree pruning for health and aesthetics
  - recommend fertilization and amendments
  - recommend and oversee pest control

### METHODS

Prior to any work, the Arborist shall walk the site with the Contractor, the Engineer, the Town Tree Warden, and, if specified, the MassDOT Landscape Architect, to review trees, limits of construction activities, and other concerns. Where required for proper assessment of tree impacts, limits of work shall be staked or otherwise marked in the field prior to the site walk.

Trees to be removed shall be painted or otherwise marked.

Trees to be retained shall be marked such that it does not mar or damage the tree and such that marker is not easily removed. As applicable to the work and scope of the project, trees designated for removal or to be retained shall be noted on the plan and/or in the arborist's report and photographed.

Trees designated to remain that are damaged or removed by construction activities shall be noted and photographed for inclusion in inspection reports submitted to the Engineer.

### MEASUREMENT AND BASIS OF PAYMENT



**GENERAL**

Work under Item 183.2 is based upon the disposal of used granular-activated carbon as the treatment medium for contaminated groundwater (Item 183.1) that is found during excavations in which contaminated groundwater is encountered.

**BASIS OF PAYMENT**

Payment shall be made at the unit price bid per pound of carbon that is properly disposed and replaced, as necessary, to meet treated water discharge requirements during dewatering operations at the site. Payment for Disposal of Granular Activated Carbon shall include compensation for all labor, equipment, materials, permits, characterization, sampling and on-site or laboratory analysis as needed or required by permits, for replacement and disposal of liquid-phase activated carbon for the on-site contaminated groundwater pumping, collection, treatment and treated water discharge system during the time period required to complete the work. No payments shall be made for replacing carbon which is spent due to the Contractor's failure to remove floating petroleum product or excess sediments prior to the groundwater entering the carbon treatment units. All other costs associated with treatment of contaminated groundwater will be covered under Item 183.1- Treatment of Contaminated Groundwater.

**ITEM 245.04****4 FOOT X 4 FOOT REINFORCED CONCRETE  
BOX CULVERT****FOOT**

The work under this item shall conform to the relevant provisions of Subsections 112, 127, 140 and 230 of the Standard Specifications and the following:

Work under this item shall include all materials, equipment and labor needed to construct the precast concrete box culvert, and includes concrete, reinforcing steel, membrane waterproofing and bituminous damp-proofing. Work shall also include the removal of the existing concrete box culvert, headwall and wingwalls to the extents shown on the Plans.

This work shall consist of designing, fabricating, and installing cast-in-place or precast concrete box culverts. The culvert shall be a three-sided reinforced concrete culvert at the location of the sewer line to limit impact to the utility. The contractor may also elect to use cast-in-place concrete for the four-sided box culvert between the existing culvert cut line and the sewer line. The remainder of the proposed box culvert extension may be cast-in-place or precast concrete box culverts. The box sections shall conform to the dimensions and geometry shown on the Plans. All elements to be designed in accordance with current AASHTO LRFD specifications.

Prior to construction, the Contractor shall investigate and dimension the existing culvert end and match them for the proposed culvert extension. This investigation shall be reflected in the shop drawings to show the method of connecting the existing culvert to the proposed culvert segment.

The Contractor shall install a 2'-6" bedding of gravel borrow for bridge foundation below the proposed box culvert extension in accordance with the detail. If additional unsuitable material



below this bedding is found, it shall be removed and replaced with gravel borrow for bridge foundation at the direction of the engineer.

If chosen as the selected method of culvert construction, all precast sections shall have positive connections between segments thru the use of shear keys and bolted connections. Details to be designed by the contractor and approved by the engineer prior to any fabrication. Shear keys, if used, shall be filled with non-shrink grout and waterproofed.

Bituminous damp-proofing will be required on the top and sides of the proposed box culvert extension and 2 feet beyond the cut line onto the existing culvert as shown on the Plans. Bituminous damp-proofing is also required along any below grade section of the head wall, cutoff and wing walls.

### Design

The Contractor shall submit design calculations and drawings for the proposed box culvert extension, headwall, cutoff and wing walls prepared in accordance with the latest AASHTO LRFD Bridge Design Specifications and the MassDOT LRFD Bridge Design Manual for HL-93 loading using English units for approval of the Engineer. Design computations shall be submitted for approval. To expedite the review and approval process, submissions containing computer computations shall include electronic copies of the actual input and output files. The design computations shall consider all loadings as are appropriate for each stage of fabrication, shipment, construction and upon completion. Design computations and shop drawings shall be prepared by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

The culvert extension end is to be constructed as stone masonry in accordance with E302.2.0 of the MassDOT Construction Standards and as shown on the Plans.

Prior to fabrication, eight (8) sets of complete shop drawings showing, as a minimum, the following information shall be submitted to the Engineer for approval of the precast concrete option:

1. Plan layout of the structure indicating the piece mark of each box culvert section;
2. Complete details of all precast box sections, including all dimensions and tolerances, locations and types of reinforcement, finish treatments, and concrete strengths at lifting and at 28 days;
3. Joint dimensions and details including type and brand of joint sealing materials;
4. Locations and methods of forming lifting holes, type and location of lifting devices, and the method of handling and transporting all precast box sections to the job site.

### Bituminous Damp-Proofing

Bituminous damp-proofing shall be applied to surfaces as listed above. This work shall conform to Subsection 970 of the Standard Specifications.

### COMPENSATION

The box culvert extension will be measured for payment by the foot, along the center of the culvert, complete in place.



The box culvert extension will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for design, drawings, excavation, existing culvert/headwall/wingwall demolition, culvert extension, culvert stone masonry end, stone bedding, geotextile fabric, bituminous damp-proofing, gravel backfill and compaction, but all costs in connection there with shall be included in the Contract unit price bid.

Unsuitable material encountered at the bottom of the culvert excavation will be removed and paid for under Item 141., Class A Trench Excavation.

Gravel borrow for bridge foundation shall be used in backfilling area where unsuitable material has been removed and will be paid under Item 151.1, Gravel Borrow for Bridge Foundation.

Control of water during removal of existing headwall and the construction of the proposed culvert extension will be paid under Item 991.1, Control of Water.

**ITEM 751.72**                      **COMPOST BLANKET**                      **SQUARE YARD**  
*REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)*

The work under this Item shall conform to the relevant provisions of Subsection 751 and M1.06.0 Organic Soil Additives of the Standard Specifications and the following:

Work shall consist of furnishing and pneumatically applying compost as a thin mulch blanket (1/2-1 inch depth) over prepared soil to provide temporary soil stabilization and organic matter for plant growth.

**SUBMITTALS AND MATERIALS**

No materials shall be delivered until the required submittals have been approved by the Engineer. Delivered materials shall match the approved samples. Approval of test results does not constitute final acceptance.

Contractor shall submit to the Engineer samples and certified test results no sooner than 60 days prior to application of compost. Vender certification that material delivered meets the test results shall be submitted if requested.

Compost may be a blended product of compost and fine wood chips. No kiln-dried wood, construction debris or ground palette is allowed. Material shall meet the following criteria:

- Organic matter content shall be minimum 30 percent (dry weight basis)
- Moisture content shall be 30-60 percent (wet weight basis)
- Bulk Density <1000 lb/cy
- pH shall be 5.5-7.5
- Conductivity shall be a maximum of 4 mmhos
- Stability test shall produce a maximum of 8mg CO<sub>2</sub>-C/gram of organic material per day
- Particle size shall not exceed ¾ inch
- Compost may be a blended product of compost and fine wood chips.



Compost testing shall be by a laboratory approved by the US Compost Council using the Testing Method for the Examination of Compost and Composting (TMECC) protocols.

The Engineer shall approve the Contractor's equipment for application.

### **CONSTRUCTION METHODS**

Application of compost material shall not begin until the Engineer has approved the site and soil conditions. Soil preparation shall be as specified under the applicable item for soil placement or for seeding. The Contractor shall notify the Engineer when areas are ready for inspection and application of compost.

Compost blanket shall be pneumatically applied (blown on) to a minimum depth of one half to one inch. Where shown on the plans or when directed by the Engineer depth may be increased to provide berms for sediment control or to otherwise prevent slope erosion.

When compost blanket is proposed with seeding, seed shall be broadcast and shall occur in conjunction with compost blanket, as specified under the relevant item for seeding.

When compost blanket is proposed for areas with planting, compost (and seed if applicable) shall be applied after planting. If compost and seed occur prior to planting, areas shall be regraded and compost and seed reapplied to the satisfaction of the Engineer and at the Contractor's expense.

### **METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 751.7 will be measured and paid for at the Contract unit price per Cubic Yard which price shall include all labor, materials, equipment, and all incidental costs required to complete the work of pneumatically applying compost.

Surface preparation of substrate receiving compost blanket shall be compensated under the applicable item for placement of loam, sand, ordinary borrow, wetland soil, topsoil rehandled and spread, tilled existing soil, or other specified substrate.

Seeding will be compensated for under the appropriate seeding items.

### **ITEM 754.24**

### **ATLANTIC STURGEON PROTECTION PLAN**

### **LUMP SUM**

The work to be done under this item consists of the monitoring and protection of Atlantic Sturgeon during work in the water of the Taunton River or other areas designated by the Engineer and in accordance with applicable environmental permits.

#### **Construction Methods**

This work shall consist of three (3) primary tasks as follows:

1. Monitoring of Active Construction Areas:



Prior to the start of any construction activity, the contractor shall submit to the Engineer for approval the name and qualifications of the proposed Atlantic Sturgeon Monitor for the project. The Monitor shall be a qualified biologist approved by the Natural Heritage and Endangered Species Program (NHESP) that has experience in rare species ecology and management during construction projects. The primary objective of the Monitor is to ensure that impacts to the Atlantic Sturgeon are avoided to the greatest extent possible during the project.

Prior to beginning work on the installation of cofferdams or other water control barriers, a turbidity curtain or other suitable barrier shall be installed around the proposed work area. After installation of the turbidity curtain, the Monitor shall be responsible for searching the work areas inside the barrier for any Atlantic Sturgeon and, pursuant to a Scientific Collection permit, shall relocate any Atlantic Sturgeon or protected species to a suitable habitat outside of the work zone. Once any required relocations are complete, the Contractor can begin installing the proposed cofferdams within the turbidity barrier.

The Monitor shall be present as the cofferdams are installed. Once installed, the Monitor shall search within the cofferdams and in the vicinity to remove any Atlantic Sturgeon encountered and, again, after the area is dewatered. Work shall be avoided during the anadromous fisheries migration of **March 1 to June 30** each year.

A written report shall be provided to the Resident Engineer following each inspection. Any and all rare species encountered at the site should be reported to NHESP on the rare Animal Observation Form as soon as possible. Furthermore, the NHESP shall receive a report notifying them of the initiation of work and after the completion of work indicating the dates of all searches, species observed, and any corrective measures taken. The Monitor may modify the above noted plan, with NHESP written approval, to accommodate specific construction sequencing details of a particular project.

## 2. Implementation of a Worker Training Program and Notification Procedure:

There shall be the implementation of a site worker training program. This training program shall be developed and presented by the Monitor prior to the start of the project. Construction crews, project foreman, and site engineers shall participate in a special training session aimed at making them aware of the ongoing rare species concerns and the various protective measures in place to safeguard the Atlantic Sturgeon.

To help facilitate learning of the important concepts presented during the training, the Monitor shall produce a laminated 'informational sheet' on the Atlantic Sturgeon to be distributed to the workers during the training session and posted at conspicuous locations at the project site. This informational sheet shall include representative photographs and diagnostic features of the Atlantic Sturgeon to aid identification, an outline of the notification procedure, and contact information for the Monitor and NHESP.

## 3. In-Water Construction Work and Equipment Limited to One-Third of River's Total Width at Any Time

To allow the safe passage of fisheries during construction, the Contractor will be prohibited from blocking more than one-third of the river's width at any time. For short periods



between December and February, the Contractor may request, and the Resident Engineer may allow, no more than one-half the width of the river to be blocked by work or equipment at any time.

### COMPENSATION

The work will be paid at the Contract lump sum price bid and shall include the cost of the Monitor, permits, training, inspections, reports, and turbidity curtains, including installation, maintenance and removal of the same and all other work as described in the Item. Upon approval of the Monitor by the Resident Engineer and NHESP, a payment of 30% of the Lump Sum shall be paid. The remaining 70% shall be paid in 10% increments distributed equally throughout the remaining period of the Contract.

<b><u>ITEM 755.35</u></b>	<b><u>INLAND WETLAND REPLICATION AREA</u></b>	<b><u>LUMP SUM</u></b>
<i>REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)</i>		

The work under this item shall conform to the relevant provisions of Subsections 120, 770, 771 of the Standard Specifications and the following:

Work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist as specified under that item.

Wetland Restoration work shall be as specified and compensated under that item. Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation.

The Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer, specified herein, or specified in permit conditions and approvals. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

### DESCRIPTION OF WORK

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Approximate Location: 118+20 – 118+50 RT  
Area: 1,379 s.f.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the Contract; including but not limited to damage to soils or vegetation due to erosion, sedimentation,



compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the Wetland Replication construction work shall not be from the same company as that which is performing planting, seeding, or participating in any aspect of the Wetland Replication construction. ▯

### SUBMITTALS - DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): As specified below, shall be submitted to the Engineer for distribution to appropriate regulatory agencies.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

### SUBMITTALS - MATERIAL

#### **Soil and Amendments**

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants.

At least sixty (60) days prior to installation and prior to ordering, the Contractor shall submit for approval sources of soil, compost, and amendments. Submittal shall include the supplier and location of the source. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments for soil texture, organic carbon content or other routine soil analysis parameters (e.g., pH, Cation Exchange Capacity, Percent Base Saturation) and Soil Organic Matter Analysis will be required if requested by the Engineer. The grab samples shall be collected by the Contractor or Wetland Specialist from multiple representative locations in the wetland topsoil mix following the "Umass Soil and Plant Tissue Testing Laboratory Sampling and Collection Protocols" (or equivalent certification paperwork provided by the soil supplier). The lab analysis shall be provided to the Engineer along with written certification from the Contractor or Wetland Specialist that the wetland topsoil was collected per the referenced protocol and meets the desired specification. The analysis and written certification of same shall be provided to the Engineer prior to placing the wetland topsoil in the Replication Area.

#### **Seed Mix**



Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

### **Plant Certification**

Plant Certification shall be per the applicable requirements of Subsection 771, PLANTING TREES, SHRUBS AND GROUND COVER, of the Standard Specifications. The nursery source shall certify the provenance or origin of all plants.

**Other Material:** Submittals shall be per the respective item.

### **MATERIALS**

#### **Sediment Control Barrier and Erosion Prevention Measures**

Sediment control barriers shall be per Item 767.121.

#### **Wetland Soil**

Soil appropriate for the Replication Area may be either hydric soil excavated from the impacted wetland, a manufactured mix of compost and on-site borrow, or a combination thereof, as approved by the Engineer.

Hydric soil from the impacted wetland area may be spread on the surface of the constructed Replication Area as an inoculant or can be placed in a bulk fashion in a roughly 1:1 ratio of area and depth. Soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Hydric soil from the impacted wetland that is infested with invasive plant species identified on the Massachusetts Invasive Plant Advisory Group (MIPAG) shall not be used in the Replication Area unless approved by the Wetland Specialist and Engineer. To the extent possible, infested soil shall be disposed of within the project limits in an upland area outside of regulated areas and as approved by the Invasive Plant Management Strategy item (if in the contract) or by the Engineer.

A manufactured mix suitable for wetlands shall consist of on-site borrow from the proposed Replication Area (if approved by the Wetland Specialist and Engineer) thoroughly mixed with compost to achieve a target organic carbon content of 10-12% (up to 21% percent organic matter) by dry weight. The organic material used for mixing shall be well or partially decomposed. Clean leaf compost is the preferred soil amendment to achieve these standards though other materials



may be used if approved by the Wetland Specialist and Engineer. Note that “clean” refers both to a negligible amount (<1%) of physical contaminants such as plastic and to the lack of chemical contaminants that might pose a hazard to plants or animals. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

### Plants

Plant material shall conform to the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUND COVER, of the latest edition of the Standard Specifications and as amended below.

Plants shall be native species, not cultivars. To the extent possible, plants shall originate from the applicable EPA Level III Ecoregion.

[Select as appropriate and remove bullet]

Plant species and sizes to be included in the Replication Area shall be as specified on the plans.

Requests for substitutions shall be submitted in writing to the Engineer for review by the Wetland Specialist, MassDOT Landscape Architect, and, if required, the relevant regulatory agency at least thirty (30) days prior to planting. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Transplanting and plant material collected from the wild is prohibited unless approved in writing by the Engineer. Plants shall be selected from certified nurseries that have been inspected by state and/or federal agencies.

### Seed Mix

Seeding shall conform to the Standard Specifications Section M6, ROADSIDE DEVELOPMENT MATERIALS.

### **Wetland Mix – Part Shade**

<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
<b>Grass</b>		
Poa palustris	Fowl Bluegrass	25.00%
Elymus riparius	Riverbank Wild Rye	19.00%
Carex lurida	Shallow Sedge	17.00%
Carex vulpinoidea	Fox Sedge	10.00%
Cinna arundinacea	Sweet Woodreed	5.00%
Sparganium eurycarpum	Giant Bur Reed Eco PA	4.00%
Carex scoparia	Broom sedge	4.00%
Carex lupulina	Hop Sedge	4.00%
Scirpus polyphyllus	Many Leaved Bulrush	3.00%



Juncus effusus	Soft Rush	2.50%
Carex intumescens	Bladder Sedge	2.00%
Sparganium americanum	Burrweed	2.00%
Scirpus cyperinus	Woolgrass	1.00%
Carex crinita	Fringed Sedge	1.00%
Juncus tenuis	Path Rush	0.50%
		<b>100.00%</b>

Species ecotype shall be as native to New England region as possible.

### Seeding Rate

Apply this mix at 20 lbs PLS/acre.

Fertilizers shall not be used.

### Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

### Mulch/Compost Blanket for Seeding

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Mulch shall be incidental to seeding.

Compost Blanket may be used in lieu of mulch for seeding. Compost Blanket shall meet the material and submittal requirements of that Item and shall be applied as specified below. Compost Blanket shall be compensated under that item.

## CONSTRUCTION METHODS & SEQUENCE

### **SITE PROTECTION MEASURES**

#### Minimizing Damage

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

Wetland topsoil shall be deposited and graded in the Replication Area in a manner that minimizes travel and subsequent compaction of the subgrade (including any specified pit and mound topography) to the extent practicable, including use of track mounted excavators as appropriate.



Should soils be compacted, they shall be loosened by a method such as disking, spring-tooth harrowing and/or rototilling. The Contractor shall use boards, timber or composite mats, or other approved materials as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

### Stockpiling of Soil

Stockpiling of soil, including hydric soil for replication, shall be at least 100 feet from the edge of the bordering and isolated vegetated wetlands and inland banks, unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. Any areas of exposed soil or stockpiles within and adjacent to the Replication Area that will remain inactive for more than 7 calendar days shall be sown with a mix of rapid germinating annual grasses (e.g., annual rye) covered with a layer of straw mulch applied at a rate of 90 pounds per 1,000 square feet. As necessary, the mulch shall be anchored with a tacking coat (non-tar) applied by a hydro seeder or other method recommended by the Wetland Specialist in consultation with the Engineer. In the event that there is excess borrow, it shall be disposed of under Excavation, Item 120.1.

### Sediment Barriers

**Placement:** Sediment barriers shall be installed along the downslope perimeter of the Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Where construction work is immediately upgradient of the wetland, barriers shall be located so as to protect the Replication Area until slopes are stabilized. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

**Maintenance:** The Contractor shall ensure that all sediment barriers function as intended and at all times per the specifications of those respective items.

### Existing Trees to Remain

**Tree protection** shall be per the relevant specifications and as shown on the plans or as required by the Engineer. To protect root systems of existing trees to remain, the limits of the Replication Area may be adjusted, but, the total area of replication required by the permits shall not be reduced. Access route may be adjusted as required.

**Trees to be retained as snags** (upright dead or dying trees left for wildlife habitat) within or adjacent to the Replication Area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect during the initial site walk. Trees to remain as snags shall be clearly marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

**Coarse woody debris** in the form of cut trees, stumps, logs, and brush shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect. On site material shall be selected and marked by the Wetland Specialist, retained on the project site, and placed as specified below under Placement of Coarse Woody Debris.



All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal.

Work shall be coordinated with Clearing or Tree Removal Item and compensated under that Item.

## **PRE-WETLAND CONSTRUCTION SITE WALK**

***Delineating the Replication Area and Access Route.*** The Contractor shall stake out the Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

As part of the delineation and approval process, the Wetland Specialist shall mark trees to be converted to snags, select course woody debris to be retained for re-use, and select rocks or other elements to be used for habitat features.

**Invasive Plants:** As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described herein under Invasive Plants.

## **SOIL WORK**

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist to achieve the desired hydrology and micro-habitat. If adjustments are required, a Request for Information (RFI) shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

### **Excavation & Grading**

When required by permits, the Wetland Specialist shall notify MADEP and the ACOE (as applicable) at least 72 hours prior to excavation.

Soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and disposed of, or, if suitable for reuse, be stockpiled in an approved location. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist and provided to the Engineer and the Contractor.

Replication area shall be excavated as shown on the drawings. Where replication area is adjacent to existing reference wetland, finish grade of replication shall generally match existing grades and micro-topography, notwithstanding any deviations that are necessary to achieve the desired hydrology and habitat in the Replication Area.

Prior to placement of backfill, scarify subgrade to a depth of 4 to 6 inches.

### **Placement of Wetland Soil**



Following excavation, scarification, and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, suitable soil previously removed or an evenly mixed organic/mineral soil created on-site shall be spread to the design depth and thickness over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Vehicles used to transport soil from offsite shall be washed or cleaned with air pressure to prevent exotic or invasive seeds or root fragments from contaminating the Replication Area.

### Final Grading

The finished grade of the Replication Area shall be at an elevation that will provide an unrestricted hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland relative to the impacted reference wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography in the form of hummocks, pits and mounds shall be as shown on the plans or as adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with soil as specified herein and at the Contractor's expense.

### Installation of Monitoring Wells in Replication Area

#### **[Remove section if not required.]**

For a constructed Replication Area over 1,000 square feet, a representative number of monitoring wells shall be installed in locations as shown on the Plans. Monitoring wells shall include data loggers. For purposes of this specification, a data logger refers to a battery powered device that records groundwater level. Data shall be collected by the Wetland Specialist and submitted with Monitoring Reports and as required by applicable permits. Wells shall be installed immediately following completion of construction of the Wetland Replication Area. Wells shall be installed in accordance with USDA/NRCS technical report entitled: "Sprecher, S.W. 2008. Installing monitoring wells in soils (Version 1.0). National Soil Survey Center, Natural Resources Conservation Service, USDA, Lincoln, NE." or equivalent methodology approved by Engineer.

## **RESTORING VEGETATION**

### Placement of Coarse Woody Material

If specified within this Contract or if directed by the Wetland Specialist or Landscape Architect during the initial site walk, woody debris shall be placed in the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 5-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.



## Planting

Following placement of wetland soil and approval of final grade and conditions, Replication Area shall be planted. Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUND COVER of the Division I Standard Specifications and as amended below.

Planting Season shall be May 15-June 15 and September 1-November 1 unless otherwise specified in applicable permit conditions.

Prior to planting, the Wetland Specialist shall approve the condition of the plant material and the method of installation and shall oversee the planting work. Replication Area shall be planted in the dry. Plants shall be placed according to the planting details and within the range of target elevations and at the spacing shown on the Plans or, if spacing is not indicated on the Plans, at the direction of the Wetland Specialist. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer or Wetland Specialist and shall be replaced at the Contractor's expense.

Plant material shall be furnished and installed as indicated including all labor, materials, plants, equipment, incidentals, re-setting of plants (frost heaves, etc), irrigation, re-planting and clean up. If previously approved species are not available at the time of planting, the Wetland Specialist may propose substitutions relative to species, size, and quantities for review and approval by the MassDOT Landscape Architect. Upon approval by MassDOT, substitutions shall be approved by the regulating authority, if and as necessary. Provisions shall be made for a growth warranty of at least two (2) calendar years from the date of Conditional Acceptance as described below or as required by permits.

## Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Broadcast by hand or with a hand-held spreader followed by application of straw mulch. If necessary, seed shall be lightly raked to insure good seed-to-soil contact.
- Hydro-seeded with hydro mulch per the Standard Specifications and per the manufacturer's directions.
- Hand broadcast seed with Compost Blanket pneumatically applied at the same time to ensure light cover of soil topdressing over seed.

If spring conditions are drier than usual, supplemental watering may be required. If sowing during the summer months, supplemental watering will likely be required until germination.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

## PLANT ESTABLISHMENT AND INVASIVE MANAGEMENT



Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by May 15 after fall planting shall be replaced within the immediate or next planting period and at the Contractor's expense.

Seeding that fails to established according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

Invasive Plants: Corrective measures shall be taken to remove or treat invasive plant species in the Replication Areas. Invasive plants shall include those listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District's Compensatory Mitigation Guidance

If chemical treatment of invasive plants is necessary, the strategy for treatment shall be as determined under Item 102.3 Invasive Plant Management Strategy. That strategy shall be coordinated with the Wetland Specialist and all applicable permits and permitting agencies. Chemical application under 102.33 Invasive Plant Management On-site shall be compensated under that item and shall be for the duration of the contract only.

#### CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist demonstrating that the wetland replication construction work was done according to plans (or how modified) and meets required permit conditions. The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Replication Area and surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The final finished target elevations have been met and maintained relative to the approved plans and reference wetland. Areas that are too high or too low should be identified along with suggested corrective measures.
- Hydrology meets performance standards.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.



Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions. The Wetland Specialist shall recommend corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

#### REQUEST FOR CERTIFICATE OF COMPLIANCE

If required, a request for a Certificate of Compliance (Partial or Full) pursuant to the Massachusetts Wetlands Protection Act regulations shall be prepared and submitted to MassDOT within 30 days following Conditional Acceptance.

The Request for Certificate of Compliance shall include the following:

- A brief narrative of the work on company letterhead signed by the Wetland Specialist. Narrative shall be prepared as a MS Word document and shall include substantive explanation that demonstrates compliance with EACH relevant permit condition. Narrative shall note variations from the originally permitted design.
- As-built Drawings signed by the Contractor's PE registered in the Commonwealth of Massachusetts. As-built drawings shall show hydrologic conditions, status of plantings and seeding, and shall include a narrative and minimum of 4 photographs documenting site conditions. Plans should note variations from the originally permitted design.

When required, drawings shall meet the Army Corp of Engineer's New England District's Compensatory Replication Guidance, including: scale in the range of 1"=20' to 1"= 100', contours at 1' intervals, spot elevations for intermediate elevations, and polygons outlining each Replication Area, and, as applicable, plant community types. The As-built Drawings shall be provided to the Engineer electronically in Portable Document Format (PDF). If requested by the Engineer, the Drawings shall be provided in printed paper format (11" x 17" sheets, unless otherwise directed). Drawings must be scalable.

- Other documents as required.

#### FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Contractor, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. Final Acceptance will initiate the start of the Wetland Monitoring Period.

The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover at least 95 percent of the Replication Area, excluding areas of open water areas or planned bare soil.
- No sediments have entered the wetland.



- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

If the mitigation work does not meet the above condition and is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions. Work not approved will be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

#### MONITORING REPORTS FOR REGULATORY COMPLIANCE

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 95 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

#### METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.35 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required soil, site preparation, grading, wetland seeding, planting, mulching, watering, monitoring wells, registered surveyor, as-built plans, Request for Certificate of Compliance, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% after receipt and acceptance of Certificate of Compliance by the Engineer and once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

Sediment Control Barrier will be paid under Item 767.121

Wetland Specialist will be paid under Item 755.75



Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

**ITEM 755.45**                      **WETLAND RESTORATION**                      **SQUARE YARD**  
**REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)**

**DESCRIPTION**

The work under this item shall conform to the relevant provisions of Subsections 120, 751, 765, 767, and 771 of the Standard Specifications and the following:

The work under this item shall include all labor and furnishing of materials to complete the work specified herein to protect and restore existing inland wetland areas that will be temporarily impacted as shown on the drawings and as required by the Engineer.

Inland Wetland Replication work shall be as specified and compensated under that item. Tidal wetland mitigation shall be as specified under the appropriate item for tidal wetlands.

Restoration Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

All work shall be in coordination with an approved Wetland Specialist. Wetland Specialist qualifications and requirements shall be per Item 755.75, Wetland Specialist.

**SUBMITTALS – DOCUMENTS**

Survey: To establish or confirm pre-construction baseline elevation of temporarily impacted area(s), a survey shall be submitted to the Engineer prior to any fill or other land disturbance.

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): If applicable, request for a Certificate of Compliance shall be submitted to the Engineer for distribution to appropriate regulatory agencies as specified below.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.76 Wetland Monitoring Reports.

**ASSOCIATED ITEMS AND MATERIALS**

**Seed Mix**

Required submittals include:



- Certificate of Materials from the supplier shall be submitted and approved 30 days prior to ordering seed. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).
- Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.
- Bill of lading or a notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

Seed mix shall be:

#### Wetland Mix – Part Shade

	<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS By Weight</u>
<u>Grass</u>			
	<i>Poa palustris</i>	Fowl Bluegrass	25.00%
	<i>Elymus riparius</i>	Riverbank Wild Rye	19.00%
	<i>Carex lurida</i>	Shallow Sedge	17.00%
	<i>Carex vulpinoidea</i>	Fox Sedge	10.00%
	<i>Cinna arundinacea</i>	Sweet Woodreed	5.00%
	<i>Sparganium eurycarpum</i>	Giant Bur Reed Eco PA	4.00%
	<i>Carex scoparia</i>	Broom sedge	4.00%
	<i>Carex lupulina</i>	Hop Sedge	4.00%
	<i>Scirpus polyphyllus</i>	Many Leaved Bulrush	3.00%
	<i>Juncus effusus</i>	Soft Rush	2.50%
	<i>Carex intumescens</i>	Bladder Sedge	2.00%
	<i>Sparganium americanum</i>	Burrweed	2.00%
	<i>Scirpus cyperinus</i>	Woolgrass	1.00%
	<i>Carex crinita</i>	Fringed Sedge	1.00%
	<i>Juncus tenuis</i>	Path Rush	0.50%
			<u>100.00%</u>

Species ecotype shall be as native to New England region as possible.

#### Seeding Rate

Apply this mix at 20 lbs PLS/acre.

**Fertilizers** shall not be used.

**Straw mulch or hydromulch** shall be per Section M6 of the Standard Specifications.



## **Water**

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

## **CONSTRUCTION METHODS & SEQUENCE**

### **Site Protection Prior to Impacts**

Prior to any land work, as part of the initial site-walk, the Wetland Specialist shall photo-document the site and provide a summary report of existing conditions as outlined under Item 755.75 Wetland Specialist.

Where and as required vegetation shall be cut flush and area surveyed to establish pre-construction elevations.

Following the cutting and surveying, temporary separation fabric or timber matting shall be placed as required to protect soil and vegetation from compaction, contamination, and/or other damages. Fabric and timber mats shall be placed as specified under the respective items and the Engineer shall approval placement.

### **Restoration Upon Completion of Roadway Construction Work**

#### **Sediment Barriers**

If required for sediment control during Restoration work (i.e, tilling is required to restore soil), sediment barriers shall be installed along the downslope perimeter of the Restoration Area beginning and ending in the surrounding upland so that no disturbed soil can enter adjacent wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to any soil disturbance. No work shall take place outside the barriers.

#### **Removal of Fill and Grading**

Fill and temporary separation fabric or mats shall be removed and disposed of as specified under the respective items.

If required, grades shall be restored to pre-construction elevations as shown in the baseline survey or as required by the Engineer and Wetland Specialist to restore hydrologic functions. Final elevations shall be approved by the Engineer prior to soil preparation and seeding. Grading shall be incidental to this item.

Following approval of grading to elevations required, soil shall be prepared and seeded as follows.

#### **Soil Scarification**

Compacted soil shall be scarified with equipment approved by the Engineer. Upon approval of soil scarification, the area shall be seeded with mulch as specified below. Seeding shall immediately follow soil preparation.



### Seeding with Mulch

Upon approval of prepared soil, area shall be seeded. Seeding shall be hand broadcast with straw mulch applied per the Standard Specifications and per the manufacturer's directions. Hydromulch shall be straw or wood fiber only and shall be per the manufacturer's recommendations.

Seed tags shall be submitted at time of seeding.

### Planting

Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Specifications and as amended below.

Planting Season is May 15-June 15 and September 1-November 1 unless otherwise specified in applicable permit conditions.

Restoration Area shall be planted in the dry. Plants shall be placed according to the planting details and within the range of target elevations and at the spacing shown on the Plans or, if spacing is not indicated on the Plans, at the direction of the Wetland Specialist or the MassDOT Landscape Architect. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer and shall be replaced at the Contractor's expense.

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by June 1 after fall planting shall be replaced at the Contractor's expense.

Plant material shall be furnished and installed as indicated including all labor, materials, plants, equipment, incidentals, re-setting of plants (frost heaves, etc), irrigation, re-planting and clean up.

If previously approved species are not available at the time of planting, the MassDOT Landscape Architect will propose substitutions relative to species, size, and quantities. Substitutions shall then be approved by the regulating authority if necessary. Provisions shall be made for a growth warranty as described below or as required by permits.

### PLANT AND SEED ESTABLISHMENT

Seeding that fails to establish according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

### CONDITIONAL ACCEPTANCE OF WORK



***[1) Delete references to Wetland Specialist and narrative if not required or considered unnecessary for this project. 2) For small projects where permits allow, Acceptance may be collapsed into one inspection. In this case, modify as needed.]***

Conditional Acceptance shall indicate approval of the wetland restoration work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist (if applicable to project) demonstrating that the wetland restoration work was done according to plans (or how modified) and meets required permit conditions (if applicable). The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Restoration Area and the surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The target elevations have been restored per the survey or adjusted per the Engineer. Areas that are too high or too low should be identified along with suggested corrective measures.
- Soil compaction has been mitigated.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- Hydrology meets performance standards and has been adequately restored.
- Specified seed mix has been seeded and seeded species in the wetland and adjacent upland show signs of good germination and healthy growth.
- Planted woody and herbaceous species (if included) meet specifications and are establishing well.
- There are no invasive plants visible in the restored wetland area.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Restoration work is not approved, MassDOT will issue a rejection letter requiring corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

#### FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Restoration Area. Final Acceptance will initiate the start of the Monitoring Period (if required).

The following conditions shall be inspected and approved for acceptance and payment:

- Hydrology is functioning as intended.



- The desired seeded species are establishing well and cover 100 percent of the restoration area, excluding areas of open water, large boulders or planned bare soil.
- No sediments have entered the wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- Planted woody and herbaceous species (if included) meet specifications and are establishing well.
- There are no visible invasive plants.

If the restoration work is not approved, MassDOT will issue a rejection letter requiring corrective action. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation. Work not approved shall be addressed by the Contractor at no extra cost.

#### MONITORING REPORTS FOR REGULATORY COMPLIANCE

##### **[Delete section if no monitoring]**

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended, relative to the preexisting condition of the restored wetland.
- Seeded species are establishing well and cover 100 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

#### METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.45 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, compost and amendments, seed, mulch, equipment, submittals, maintenance, grading, and incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 50% upon completion of soil preparation and seeding
- 25% upon Conditional Acceptance
- 25% upon Final Acceptance or approval of the Engineer

Sediment Control Barrier will be paid under Item 767.121

**Wetland Specialist will be paid under Item 755.75**



Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

**ITEM 755.75****WETLAND SPECIALIST** **HOUR**

*REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)*

Work under this Item shall be for services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications hereafter referred to as the “Wetland Specialist.”

“Wetland Mitigation” shall be used herein for applicable wetland work. For this project, applicable wetland work is for: Item 755.35 Inland Wetland Replication Area (creation of a new wetland) and Item 755.45 Wetland Restoration (restoration after temporary impacts).

The Wetland Specialist shall demonstrate knowledge and expertise to coordinate and oversee all work associated with the Wetland Mitigation as defined herein, as shown on the Plans, as required by permits, and as specified under the relevant Wetland Mitigation items.

Regulatory monitoring reports following Final Acceptance of the Wetland Mitigation shall be per Item 755.76, Wetland Monitoring Reports.

For all onsite work, the Wetland Specialist shall sign in and sign out with the Engineer.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

**QUALIFICATIONS**

The Wetland Specialist shall have a minimum of five (5) years of experience with construction and monitoring of wetland mitigation areas similar in size, type, and complexity to the Contract mitigation. When required by permits, at least ten (10) years of experience may be required. The Wetland Specialist shall be thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40), U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance, and all other relevant regulations of the Massachusetts Department of Environmental Protection and the U.S. Army Corps of Engineers New England District.

**SUBMITTALS - QUALIFICATION**

Within sixty (60) days following the Notice to Proceed, the Contractor shall provide proof of qualifications for the Wetland Specialist to the Engineer for approval. Submittals shall include, but not be limited to, the following:

- Resume of the individual on-site implementing the Wetland Specialist work. If the Wetland Specialist changes over the course of the project, the new individual shall submit resume and qualifications for approval 30 days prior to doing any work on-site.
- Resume of any personnel working on-site in place of the Wetland Specialist. Individual shall be approved prior to work on-site.
- Narrative describing the company, its expertise, technical qualifications and experience with wetland construction.



- At least three (3) references from prior work of a similar nature completed in the last five (5) years and by the individuals who will perform the work. Provide contact information for each reference including address, phone number and email.
- A summary of each reference project including nature of the work, project size, dates, and period of construction and monitoring, methodologies used, and summary of success (or not) in terms of meeting performance objectives. Summary shall include a minimum of one before and one after photo for each project.

## SUBMITTALS – DOCUMENTATION AND REPORTS

### Wetland Construction Oversight

Wetland Specialist shall provide documentation of pre-existing conditions and wetland construction as specified below and as part of fulfilling the Scope of Work described below. Documentation shall include photos that are clear and legible. Photos are incidental to this item.

- ***Site Walk Prior to Disturbance and Construction of Wetlands:*** Provide brief assessment with photos, including documentation of the existing wetlands to be impacted (both permanent and temporary), proposed wetland replication area, and reference/model wetland areas (typically an adjacent undisturbed wetland or the existing wetland to be impacted). Photos of existing wetlands that will be temporarily impacted shall include a view from at least 3 angles.
- ***Excavation and Grading:*** Documentation shall include minimum of two photos of the excavated wetland and two photos after final grading prior to planting and seeding. For restoration areas, photos shall show soil preparation (i.e, tilling and grading), if applicable.
- ***Approval of Subgrades:*** The Wetland Specialist shall inspect the sub-grade of the Replication Area to ensure that proper hydrology is likely to be established and shall provide the Engineer with written confirmation and photographs upon completion of subgrade excavation work. Written confirmation shall include recommended field adjustments, based on field observations, to achieve the desired hydrology and designed wetland system.
- ***Planting and Seeding:*** Provide assessment and photos of vegetation upon completion of planting and seeding work.
- ***Data logger output from Monitoring Wells*** shall be submitted with reports, if applicable and requested. **[Delete if wells are not required for the project.]**

Wetland construction documentation and reports shall be submitted with Request for Conditional Acceptance and for the Order of Conditions, Water Quality Certifications, and other regulatory permits as required. **[Amend to specify what is required for Permits].**

### Requests for Acceptance of Work & Regulatory Compliance

The Wetland Specialist shall submit the following documents if and as specified herein and under Item the relevant Wetland Mitigation items:

- Request for Conditional Acceptance.
- Request for Certificate of Compliance (Partial or Full) when applicable.
- Request for Final Acceptance.



## SCOPE OF WORK

In the event of discrepancies with the applicable permits, the Wetland Specialist shall submit a Request for Information (RFI) to the Engineer.

### General

The Wetland Specialist shall be responsible for the following:

- Review and have a comprehensive knowledge of the environmental permits relevant to the specific mitigation work being done so as to ensure compliance throughout the duration of the contract.
- Identify and inform the Contractor and Engineer of unique site conditions which may require adjustments to the schedule, design, or construction methods. For example, wildlife nesting, illegal dumping, or rare species.
- Identify and inform the Contractor and Engineer of any sediment or erosion control problems observed within mitigation areas.
- Advise so as to avoid impacts to adjacent areas and regulated wetland resources.
- Participate in necessary meetings as required by permits and when requested by the Engineer.

### Inspections & Construction Oversight

The Wetland Specialist shall be responsible for, but not limited to, the following:

- Pre-Construction Site Walk
  - Following surveying, flagging, and staking of all relevant boundaries and elevations by the Contractor, the Wetland Specialist shall walk the site with the Engineer and the Contractor to review existing and proposed conditions, recommend changes if necessary, and approve the following: location and boundaries of the Mitigation Area, target elevations and grades, location of tree protection associated with the Mitigation Area, and final layout and limits of clearing for access route.
  - Select and mark snags, logs, and woody material to be retained for placement in the Wetland Mitigation, as appropriate.
  - Note invasive plants in and adjacent to Wetland Mitigation.
  - Provide summary report if and as specified under Wetland Mitigation items.
- Excavation, Soil Placement, Grading for Replication Areas
  - Approve excavated depth and grading for appropriate wetland hydrology, subsoil preparation, and finished grade of placed wetland soil.
  - Adjust grades as required and approve microtopography. If grades need to be adjusted, submit an RFI to the Engineer.
  - If requested by the Engineer, the Wetland Specialist shall inspect stockpiled wetland soil for moisture content and signs of undesirable weeds.
- Soil Protection and Restoration Measures for Restoration Areas
  - Review and approve methods of soil protection and restoration if required.
  - Confirm decompaction will adequately restore appropriate wetland hydrology. If decompaction measures need to be adjusted, submit an RFI to the Engineer.
- Re-vegetation of Mitigation Area
  - Placement of woody material to be re-used.



- Verify seed used complies with specifications and site conditions, determine limits for wetland seeding based on elevations, approve seeding and mulching methods, and collect seed tags to submit with Request for Conditional Acceptance.
- Review planting methods (if applicable) prior to installation and oversee layout of wetland plants.

### Conditional Acceptance

Upon completion of construction of the wetland, as part of the Request for Conditional Acceptance, the Wetland Specialist shall provide a brief narrative demonstrating that the wetland construction work was done according to plans (or how modified) and meets the conditions required for acceptance as specified under the Wetland Mitigation items. Submittal shall include a report and photo documentation of pre-construction conditions, construction work, seeding, planting, and other work as specified under the Wetland Mitigation items. Photos of completed Wetland Restoration areas shall include the same views as the pre-construction reference photos.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the Wetland Mitigation items.

Upon approval, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

### Request for Certificate of Compliance

If required, a Request for Certificate of Compliance shall be prepared and submitted to the Engineer immediately following Conditional Acceptance. Request shall be as specified under the relevant Wetland Mitigation items.

### Request for Final Acceptance

Following one full growing season, the Wetland Specialist shall provide a brief narrative of the status of the Wetland Mitigation to be submitted with the Request for Final Acceptance.

Upon receipt of the Request, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the relevant Wetland Mitigation items.

If the Wetland Mitigation is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

## METHOD OF MEASUREMENT

Item 755.75 Wetland Specialist shall be measured per hour for on-site service provided by the Wetland Specialist.

Work shall include all inspections, photos, submittals, and associated tasks for construction and restoration oversight, narratives for Conditional and Final Acceptance, Request for Certificate of



Compliance (Partial or Full) if required, documentation required for permits, and all other work specified above. Payment shall not include travel time or time spent off-site on reports. Decimal Pay Limits will be 0.25 hours.

## BASIS OF PAYMENT

Item 755.75 Wetland Specialist shall be paid at the Contractor bid price for each hour, or fraction thereof, spent on-site to perform the work as described above. Reports and photo documentation are required for payment.

Post wetland construction reports shall be per Item 755.76, Wetland Monitoring Reports.

<b><u>ITEM 755.76</u></b>	<b><u>WETLAND MONITORING REPORTS</u></b>	<b><u>LUMP SUM</u></b>
<i>REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)</i>		

Work under this item shall be for the submittal of Wetland Monitoring Reports following the completion of wetland construction and shall include all inspections, photos, and other work required to complete those reports as specified herein.

“Wetland Mitigation” shall be used herein for applicable wetland work, whether Wetland Replication (creation of a new wetland) and/or Wetland Restoration (restoration after temporary impacts).

The Contractor shall retain the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications, hereafter referred to as the “Wetland Specialist,” to complete the Wetland Monitoring reports. Wetland Specialist shall meet requirements specified under Item 755.75 Wetland Specialist.

All on-site Wetland Specialist services required to complete the construction and revegetation of the wetland replication, including preparation and submission of monitoring reports during construction, shall be per Item 755.75 Wetland Specialist.

## SCOPE OF WORK

### Post-Construction Wetland Monitoring Reports

Final Acceptance of the wetland construction work as specified under item 755.35 and 755.45 shall initiate the beginning of the Monitoring Period.

Inspections and reports shall be performed to ensure compliance with mitigation requirements defined under the relevant Wetland Mitigation items and with all applicable environmental permits. Monitoring reports shall cover the following:

- Identification of all plant species present
- Percent cover for each plant species and overall percent surface area cover by indigenous wetland plant species for replication area and upland
- Description of the viability, health, and vigor of installed plants as well as volunteer plant species within the replication areas



- Description of remedial measures taken to ensure criteria are met
- Depth to apparent water table and/or depth of surface inundation, both as measured from the soil surface and data loggers, as appropriate.
- A conclusion regarding the success of the wetland mitigation area relative to the performance standards at 310 CMR 10.55(4)(b) (unless varied), the design plans, and performance criteria established by MADEP in the variance conditions (when applicable), and the reference wetland.
- Recommendation for a corrective plan of action if needed.

Reports shall be submitted to the Engineer as a digital copy in Portable Document Format (PDF) unless otherwise requested. Hard copies shall be provided as requested by the Engineer. All reports shall be marked with the applicable permit numbers and identifying information as required in the permits. Reports shall include photo documentation of the wetland/s being monitored and shall include a minimum of 3 views from different orientations. Views shall be labeled.

Spring Reports, when required, shall be submitted to the Engineer by July 1 for dispersal to the appropriate permitting agencies.

End of Year Reports (which may serve as the Fall Report) shall be based on inspections that occur prior to October 15th. Reports shall be submitted to the Engineer no later than November 1 of each year.

Monitoring Reports shall be as follows for **XX** years: [Select/amend as required for permits. If monitoring is required beyond 2 years after expected close of construction contract, please coordinate with MassDOT Environmental].

- *MassDEP: # Reports - (note if spring and/or 1 end of year).*
- *ACOE: # Reports (note if spring and/or 1 end of year).*
- *Conservation Commission: # Reports (note if spring and/or 1 end of year).*
- *Other: # Reports (note if spring and/or 1 end of year).*

#### **BASIS OF PAYMENT AND METHOD OF MEASUREMENT**

Item 755.76 Wetland Monitoring Reports and associated inspections shall be at the Contract unit price per Lump Sum and shall include all labor, materials, equipment, and all incidental costs required to complete the work. Lump Sum will be paid in equal installments of the Lump Sum divided by the number of reports submitted. Payment shall be upon submittal and acceptance of each report, based on the following schedule: **[Complete/modify as applicable. # reports is for report submitted, not # of inspections.]**

- Year 1 = **xx Reports**
- Year 2 = **xx Reports**

#### **ITEM 756. NPDES STORMWATER 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. On February 16, 2012 (77 FR 12286), EPA issued the final NPDES Construction General Permit (CGP) for construction activity. The Contractor shall be fully responsible for compliance with the CGP. 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 14 day review period commencing from the date on which EPA enters the Notice into their database. 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 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.

It is the responsibility of the Contractor to prepare the SWPPP to meet the requirements of the most recently issued CGP. The Contractor shall submit the Plan to the Engineer for approval at least 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 (reference to Part 9.1.1 of the 2012 CGP).

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, 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. 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 Engineer must approve the contractor's inspector. 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. 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. 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. The 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 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 Contractor is advised 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, etcetera. 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 is required to use EPA's electronic NOI system or "eNOI system" to prepare and submit NOT. The electronic NOT form can be found at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting>. If you are given approval by the EPA Regional Office to use a paper NOT, you must complete the form in Appendix K of the 2012 CGP.

## COMPENSATION



Item 756 will be paid at the contract unit price, lump sum, which price shall include all work detailed above, including plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees.

Payment of 50% of the contract price shall be made upon acceptance of the Storm Water Pollution Prevention plan. Payment of 40% of the contract price shall be made in equal installments for implementation of the Stormwater Pollution Prevention plan. Payment of the final 10% of the contract price shall be paid upon satisfactory submissions of a Notice of Termination (NOT) when final stabilization has been achieved.

**ITEM 765.442 SEEDING – RIVERBANK MIX – PART SHADE POUND**  
*Revised 06/10/2021, 11/30/2021*

Work under this item shall consist of furnishing the mix specified below at the quantity required.

**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 of address seller. The origin of seed must be listed on the seed tag for all species in a mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed. Ecotype 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.

### SEEDING SEASON

The appropriate seeding seasons are:

Spring: April 1 – May 15

Fall: October 1 – December 1 for dormant seeding

### PERMANENT SEED MIX

#### **Calculating Pure Live Seed (PLS)**

Quantities specified are PURE LIVE SEED. Greater quantities of ordered seed may be required to achieve actual specified seeding rates.

Pure Live Seed (PLS) is defined as a percentage calculated by multiplying the percent of pure seed by the percent of viable seed (total germination, hard seed, and dormant seed). For example:

If a seed label indicates 90% purity, 78% germination, 10% hard seed, and 2% dormancy, it is calculated to be  $90\% \times [78 + 10 + 2]\% = 81\%$  PLS.

Therefore, each pound of PLS would need  $1 \text{ pound} / 0.81 = 1.2$  pounds of seed with a 90% purity and 90% total germination

Seed mix shall be as specified below. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

#### **Seeding – Riverbank Mix – Part Shade**

<u>Botanical Name</u>	<u>Common Name</u>	<u>% PLS by Weight</u>
Grass		
Elymus virginicus	Virginia Wild Rye	20.00%
Elymus canadensis	Canada Wild Rye	18.00%



Schizachyrium scoparium	Little Bluestem 'Camper'	15.00%
'Camper'		
Andropogon gerardii NY Eco	Big Bluestem NY Eco	14.00%
Festuca rubra	Creeping Red Fescue	12.00%
Dichanthelium clandestinum	Deertongue grass 'Tioga'	7.00%
'Tioga'		
Agrostis perennans	Upland Bentgrass	4.10%
Juncus tenuis	Path Rush	1.00%
Carex vulpinoidea	Fox Sedge	1.00%
Juncus effusus	Soft Rush	0.10%
		<hr/> 92.20%
Herb/Forb		
Chamaecrista fasciculata	Partridge Pea	4.00%
Penstemon digitalis	Beard-tongue	0.60%
Aster novae-angliae	New England Aster	0.50%
Solidago nemoralis	Grey Goldenrod	0.50%
Solidago rigida	Rigid Goldenrod	0.50%
Eupatorium maculatum	Spotted Joe Pye Weed	0.40%
Aster laevis NY Ecotype	Smooth Aster NY Ecotype	0.40%
Verbena hastata	Blue Vervain	0.30%
Aster cordifolius	Blue Wood Aster	0.30%
Eupatorium perfoliatum	Boneset	0.30%
		<hr/> 7.80%
		<hr/> 100.00%

**Seeding Rate:**

Apply this mix at 20 lbs PLS/acre on areas of less than 3:1 slope and 60 lbs PLS/acre on areas of greater than 3:1 slope.

Any species substitutions shall be with a species having similar characteristics and function. Substitutions must be approved by MassDOT Landscape Design Section per the documentation submittal process.

**50% Increase Adjustment for Field Conditions**

Seeding under the following conditions requires a 50% increase in the permanent mix at the time of construction:

- Seeding out of season
- OR
- Seeding after Compost Blanket has been applied (unless already increased for out of season).

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Seeding – Riverbank Mix – Part Shade will be measured for payment by the pound of Pure Live Seed, complete in place.



Seeding – Riverbank Mix – Part Shade will be paid at the contract unit price per pound of Pure Live Seed, upon approval of all Seed Submittal Documentation. Overseeding required to correct poor germinations or establishment shall be incidental to the item.

Application and care of native seed mix will be paid for separately under Item 765.635 Native Seeding and Establishment.

DRAFT



## ***NATIVE SEED WORKSHEET***

Project Description: \_\_\_\_\_ Project No: \_\_\_\_\_

Contractor: \_\_\_\_\_ Contract No: \_\_\_\_\_

Seed Mix Number & Description: \_\_\_\_\_

### **Contractor: Complete Prior To Ordering**

Pounds of Seed Required Per Contract:

\_\_\_\_\_ lbs./acre for \_\_\_\_\_ Acre(s) OR \_\_\_\_\_ SY

Additional 50% increase if required (out of season or seeding over compost blanket):

\_\_\_\_\_ **lbs. Total Seed Required**

Calculated Quantity for **Pure Live Seed (PLS<sup>1</sup>)**:

\_\_\_\_\_ **Total Pounds PLS**

### **Engineer: Verification at Time of Application**

Number pounds delivered to site<sup>2</sup>: \_\_\_\_\_ Date(s): \_\_\_\_\_

Actual Seed Bag Tag/s Received or photo documented by Engineer: \_\_\_\_\_

<sup>1</sup> *PLS = % pure seed x % viable seed (total germination, hard seed, and dormant seed).*

<sup>2</sup> *Quantity delivered should match pounds **Total Pounds PLS** and **Verification of Seed Delivery**. Pounds should be shown on each Seed Tag.*



***MASSDOT VERIFICATION OF SEED DELIVERY***

Date \_\_\_\_\_

I/We hereby certify that \_\_\_\_\_ pounds of seed mixture,

Lot Number \_\_\_\_\_ (Label attached), has been sold and delivered to

\_\_\_\_\_ for Massachusetts Department of Transportation

for Project Number \_\_\_\_\_ /Contract Number \_\_\_\_\_, located in

\_\_\_\_\_, MA. The material was delivered on (*date*) \_\_\_\_\_.

The labels and contents meet all State and Federal regulations. The mixture consists of the following species, including cultivar if applicable and ecotype region, and at the following percentages (may be attached separately):

Name (print): \_\_\_\_\_ Title: \_\_\_\_\_

Supplier: \_\_\_\_\_

Signature and Seal: \_\_\_\_\_



**ITEM 765.635 NATIVE SEEDING AND ESTABLISHMENT SQUARE YARD***Revised 06/10/2021, 11/30/2021*

Work shall conform to the relevant provisions of Subsections 765 and 767 of the Standard Specifications and the following:

The work under this item shall consist of seeding, mowing, and other care to establish a stand of grass in the areas shown on the plans or as required by the Engineer. For the purposes of these specifications, the term “grass” shall apply to all the forbs, grasses, sedges, and rushes included in the materials.

**QUALIFICATIONS**

Seeding shall be done by a company having a minimum of five years of experience with native seed establishment. Prior to beginning work, the seeding Contractor shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications shall include providing documentation (photos and contacts) to demonstrate knowledge and expertise with native seeding and establishment and proof of having completed successful native seeding projects.

**SEEDING SEASON**

Seeding seasons for native mixes is April 1 - May 15 and October 1 - December 1 for dormant seeding. Written approval must be obtained for seeding outside the seeding season and, if approved, the permanent seed rate shall be increased by 50%.

**MATERIAL AND SUBMITTALS**

**Seed Mixes and Submittals** shall be per the item(s) for permanent seed mixes.

**Compost Blanket**, if used, shall meet the material and submittal requirements for that item.

**Hydromulch** shall be wood fiber or straw applied per the Standard Specifications and at the rates specified below and per the manufacturer.

A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of hydromulch, tackifier, and seed, per 100 gallons of water and as applicable to products used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above.

**Fertilizer**

No fertilizers shall be applied.

**Water**

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.



## SEEDING

Hand broadcast method shall be used for all areas smaller than half an acre 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 Compost Blanket application (when applied).

Surface preparation shall be approved by the Engineer prior to seeding.

### **Seeding over Various Substrates**

Loam: Seeding shall occur within 72 hours of loam placement to prevent loss of topsoil. 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.

Compost Blanket: Compost Blanket shall be applied as specified under that item. Seed should be hand broadcast at the same time as compost application to ensure a thin cover of compost over seed.

When seeding is done after application of Compost Blanket the rate shall be increased by 50%. If the Compost Blanket is applied after December 1, seed shall be broadcast over the compost in the Spring and the rate increased by 50% specified under Seed Application.

### **Cover Crop**

A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

### **Seed Application**

All seed shall be mulched as specified herein.

Seed application shall be by broadcast seeding as described below.

### Broadcast Seeding



Seed shall be broadcast spread using a cyclone or whirlwind seeder or hand broadcast. Small or light-seeded species such as bluestem may be mixed with approved filler to achieve an even distribution. Seed shall not be broadcast when wind velocities are greater than 15 mph.

Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction (horizontally and vertically). To ensure seed to soil contact with broadcasting of seed, seeding shall be followed by rolling or tracking with equipment approved by the Engineer.

Broadcast seed shall be mulched with weed-free straw mulch unless seeding is done as part of Compost Blanket in which case it shall be as specified above under seeding with Compost Blanket application.

### Hydromulching

Hydromulching shall be per the manufacturer's directions and as follows.

### CARE DURING GERMINATION AND ESTABLISHMENT

Contractor shall care for seeded areas as necessary for successful germination. Care will include watering and weed control as necessary to achieve establishment of the specified seeded species after one growing season as specified below.

The contractor shall maintain the stand of grasses to ensure healthy growth of the seeded species. Work shall include mowing or weed-whacking for weed control, watering if necessary, and removal of invasive plants.

Watering shall be sufficient to achieve soil moisture to a depth of 2 inches or more and such moisture is uniform. Method of watering shall not erode or damage soil or grassed surfaces.

General Weed Control: Unless otherwise directed, mowing shall be as specified under Mowing for Weed Control for seed establishment. Weeds shall be mowed prior to weeds setting seed (by the end of July unless otherwise approved).

Control of Invasive and Aggressive Weeds: Invasive and aggressive weeds, including but not limited to mugwort, ragweed, knapweed, foxtail, crabgrass, and chicory must be cut or treated prior to going to seed. Herbicide treatment must be coordinated with MassDOT. Undesired species (such as chicory) introduced due to use of incorrect seed mix shall be removed at the Contractor's expense.

### **Mowing for Weed Control**

Mowing for weed control shall be completed after weeds have sprouted and show leaf and bud growth, but prior to setting seed, generally between July 7<sup>th</sup> and August 1<sup>st</sup>, 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

Native Seeding and Establishment will be measured for payment by the square yard, complete in place.

Native Seeding and Establishment 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, site preparation (including raking, tilling, removal of debris and stones, and other work to the prepare site for seeding), seed application, rolling to ensure seed-to-soil contact, weed control, mowing, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Furnishing native seed mix will be paid for separately under Item 765.442 Seeding – Riverbank Mix – Part Shade.

Compost blanket will be paid for separately under Item 751.72 Compost Blanket.

Schedule of payment shall be as follows:

30% upon Conditional Acceptance

20% upon Interim Acceptance of Care, except this amount will be reduced to zero and final payment will be reduced accordingly when areas requiring weed control are not mowed as specified in the Interim Acceptance criteria.

50% upon Final Acceptance of Establishment

#### **ITEM 767.121**

#### **SEDIMENT CONTROL BARRIER**

#### **FOOT**

**REV. 2022.02.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)**

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.

## 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.

## 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.

## 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.

Sedimentation fence used in conjunction with compost filter will be measured and paid for separately under Standard Item 697, Sedimentation Fence.

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 991.1****CONTROL OF WATER – STRUCTURE NO. 1****LUMP SUM**

The work under this item shall conform to the relevant provisions of Subsection 140.60 of the Standard Specifications and the following:

The work under this item includes all dewatering and stream diversions necessary to accomplish the headwall removal and culvert extension located at Station 121+40 LT and the associated headwalls, cut off walls and wing walls. This item shall also be used for control of water to install outfalls and stone for pipe ends at Sta 101+70 RT and 125+80 RT, the retaining walls at Sta 117+00 – 118+20 RT and 124+70 – 134+85 RT and the wetland replication area. Stream diversions and dewatering of excavation shall be conducted to ensure that the construction and placement of the culverts, drainage pipes, headwalls, field stone masonry ends, retaining walls and streambed material are placed “in the dry.”

The Contractor shall furnish all labor, materials and equipment required for completing the work. Furthermore, the operations of Control of Water neither shall cause the accumulation of siltation nor any adverse effect to the water or the environment.

Work under this item shall include all materials, equipment and labor needed to construct and install temporary control of water system. The temporary control of water system includes water flow diversion and sedimentation and erosion control. The temporary control of water system shall be non-permanent which does not harm the ecology of the stream, land under water, and surrounding land, and shall be comprised of a combination of a bypass channel (such as a pipe) sandbag cofferdams, and/or other approved impervious curtains, and dewatering to facilitate construction activities. Operations of Control of Water shall not adversely affect the quality of the required construction.

Work under this Item also includes pumping operations, installation of bypass piping or lined trench, installation of earth berms, sandbags, filter fabrics, weirs, stone, and all other means to collect, settle, and discharge water back into resource areas during construction.

As part of the work under this Item, it is the responsibility of the Contractor to determine the need and extent of sedimentation basins and dewatering techniques and sedimentation controls needed to control water and sediment at the site.

**SUBMITTALS**

Prior to the commencement of any work at the site, the Contractor shall submit to the Engineer and the Conservation Commission for review and approval a detailed plan for water control,



including the construction of the water control system, and a culvert and retaining wall work sequence plan with a timetable and details specific to each of the phases of construction. The submittals shall include working drawings and calculations detailing the methods and materials proposed to account for all anticipated loads and construction conditions necessary to permit the work while maintaining a safe work area and protecting property from damage.

The Water Control Plan shall include a Sedimentation and Erosion Control Plan and a Water Flow Diversion and Containment Plan. The plans shall be adequate in detail to define specifics regarding materials, sizes, connections and incidental items associated with the work. The furnishing of such plans shall not serve to relieve the Contractor's responsibility for the safety of the work or his responsibility for the successful completion of the project. The proposed plans submitted shall be designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The Contractor's attention is directed to the Order of Conditions included herein for additional information on submittal requirements.

The Contractor shall make his/her own evaluation of existing conditions and water flow, the effects of his proposed temporary works and construction methods and shall provide in his design for all loads and construction conditions necessary to permit construction of the specified structures while maintaining public safety and protecting completed work and all third-party property from damage due to his operations. The Contractor shall also provide a description and details of the intended methods to prevent debris, including airborne particles, from entering resource areas during the entire project duration.

**Sedimentation and Erosion Control Plan:** The Contractor shall submit to the Engineer, plans and details of the intended sedimentation treatment basin system that will be used along with dewatering techniques, and its location at the site. All discharge resulting from dewatering activities shall be directed to temporary sedimentation treatment basins at locations approved by the Engineer. At no time shall said discharge be directly released into the resource area. The proposed plan shall include methods and equipment necessary to discharge water from the sedimentation treatment basins. Sedimentation treatment basins shall be sized appropriately to adequately dewater from the proposed work zone while allowing sufficient time for sediments to settle out of the water, and with a depth such that a minimum of 18 inches of freeboard is maintained throughout its use.

**Water Flow Diversion and Containment Plan:** The Contractor shall submit plans and details along with a complete description showing the proposed cofferdam system for control of water and dewatering plan to the Engineer for his approval prior to the start of the work. The proposed plan shall include methods and equipment necessary to perform the work and shall include water discharge methods and equipment to bring water from the work zone to sedimentation treatment basin.

## CONSTRUCTION METHODS

The work to be done under this item shall include placing and removing sandbag cofferdams with or without impervious curtains, or an equivalent cofferdam unit, at locations shown on the Contract Drawings. This work shall also include dewatering within the cofferdams, if needed to conduct the work. The dewatering discharge shall be directed to a temporary sedimentation treatment basin. The bags shall not decay nor rip or tear during the installation, its service life within the waterway, or during the cofferdam removal process. The Contractor shall not disturb the stream



bed prior to placing the cofferdams in order to avoid migration of silts and sands further downstream. The Contractor is responsible for researching the seasonal flow characteristics of the stream to determine appropriate cofferdam details.

The contractor is responsible to determine what size water diversion structure is required based on the flow characteristics and seasonal properties of the stream. Approval from the Conservation Commission and the Engineer are required prior to installation of the water control.

Measures to control the discharge of sediment or pollutants into the water resource areas shall include, but not be limited to the following:

1. Site construction areas outside the buffer zones and on relatively flat ground.
2. Schedule the work within the resource areas to avoid periods of anticipated high water (i.e. spring floods) and inclement weather.
3. Management of construction operations involving hazardous materials, such as refueling and maintenance of equipment within the resource areas.
4. Installation and continuous maintenance of water control measures throughout the project.
5. Treatment of all discharge resulting from dewatering activities through a sedimentation/detention basin to control turbidity. At no time shall the discharge from dewatering activities be directly released into a resource area.

The locations of any sandbag dams and sedimentation/retention basins will be determined by the Contractor based on the selected methods of construction. Placement of the basins shall be in an upland area that is within the existing right of way or temporary easements.

All dewatering and related water control work shall be conducted in such a manner as to prevent siltation or contamination of the waterway. At a minimum, the settling basin shall be constructed of an earthen berm lined with geotextile fabric and surrounded by staked hay bales. The basin shall meet or exceed the following criteria:

1. The size and location of the basin shall be determined based on the size of the Contractor's pump and the anticipated flows for the river and the need to perform demolition and construction.
2. The outlet/weir of the dewatering basin shall not cause erosion of the surrounding area. An approved method of controlling erosion, such as an erosion control blanket, stone, etc., shall be used at the outlet of the basin.
3. The Contractor shall not allow any sediment within the settling basin to accumulate to a depth of greater than 12 inches at any point in the basin, nor shall the water level be allowed to rise to a height of more than 24 inches.
4. The sedimentation treatment basin shall be designed with a minimum of 18 inches of freeboard, which must be maintained at all times.



5. The Contractor shall inspect the settling basin(s) at least twice daily when in operation.
6. Damages shall be repaired immediately.
7. The settling basin outlet shall be cleaned daily.
8. The sediments within the settling basin shall be disposed of as approved by the Engineer.

Upon completion of water control, the materials and equipment used to maintain the cofferdam(s) and sedimentation treatment basin(s) shall become the property of the Contractor and shall be removed by the Contractor from the site. The area affected shall be restored to its natural condition in a manner subject to the Engineer's approval.

The Contractor is advised that the effectiveness of the water control method used will vary based on the field conditions and the time at which the actual excavation work is being performed. The Engineer has the right to order the Contractor to stop all excavation operations when in his judgment the Contractor's water control operations are failing to produce adequate results or are posing a threat to the environment.

#### COMPENSATION

Payment for all water control work, including design for the stream diversion system and dewatering operations, excavation, sedimentation basins, all necessary equipment, materials and installation and removal, bypass piping, pumping, placing and/or removal of temporary dikes or other retaining structures, straw bales, silt fence and pipes all as outlined above shall be included in the Lump Sum Contract Price for this Item.





## **Appendix H – Project Plans**

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# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

## HIGHWAY DIVISION

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	52
PROJECT FILE NO.		606024	

# TITLE SHEET & INDEX

## PLAN AND PROFILE OF

## ROUTE 44 (DEAN STREET)

IN THE CITY OF

# TAUNTON

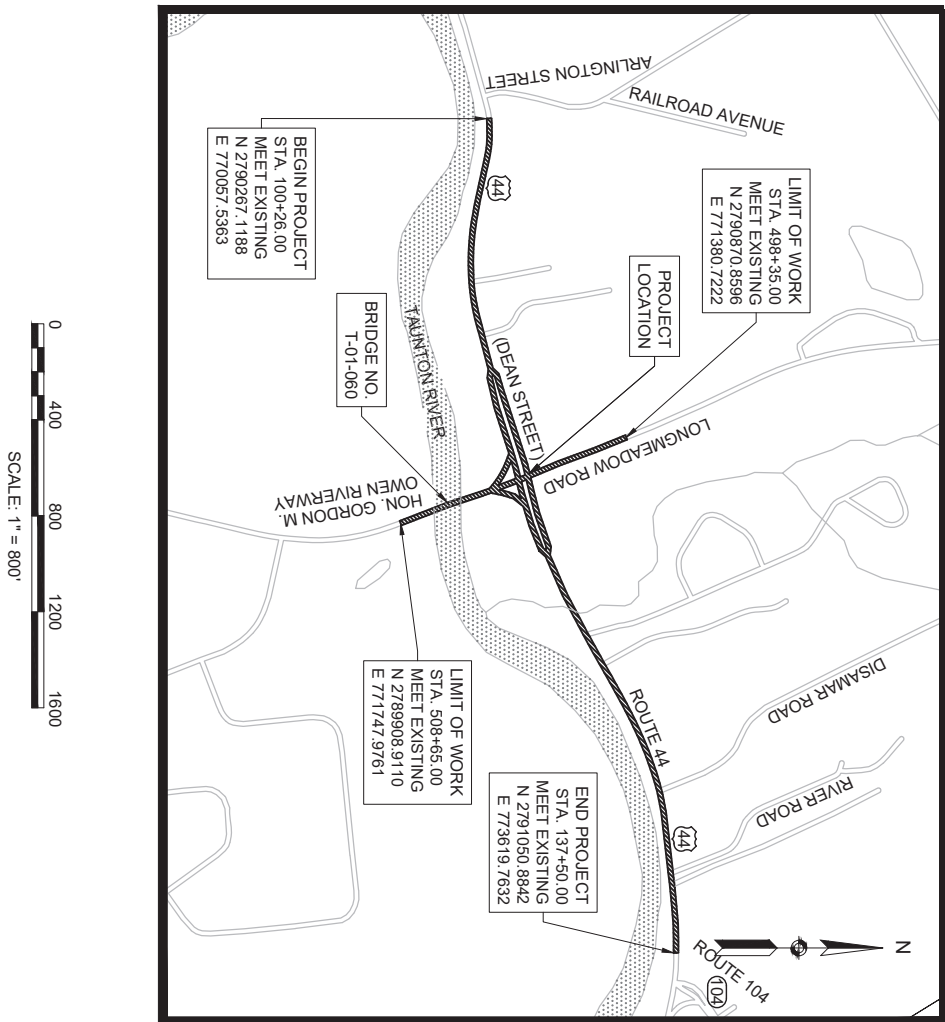
BRISTOL COUNTY

THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

# USACE PCN SUBMISSION PLANS

## INDEX

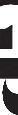
SHEET NO.		DESCRIPTION
1		TITLE SHEET & INDEX
2		LEGEND & ABBREVIATIONS
3		KEY PLAN
4-6		TYPICAL SECTIONS
7-16		CONSTRUCTION PLANS
17-26		DRAINAGE & UTILITY PLANS
27-36		LANDSCAPE PLANS
37		LANDSCAPE DETAILS
38		WETLAND REPLICATION PLAN AND DETAIL
39-42		CONSTRUCTION DETAILS
43-52		STRUCTURAL DETAILS



LENGTH OF PROJECT = 4,754 FEET = 0.900 MILES

Design Designation			
Street Name	Route 44 (Dean Street)	Longmeadow Road Hon. Gordon M. Owen Riverway	
Design Speed	40 MPH	40 MPH	
ADT (2018)	47,120 VPD	18,500 VPD	
ADT (2038)	57,500 VPD	20,450 VPD	
K	7.2%	9.3%	
D	65%	61%	
T (Peak Hour)	3.0%	3.8%	
T (Average Day)	3.0%	3.8%	
DHV	4,140 VPH	1,910 VPD	
DDHV	2,690 VPH	1,160 VPD	
Functional Classification	Urban Principal Arterial	Urban Collector	

JULY 2022

 <b>Greenman-Pedersen, Inc.</b> Engineering & Construction Services 161 Ballardvale Street, Suite 202, Wilmington, MA 01887 Tel: (978) 571-2999 Fax: (978) 658-3044 <a href="http://www.gpinc.com">http://www.gpinc.com</a>			
8/23/2022	Confirmed HTL / MHV / OHW Boundaries	2	
8/1/2022	Response to USACE Comments	1	
DATE	DESCRIPTION	REV #	







































































































































**MassDOT**  
Massachusetts Department of Transportation  
Highway Division

























<p style="text-align: center;"><b>RECOMMENDED FOR APPROVAL</b></p>	
<p style="text-align: center;">CHIEF ENGINEER _____</p> <p style="text-align: center;">DATE _____</p>	<p style="text-align: center;">APPROVED</p>
<p style="text-align: center;">DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION</p>	
<p>APPROVED:</p>	
<p>_____ DIVISION ADMINISTRATOR</p>	<p>_____ DATE</p>
<p>_____ HIGHWAY ADMINISTRATOR</p>	
<p>_____ DATE</p>	



GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST SQUARE
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W/ 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLEWIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		CHAIN LINK OR METAL POSTS
		WOOD FENCE
		SILT FENCE/COMPOST FILTER TUBES
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND *ONLY* - WHITE
		STOP LINE (12" WHITE)
		CROSSWALK (12" OR 24")
		SOLID WHITE LINE (6" OR 12")
		SOLID YELLOW LINE (6" OR 12")
		BROKEN WHITE LINE (6")
		BROKEN YELLOW LINE (6")
		DOTTED WHITE LINE (6")
		DOTTED YELLOW LINE (6")
		DOTTED WHITE LINE EXTENSION (6")
		DOTTED YELLOW LINE EXTENSION (6")

\* BROKEN WHITE/YELLOW LINES TO BE 10' LINE SEGMENTS WITH 30' GAPS (TYP.) (BYL ON SHARED USE PATH TO BE 3' IN LENGTH WITH 9' GAP)

\*\* DWLEX AND DYLEX LINES TO BE 2' IN LENGTH WITH 6' GAP (TYP.)

\*\*\* DWL AND DYL LINES TO BE 3' IN LENGTH WITH 9' GAP (TYP.) (IF WIDE LINE IS SPECIFIED, THE WIDTH SHALL BE 12")

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION WAS PROVIDED BY CCR ASSOCIATES IN 2014 (6/17) 789-0111. SUPPLEMENTAL SURVEY WAS PROVIDED BY GREENMAN PEDERSEN, INC. IN MARCH AND OCTOBER, 2017. VERTICAL DATUM IS BASED ON NAVD88. HORIZONTAL DATUM IS BASED ON NAD83.
2. THE LOCATIONS AND SIZES OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE THE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.
3. WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R&R).
7. IT IS INTENDED THAT EXISTING GRANITE CURB IS TO BE USED IN PROPOSED WORK TO THE MAXIMUM EXTENT. THE ENGINEER SHALL DETERMINE THE SUITABILITY OF THE CURB FOR RE-USE. EXISTING AND PROPOSED GRANITE CURB SHALL NOT BE INTERSPERSED. THE COST OF CURB REMOVED AND RESET SHALL INCLUDE THE TRANSPORTING OF THE CURB TO A LOCATION WITHIN THE PROJECT LIMITS.
8. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.
9. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC UNLESS OTHERWISE NOTED.
10. ALL EXISTING STATE, COUNTY, CITY AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
11. ALL TRANSVERSE JOINTS AND ALL LONGITUDINAL JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT POURED RUBBERIZED ASPHALT SEALER MEETING THE REQUIREMENTS OF SPECIAL PROVISIONS ITEM 453.
12. ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM BORROW PLACED AND SEEDED. THE LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.
13. THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
14. PRIOR TO THE START OF ANY NEW UTILITY WORK, ALL ELEVATIONS OF EXISTING UTILITIES IN THOSE AREAS ARE TO BE VERIFIED. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY SHOULD ANY DISCREPANCIES OCCUR.
15. ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
16. ALL PUBLICLY OWNED GATE BOXES, SERVICE BOXES, MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
17. ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
18. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
19. CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
20. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTIBILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER GENERAL CLASS B TRENCH EXCAVATION.

GENERAL ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC	EXC	EXCAVATION	PVCC	POINT OF VERTICAL COMPOUND CURVATURE
ABAN	ABANDON	F&G	FRAME AND COVER	PVI	POINT OF VERTICAL INTERSECTION
ADJ	ADJUST	F&G	FRAME AND GRATE	PVRC	POINT OF VERTICAL REVERSE CURVATURE
APPROX.	APPROXIMATE	FDN.	FOUNDATION	PVT	POINT OF VERTICAL TANGENCY
A.C.	ASPHALT CONCRETE	FLOSTN	FIELDSTONE	PVMT	PAVEMENT
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	GAR	GARAGE	PWW	PAVED WATER WAY
BIT.	BITUMINOUS	GD	GROUND	R	RADIUS OF CURVATURE
BC	BOTTOM OF CURB	GG	GAS GATE	R&D	REMOVE AND DISPOSE
BD.	BOUND	GI	GUTTER INLET	RCP	REINFORCED CONCRETE PIPE
BL	BASELINE	GIP	GALVANIZED IRON PIPE	RD	ROAD
BLDG	BUILDING	GRAN	GRANITE	RDWY	ROADWAY
BM	BENCHMARK	GRAV	GRAVEL	REM	REMOVE
BO	BY OTHERS	GRD	GUARD	RETAIN	RETAIN
BOS	BOTTOM OF SLOPE	HDW	HEADWALL	RET WALL	RETAINING WALL
BR.	BRIDGE	HMA	HOT MIX ASPHALT	ROW	RIGHT OF WAY
BV	BOTTOM OF WALL	HOR	HORIZONTAL	R&R	REMOVE AND RESET
CB	CATCH BASIN	HYD	HYDRANT	R&S	REMOVE AND STACK
CBCL	CATCH BASIN WITH CURB INLET	INV	INVERT	RT	RIGHT
CC	CEMENT CONCRETE	JCT	JUNCTION	SB	STONE BOUND
CCM	CEMENT CONCRETE MASONRY	L	LENGTH OF CURVE	SHLD	SHOULDER
CEM	CEMENT	LB	LEACH BASIN	SMH	SEWER MANHOLE
CI	CURB INLET	LP	LIGHT POLE	ST	STREET
CIP	CAST IRON PIPE	LT	LEFT	STA	STATION
CIPP	CURED IN PLACE PIPE	MAX	MAXIMUM	SSD	STOPPING SIGHT DISTANCE
CIT	CHANGE IN TYPE	MB	MAILBOX	SSLO	STATE HIGHWAY LAYOUT LINE
CLF	CHAIN LINK FENCE	MH	MANHOLE	SW	SIDEWALK
CL	CENTERLINE	MHB	MASSACHUSETTS HIGHWAY BOUND	T	TANGENT DISTANCE OF CURVE/TRUCK %
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	TAN	TANGENT
CSP	CORRUGATED STEEL PIPE	MU	MECHANICAL JOINT	TEMP	TEMPORARY
CO.	COUNTY	NO.	NUMBER	TC	TOP OF CURB
CONC	CONCRETE	NTS	NOT TO SCALE	TOS	TOP OF SLOPE
CONST	CONSTRUCTION	PC	POINT OF CURVATURE	TW	TOP OF WALL
CONST	CONSTRUCTION	PCC	POINT OF COMPOUND CURVATURE	TYP	TYPICAL
CR GR	CROWN GRADE	P.G.L.	PROFILE GRADE LINE	UP	UTILITY POLE
DHV	DESIGN HOURLY VOLUME	PI	POINT OF INTERSECTION	VAR	VARIES
DI	DROP INLET	POC	POINT ON CURVE	VERT	VERTICAL
DIA	DIAMETER	POT	POINT ON TANGENT	VC	VERTICAL CURVE
DIP	DUCTILE IRON PIPE	PRC	POINT OF REVERSE CURVATURE	WCR	WHEEL CHAIR RAMP
DW	STEADY DONT WALK - PORTLAND ORANGE	PROJ	PROJECT	WG	WATER GATE
DWY	DRIVEWAY	PROP	PROPOSED	WIP	WROUGHT IRON PIPE
ELEV (or EL.)	ELEVATION	PSB	PLANTABLE SOIL BORROW	WM	WATER METER/WATER MAIN
EMB	EMBANKMENT	PT	POINT OF TANGENCY	WSO	WATER SHUT OFF
EOP	EDGE OF PAVEMENT	PVC	POINT OF VERTICAL CURVATURE	X-SECT	CROSS SECTION
EXIST (or EX)	EXISTING				

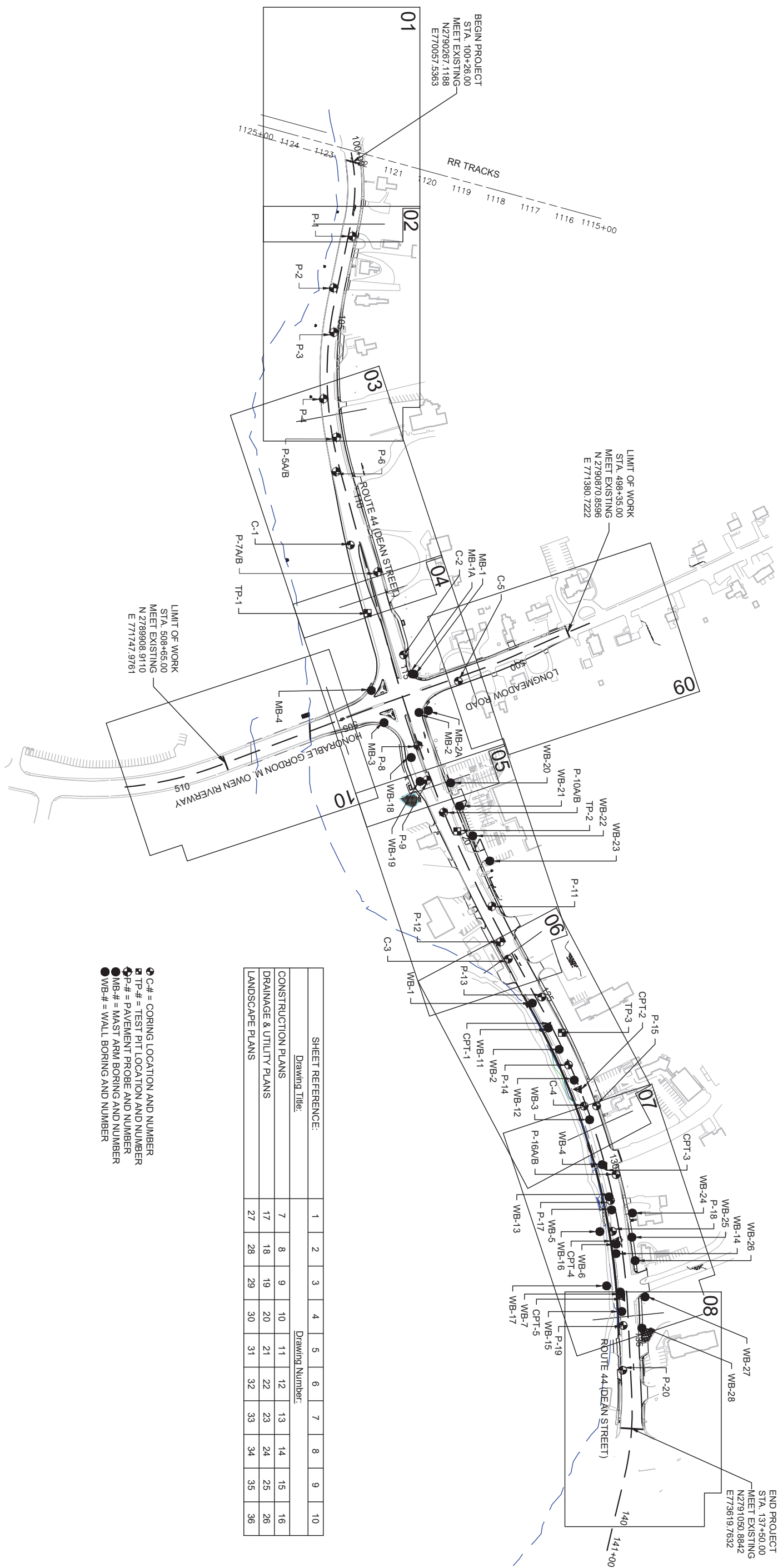
TAUNTON  
ROUTE 44 (IDEAN STREET)

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	52
PROJECT FILE NO.		606024	

LEGEND & ABBREVIATIONS

VAR	VARIES	VERT	VERTICAL
VC	VERTICAL CURVE	WCR	WHEEL CHAIR RAMP
WG	WATER GATE	WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN	WSO	WATER SHUT OFF
X-SECT	CROSS SECTION		



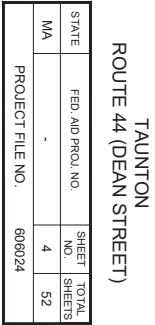


TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	52
PROJECT FILE NO.		606024	

## KEY PLAN

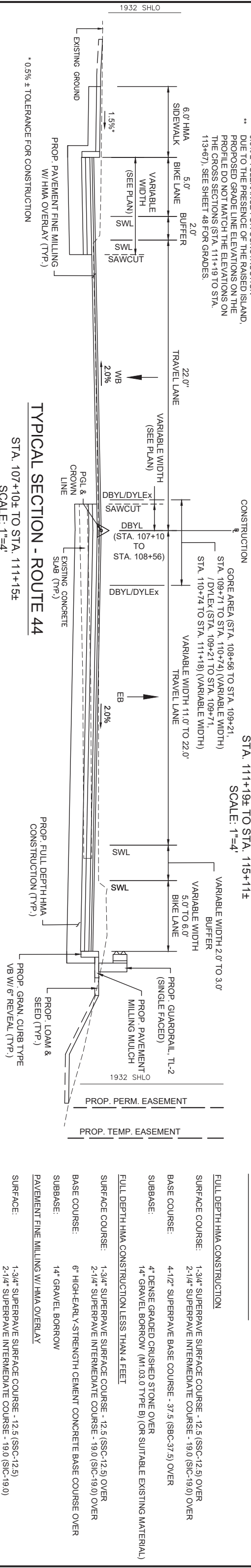




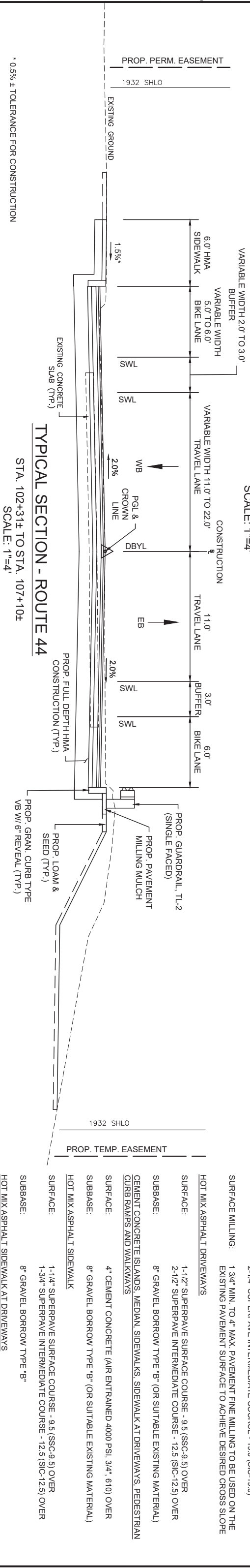


## PAVEMENT NOTES

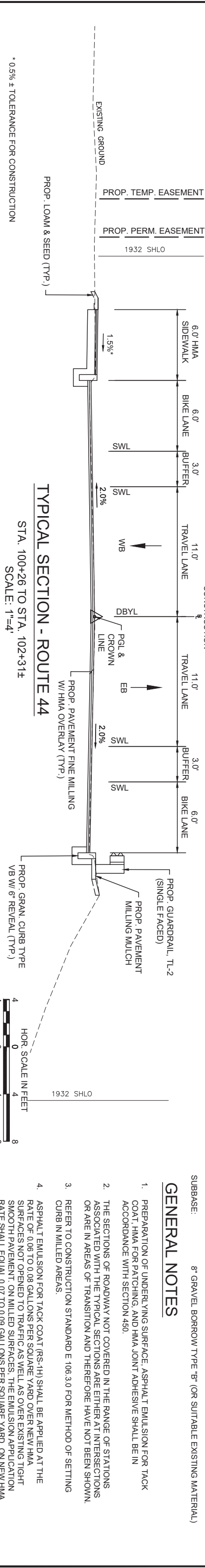
\* 0.5% ± TOLERANCE FOR CONSTRUCTION  
 \*\* DUE TO THE PRESENCE OF THE RAISED ISLAND,  
 PROPOSED GRADE LINE ELEVATIONS ON THE  
 PROFILE DO NOT MATCH THE ELEVATIONS ON  
 THE CROSS SECTIONS (STA. 11+19 TO STA.  
 11+367), SEE SHEET 48 FOR GRADES.



## TYPICAL SECTION - ROUTE 44



## TYPICAL SECTION - ROUTE 44



1. PREPARATION OF UNDERLYING SURFACE: ASPHALT EMULSION FOR TACK COAT, HMA FOR PATCHING, AND HMA JOINT ADHESIVE SHALL BE IN ACCORDANCE WITH SECTION 450.
2. THE SECTIONS OF ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER AT INTERSECTIONS OR ARE IN AREAS OF TRANSITION AND THEREFORE HAVE NOT BEEN SHOWN.
3. REFER TO CONSTRUCTION STANDARD E 106.3.0 FOR METHOD OF SETTING CURB IN MILLED AREAS.
4. ASPHALT EMULSION FOR TACK COAT (RS-1H) SHALL BE APPLIED AT THE RATE OF 0.06 TO 0.08 GALLONS PER SQUARE YARD OVER NEW HMA SURFACES NOT OPENED TO TRAFFIC AS WELL AS OVER EXISTING TIGHT SMOOTH PAVEMENT. ON MILLED SURFACES, THE EMULSION APPLICATION RATE SHALL EQUAL 0.07 TO 0.09 GALLONS PER SQUARE YARD. ON NEW HMA PATCHES, THE EMULSION APPLICATION RATE SHALL EQUAL 0.06 TO 0.09

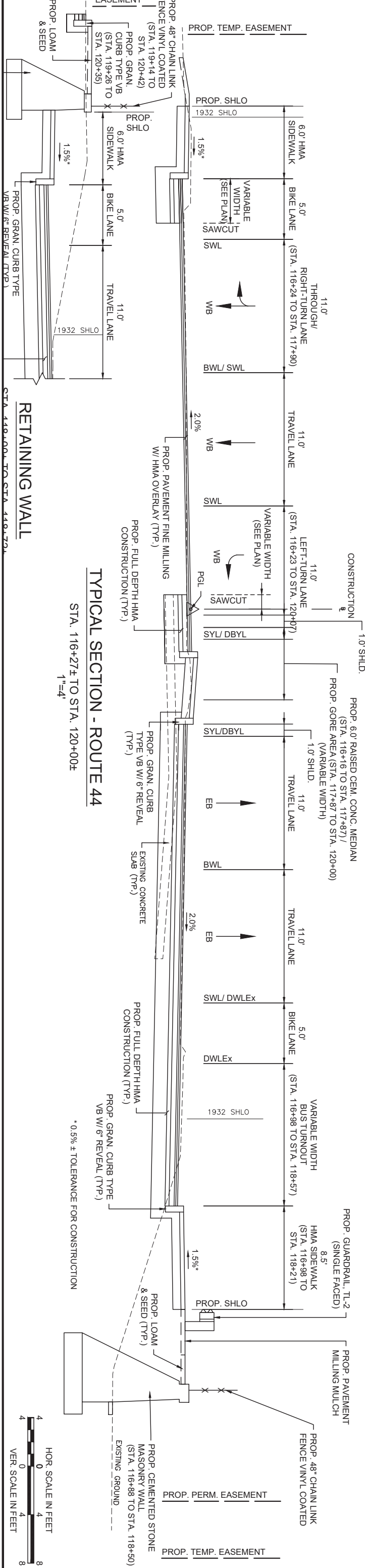
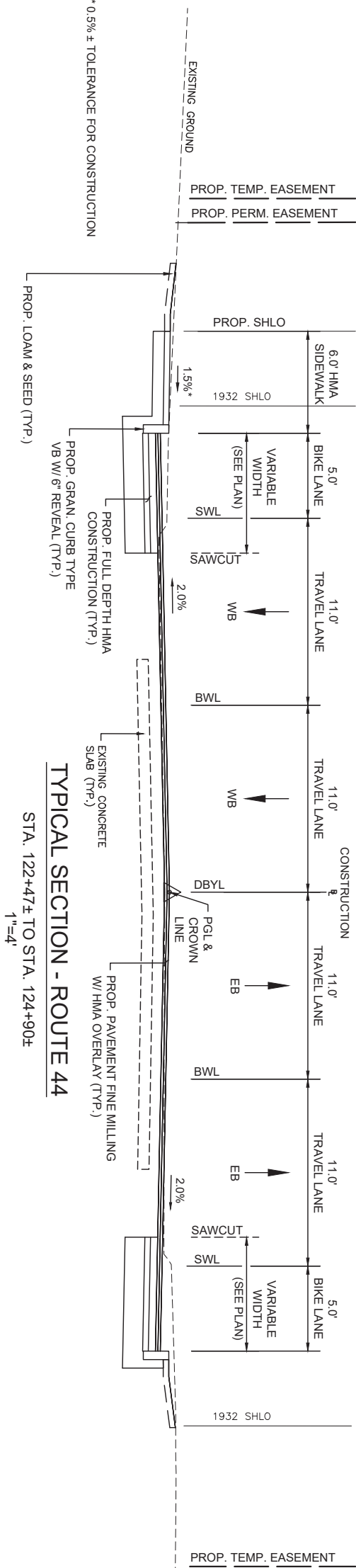
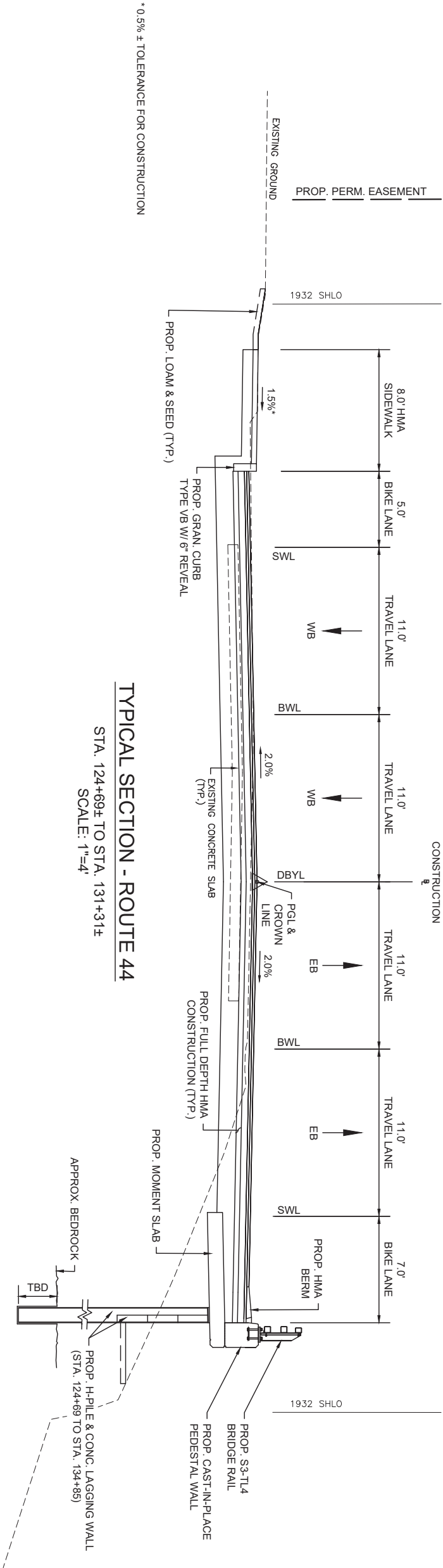
## GENERAL NOTES

HOR. SCALE IN FEET

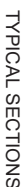
0 4 8

VER. SCALE IN FEET

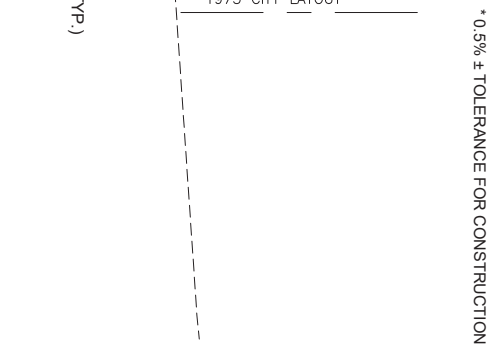




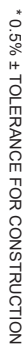




STA. 504+68± TO STA. 507+46±  
SCALE: 1"=4'



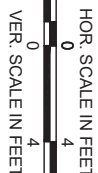
STA. 500+27± TO STA. 502+63±  
SCALE: 1"=4'



STA. 135+50± TO STA. 136+00±  
SCALE: 1"=4'



STA. 131+31± TO STA. 134+85±  
SCALE: 1"=4'





















Highway Guard Details

Traffic Signal Conduit

Water Supply Alterations

Drainage Details

STA. 118+28 RT TO STA. 118+57 RT - ITEM 620.12  
STA. 118+57 RT TO STA. 118+65 RT - ITEM 620.32  
STA. 118+65 RT TO STA. 118+95 RT - ITEM 620.12  
STA. 118+95 RT - ITEM 627.1  
STA. 120+79 RT - ITEM 627.82  
STA. 120+91 RT TO 121+29 RT - ITEM 620.12  
STA. 121+29 RT - ITEM 627.1  
STA. 121+29 LT - ITEM 627.1  
STA. 121+28 LT TO STA. 122+34 LT - ITEM 620.12  
STA. 122+34 LT TO STA. 122+48 LT - ITEM 620.32  
STA. 122+48 LT ITEM 627.82

NONE

SEE SHEET 61

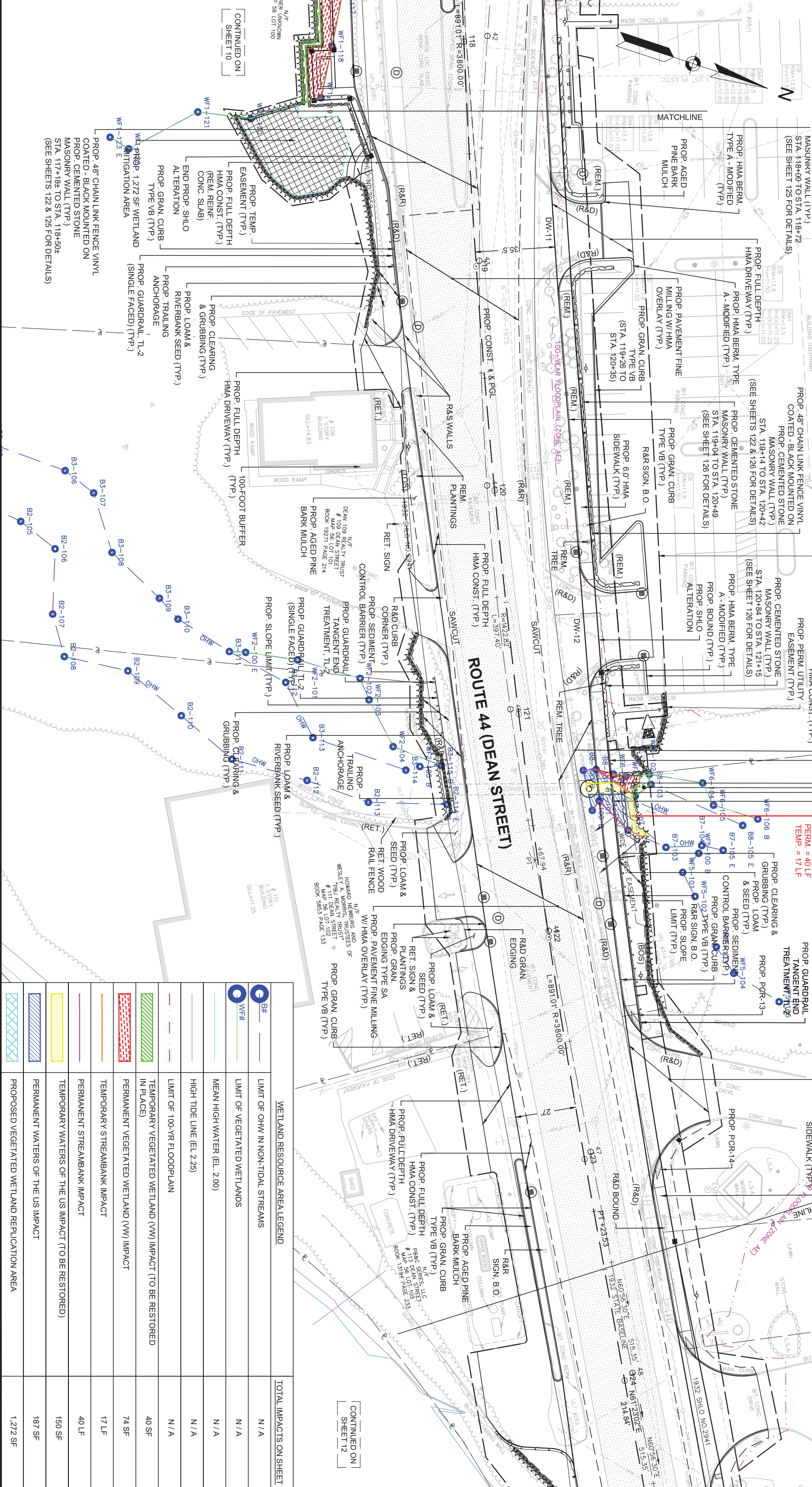
SEE SHEET 61

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	52

PROJECT FILE NO. 000024

CONSTRUCTION PLANS



WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
B#	LIMIT OF OHW IN NON-TIDAL STREAMS	N / A
WF#	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL. 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	40 SF
	PERMANENT VEGETATED WETLAND (VW) IMPACT	74 SF
	TEMPORARY STREAMBANK IMPACT	17 LF
	PERMANENT STREAMBANK IMPACT	40 LF
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	150 SF
	PERMANENT WATERS OF THE US IMPACT	187 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	1,272 SF







HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

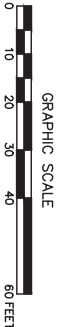
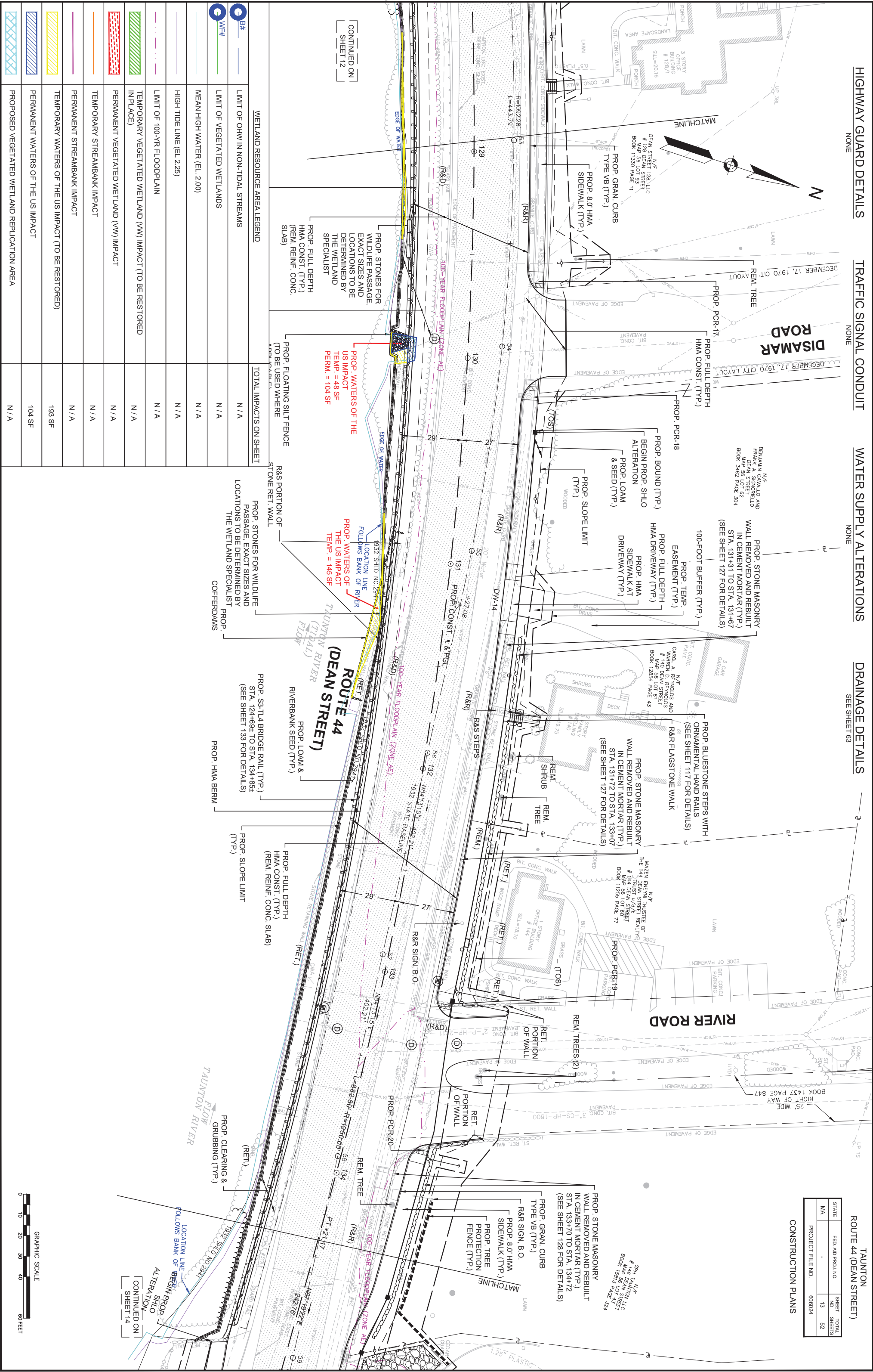
DRAINAGE DETAILS

SEE SHEET 13

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	52
PROJECT FILE NO.		000024	

CONSTRUCTION PLANS



WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
ⓑ#	LIMIT OF OHW IN NON-TIDAL STREAMS	N/A
ⓐ#	LIMIT OF VEGETATED WETLANDS	N/A
	MEAN HIGH WATER (EL. 2.00)	N/A
	HIGH TIDE LINE (EL. 2.25)	N/A
	LIMIT OF 100-YR FLOODPLAIN	N/A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N/A
	PERMANENT VEGETATED WETLAND (VW) IMPACT	N/A
	TEMPORARY STREAMBANK IMPACT	N/A
	PERMANENT STREAMBANK IMPACT	N/A
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	193 SF
	PERMANENT WATERS OF THE US IMPACT	104 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N/A

WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
ⓑ#	LIMIT OF OHW IN NON-TIDAL STREAMS	N/A
ⓐ#	LIMIT OF VEGETATED WETLANDS	N/A
	MEAN HIGH WATER (EL. 2.00)	N/A
	HIGH TIDE LINE (EL. 2.25)	N/A
	LIMIT OF 100-YR FLOODPLAIN	N/A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N/A
	PERMANENT VEGETATED WETLAND (VW) IMPACT	N/A
	TEMPORARY STREAMBANK IMPACT	N/A
	PERMANENT STREAMBANK IMPACT	N/A
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	193 SF
	PERMANENT WATERS OF THE US IMPACT	104 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N/A







HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

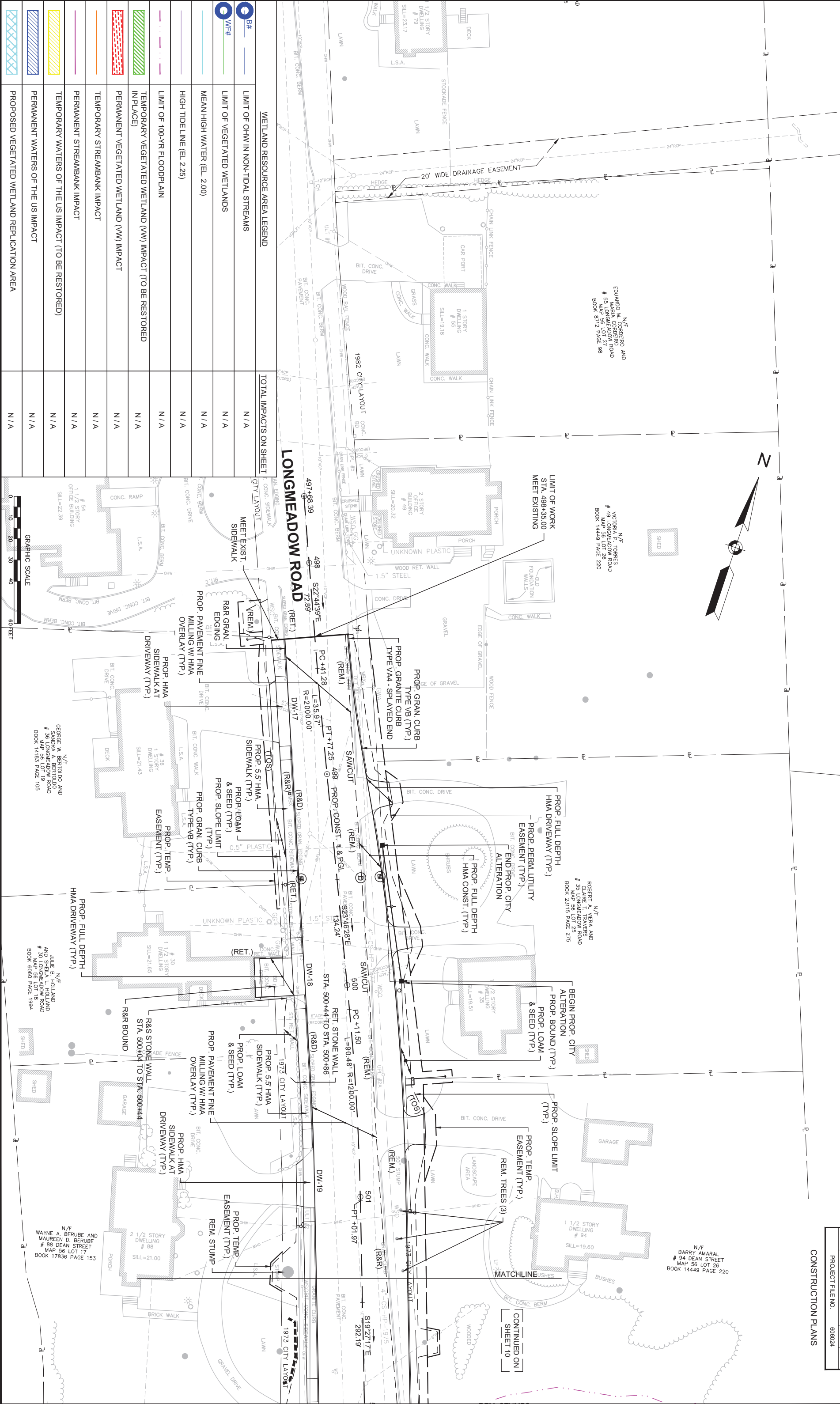
DRAINAGE DETAILS

SEE SHEET 65

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	52
PROJECT FILE NO.		606024	

CONSTRUCTION PLANS



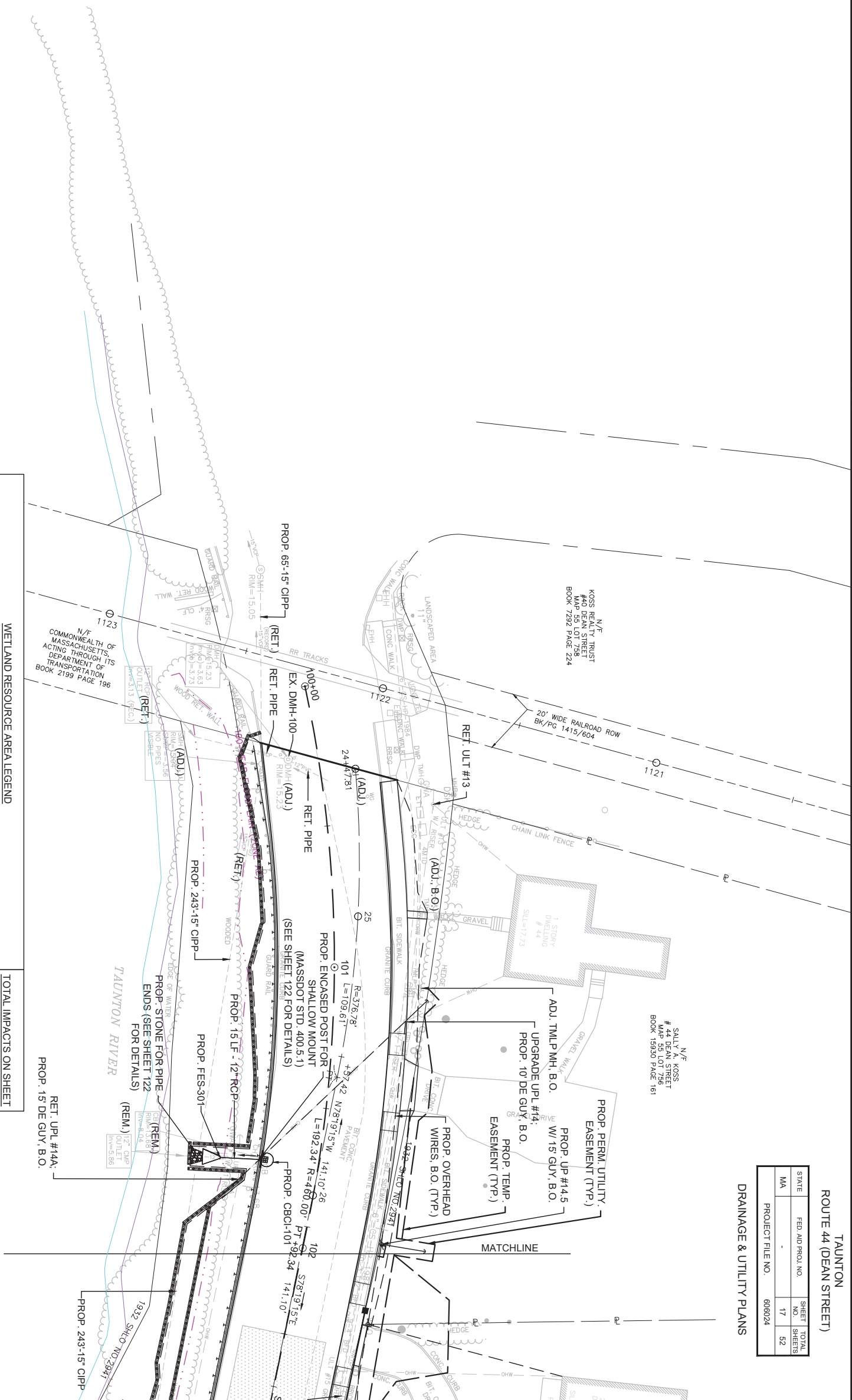









TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	52
PROJECT FILE NO.		606024	

## DRAINAGE & UTILITY PLANS

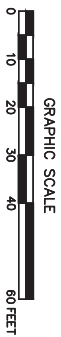


WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
	LIMIT OF STREAM BANK / WATERS OF THE US	N / A
	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N / A
	PERMANENT VEGETATED WETLAND (VW) IMPACT	N / A
	TEMPORARY STREAMBANK IMPACT	N / A
	PERMANENT STREAMBANK IMPACT	N / A
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	N / A
	PERMANENT WATERS OF THE US IMPACT	N / A
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N / A

## UTILITY LEGEND

<u>PROPOSED</u>	<u>EXISTING</u>
"SIZE & TYPE"	"SIZE & TYPE" (DIRECTION OF FLOW)
—————▶	—————▶
"SIZE & TYPE"	"SIZE & TYPE"
—————	—————
"SIZE & TYPE"	"SIZE & TYPE"
—————	—————
"SIZE & TYPE"	"SIZE & TYPE"
—————	—————
"NAME OF UTILITY"	
—————	
—————	
—————	
—————	
—————	

CONTINUED ON  
SHEET 18





TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	52
PROJECT FILE NO. 606024			

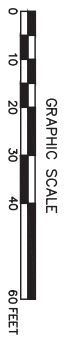
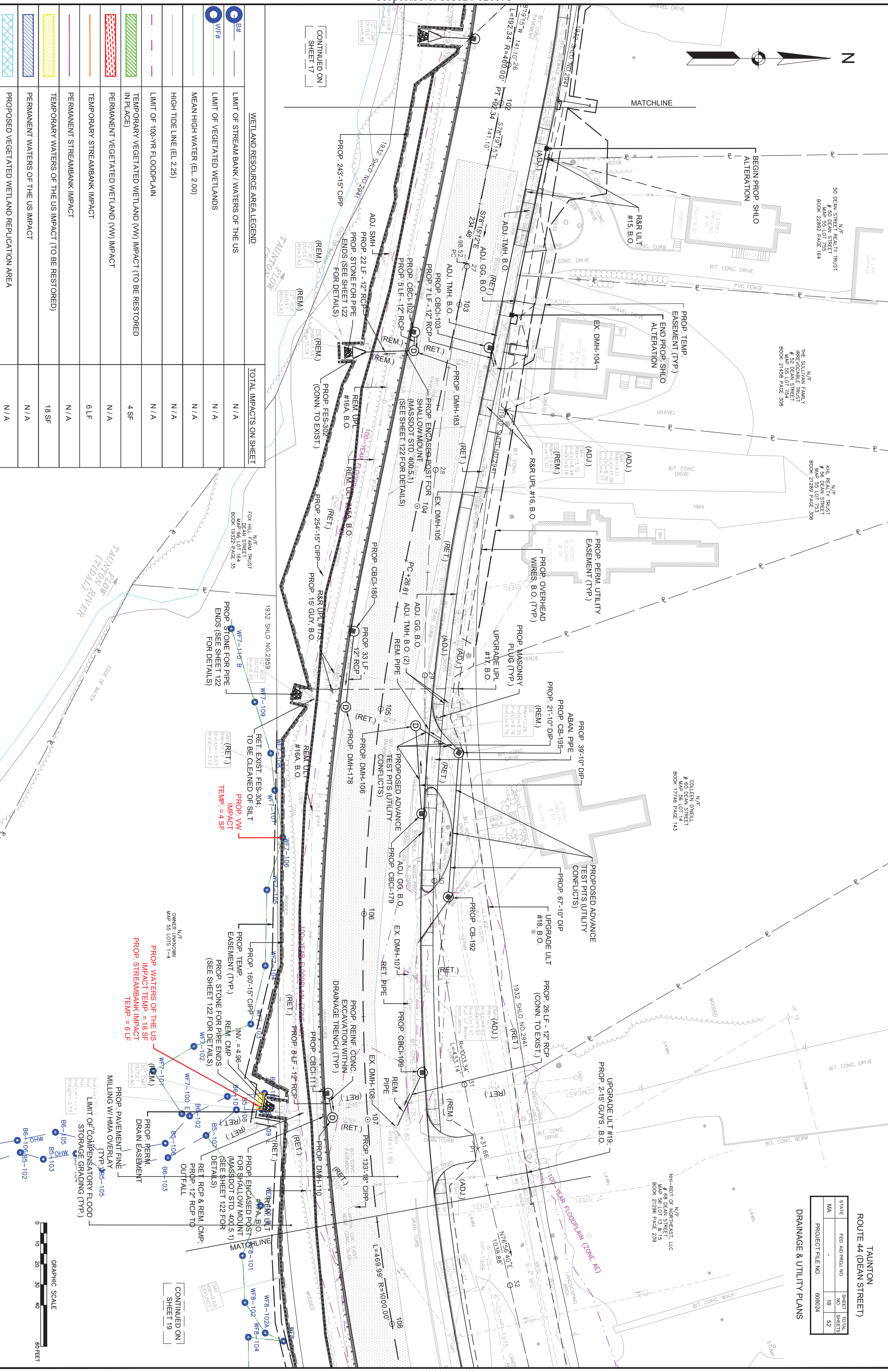
DRAINAGE & UTILITY PLANS



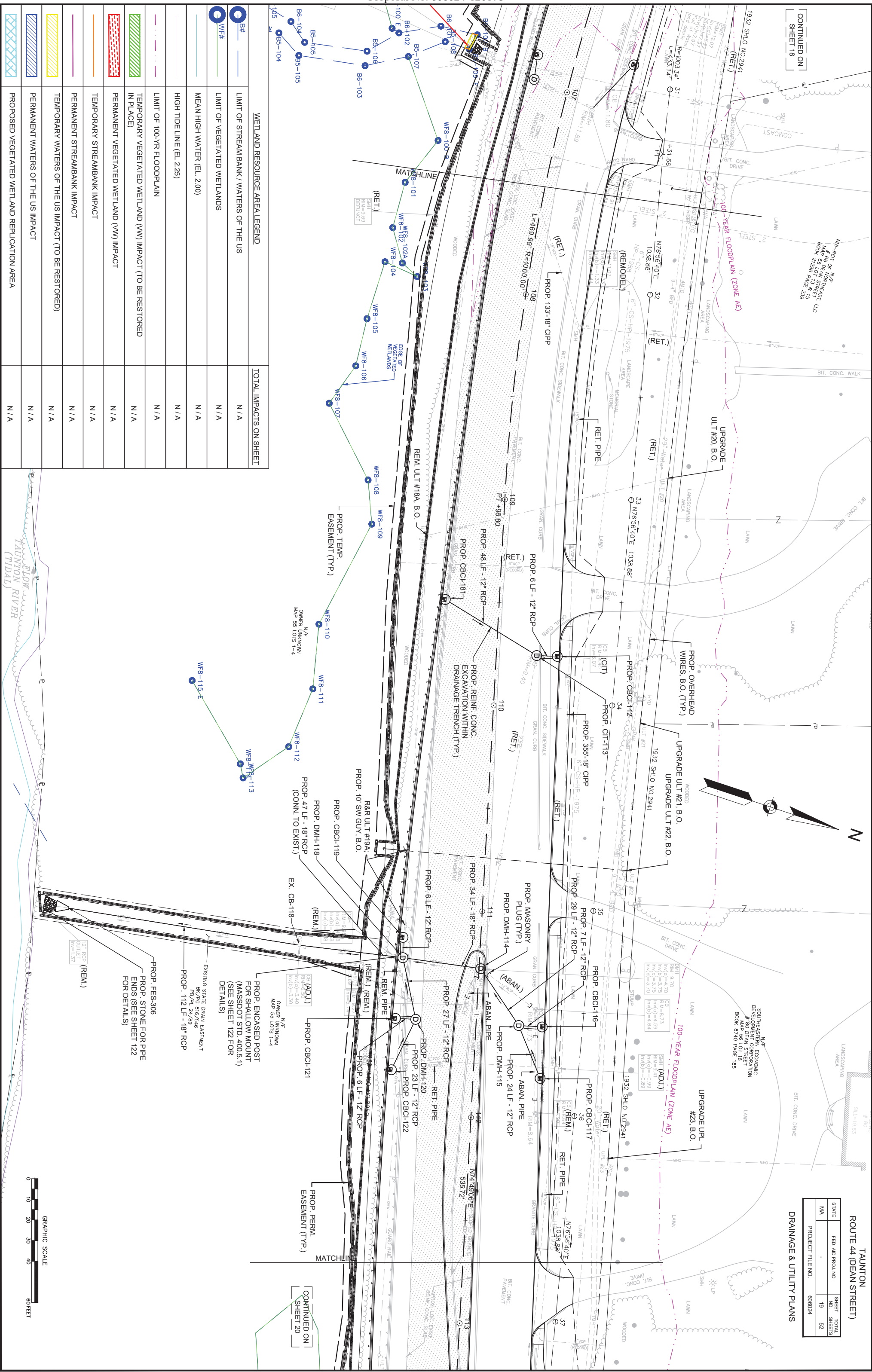
MATCHLINE

CONTINUED ON  
SHEET 17

CONTINUED ON  
SHEET 19



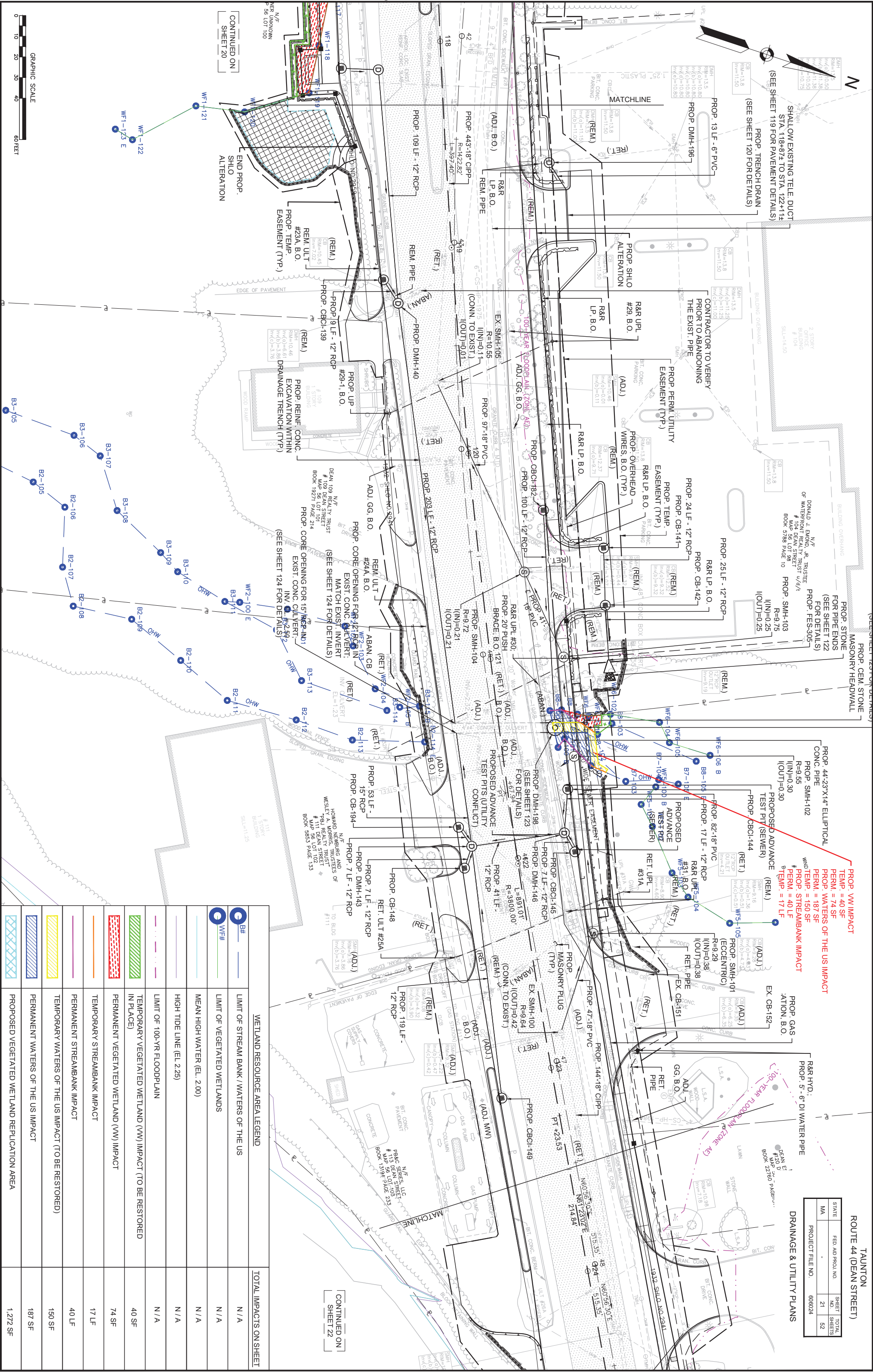








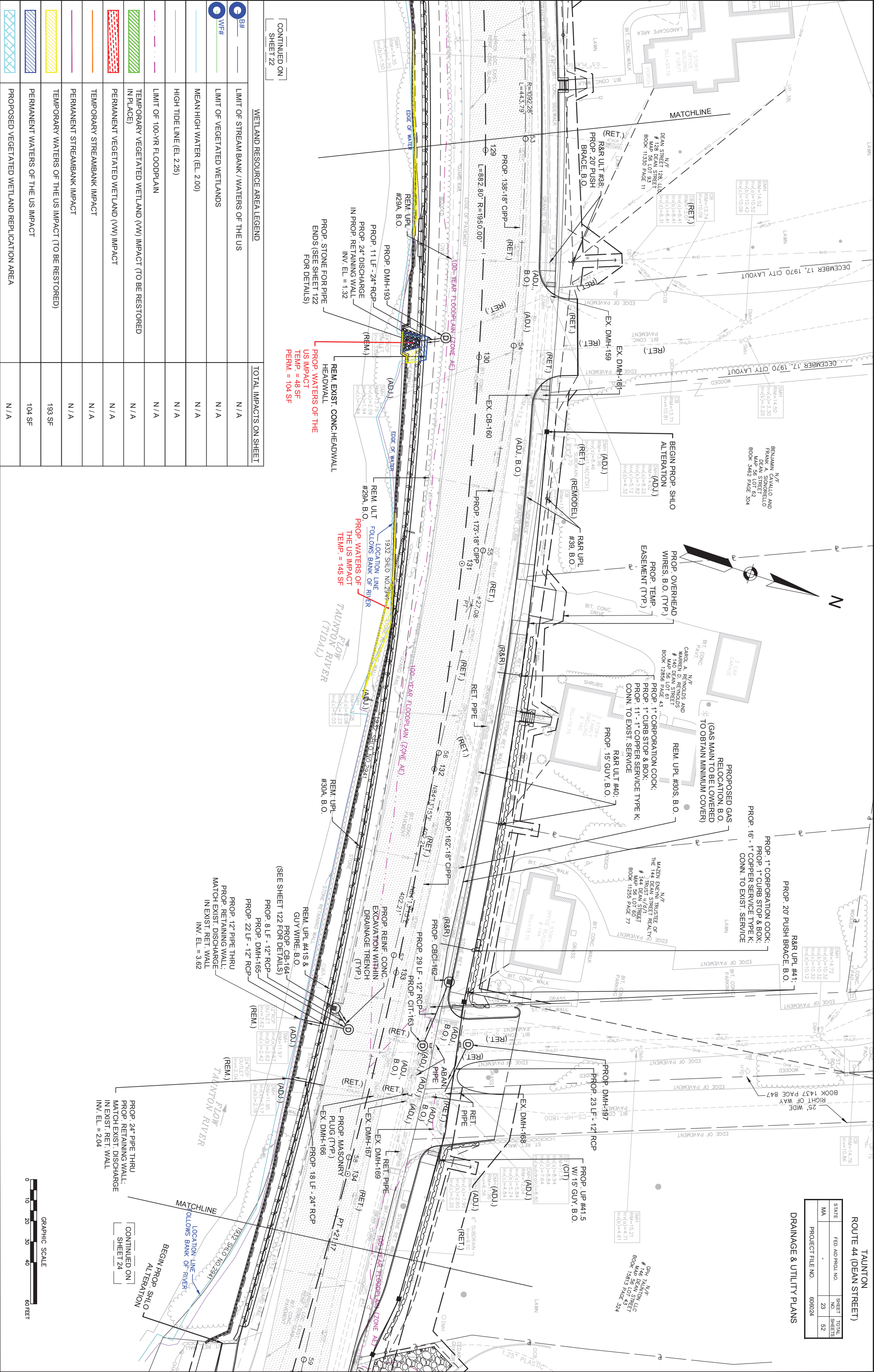








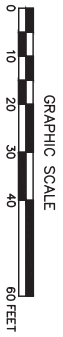




WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
BH	LIMIT OF STREAM BANK / WATERS OF THE US	N / A
WF#	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL. 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N / A
	PERMANENT VEGETATED WETLAND (VW) IMPACT	N / A
	TEMPORARY STREAMBANK IMPACT	N / A
	PERMANENT STREAMBANK IMPACT	N / A
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	193 SF
	PERMANENT WATERS OF THE US IMPACT	104 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N / A

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	52
PROJECT FILE NO.		606024	

DRAINAGE & UTILITY PLANS



CONTINUED ON  
SHEET 24

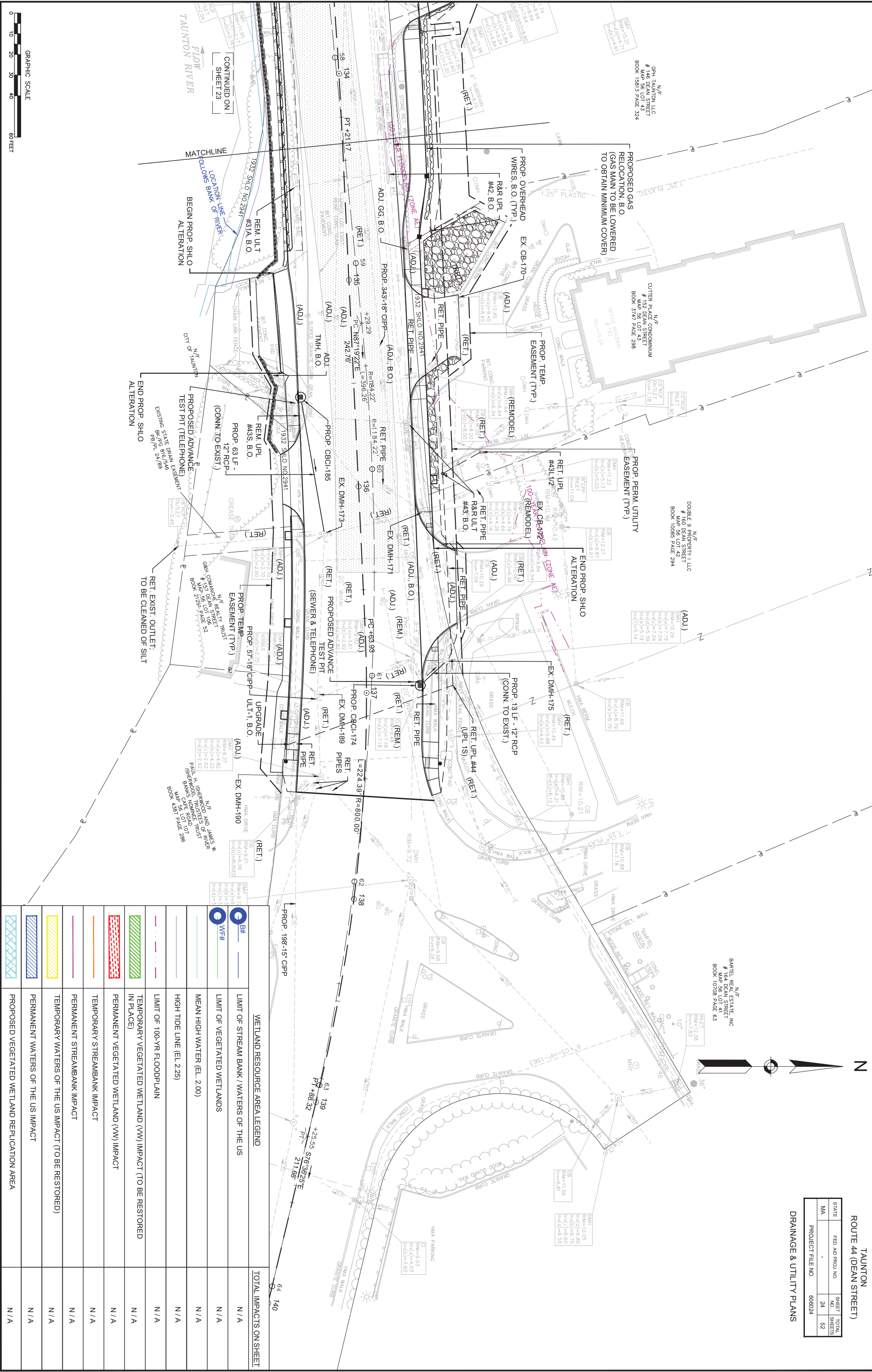
CONTINUED ON  
SHEET 22















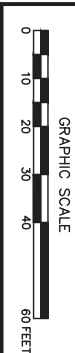
TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	52
PROJECT FILE NO.		606024	

DRAINAGE & UTILITY PLANS



WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
	LIMIT OF STREAM BANK / WATERS OF THE US	N / A
	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL. 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (WV) IMPACT (TO BE RESTORED IN PLACE)	N / A
	PERMANENT VEGETATED WETLAND (WV) IMPACT	N / A
	TEMPORARY STREAMBANK IMPACT	N / A
	PERMANENT STREAMBANK IMPACT	N / A
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	N / A
	PERMANENT WATERS OF THE US IMPACT	N / A
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N / A



TAUNTON RIVER  
FLOW  
CONTINUED ON SHEET 23  
MATCHLINE  
LOCATION LINE  
FOLLOWS BANK OF RIVER  
BEGIN PROP. SHLO ALTERATION  
END PROP. SHLO ALTERATION

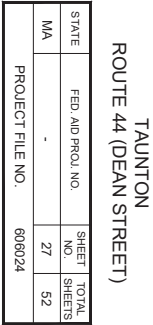






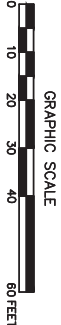
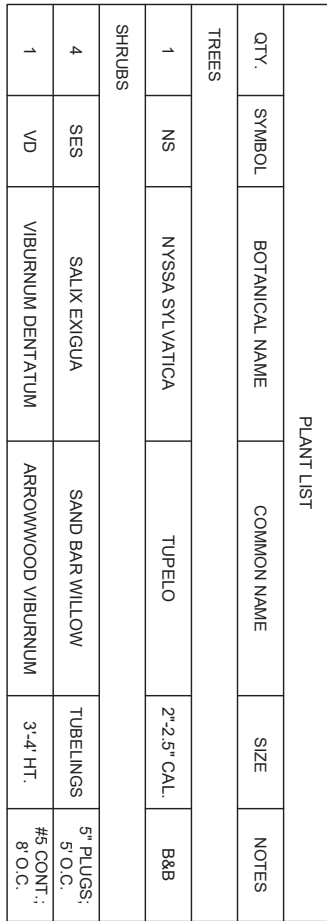






TAUNTON  
ROUTE 44 (DEAN STREET)

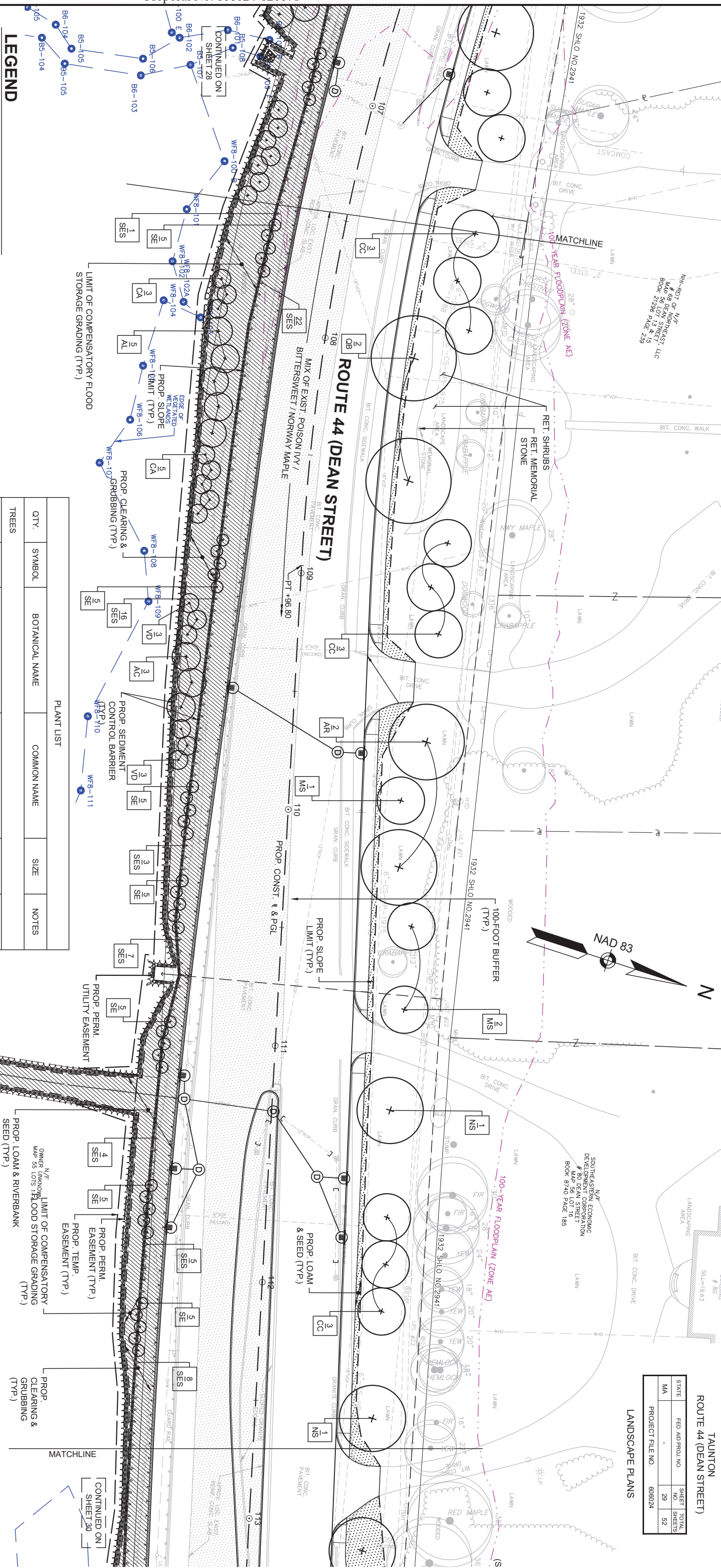
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	52
PROJECT FILE NO.		606024	

















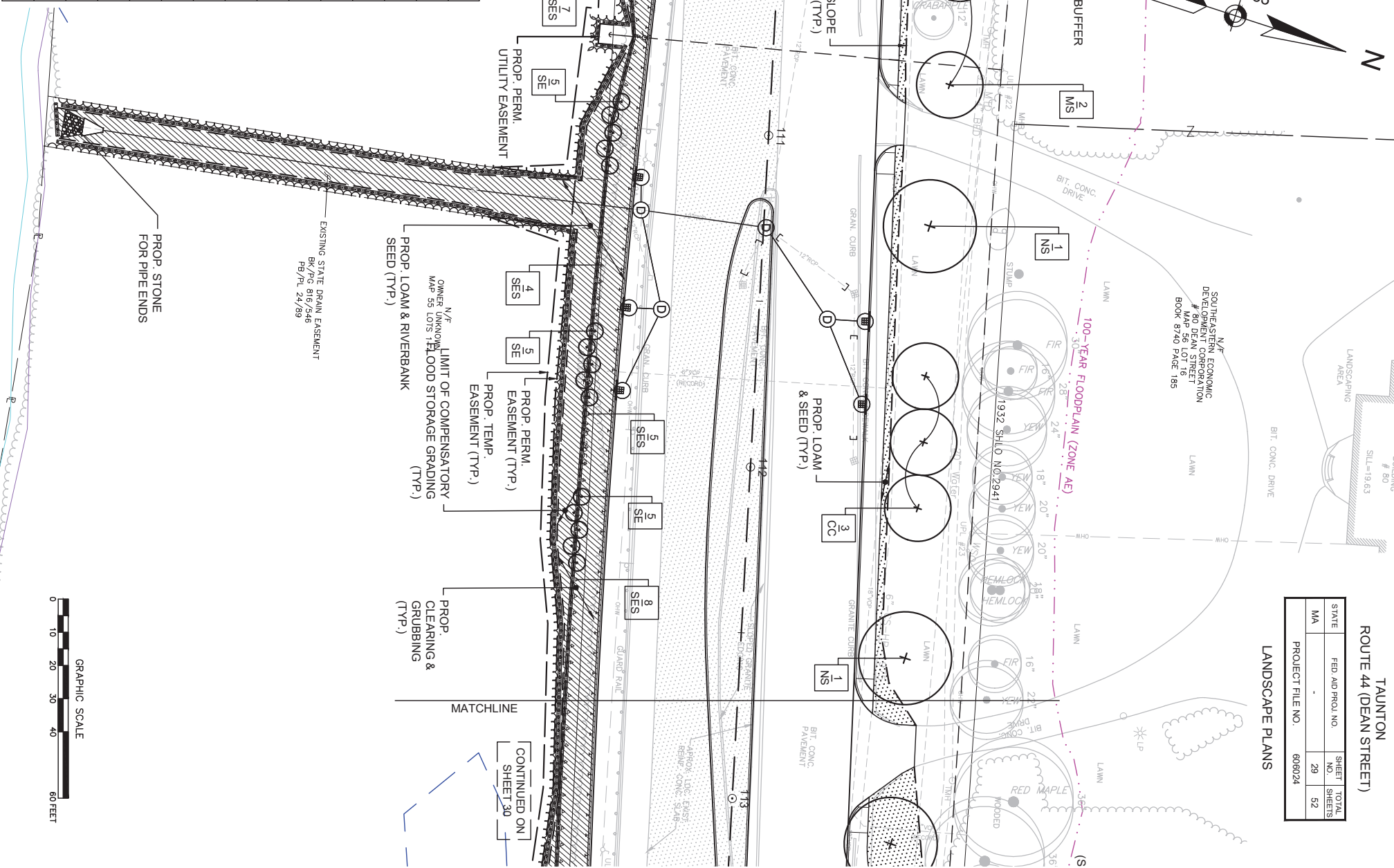
LANDSCAPE PLANS



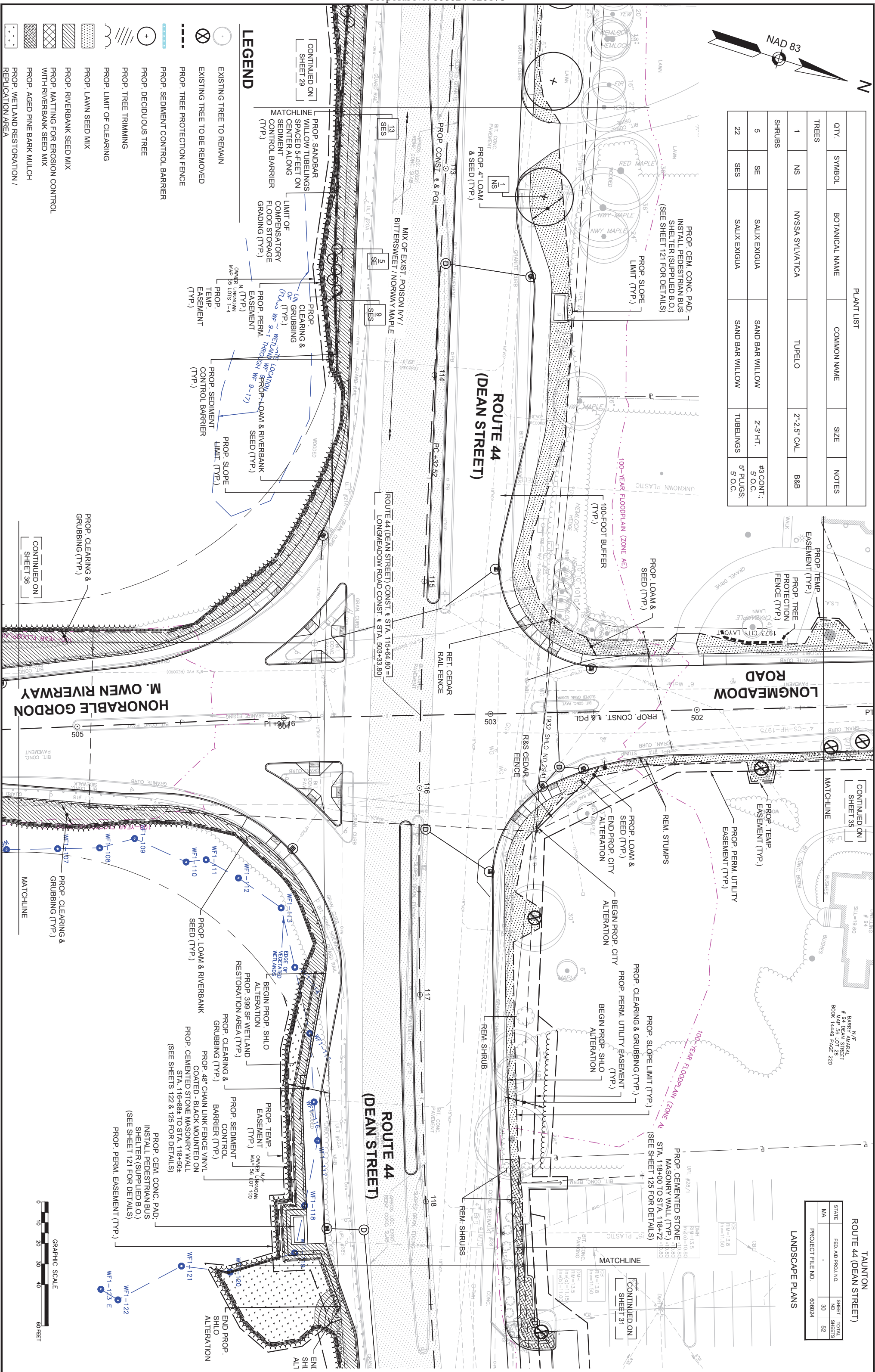


	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED
	PROP. TREE PROTECTION FENCE
	PROP. SEDIMENT CONTROL BARRIER
	PROP. DECIDUOUS TREE
	PROP. TREE TRIMMING
	PROP. LIMIT OF CLEARING
	PROP. LAWN SEED MIX
	PROP. RIVERBANK SEED MIX
	PROP. MATTING FOR EROSION CONTROL WITH RIVERBANK SEED MIX
	PROP. AGED PINE BARK MULCH
	PROP. WETLAND RESTORATION / REPLICATION AREA

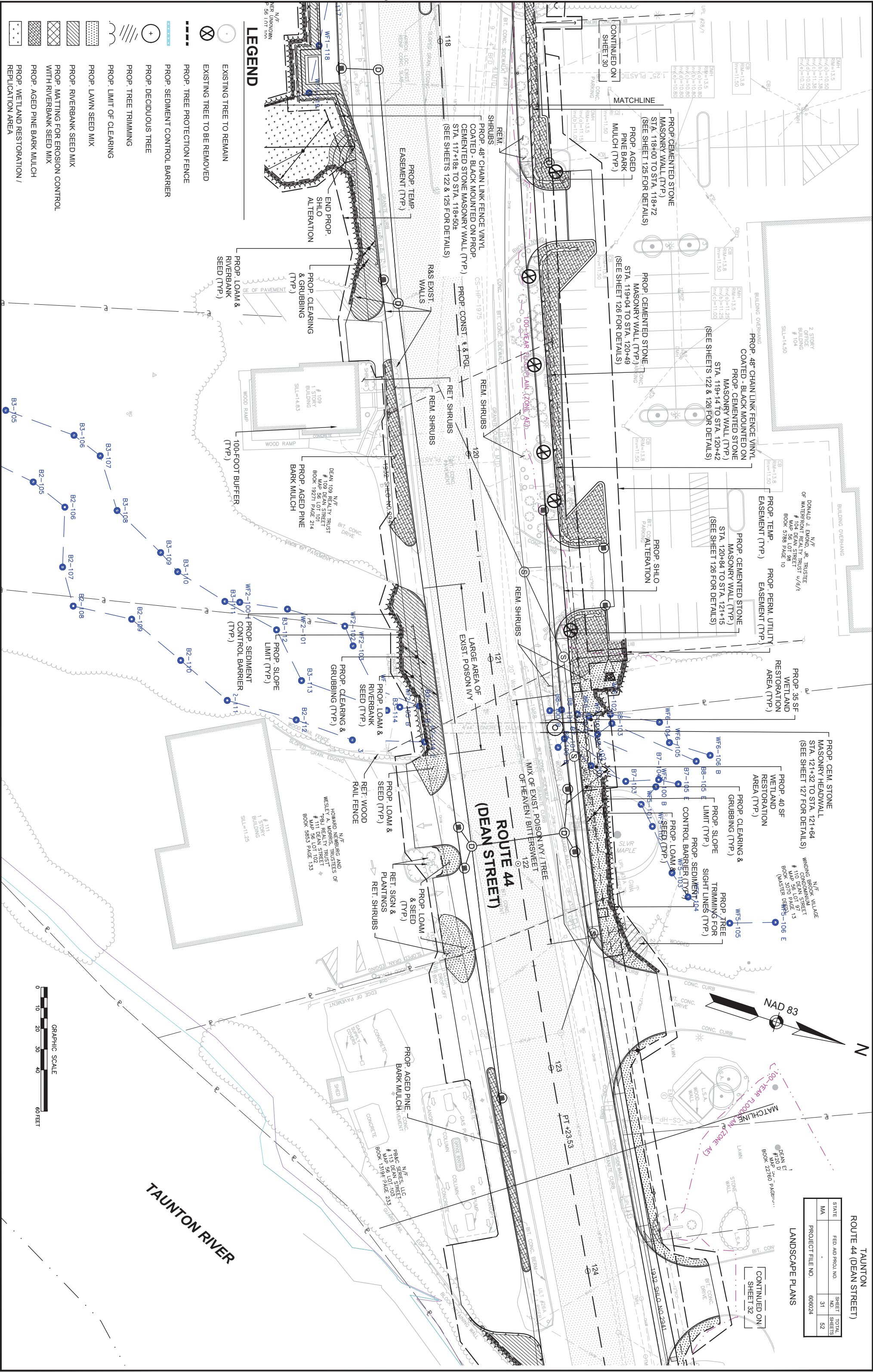
PLANT LIST					
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
TREES					
2	AR	ACER RUBRUM	RED MAPLE	2"-2.5" CAL.	B&B
9	CC	CRATAEGUS CRUSGALLI INERMIS	THORNLESS COCKSPUR HAWTHORN	1.5"-2" CAL.	B&B
3	MS	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	1.5"-2" CAL.	B&B
2	NS	NYSSA SYLVATICA	TUPELO	2"-2.5" CAL.	B&B
2	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2"-2.5" CAL.	B&B
SHRUBS					
3	AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	8"-10" CLUMP	B&B; 12" O.C.
5	AL	ALNUS RUGOSA	SPECKLED ALDER	3-4" HT.	#5 CONT.; 12" O.C.
8	CA	CORNUS AMOMUM	SILKY DOGWOOD	3-4" HT.	#5 CONT.; 8" O.C.
35	SE	SALIX EXIGUA	SAND BAR WILLOW	2-3" HT.	#3 CONT.; 5" O.C.
66	SES	SALIX EXIGUA	SAND BAR WILLOW	TUBELINGS	5" PLUGS; 5" O.C.
6	VD	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	3-4" HT.	#5 CONT.; 8" O.C.





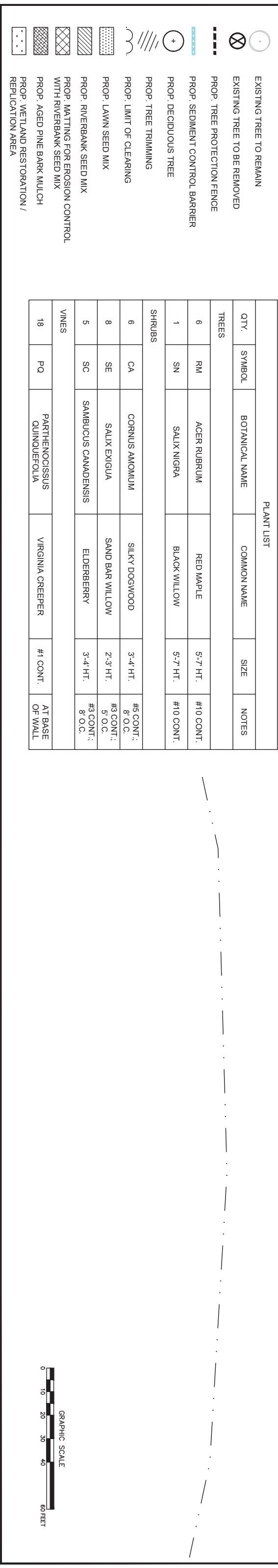




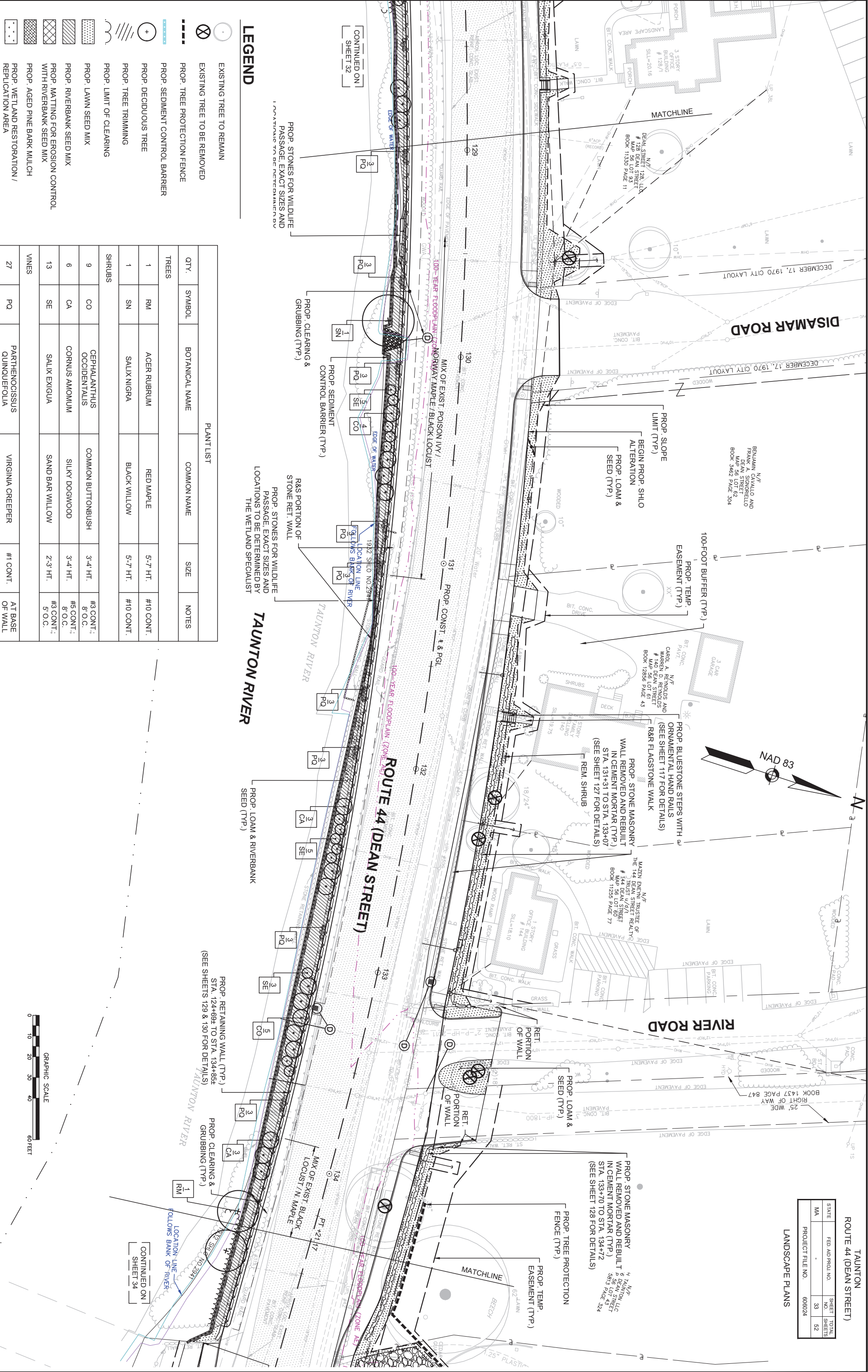


TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	31	52
PROJECT FILE NO.		606024	

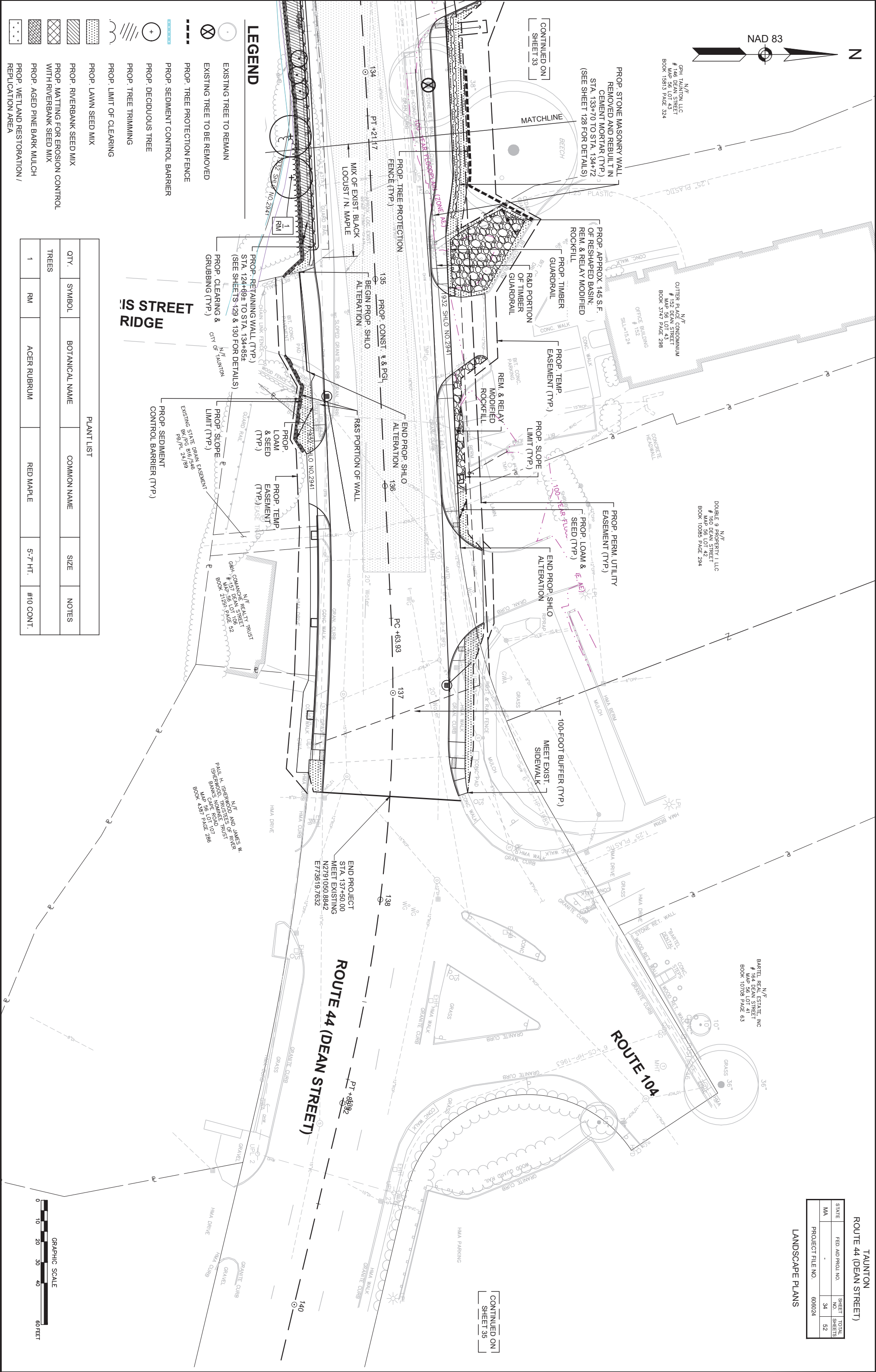




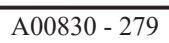




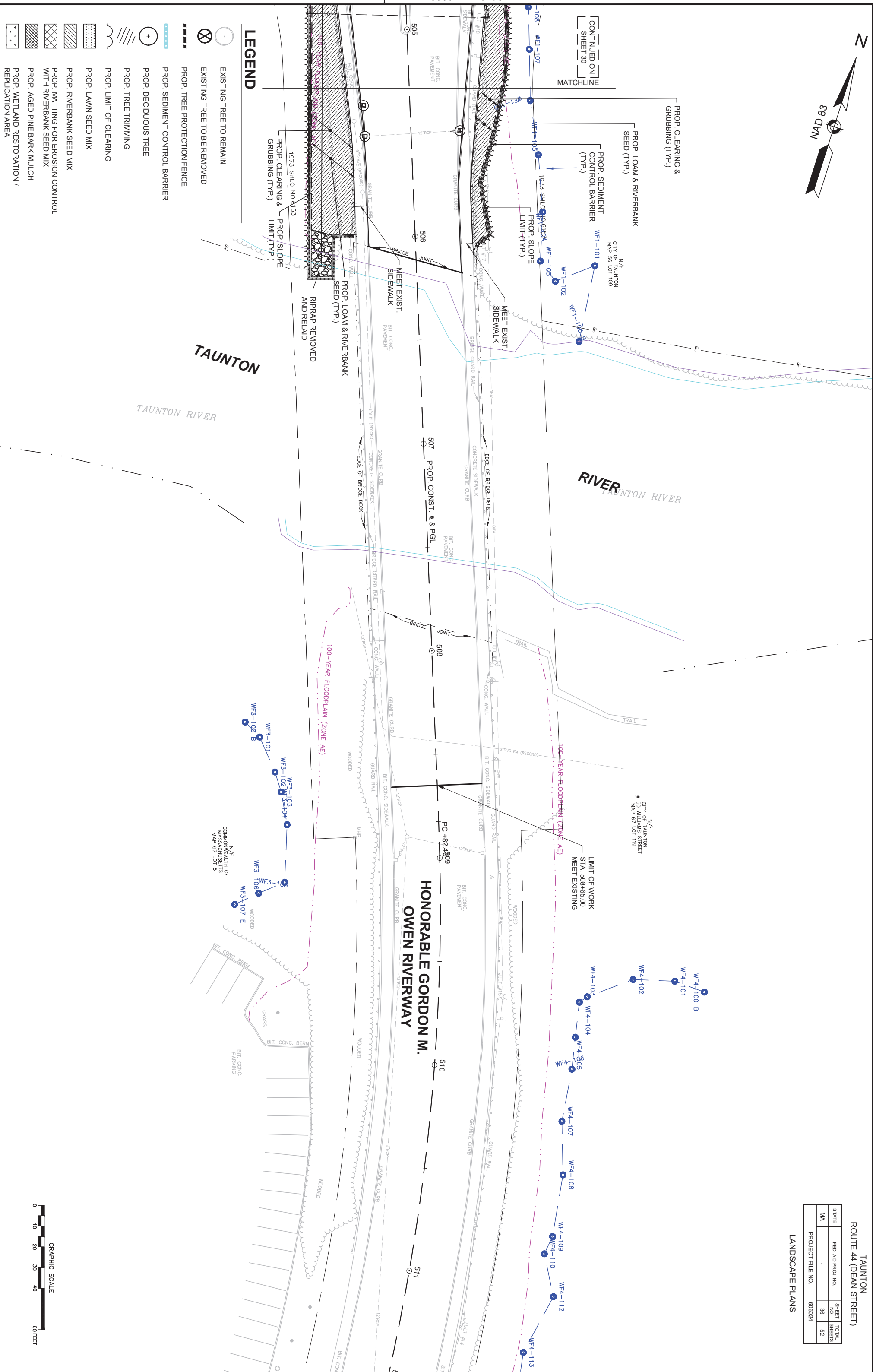
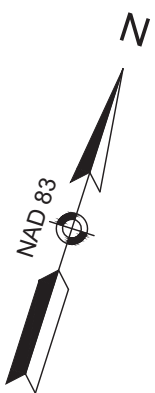












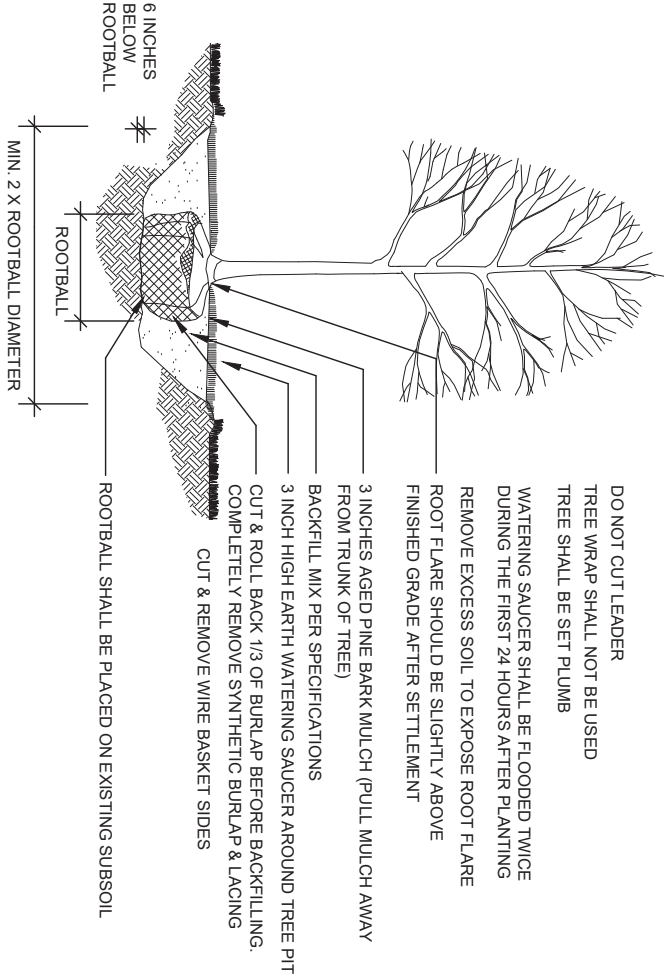
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	52
PROJECT FILE NO.		606024	



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	52
PROJECT FILE NO. 606024			

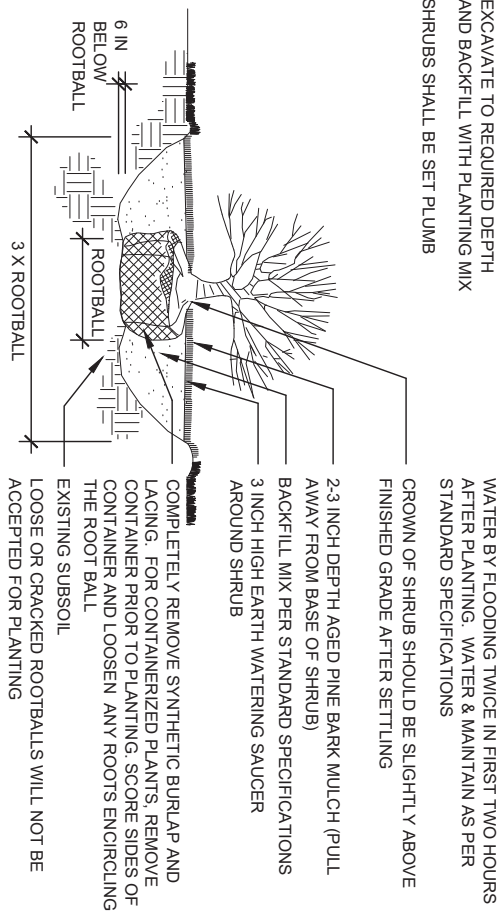
LANDSCAPE DETAILS

MASTER PLANT LIST												
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	SHT 101	SHT 102	SHT 103	SHT 104	SHT 106	SHT 107	SHT 108
TREES												
4	AR	ACER RUBRUM	RED MAPLE	2'-2.5' CAL.	B&B	-	2	2	-	-	-	-
8	RM	ACER RUBRUM	RED MAPLE	5'-7' HT.	#10 CONT.	-	-	-	-	6	1	1
9	CC	CRATAEGUS CRUS-GALLI INERMIS	THORNLESS COCKSPUR HAWTHORN	1.5"-2" CAL.	B&B	-	-	9	-	-	-	-
5	MS	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	1.5"-2" CAL.	B&B	-	2	3	-	-	-	-
9	NS	NYSSA SYLVATICA	TUPELO	2'-2.5' CAL.	B&B	1	5	2	1	-	-	-
5	PO	PLATANUS OCCIDENTALIS	AMERICAN PLANETREE	2'-2.5' CAL.	B&B	-	5	-	-	-	-	-
2	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2'-2.5' CAL.	B&B	-	-	2	-	-	-	-
2	SN	SALIX NIGRA	BLACK WILLOW	5'-7' HT.	#10 CONT.	-	-	-	-	1	1	-
SHRUBS												
6	AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	8'-10' CLUMP	B&B; 12' O.C.	-	3	3	-	-	-	-
8	AL	ALNUS RUGOSA	SPECKLED ALDER	3'-4' HT.	#5 CONT.; 12' O.C.	-	3	5	-	-	-	-
9	CO	CEPHALANTHUS OCCIDENTALIS	COMMON BUTTONBUSH	3'-4' HT.	#3 CONT.; 8' O.C.	-	-	-	-	-	9	-
30	CA	CORNUS AMOMUM	SILKY DOGWOOD	3'-4' HT.	#5 CONT.; 8' O.C.	-	10	8	-	6	6	-
14	HV	HAMAMELIS VIRGINIANA	WITCH HAZEL	3'-4' HT.	#5 CONT.; 8' O.C.	-	14	-	-	-	-	-
66	SE	SALIX EXIGUA	SAND BAR WILLOW	2'-3' HT.	#3 CONT.; 5' O.C.	-	5	35	5	8	13	-
197	SES	SALIX EXIGUA	SAND BAR WILLOW	TUBELINGS	5" PLUGS; 5' O.C.	4	105	66	22	-	-	-
15	SC	SAMBUCUS CANADENSIS	ELDERBERRY	3'-4' HT.	#3 CONT.; 8' O.C.	-	10	-	-	5	-	-
21	VD	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	3'-4' HT.	#5 CONT.; 8' O.C.	1	14	6	-	-	-	-
VINES												
45	PQ	PARTHENOISSUS QUINQUEFOLIA	VIRGINIA CREEPER	#1 CONT.	AT BASE OF WALL	-	-	-	-	18	27	-



DECIDUOUS TREE PLANTING

NOT TO SCALE

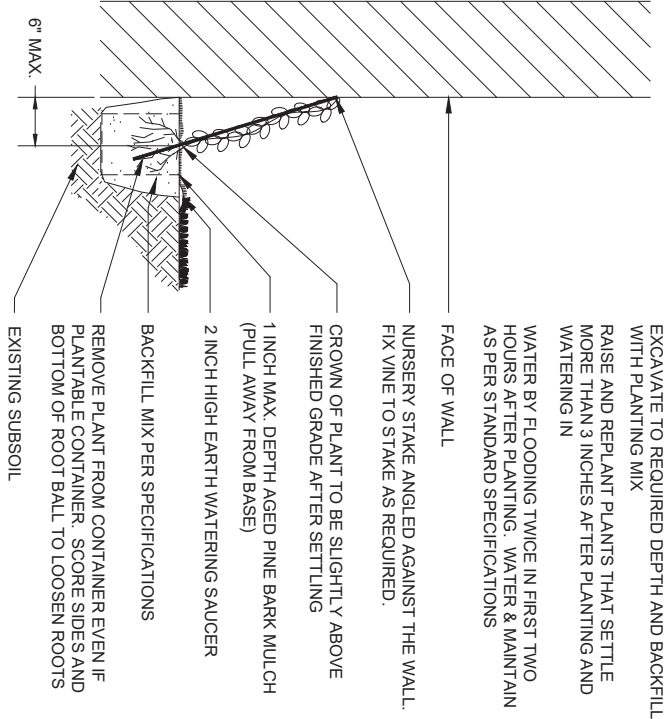


SHRUB PLANTING

NOT TO SCALE

SEEDING SCHEDULE			
LEGEND	TYPE	SUB TYPE	NOTES
	LAWN SEED MIX	LAWNS OR SLOPES AND SHOULDERS - M6.03.0	FOR USE IN YARDS AND SHOULDERS FREQUENTLY MOWN. (SEED OVER 4" LOAM FOR LAWNS)
	RIVERBANK SEED MIX	PART SHADE	FOR USE IN NO MOW / INFREQUENTLY MOWN AREAS; RIVERBANK SEED SHALL BE BROADCAST MANUALLY. (SEED AND COVER CROP OVER 4" LOAM FOR ROADSIDES)
	* WETLAND SEED MIX	PART SHADE	FOR USE IN WETLAND RESTORATION & REPLICATION AREAS. REFER TO SPECIAL PROVISIONS.

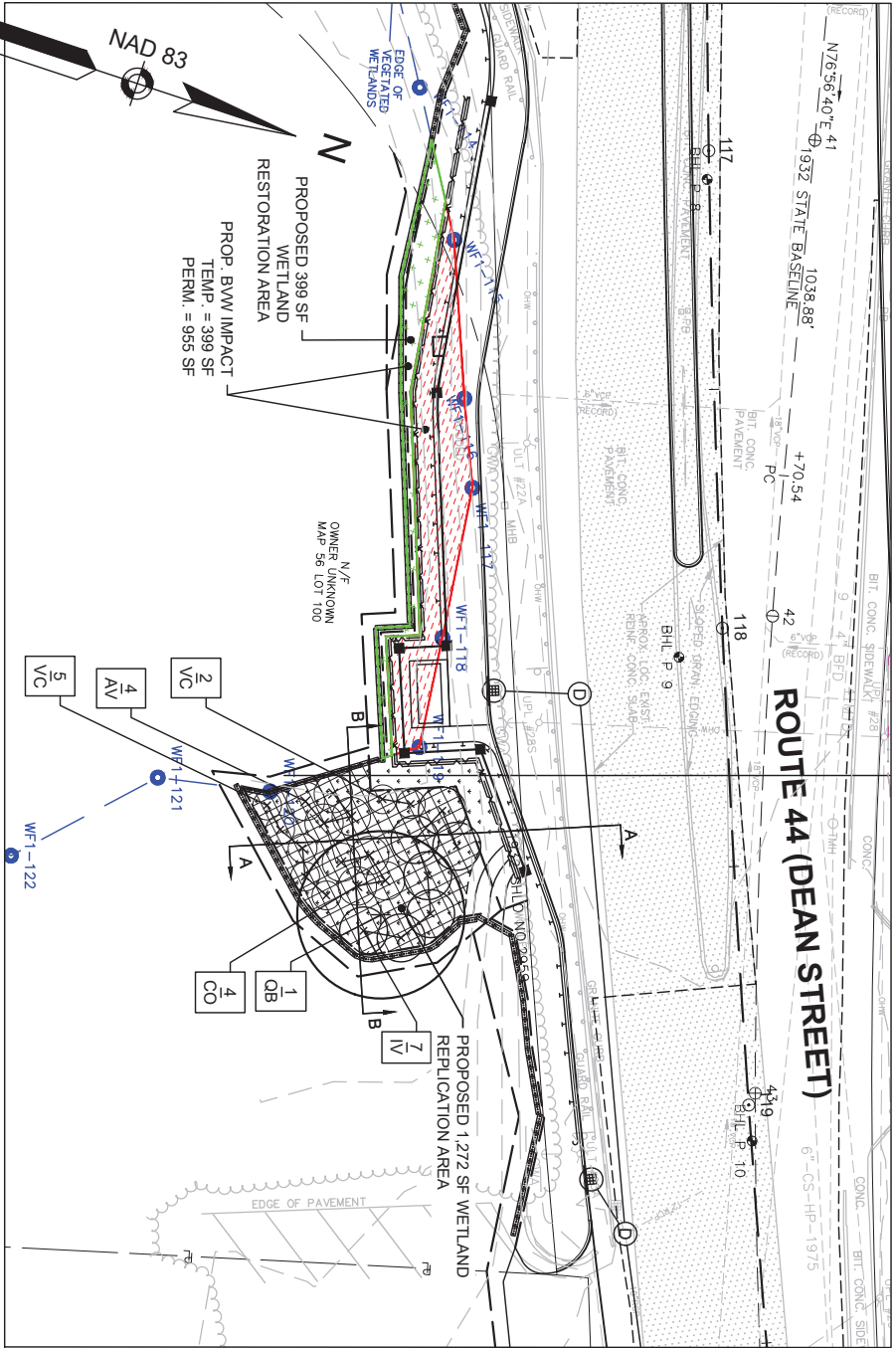
\* INCIDENTAL TO WETLAND RESTORATION & MITIGATION AREAS



VINE PLANTING

NOT TO SCALE





WETLAND REPLICATION & RESTORATION PLAN

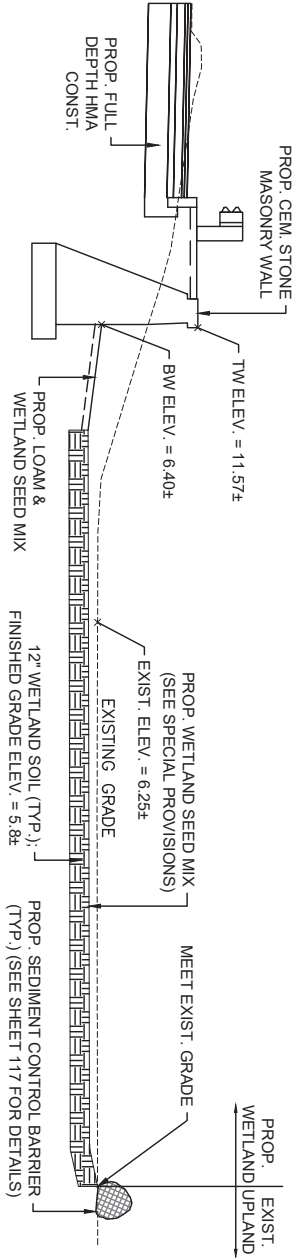
SCALE: 1" = 20'-0"

*WETLAND REPLICATION PLANT SCHEDULE				
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
4	CO	CEPHALANTHUS OCCIDENTALIS	COMMON BUTTONBUSH	3-4' HT.
6	IV	ILEX VERTICILLATA	COMMON WINTERBERRY (FEMALE)	3-4' HT.
1	IV	ILEX VERTICILLATA	COMMON WINTERBERRY (MALE)	3-4' HT.
4	AV	AZALEA VISCOSUM	SWAMP AZALEA	2-3' HT.
1	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	1"-1.5" CAL.
7	VC	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	2-3' HT.

\*WETLAND PLANTS ARE INCIDENTAL TO INLAND WETLAND REPLICATION AREAS

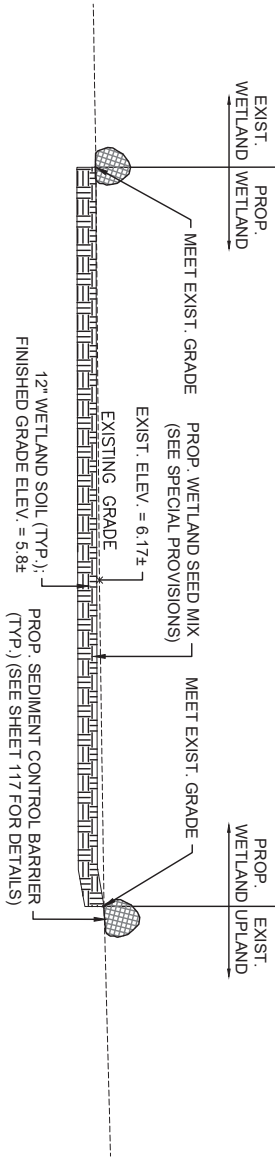
WETLAND REPLICATION & RESTORATION NOTES

- PRIOR TO ENGAGING IN CONSTRUCTION ACTIVITIES RELATED TO THE REPLACEMENT WETLAND, THE CONTRACTOR SHALL BE REQUIRED TO MEET WITH THE WETLAND SPECIALIST TO REVIEW ANY SPECIAL CONSTRUCTION AND EROSION CONTROL REQUIREMENTS.
- CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED SUCH THAT EXCAVATED WETLAND SOIL SHALL BE RELOCATED AS QUICKLY AS POSSIBLE.
- TO MINIMIZE COMPACTION OF THE INSTALLED HYDRIC SOILS, THE CONTRACTOR SHALL USE SMALL CONSTRUCTION EQUIPMENT (LESS THAN 9000 LBS OPERATING WEIGHT) AND HAND METHODS AS APPROVED BY THE WETLAND SPECIALIST AND AS DIRECTED BY THE ENGINEER WHEN GRADING AND PLANTING THE PROPOSED WETLAND REPLICATION AREA.
- SOME TREES CUT FOR WETLAND REPLICATION SHALL BE RE-USED ON SITE FOR RESTORATION PURPOSES. CUT TREES SHALL BE RE-LAND WITHIN THE WETLAND / DISTURBED AREA PER THE DIRECTION OF THE WETLAND SPECIALIST.
- WETLAND SPECIALIST SHALL LOCATE PLANTS IN WETLAND REPLICATION AND RESTORATION AREAS AS APPROPRIATE TO BEST PROTECT AND RESTORE DISTURBED AREA. COMPOST TOPSOIL SHALL BE USED IN LIEU OF MULCH AROUND PLANTS.
- APPLY WETLAND SEED MIX TO WETLAND REPLICATION AREA AS WELL AS WETLAND RESTORATION AREAS AS PER THE SPECIAL PROVISIONS.
- COMPOST FILTER TUBES SHALL BE 100% BIODEGRADABLE AND LEFT IN PLACE AT THE CONCLUSION OF WETLAND REPLICATION CONSTRUCTION. ANY NON-BIODEGRADABLE MATERIAL, IF USED, SHALL BE REMOVED AND DISPOSED OF OFF SITE AT CONTRACTOR'S EXPENSE. FILTER TUBE COMPOST SHALL BE SPREAD / RAKED AROUND TO ELIMINATE BERM.



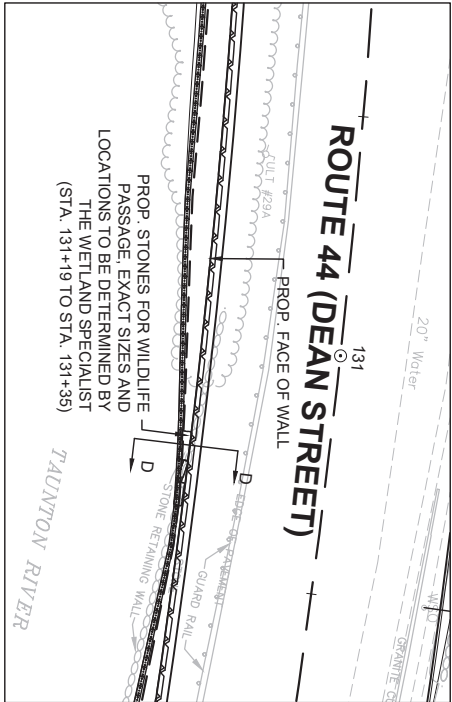
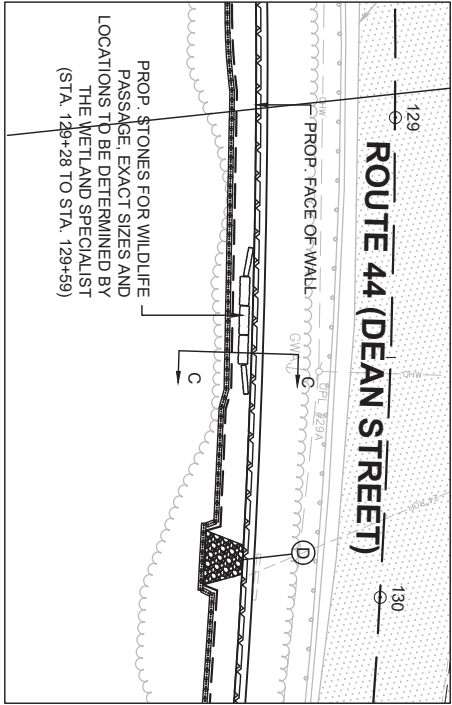
SECTION A-A

SCALE: 1" = 5'-0"



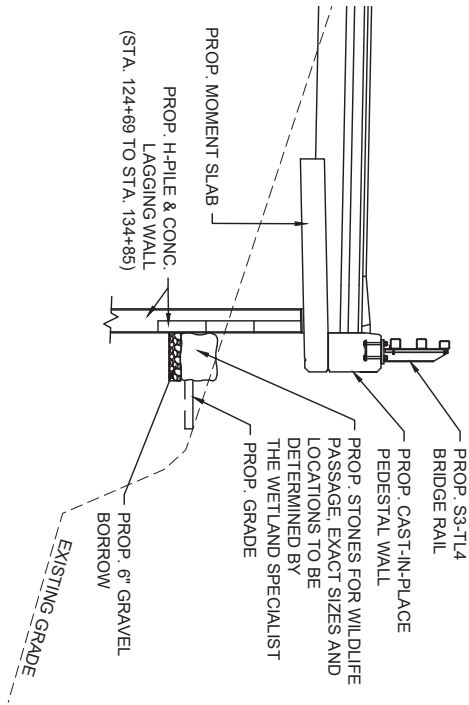
SECTION B-B

SCALE: 1" = 5'-0"



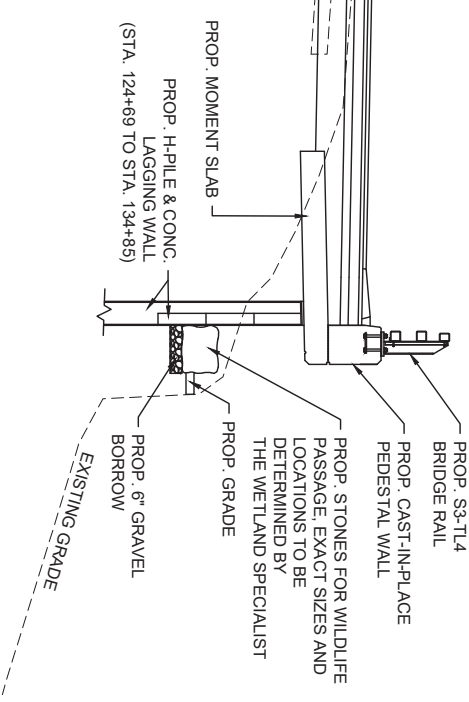
STONES FOR WILDLIFE PASSAGE - PLAN VIEW

SCALE: 1" = 20'-0"



SECTION C-C

SCALE: 1" = 5'-0"



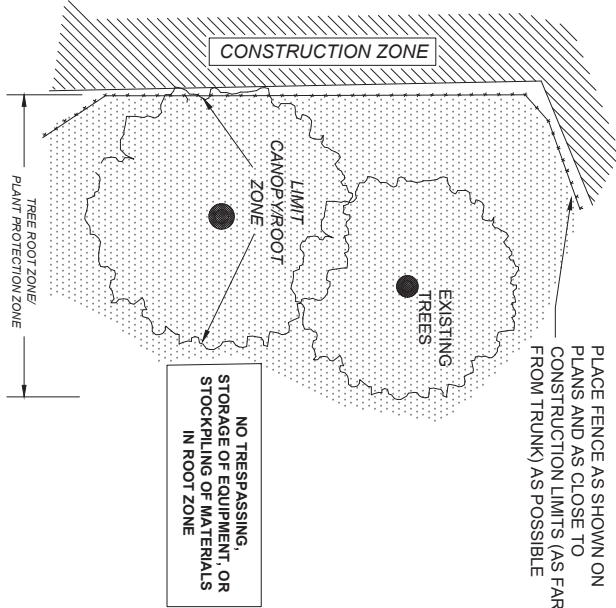
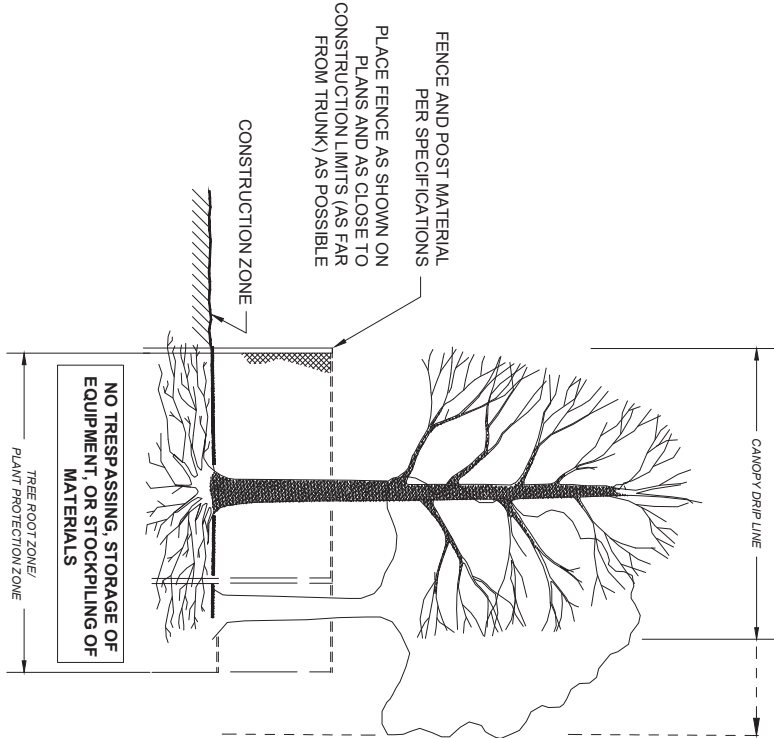
SECTION D-D

SCALE: 1" = 5'-0"

TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	38	52
PROJECT FILE NO.		606024	

WETLAND REPLICATION PLAN AND DETAIL

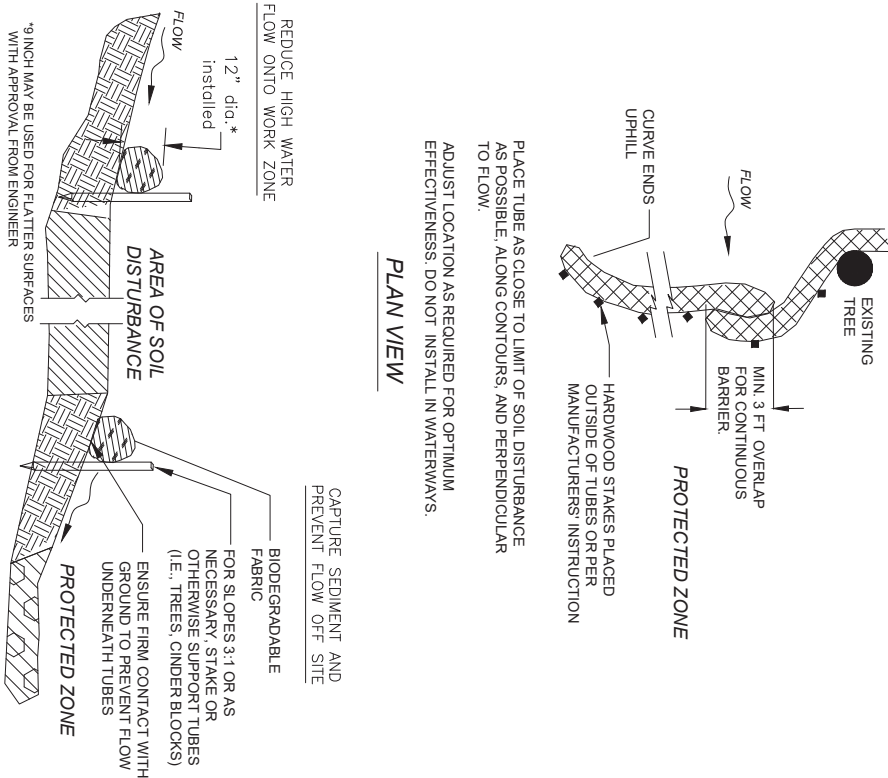




SECTION - FENCE PROTECTION OF ROOT ZONE

TREE PROTECTION - ROOT ZONE

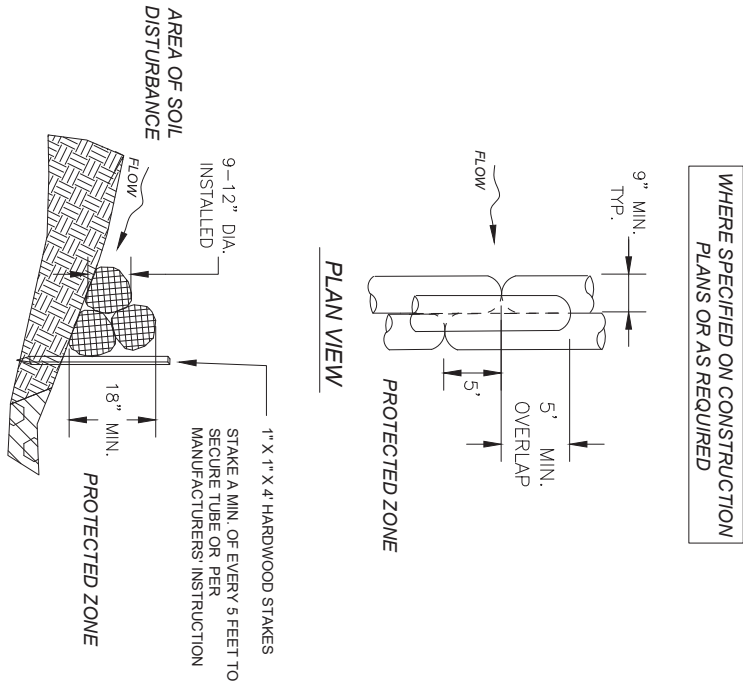
NOT TO SCALE



SECTION

SEDIMENT BARRIER - COMPOST FILTER TUBE

NOT TO SCALE



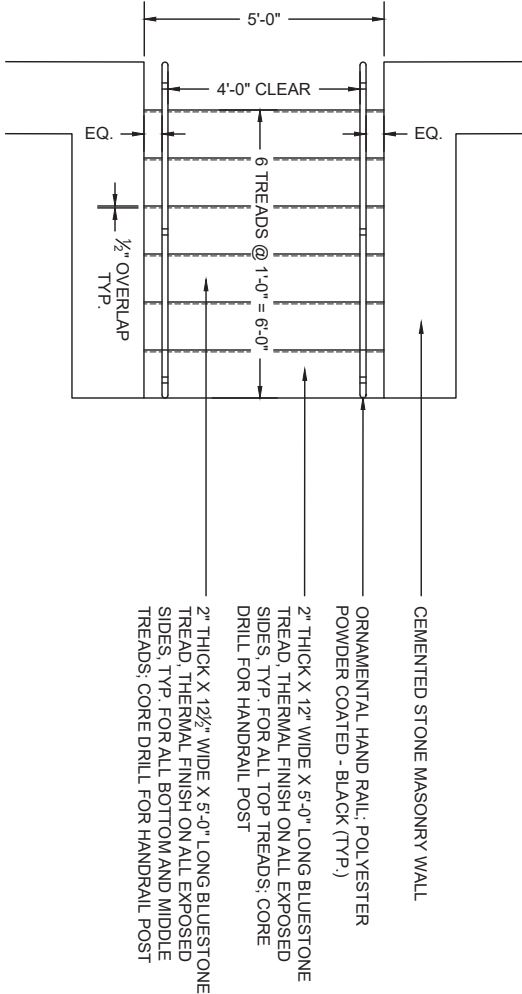
PLAN VIEW

SECTION

COMPOST FILTER TUBES STACKED

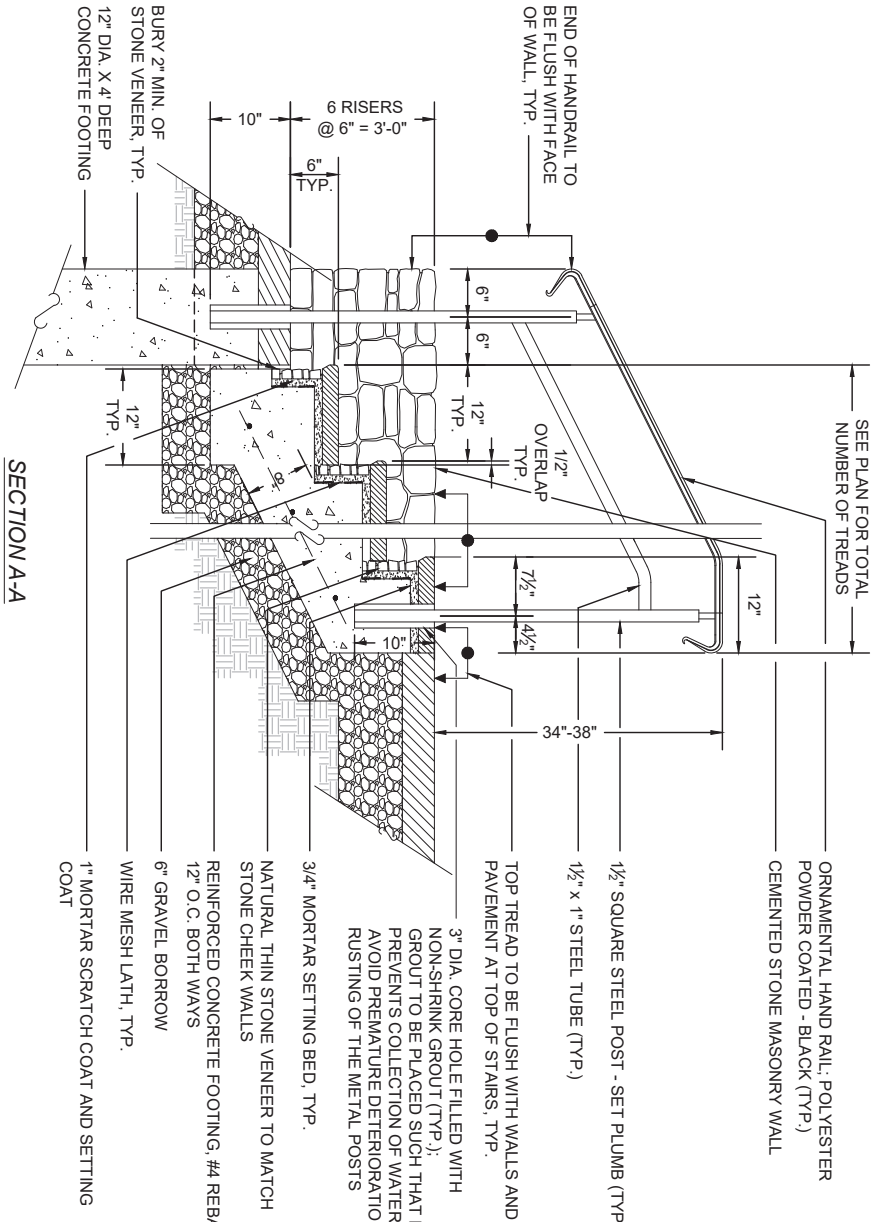
NOT TO SCALE

PLAN



TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	52
PROJECT FILE NO. 606024			

CONSTRUCTION DETAILS

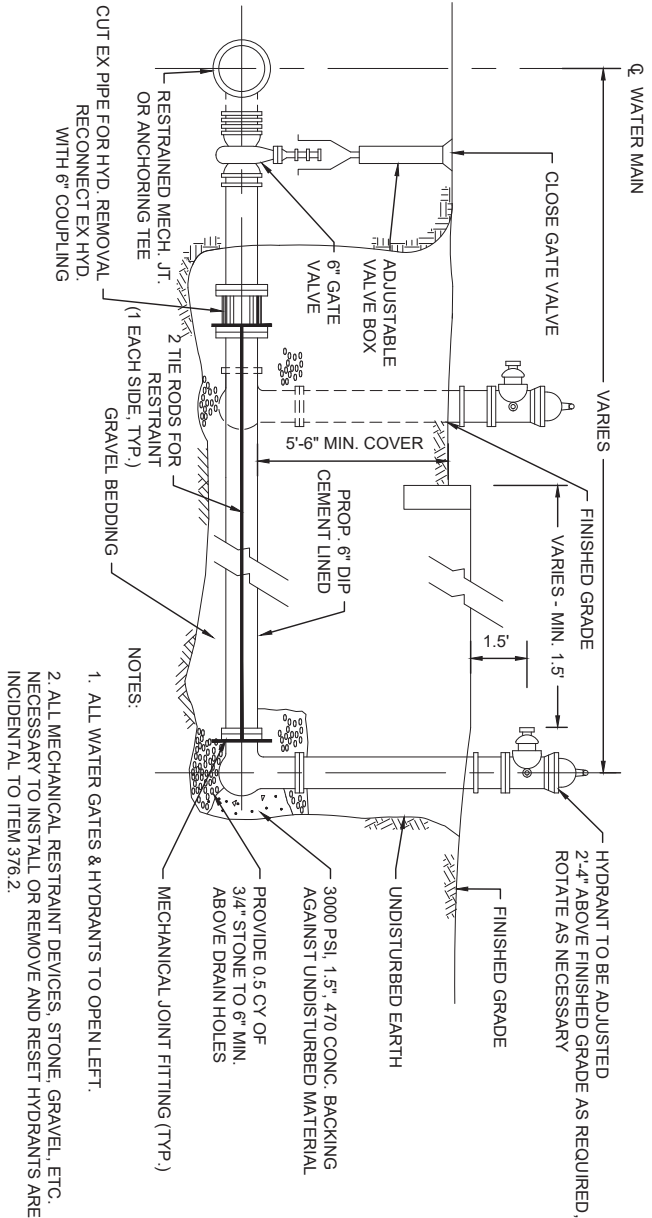


SECTION A-A

BLUESTONE STEPS WITH ORNAMENTAL HAND RAILS

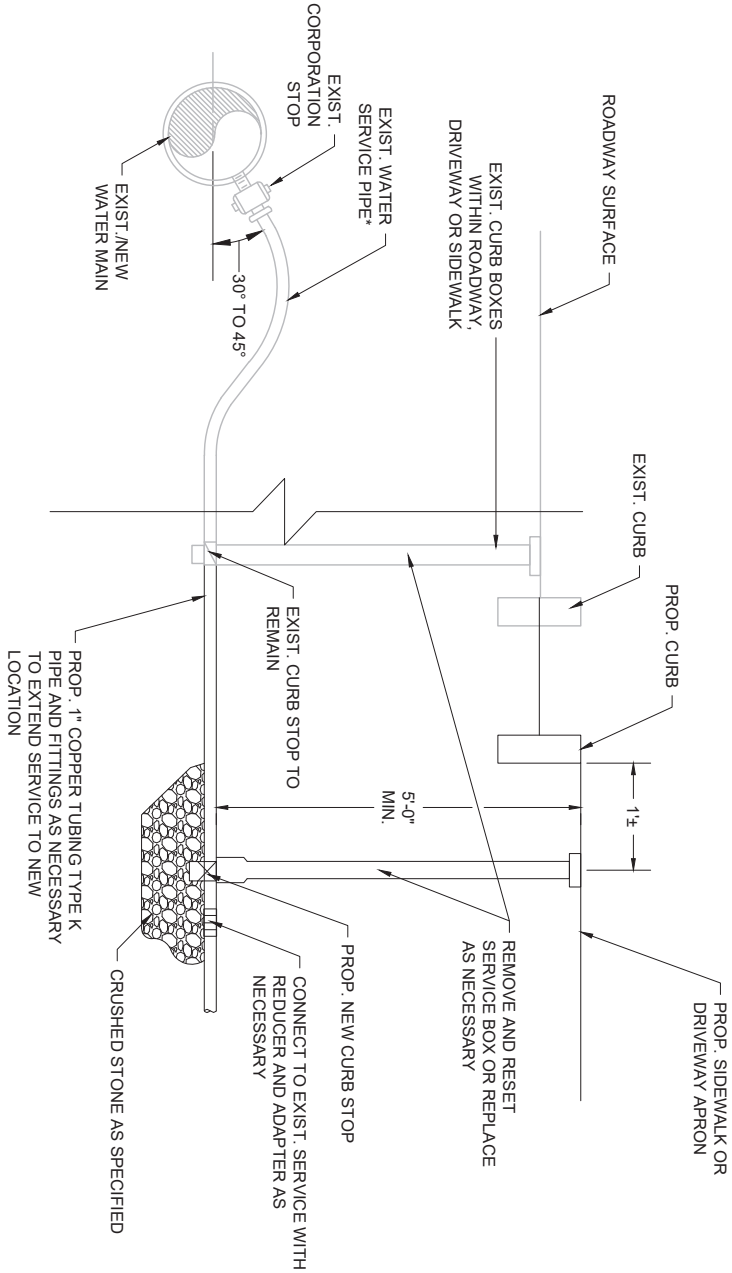
NOT TO SCALE





## HYDRANT REMOVED AND RESET

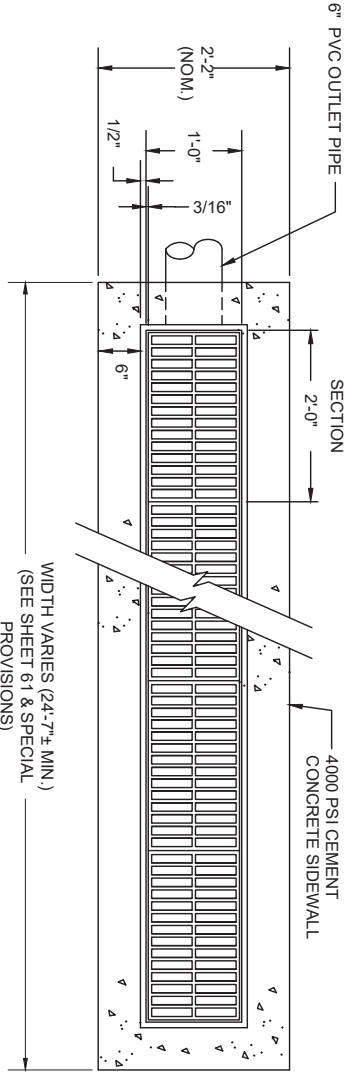
NOT TO SCALE



\* IF EXISTING WATER SERVICE LINE IS NOT COPPER, CONTRACTOR SHALL INFORM TAUNTON WATER DEPARTMENT. NO CONNECTION SHALL BE MADE UNTIL THE TAUNTON WATER DEPARTMENT DETERMINES IF THE EXISTING LINE IS SUITABLE TO BE EXTENDED OR MUST BE REPLACED TO THE MAIN.

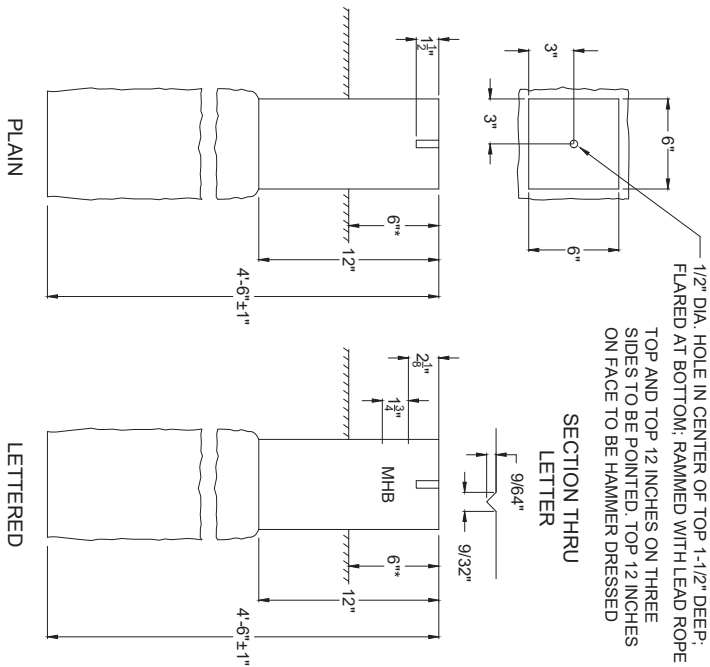
## CURB STOP RELOCATION DETAIL

NOT TO SCALE



## TRENCH DRAIN

NOT TO SCALE



### NOTES:

- FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHODS, SEE STANDARD SPECIFICATIONS.
  - ALL BOUNDS UTILIZED TO MARK THE STATE HIGHWAY LAYOUT SHALL BE SET AT THE DIRECTION OF THE DISTRICT SURVEY ENGINEER, PRIOR TO COMMENCING THE WORK. THE CONTRACTOR SHALL NOTIFY THE DISTRICT SURVEY ENGINEER TO SCHEDULE THE WORK.
- \* BOUNDS TO BE LOCATED IN LAWNS SHALL BE SET WITH TOP OF BOUND 2" BELOW GROUND LINE. BOUNDS LOCATED IN SIDEWALKS OR DRIVES SHALL BE SET WITH TOP OF BOUND FLUSH WITH THE SURFACE.

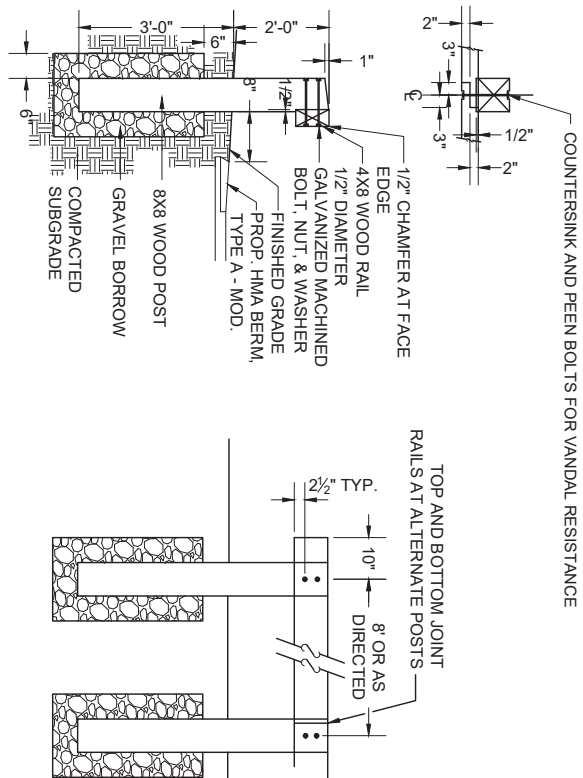
## GRANITE BOUNDS

NOT TO SCALE

TAUNTON ROUTE 44 (DEAN STREET)				
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	-	40	52	
PROJECT FILE NO.		606024		

CONSTRUCTION DETAILS



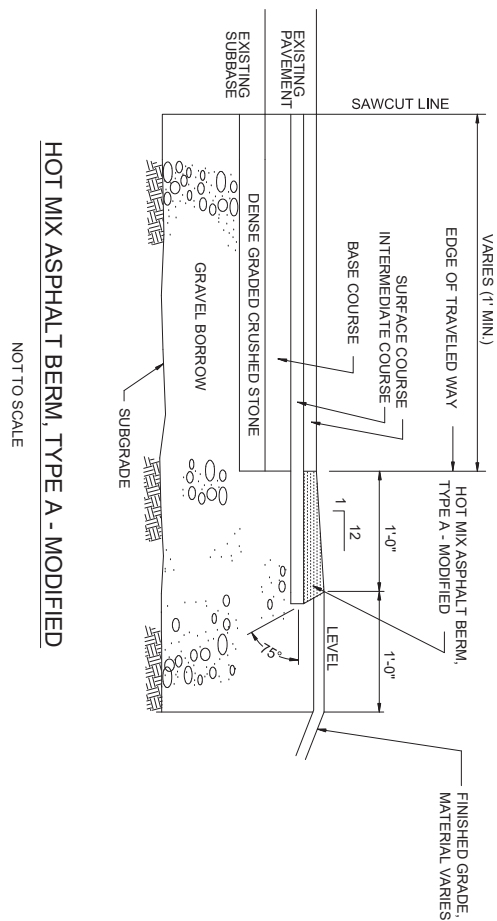


## SECTION

## FRONT ELEVATION

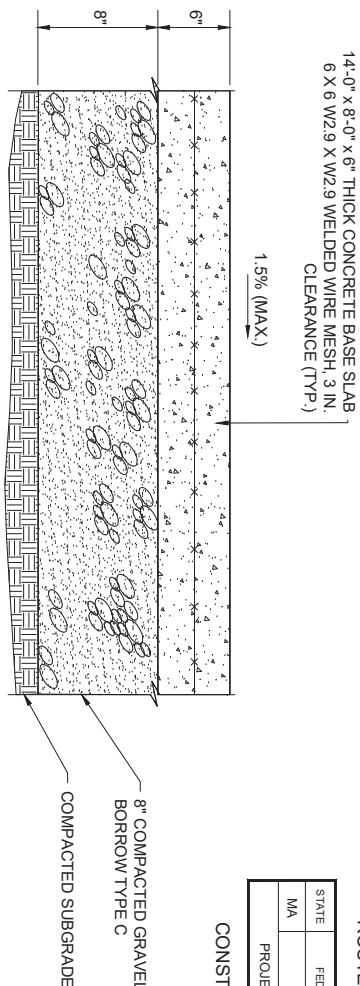
PROP. TIMBER GUARDRAIL

N.T.S.



**HOT MIX ASPHALT BERM, TYPE A - MODIFIED**

NOT TO SCALE

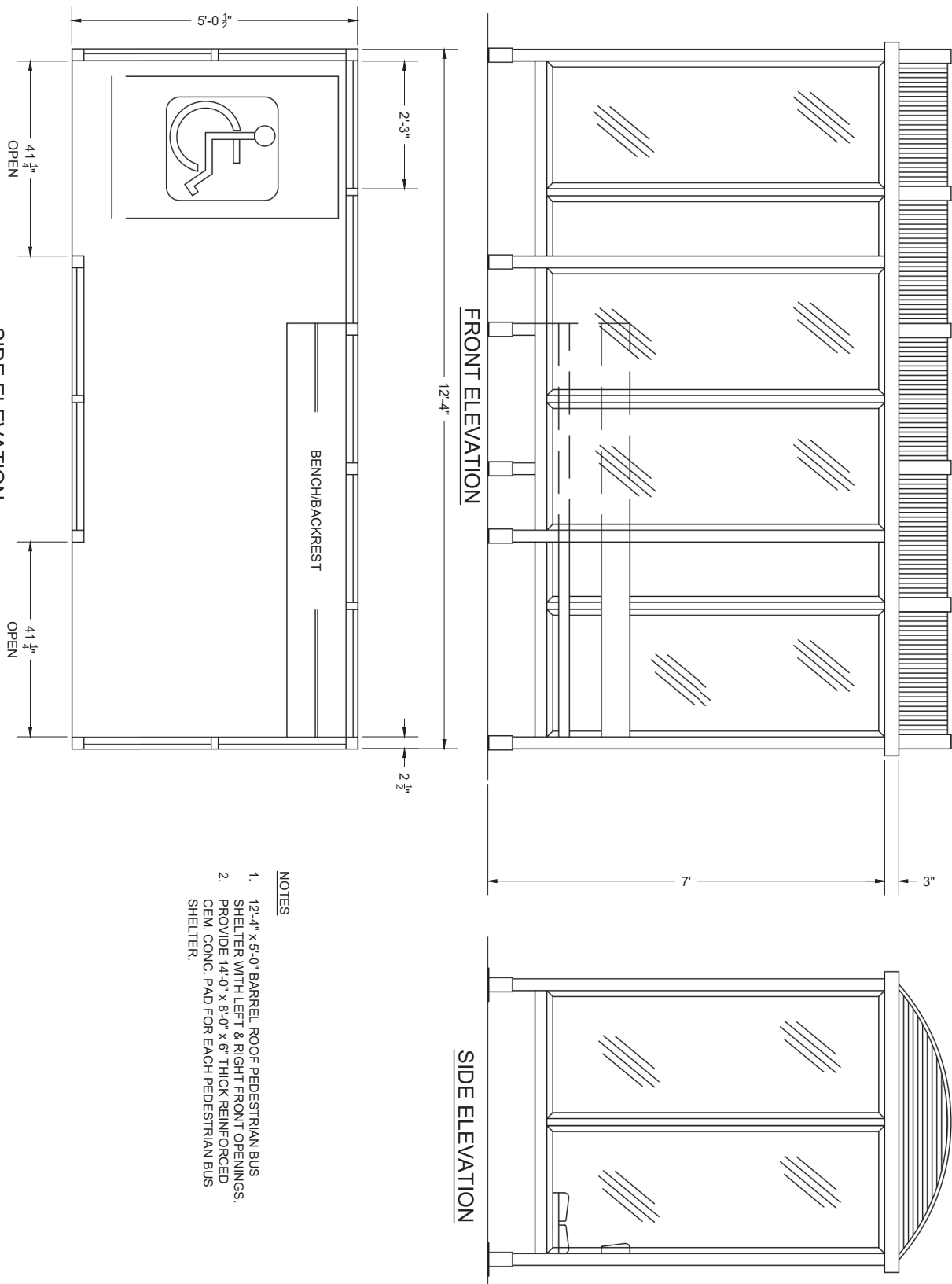


**CEMENT CONCRETE PAD**

NOT TO SCALE

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	52
PROJECT FILE NO.		608024	

## CONSTRUCTION DETAILS



FRONT ELEVATION

## SIDE ELEVATION

1. 12'-4" x 5'-0" BARREL ROOF PEDESTRIAN BUS SHELTER WITH LEFT & RIGHT FRONT OPENINGS
2. PROVIDE 14'-0" x 8'-0" x 6" THICK REINFORCED CEM. CONC. PAD FOR EACH PEDESTRIAN BUS SHELTER.

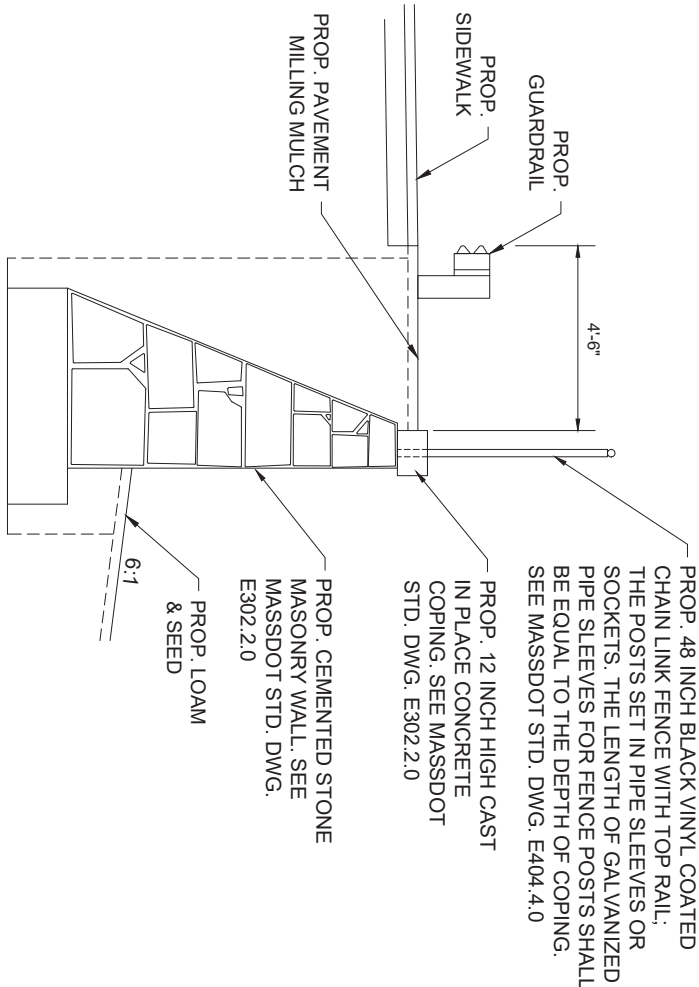
PEDESTRIAN BUS SHELTER (SUPPLIED B.O.)

NOT TO SCALE



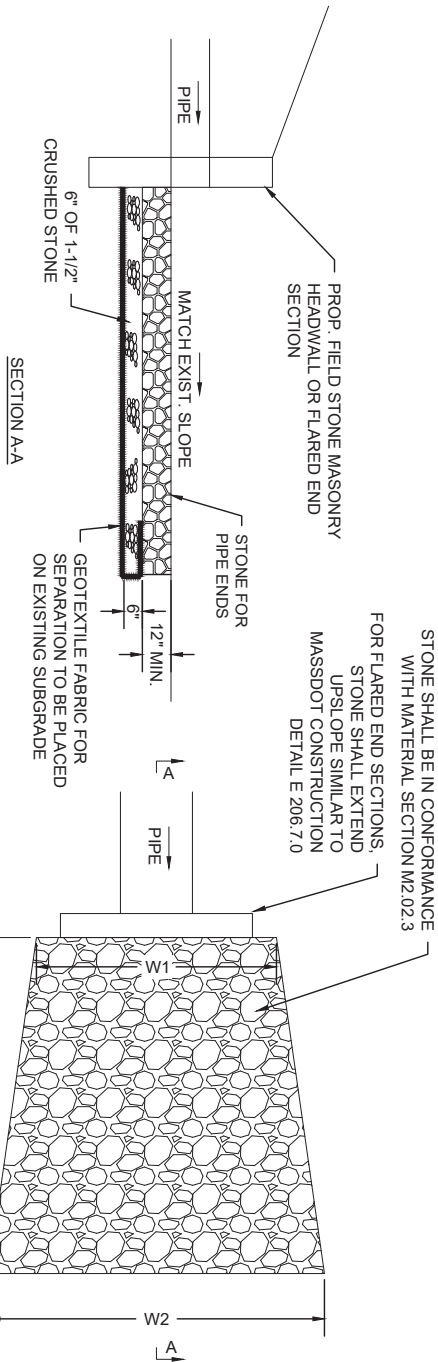
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	122	52
PROJECT FILE NO.		606024	

CONSTRUCTION DETAILS



CHAIN LINK FENCE ATTACHMENT TO  
RETAINING WALL

N.T.S.  
STA. 116+88± RT TO STA. 118+50± RT



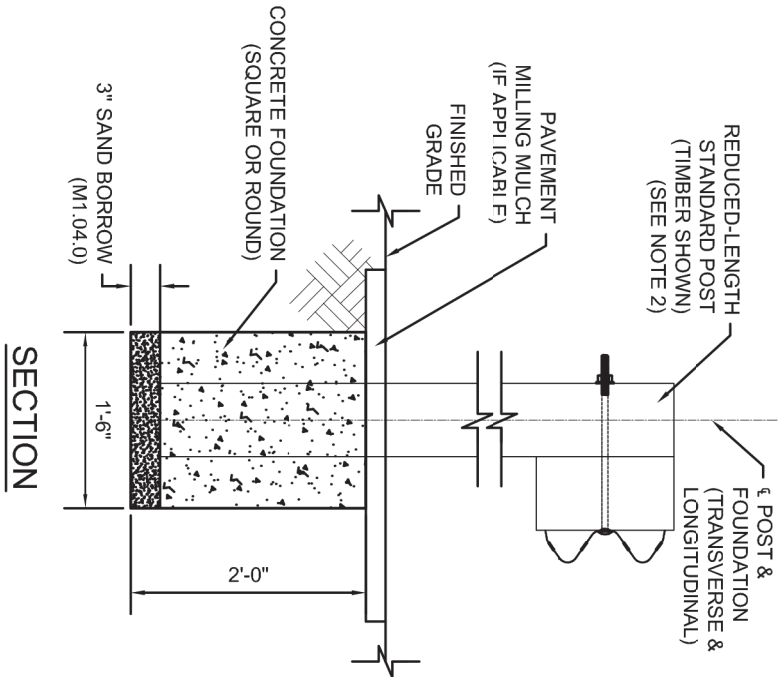
STONE FOR PIPE ENDS

NOT TO SCALE

PLAN VIEW

STONE FOR PIPE ENDS SIZE TABLE			
	OUTFALL		
	L	W1	W2
FES-301	4.00'	3.00'	5.67'
FES-302	4.00'	3.00'	5.67'
FES-304	4.00'	3.00'	5.67'
OUTLET STA. 106+92 RT	4.00'	3.00'	5.67'
FES-306	6.00'	4.50'	8.50'
FES-306	4.00'	3.00'	5.67'
OUTLET STA. 124+98 RT	6.00'	4.50'	8.50'
OUTLET STA. 125+80 RT	4.00'	3.00'	5.67'
OUTLET STA. 129+94 RT	8.00'	6.00'	11.33'

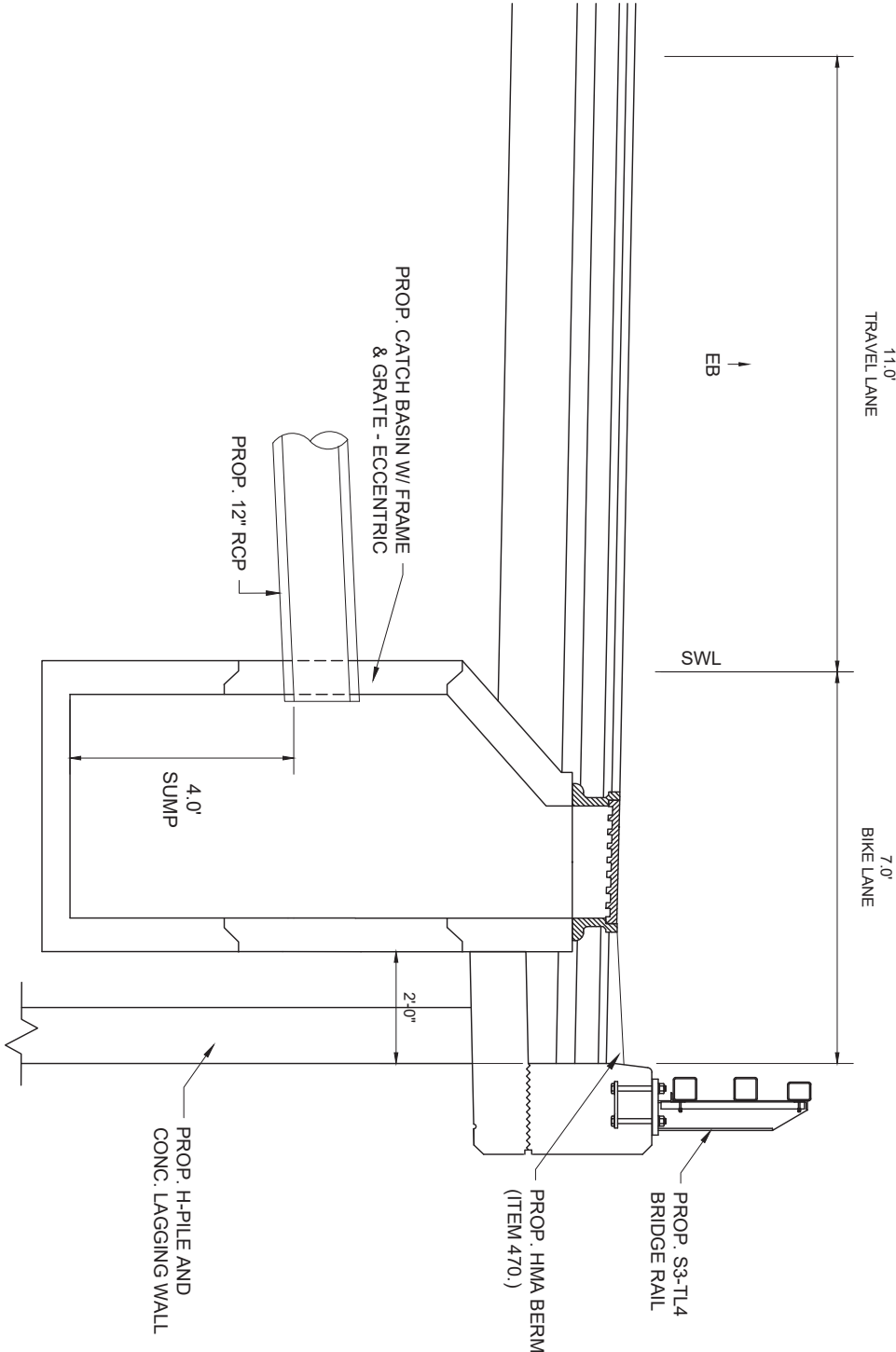
- NOTES:**
1. WHEN THE CONSTRUCTION OF GUARDRAIL AT THE REQUIRED POST SPACING RESULTS IN POST(S) CONFLICTING WITH UNDERGROUND UTILITIES OR OTHER UNDERGROUND OBSTRUCTIONS, AN ENCASED POST MAY BE USED WHERE A 2'-0" DEPTH WILL AVOID THE CONFLICT. INSTALL WHERE SHOWN IN THE PLANS AND/OR AS-NEEDED.
  2. USE A STANDARD POST WITH REDUCED LENGTH SUCH THAT THE PANEL HEIGHT IS MAINTAINED WHILE THE POST BOTTOM TERMINATES AT THE BOTTOM OF THE CONCRETE FOUNDATION AT THE TOP OF THE 3" (MIN) SAND BORROW.
  3. CONCRETE FOUNDATION SHALL BE 3500 PSI, CEMENT CONCRETE (M4.02.00). AFTER CASTING THE CONCRETE, ENSURE THE SURROUNDING SOIL MATERIAL IS COMPLETELY BACKFILLED AND TAMPED TO PROVIDE FULL PASSIVE RESISTANCE.
  4. ENCASED POSTS ARE NOT PERMITTED FOR CONSECUTIVE POSTS UNLESS OTHERWISE SHOWN IN THE PLANS.



ENCASED POST FOR SHALLOW MOUNT

CATCH BASIN AT RETAINING WALL

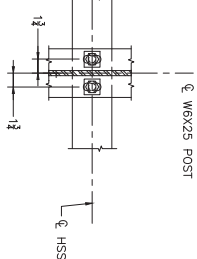
N.T.S.



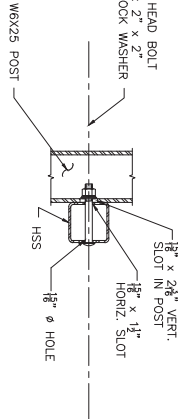


STATE	FED. AID PROJ. NO.	SHEET TOTAL
MA	S/P/H/P/C/M/D-0035(015)X	43 OF 52
PROJECT FILE NO. 606024		

STRUCTURAL DETAILS -  
S3-TL4 BRIDGE  
RAILING DETAILS

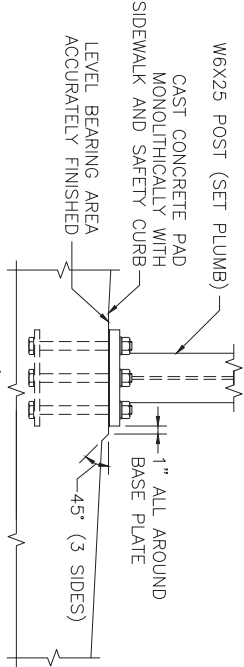


SECTION 5  
SCALE: 1" = 2'-0"



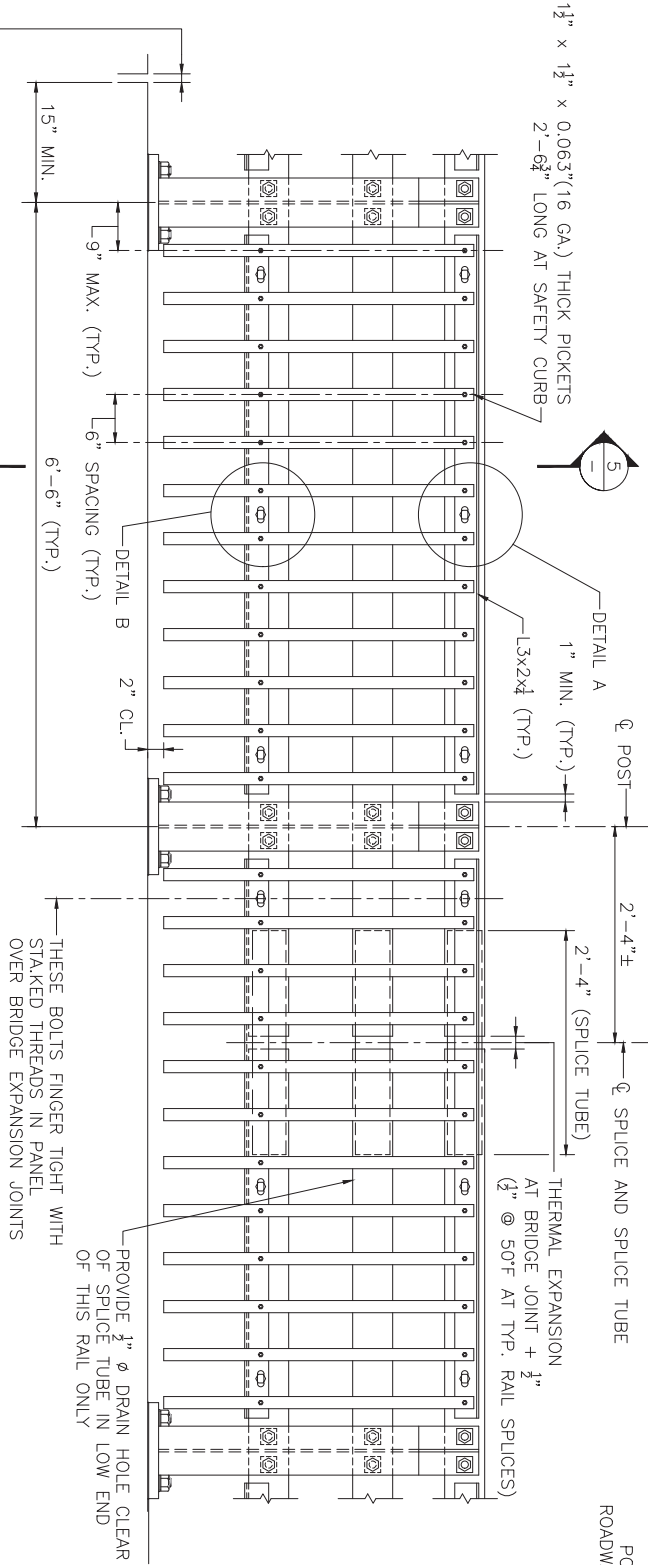
NOTE:  
CONNECTIONS AT LOWER RAILS SHOWN.  
CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS  
SCALE: 1" = 2'-0"

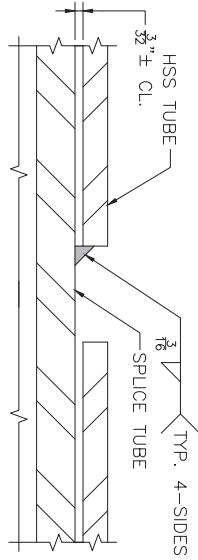


SETTING OF POSTS (PROFILE GRADE OVER 1.5%)  
SCALE: 1" = 2'-0"

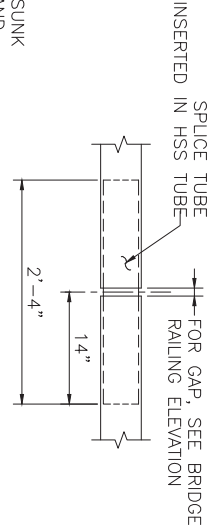
- RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASHTO M 270 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING (HSS) SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 500 WITH A CERTIFIED  $F_y = 50$  KSI MINIMUM. THE MINIMUM HORIZONTAL BENDING RADIUS OF THE HSS TUBING SHALL BE 8 FEET. PICKET CARRIER ANGLES, ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASHTO M 270 GRADE 36. PICKET TUBING SHALL CONFORM TO ASTM A 513 WITH  $F_y = 36$  KSI MIN. OR A 500 GRADE B.
- ALL STEEL (EXCEPT THE  $\frac{5}{8}$ " ANCHOR PLATE AND FASTENERS) SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STD. 595B COLOR NO. 10045). ANCHOR PLATE SHALL BE GALVANIZED ONLY. HEADS OF  $\frac{5}{8}$ "  $\phi$  ROUND HEAD BOLTS SHALL BE PAINTED TO MATCH RAIL.
- ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL  $1/8$  TURN AFTER STEEL IS IN PLACE.
- RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR (4) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN THE PANELS OVER EXPANSION JOINT.
- ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
- ALL POSTS TO BE PLUMB WHEN PROFILE GRADE EXCEEDS 1.5%. FOR PROFILE GRADES LESS THAN 1.5%, POSTS SHALL BE SET PERPENDICULAR TO GRADE.
- POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK-GROUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.
- $\frac{5}{8}$ "  $\phi$  ROUND HEAD BOLTS SHALL CONFORM TO THE CHEMICAL AND PHYSICAL REQUIREMENTS OF ASHTO M 164.



BRIDGE RAILING ELEVATION  
SCALE: 1" = 2'-0"

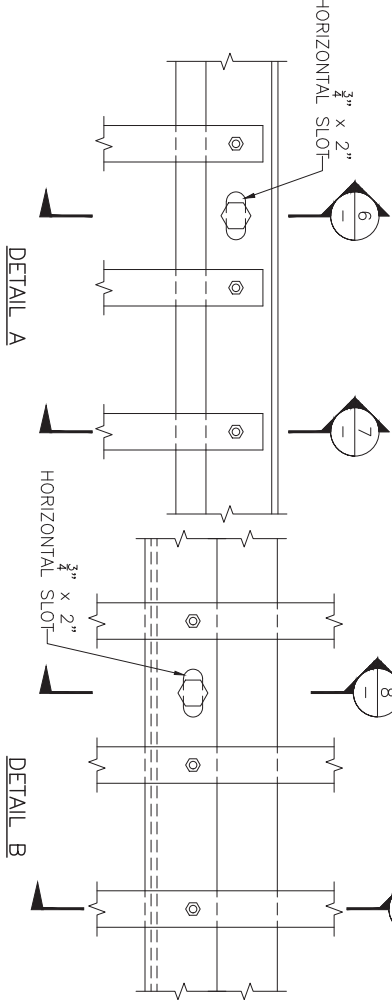
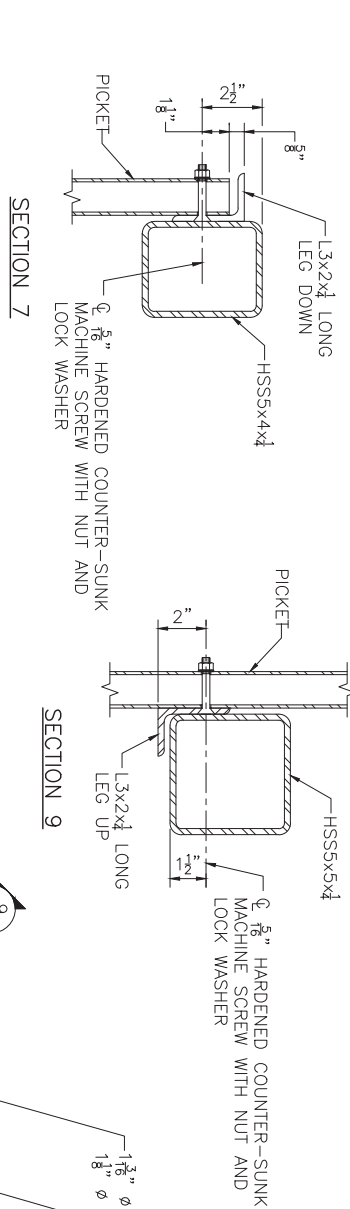


SPLICE DETAIL  
FULL SIZE



TYPICAL SPLICE  
SCALE: 1" = 2'-0"

SPLICE TUBE DETAILS  
SCALE: 3" = 2'-0"



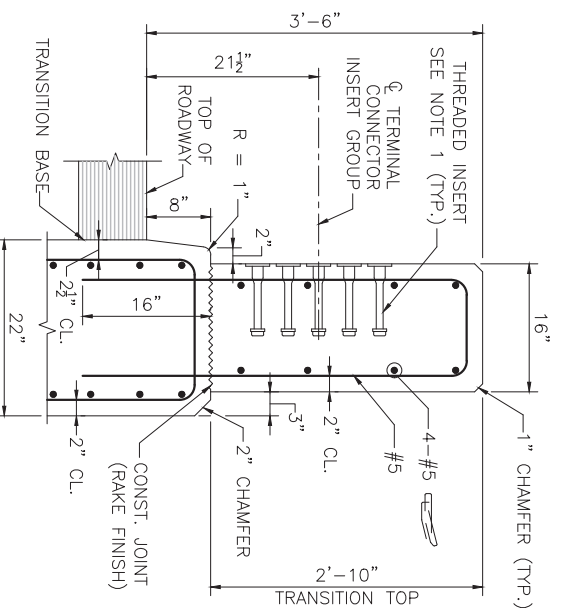
TYPICAL PICKET TO RAIL DETAILS  
SCALE: 3" = 2'-0"

ANCHOR PLATE  
SCALE: 3" = 2'-0"

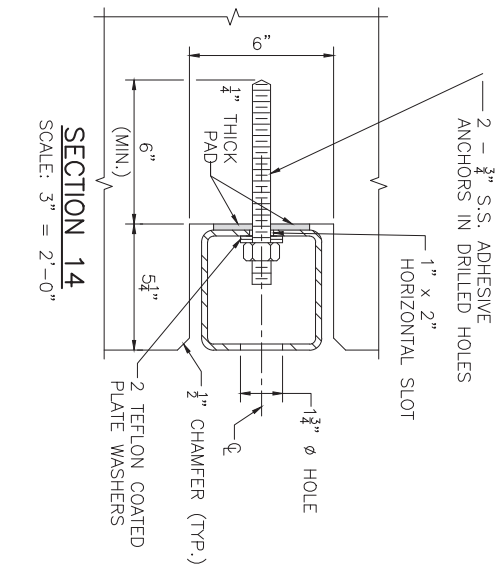
ANCHOR BOLT  
SCALE: 3" = 2'-0"

BASE PLATE  
SCALE: 3" = 2'-0"





SECTION 12  
SCALE: 1" = 2'-0"



SECTION 14  
SCALE: 3" = 2'-0"



SCALE:  $1\frac{1}{2}" = 2'-0"$

- | DATE                           | DESCRIPTION |
|--------------------------------|-------------|
| USE ONLY PRINTS OF LATEST DATE |             |
|                                |             |
|                                |             |
|                                |             |

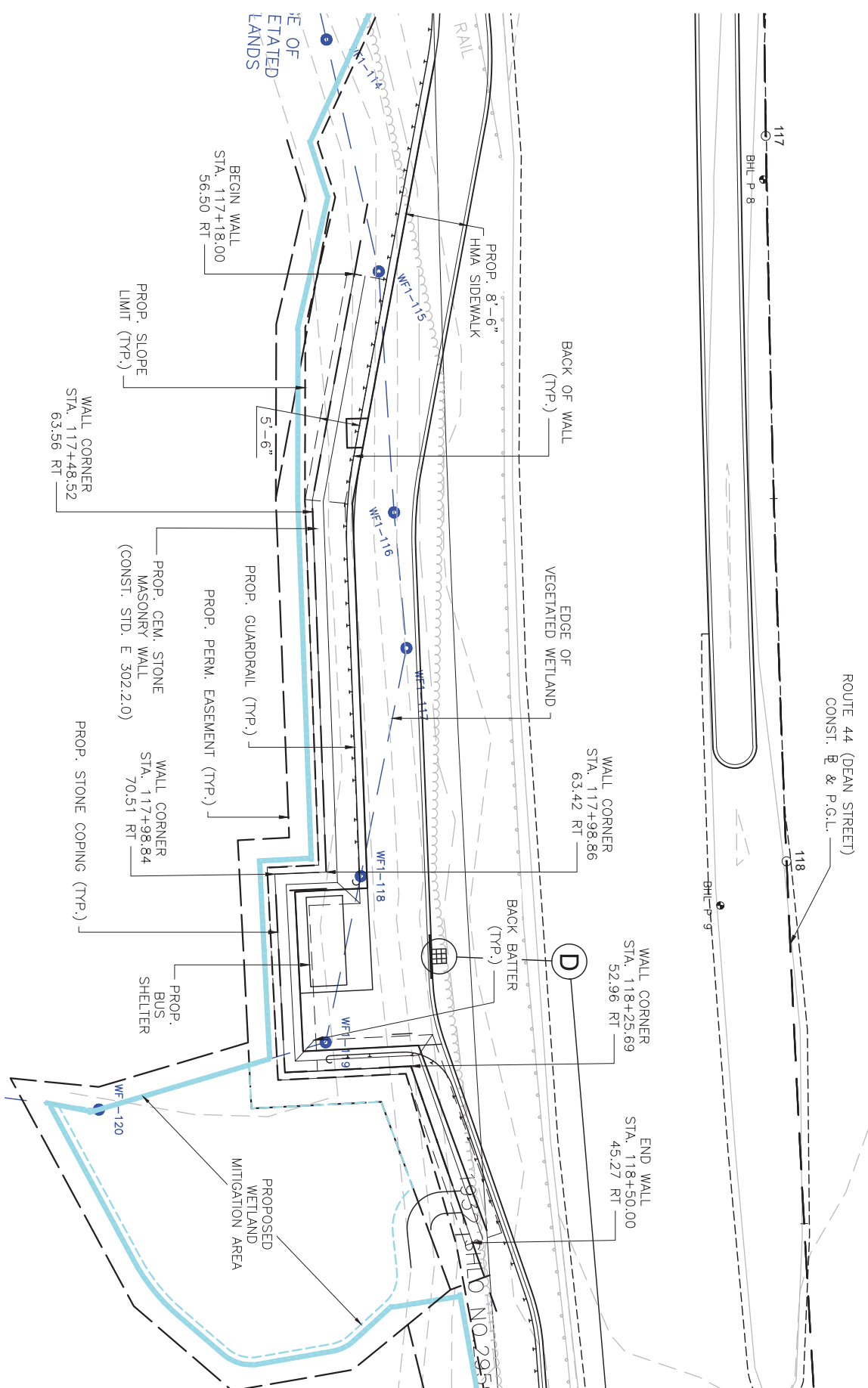
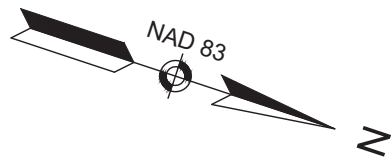






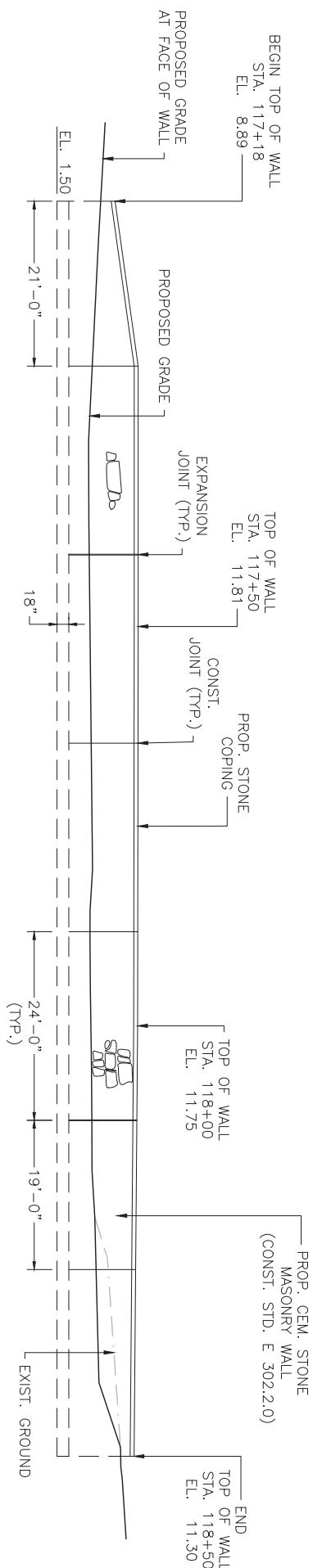






## PLAN

SCALE: 1:20



WALL NOTES:

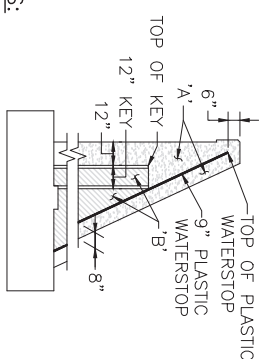
1. 4" Ø WEEP HOLES (JUST ABOVE FOOTING). PROVIDE 1 WEEP HOLE PER WALL, CENTERED ALONG WALL LENGTH, PROVIDE MIN. 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. ALL CONCRETE SHALL BE 4000 PSI, 1 ½ IN. 565 CEMENT CONCRETE.
3. CORNING OVERHANG SHALL BE 2" WHERE WALL IS LESS THAN 10' IN HEIGHT AND 3" WHERE GREATER.

## DEVELOPED ELEVATION

SCALE: 1:20

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	47	52
PROJECT FILE NO.		606024	

## STRUCTURAL DETAILS - RETAINING WALL DETAILS

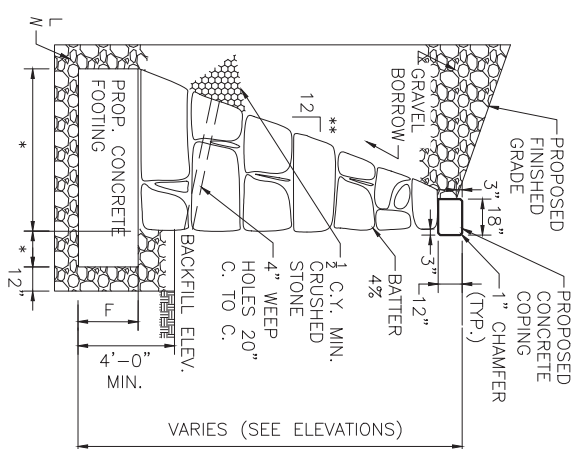


NOTES:

1. LONGITUDINAL REINFORCEMENT SHALL END 2" CLEAR OF EXPANSION JOINT.
2. 'A' - PREFORMED FILLER (IN ACCORDANCE WITH M9.14.0).
- 'B' - PREFORMED FILLER (IN ACCORDANCE WITH M3.05.3 BITUMINOUS JOINT FILLER).
3. FILLER MATERIAL SHALL BE FASTENED SECURELY TO ONE SIDE OF JOINT.

VERTICAL SECTION THRU EXP. JOINT

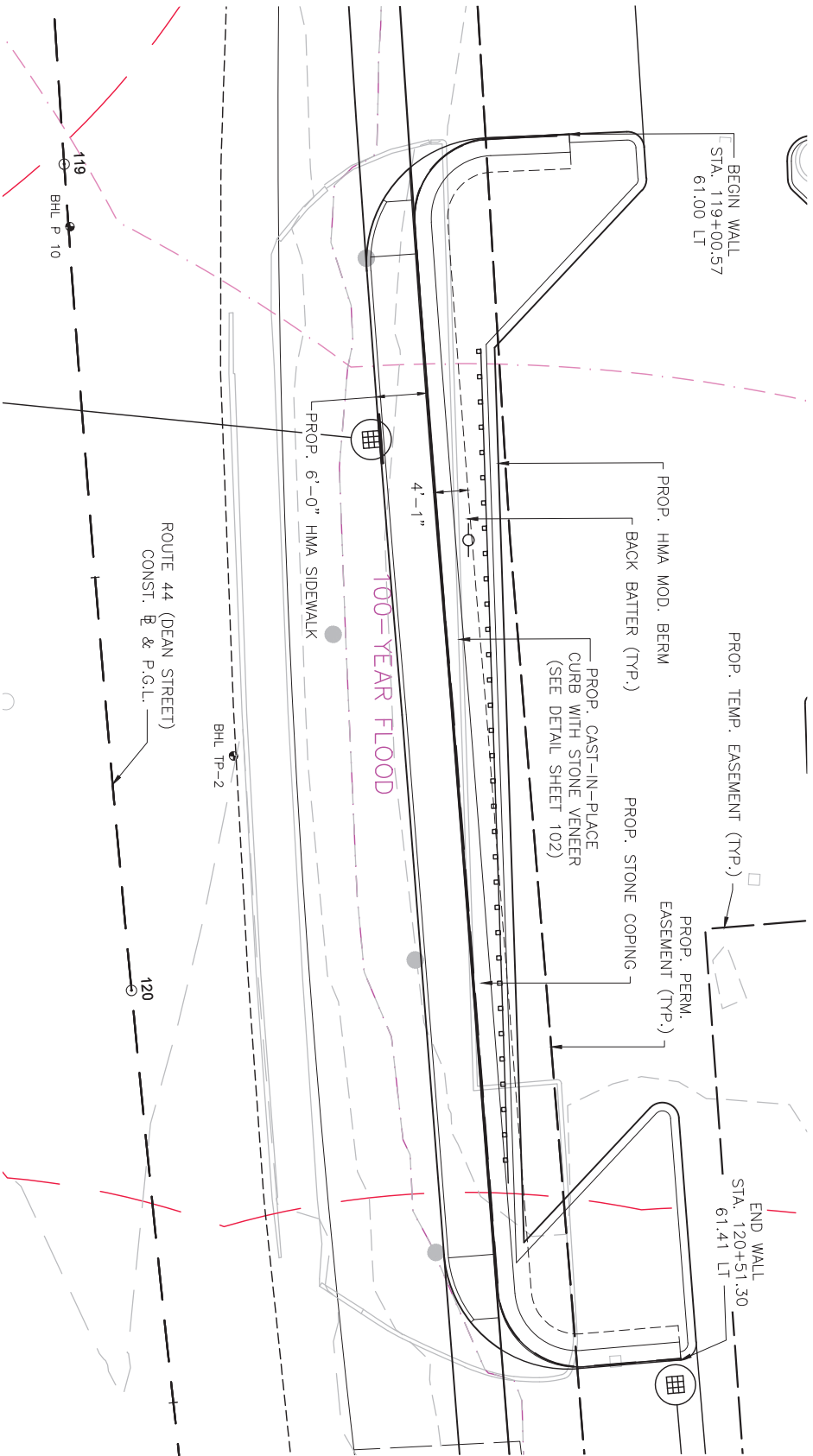
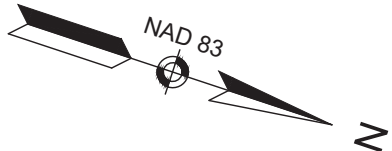
NOT TO SCALE



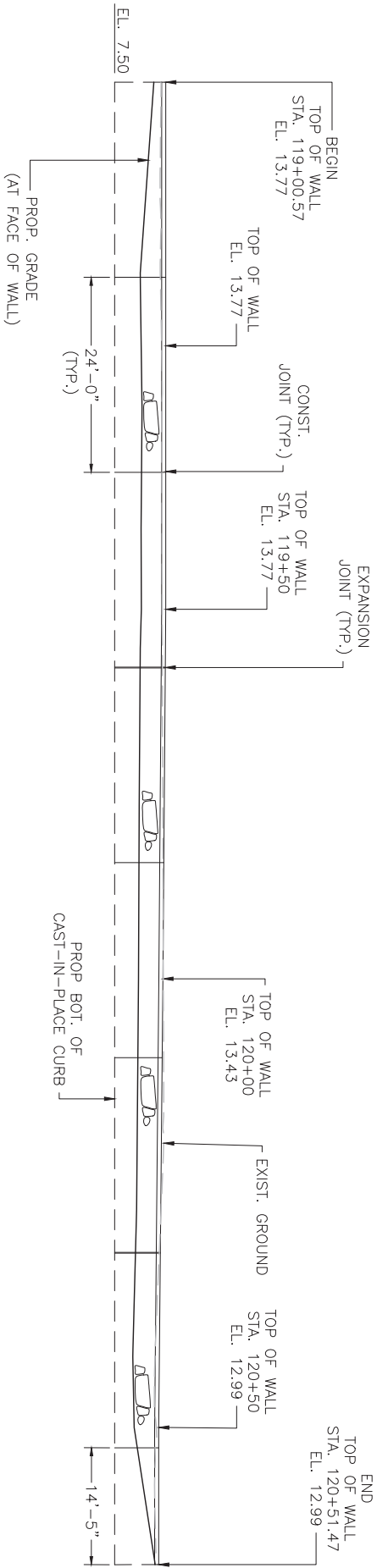
## STONE MASONRY RETAINING SECTION

SCALE:  $\frac{1}{4}" = 2'-0"$





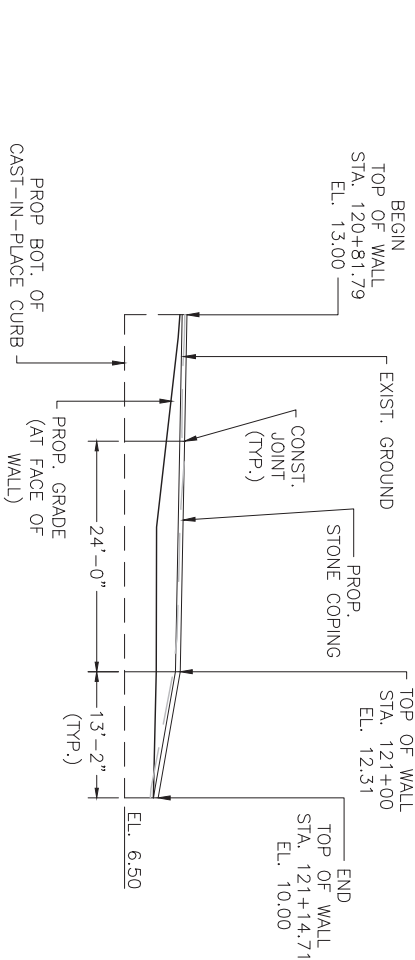
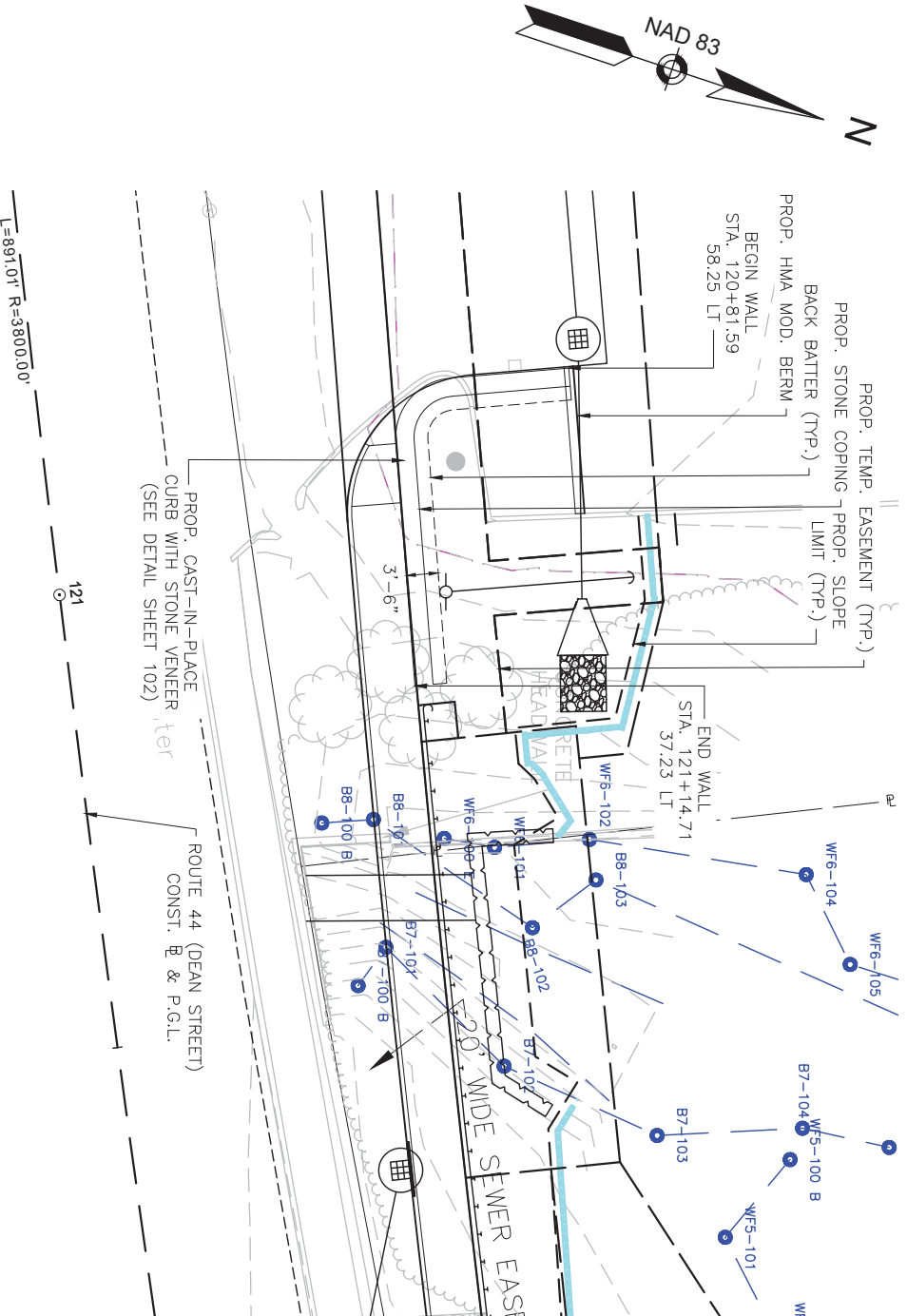
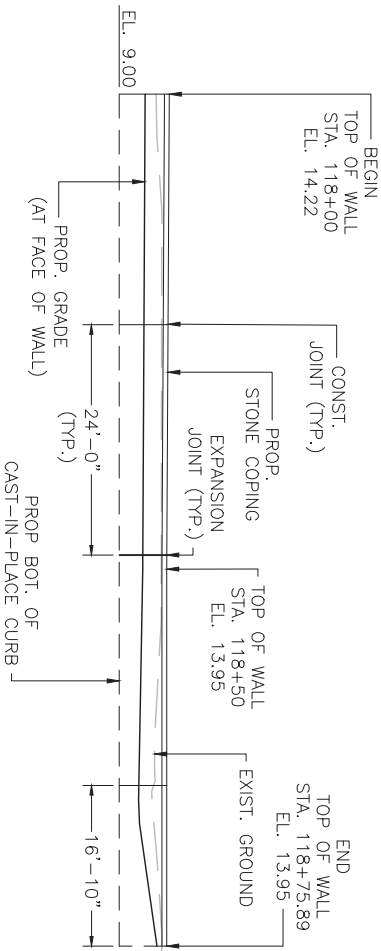
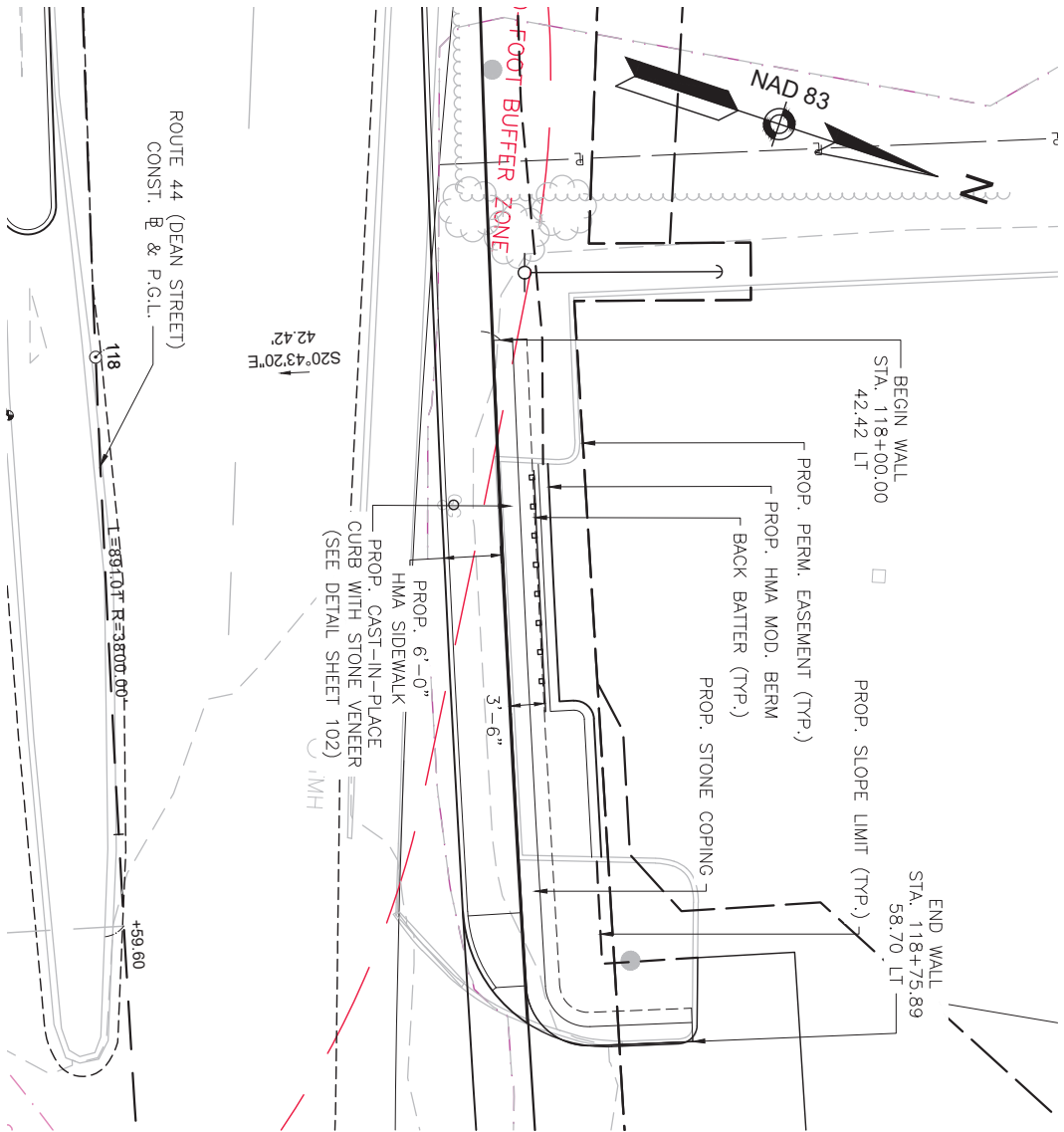
PLAN  
SCALE: 1:20



TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	48	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS

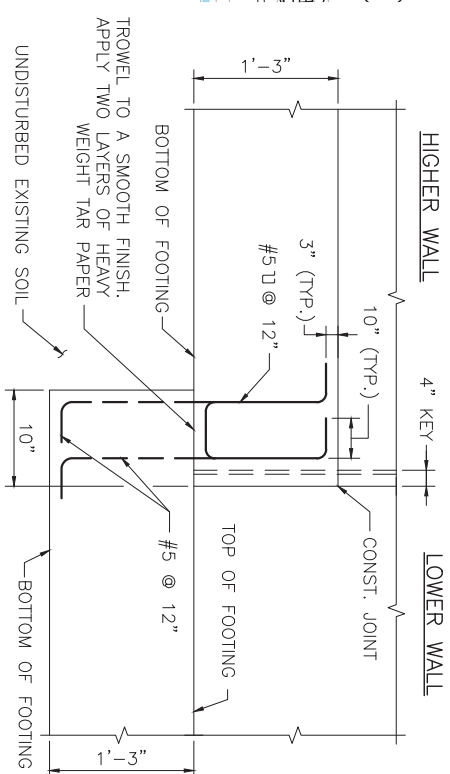
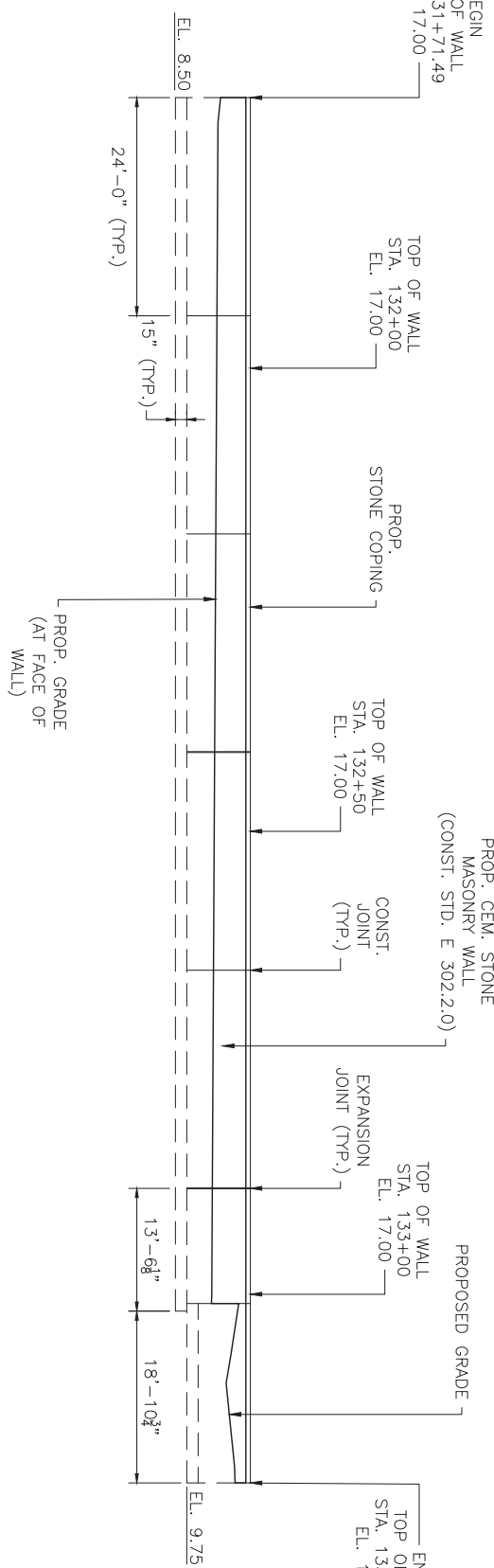
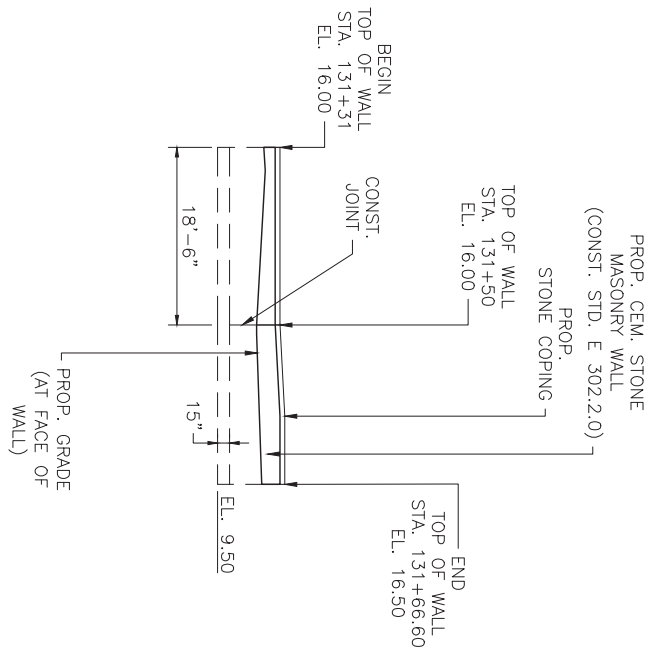
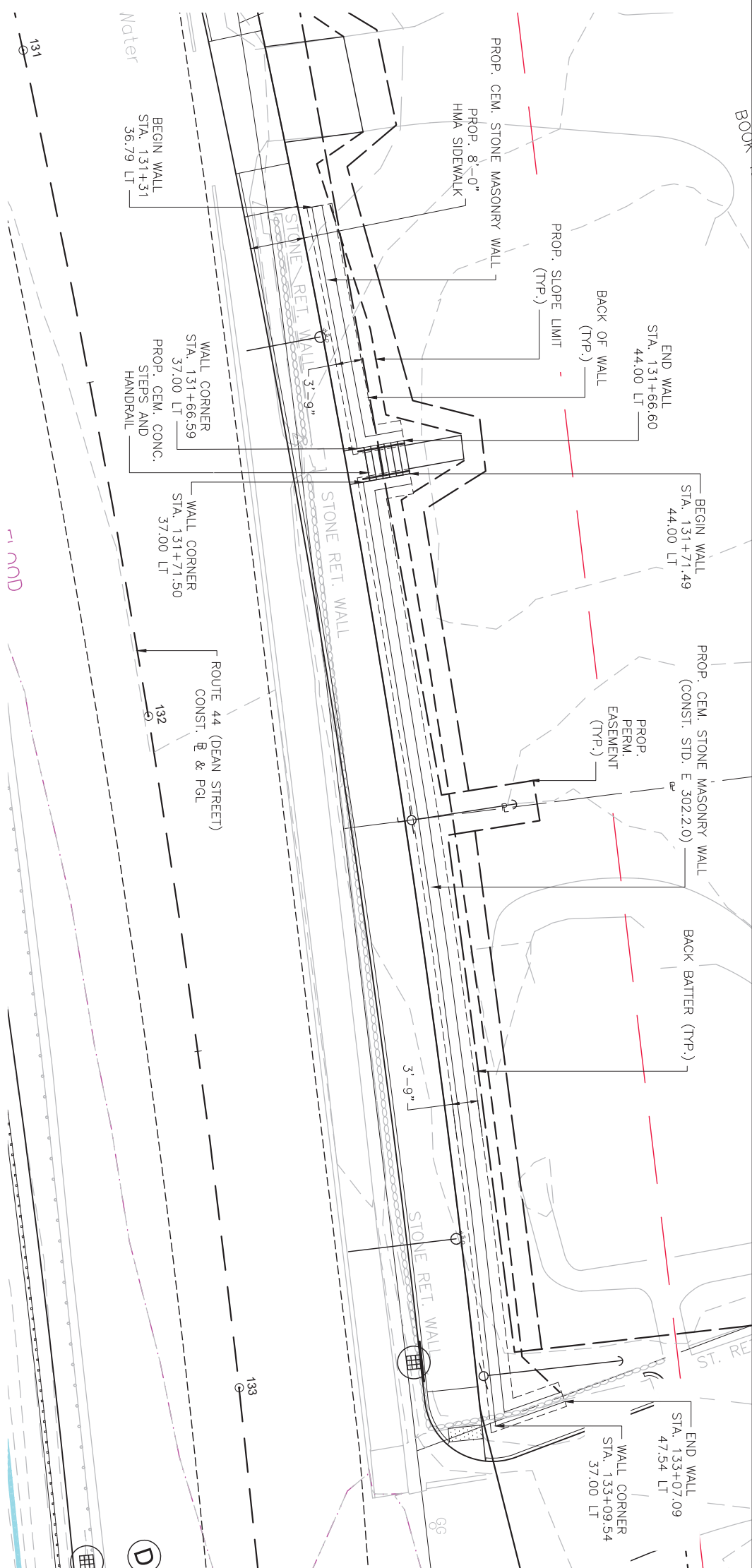




TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	49	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS





### STEPPED-UP FOOTING DETAIL

SCALE:  $\frac{1}{2}''=2'-0''$

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	50	52
PROJECT FILE NO.		606024	

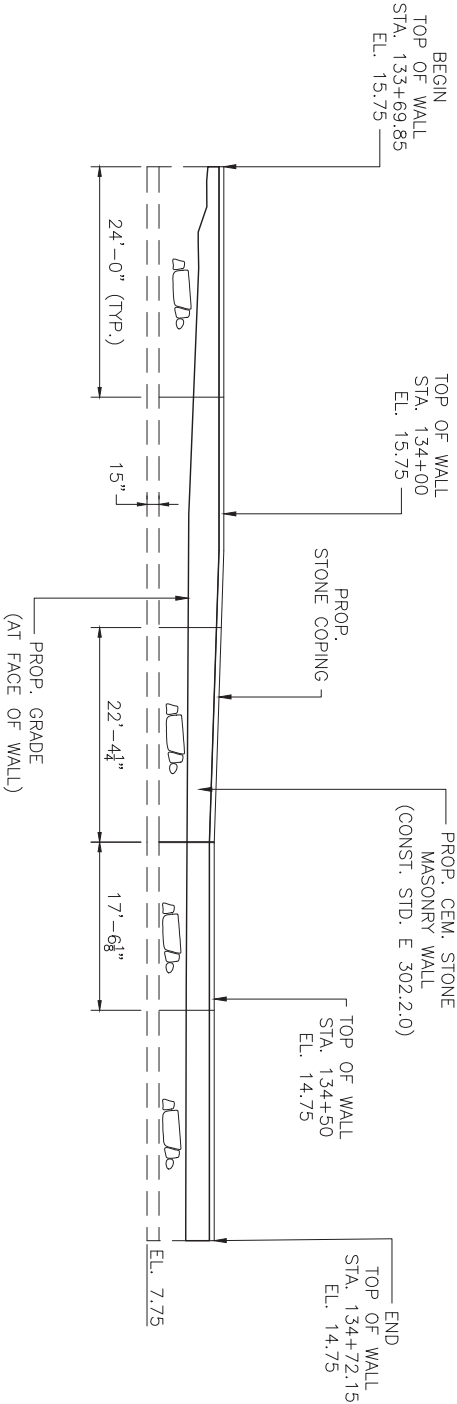
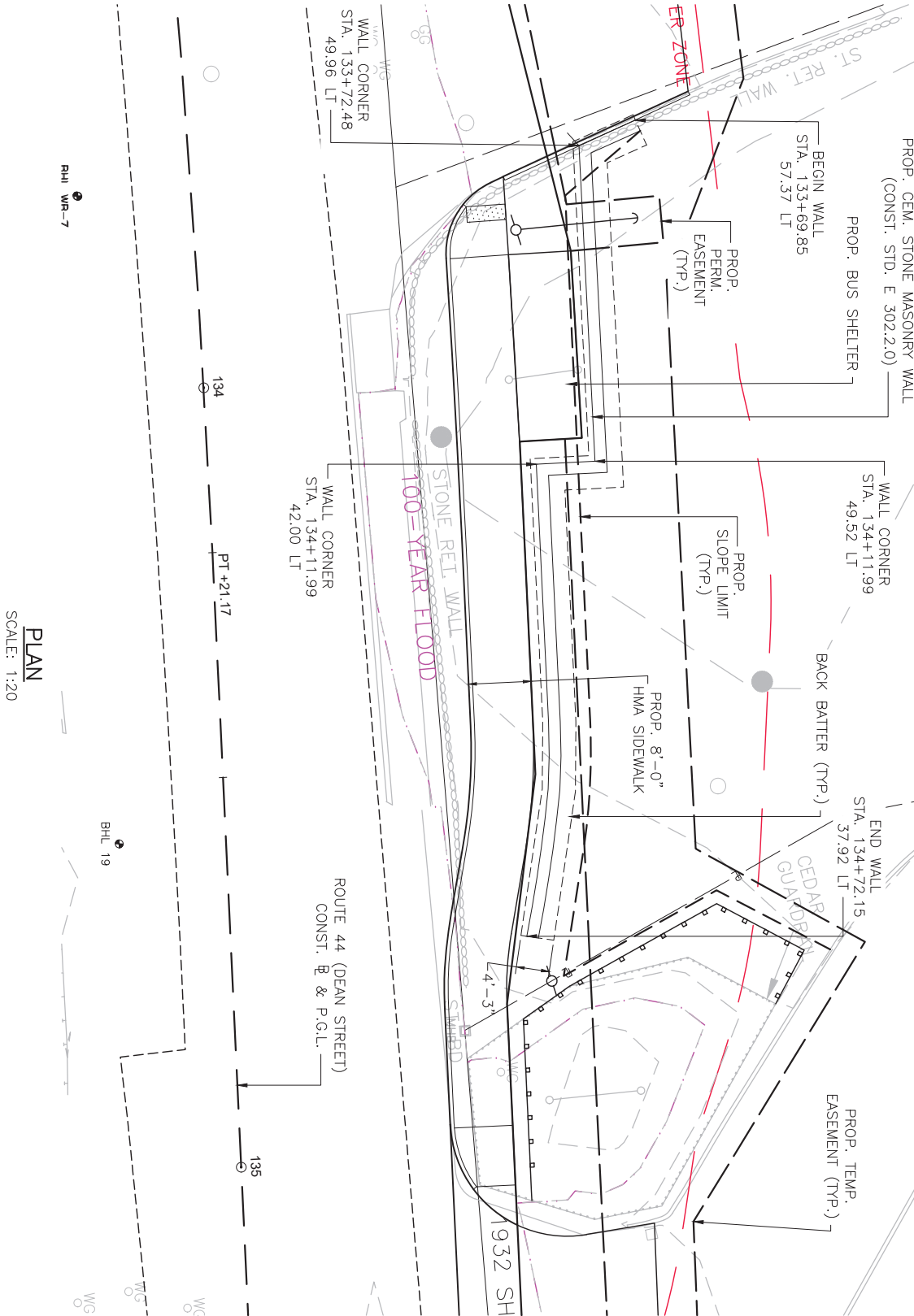
## STRUCTURAL DETAILS - RETAINING WALL DETAILS

## DEVELOPED ELEVATION

SCALE: 1:20

WALL SHEET 4 OF 5 SHEETS





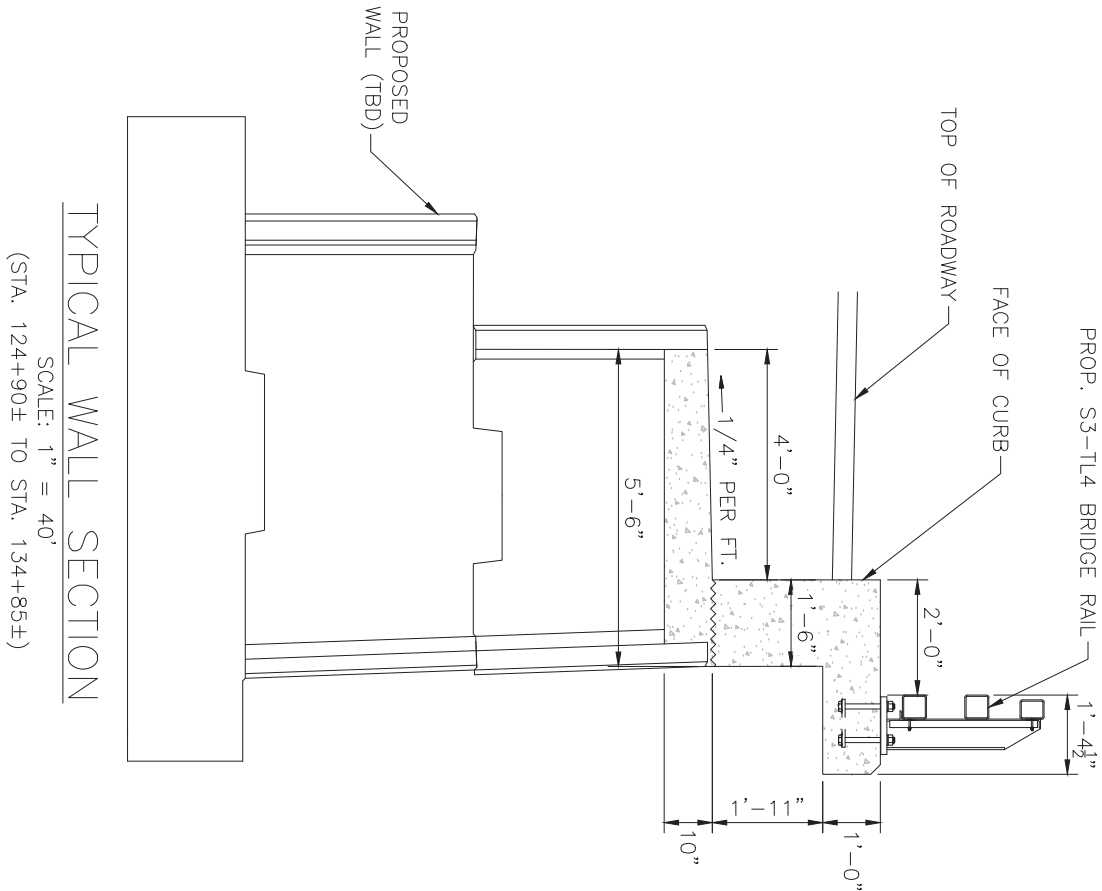
TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	51	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS



TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	52	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
TYPICAL WALL SECTION





1. What is the status of coordination with the NPS? Are MassDOT/FHWA coordinating with them directly? Can you provide documentation showing you have begun that coordination?

**MassDOT has completed coordinated with National Park Service (NPS) on the De Minimis Finding for work within the Taunton River. The Section 4(f) De Minimis Finding Concurrence signed by Jamie Fosburgh at NPS has been included with these responses. MassDOT coordinated with NPS to include additional plantings along the bank of the Taunton River to mitigate construction impacts.**

2. The NMFS PRD coordination form for ESA has dates in the signature blocks but did not appear to be signed. Has that coordination form been sent to NMFS, and did NMFS sign their concurrence? Please send me the signed form when received.

**Tim Dexter of MassDOT provided a signature and sent the forms back to NMFS on 6/02/2022 (attached) and received several conservation recommendations which have been incorporated into the contract documents for the project. NMFS signed their concurrence on 6/07/2022.**

3. The EFH mapper shows no EFH in this location, but the river does contain alewife, blueback herring, shad, and American eel. My understanding is federal agencies are also required to consult with NMFS HCD under the Fish and Wildlife Coordination Act (FWCA) when proposed actions might result in modifications to a natural stream or body of water which contain NOAA trust resources, including diadromous fish. Did this project require FWCA coordination and if so, has FHWA begun that coordination?

**MassDOT prepared and submitted an EFH Consultation Form which has been attached with these responses.**

4. The narrative indicates the existing granite block wall will be removed but I could not find this on the plans. Can you please point it out to me? I see a section of existing wall between flags B1-160 and B1-162 but this section does not seem to be being removed (no impacts or work shown).

**Please see the attached dewatering and wall removal plan. It should be clarified that a portion (not all) of the existing granite block retaining wall will be removed. The remainder of the wall will be retained in place with the proposed wall being constructed behind the existing wall. The PCN plans have also been modified to show the location of the proposed dewatering and wall removal.**

5. Is any of the new wall replacing the old wall (in the same location) or is it all in new locations? If it replaces existing wall, is it in the same footprint, or landward/waterward of the existing wall? If there is more existing wall than the short section between flags B1-160 and B1-162 can it be shown on the plans, and any sections being removed labeled? It is important for my mitigation decision to know if the wall is a new impact or simply replacing an old impact.

**From approximately Sta. 130+95 – 131+75 the proposed soldier pile and lagging wall will replace the existing granite block wall. From approximately Sta. 131+75 – 134+00 the proposed wall will be constructed landward of the existing wall which will be retained in place. Outside of these locations the impacts associated with the construction of the wall will be “new” impacts. The plans have been revised to reflect where the existing wall will be removed or maintained.**

6. The plans say “SVN” on page 1. This should be changed to PCN.



**The plans have been revised to indicate that they were prepared to accompany a PCN application.**

7. Please revise the plans to use different line colors or types to differentiate between the limits of vegetated wetlands and rivers/streams (different lines for HTL and MHW if tidal, or OHW if non-tidal). Currently all waters/wetlands use the same blue line.

**The plans and legend have been revised to include different color lines / boundaries for rivers / streams, vegetated wetlands, HTL and MHW.**

8. The plans indicate the Taunton River is tidal in this location, though this is not mentioned in the narrative. Is this accurate? If it is tidal, we will need to have the High Tide Line (HTL) and Mean High Water (MHW) lines depicted/labeled on the plans. In tidal waters the Corps has jurisdiction over all discharges of fill below HTL, so the impacts may need to be revised to reflect this (if HTL is above the limits of the river shown on the plans).

**The Mean High Water line and High Tide Line have been included on the plans.**

9. In non-tidal waters, our jurisdiction is up to the Ordinary High Water (OHW) mark of streams/rivers. OHW should be depicted/labeled on the plans for all non-tidal streams (unnamed perennial and intermittent streams, and Taunton River if non-tidal in this location).

**This portion of the Taunton River is tidal, the HTL and MHW has been included on the revised plans. The OHW for the non-tidal stream has also been added to the plans.**

10. The landscape plans appear to show seeding and tree and shrub plantings in the river, waterward of the new wall and below MHW. Is that correct? It seems like they would be under water much of the time and not survive. Or is there a bank on which they will be planted?

**The location of all plantings is landward of the MHW and in areas that are currently vegetated. The plans on the bank were selected in part because of their ability to survive in wet and occasionally inundated soils.**

11. Following on 10 above, I am trying to get a clearer picture of where the new wall will be installed. I am assuming Photo 1 shows the location where the wall will be installed – is that correct? There is a stone slope leading down to possibly the top of a wall (unclear on this). Will the new wall be installed at the toe of the stone slope (where there may be the top of a wall visible)? In that situation there does not appear to be anywhere to plant trees/shrubs. Or, will it be toward the top or somewhere in the middle of the existing slope? It would be helpful if that stone slope could be depicted on the plans to help clarify. The sections views on sheets 5 and 6 suggest the new wall will be toward the middle of the slope. Can a more detailed section view be included, more clearly depicting the existing wall and rock slope in relation to the new wall and proposed plantings, and clarifying if the old wall is being retained or removed?

**The proposed wall will be installed east of the Route 44 - Longmeadow Road – Hon. Gordon M. Owen Riverway intersection beginning at approximately Station 124+75 and extending to approximately Station 134+95. From approximately Station 131+00 to Station 134+15 there is an existing granite block retaining wall that will be removed from Station 131+00 to 131+75 and retained from 131+75 to 134+15.**



In sections where the existing wall will be retained the proposed retaining wall will be construction behind the existing wall and approximately halfway up the existing stone slope.

12. At flag B-144, there are impacts with no callout. Were these missed or are they included in one of the callouts to the left or right?

The impacts at flag B-144 are part of one continuous impact area that is associated with the construction of the wall. The impacts that appear on sheets 13 & 23 are accounted for in the text labels on sheets 12 & 22.

13. Can you clarify which stream the culvert is being extended on? The narrative says it is the culvert conveying the intermittent stream. However, it appears to be the stream delineated by the B-7/B-8 series flags, which is the perennial stream according to Table 2.2.1.

At approximately Sta. 121+50 there is an existing 4'x4' box culvert than conveys stream flow south beneath Route 44. The north side of this stream is delineated by the B-7 / B-8 flag series and the south side of the stream is delineated by the B-2 / B-3 flag series. The project proposes to extend only the north side of this culvert, this widening is necessary to accommodate the proposed roadway widening and construction of pedestrian accommodations. The south side of the culvert will be retained in its existing condition.

14. I will need the Hydraulic Report when it is finished in order to begin coordination with FEMA.

The completed HEC-RAS Analysis has been provided and shows that the project will not result in a rise in the Base Flood Elevation.

#### **Additional Comments**

A Stream Visual Assessment Protocol has been included with the supporting documentation referenced above.



#### **Section 4(f) De Minimis Finding Concurrence**

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## Section 4(f) *de minimis* Impact Determination [per 23 CFR 771]

**NOTE:** *De minimis* impacts are defined as those that, after considering any measures to minimize harm, do not adversely affect the activities, features or attributes that qualify a significant public park, recreation area, or wildlife and/or waterfowl refuge for protection under Section 4(f) of the DOT of 1966, as amended.

This form is prepared to document the analysis of planned impacts to a Section 4(f) facility and seek concurrence from the official with jurisdiction that the below-referenced MassDOT federal-aid transportation project's minor impacts would not adversely affect the operation/function of the subject resource.

**Project Information Table**

<b>Project Proponent:</b>	MassDOT Highway Division
<b>Project Name:</b>	TAUNTON- RECONSTRUCTION OF ROUTE 44 (DEAN STREET), FROM ARLINGTON STREET TO ROUTE 104 (SOUTH MAIN STREET)
<b>Project Location:</b>	Route 44 (Dean Street) in Taunton, MA
<b>Project Description:</b>	The project consists of the reconstruction of Route 44 (Dean Street) through cross-section widening from two to four lanes and the introduction of complete streets elements; the realignment of the intersections with Route 44 throughout the project limits (Longmeadow Road and Honorable Gordon M. Owen Riverway); and the construction of an approximately 1000' retaining wall adjacent to the Taunton River. The purpose of the project is to improve the connection between downtown Taunton and Route 24, provide accommodations for alternative means of travel, enhance safety conditions, provide pedestrian and bicycle amenities, meet current ADA/AAB standards, improve vehicular traffic operations, and provide an improved retaining wall to prevent Route 44 from further failing into the Taunton River.
<b>Section 4(f) Resource:</b>	Taunton River
<b>Type of Section 4(f) Resource:</b>	Wild and Scenic River
<b>Official with Jurisdiction:</b>	National Park Service
<b>Impacts to Section 4(f) Resource:</b>	The construction of an approximately 1000' retaining wall is proposed from STA 124+90 to STA 134+85 and will require permanent and temporary easements in the Wild and Scenic Taunton River, as shown on the attached Planset. The easements are necessary to accommodate the construction of the proposed roadways improvements, including pedestrian, bicycle, and public transit accommodations, as well as the construction of the proposed retaining wall that will replace the existing, failing retaining wall that supports Route 44.
<b>Measures to Minimize Harm to Section 4(f) Resource:</b>	The initial wall design called for a modular block wall that would have had a wider footprint than the soldier pile wall that is being proposed. The construction of a modular block wall would have also required a larger area of dewatering



	<p>and temporary excavation. This alternative was ultimately deemed not feasible due to both the larger wetland impacts and concerns about global stability stemming from the underlying clay soils. Additionally, a geocell wall would not be able to utilize the cantilever technique for sidewalk construction resulting in a larger footprint and encroachment into the Taunton River. A geocell wall would also have a sloped face rather than the vertical face of the proposed soldier pile wall resulting in additional impacts over the selected alternative. The preferred alternative for the construction of a soldier pile was deemed to result in a smaller impact area while also achieving the necessary structural and safety goals for Route 44.</p> <p>Proposed tree protection, replacement of loam and seed affected by construction easements, and sediment control barriers will be provided throughout the project limits. Particularly, compost blankets and riverbank seed will be provided adjacent to the Taunton River; in addition to numerous new plantings of various species between the newly constructed retaining wall and riverbank.</p> <p>The preferred alternative was selected to provide the necessary upgrades while minimizing effects to the Taunton River to the maximum extent practicable.</p>
<b>Public Outreach and public comments:</b>	<p>Public input was sought for the de minimis impact determination through a legal notice advertised in the Taunton Daily Gazette on 2/7/2022. No comments on the de minimis impact determination were received during the 15 day public comment period.</p>

### Summary and Determination

Based on the minor scope of the above-referenced impacts, including measures to minimize harm, MassDOT Highway Division has determined that the project will not adversely affect the activities, features or attributes that qualify the resource for protection under Section 4(f).

### MassDOT Intent to make a De Minimis Determination

**This notification hereby serves to inform the official with jurisdiction of MassDOT's intent to make a *de minimis* impact determination for the described proposed "use" of the subject Section 4(f) resource.**

\_\_\_\_\_  
 Bryan Cordeiro, Environmental Planner  
 MassDOT Highway Division

\_\_\_\_\_  
 Date



#### Section 4 (f) De Minimis Finding Concurrence

After consideration of any comments received from the public, as the official with jurisdiction over said resource, I hereby concur with the determination that "use" will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).

<b>JAMES FOSBURGH</b>	Digitally signed by JAMES FOSBURGH Date: 2022.02.24 12:20:46 -05'00'	_____
Official with Jurisdiction National Park Service		Date

#### MassDOT Request for Federal Highway Administration (FHWA) Approval

MassDOT Highway Division requests final approval from FHWA that the proposed "use" of the above described Section 4(f) resource meets the criteria of a *de minimis* impact, as specified under 23 CFR 774.17.

_____ Jeffrey McEwen, Division Administrator (or designee) Federal Highway Administration Massachusetts Division	_____
	Date



**MassDOT Signed GARFO NLAA Verification Formed**

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## Appendix A. Verification Form (updated December 10, 2020)

Federal Highway Administration (FHWA) or the applicable state Department of Transportation (DOT) shall submit a signed version of this completed form, together with any project plans, maps, supporting analyses, etc., to NOAA's National Marine Fisheries Service (NMFS), Greater Atlantic Regional Fisheries Office, Protected Resources Division (GARFO PRD) at nmfs.gar.esa.section7@noaa.gov with "FHWA GARFO NLAA Program: [Project Title or Number]" in the subject line. **Note:** project design contractors and/or consultants may assist in preparing the form, but only FHWA/DOT staff shall sign off on it on the final page.

### Project Activity Type (check all that apply to the entire action):

- ☐ 1. Bridge repair, demolition, or replacement project  
☐ 2. Culvert repair or replacement project  
☐ 3. Dock, pier, or waterway access project (includes construction, demolition, and repairs)  
☒ 4. Slope stabilization project

### Transportation Project Information

Name of Project:	Reconstruction of Rt 44 (Dean St.) in Taunton, MA		
Reinitiation (Yes/No):	No		
State DOT/Program:	MassDOT - Highway Division		
DOT ID Code:	606024		
Contact Person:	Timothy Dexter		
Phone:	857-274-8735	Email:	timothy.dexter@state.ma.us
Project Latitude (e.g., 42.625884):	41.904256		
Project Longitude (e.g., -70.646114):	-71.076082		
Maximum Water Depth (m)	3.4		
Anticipated Project Start Date:	July 2024	Anticipated Project End Date:	June 2025
City/Town:	Taunton, MA	Water body:	Taunton River
Project/Action Description and Purpose:	<p>The proposed project is to widen Route 44 and provide a four-lane cross section throughout the Project corridor to improve traffic flow, intersection operations, safety, pedestrian and bicycle access, and inadequate drainage systems. The Project aims to improve the connection between downtown Taunton and Route 24, provide public transit accommodations, and enhance safety conditions. In order to facilitate these improvements, the Project includes construction of a retaining wall adjacent to / within the Taunton River as well as the extension of an existing culvert. In water work consists of removal (including dewatering and excavation) of the existing granite block retaining wall, construction of the proposed soldier pile and lagging retaining wall including the installation of 117 piles (approximately 25 of which are entirely or partial below MHW), and extension of the existing culvert that conveys an unnamed intermittent stream south beneath Route 44. The project proposes to extend the culvert only on the north side of Route 44 and will only result in work within / impacts to the unnamed intermittent stream. There will be 400 sf (0.01 acres) of permanent impacts within the Taunton River resulting from the new retaining wall, including an additional 1,861 sf (0.04 acres) of temporary impacts due to dewatering and construction access. The existing and proposed retaining walls will be accessed via Route 44 and a barge within the Taunton River. The method for dewatering will be selected by the contractor and will most likely consist of either sheet piles or sandbags and plastic. If the selected dewatering is proposed to consist of sheet piles then a "soft start" method will be utilized for their installation. The construction of the retaining wall does not include any driving of</p>		



**ESA-listed species and/or critical habitats in the action area (Check all that apply)**

<input checked="" type="checkbox"/>	Atlantic sturgeon (all DPSs)	<input type="checkbox"/>	Kemp's ridley sea turtle
<input type="checkbox"/>	Atlantic sturgeon critical habitat Indicate which DPS (GOM, NYB, Chesapeake Bay DPSs): <div style="border: 1px solid black; padding: 2px;">Select DPS</div>	<input type="checkbox"/>	Loggerhead sea turtle (Northwest Atlantic DPS)
<input type="checkbox"/>	Shortnose sturgeon	<input type="checkbox"/>	Leatherback sea turtle
<input type="checkbox"/>	Atlantic salmon (GOM DPS)	<input type="checkbox"/>	North Atlantic right whale
<input type="checkbox"/>	Atlantic salmon critical habitat (GOM DPS)	<input type="checkbox"/>	North Atlantic right whale critical habitat
<input type="checkbox"/>	Green sea turtle (North Atlantic DPS)	<input type="checkbox"/>	Fin whale

\* Please consult GARFO PRD's ESA Section 7 Mapper for ESA-listed species and critical habitat information for your action area at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater>.

**The following stressors are applicable to the action:**

- ☒ Underwater Noise
- ☒ Impingement/Entrainment and Entanglement
- ☒ Water Quality/Turbidity
- ☒ Habitat Alteration
- ☒ Vessel Traffic

**Impacts Table**

Habitat Alteration		
	Permanent (acres)	Temporary (acres)
Sand (saline)	0.00	0.00
Silt/Mud/Clay (saline)	0.00	0.00
Hard bottom (saline)	0.00	0.00
Submerged Aquatic Vegetation (SAV) (saline)	0.00	0.00
Sand (freshwater)	0.01	0.04
Silt/Mud/Clay (freshwater)	0.00	0.00
Hard bottom (freshwater)	0.00	0.00
Submerged Aquatic Vegetation (SAV) (freshwater)	0.00	0.00
<b>Total amount of habitat alteration</b>		
	0.05	
In-water Construction Impacts		
	Amount in meters	
Width of water body in action area (m)	33.0	
Stressor category that extends furthest distance into water body (e.g.; underwater noise, turbidity plume)	Vessel (approx 30' long barge)	
Maximum extent of stressor into the water body (m)	10.0	



**Project Design Criteria (PDC) Checklist**

FHWA/DOT shall incorporate all general PDCs and all applicable PDCs in the appropriate stressor categories. For any PDCs that are not incorporated, additional justification is required for a project to be eligible for the NLAA Program. FHWA/DOT shall check the corresponding box for each PDC that is, or will be, incorporated into the project or indicate if not applicable.

GENERAL PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1.	Ensure all operators, employees, and contractors are aware of all FHWA environmental commitments, including these PDC, when working in areas where ESA-listed species may be present or in critical habitat.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2.	No portion of the proposed action will individually or cumulatively have an adverse effect on ESA-listed species or critical habitat.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3.	<p>No portion of the proposed action that may affect the GOM DPS of Atlantic salmon will occur in the tidally influenced portion of rivers/streams where their presence is possible from <u>April 10 through November 7</u>. The range of the GOM DPS only occurs in Maine.</p> <p><b>Note:</b> If the project will occur within the geographic range of the GOM DPS Atlantic salmon but their presence is not expected following the best available commercial scientific data, the work window does not need to be applied. Please attach best available information (i.e. local fisheries biologist correspondence).</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.	<p>No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as spawning grounds as follows:</p> <ul style="list-style-type: none"> <li>i. Gulf of Maine: Apr 1-Aug 31</li> <li>ii. Southern New England/New York Bight: Mar 15-Aug 31</li> <li>iii. Chesapeake Bay: Mar 15-Jul 1 and Sep 15-Nov 1</li> </ul> <p><b>Note:</b> If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.	<p>No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as overwintering grounds where dense aggregations are known to occur as follows:</p> <ul style="list-style-type: none"> <li>i. Gulf of Maine: Oct 15-Apr 30</li> <li>ii. Southern New England/New York Bight: Nov 1-Mar 15</li> <li>iii. Chesapeake Bay: Nov 1-Mar 15</li> </ul> <p><b>Note:</b> If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval.</p>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	6.	Within designated critical habitat for Atlantic sturgeon, no work will affect hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand) (PBF 1).
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.	Work will result in no or only temporary/short-term changes in water temperature, water flow, salinity, or dissolved oxygen levels.



Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	If ESA-listed species are (a) likely to pass through the action area at the time of year when project activities occur; and/or (b) the project will create an obstruction to passage when in-water work is completed, then a zone of passage (~50% of water body) with appropriate habitat for ESA-listed species (e.g., depth, water velocity, etc.) must be maintained (i.e., physical or biological stressors such as turbidity and sound pressure must not create barrier to passage).
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9.	The project will not adversely impact any submerged aquatic vegetation (SAV) or oyster reefs.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10.	No blasting or use of explosives will occur.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11.	No in-water work on large dams or tide gates (small dam and tide gate repairs may be permitted with prior review and approval from NMFS).

#### UNDERWATER NOISE PDCs

Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.	<p>If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a “soft start” is required to allow animals an opportunity to leave the project vicinity before sound pressure levels increase. <i>In addition to using a soft start at the beginning of the work day for pile driving, one must also be used at any time following cessation of pile driving for a period of 30 minutes or longer.</i></p> <p><u>For impact pile driving:</u> pile driving will commence with an initial set of three strikes by the hammer at 40% energy, followed by a one minute wait period, then two subsequent three-strike sets at 40% energy, with one-minute waiting periods, before initiating continuous impact driving.</p> <p><u>For vibratory pile installation:</u> pile driving will be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period will be repeated two additional times, followed immediately by pile-driving at full rate and energy.</p>



Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.	<p>If the project includes non-timber piles*, please attach your calculation to this verification form showing that the noise is below the injury thresholds of ESA-listed species in the action area. The GARFO Acoustic Tool can be used as a source, should you not have other information: <a href="https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultation-technical-guidance-greater-atlantic">https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultation-technical-guidance-greater-atlantic</a>.</p> <p>*Effects from timber and steel sheet piles were analyzed in the NLAA programmatic consultation, so no additional information is necessary.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.	Any new pile-supported structure must involve the installation of no more than 50 piles (below MHW).

Pile material (e.g., steel pipe, concrete)	Pile diameter/width (inches)	Number of piles	Installation method (e.g., impact hammer, vibratory start and then impact hammer to depth, drilling)
Steel Pipe	30	117	Cored in place via drilling

IMPINGEMENT/ENTRAINMENT AND ENTANGLEMENT PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.	<p>If excavating or dredging, only mechanical buckets, hydraulic cutterheads, or low volume hopper dredges (e.g., CURRITUCK, ≤300 cubic yard maximum bin capacity) may be used.</p> <p><b>Note:</b> We consider excavating a smaller scale form of mechanical dredging.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16.	<p>No new excavation or dredging in Atlantic sturgeon or salmon critical habitat (excavation in a prior construction footprint or maintenance dredging is permitted, but still must meet all other PDCs). New excavation or dredging outside Atlantic sturgeon or salmon critical habitat is limited to one-time events (e.g., burying a cable or utility line) and minor (≤2 acres) expansions of areas already subject to prior excavation or maintenance dredging. Locating a replacement bridge within 250 feet (centerline to centerline) of an existing bridge and excavation of sediment around bridge piers are considered work in a previous construction footprint.</p> <p><b>Note:</b> We consider excavating a smaller scale form of mechanical dredging.</p>



Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.	Temporary intakes related to construction are prohibited in sturgeon and salmon spawning, rearing, or overwintering habitat during the time of year windows identified in General PDCs 3-5. If utilized outside those areas and times of year and in an area with anticipated sturgeon and salmon presence, temporary intakes must be equipped with 2-millimeter wedge wire mesh screening and must not have greater than 0.5 feet per second intake velocities, to prevent impingement or entrainment of juvenile and early life stages of these species.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.	Work behind cofferdams, turbidity curtains, or other instruments that prevent access of animals to the project area is required when ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, access control measures are not necessary). Once constructed, work inside a cofferdam at any time of year may be permitted with NMFS approval, provided the cofferdam is installed/removed outside the time-restricted period.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19.	No new permanent surface water withdrawal, water intakes, or water diversions.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20.	Turbidity control measures, including cofferdams, must be designed to not entangle or entrap ESA-listed species.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	21.	Any in-water lines, ropes, or chains must be made of materials and installed in a manner to minimize or avoid the risk of entanglement by using thick, heavy, and taut lines that do not loop or entangle. Lines can be enclosed in a rigid sleeve.

WATER QUALITY/TURBIDITY PDCs			
Yes	N/A	PDC #	PDC Description
<input type="checkbox"/>	<input checked="" type="checkbox"/>	22.	In-water offshore disposal may only occur at designated disposal sites that have already been the subject of ESA section 7 consultation with NMFS and where a valid consultation is in place.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	23.	Any temporary discharges must meet state water quality standards (e.g., no discharges of substances in concentrations that may cause acute or chronic adverse reactions, as defined by EPA water quality standards criteria).
<input checked="" type="checkbox"/>	<input type="checkbox"/>	24.	Only repair, upgrades, relocations, and improvements of existing discharge pipes or replacement in-kind are allowed; no new construction of untreated discharges.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	25.	Work behind cofferdams, turbidity curtains, or other instruments to control turbidity is required when operationally feasible and ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, turbidity control methods are not necessary).



HABITAT ALTERATION PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	26.	Minimize all new waterward encroachment and permanent fill.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	27.	In Atlantic salmon critical habitat, stream simulation design with a minimum span of 1.2 bankfull width will be used in areas with minimal tidal influence. In tidal areas, a design that allows for unimpeded flow will be used (no delay in water entering or exiting the area upstream of the crossing).
<input type="checkbox"/>	<input checked="" type="checkbox"/>	28.	In Atlantic salmon critical habitat, no culvert end extensions, invert line culvert rehabilitation, or slipline culvert rehabilitation may occur.

VESSEL TRAFFIC PDCs			
Yes	N/A	PDC #	PDC Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	29.	Maintain project (i.e., construction) vessels operating within the action area to speed limits below 10 knots and dredge vessels to speeds of 4 knots maximum, while dredging.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	30.	Maintain a 1,500-foot buffer between project (i.e., construction) vessels and ESA-listed whales and a 300-foot buffer between project vessels and sea turtles. This also applies to dredge vessels.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	31.	The number of project (construction) vessels must be limited to the greatest extent possible, as appropriate to size and scale of project.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	32.	The project must not result in the permanent net increase of commercial vessels.

### Justification for NLAA Determination if not Incorporating All PDC

If the project is not in compliance with all of the general and stressor-based PDCs, but you can provide justification and/or special conditions to demonstrate why the project still meets the NLAA determination and is consistent with the aggregate effects considered in the programmatic consultation, you may still certify your project through the NLAA program using this verification form. Please identify which PDCs your project does not meet (e.g., PDC 9, PDC 15, PDC 22, etc.) and provide your rationale and justification for why the project is still eligible for the verification form. Project modifications must not result in different effects not already considered.

To demonstrate that the project is still NLAA, you must explain why the effects on ESA-listed species or critical habitat are **insignificant** (i.e., too small to be meaningfully measured or detected) or **discountable** (i.e., extremely unlikely to occur). **Please use this language in your justification.**



PDC#	Justification



**FHWA/DOT Verification of Determination (To be filled out by FHWA/DOT staff only)**

By submitting this Verification Form, FHWA, or the state DOT as FHWA's designated non-federal representative, indicates that they determined that the proposed activity described above is not likely to adversely affect (NLAA) ESA-listed species or designated critical habitat under NMFS jurisdiction in accordance with the Program, and all effects (direct, indirect, interrelated, and interdependent) are either insignificant (so small they cannot meaningfully be measured, detected, or evaluated) or discountable (extremely unlikely to occur).

<input checked="" type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, we have determined that the action complies with all applicable PDCs and is not likely to adversely affect listed species.
<input type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, we have determined that the action is not likely to adversely affect listed species per the justifications and/or special conditions provided above.
FHWA/DOT Signature:	
<i>Tim Dexter</i>	
Date:	

By providing your determination and signature, you are certifying that to the best of your knowledge the information provided in this form is accurate and based upon the best available scientific information. This form must be filled out and signed by FHWA or state DOT staff, as an officially designated non-federal representative.

**GARFO PRD Concurrence (To be filled out by GARFO PRD)**

After receiving the Verification Form, GARFO PRD will contact FHWA/DOT with any concerns and indicate whether GARFO PRD concurs with FHWA/DOT's determination.

<input checked="" type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, GARFO PRD concurs with FHWA/DOT's determination that the action complies with all applicable PDCs and is not likely to adversely affect listed species or critical habitat.
<input type="checkbox"/>	In accordance with the FHWA GARFO NLAA Program, GARFO PRD concurs with FHWA/DOT's determination that the action is not likely to adversely affect listed species or critical habitat per the justifications and/or special conditions provided above.
<input type="checkbox"/>	GARFO PRD does not concur with FHWA/DOT's determination that the action complies with the applicable PDCs (with or without justifications), and recommends an individual Section 7 consultation to be completed independent from the FHWA GARFO NLAA Program.
GARFO PRD Signature:	
Date:	



## **NOAA / NMFS Conservation Recommendations**

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## Federal Interagency Comment Form

**Date:** 06/02/2022

**Project:** Taunton Rt. 44 Retaining Wall Reconstruction

**Appl No.:** Taunton 606024

**Commenting Agency:** NOAA/NMFS/GARFO/HESD

**Action Agency Project Manager:** Tim Dexter, Mass DOT

**Waterway:** Taunton River, Taunton, MA

**Activity:** The proposed project is to widen Route 44 and provide a four-lane cross section throughout the Project corridor. The project also includes replacement of a retaining wall along the Taunton River and an extension of an existing culvert to accommodate the widened roadway.

### ESSENTIAL FISH HABITAT (EFH)

Project is not in designated EFH. This is FWCA consultation. River herring, American shad and white perch spawn in the Taunton River.

**ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS:** (Note: EFH CRs require a response from the federal action agency within 30 days of receipt or 10 days before a permit is issued if CRs are not included as a special condition of the permit. In addition, a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920 (j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above EFH determination or EFH conservation recommendations.)

### FISH AND WILDLIFE COORDINATION ACT COMMENTS

1. No work that produces greater than minimal turbidity (e.g. excavation) should be conducted during the spring (March 1 – June 30) and fall (Sept. 1 – Nov. 30) diadromous fish migration periods.
2. Appropriate soil erosion, sediment and turbidity controls should be used and maintained in effective operating condition during construction. Activities capable of producing greater than minimal turbidity or sedimentation should be done during periods of low-flow or no-flow, when the stream is waterward of the work, or when controls are used to obtain dry work conditions. Work that produces greater than minimal turbidity or sedimentation should not be done during the TOY restrictions in CR 1.
3. Sediment controls in streams should be installed and removed during the same TOY work window. Controls (e.g. turbidity curtains) should not encroach >25% of the width of the stream from OHW during the TOY restrictions in CR 1.

### ENDANGERED SPECIES

Threatened or endangered species under the jurisdiction of NMFS may be present in the project area. The federal action agency will be responsible for determining whether the proposed action may affect listed species. If they determine that the proposed action may affect a listed species, they should submit their determination of effects, along with justification and a request for concurrence to the attention of the Section 7 Coordinator, NMFS, Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930 or [nmfs.gar.esa.section7@noaa.gov](mailto:nmfs.gar.esa.section7@noaa.gov). If you have any questions regarding these comments, please contact Roosevelt Mesa at [Roosevelt.mesa@noaa.gov](mailto:Roosevelt.mesa@noaa.gov).

### OTHER:

Provide a copy of the permit when issued.

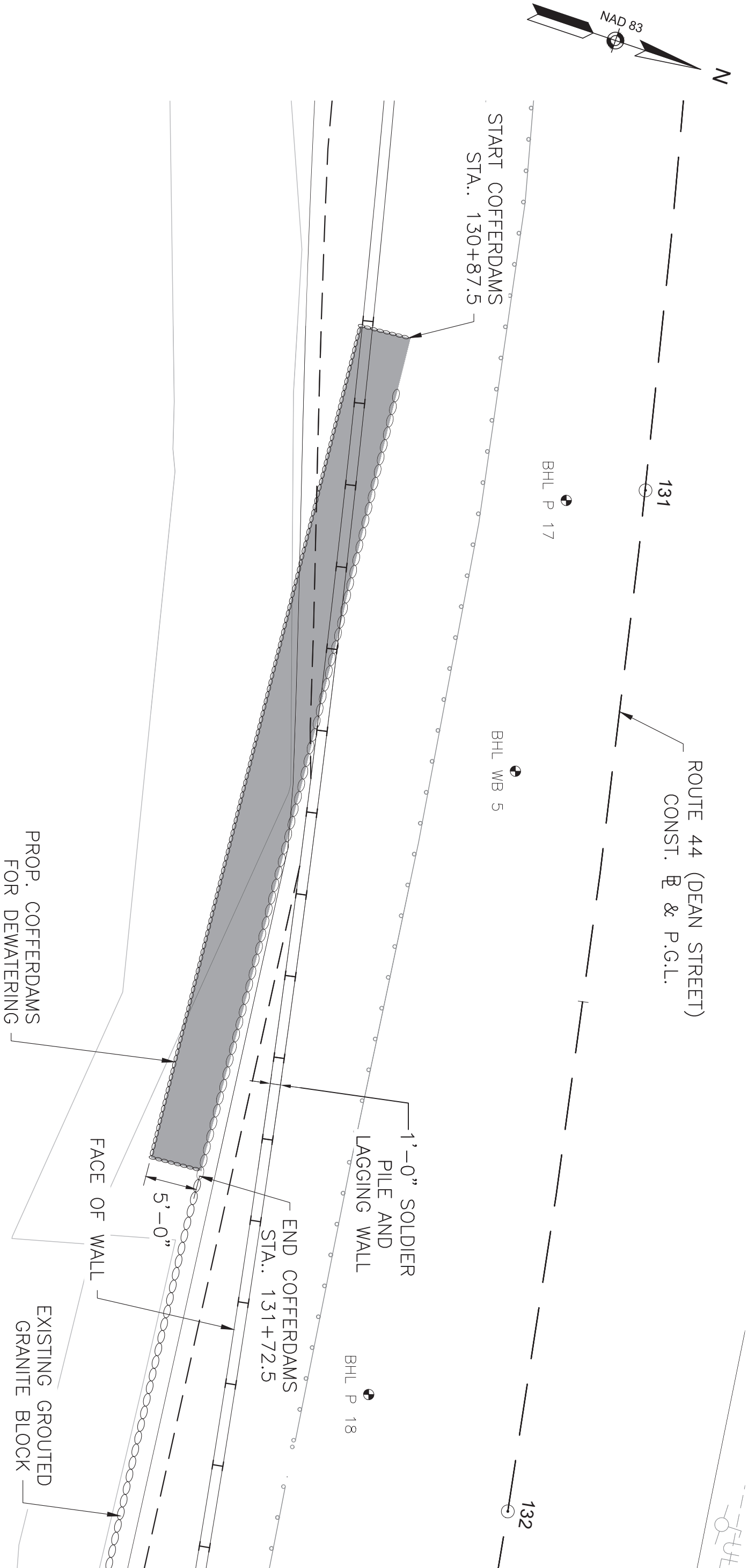
Prepared by:   Sabrina Pereira   date:   06/02/2022



## **Dewatering Plan**

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**PLAN**  
**DEWATERING AT GRANITE BLOCK WALL**  
SCALE: 1"=10'-0"

TAUNTON  
ROUTE 44 (DEAN STREET)  
DEWATERING NEED AT  
PROPOSED SOLDIER PILE WALL

**GPI** Engineering  
Design  
Planning  
Construction Management  
Greennan-Pedersen, Inc.  
181 Ballardvale Street  
Suite 202  
Wilmington, MA 01887  
978.570.2999  
GPI.NET.COM



## **Revised PCN Plans**

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MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION

PLAN AND PROFILE OF

ROUTE 44 (DEAN STREET)

IN THE CITY OF  
TAUNTON  
BRISTOL COUNTY

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	52
PROJECT FILE NO.		006024	

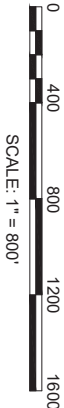
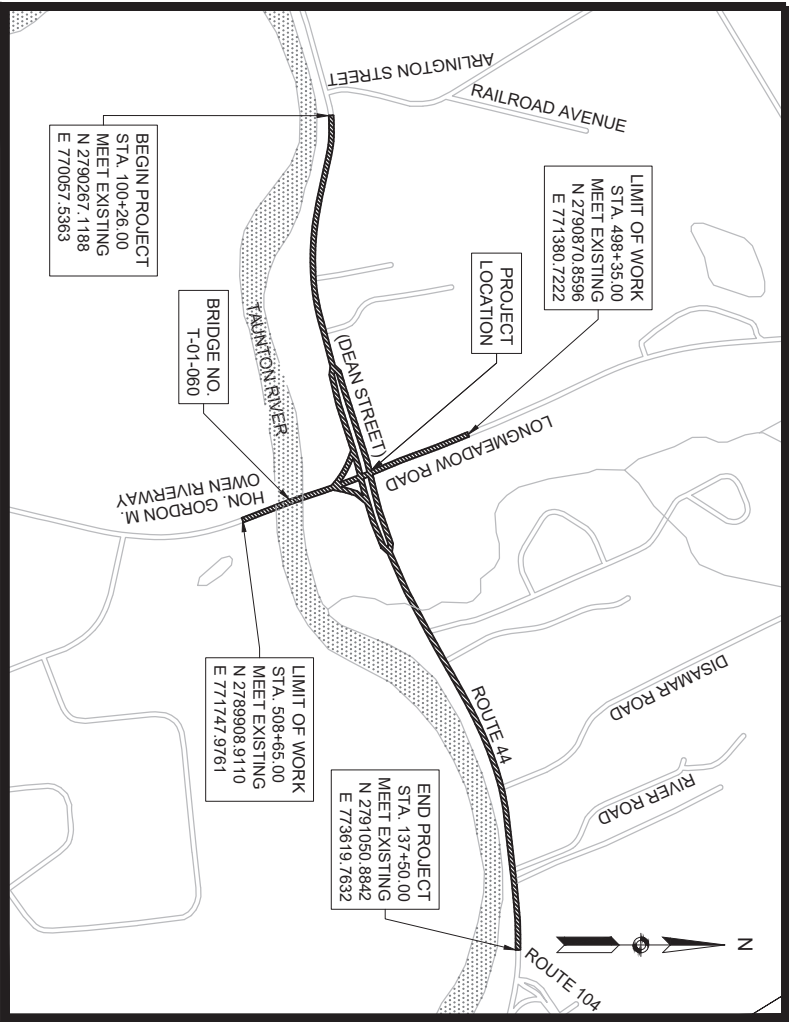
TITLE SHEET & INDEX

THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1988 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

USACE PCN SUBMISSION PLANS

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	KEY PLAN
4-6	TYPICAL SECTIONS
7-16	CONSTRUCTION PLANS
17-26	DRAINAGE & UTILITY PLANS
27-36	LANDSCAPE PLANS
37	LANDSCAPE DETAILS
38	WETLAND REPLICATION PLAN AND DETAIL
39-42	CONSTRUCTION DETAILS
43-52	STRUCTURAL DETAILS



LENGTH OF PROJECT = 4.754 FEET = 0.900 MILES

DESIGN DESIGNATION

STREET NAME	ROUTE 44 (DEAN STREET)	LONGMEADOW ROAD/ HON. GORDON M. OWEN RIVERWAY
DESIGN SPEED	40 MPH	40 MPH
ADT (2018)	47,120 VPD	18,500 VPD
ADT (2038)	57,500 VPD	20,450 VPD
K	7.2%	9.3%
D	65%	61%
T (PEAK HOUR)	3.0%	3.8%
T (AVERAGE DAY)	3.0%	3.8%
DHV	4,140 VPH	1,910 VPD
DDHV	2,680 VPH	1,160 VPD
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN COLLECTOR

JULY 2022

**Greenman-Pedersen, Inc.**  
Engineering & Construction Services

161 Ballardvale Street, Suite 202, Wilmington, MA 01867  
Tel: (978) 570-2599 Fax: (978) 658-3044  
<http://www.gpinc.com>

DATE	DESCRIPTION	REV #	





































































































































RECOMMENDED FOR APPROVAL

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION APPROVED:	CHIEF ENGINEER		DATE
	APPROVED		





























DIVISION ADMINISTRATOR	DATE	HIGHWAY ADMINISTRATOR	DATE
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GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST SQUARE
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W/ 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLEWIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		CHAIN RAIL - WOOD POSTS
		WOOD FENCE
		SILT FENCE/COMPOST FILTER TUBES
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND *ONLY* - WHITE
		STOP LINE (12" WHITE)
		CROSSWALK (12" OR 24")
		SOLID WHITE LINE (6" OR 12")
		SOLID YELLOW LINE (6" OR 12")
		BROKEN WHITE LINE (6")
		BROKEN YELLOW LINE (6")
		DOTTED WHITE LINE (6")
		DOTTED YELLOW LINE (6")
		DOTTED WHITE LINE EXTENSION (6")
		DOTTED YELLOW LINE EXTENSION (6")
		DOUBLE WHITE LINE (6")
		DOUBLE YELLOW LINE (6")

\* BROKEN WHITE/YELLOW LINES TO BE 10' LINE SEGMENTS WITH 30' GAPS (TYP.). (BYL ON SHARED USE PATH TO BE 3' IN LENGTH WITH 9' GAP)

\*\* DWLEX AND DYLEX LINES TO BE 2' IN LENGTH WITH 6' GAP (TYP.)

\*\*\* DWL AND DYL LINES TO BE 3' IN LENGTH WITH 9' GAP (TYP.) (IF WIDE LINE IS SPECIFIED, THE WIDTH SHALL BE 12")

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION WAS PROVIDED BY CCR ASSOCIATES IN 2014 (6/17) 789-0111. SUPPLEMENTAL SURVEY WAS PROVIDED BY GREENMAN PEDERSEN, INC. IN MARCH AND OCTOBER, 2017. VERTICAL DATUM IS BASED ON NAVD88. HORIZONTAL DATUM IS BASED ON NAD83.
2. THE LOCATIONS AND SIZES OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE THE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.
3. WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R&R).
7. IT IS INTENDED THAT EXISTING GRANITE CURB IS TO BE USED IN PROPOSED WORK TO THE MAXIMUM EXTENT. THE ENGINEER SHALL DETERMINE THE SUITABILITY OF THE CURB FOR RE-USE. EXISTING AND PROPOSED GRANITE CURB SHALL NOT BE INTERSPERSED. THE COST OF CURB REMOVED AND RESET SHALL INCLUDE THE TRANSPORTING OF THE CURB TO A LOCATION WITHIN THE PROJECT LIMITS.
8. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.
9. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC UNLESS OTHERWISE NOTED.
10. ALL EXISTING STATE, COUNTY, CITY AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
11. ALL TRANSVERSE JOINTS AND ALL LONGITUDINAL JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT POURED RUBBERIZED ASPHALT SEALER MEETING THE REQUIREMENTS OF SPECIAL PROVISIONS ITEM 453.
12. ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM BORROW PLACED AND SEEDED. THE LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.
13. THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
14. PRIOR TO THE START OF ANY NEW UTILITY WORK, ALL ELEVATIONS OF EXISTING UTILITIES IN THOSE AREAS ARE TO BE VERIFIED. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY SHOULD ANY DISCREPANCIES OCCUR.
15. ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
16. ALL PUBLICLY OWNED GATE BOXES, SERVICE BOXES, MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
17. ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
18. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
19. CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
20. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTIBILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER GENERAL CLASS B TRENCH EXCAVATION.

GENERAL ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC	EXC	EXCAVATION	PVCC	POINT OF VERTICAL COMPOUND CURVATURE
ABAN	ABANDON	F&G	FRAME AND COVER	PVI	POINT OF VERTICAL INTERSECTION
ADJ	ADJUST	F&G	FRAME AND GRATE	PVRC	POINT OF VERTICAL REVERSE CURVATURE
APPROX.	APPROXIMATE	FDN.	FOUNDATION	PVT	POINT OF VERTICAL TANGENCY
A.C.	ASPHALT CONCRETE	FLOSTN	FIELDSTONE	PVMT	PAVEMENT
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	GAR	GARAGE	PWW	PAVED WATER WAY
BIT.	BITUMINOUS	GD	GROUND	R	RADIUS OF CURVATURE
BC	BOTTOM OF CURB	GG	GAS GATE	R&D	REMOVE AND DISPOSE
BD.	BOUND	GI	GUTTER INLET	RCP	REINFORCED CONCRETE PIPE
BL	BASELINE	GIP	GALVANIZED IRON PIPE	RD	ROAD
BLDG	BUILDING	GRAN	GRANITE	RDWY	ROADWAY
BM	BENCHMARK	GRAV	GRAVEL	REM	REMOVE
BO	BY OTHERS	GRD	GUARD	RET	RETAIN
BOS	BOTTOM OF SLOPE	HDW	HEADWALL	RET WALL	RETAINING WALL
BR.	BRIDGE	HMA	HOT MIX ASPHALT	ROW	RIGHT OF WAY
BV	BOTTOM OF WALL	HOR	HORIZONTAL	R&R	REMOVE AND RESET
CB	CATCH BASIN	HYD	HYDRANT	R&S	REMOVE AND STACK
CBCL	CATCH BASIN WITH CURB INLET	INV	INVERT	RT	RIGHT
CC	CEMENT CONCRETE	JCT	JUNCTION	SB	STONE BOUND
CCM	CEMENT CONCRETE MASONRY	L	LENGTH OF CURVE	SHLD	SHOULDER
CEM	CEMENT	LB	LEACH BASIN	SMH	SEWER MANHOLE
CI	CURB INLET	LP	LIGHT POLE	ST	STREET
CIP	CAST IRON PIPE	LT	LEFT	STA	STATION
CIPP	CURED IN PLACE PIPE	MAX	MAXIMUM	SSD	STOPPING SIGHT DISTANCE
CIT	CHANGE IN TYPE	MB	MAILBOX	SHLO	STATE HIGHWAY LAYOUT LINE
CLF	CHAIN LINK FENCE	MH	MANHOLE	SW	SIDEWALK
CL	CENTERLINE	MHB	MASSACHUSETTS HIGHWAY BOUND	T	TANGENT DISTANCE OF CURVE/TRUCK %
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	TAN	TANGENT
CSP	CORRUGATED STEEL PIPE	MU	MECHANICAL JOINT	TEMP	TEMPORARY
CO.	COUNTY	NO.	NUMBER	TC	TOP OF CURB
CONC	CONCRETE	NTS	NOT TO SCALE	TOS	TOP OF SLOPE
CONST	CONSTRUCTION	PC	POINT OF CURVATURE	TW	TOP OF WALL
CONST	CONSTRUCTION	PCC	POINT OF COMPOUND CURVATURE	TYP	TYPICAL
CR GR	CROWN GRADE	P.G.L.	PROFILE GRADE LINE	UP	UTILITY POLE
DHV	DESIGN HOURLY VOLUME	PI	POINT OF INTERSECTION	VAR	VARIES
DI	DROP INLET	POC	POINT ON CURVE	VERT	VERTICAL
DIA	DIAMETER	POT	POINT ON TANGENT	VC	VERTICAL CURVE
DIP	DUCTILE IRON PIPE	PRC	POINT OF REVERSE CURVATURE	WCR	WHEEL CHAIR RAMP
DW	STEADY DONT WALK - PORTLAND ORANGE	PROU	PROJECT	WG	WATER GATE
DWY	DRIVEWAY	PROP	PROPOSED	WIP	WROUGHT IRON PIPE
ELEV (or EL.)	ELEVATION	PSB	PLANTABLE SOIL BORROW	WM	WATER METER/WATER MAIN
EMB	EMBANKMENT	PT	POINT OF TANGENCY	WSO	WATER SHUT OFF
EOP	EDGE OF PAVEMENT	PVC	POINT OF VERTICAL CURVATURE	X-SECT	CROSS SECTION
EXIST (or EX)	EXISTING				

TAUNTON  
ROUTE 44 (IDEAN STREET)

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	52
PROJECT FILE NO.		606024	

LEGEND & ABBREVIATIONS

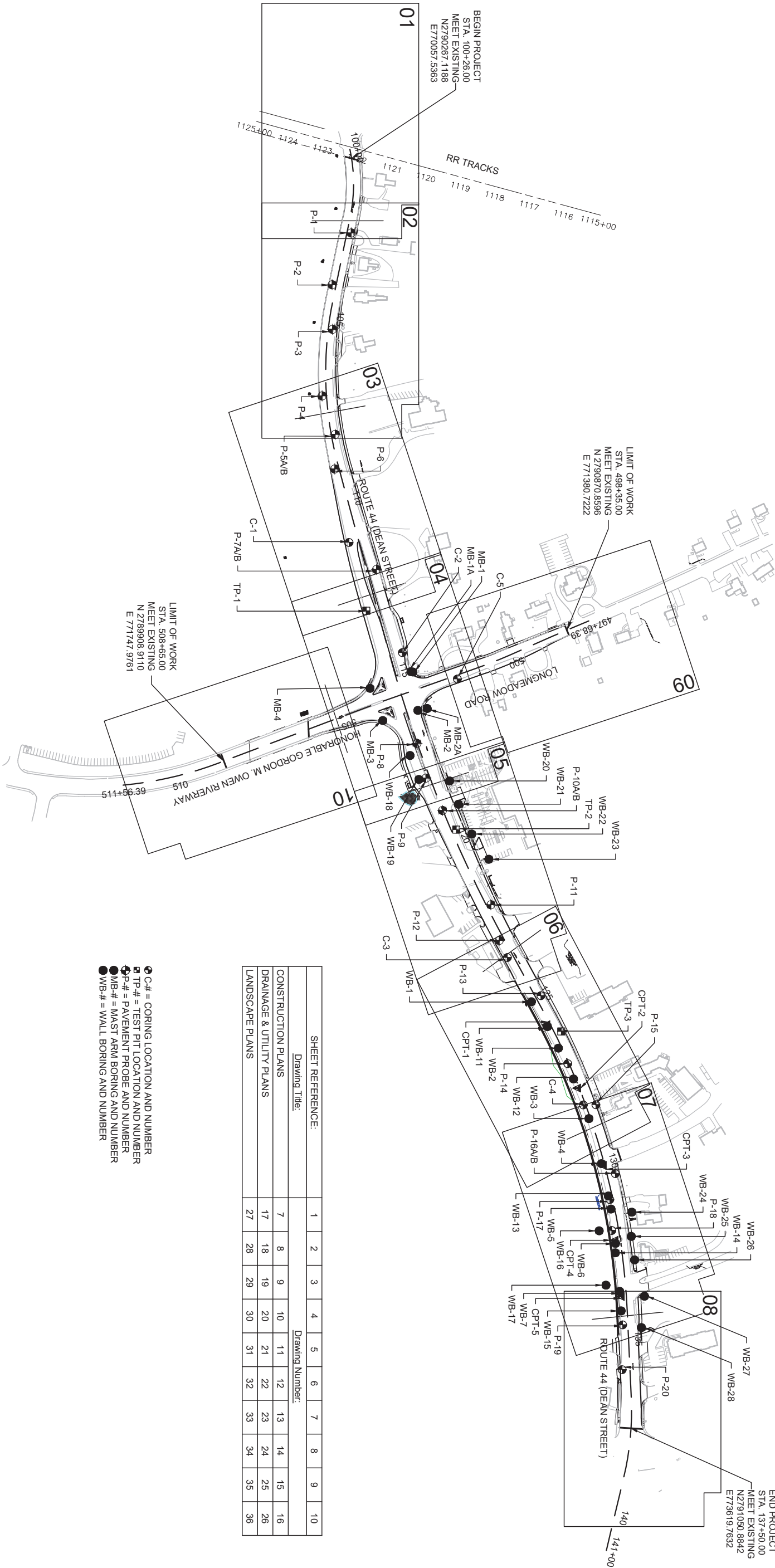
VAR	VARIES	VERT	VERTICAL
VC	VERTICAL CURVE	WCR	WHEEL CHAIR RAMP
WG	WATER GATE	WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN	WSO	WATER SHUT OFF
X-SECT	CROSS SECTION		



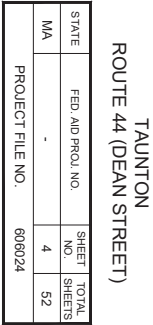


TAUNTON				
ROUTE 44 (DEAN STREET)				
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	-	3	52	
PROJECT FILE NO.		606024		

KEY PLAN

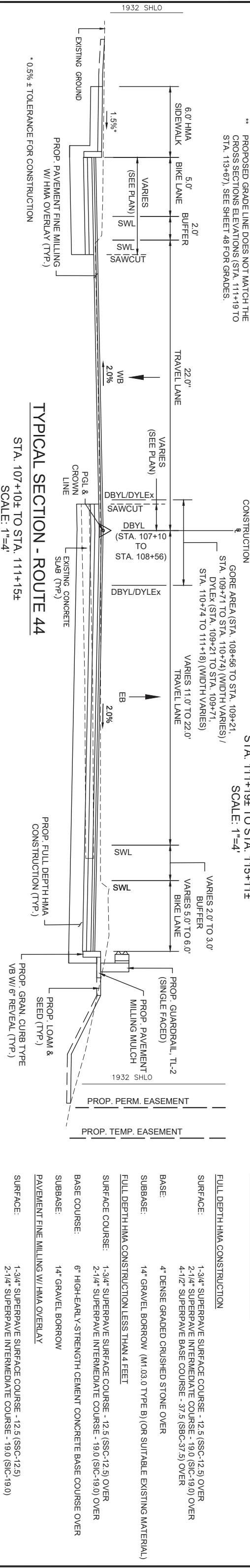






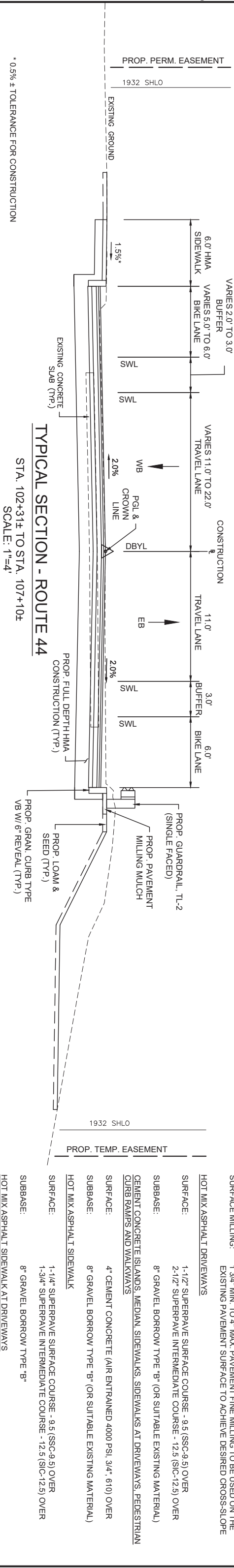
## PAVEMENT NOTES

\* 0.5% ± TOLERANCE FOR CONSTRUCTION  
\* PROPOSED GRADE LINE DOES NOT MATCH THE  
\* CROSS SECTIONS ELEVATIONS (STA. 11+19 TO  
\* STA. 113+67), SEE SHEET 48 FOR GRADES.



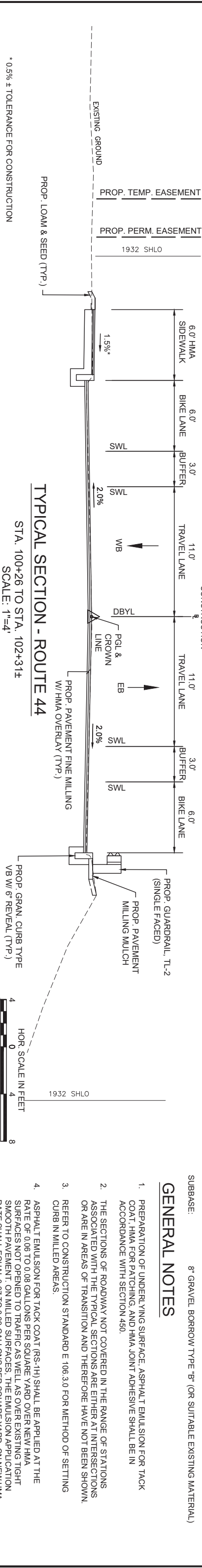
## TYPICAL SECTION - ROUTE 44

\* 0.5% ± TOLERANCE FOR CONSTRUCTION



## TYPICAL SECTION - ROUTE 44

\* 0.5% ± TOLERANCE FOR CONSTRUCTION

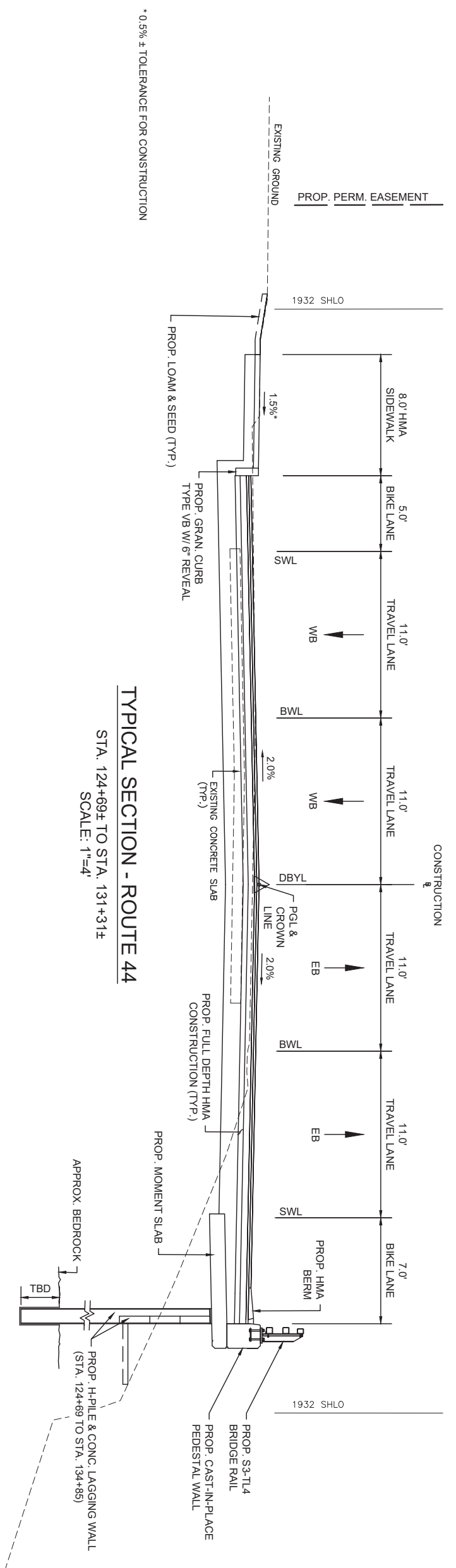


## GENERAL NOTES

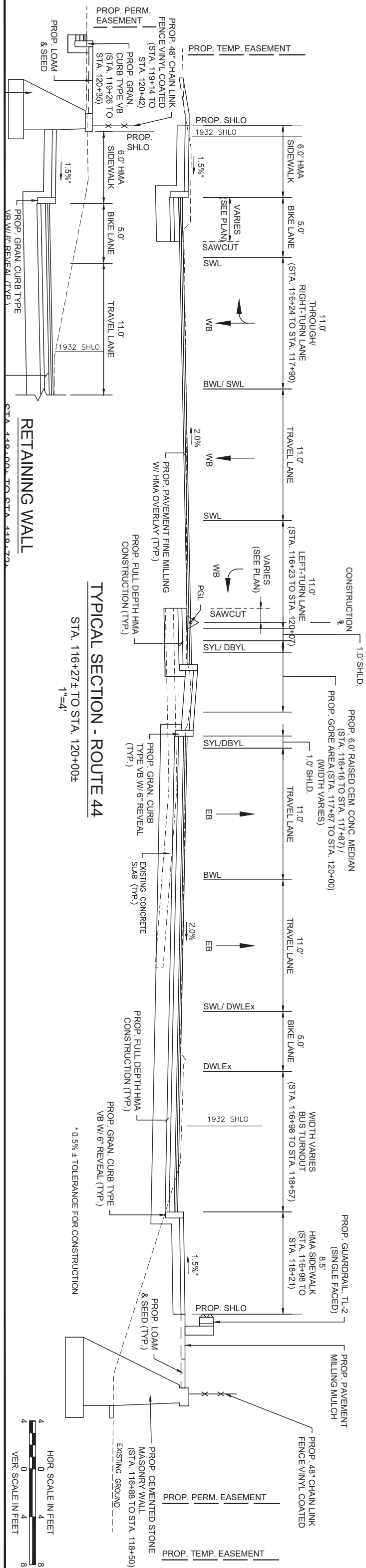
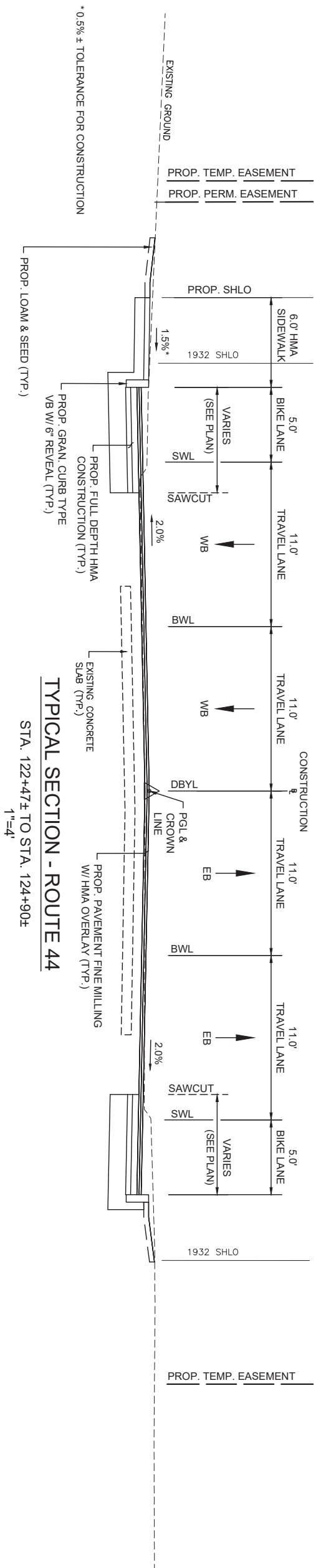
1. PREPARATION OF UNDERLYING SURFACE, ASPHALT EMULSION FOR TACK COAT, HMA FOR PATCHING, AND HMA JOINT ADHESIVE SHALL BE IN ACCORDANCE WITH SECTION 450.
2. THE SECTIONS OF ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER AT INTERSECTIONS OR ARE IN AREAS OF TRANSITION AND THEREFORE HAVE NOT BEEN SHOWN.
3. REFER TO CONSTRUCTION STANDARD E 106.3.0 FOR METHOD OF SETTING CURB IN MILLED AREAS.

4. ASPHALT EMULSION FOR TACK COAT (RS-1H) SHALL BE APPLIED AT THE RATE OF 0.06 TO 0.08 GALLONS PER SQUARE YARD OVER NEW HMA SURFACES NOT OPENED TO TRAFFIC AS WELL AS OVER EXISTING TIGHT SMOOTH PAVEMENT ON MILLED SURFACES. THE EMULSION APPLICATION RATE SHALL EQUAL 0.07 TO 0.09 GALLONS PER SQUARE YARD. ON NEW HMA PATCHES, THE EMULSION APPLICATION RATE SHALL EQUAL 0.06 TO 0.09

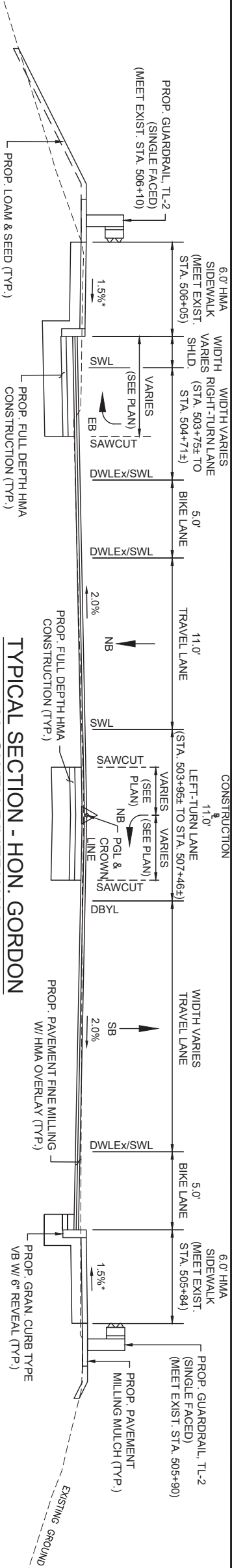




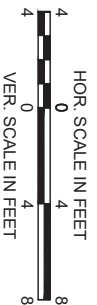
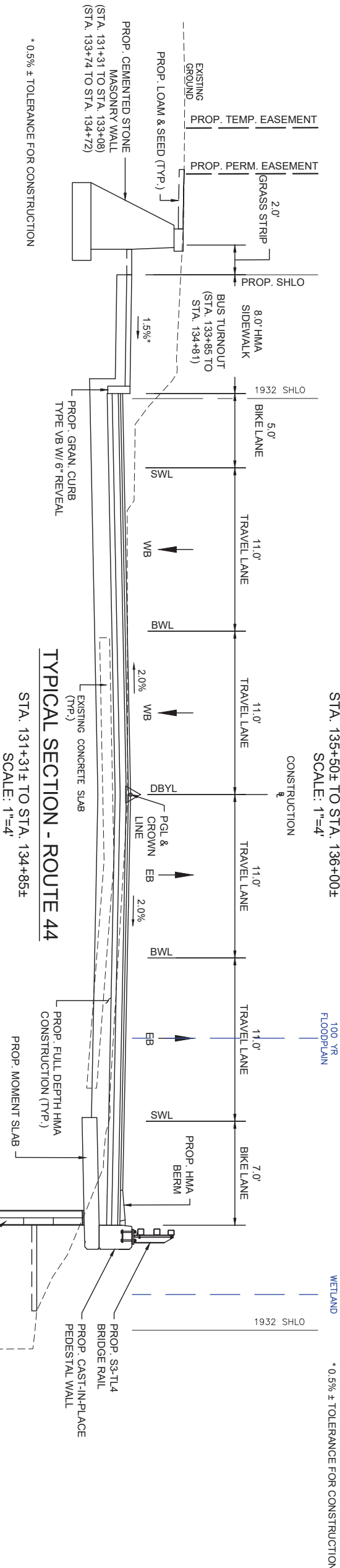
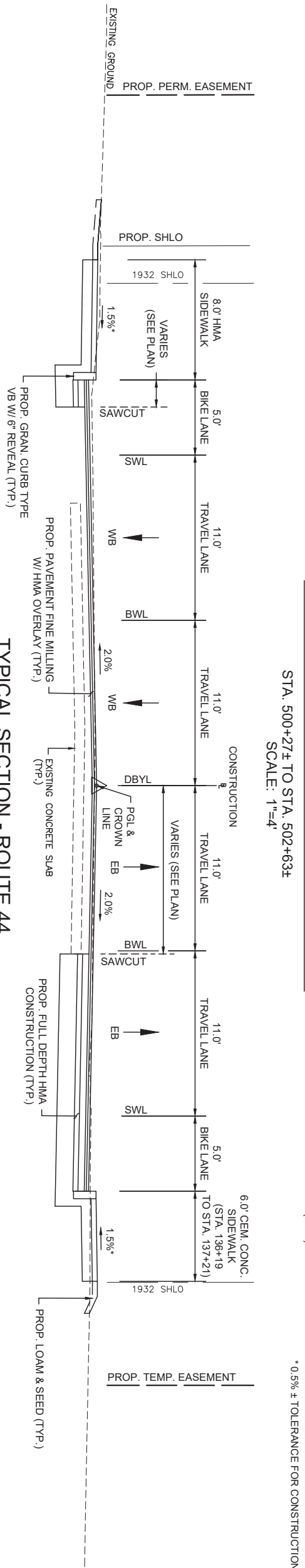
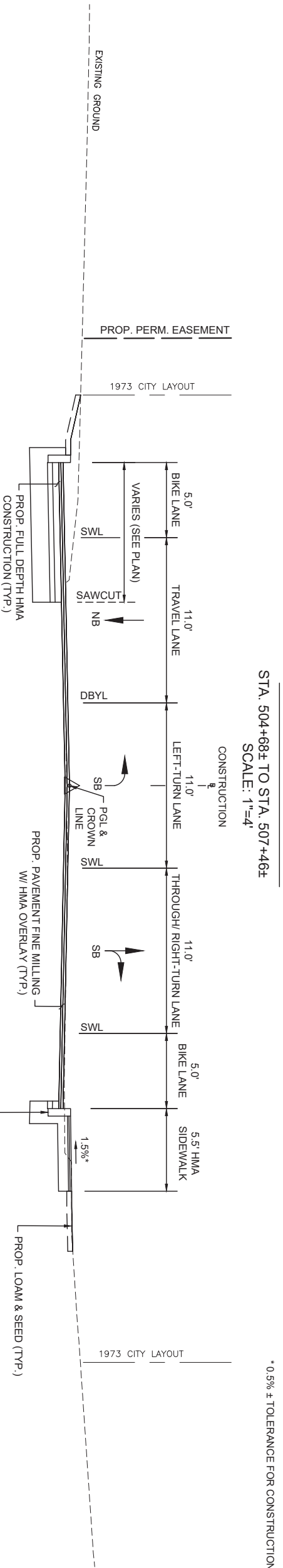
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	5	52
PROJECT FILE NO.		606024	







TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	6	52
PROJECT FILE NO.		006024	









HIGHWAY GUARD DETAILS

STA. 100+17 RT TO STA. 114+14 RT - ITEM 620.12

TRAFFIC SIGNAL CONDUIT

NONE

WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
	WF#	LIMIT OF STREAM BANK / WATERS OF THE US
	WF#	LIMIT OF VEGETATED WETLANDS
		MEAN HIGH WATER (EL. 2.00)
		HIGH TIDE LINE (EL. 2.25)
		LIMIT OF 100-YR FLOODPLAIN
		TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)
		PERMANENT VEGETATED WETLAND (VW) IMPACT
		TEMPORARY STREAMBANK IMPACT
		PERMANENT STREAMBANK IMPACT
		TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)
		PERMANENT WATERS OF THE US IMPACT
		PROPOSED VEGETATED WETLAND REPLICATION AREA
		N/A

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE SHEET 58

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	52
PROJECT FILE NO.		006024	

CONSTRUCTION PLANS



N/F  
50 DEAN STREET REALTY TRUST  
# 50 DEAN STREET  
MAP 55 LOT 755  
BOOK 22892 PAGE 164

N/F  
THE SUZANNE EMMY  
IRREVOCABLE TRUST  
# 52 DEAN STREET  
MAP 55 LOT 754  
BOOK 21458 PAGE 308

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. TEMP.  
EASEMENT (TYP.)  
END PROP. SHO  
ALTERATION

PROP. BOUND (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

RET. GRAN. CURB  
R&R PORTION OF  
GRAN. CURB

RET. STUMPS  
R&R 6' GRAN. CURB

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. SLOPE LIMIT (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. TEMP.  
EASEMENT (TYP.)  
END PROP. SHO  
ALTERATION

PROP. BOUND (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

RET. GRAN. CURB  
R&R PORTION OF  
GRAN. CURB

RET. STUMPS  
R&R 6' GRAN. CURB

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. SLOPE LIMIT (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. TEMP.  
EASEMENT (TYP.)  
END PROP. SHO  
ALTERATION

PROP. BOUND (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

RET. GRAN. CURB  
R&R PORTION OF  
GRAN. CURB

RET. STUMPS  
R&R 6' GRAN. CURB

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. SLOPE LIMIT (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. TEMP.  
EASEMENT (TYP.)  
END PROP. SHO  
ALTERATION

PROP. BOUND (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

RET. GRAN. CURB  
R&R PORTION OF  
GRAN. CURB

RET. STUMPS  
R&R 6' GRAN. CURB

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. SLOPE LIMIT (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. TEMP.  
EASEMENT (TYP.)  
END PROP. SHO  
ALTERATION

PROP. BOUND (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

RET. GRAN. CURB  
R&R PORTION OF  
GRAN. CURB

RET. STUMPS  
R&R 6' GRAN. CURB

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. SLOPE LIMIT (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. TEMP.  
EASEMENT (TYP.)  
END PROP. SHO  
ALTERATION

PROP. BOUND (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

RET. GRAN. CURB  
R&R PORTION OF  
GRAN. CURB

RET. STUMPS  
R&R 6' GRAN. CURB

PROP. HMA SIDEWALK  
AT DRIVEWAY (TYP.)

PROP. SLOPE LIMIT (TYP.)  
PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. FULL DEPTH  
HMA DRIVEWAY (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. TREE  
PROP. PERM. UTILITY  
EASEMENT (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

RET. SIGN  
PROP. CEM. CONC. WALK &  
PROP. GRAN. CURB TYPE VB  
(STA. 103+13 LT TO STA. 103+19 LT)

ROUTE 44  
(DEAN STREET)

TAUNTON RIVER  
(TIDAL)

PROP. STREAMBANK  
IMPACT TEMP. = 4 LF  
PERM. = 9 LF

PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. PAVEMENT FINE  
MILLING W/ HMA  
OVERLAY (TYP.)

CONTINUED ON  
SHEET 7

ROUTE 44  
(DEAN STREET)

TAUNTON RIVER  
(TIDAL)

PROP. STREAMBANK  
IMPACT TEMP. = 4 SF  
PERM. = 4 SF

PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. PAVEMENT FINE  
MILLING W/ HMA OVERLAY  
(TYP.)

CONTINUED ON  
SHEET 9

ROUTE 44  
(DEAN STREET)

TAUNTON RIVER  
(TIDAL)

PROP. STREAMBANK  
IMPACT TEMP. = 6 LF  
PERM. = 6 LF

PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. PAVEMENT FINE  
MILLING W/ HMA OVERLAY  
(TYP.)

CONTINUED ON  
SHEET 9

ROUTE 44  
(DEAN STREET)

TAUNTON RIVER  
(TIDAL)

PROP. STREAMBANK  
IMPACT TEMP. = 18 SFO  
PERM. = 18 SFO

PROP. GRAN. CURB  
TYPE VB (TYP.)

PROP. PAVEMENT FINE  
MILLING W/ HMA OVERLAY  
(TYP.)

CONTINUED ON  
SHEET 9



















HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

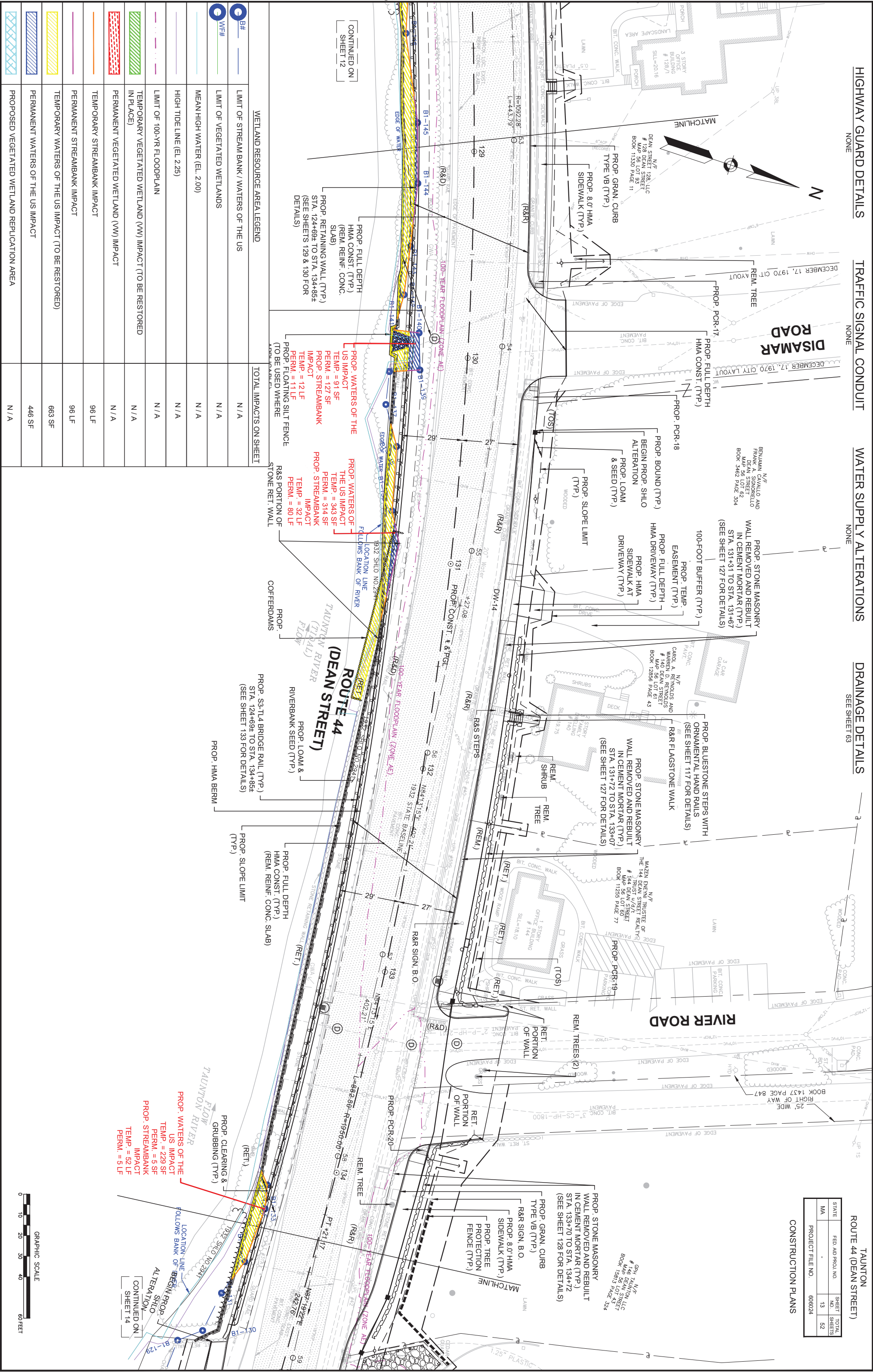
DRAINAGE DETAILS

SEE SHEET 13

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	52
PROJECT FILE NO.		000024	

CONSTRUCTION PLANS





HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

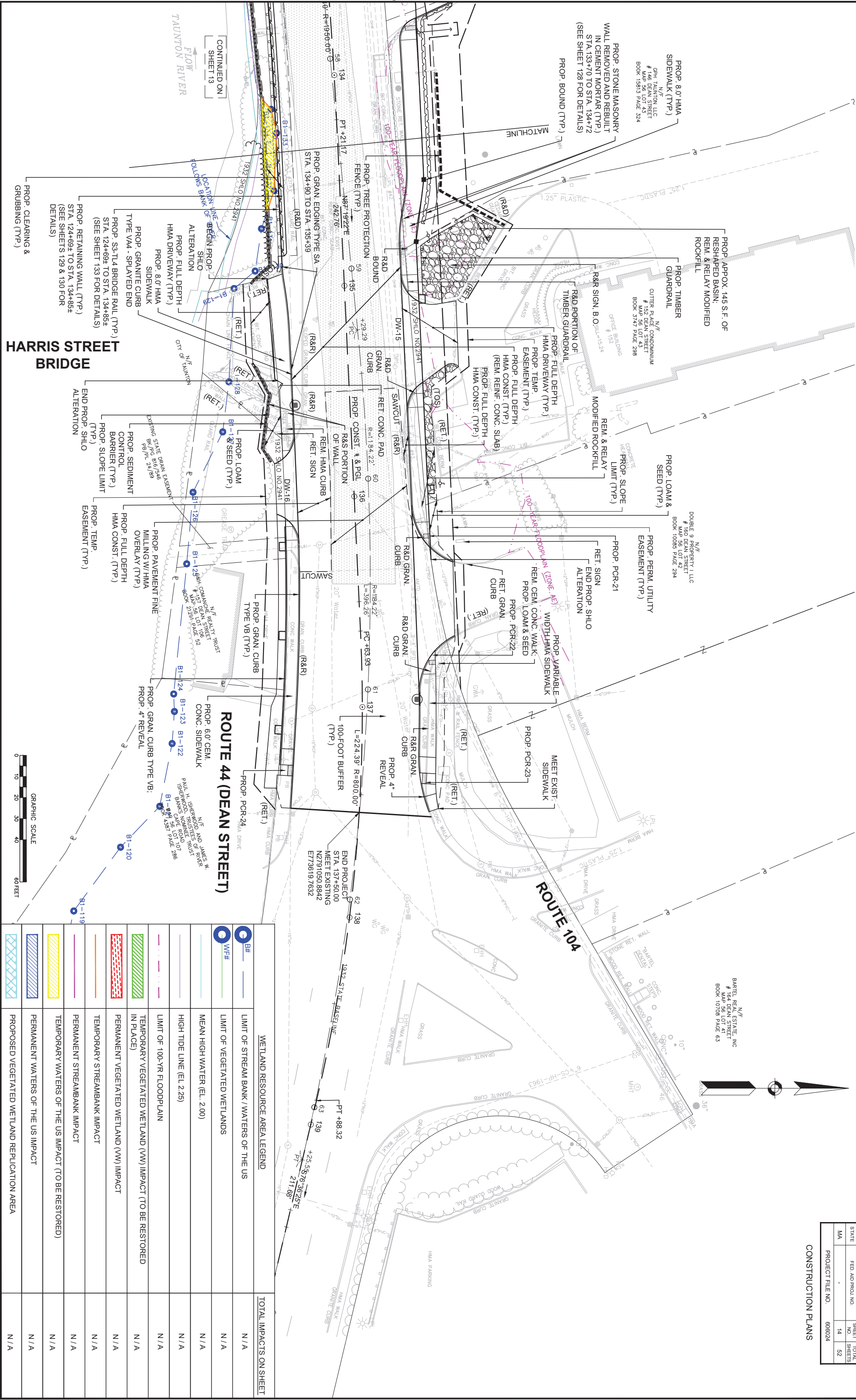
DRAINAGE DETAILS

SEE SHEET 64

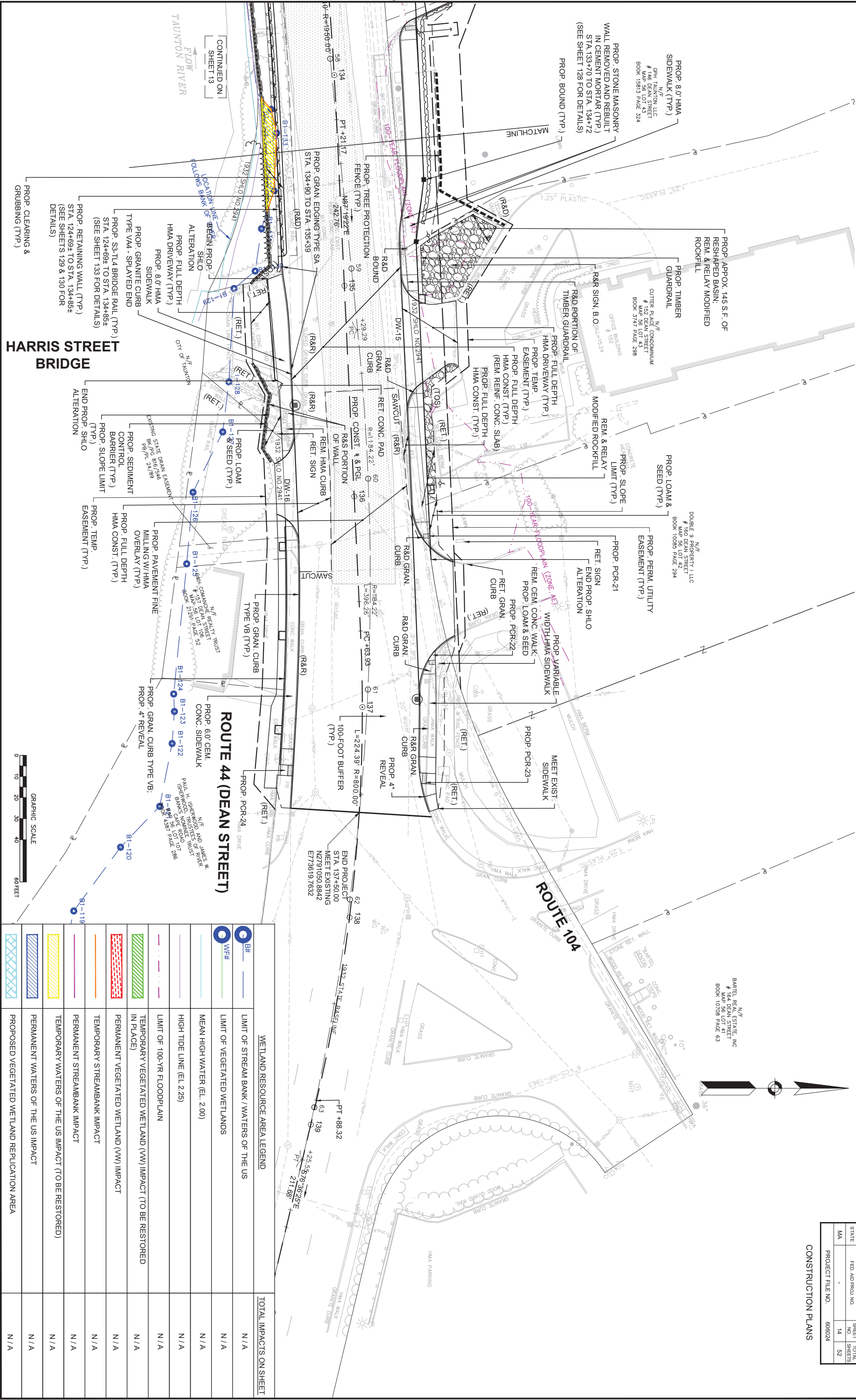
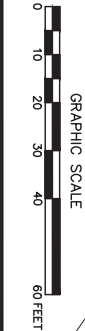
TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	52
PROJECT FILE NO.		606024	

CONSTRUCTION PLANS



HARRIS STREET  
BRIDGE





HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

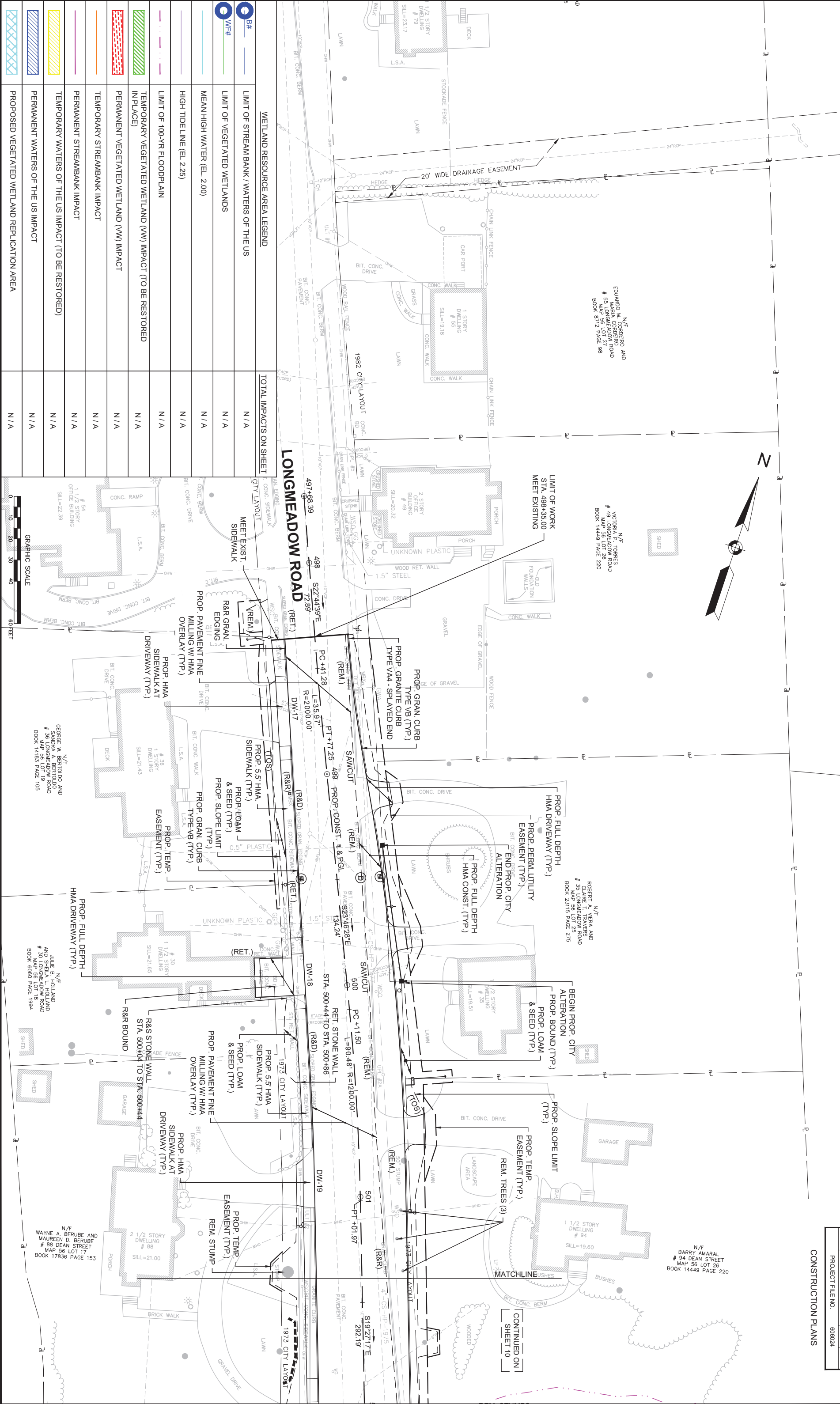
DRAINAGE DETAILS

SEE SHEET 65

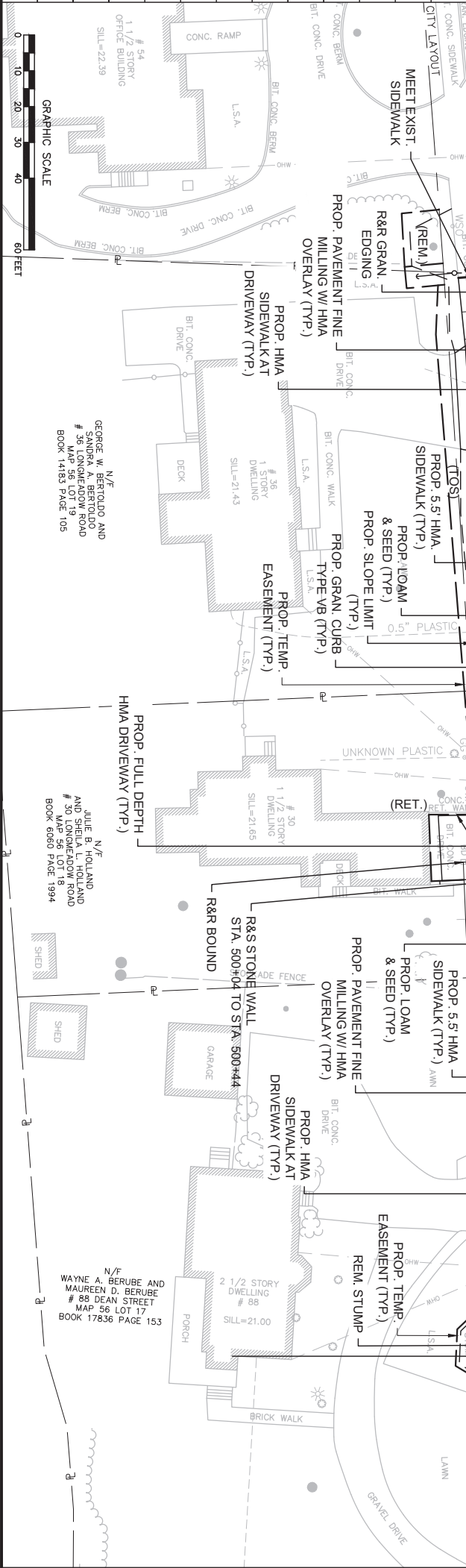
TAUNTON  
ROUTE 44 (DEAN STREET)

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MA	-	15	52
PROJECT FILE NO.		606024	

CONSTRUCTION PLANS

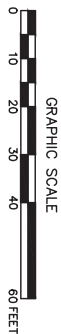



WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
	LB#	LIMIT OF STREAM BANK / WATERS OF THE US
	WF#	LIMIT OF VEGETATED WETLANDS
		MEAN HIGH WATER (EL. 2.00)
		HIGH TIDE LINE (EL. 2.25)
		LIMIT OF 100-YR FLOODPLAIN
		TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)
		PERMANENT VEGETATED WETLAND (VW) IMPACT
		TEMPORARY STREAMBANK IMPACT
		PERMANENT STREAMBANK IMPACT
		TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)
		PERMANENT WATERS OF THE US IMPACT
		PROPOSED VEGETATED WETLAND REPLICATION AREA





STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	52
PROJECT FILE NO.		606024	

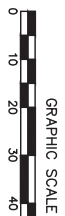
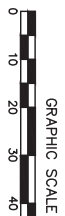


WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
 B#	LIMIT OF STREAM BANK / WATERS OF THE US	N / A
 WF#	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N / A
	PERMANENT VEGETATED WETLAND (VW) IMPACT	N / A
	TEMPORARY STREAMBANK IMPACT	7 LF
	PERMANENT STREAMBANK IMPACT	5 LF
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	154 SF
	PERMANENT WATERS OF THE US IMPACT	102 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N / A

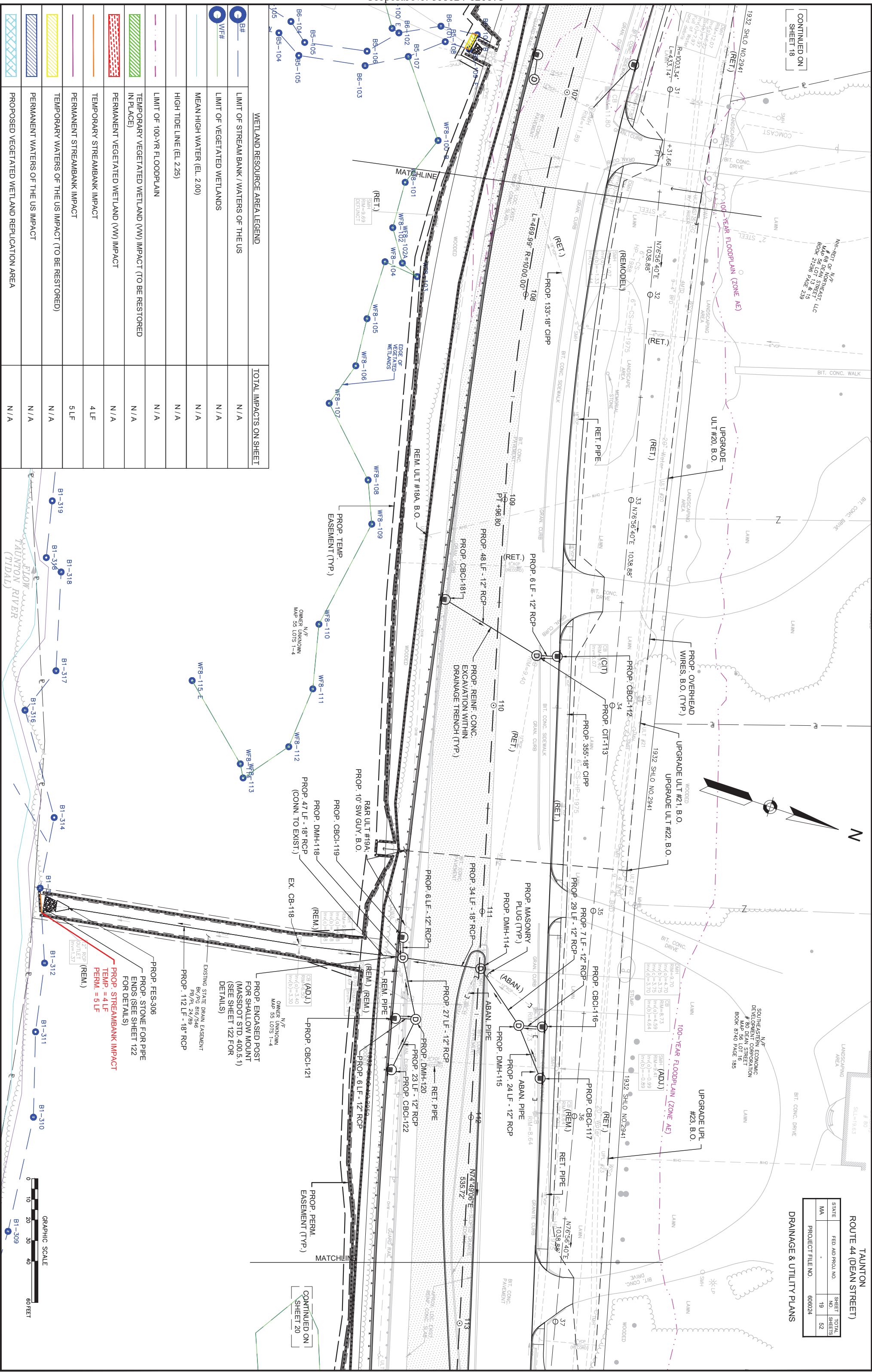














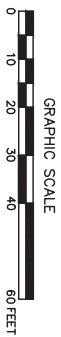




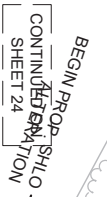
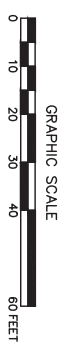


TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	52
PROJECT FILE NO.		606024	







DRAINAGE & UTILITY PLANS

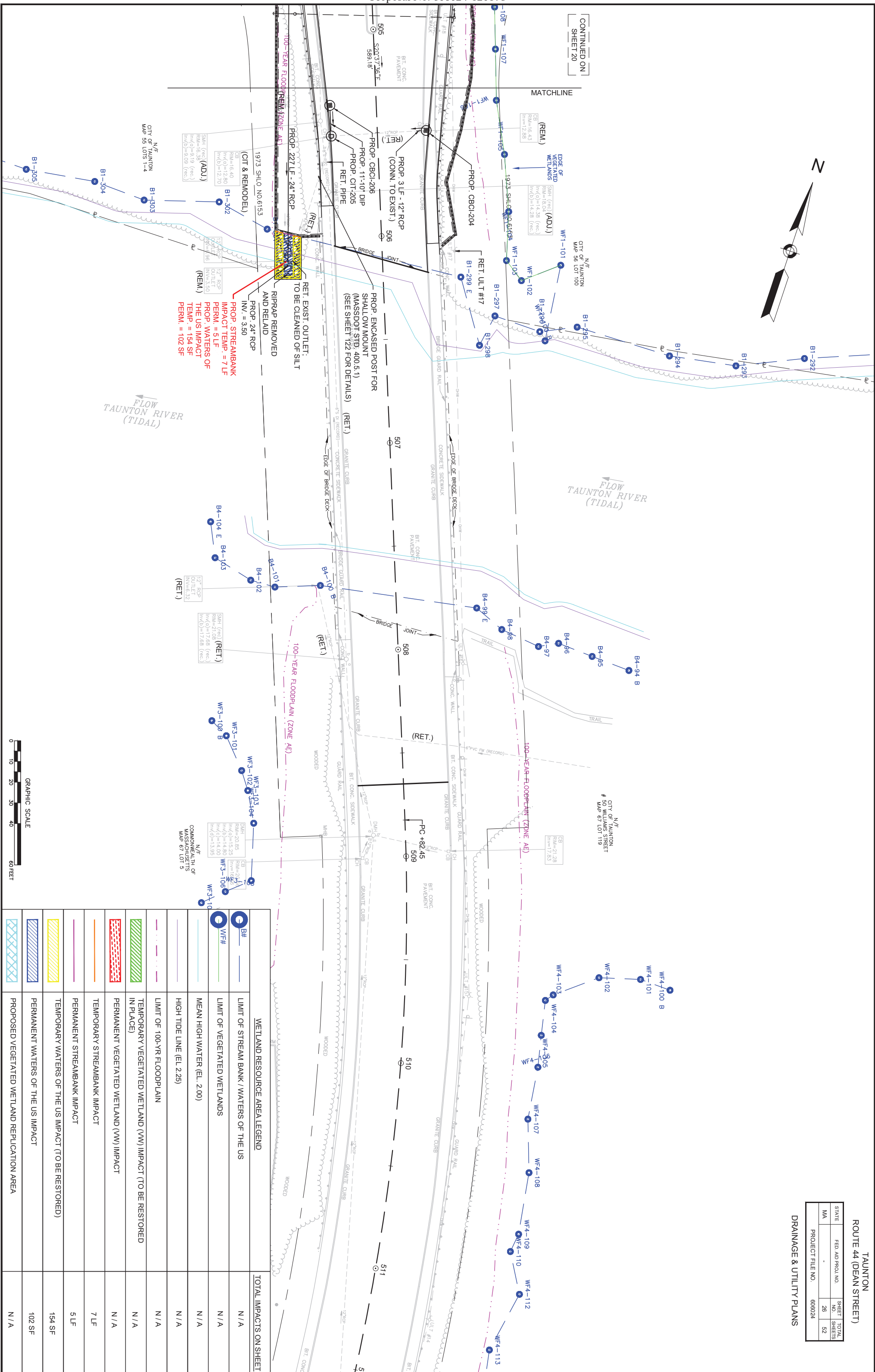














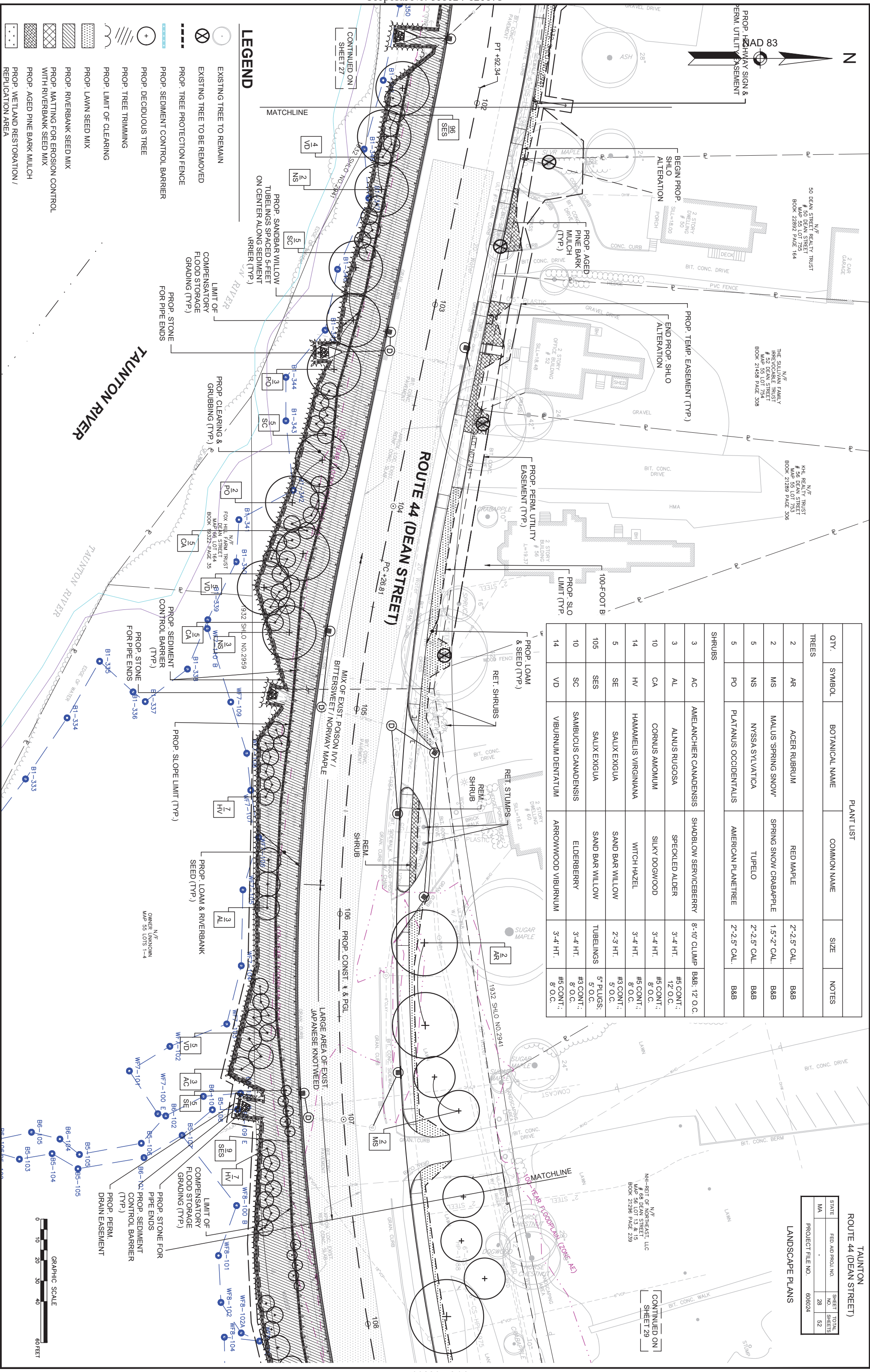




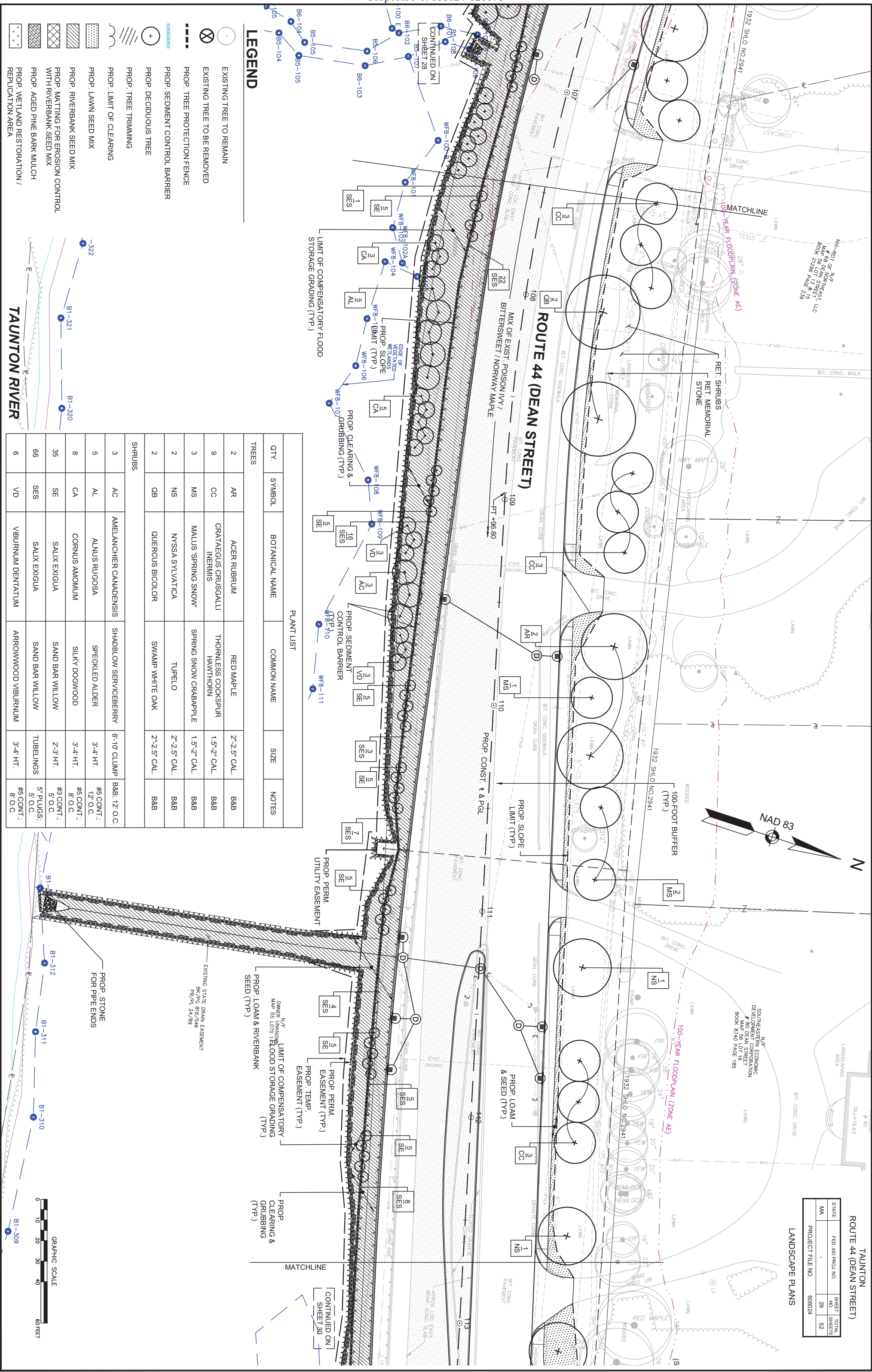
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	28	52
PROJECT FILE NO.		606024	

TAUNTON  
ROUTE 44 (DEAN STREET)

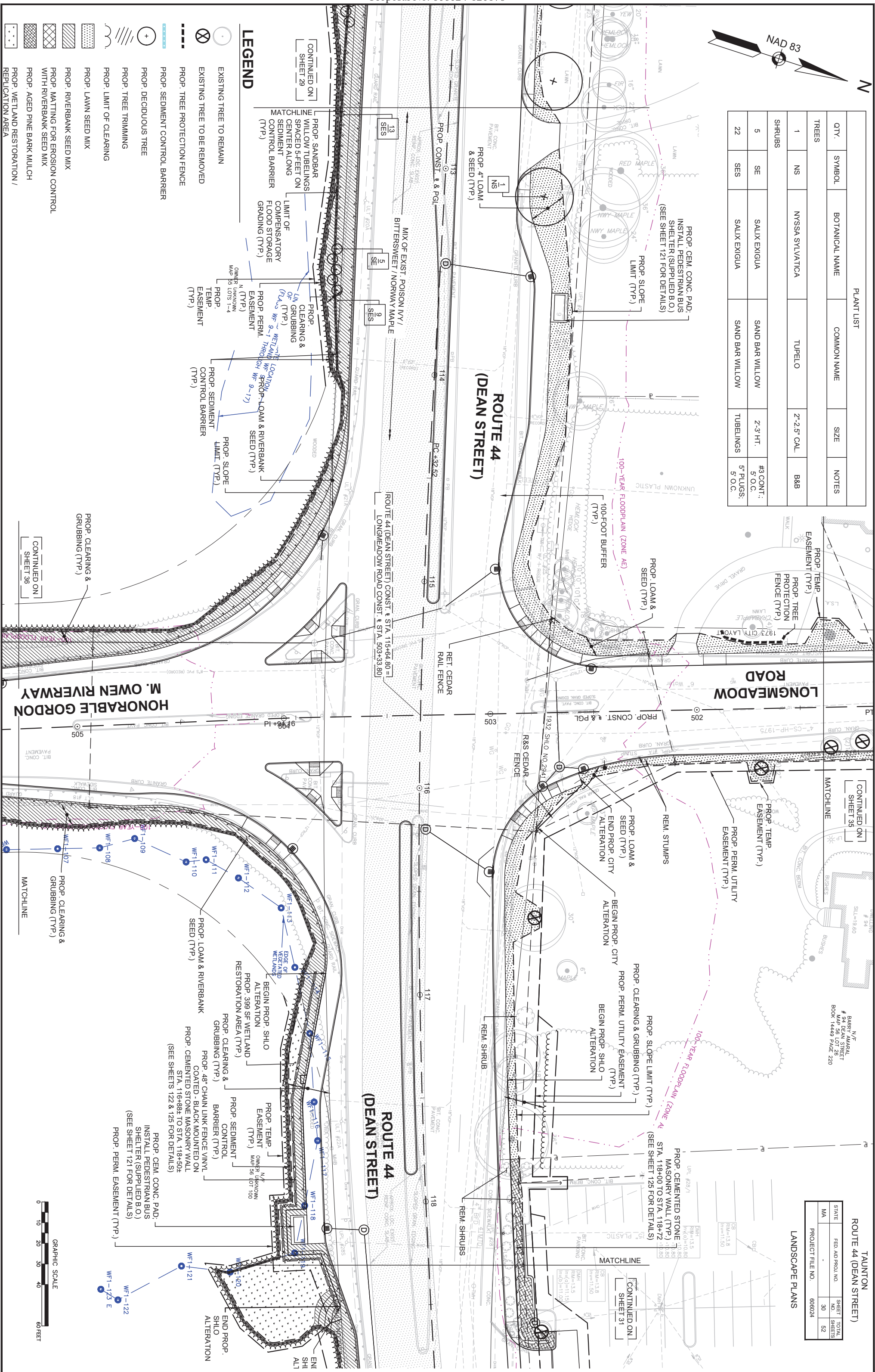
## LANDSCAPE PLANS

















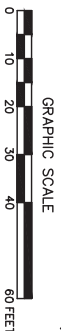


GRAPHIC SCALE

A horizontal scale bar with alternating black and white segments. The segments are labeled with numbers: 0, 10, 20, 30, 40, and 60 FEET. The bar is divided into segments of varying lengths, with the final segment from 40 to 60 feet being the longest.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	32	52
PROJECT FILE NO.		606024	











TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	35	52
PROJECT FILE NO.		606024	

LANDSCAPE PLANS

N/F  
BARRY AMARAL  
# 94 DEAN STREET  
MAP 56 LOT 26  
BOOK 14449 PAGE 220

N/F  
ROBERT A. VERA AND  
CLAIRE T. TRAVERS  
# 35 LONGMEADOW ROAD  
MAP 55 LOT 25  
BOOK 23115 PAGE 275

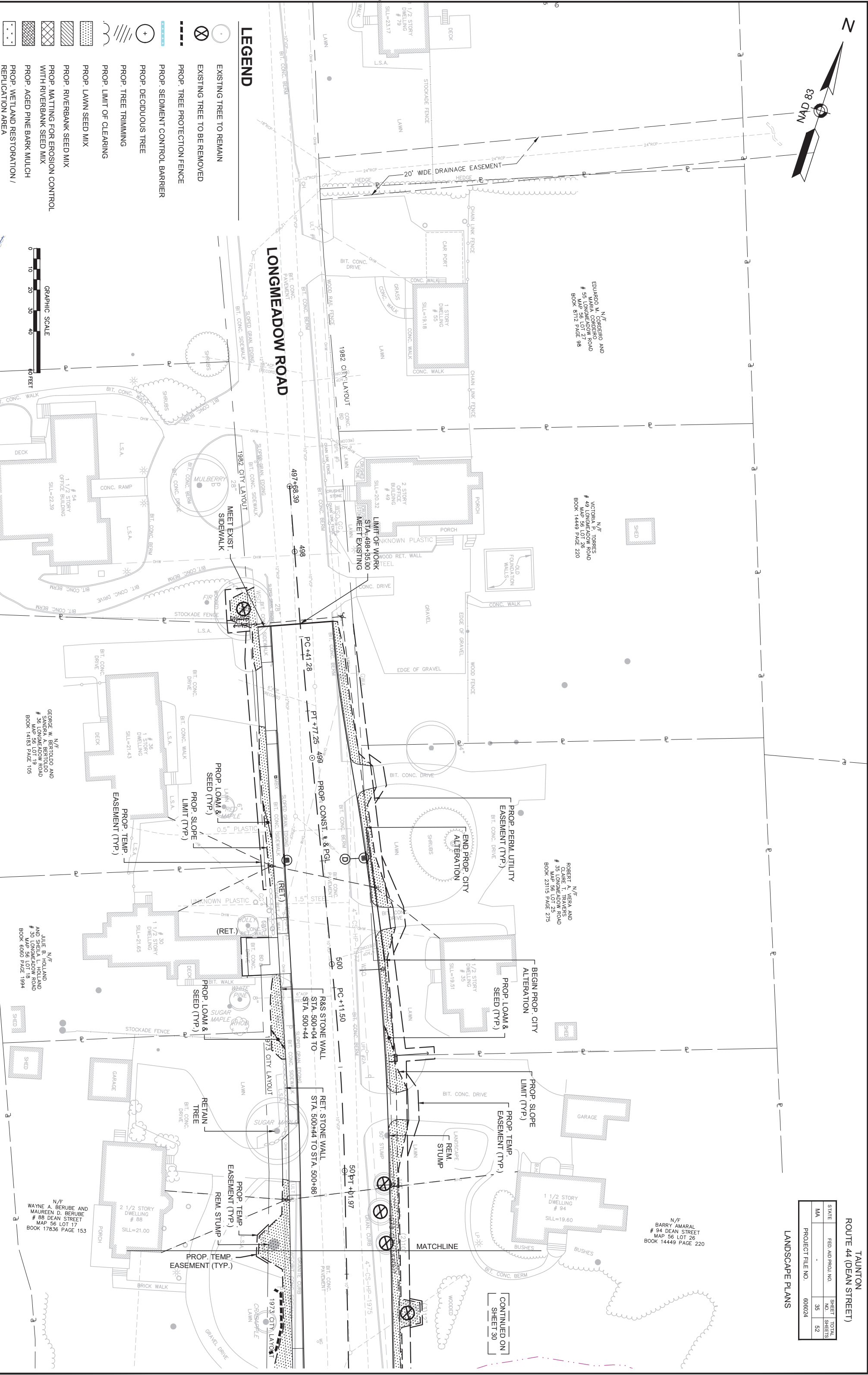
N/F  
EDUARDO M. GONZALEZ  
# 55 LONGMEADOW ROAD  
MAP 55 LOT 27  
BOOK 6712 PAGE 98

N/F  
VICTORIA P. TORRES  
# 49 LONGMEADOW ROAD  
MAP 55 LOT 27  
BOOK 14449 PAGE 220

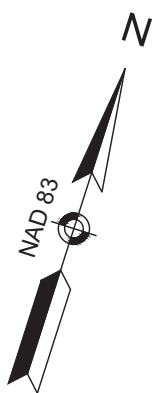
- LEGEND**
- EXISTING TREE TO REMAIN
  - EXISTING TREE TO BE REMOVED
  - PROP. TREE PROTECTION FENCE
  - PROP. SEDIMENT CONTROL BARRIER
  - PROP. DECIDUOUS TREE
  - PROP. TREE TRIMMING
  - PROP. LIMIT OF CLEARING
  - PROP. LAWN SEED MIX
  - PROP. RIVERBANK SEED MIX
  - PROP. MATTING FOR EROSION CONTROL WITH RIVERBANK SEED MIX
  - PROP. AGED PINE BARK MULCH
  - PROP. WETLAND RESTORATION / REPLICATION AREA

GRAPHIC SCALE

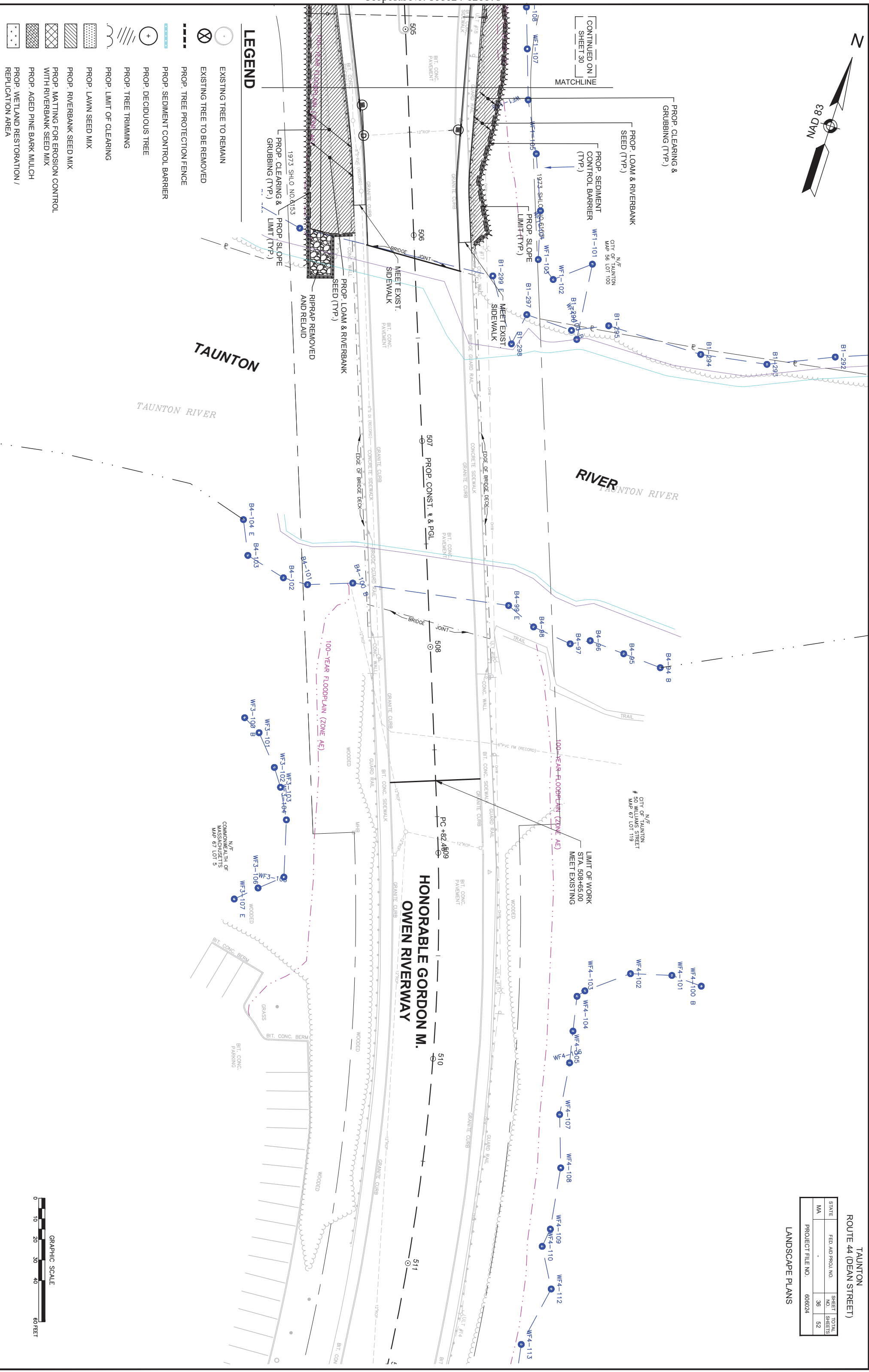
0 10 20 30 40 60 FEET







TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	52
PROJECT FILE NO.		606024	

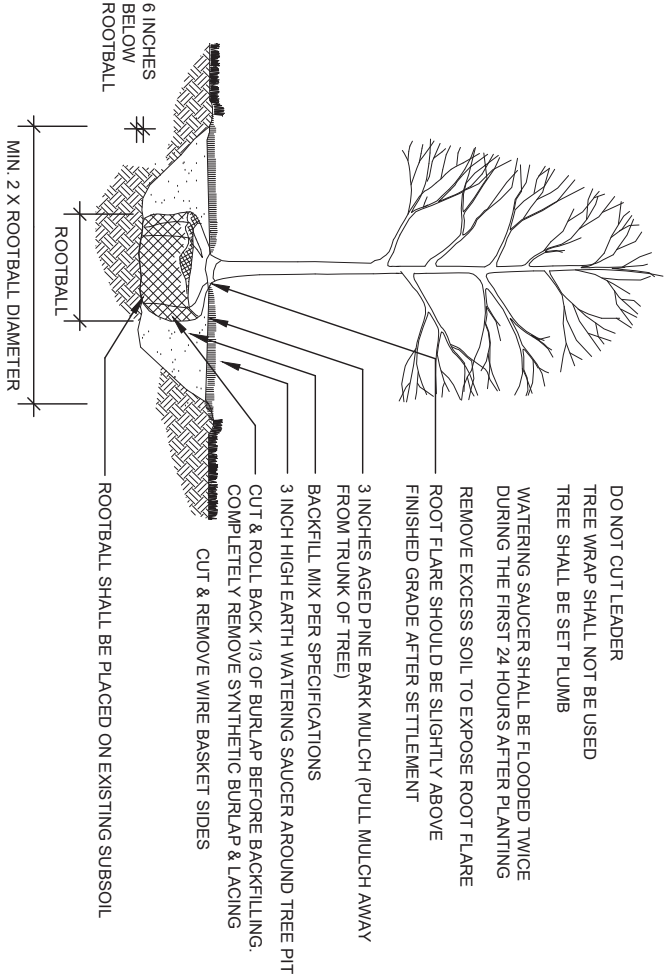




STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	52
PROJECT FILE NO.		606024	

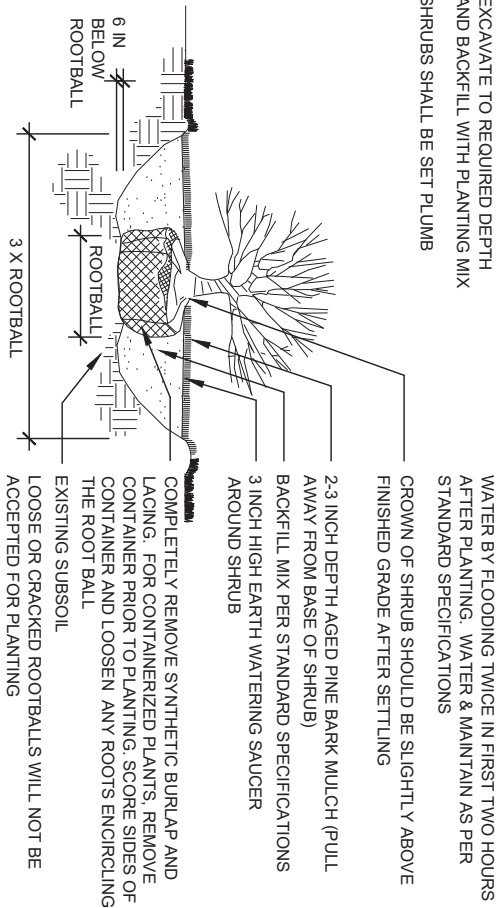
LANDSCAPE DETAILS

MASTER PLANT LIST												
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	SHT 101	SHT 102	SHT 103	SHT 104	SHT 106	SHT 107	SHT 108
TREES												
4	AR	ACER RUBRUM	RED MAPLE	2'-2.5' CAL.	B&B	-	2	2	-	-	-	-
8	RM	ACER RUBRUM	RED MAPLE	5'-7' HT.	#10 CONT.	-	-	-	-	6	1	1
9	CC	CRATAEGUS CRUS-GALLI INERMIS	THORNLESS COCKSPUR HAWTHORN	1.5"-2" CAL.	B&B	-	-	9	-	-	-	-
5	MS	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	1.5"-2" CAL.	B&B	-	2	3	-	-	-	-
9	NS	NYSSA SYLVATICA	TUPELO	2'-2.5' CAL.	B&B	1	5	2	1	-	-	-
5	PO	PLATANUS OCCIDENTALIS	AMERICAN PLANETREE	2'-2.5' CAL.	B&B	-	5	-	-	-	-	-
2	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2'-2.5' CAL.	B&B	-	-	2	-	-	-	-
2	SN	SALIX NIGRA	BLACK WILLOW	5'-7' HT.	#10 CONT.	-	-	-	-	1	1	-
SHRUBS												
6	AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	8'-10' CLUMP	B&B; 12' O.C.	-	3	3	-	-	-	-
8	AL	ALNUS RUGOSA	SPECKLED ALDER	3'-4' HT.	#5 CONT.; 12' O.C.	-	3	5	-	-	-	-
9	CO	CEPHALANTHUS OCCIDENTALIS	COMMON BUTTONBUSH	3'-4' HT.	#3 CONT.; 8' O.C.	-	-	-	-	-	9	-
30	CA	CORNUS AMOMUM	SILKY DOGWOOD	3'-4' HT.	#5 CONT.; 8' O.C.	-	10	8	-	6	6	-
14	HV	HAMAMELIS VIRGINIANA	WITCH HAZEL	3'-4' HT.	#5 CONT.; 8' O.C.	-	14	-	-	-	-	-
66	SE	SALIX EXIGUA	SAND BAR WILLOW	2'-3' HT.	#3 CONT.; 5' O.C.	-	5	35	5	8	13	-
197	SES	SALIX EXIGUA	SAND BAR WILLOW	TUBELINGS	5" PLUGS; 5' O.C.	4	105	66	22	-	-	-
15	SC	SAMBUCUS CANADENSIS	ELDERBERRY	3'-4' HT.	#3 CONT.; 8' O.C.	-	10	-	-	5	-	-
21	VD	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	3'-4' HT.	#5 CONT.; 8' O.C.	1	14	6	-	-	-	-
VINES												
45	PQ	PARTHENOISSUS QUINQUEFOLIA	VIRGINIA CREEPER	#1 CONT.	AT BASE OF WALL	-	-	-	-	18	27	-



DECIDUOUS TREE PLANTING

NOT TO SCALE

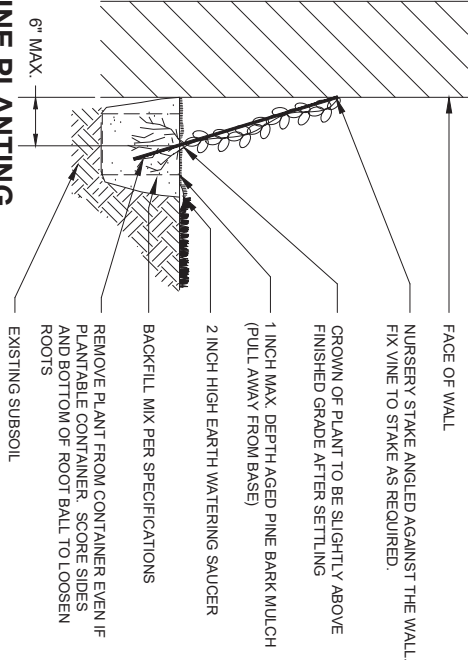


SHRUB PLANTING

NOT TO SCALE

SEEDING SCHEDULE			
LEGEND	TYPE	SUB TYPE	NOTES
	LAWN SEED MIX	LAWNS OR SLOPES AND SHOULDERS - M6.03.0	FOR USE IN YARDS AND SHOULDERS FREQUENTLY MOWN. (SEED OVER 4" LOAM FOR LAWNS)
	RIVERBANK SEED MIX	PART SHADE	FOR USE IN NO MOW / INFREQUENTLY MOWN AREAS; RIVERBANK SEED SHALL BE BROADCAST MANUALLY. (SEED AND COVER CROP OVER 4" LOAM FOR ROADSIDES)
	* WETLAND SEED MIX	PART SHADE	FOR USE IN WETLAND RESTORATION & REPLICATION AREAS. REFER TO SPECIAL PROVISIONS.

\* INCIDENTAL TO WETLAND RESTORATION & MITIGATION AREAS



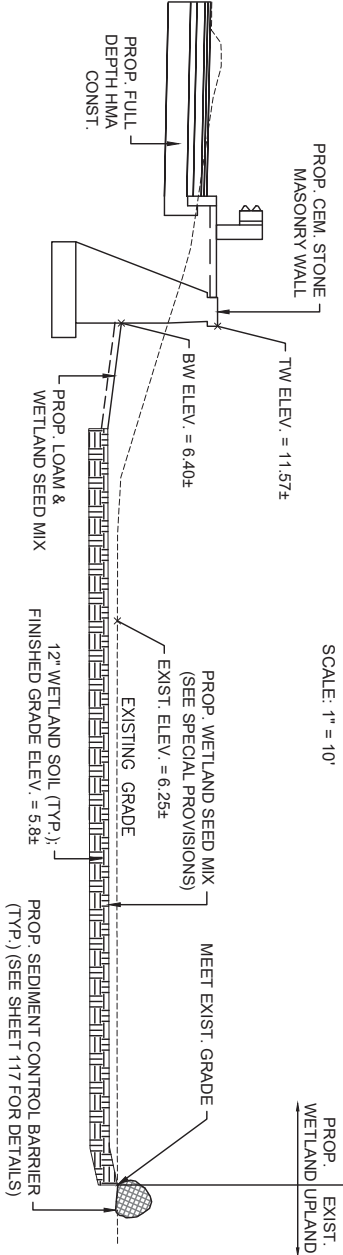
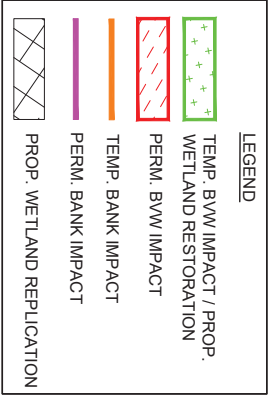
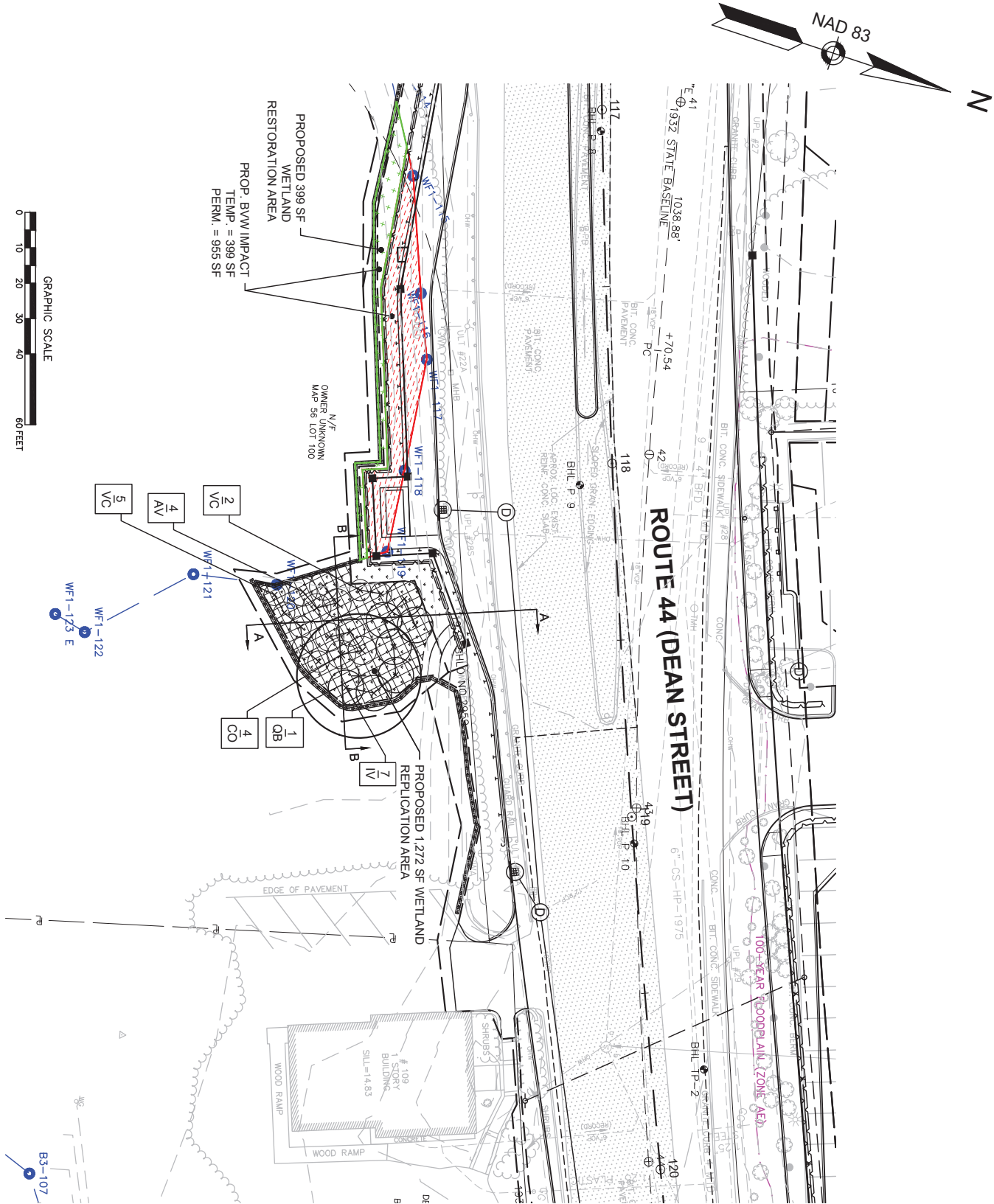
VINE PLANTING

NOT TO SCALE



TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	38	52
PROJECT FILE NO.		606024	

WETLAND REPLICATION PLAN AND DETAIL



## NOTES: WETLAND AND ACCESS ROUTE

PRIOR TO ENGAGING IN CONSTRUCTION ACTIVITIES RELATED TO THE REPLACEMENT WETLAND, THE CONTRACTOR SHALL BE REQUIRED TO MEET WITH THE WETLAND SPECIALIST TO REVIEW ANY SPECIAL CONSTRUCTION AND EROSION CONTROL REQUIREMENTS. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED SUCH THAT EXCAVATED WETLAND SOIL SHALL BE RELOCATED AS QUICKLY AS POSSIBLE.

TO MINIMIZE THE DISTURBANCE OF VEGETATION, THE CONTRACTOR SHALL USE SMALL CONSTRUCTION EQUIPMENT (LESS THAN 9000 LBS OPERATING WEIGHT) AND HAND METHODS AS APPROVED BY THE WETLAND SPECIALIST AND AS DIRECTED BY THE ENGINEER.

ALL TREES CUT FOR WETLAND REPLICATION SHALL BE RE-USED ON SITE FOR RESTORATION PURPOSES. CUT TREES SHALL BE RE-LAID WITHIN THE WETLAND / DISTURBED AREA PER THE DIRECTION OF THE WETLAND SPECIALIST.

WETLAND SPECIALIST SHALL LOCATE PLANTS IN WETLAND REPLICATION AREA. RESTORATION AREA AS APPROPRIATE TO BEST PROTECT AND RESTORE DISTURBED AREA. COMPOST TOPSOIL SHALL BE USED IN LIEU OF MULCH.

APPLY WETLAND SEED MIX TO WETLAND REPLICATION AREA AS WELL AS WETLAND RESTORATION AREAS.

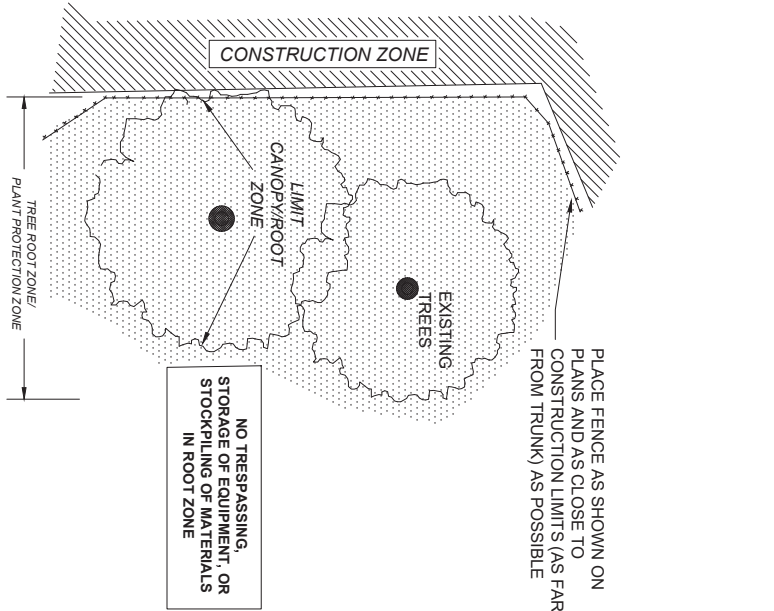
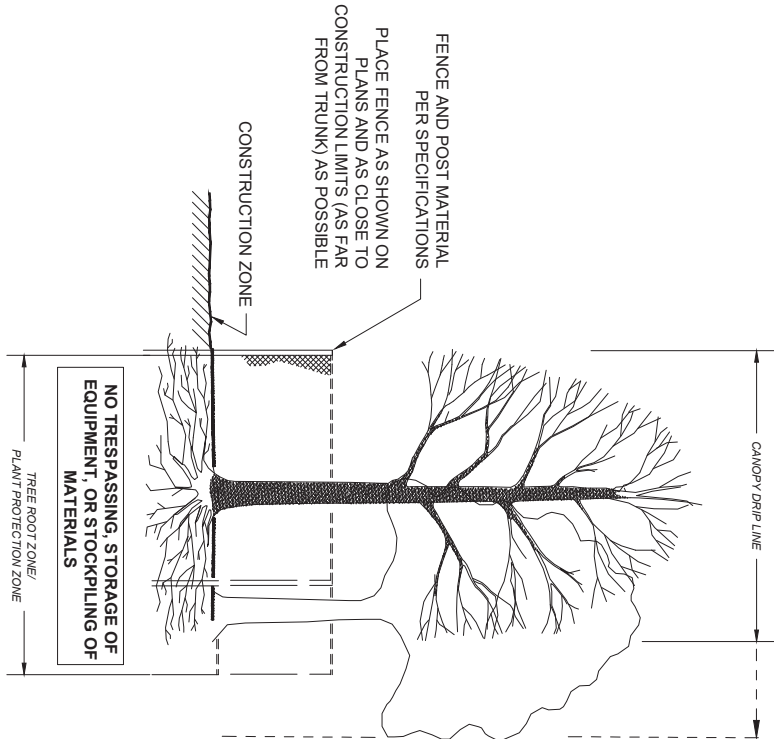
COMPOST FILTER TUBES SHALL BE 100% BIODEGRADABLE AND LEFT IN PLACE AT THE CONCLUSION OF WETLAND REPLICATION CONSTRUCTION. ANY NONBIODEGRADABLE MATERIAL, IF USED, SHALL BE REMOVED AND DISPOSED OF OFF SITE AT CONTRACTOR'S EXPENSE.

*WETLAND REPLICATION PLANT SCHEDULE				
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	NOTES
6	IV	ILEX VERTICILLATA	COMMON WINTERBERRY (FEMALE)	10' O.C.
1	IV	ILEX VERTICILLATA	COMMON WINTERBERRY (MALE)	10' O.C.
1	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	#15 CONT.
21	VC	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	6' O.C.

\*WETLAND PLANTS ARE INCIDENTAL TO INLAND WETLAND REPLICATION AREAS

LEGEND	
	PROP. SEDIMENT CONTROL BARRIER
	PROP. DECIDUOUS TREE
	PROP. SHRUB
	PROP. WETLAND SEED MIX





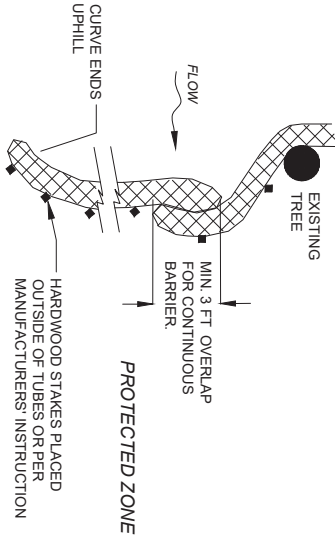
TAUNTON ROUTE 44 (DEAN STREET)				
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	-	39	52	
PROJECT FILE NO.		606024		

CONSTRUCTION DETAILS

SECTION - FENCE PROTECTION OF ROOT ZONE

TREE PROTECTION - ROOT ZONE

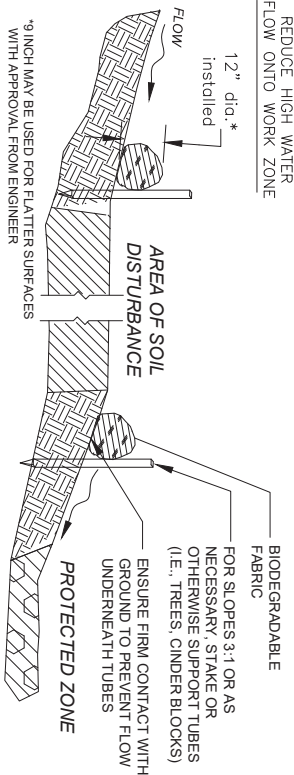
NOT TO SCALE



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.  
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLAN VIEW

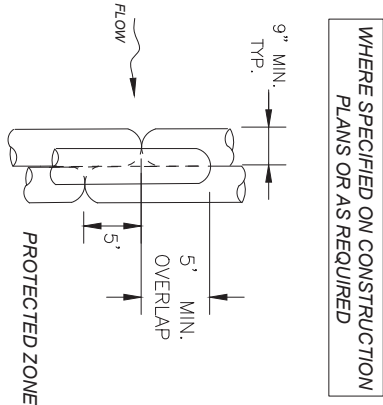
CAPTURE SEDIMENT AND PREVENT FLOW OFF SITE



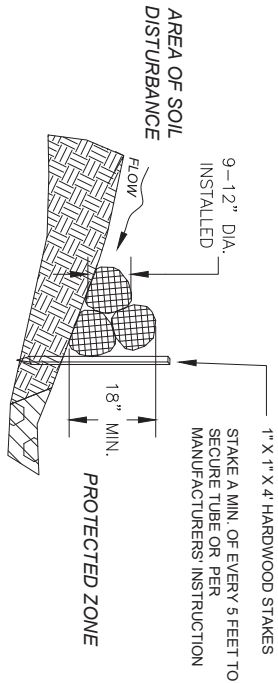
SECTION

SEDIMENT BARRIER - COMPOST FILTER TUBE

NOT TO SCALE



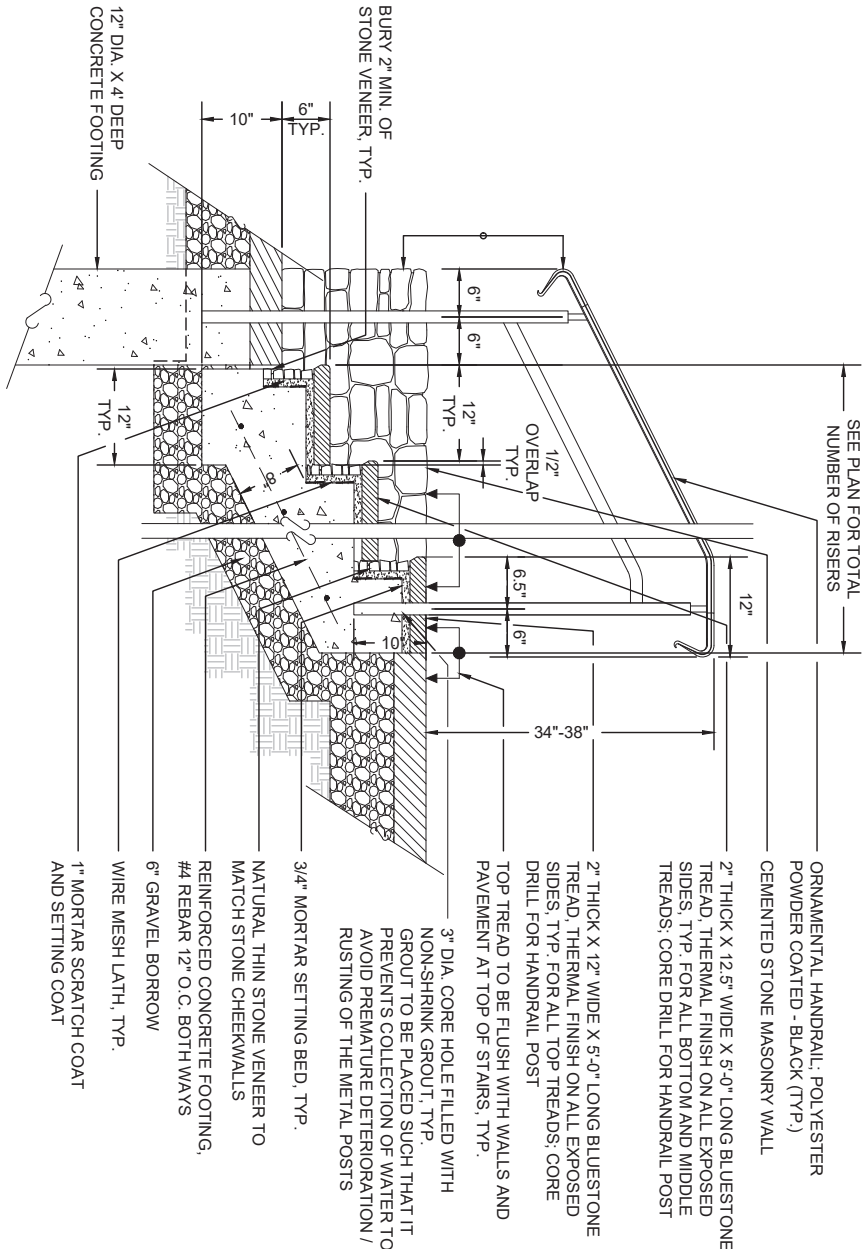
PLAN VIEW



SECTION

COMPOST FILTER TUBES STACKED

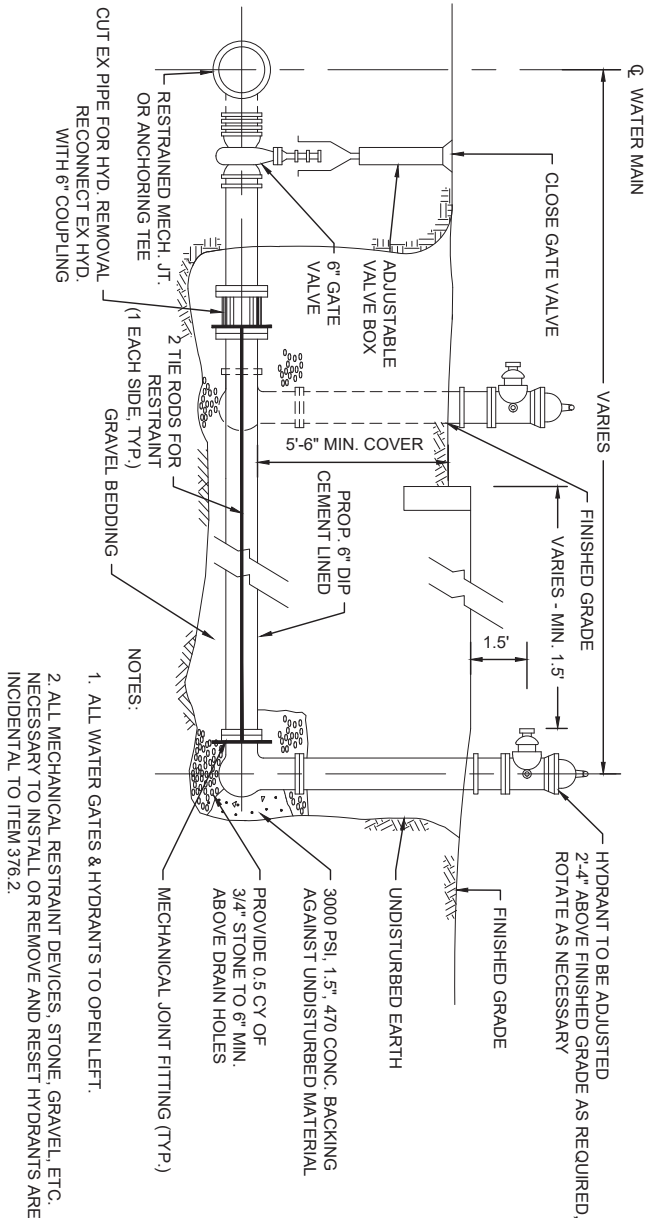
NOT TO SCALE



BLUESTONE STEPS WITH ORNAMENTAL HANDRAILS

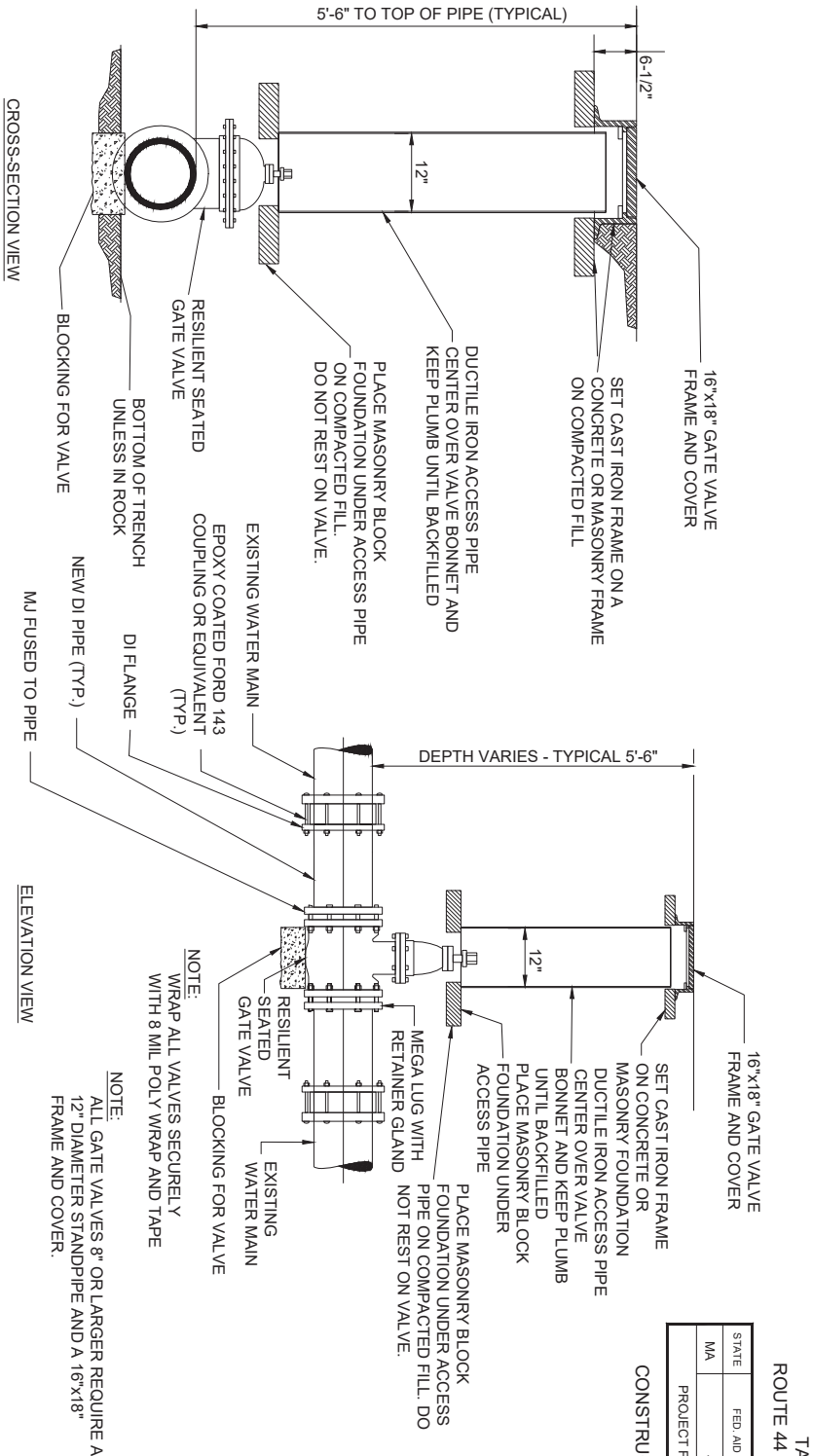
NOT TO SCALE





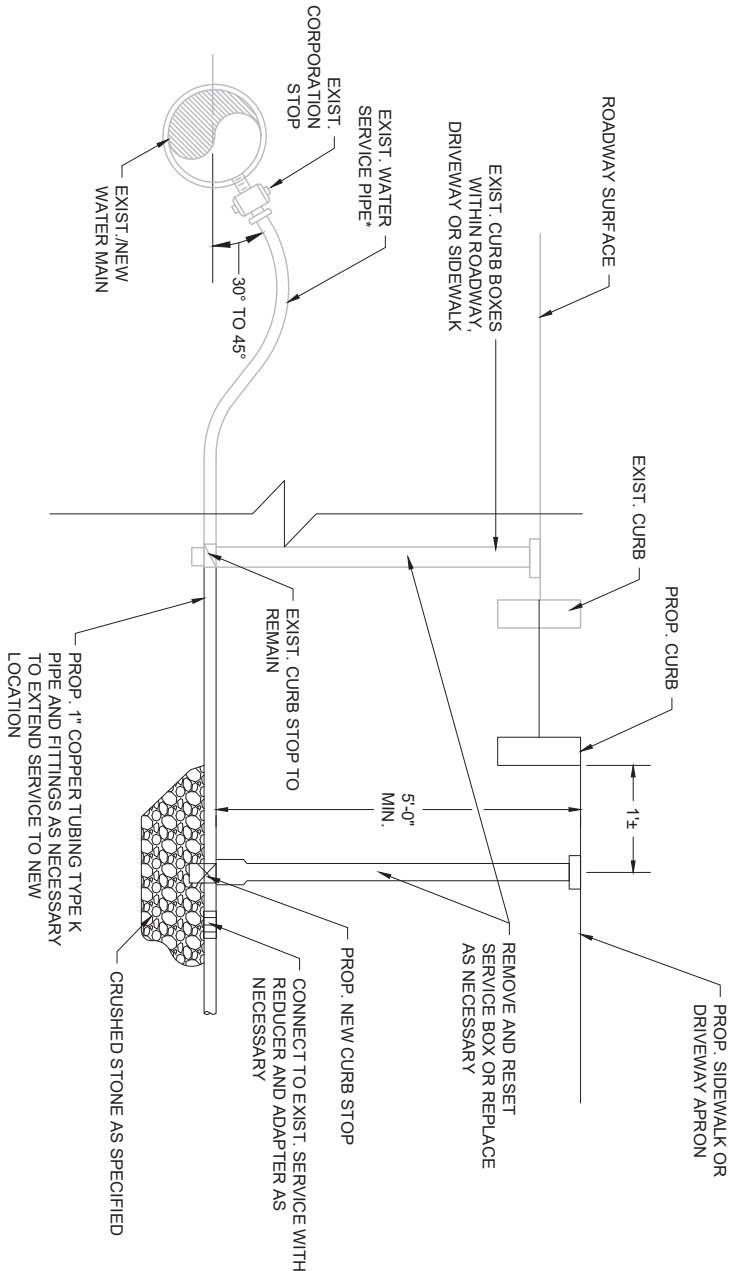
### HYDRANT REMOVED AND RESET

NOT TO SCALE



### TYPICAL GATE VALVE INSTALLATION

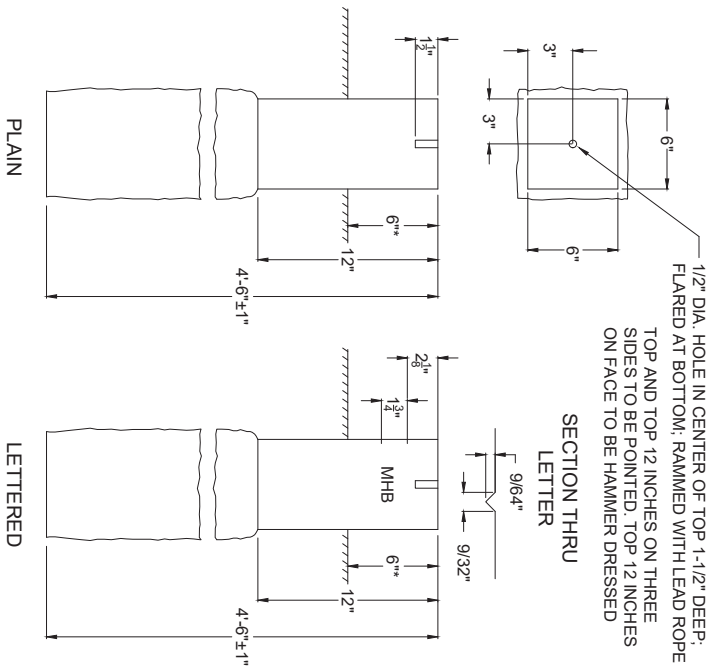
NOT TO SCALE



\* IF EXISTING WATER SERVICE LINE IS NOT COPPER, CONTRACTOR SHALL INFORM TAUNTON WATER DEPARTMENT. NO CONNECTION SHALL BE MADE UNTIL THE TAUNTON WATER DEPARTMENT DETERMINES IF THE EXISTING LINE IS SUITABLE TO BE EXTENDED OR MUST BE REPLACED TO THE MAIN.

### CURB STOP RELOCATION DETAIL

NOT TO SCALE



\* BOUNDS TO BE LOCATED IN LAWNS SHALL BE SET WITH TOP OF BOUND 2" BELOW GROUND LINE. BOUNDS LOCATED IN SIDEWALKS OR DRIVES SHALL BE SET WITH TOP OF BOUND FLUSH WITH THE SURFACE.

NOTES:  
1. FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHODS, SEE STANDARD SPECIFICATIONS.  
2. ALL BOUNDS UTILIZED TO MARK THE STATE HIGHWAY LAYOUT SHALL BE SET AT THE DIRECTION OF THE DISTRICT SURVEY ENGINEER. PRIOR TO COMMENCING THE WORK, THE CONTRACTOR SHALL NOTIFY THE DISTRICT SURVEY ENGINEER TO SCHEDULE THE WORK.

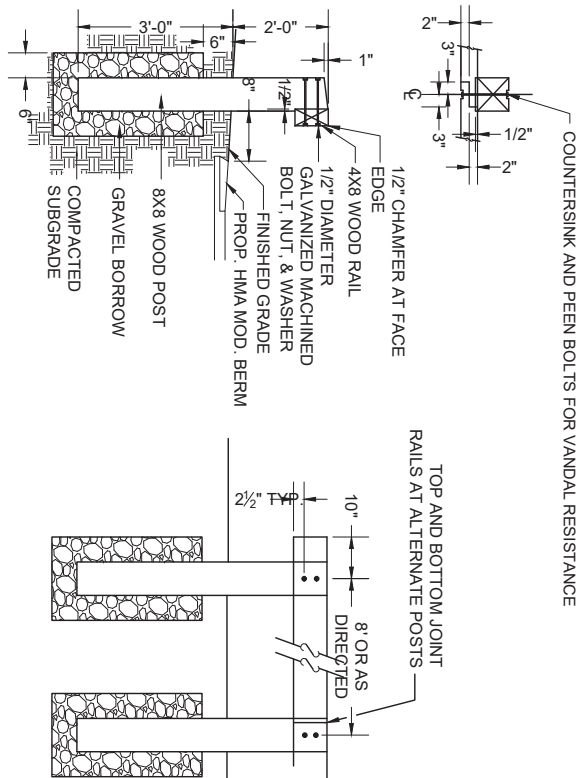
### GRANITE BOUNDS

NOT TO SCALE

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	40	52
PROJECT FILE NO. 006024			

### CONSTRUCTION DETAILS



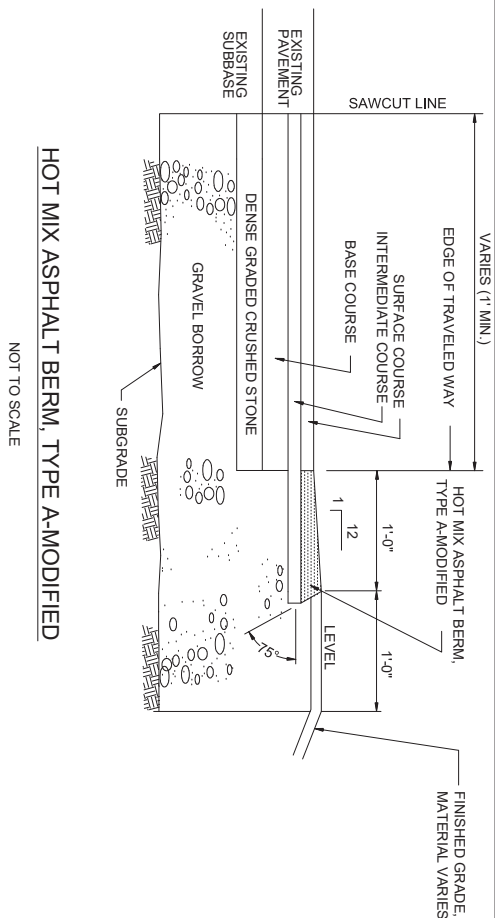


## SECTION

## PROP. TIMBER GUARDRAIL

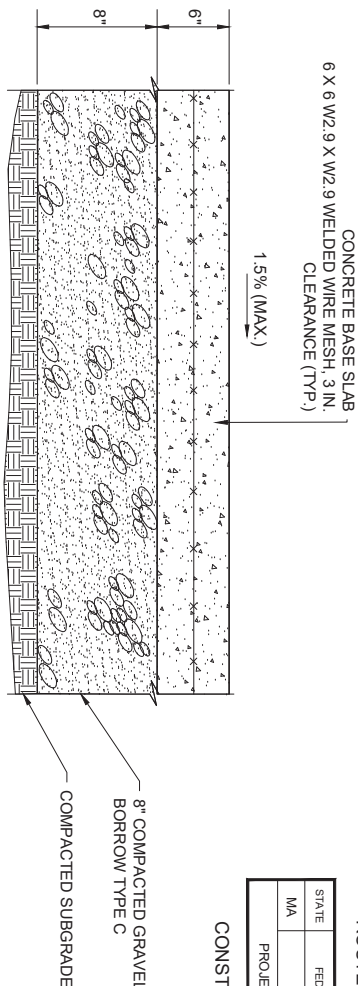
N.T.S.

## FRONT ELEVATION



### HOT MIX ASPHALT BERM, TYPE A-MODIFIED

NOT TO SCALE

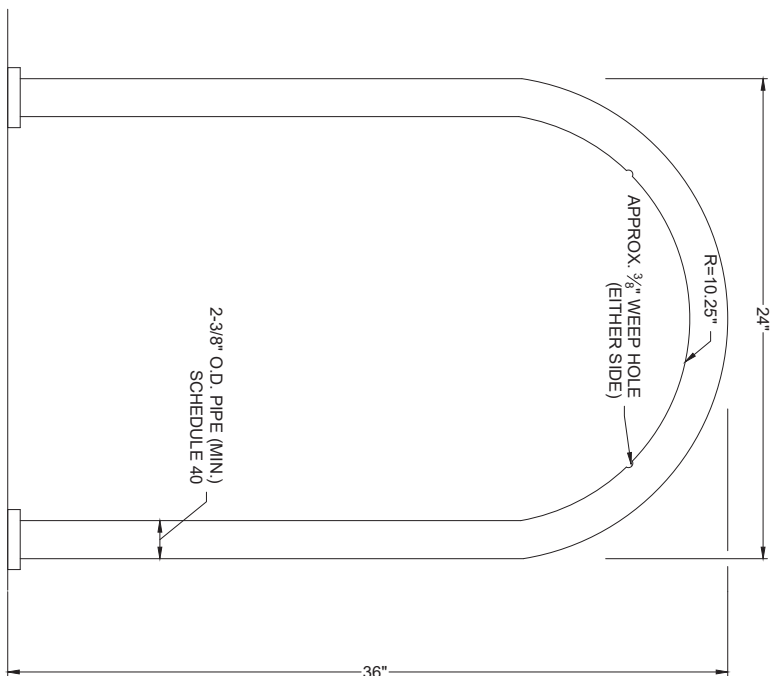


## CEMENT CONCRETE FOUNDATION FOR BIKE RACKS AND BUS SHELTERS

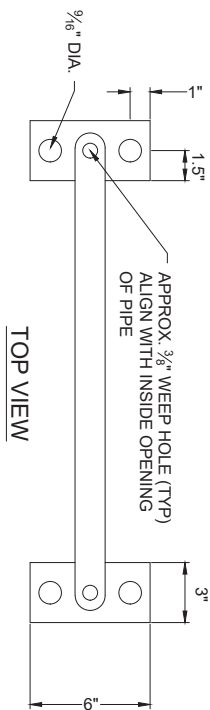
NOT TO SCALE

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	52
PROJECT FILE NO.		606024	

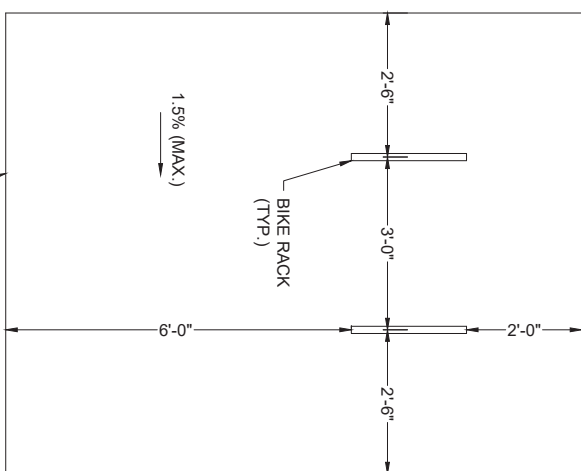
## CONSTRUCTION DETAILS



FRONT VIEW



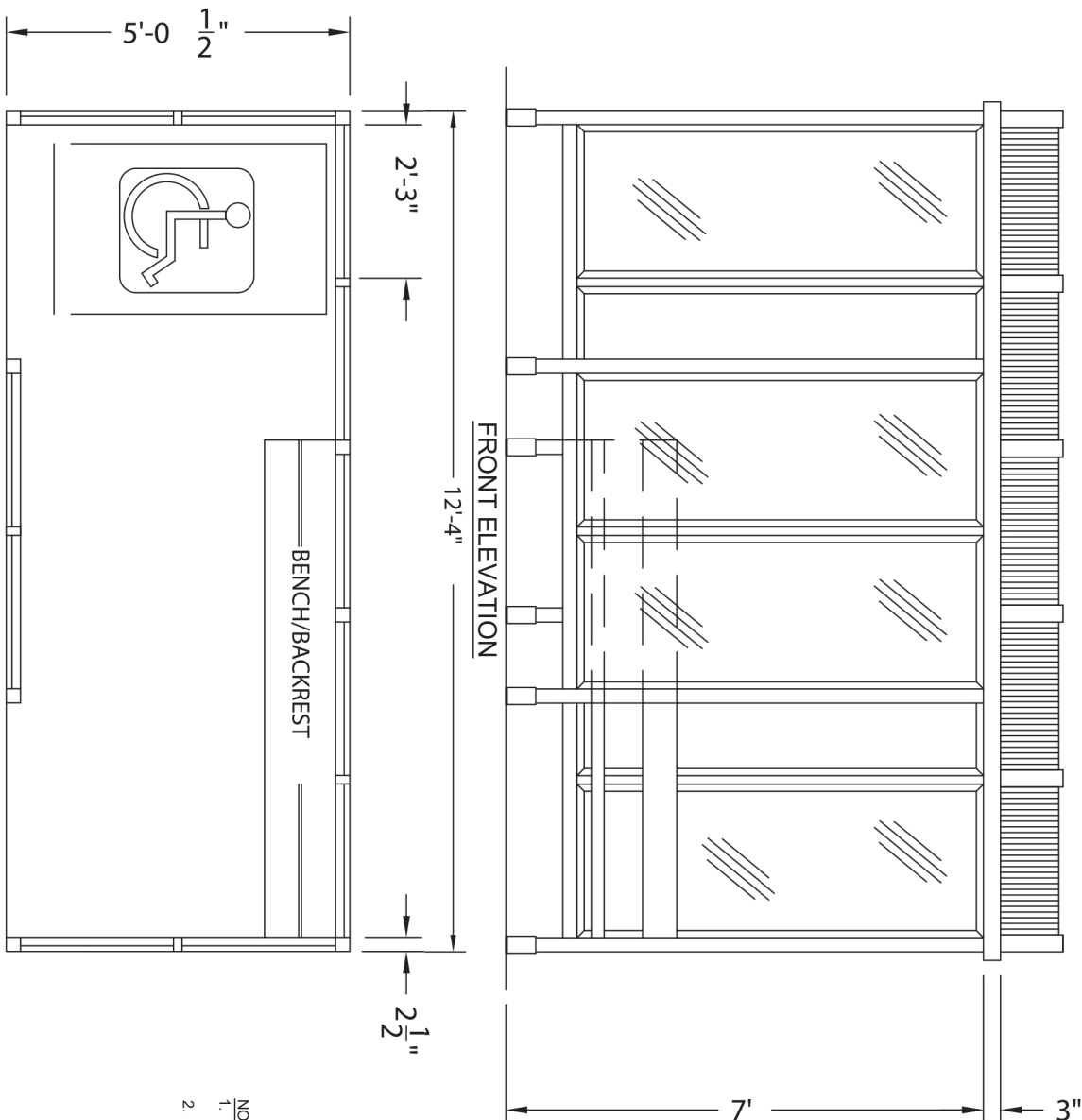
TOP VIEW



## BICYCLE RACK PLACEMENT

- ✓ CEMENT CONCRETE PAD
- NOTES:
1. ALL DIMENSIONS MINIMUM.

- NOTES:**
1. DIMENSIONS ARE APPROXIMATE AND WILL BE DETERMINED IN COORDINATION WITH THE MANUFACTURER. BIKE RACK ELEMENTS TO BE OF THE INVERTED "U" TYPE.



### FRONT ELEVATION

## SIDE ELEVATION

- NOTES:**
1. 12"x4"x5" BARREL ROOF PASSENGER/SMOKING SHELTER LEFT & RIGHT FRONT OPENINGS.
  2. RECOMMENDED PAD SIZE - 14"0"x7'-0"x6" THICK MINIMUM.

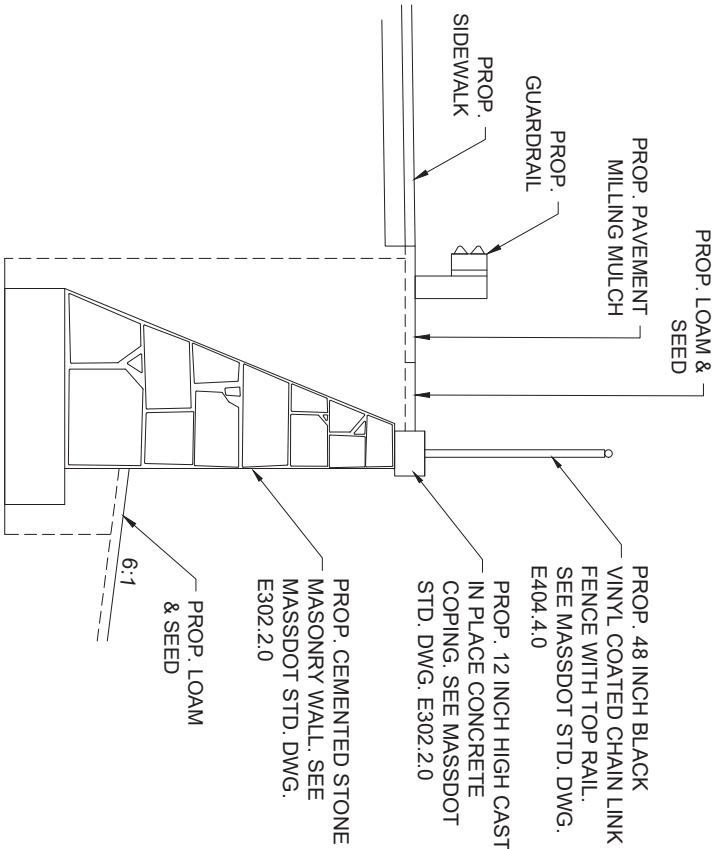
## BICYCLE RACK

NOT TO SCALE

## PEDESTRIAN BUS SHELTER

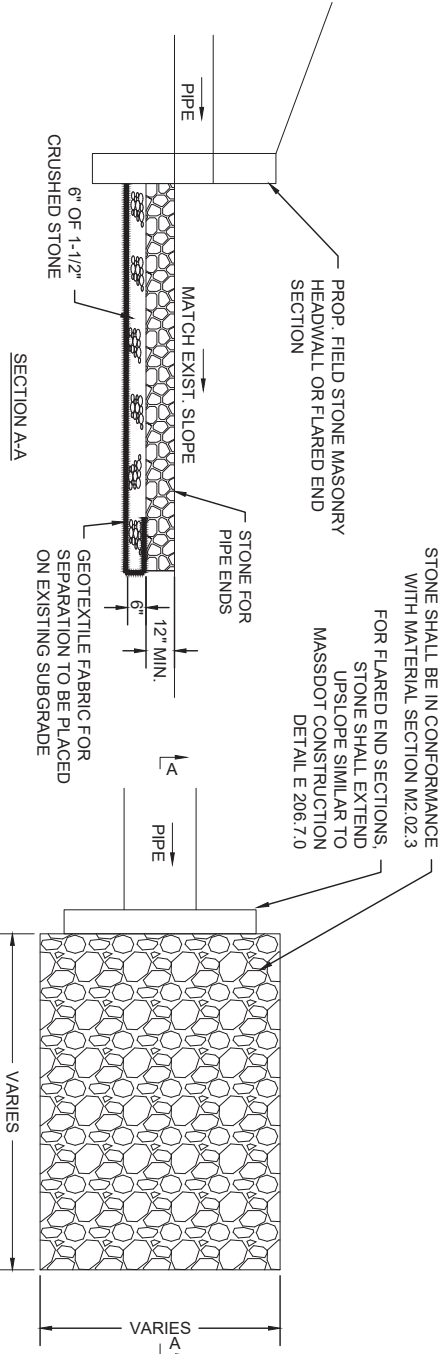
NOT TO SCALE





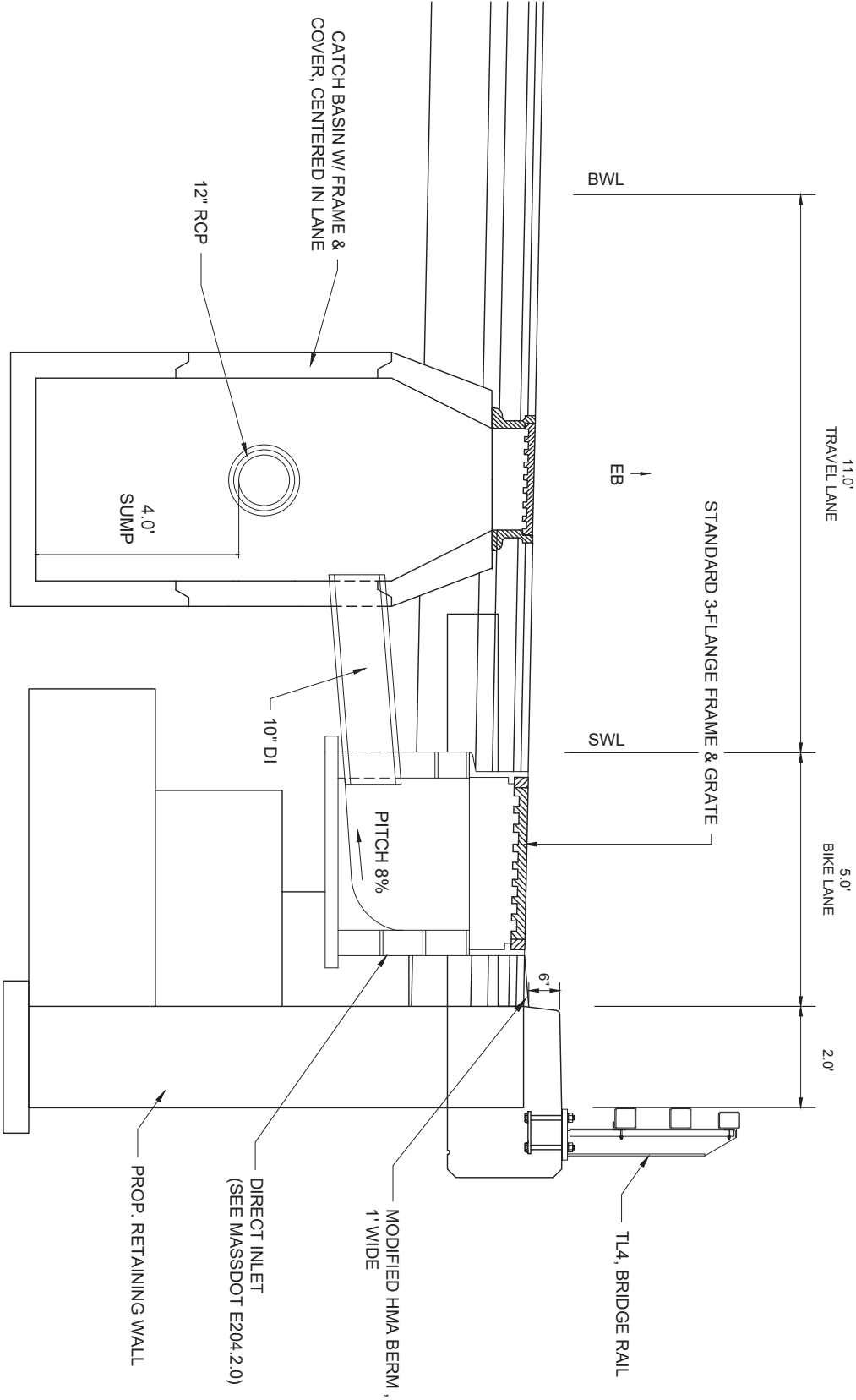
**CHAIN LINK FENCE ATTACHMENT TO RETAINING WALL**

N.T.S.  
STA. 117+18± RT TO STA. 118+50± RT



**STONE FOR PIPE ENDS**

NOT TO SCALE



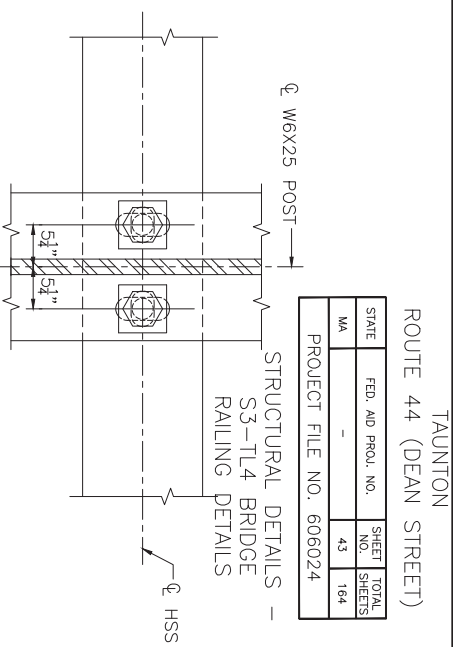
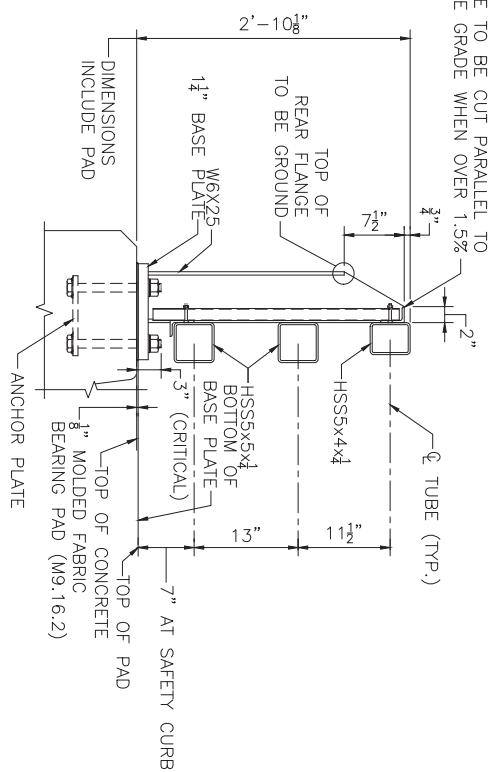
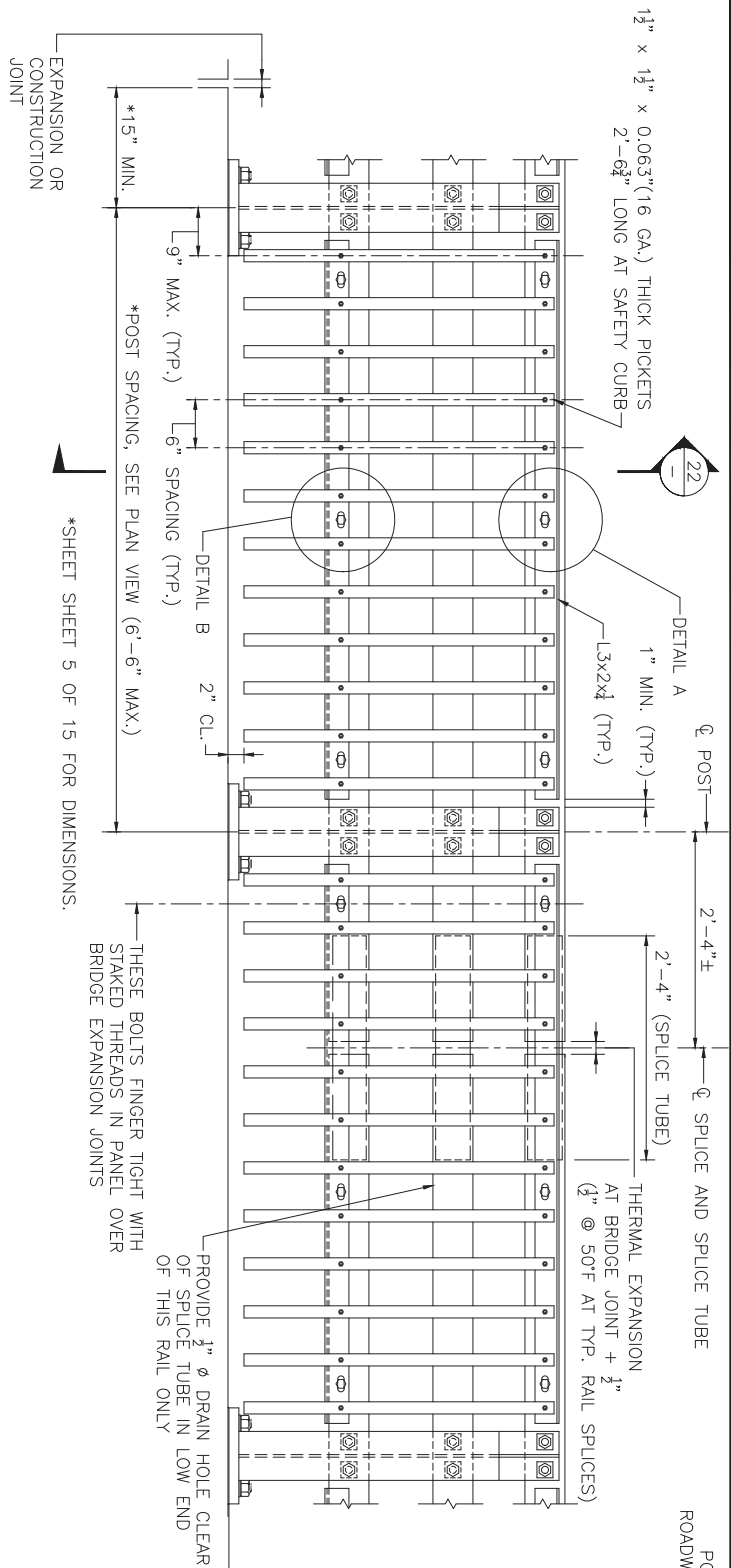
**DIRECT INLET DETAIL AT RETAINING WALL TO AVOID CONFLICTS**

N.T.S.

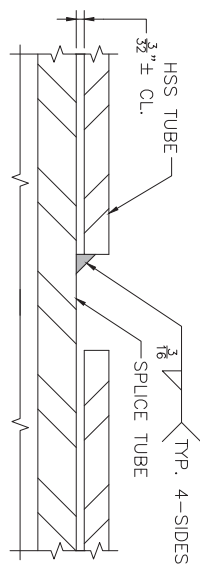
TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	108	52
PROJECT FILE NO. 606024			

**CONSTRUCTION DETAILS**

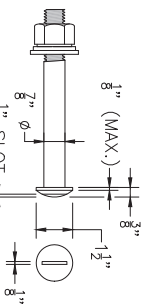




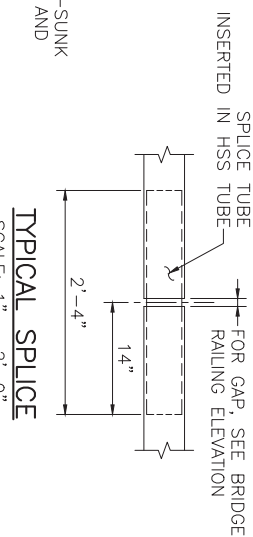
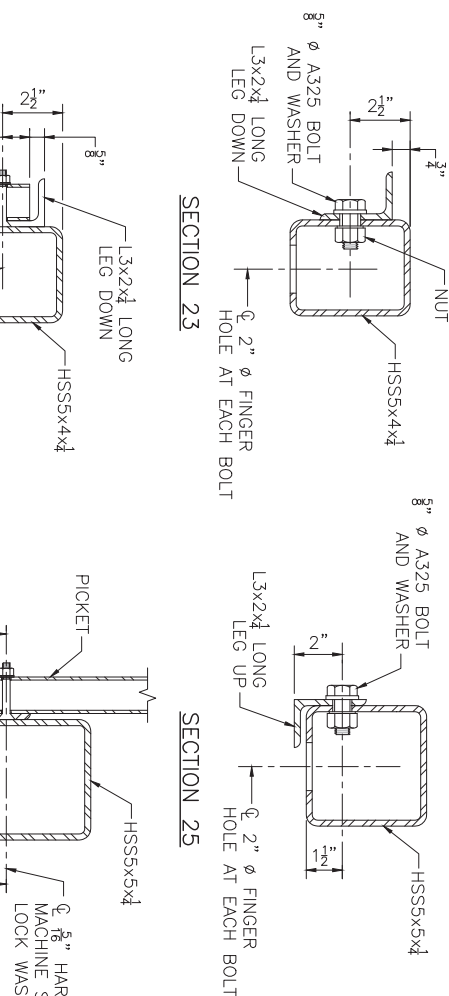
BRIDGE RAILING ELEVATION



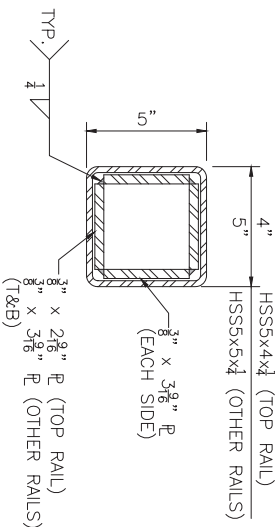
## SPLICE DETAIL



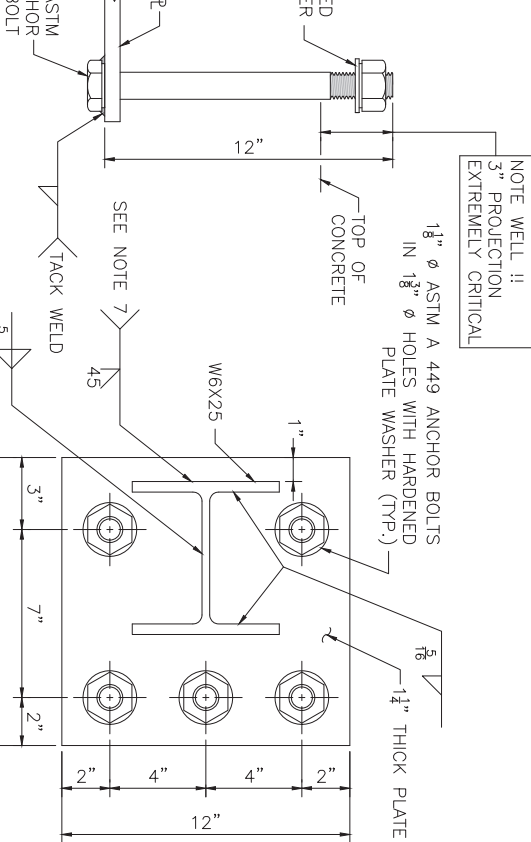
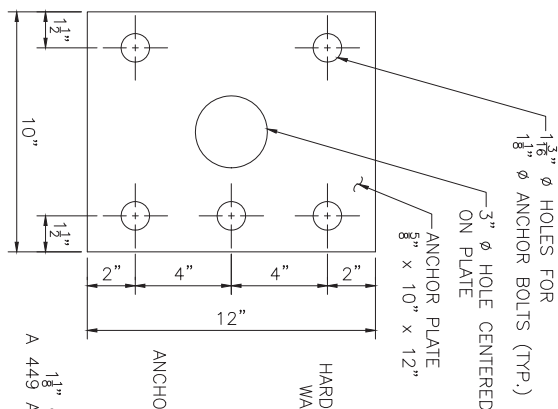
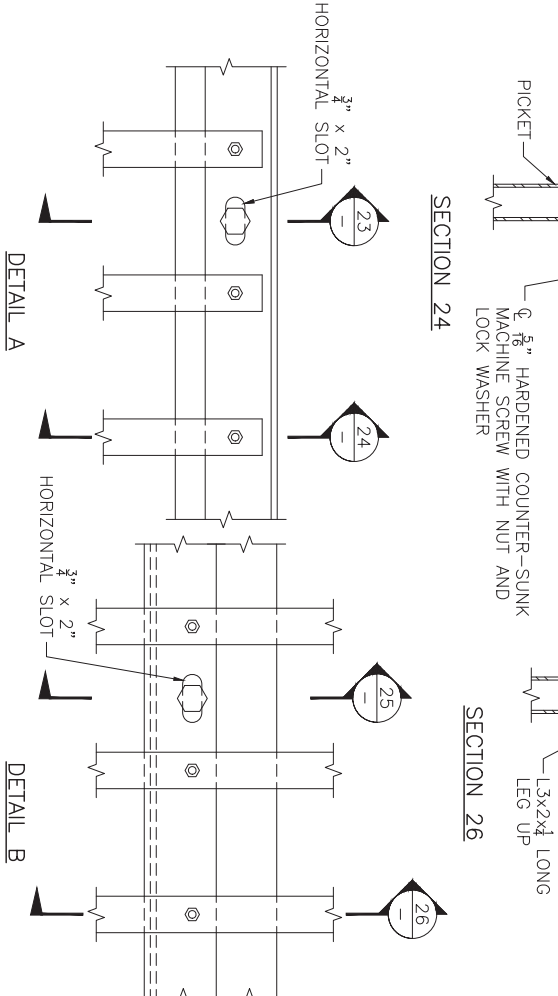
1/8" Ø ROUND HEAD BOLT



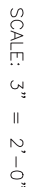
## TYPICAL SPLICE



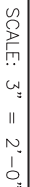
## SPLICE TUBE DETAILS



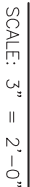
## TYPICAL PICKET TO RAIL DETAILS



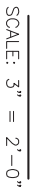
ANCHOR PLATE



## ANCHOR BOLT



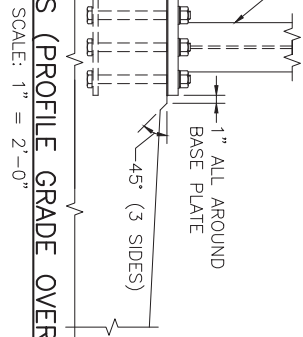
BASE PLATE



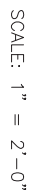
1. RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING (HSS) SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 500 WITH A CERTIFIED  $F_y = 50$  KSI MINIMUM. THE MINIMUM HORIZONTAL BENDING RADIUS OF THE HSS TUBING SHALL BE 8 FEET. PICKET CARRIER ANGLES, ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 36. PICKET TUBING SHALL CONFORM TO ASTM A 513 WITH  $F_y = 36$  KSI MIN. OR A 500 GRADE B.
2. ALL STEEL (EXCEPT THE  $\frac{5}{8}$ " ANCHOR PLATE AND FASTENERS) SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STD. 595B COLOR NO. 10045). ANCHOR PLATE SHALL BE GALVANIZED ONLY. HEADS OF  $\frac{7}{8}$ "  $\phi$  ROUND HEAD BOLTS SHALL BE PAINTED TO MATCH RAIL.
3. ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN AFTER STEEL IS IN PLACE.
4. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR (4) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN THE PANELS OVER EXPANSION JOINT.
5. ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
6. ALL POSTS TO BE PLUMB WHEN PROFILE GRADE EXCEEDS 1.5%. FOR PROFILE GRADES LESS THAN 1.5%, POSTS SHALL BE SET PERPENDICULAR TO GRADE.
7. POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK-GROUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.
8.  $\frac{7}{8}$ "  $\phi$  ROUND HEAD BOLTS SHALL CONFORM TO THE CHEMICAL AND PHYSICAL REQUIREMENTS OF AASHTO M 164.

### RAILING NOTES:

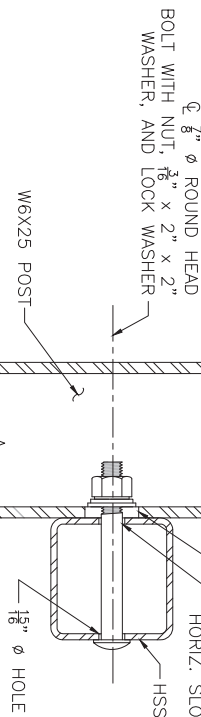
### SETTING OF POSTS (PROFILE GRADE OVER 1.5%)



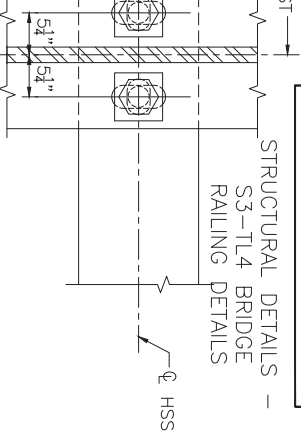
## TYPICAL RAIL TO POST CONNECTIONS



## SECTION THRU RAIL

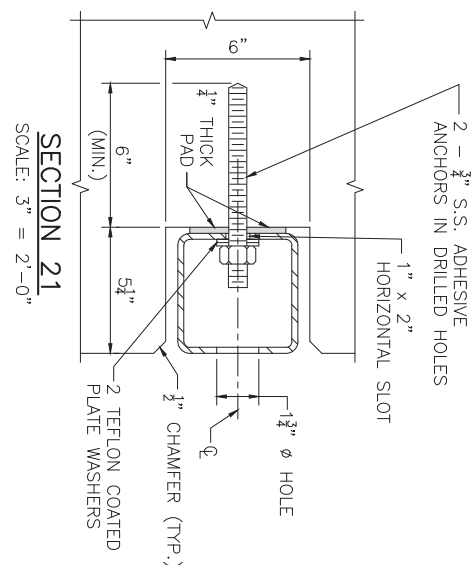
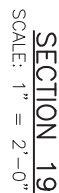
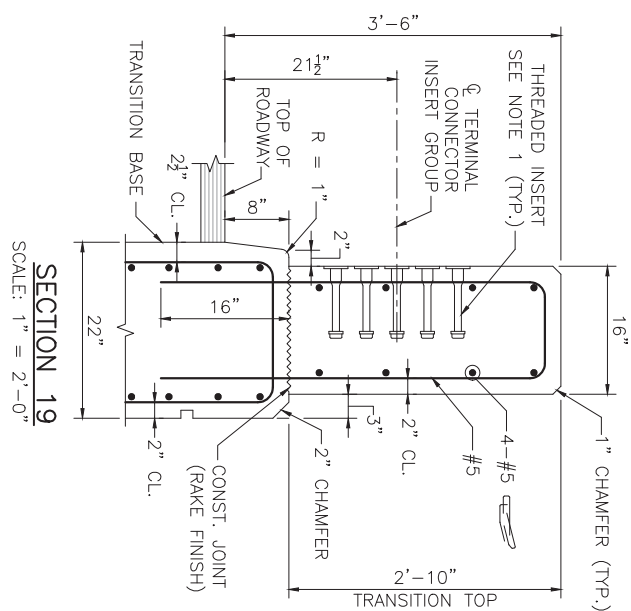
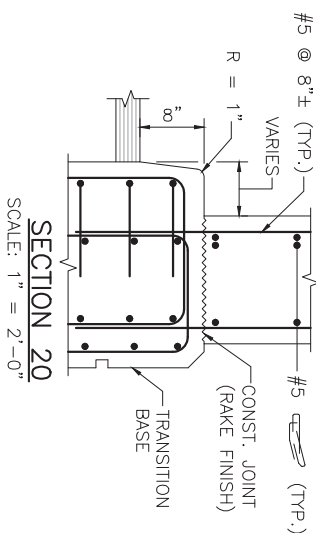
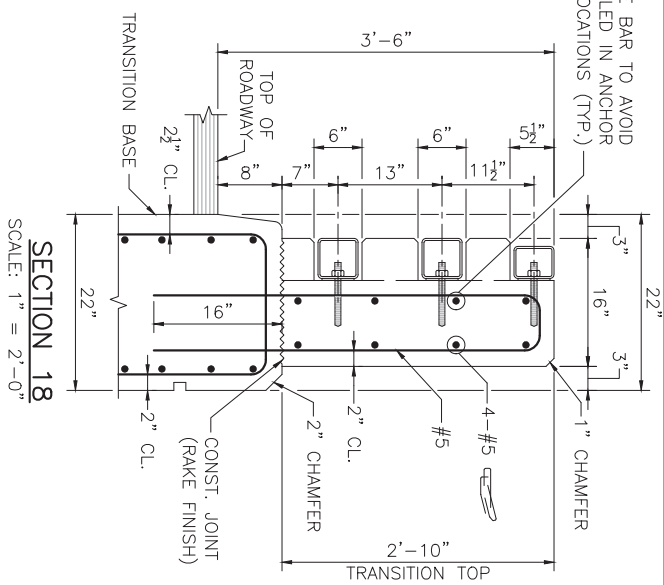
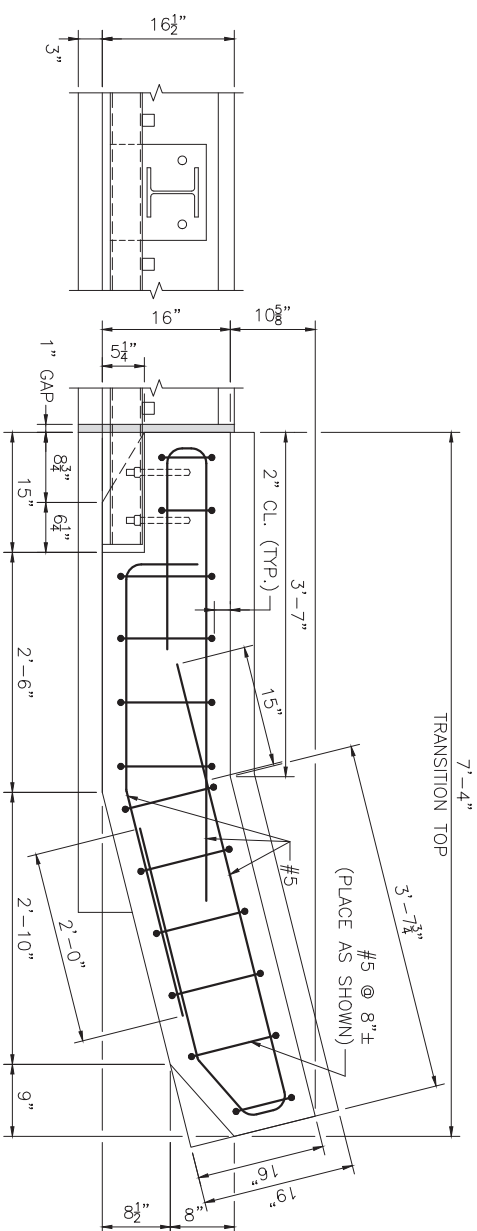
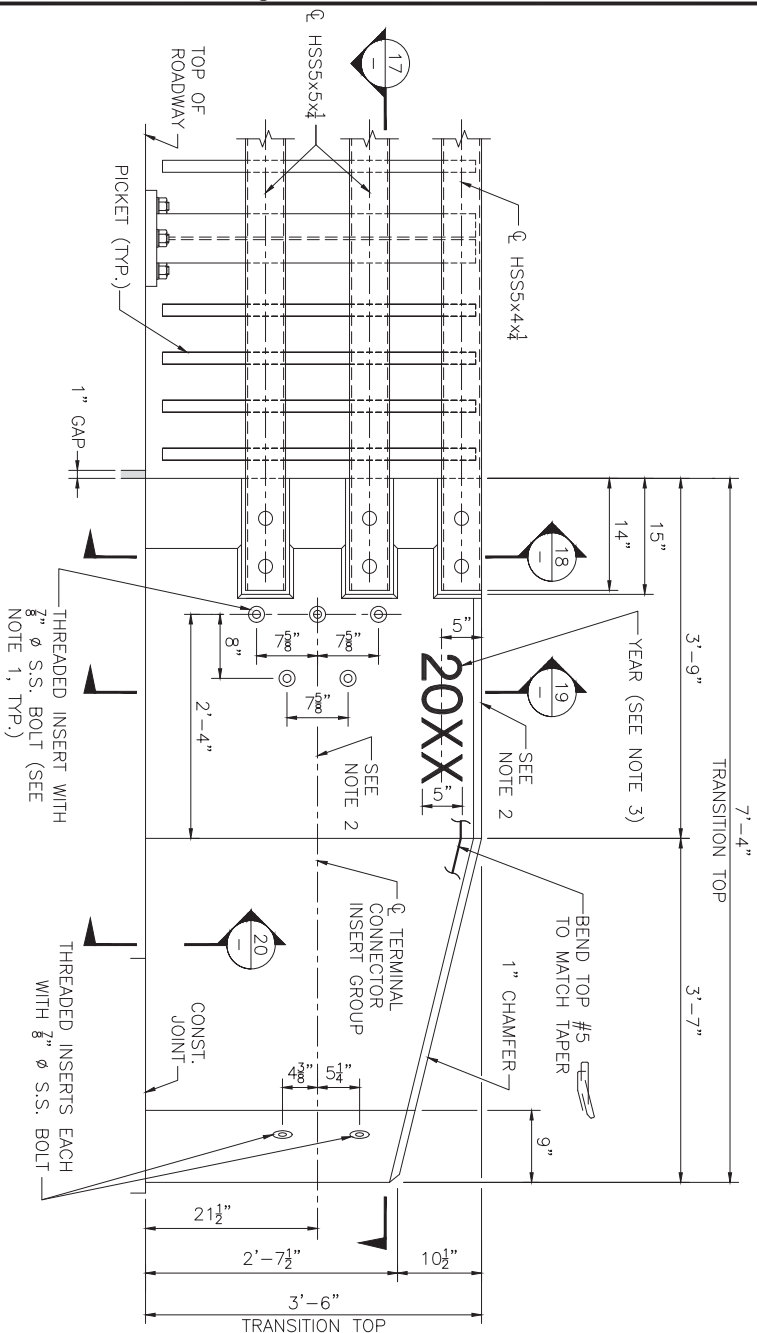
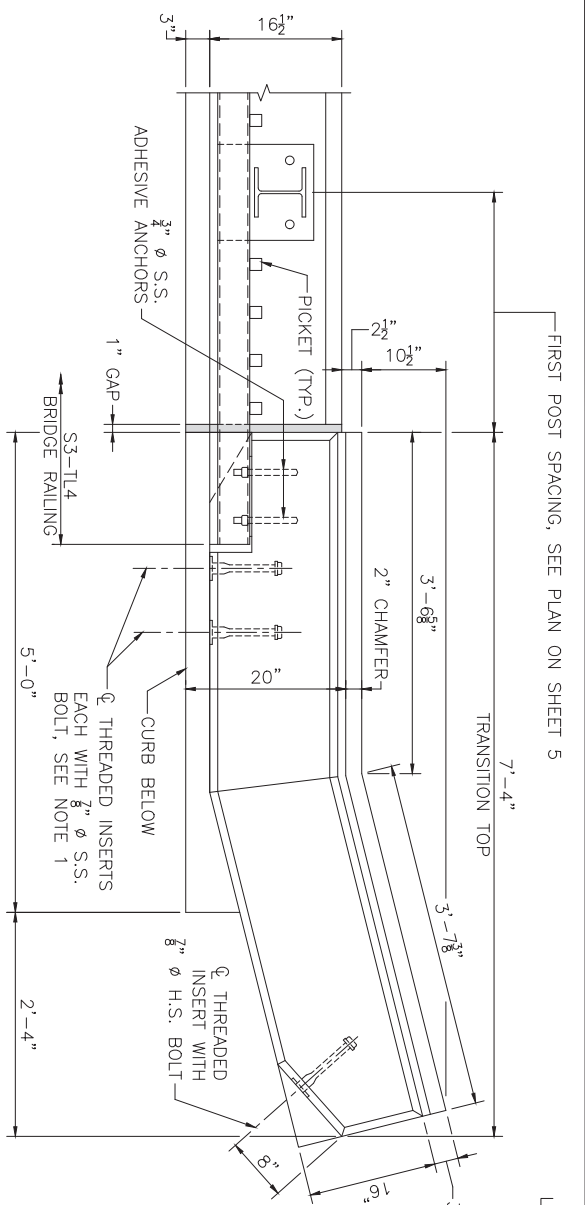


SECTION THRU POST WEEK



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	43	164
PROJECT FILE NO. 606024			





- NOTES:**
1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING A NOMINAL SHEAR RESISTANCE OF 20 KIPS PER  $\frac{5}{8}$ "  $\phi$  S.S. BOLT. S.S. BOLTS SHALL BE  $\frac{5}{8}$ "  $\phi$  x  $1\frac{1}{2}$ " LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR  $\frac{7}{8}$ " S.S. BOLTS SHALL BE GALVANIZED AND CAST INTO THE TRANSITION.

2. FOR AN APPROACH GRADE UP TO 3%, THE TRANSITION MAY BE CAST SQUARE AND SET PLUMB WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SQUARE TO THE POST.

FOR AN APPROACH GRADE IN EXCESS OF 3%, THE TRANSITION TOP AND THE TOP OF CURB SHALL FOLLOW THE APPROACH GRADE. THE HEIGHT OF THE TRANSITION TOP SHALL VARY PROVIDED THAT THE MINIMUM DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE MET. THE BOTTOM OF THE TRANSITION BASE SHALL BE SET LEVEL WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SLOPED TO FOLLOW THE APPROACH GRADE.

3. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST GUARDRAIL TRANSITION IS CAST. USE THIS YEAR FOR ALL GUARDRAIL TRANSITIONS.
4. ALL CONCRETE FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI, 4", 685 HP CEMENT CONCRETE.

5. LIFTING DEVICES (NOT SHOWN), INCLUDING THEIR NUMBER AND LOCATION, SHALL BE DESIGNED AND DETAILED BY THE PRECASTER. THEY SHALL BE GALVANIZED AND SHALL BE PLACED AND RECESSED IN POCKETS TO PROVIDE 1 1/2" CLEAR COVER TO THE FACE OF THE TRANSITION CONCRETE. THESE DEVICES SHALL BE CLEARLY SHOWN ON THE SHOP DRAWINGS ALONG WITH ALL SUPPORTING CALCULATIONS AND/OR CATALOG CUTS. ONCE THE PRECAST TRANSITION IS SET IN PLACE, THE LIFTING DEVICE POCKETS SHALL BE FILLED WITH A NON-SHRINK GROUT THAT MATCHES THE COLOR OF THE TRANSITION CONCRETE WHEN CURED AND THE FILLED POCKETS SHALL BE RUBBED WITH A CORUNDUM STONE TO BLEND OUT THE JOINTS.

TAUNTON  
ROUTE 44 (DEAN STREET)  
STRUCTURAL DETAILS –  
PRECAST HIGHWAY GUARDRAIL  
TRANSITION DETAILS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	44	164
PROJECT FILE NO. 606024			

DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

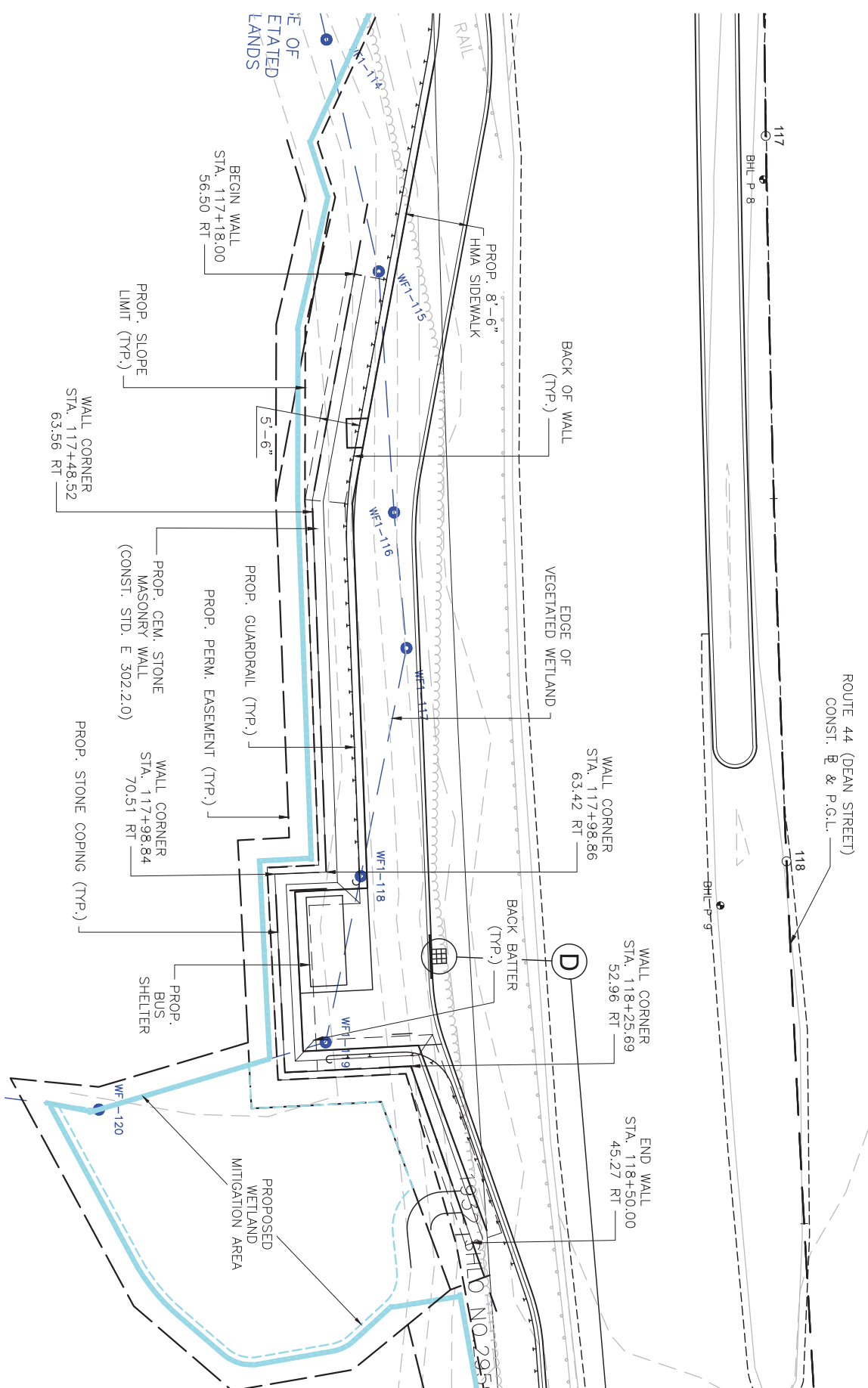
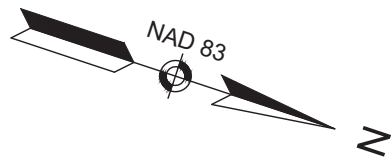






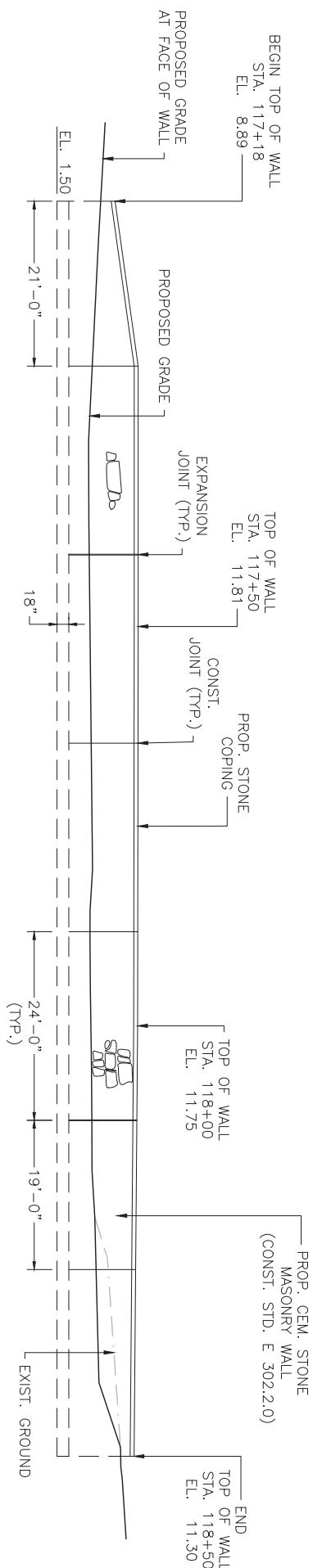






## PLAN

SCALE: 1:20



WALL NOTES:

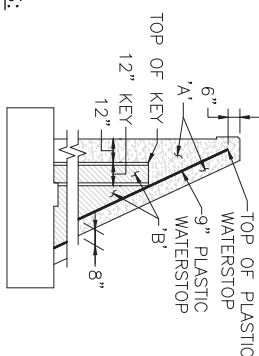
1. 4" Ø WEEP HOLES (JUST ABOVE FOOTING). PROVIDE 1 WEEP HOLE PER WALL, CENTERED ALONG WALL LENGTH, PROVIDE MIN. 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. ALL CONCRETE SHALL BE 4000 PSI, 1 ½ IN. 565 CEMENT CONCRETE.
3. CORNING OVERHANG SHALL BE 2" WHERE WALL IS LESS THAN 10' IN HEIGHT AND 3" WHERE GREATER.

## DEVELOPED ELEVATION

SCALE: 1:20

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	47	52
PROJECT FILE NO.		606024	

## STRUCTURAL DETAILS - RETAINING WALL DETAILS

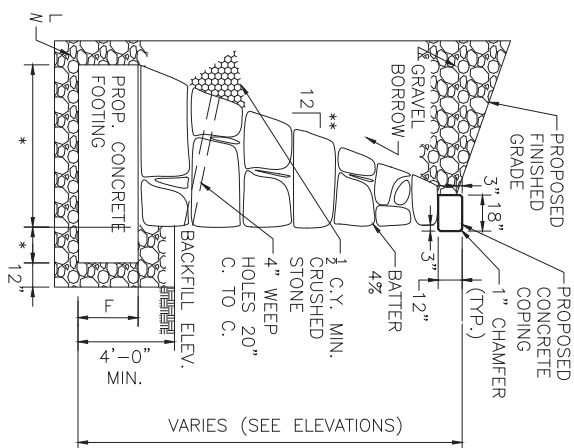


NOTES:

1. LONGITUDINAL REINFORCEMENT SHALL END 2" CLEAR OF EXPANSION JOINT.
2. A - PREFORMED FILLER (IN ACCORDANCE WITH M9.14.0).  
B - PREFORMED FILLER (IN ACCORDANCE WITH M3.05.3 BRITUMENOUS JOINT FILLER).
3. FILLER MATERIAL SHALL BE FASTENED SECURELY TO ONE SIDE OF JOINT.

VERTICAL SECTION THRU EXP. JOINT

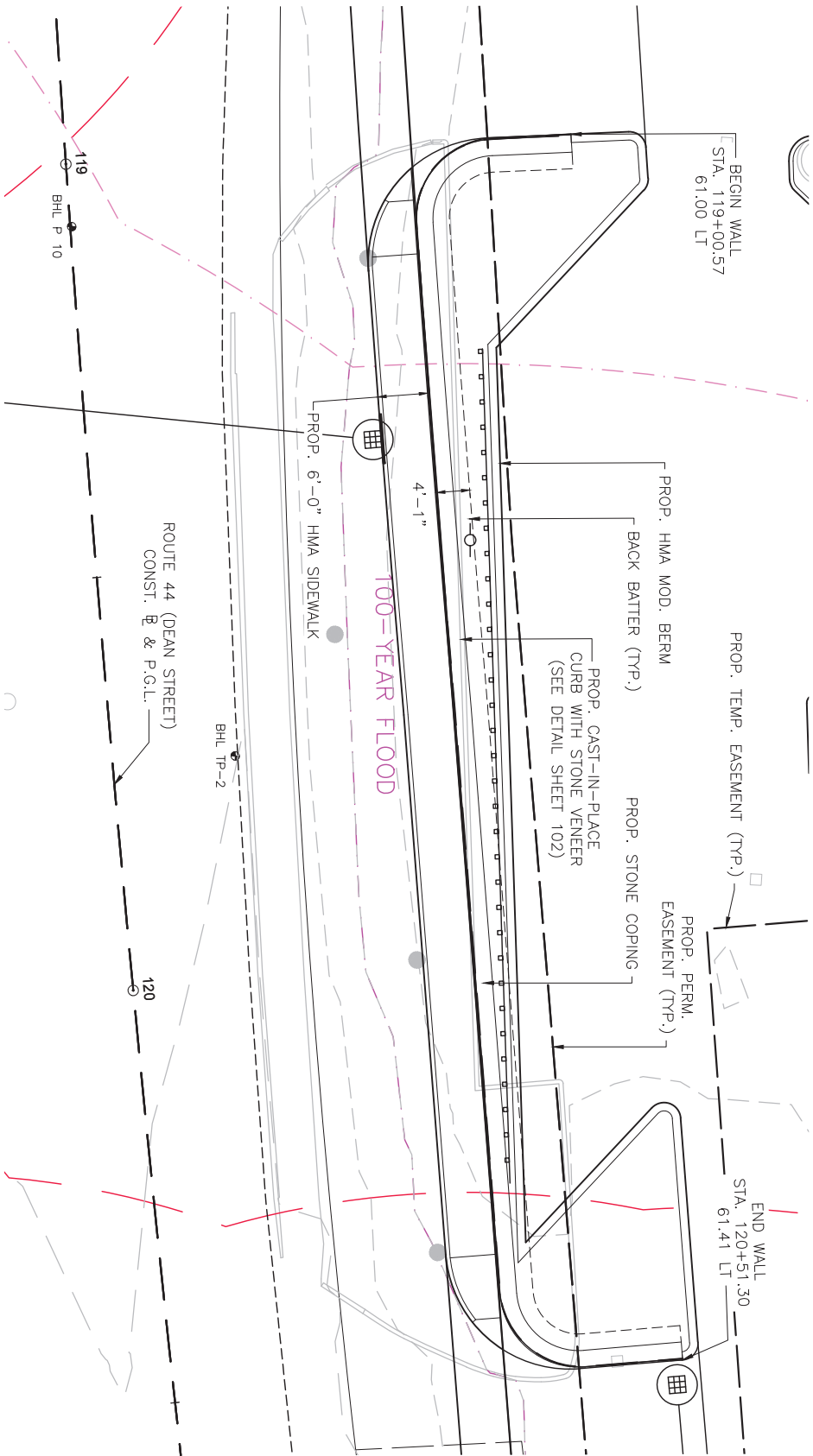
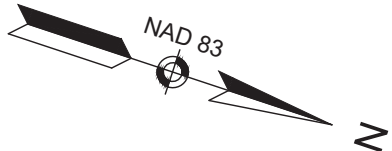
NOT TO SCALE



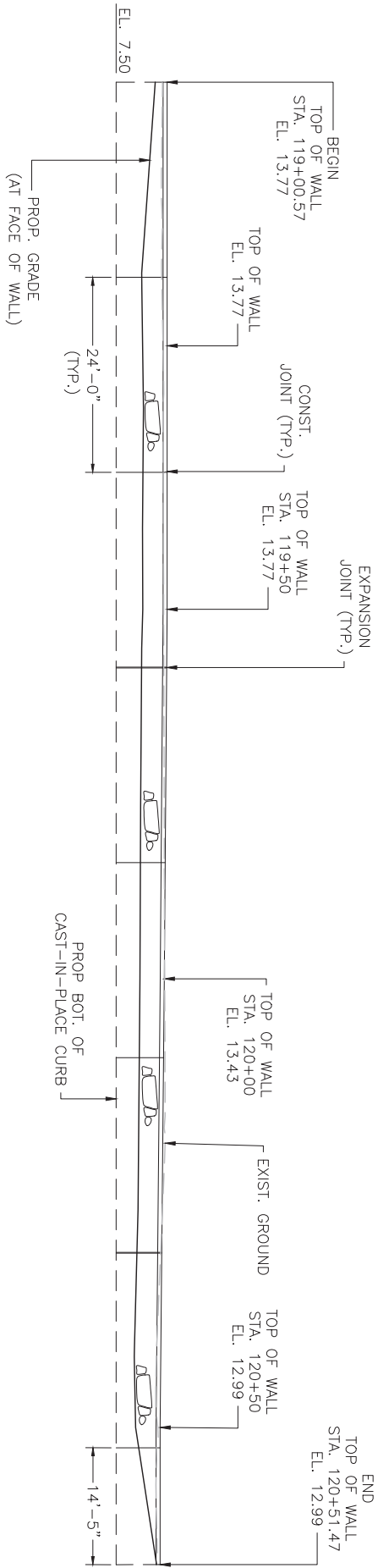
## STONE MASONRY RETAINING SECTION

SCALE:  $\frac{1}{4}'' = 2'-0''$





PLAN  
SCALE: 1:20



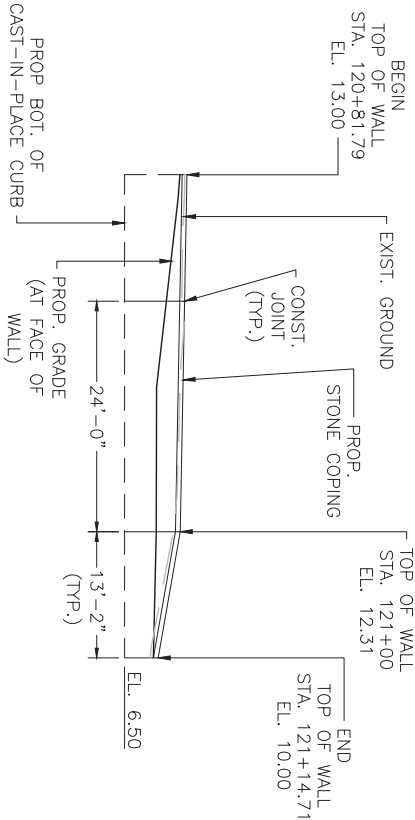
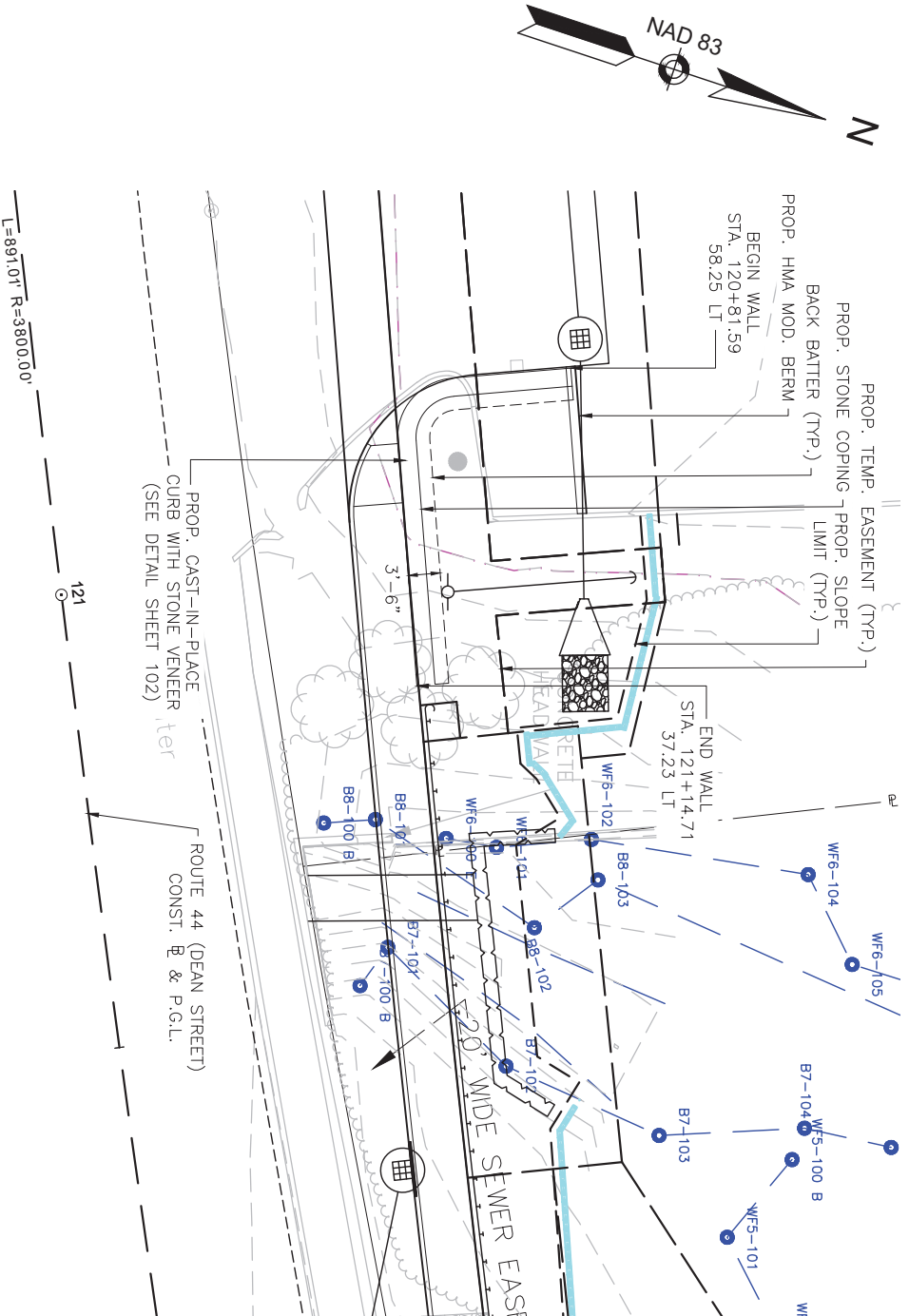
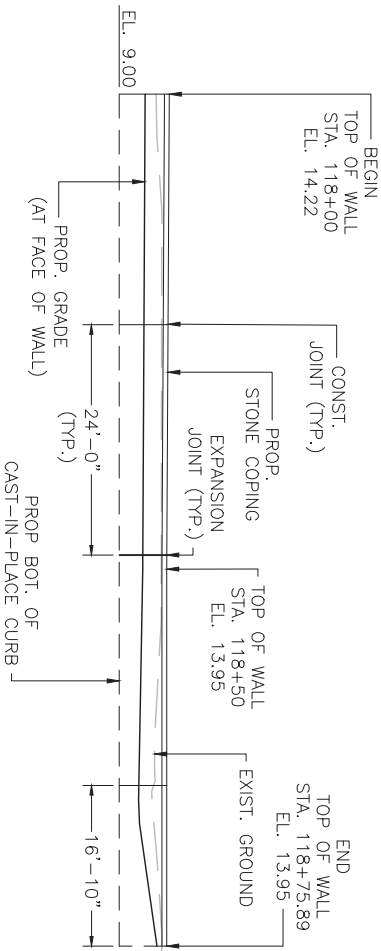
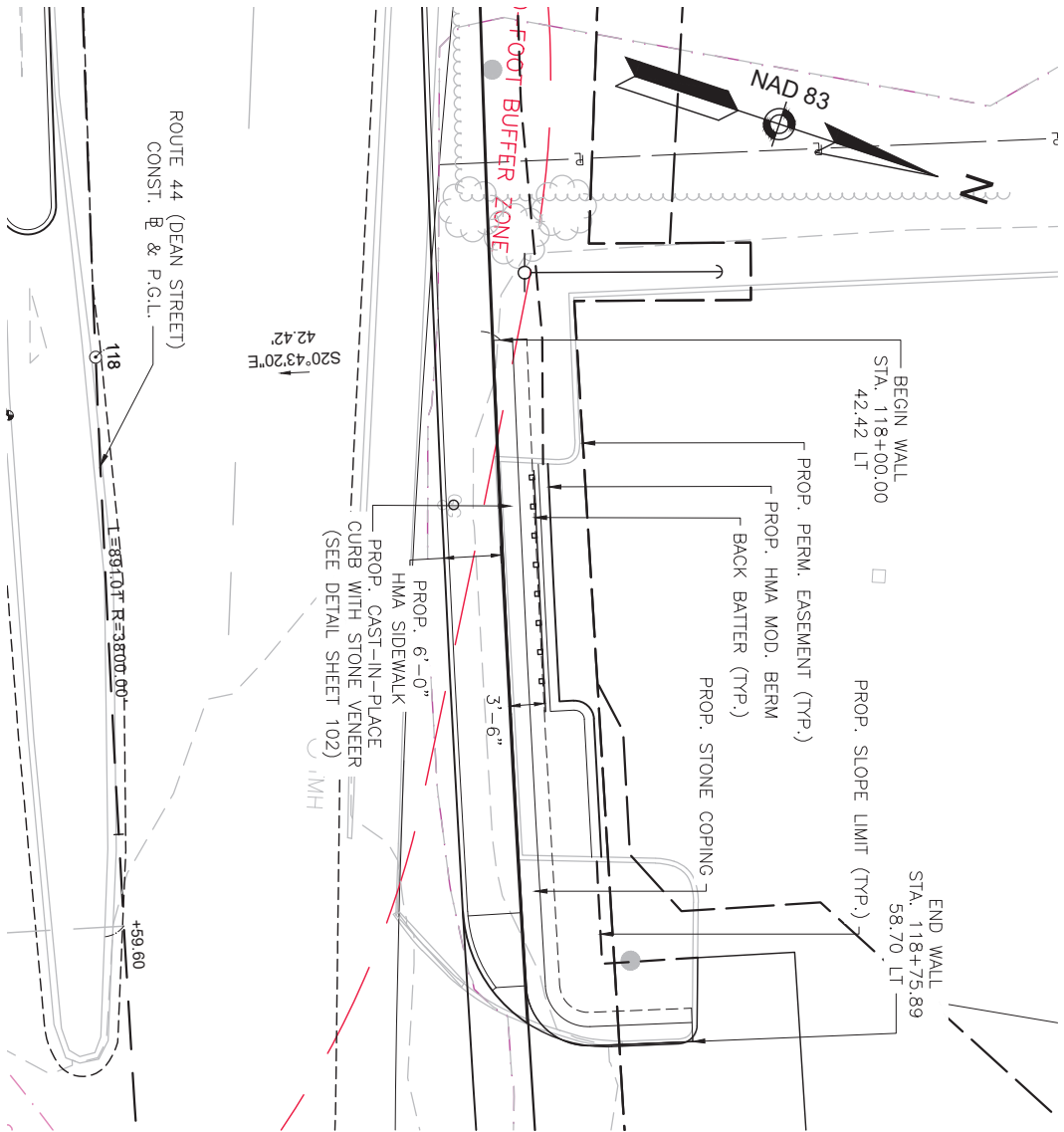
TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	48	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS

DEVELOPED ELEVATION

SCALE: 1:20

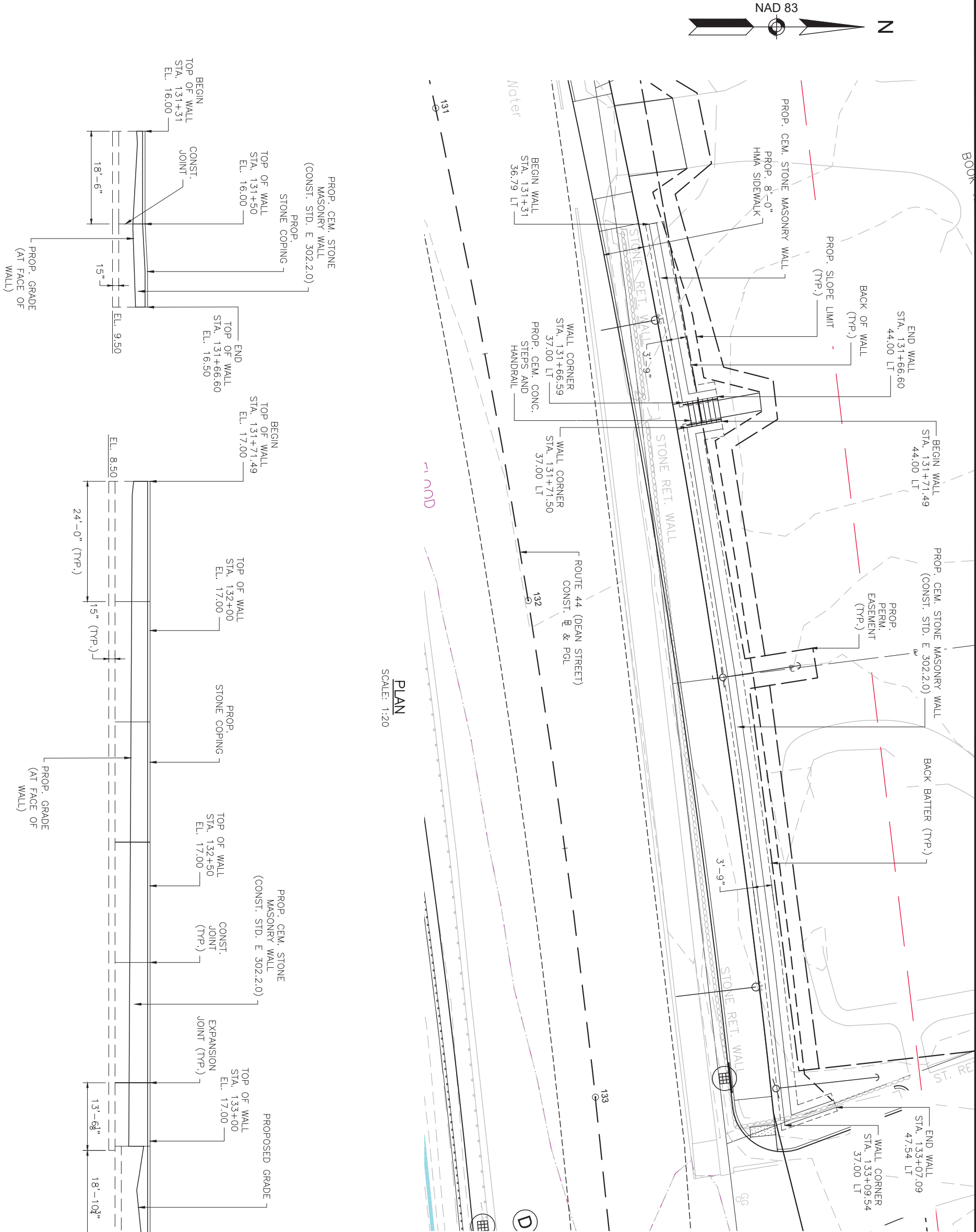




TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	49	52
PROJECT FILE NO.		606024	

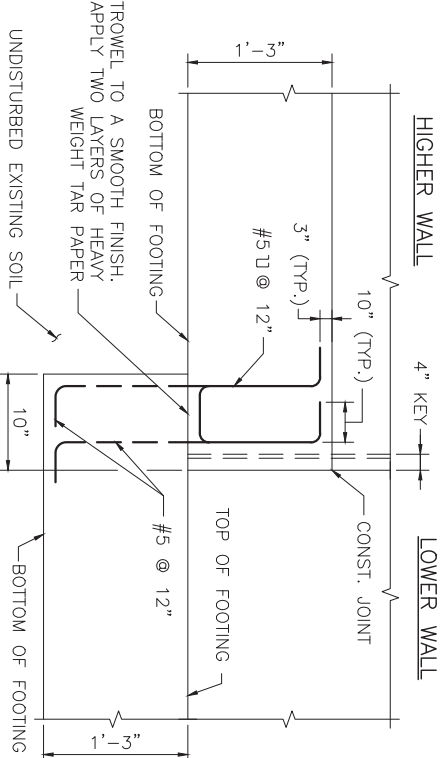
STRUCTURAL DETAILS -  
RETAINING WALL DETAILS





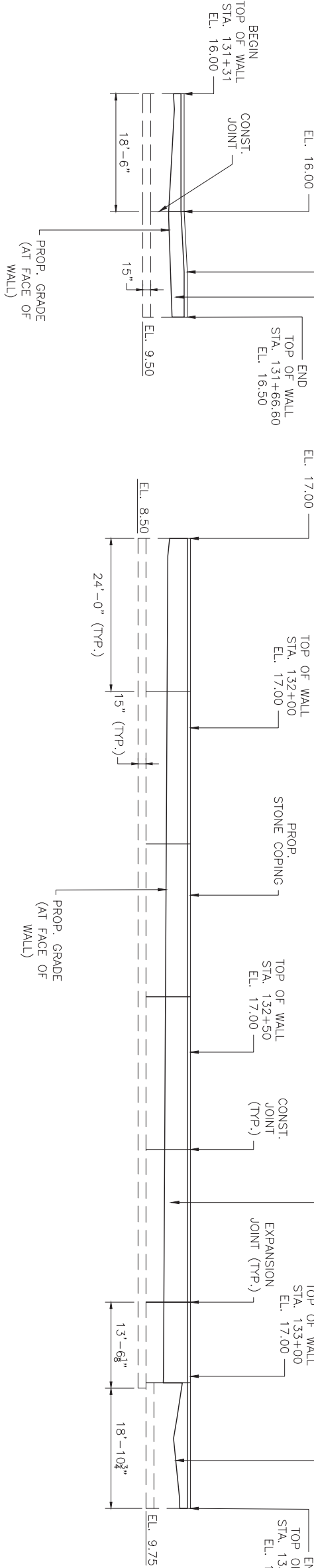
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	50	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS



STEPPED-UP FOOTING DETAIL

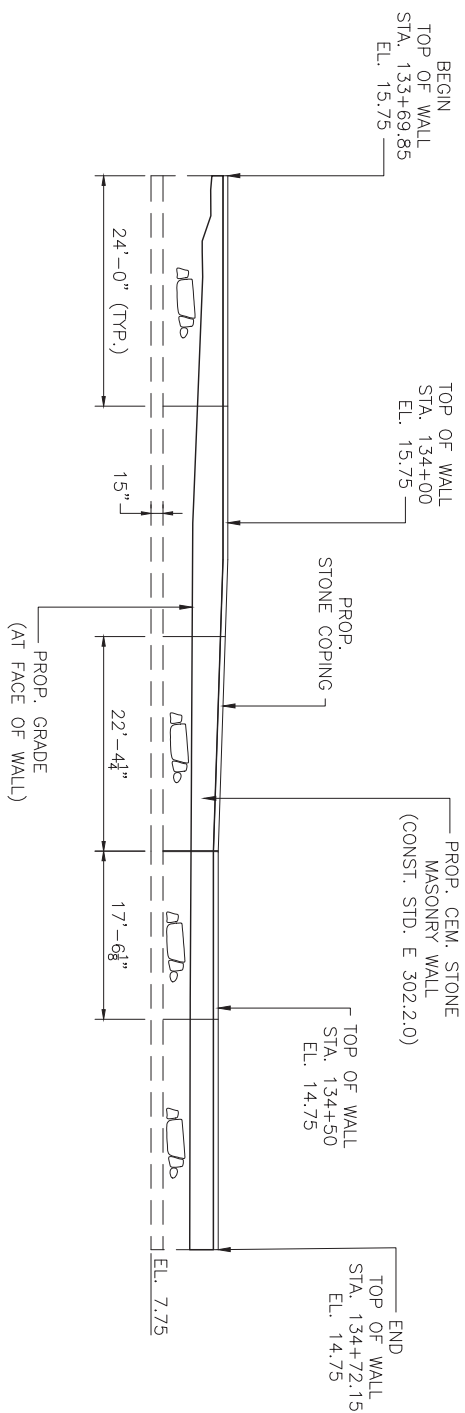
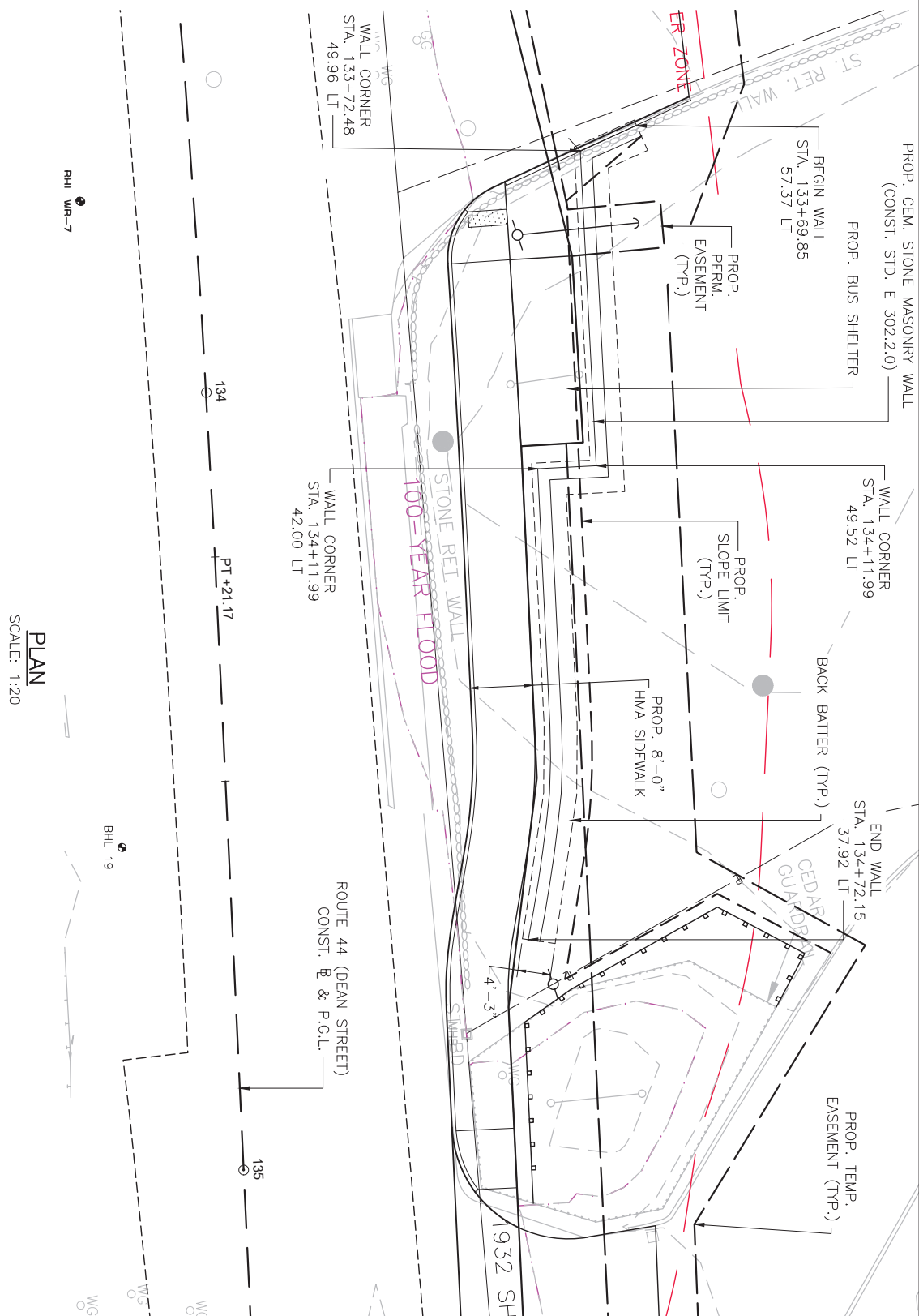
SCALE: 1/2"=2'-0"



DEVELOPED ELEVATION

SCALE: 1:20



DEVELOPED ELEVATION

SCALE: 1:20

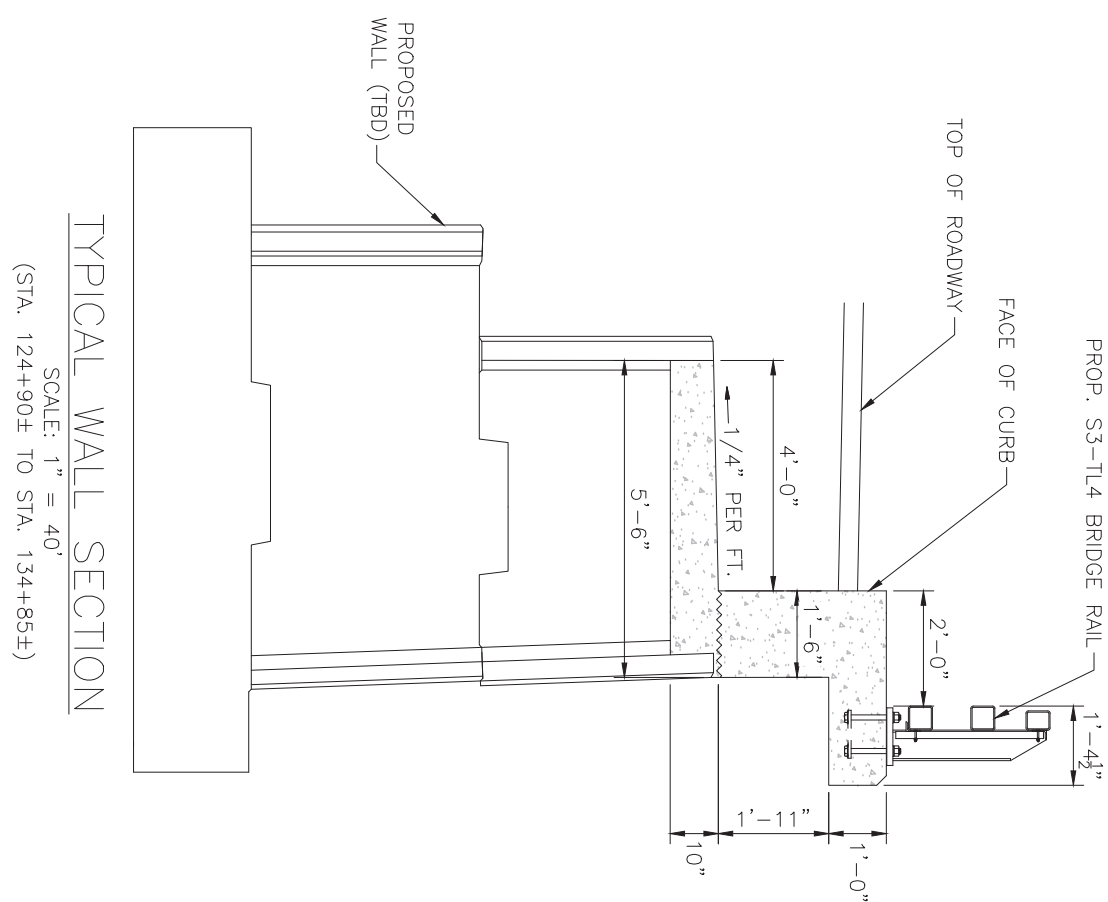
TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	51	52
PROJECT FILE NO.		606024	

## STRUCTURAL DETAILS - RETAINING WALL DETAILS



TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	52	52
PROJECT FILE NO.		608024	

### STRUCTURAL DETAILS - TYPICAL WALL SECTION





## **Stream Visual Assessment Protocol**

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**Exhibit 1: Stream Visual Assessment Protocol 2**

Date: 07/07/22 Page 1 of 4  
 Site ID: Route 44 - Taunton, MA  
 Data recorder: SAC

**Data Forms**

Owner's name\* Massachusetts Department of Transportation (MassDOT) - Highway Division

Contact info\* \_\_\_\_\_ Evaluator's name(s) Samuel Campbell  
 (\*property owner or POC for access) (include all personnel on site during assessment)

Stream name Taunton River Tributary to Not Applicable - drains to Mount Hope Bay

Assessment or Site Type Not Applicable - drains to Mount Hope Bay  
 (include purpose or goal of assessment as needed)

**Preliminary Assessment (GIS/Office data collection)****A. Watershed Description (fill in from preliminary data sheets, or refer to preliminary data location)**

Ecoregion or MLRA 59 - NE Coastal Zone HUC: 01090004 Drainage area (acres or mi<sup>2</sup>) 562

Watershed management structures: (#): dams 0 water controls 0 irrigation diversions 0

Miles of contiguous riparian cover/mile of entire stream in watershed upstream (estimated) 19 mi. / 38.5 mi.

Land use within watershed (%): cropland 4 hay land \_\_\_\_\_ grazing/pasture 1 forest 46  
 urban 17 industrial 10 other (specify) 22 (wetlands)

Agronomic practices in uplands include: Regulation / monitoring of fertilizer application

Confined animal feeding operations (#) 0 Conservation (acres) 26,000\* industrial(acres) 35,986\*  
\*Estimated acreage within watershed \*Estimated acreage within watershed

Number of stream miles on property 0.75 Number of upstream total stream miles 23

Stream hydrology: \_\_\_\_\_ intermittent; months of year wetted: \_\_\_\_\_

☒ perennial; months of year at baseflow: 0

\_\_\_\_\_ impounded / controlled; distance upstream or downstream \_\_\_\_\_

**B. Stream/Reach Description:**

Stream Gage Name or Location/Discharge: Taunton River Near  
Bridgewater, MA (0110800) / 103 ft<sup>3</sup>/s

Reach location (UTM or Lat./Long.) Lat. 41°56'02" / Long. 70°57'25"

Applicable Reference Stream: \_\_\_\_\_ Reference Stream Location: \_\_\_\_\_/\_\_\_\_\_

Information Sources or other notes:

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**SVAP2 Field Assessment**

Photo #/ID \_\_\_\_\_ to \_\_\_\_\_  
 Total # \_\_\_\_\_ Download v \_\_\_\_ by \_\_\_\_\_  
 Photographer(s) \_\_\_\_\_  
 Camera ID \_\_\_\_\_

Date: 07/06/22 Page 1 of 4  
 Site ID: Route 44 - Taunton, MA  
 Data recorder: SAC

**Preliminary Field Data**

Start Time / Water Temp: 8:00 am / ~71 F SVAP2 End Time / Water Temp: 10:00 am / ~72 F

Weather conditions today Temp 73 - 81 F / 50 -75% cloud cover / no precip.  
 (ambient temp.\ % cloud cover\ precip.)

Weather conditions over past 2 to 5 days: No precip., average temp. 72.25 F  
 (No. of days precip, amount of precip., average daytime temp.)

Schumm stage Stage E (Stable) other channel type / classification scheme \_\_\_\_\_/\_\_\_\_\_

Riparian Cover Type(s):

Actual %: Tree 30 % Shrub 48 % Herbaceous 18 % Bare 4 %

Relative %: Tree \_\_\_\_\_ % Shrub \_\_\_\_\_ % Herbaceous \_\_\_\_\_ % Bare \_\_\_\_\_ %

Bank Profile (✓ one): Stratified \_\_\_\_\_ or Homogenous ☒ ; Cohesive soil \_\_\_\_\_ or Non-cohesive soil ☒

Gradient (✓ one): Low (0-2%) \_\_\_\_\_ Moderate (>2<4%) ☒ High (>4%) \_\_\_\_\_

Regional curve used 9 - New England Province Expected bankfull width 200+/- ft

Bankfull channel width 159 ft (ft , m) Reach length 4044 ft (ft , m) Flood plain width 750 ft ft , m

Avg. riparian zone width 111 ft (ft , m) Method used Plan / GIS Floodplain wetlands 14.5 acres or ft<sup>2</sup>/ reach

Dominant substrate (% or ✓): boulder \_\_\_\_\_ cobble \_\_\_\_\_ gravel \_\_\_\_\_ sand ☒ fines/silt/clay  
 (> 250 mm) (60-250mm) (2-60 mm) (2-.06 mm) (< .06 mm)

6.	6.	10.	10.	15.	12. & 13.	12.	13.	14.	14.
Canopy cover #	Canopy cover%	Pool depth	Riffle depth	Riffle Embed %	Habitat Features Both, Fish, Inverts	Fish count	Invert. count	Aquatic Invert name/type	Group I, II, III
N/A		N/A	N/A	N/A	<b>B</b> Large wood	0	0	N/A	N/A
N/A		N/A	N/A	N/A	<b>B</b> Small wood	0	0	N/A	N/A
		N/A	N/A	N/A	<b>B</b> Overhang. Veg.	0	0	N/A	N/A
		N/A	N/A	N/A	<b>B</b> Root mats	0	0	N/A	N/A
		N/A	N/A	N/A	<b>B</b> Undercut banks	0	0	N/A	N/A
		N/A	N/A	N/A	<b>B</b> Cobble riffles	0	0	N/A	N/A
		N/A	N/A	N/A	<b>B</b> Macrophyte beds	0	0	N/A	N/A
		N/A	N/A	N/A	<b>F</b> Deep pools	0	0	N/A	N/A
		N/A	N/A	N/A	<b>F</b> Other pools (shallow, scour, plunge, pocket)	0	0	N/A	N/A
		N/A	N/A	N/A	<b>I</b> Any pools	0	0	N/A	N/A
		N/A	N/A	N/A	<b>F</b> >20" boulders	0	0	N/A	N/A
		N/A	N/A	N/A	<b>F</b> 10-20" boulder clusters	0	0	N/A	N/A
		N/A	N/A	N/A	<b>I</b> >20" boulders in riffles	0	0	N/A	N/A
		N/A	N/A	N/A	<b>I</b> 10-20" Boulder clusters in riffles	0	0	N/A	N/A
		N/A	N/A	N/A	<b>F</b> Off-channel	0	0	N/A	N/A
		N/A	N/A	N/A	<b>B</b> Other locally important	0	0	N/A	N/A



## Element Scores

Date: 07/06/22 Page 1 of 4  
 Site ID: Route 44 - Taunton, MA  
 Data recorder: SAC

Element	Notes	Score
1. Channel Condition	Channel generally natural and in good condition within this reach	7
2. Hydrologic Alteration	Some diversions for municipal water supply	7
3. Bank Condition	Banks generally in fair condition within this reach and are relatively steep	6
4. Riparian Area Quantity	Limited natural Riparian Area along north bank due to Route 44 and residential / commercial development. Limited natural riparian area along south bank due to school fields and buildings	3
5. Riparian Area Quality	Well vegetated with some invasive species present, lack of connectivity / contiguous riparian area due to development	5
6. Canopy Cover	Canopy cover limited to shading directly adjacent to banks	3
7. Water Appearance	Brown with moderate turbidity / suspended solids	5
8. Nutrient Enrichment	No nutrient enrichment indicator observed	7
9. Manure or Human Waste	No manure, human waste, or indicators of human waste observed	10
10. Pools	No pools observed in this reach	1
11. Barriers to Movement	No barriers to movement observed within this reach	10
12. Fish Habitat Complexity	Channel is relatively open with some vegetation overhanging the banks and cobble present in channel. No aquatic vegetation observed	2
13. Aquatic Invertebrate Habitat		6
14. Aquatic Invertebrate Community	None observed but habitat in fair condition to support	4
15. Riffle Embeddedness	No riffles observed in this reach	1
16. Salinity	This reach of the Taunton River is subject to tidal action	5
<b>A. Sum of all elements scored</b>		<b>83</b>
<b>B. Number of elements scored</b>		<b>16</b>

**Overall score: A/B** 5.2

1 to 2.9 Severely Degraded  
 3 to 4.9 Poor  
 5 to 6.9 Fair  
 7 to 8.9 Good  
 9 to 10 Excellent

**1 to 2.9 Severely Degraded** (list elements)  
10,12,15

**3 to 4.9 Poor** (list elements)  
4,6,14

**9 to 10 Excellent** (list elements)  
9,11

Suspected causes of SVAP2 scores less than 5 (does not meet quality criteria for stream species)

Recommendations for further assessment or actions:



**c. Site Map** – Include and label: Legend (define abbreviations), flow direction, orientation & scale, reach top/bottom, landmarks, large wood, boulders, bank/channel work, infrastructure, barriers, vegetation, sampling locations.

**\*\* Note Riparian Vegetation Left Bank and Right Bank separately for entire reach**

\*\* Quantity (Natural community, width compared to bankfull width and active floodplain, % vegetation gaps)

\*\* Quality (Natural & diverse %, age structure, invasive species %, concentrated flows, species present)

Date: 07/06/22 Page 1 of 4  
 Site ID: Route 44 - Taunton, MA  
 Data recorder: SAC

See attached plans

#### VEGETATION LIST

Swida amomum  
 Lonicera japonica  
 Smilax rotundifolia  
 Euonymys alatus  
 Carya ovata  
 Vitis aestivalis  
 Rosa multiflora  
 Acer platanoides  
 Fallopia japonica  
 Prunus serotina  
 Celastrus orbiculatus  
 Acer rubrum  
 Acer saccharinum  
 Ligustrum sinense  
 Carex sp.  
 Toxicodendron radicans  
 Rhus hirta  
 Poa sp.  
 Acer platanoides  
 Robina pseudoacacia  
 Ludwigia sp.

#### LEGEND:

Provide additional notes related to each element scored on back of site diagram, if needed.

(190-VI-NBH, December 2009 – modified by Miller SJ, ERDC, 2018)

614-49

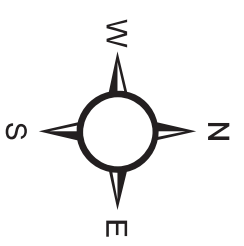




**1. Outfall and Compensatory  
Storage Area  
Wildlife Habitat Evaluation  
Rt 44/ Dean St  
Taunton, MA**

**Legend**

- ★ Outfalls
- Project Corridor
- Impact Areas



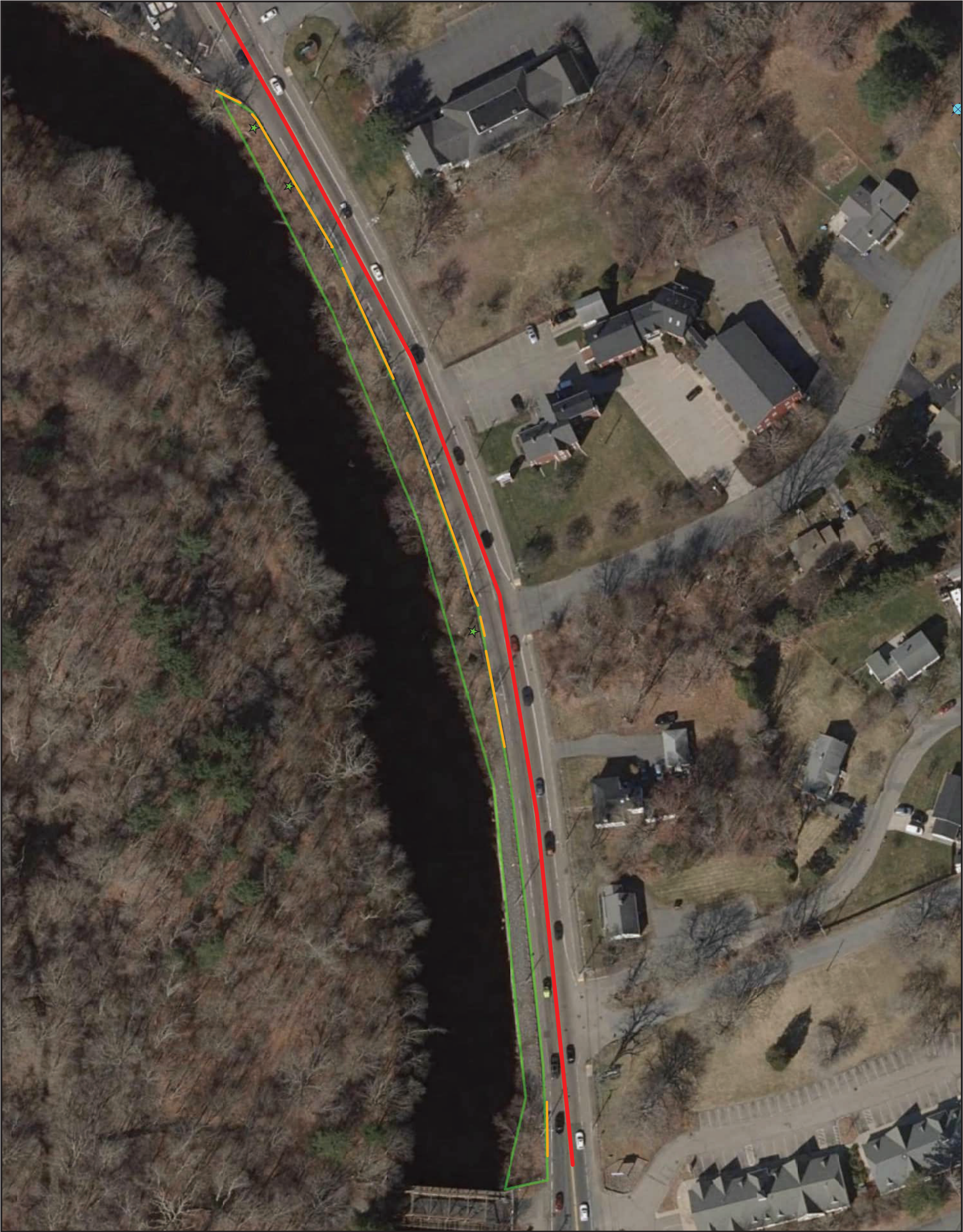
0 125 250  
Feet

1 inch = 125 feet



Data Source: MassGIS USGS Color Ortho Imagery (2014)

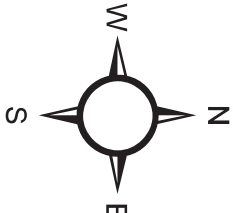




**4. Retaining Wall Area  
Wildlife Habitat Evaluation  
Rt 44/ Dean St  
Taunton, MA**

**Legend**

- ★ Outfalls
- Project Corridor
- Impact Areas
- Fill Areas



0 80 160 Feet

1 inch = 83 feet



Data Source: MassGIS USGS Color Ortho Imagery (2014)

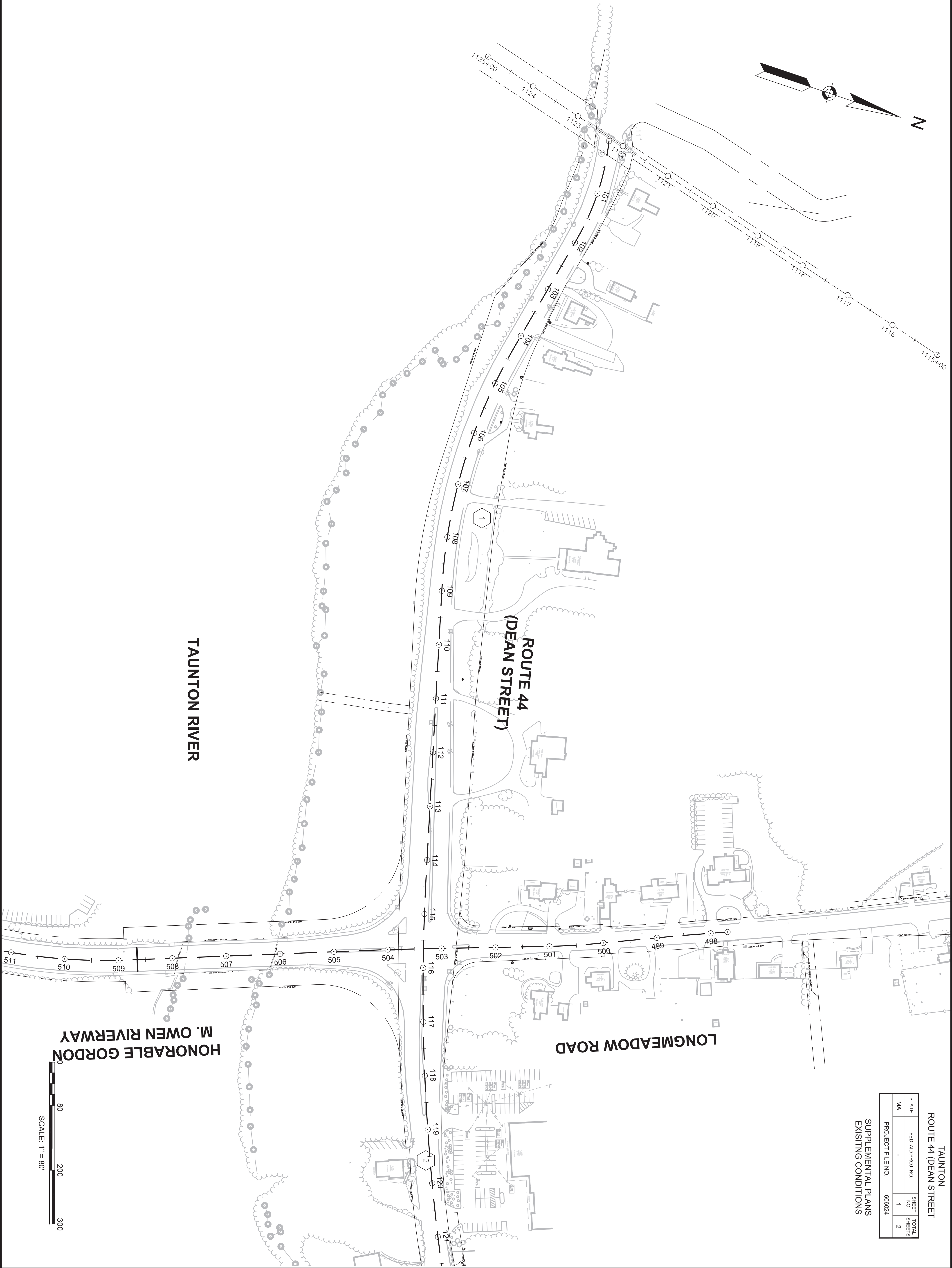
Prepared by: TD



## **Simplified Plan Set**

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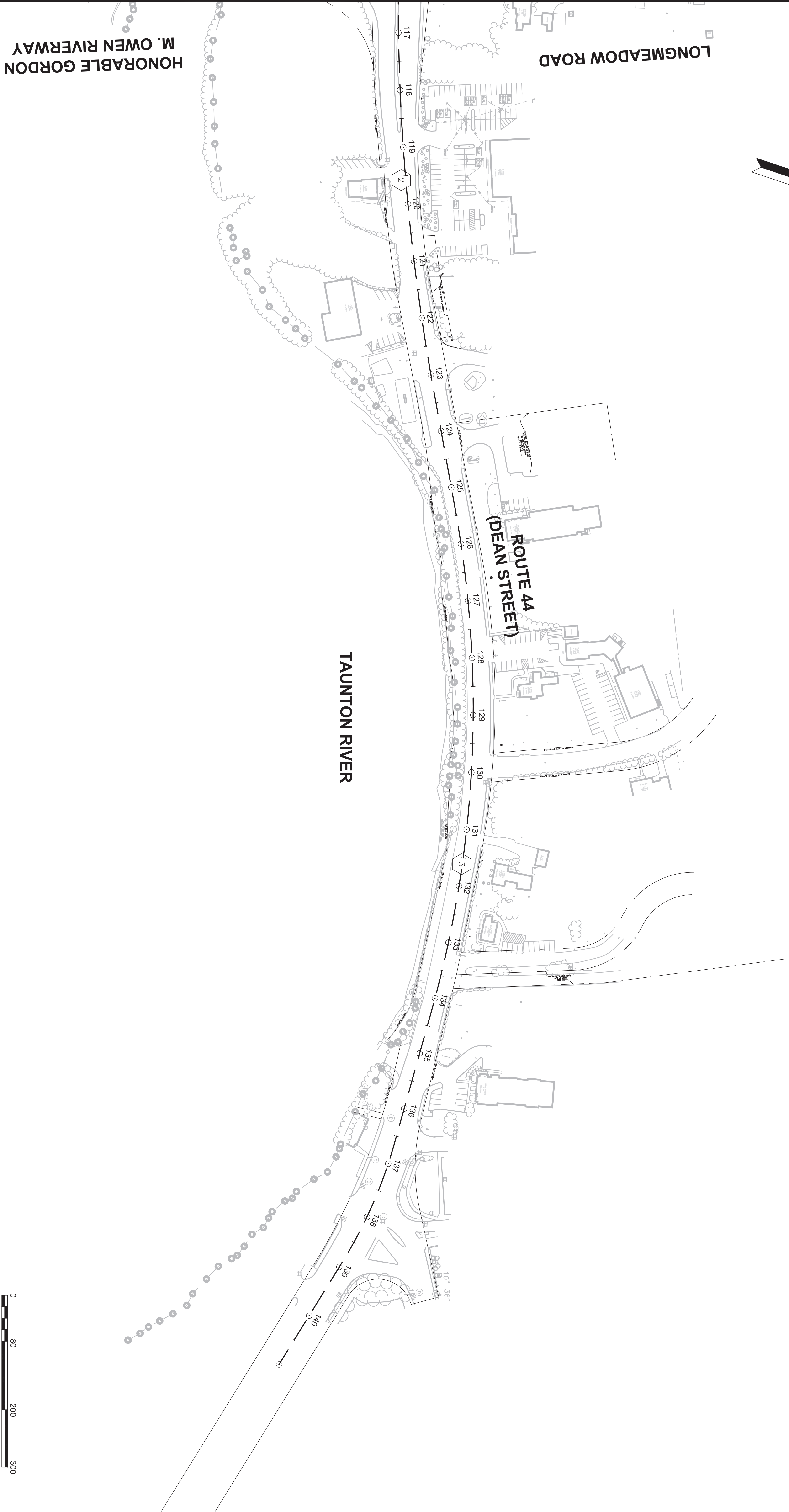
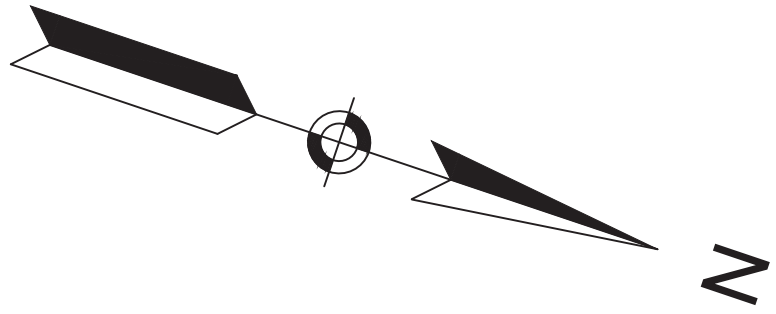




TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	2
SUPPLEMENTAL PLANS EXISTING CONDITIONS			
PROJECT FILE NO.		606024	

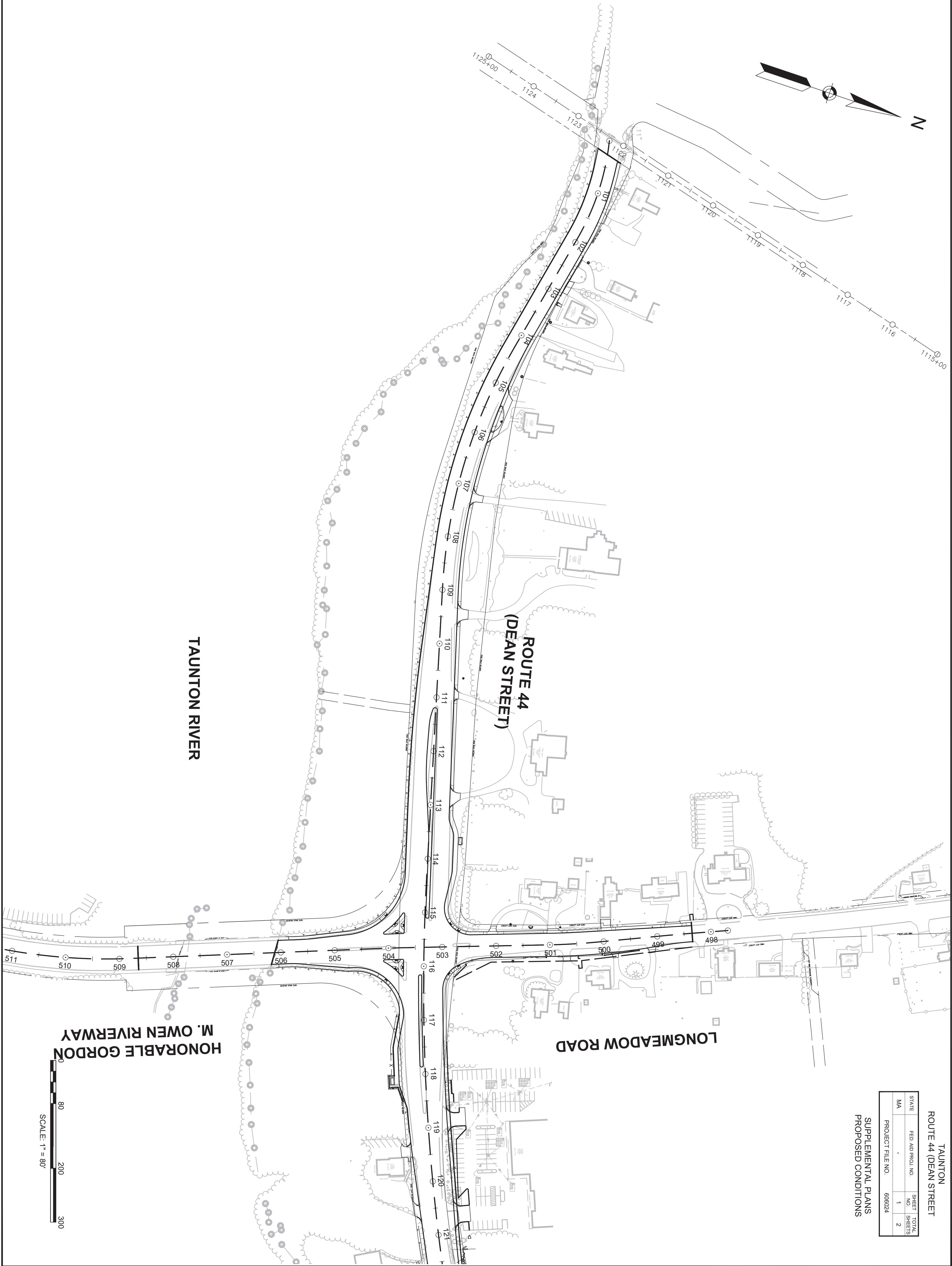


TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	2
SUPPLEMENTAL PLANS			
EXISTING CONDITIONS			
PROJECT FILE NO. 606024			



HONORABLE GORDON  
M. OWEN RIVERWAY



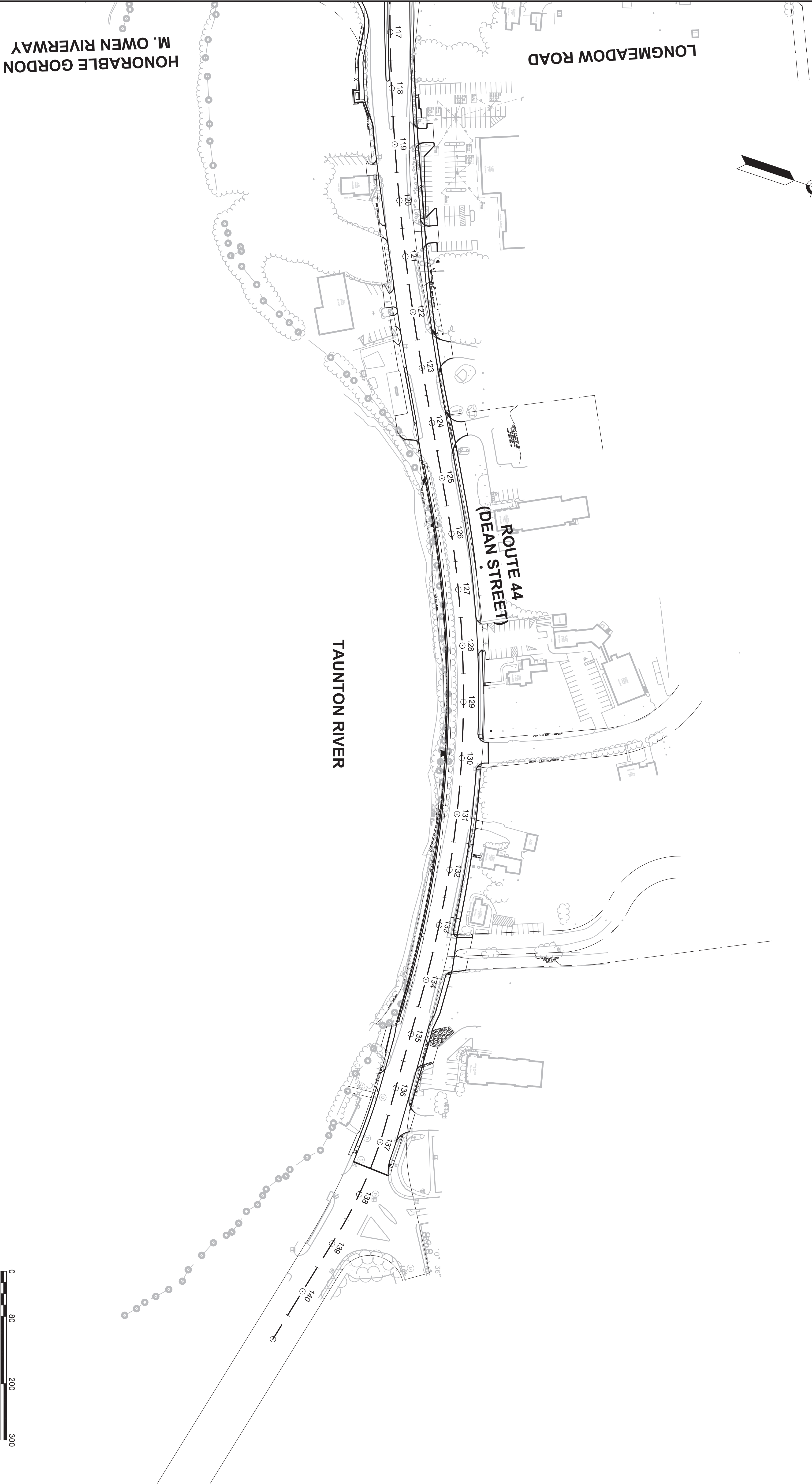
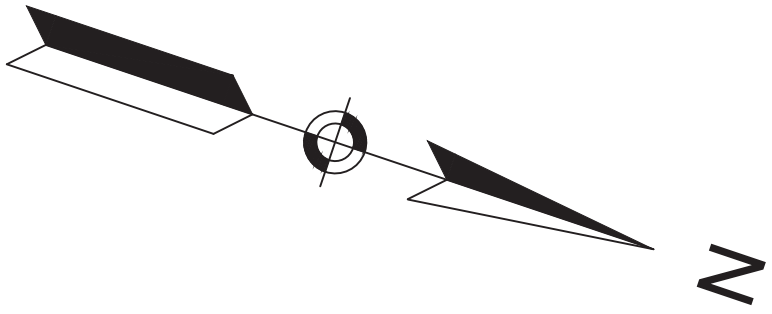


TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	2
PROJECT FILE NO.		606024	

SUPPLEMENTAL PLANS  
PROPOSED CONDITIONS



TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	2
SUPPLEMENTAL PLANS			
PROPOSED CONDITIONS			
PROJECT FILE NO. 606024			





DOCUMENT A00831

# **ARMY CORPS OF ENGINEERS**

## **GENERAL PERMIT**



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

**September 9, 2022**

Regulatory Division  
File No. NAE-2021-01406

Melissa Lenker  
Massachusetts Department of Transportation – Highway Division  
Boston, Massachusetts 02116  
(via email: [melissa.lenker@state.ma.us](mailto:melissa.lenker@state.ma.us))

Dear Ms. Lenker:

This regards your application submitted to the U.S. Army Corps of Engineers (USACE) to conduct work below the Mean High Water (MHW) line of the Taunton River, and permanently discharge 1,379 square feet of fill below the High Tide Line (HTL) of the Taunton River, below the Ordinary High Water Mark of an unnamed perennial stream, and within vegetated wetlands, associated with the reconstruction of Dean Street (Route 44) between Arlington Road and Route 104, plus portions of Longmeadow Road and Hon. Gordon M. Owen Riverway, for a total length of 0.9 miles, in Taunton, Massachusetts. The project includes widening Dean Street to a consistent four lane cross section, installation of a sidewalk on the westbound side, and bike lanes on both the eastbound and westbound sides, the construction of an approximately 1,000 linear foot long retaining wall, and stormwater improvements. An existing culvert conveying a perennial stream below Dean Street will be extended 23' on the north side of the road with a 4' x 4' concrete box culvert extension. The project also includes 970 square feet of temporary impact below the HTL of the Saugus River, below the OHW marks of one unnamed perennial and one unnamed intermittent stream, and within vegetated wetlands, associated with temporary construction access and dewatering behind cofferdams. The work is shown on the enclosed plans titled "MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION PLAN AND PROFILE OF ROUTE 44 (DEAN STREET) IN THE CITY OF TAUNTON BRISTOL COUNTY USACE PCN SUBMISSION PLANS" on 52 sheets, and dated "JULY 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. A copy of the Riverfront Area (RFA) mitigation plan required by special condition 36 of the Superseding Order of Conditions (SOC) shall be provided to the Corps and National Park Service (NPS) for review and approval concurrently with the submittal to MassDEP.

3. Within 180 days of project completion, the applicant shall forward an as-built plan of the completed work within the Taunton River Floodway to the Risk Analysis Branch, Mitigation Division, Federal Emergency Management Agency (FEMA), Region 1, 99 High Street, Boston Massachusetts, 02110 in order to assist with future mapping efforts in this region. This submission shall be made in a digital format, and provide a level of content detail acceptable to FEMA Region 1 personnel.

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

Enclosures

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  
Sabrina Pereira, NMFS, Gloucester, Massachusetts, sabrina.pereira@noaa.gov  
Jamie Fosburgh, National Park Service, Boston, Massachusetts,  
Jamie\_Fosburgh@nps.gov  
Lauren Bonatakis, National Park Service, Boston, Massachusetts,  
lauren\_bonatakis@nps.gov  
Amanda Davis, MA Division of Marine Fisheries, New Bedford, Massachusetts,  
Amanda.Davis@mass.gov  
MassDEP-WRP, Boston, Massachusetts; dep.waterways@mass.gov  
Heidi Davis, MassDEP, Boston, Massachusetts, heidi.davis@state.ma.us  
David Robinson, Massachusetts Board of Underwater Archaeological Resources  
(BUAR); david.s.robinson@mass.gov  
Conservation Commission, Taunton, Massachusetts, mrestino@taunton-ma.gov  
Samuel Campbell, Greenman-Pedersen, Inc., Wilmington, Massachusetts,  
scampbell@gpinet.com  
Timothy Dexter, MassDOT – Highway Division, Boston, Massachusetts,  
timothy.dexter@state.ma.us



# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

## HIGHWAY DIVISION

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	52
PROJECT FILE NO.		608024	

# TITLE SHEET & INDEX

## PLAN AND PROFILE OF

## ROUTE 44 (DEAN STREET)

IN THE CITY OF

# TAUNTON

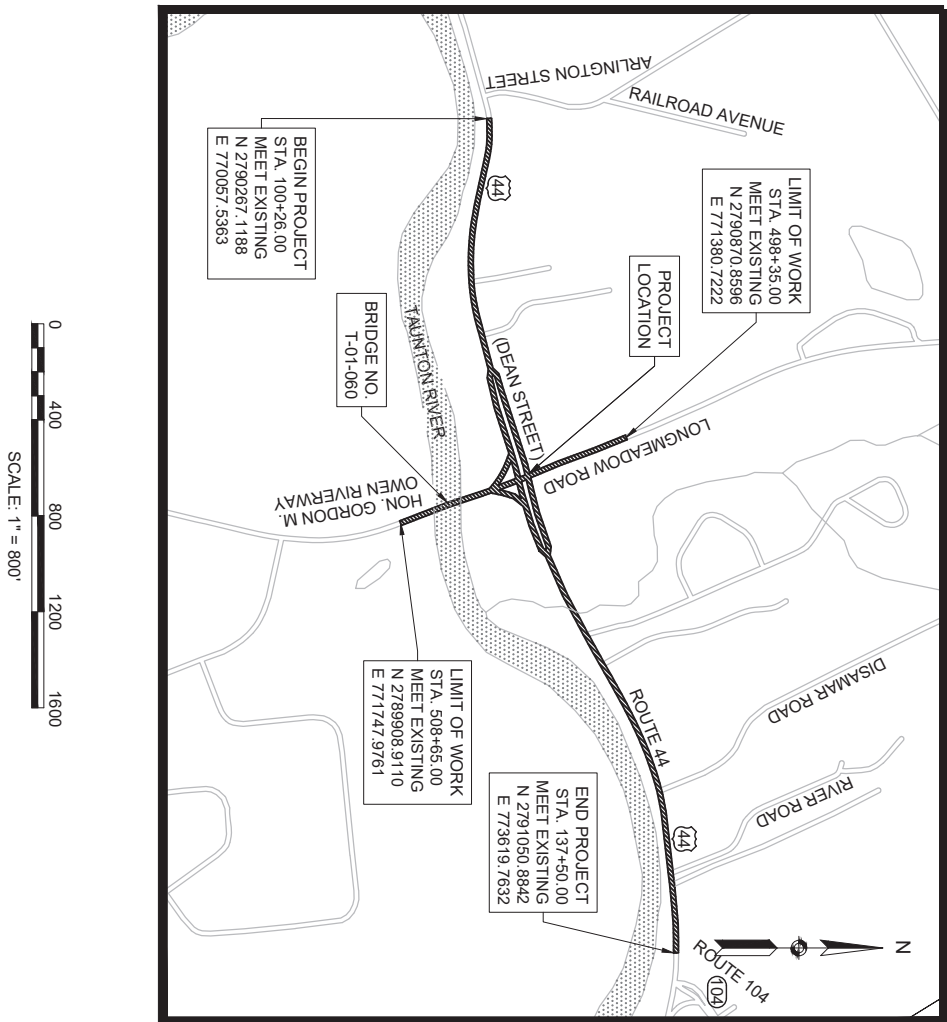
BRISTOL COUNTY

THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

# USACE PCN SUBMISSION PLANS

## INDEX

SHEET NO.		DESCRIPTION
1		TITLE SHEET & INDEX
2		LEGEND & ABBREVIATIONS
3		KEY PLAN
4-6		TYPICAL SECTIONS
7-16		CONSTRUCTION PLANS
17-26		DRAINAGE & UTILITY PLANS
27-36		LANDSCAPE PLANS
37		LANDSCAPE DETAILS
38		WETLAND REPLICATION PLAN AND DETAIL
39-42		CONSTRUCTION DETAILS
43-52		STRUCTURAL DETAILS




LENGTH OF PROJECT = 4,754 FEET = 0.900 MILES

### DESIGN DESIGNATION

STREET NAME	ROUTE 44 (IDEAN STREET)	HON. GORDON M. OWEN RIVERWAY
DESIGN SPEED	40 MPH	40 MPH
ADT (2018)	47,120 VPD	18,500 VPD
ADT (2038)	57,500 VPD	20,450 VPD
K	7.2%	9.3%
D	65%	61%
T (PEAK HOUR)	3.0%	3.8%
T (AVERAGE DAY)	3.0%	3.8%
DHV	4,140 VPH	1,910 VPD
DDHV	2,690 VPH	1,160 VPD
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN COLLECTOR

JULY 2022

 <b>Greenman - Pedersen, Inc.</b> Engineering & Construction Services			
181 Ballardvale Street, Suite 202, Wilmington, MA 01887 Tel: (978) 570-2899 Fax: (978) 665-3044 <a href="http://www.gpinc.net">http://www.gpinc.net</a>			
	8/23/2022	Confirmed HTL / MHV / OHW Boundaries	2
	8/11/2022	Response to USACE Comments	1
DATE		DESCRIPTION	REV#



**MassDOT**  
Massachusetts Department of Transportation  
Highway Division

RECOMMENDED FOR APPROVAL

**CHIEF ENGINEER**

DATE

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

**APPROVED:**

#### **DIVISION ADMINISTRATOR**





































































































DATE \_\_\_\_\_

HIGHWAY ADMINISTRATOR





























DATE \_\_\_\_\_



GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST SQUARE
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W/ 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLEWIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		CHAIN RAIL - WOOD POSTS
		WOOD FENCE
		SILT FENCE/COMPOST FILTER TUBES
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND *ONLY* - WHITE
		STOP LINE (12" WHITE)
		CROSSWALK (12" OR 24")
		SOLID WHITE LINE (6" OR 12")
		SOLID YELLOW LINE (6" OR 12")
		BROKEN WHITE LINE (6")
		BROKEN YELLOW LINE (6")
		DOTTED WHITE LINE (6")
		DOTTED YELLOW LINE (6")
		DOTTED WHITE LINE EXTENSION (6")
		DOTTED YELLOW LINE EXTENSION (6")
		DOUBLE WHITE LINE (6")
		DOUBLE YELLOW LINE (6")

\* BROKEN WHITE/YELLOW LINES TO BE 10' LINE SEGMENTS WITH 30' GAPS (TYP.) (BYL ON SHARED USE PATH TO BE 3' IN LENGTH WITH 9' GAP)

\*\* DWLEx AND DYLEx LINES TO BE 2' IN LENGTH WITH 6' GAP (TYP.)

\*\*\* DWL AND DYL LINES TO BE 3' IN LENGTH WITH 9' GAP (TYP.) (IF WIDE LINE IS SPECIFIED, THE WIDTH SHALL BE 12")

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION WAS PROVIDED BY CCR ASSOCIATES IN 2014 (6/17) 789-0111. SUPPLEMENTAL SURVEY WAS PROVIDED BY GREENMAN PEDERSEN, INC. IN MARCH AND OCTOBER, 2017. VERTICAL DATUM IS BASED ON NAVD88. HORIZONTAL DATUM IS BASED ON NAD83.
2. THE LOCATIONS AND SIZES OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE THE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.
3. WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R&R).
7. IT IS INTENDED THAT EXISTING GRANITE CURB IS TO BE USED IN PROPOSED WORK TO THE MAXIMUM EXTENT. THE ENGINEER SHALL DETERMINE THE SUITABILITY OF THE CURB FOR RE-USE. EXISTING AND PROPOSED GRANITE CURB SHALL NOT BE INTERSPERSED. THE COST OF CURB REMOVED AND RESET SHALL INCLUDE THE TRANSPORTING OF THE CURB TO A LOCATION WITHIN THE PROJECT LIMITS.
8. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.
9. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC UNLESS OTHERWISE NOTED.
10. ALL EXISTING STATE, COUNTY, CITY AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
11. ALL TRANSVERSE JOINTS AND ALL LONGITUDINAL JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT POURED RUBBERIZED ASPHALT SEALER MEETING THE REQUIREMENTS OF SPECIAL PROVISIONS ITEM 453.
12. ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM BORROW PLACED AND SEEDED. THE LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.
13. THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
14. PRIOR TO THE START OF ANY NEW UTILITY WORK, ALL ELEVATIONS OF EXISTING UTILITIES IN THOSE AREAS ARE TO BE VERIFIED. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY SHOULD ANY DISCREPANCIES OCCUR.
15. ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
16. ALL PUBLICLY OWNED GATE BOXES, SERVICE BOXES, MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
17. ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
18. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
19. CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
20. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTIBILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER GENERAL CLASS B TRENCH EXCAVATION.

GENERAL ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC	EXC	EXCAVATION	PVCC	POINT OF VERTICAL COMPOUND CURVATURE
ABAN	ABANDON	F&G	FRAME AND COVER	PVI	POINT OF VERTICAL INTERSECTION
ADJ	ADJUST	F&G	FRAME AND GRATE	PVRC	POINT OF VERTICAL REVERSE CURVATURE
APPROX.	APPROXIMATE	FDN.	FOUNDATION	PVT	POINT OF VERTICAL TANGENCY
A.C.	ASPHALT CONCRETE	FLOSTN	FIELDSTONE	PVMT	PAVEMENT
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	GAR	GARAGE	PWW	PAVED WATER WAY
BIT.	BITUMINOUS	GD	GROUND	R	RADIUS OF CURVATURE
BC	BOTTOM OF CURB	GG	GAS GATE	R&D	REMOVE AND DISPOSE
BD.	BOUND	GI	GUTTER INLET	RCP	REINFORCED CONCRETE PIPE
BL	BASELINE	GIP	GALVANIZED IRON PIPE	RD	ROAD
BLDG	BUILDING	GRAN	GRANITE	RDWY	ROADWAY
BM	BENCHMARK	GRAV	GRAVEL	REM	REMOVE
BO	BY OTHERS	GRD	GUARD	RET	RETAIN
BOS	BOTTOM OF SLOPE	HDW	HEADWALL	RET WALL	RETAINING WALL
BR.	BRIDGE	HMA	HOT MIX ASPHALT	ROW	RIGHT OF WAY
BV	BOTTOM OF WALL	HOR	HORIZONTAL	R&R	REMOVE AND RESET
CB	CATCH BASIN	HYD	HYDRANT	R&S	REMOVE AND STACK
CBCL	CATCH BASIN WITH CURB INLET	INV	INVERT	RT	RIGHT
CC	CEMENT CONCRETE	JCT	JUNCTION	SB	STONE BOUND
CCM	CEMENT CONCRETE MASONRY	L	LENGTH OF CURVE	SHLD	SHOULDER
CEM	CEMENT	LB	LEACH BASIN	SMH	SEWER MANHOLE
CI	CURB INLET	LP	LIGHT POLE	ST	STREET
CIP	CAST IRON PIPE	LT	LEFT	STA	STATION
CIPP	CURED IN PLACE PIPE	MAX	MAXIMUM	SSD	STOPPING SIGHT DISTANCE
CIT	CHANGE IN TYPE	MB	MAILBOX	SSLO	STATE HIGHWAY LAYOUT LINE
CLF	CHAIN LINK FENCE	MH	MANHOLE	SW	SIDEWALK
CL	CENTERLINE	MHB	MASSACHUSETTS HIGHWAY BOUND	T	TANGENT DISTANCE OF CURVE/TRUCK %
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	TAN	TANGENT
CSP	CORRUGATED STEEL PIPE	MU	MECHANICAL JOINT	TEMP	TEMPORARY
CO.	COUNTY	NO.	NUMBER	TC	TOP OF CURB
CONC	CONCRETE	NTS	NOT TO SCALE	TOS	TOP OF SLOPE
CONT	CONTINUOUS	PC	POINT OF CURVATURE	TW	TOP OF WALL
CONST	CONSTRUCTION	PCC	POINT OF COMPOUND CURVATURE	TYP	TYPICAL
CR GR	CROWN GRADE	P.G.L.	PROFILE GRADE LINE	UP	UTILITY POLE
DHV	DESIGN HOURLY VOLUME	PI	POINT OF INTERSECTION	VAR	VARIES
DI	DROP INLET	POC	POINT ON CURVE	VERT	VERTICAL
DIA	DIAMETER	POT	POINT ON TANGENT	VC	VERTICAL CURVE
DIP	DUCTILE IRON PIPE	PRC	POINT OF REVERSE CURVATURE	WCR	WHEEL CHAIR RAMP
DW	STEADY DONT WALK - PORTLAND ORANGE	PROU	PROJECT	WG	WATER GATE
DWY	DRIVEWAY	PROP	PROPOSED	WIP	WROUGHT IRON PIPE
ELEV (or EL.)	ELEVATION	PSB	PLANTABLE SOIL BORROW	WM	WATER METER/WATER MAIN
EMB	EMBANKMENT	PT	POINT OF TANGENCY	WSO	WATER SHUT OFF
EOP	EDGE OF PAVEMENT	PVC	POINT OF VERTICAL CURVATURE	X-SECT	CROSS SECTION
EXIST (or EX)	EXISTING				

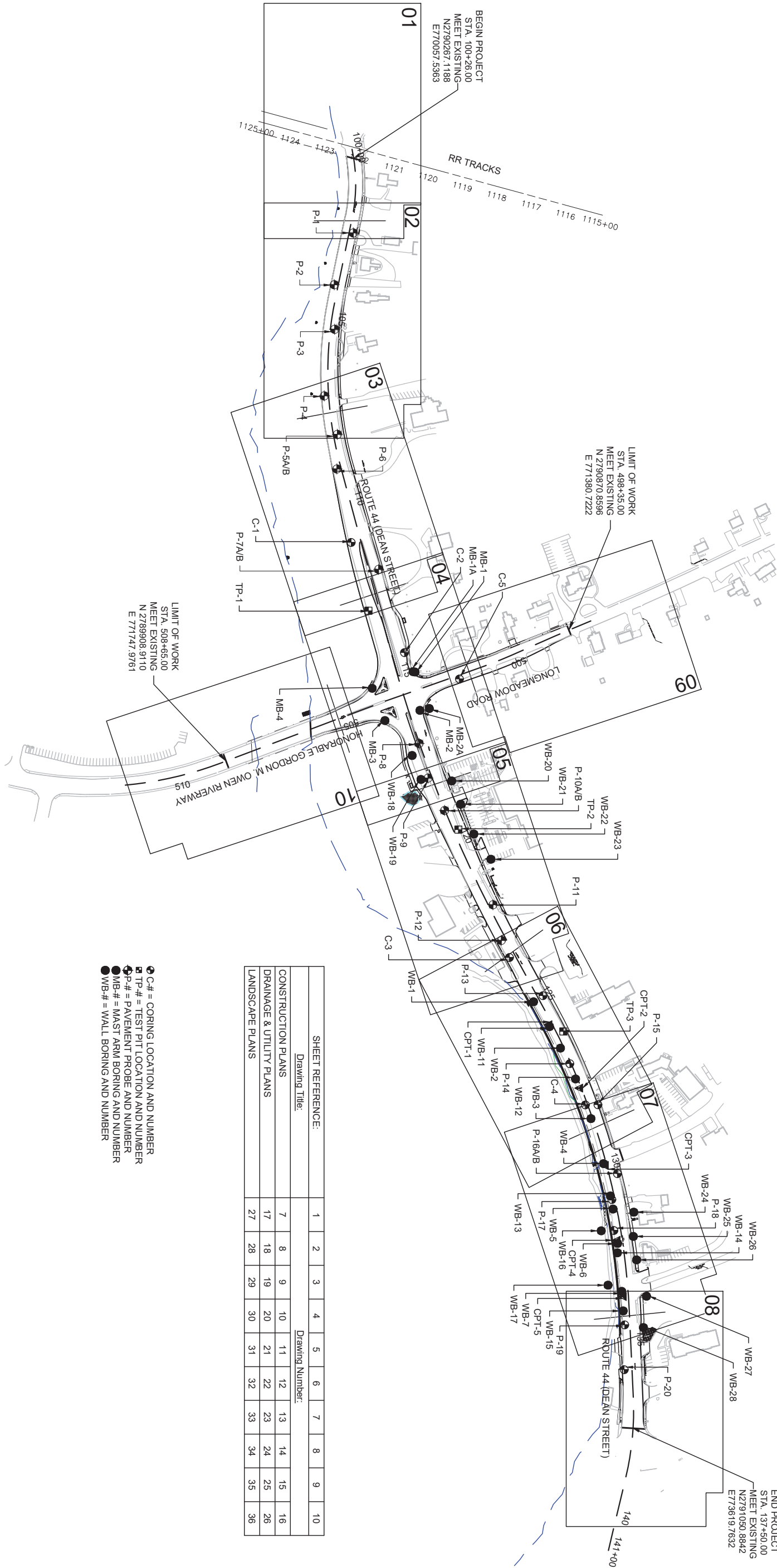
TAUNTON  
ROUTE 44 (IDEAN STREET)

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	52
PROJECT FILE NO.		606024	

LEGEND & ABBREVIATIONS

VAR	VARIES	VERT	VERTICAL
VC	VERTICAL CURVE	WCR	WHEEL CHAIR RAMP
WG	WATER GATE	WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN	WSO	WATER SHUT OFF
X-SECT	CROSS SECTION		





- C-# = CORING LOCATION AND NUMBER
- TP-# = TEST PIT LOCATION AND NUMBER
- P-# = PAVEMENT PROBE AND NUMBER
- MB-# = MAST ARM BORING AND NUMBER
- WB-# = WALL BORING AND NUMBER

SHEET REFERENCE:										
Drawing Title:					Drawing Number:					
CONSTRUCTION PLANS					1	2	3	4	5	6
DRAINAGE & UTILITY PLANS					7	8	9	10	11	12
LANDSCAPE PLANS					13	14	15	16	17	18
					19	20	21	22	23	24
					25	26	27	28	29	30
					31	32	33	34	35	36

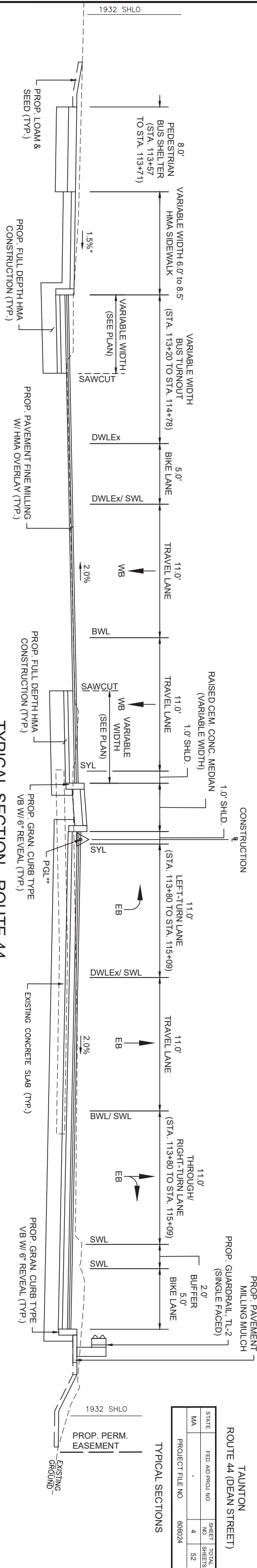
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	52
PROJECT FILE NO.		606024	

KEY PLAN



SCALE: 1" = 300'





STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	4	52
PROJECT FILE NO.		606024	

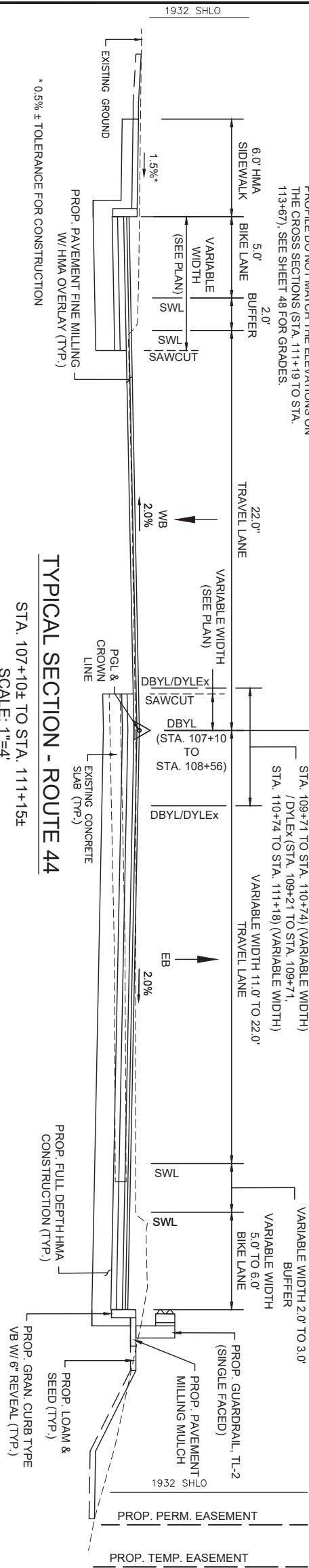
## PAVEMENT NOTES

## TYPICAL SECTION - ROUTE 44

STA. 111+19± TO STA. 115+11±

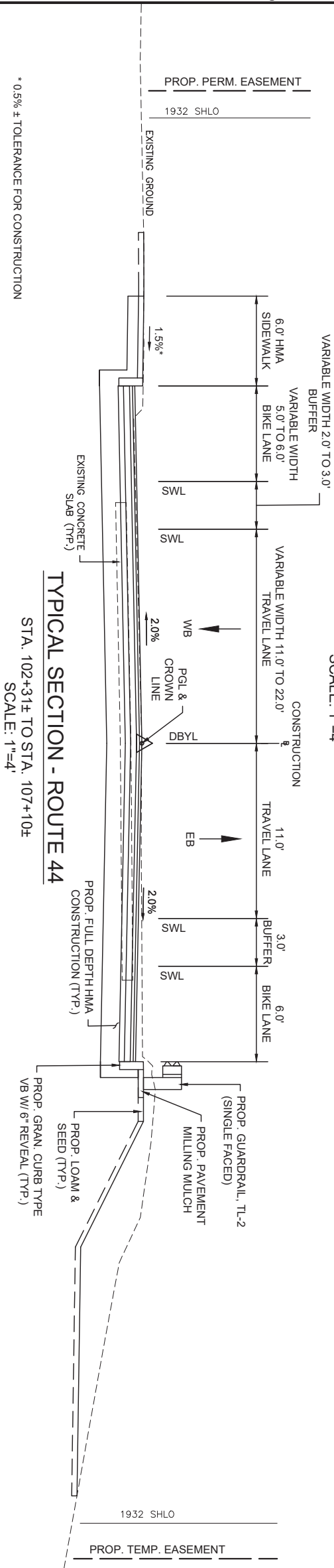
CONSTRUCTION

\* 0.5% ± TOLERANCE FOR CONSTRUCTION  
\*\* DUE TO THE PRESENCE OF THE RAISED ISLAND,  
PROPOSED GRADE LINE ELEVATIONS ON THE  
PROFILE DO NOT MATCH THE ELEVATIONS ON  
THE CROSS SECTIONS (STA. 11+19 TO STA.  
11+367), SEE SHEET 48 FOR GRADES.



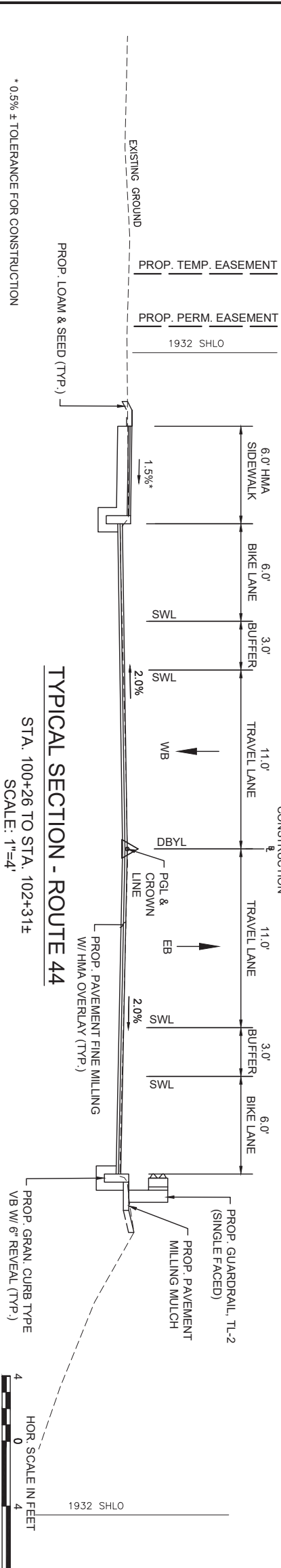
## TYPICAL SECTION - ROUTE 44

STA. 107+10± TO STA. 111+15±  
SCALE: 1"=4'



## TYPICAL SECTION - ROUTE 44

STA. 102+31± TO STA. 107+10±  
SCALE: 1"=4'



## TYPICAL SECTION - ROUTE 44

STA. 100+26 TO STA. 102+31±  
SCALE: 1"=4'

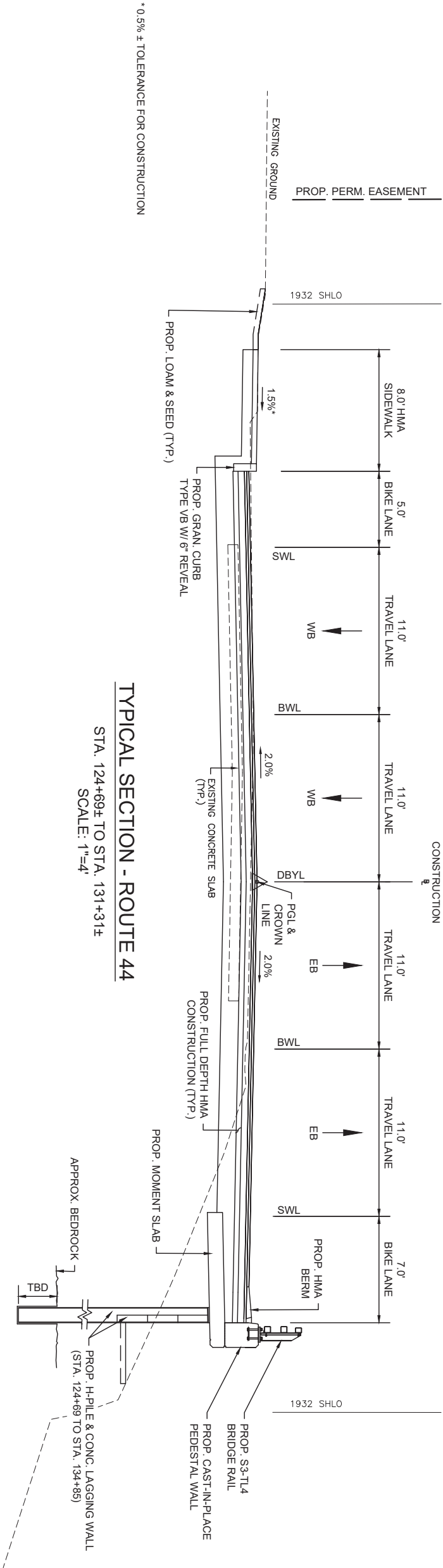


## GENERAL NOTES

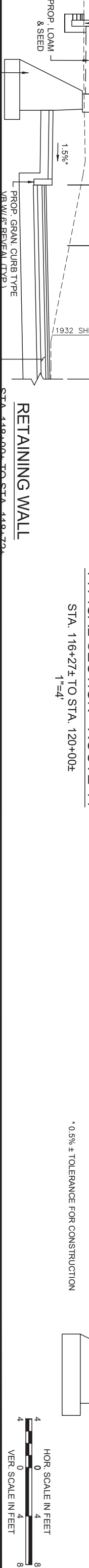
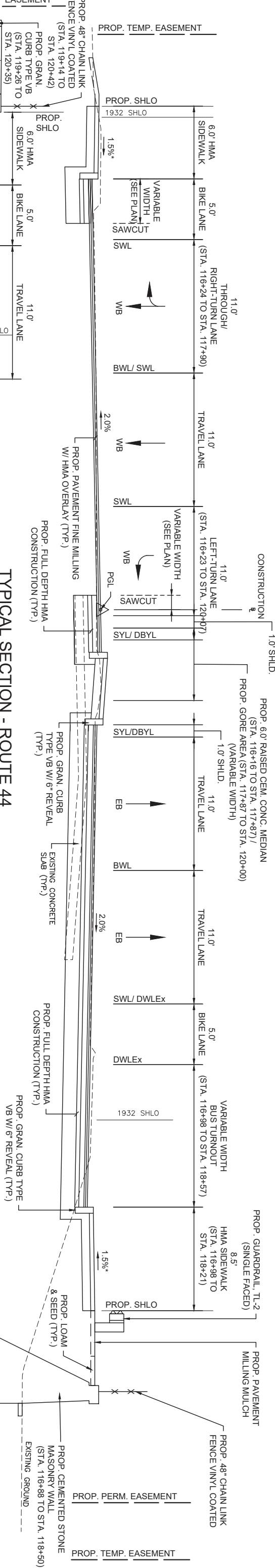
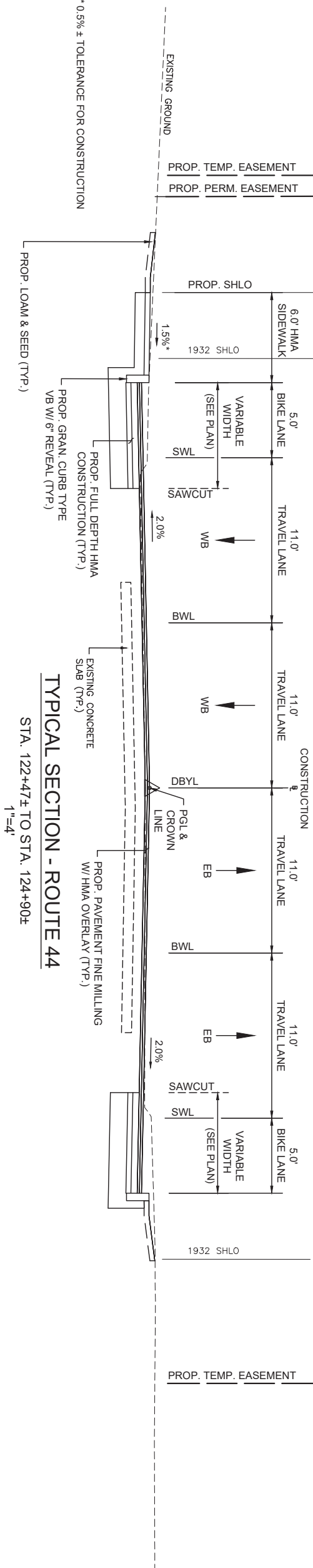
1. PREPARATION OF UNDERLYING SURFACE, ASPHALT EMULSION FOR TACK COAT, HMA FOR PATCHING, AND HMA JOINT ADHESIVE SHALL BE IN ACCORDANCE WITH SECTION 450.
2. THE SECTIONS OF ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER AT INTERSECTIONS OR ARE IN AREAS OF TRANSITION AND THEREFORE HAVE NOT BEEN SHOWN.
3. REFER TO CONSTRUCTION STANDARD E 106.3.0 FOR METHOD OF SETTING CURB IN WILDED AREAS.

4. ASPHALT EMULSION FOR TACK COAT (RS-H) SHALL BE APPLIED AT THE RATE OF 0.06 TO 0.08 GALLONS PER SQUARE YARD OVER NEW HMA SURFACES NOT OPENED TO TRAFFIC AS WELL AS OVER EXISTING TIGHT SMOOTH PAVEMENT. ON MILLED SURFACES, THE EMULSION APPLICATION RATE SHALL EQUAL 0.07 TO 0.09 GALLONS PER SQUARE YARD. ON NEW HMA PATCHES, THE EMULSION APPLICATION RATE SHALL EQUAL 0.06 TO 0.09

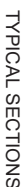




TYPICAL SECTION - ROUTE 44  
STA. 124+69± TO STA. 131+31±  
SCALE: 1"=4'







\* 0.5% ± TOLERANCE FOR CONSTRUCTION



SCALE: 1"=4'



SCALE: 1"=4'

































## HIGHWAY GUARD DETAILS

NONE

## TRAFFIC SIGNAL CONDUIT

NONE

## WATER SUPPLY ALTERATIONS

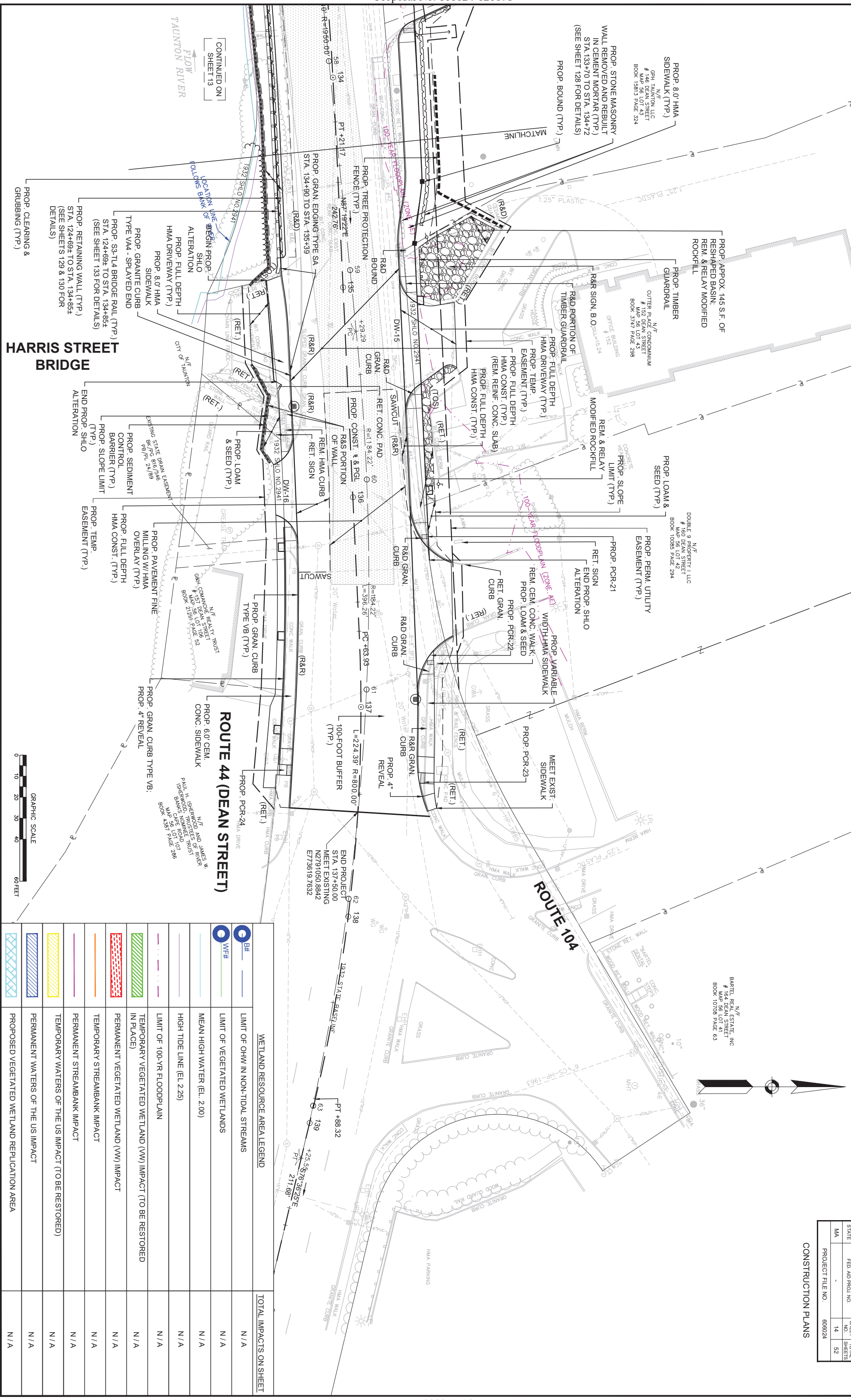
NONE

## DRAINAGE DETAILS

SEE SHEET 64

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	52
PROJECT FILE NO.		606024	





HIGHWAY GUARD DETAILS

NONE

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

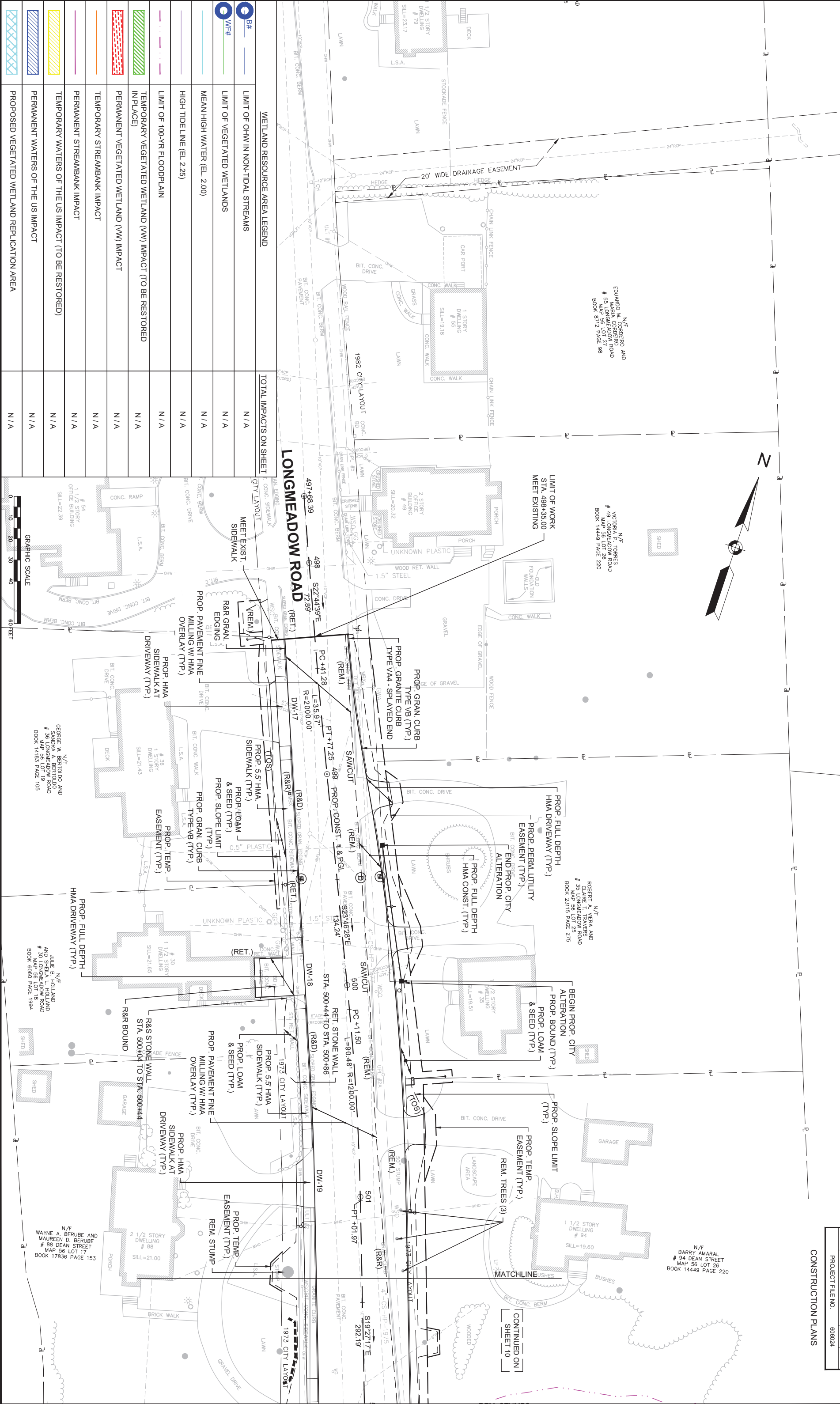
DRAINAGE DETAILS

SEE SHEET 65

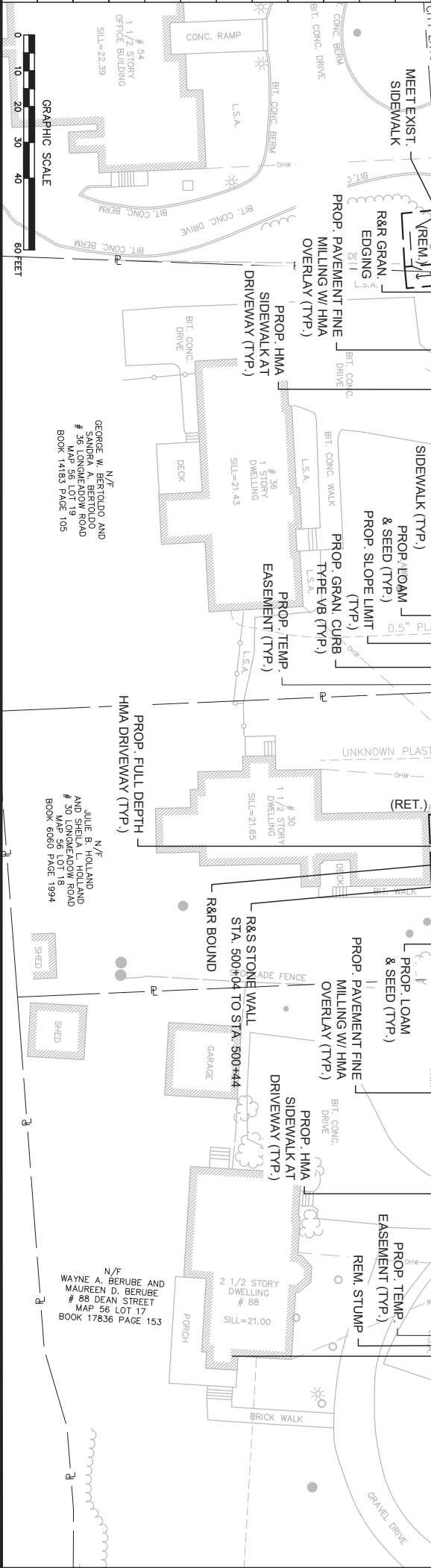
TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	52
PROJECT FILE NO.		606024	

CONSTRUCTION PLANS



WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
<div><div>●</div> <b>WB#</b></div>	LIMIT OF OHW IN NON-TIDAL STREAMS	N/A
<div><div>●</div> <b>WFB#</b></div>	LIMIT OF VEGETATED WETLANDS	N/A
<div><div>—</div></div>	MEAN HIGH WATER (EL. 2.00)	N/A
<div><div>—</div></div>	HIGH TIDE LINE (EL. 2.25)	N/A
<div><div>—</div></div>	LIMIT OF 100-YR FLOODPLAIN	N/A
<div><div>—</div></div>	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N/A
<div><div>—</div></div>	PERMANENT VEGETATED WETLAND (VW) IMPACT	N/A
<div><div>—</div></div>	TEMPORARY STREAMBANK IMPACT	N/A
<div><div>—</div></div>	PERMANENT STREAMBANK IMPACT	N/A
<div><div>—</div></div>	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	N/A
<div><div>—</div></div>	PERMANENT WATERS OF THE US IMPACT	N/A
<div><div>—</div></div>	PROPOSED VEGETATED WETLAND REPLICATION AREA	N/A





HIGHWAY GUARD DETAILS

STA. 504+67 LT TO STA. 505+77 LT - ITEM 620.12  
STA. 505+77 LT - ITEM 628.24  
STA. 504+84 RT TO STA. 505+96 RT - ITEM 620.12  
STA. 505+96 RT - ITEM 628.24

TRAFFIC SIGNAL CONDUIT

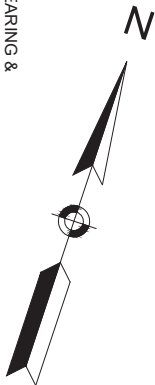
NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE SHEET 66



CONTINUED ON  
SHEET 10

PROP. CLEARING &  
GRUBBING (TYP.)

PROP. GUARDRAIL, TL-2  
(SINGLE FACED) (TYP.)

PROP. LOAM &  
RIVERBANK SEED (TYP.)

PROP. SEDIMENT  
CONTROL BARRIER  
(TYP.)

PROP. GRAN. CURB  
TYPE VA

PROP. PAVEMENT  
FINE MILLING W/  
HMA OVERLAY (TYP.)

EDGE OF  
VEGETATED  
WETLANDS

PROP. SLOPE LIMIT  
(TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

PROP. GRAN.  
CURB TYPE  
VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

PROP. GRAN.  
CURB  
TYPE VB (TYP.)

FLOW  
TAUNTON RIVER  
(TIDAL)

HONORABLE GORDON M.  
OWEN RIVERWAY

LIMIT OF PROP. PAVEMENT FINE  
MILLING W/ HMA OVERLAY  
(MEET AT EXIST. BRIDGE JOINT)

MEET EXIST. SIDEWALK  
AND RELAID  
RIPRAP REMOVED

PROP. GRAN. CURB TYPE VA

PROP. SLOPE LIMIT (TYP.)

PROP. LOAM &  
RIVERBANK SEED (TYP.)

PROP. GUARDRAIL, TL-2  
(SINGLE FACED) (TYP.)

PROP. 6.0' HMA  
SIDEWALK (TYP.)

PROP. GRAN. CURB  
TYPE VB (TYP.)

FLOW  
TAUNTON RIVER  
(TIDAL)

N/F  
CITY OF TAUNTON  
# 55 HANCOCK STREET  
MAP 67 LOT 119

100-YEAR FLOODPLAIN (ZONE AE)

LIMIT OF WORK  
STA. 508+65.00  
MEET EXISTING

PC+82.45

509

510

511

512

513

514

515

516

517

518

519

WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
BH	LIMIT OF OHW IN NON-TIDAL STREAMS	N / A
WF#	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL. 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	N / A
	PERMANENT VEGETATED WETLAND (VW) IMPACT	N / A
	TEMPORARY STREAMBANK IMPACT	N / A
	PERMANENT STREAMBANK IMPACT	N / A
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	95 SF
	PERMANENT WATERS OF THE US IMPACT	59 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	N / A

TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	52
PROJECT FILE NO.		000024	

CONSTRUCTION PLANS

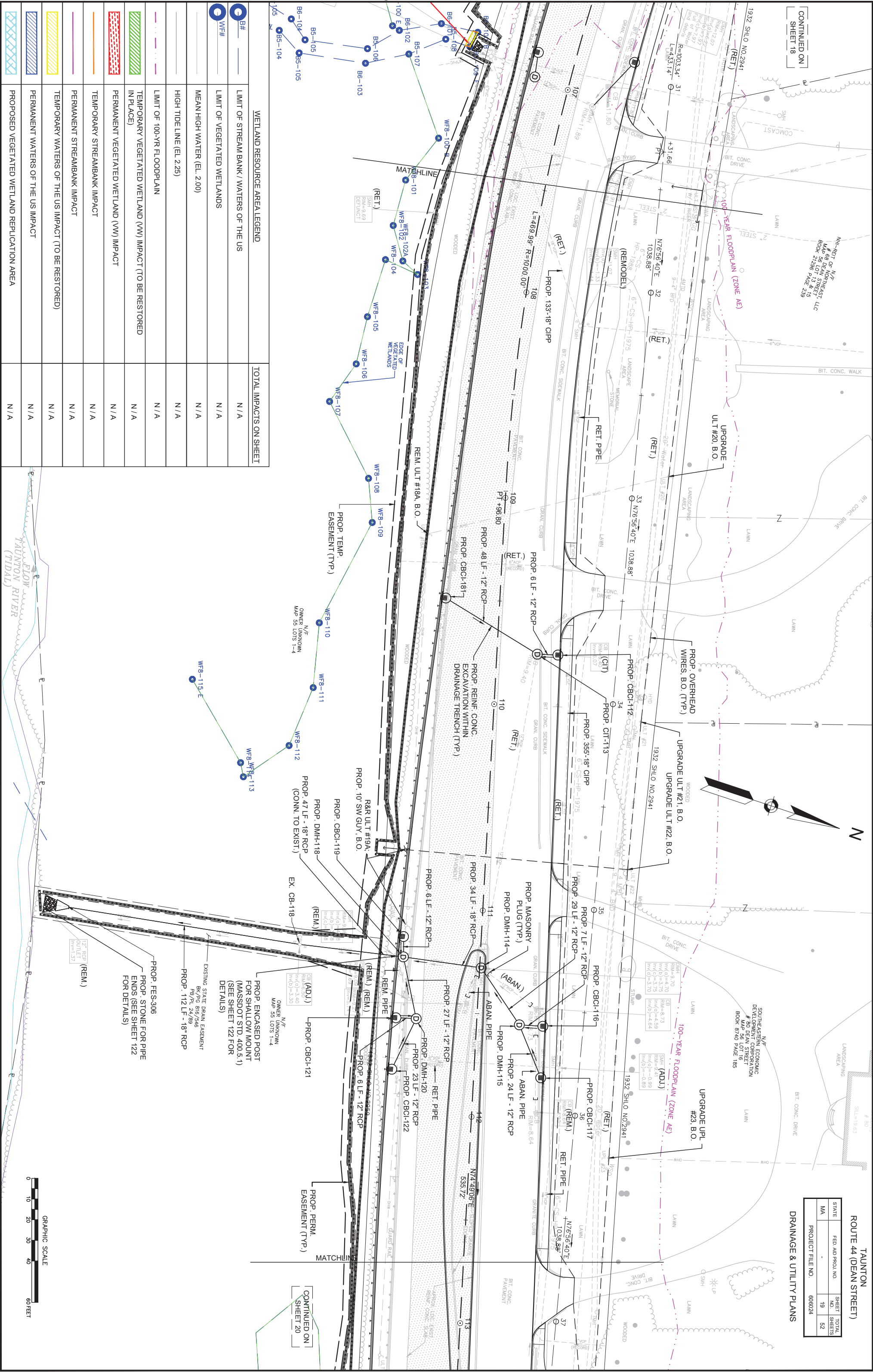












TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	52

PROJECT FILE NO.	606024
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DRAINAGE & UTILITY PLANS

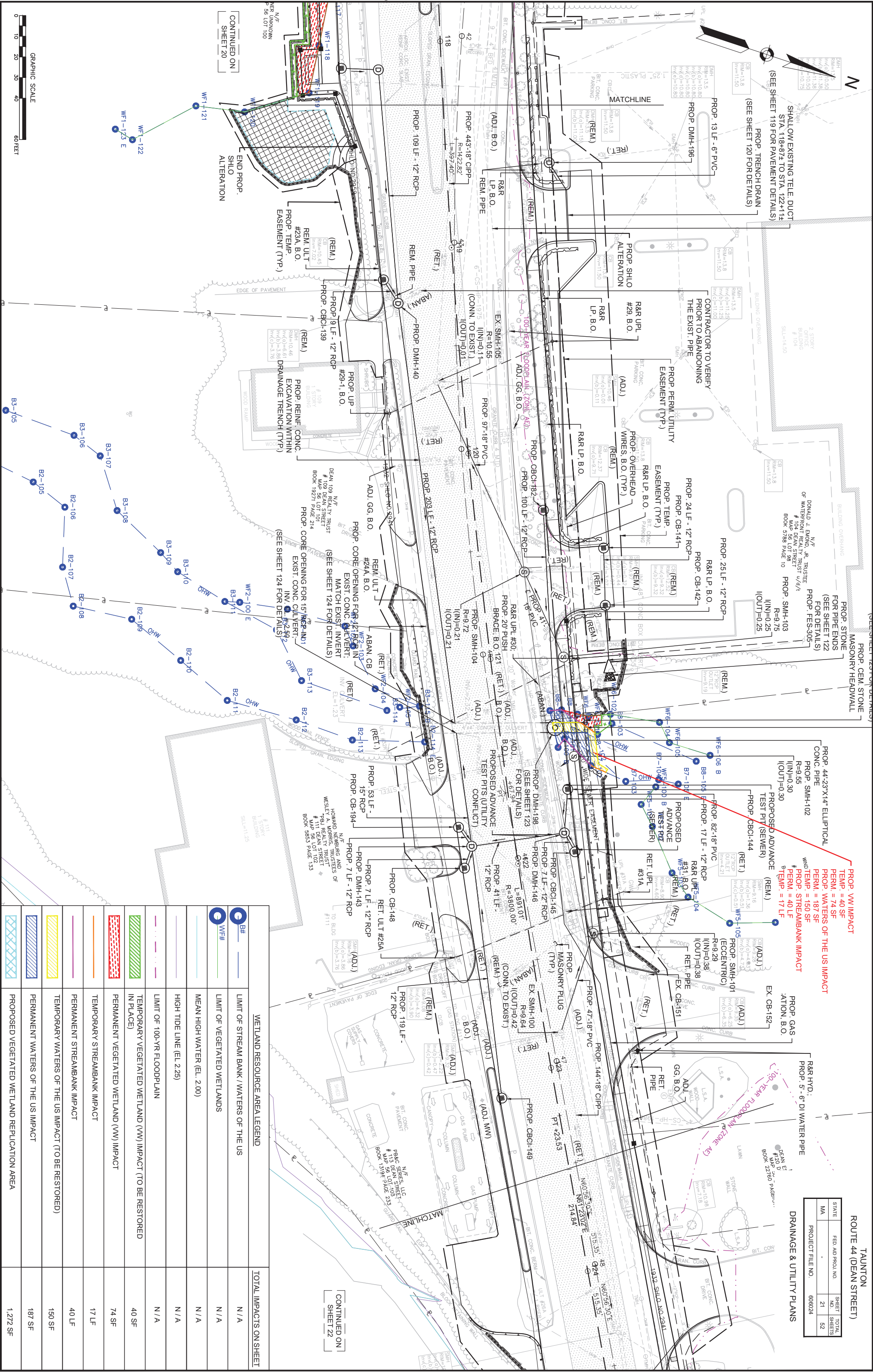
GRAPHIC SCALE







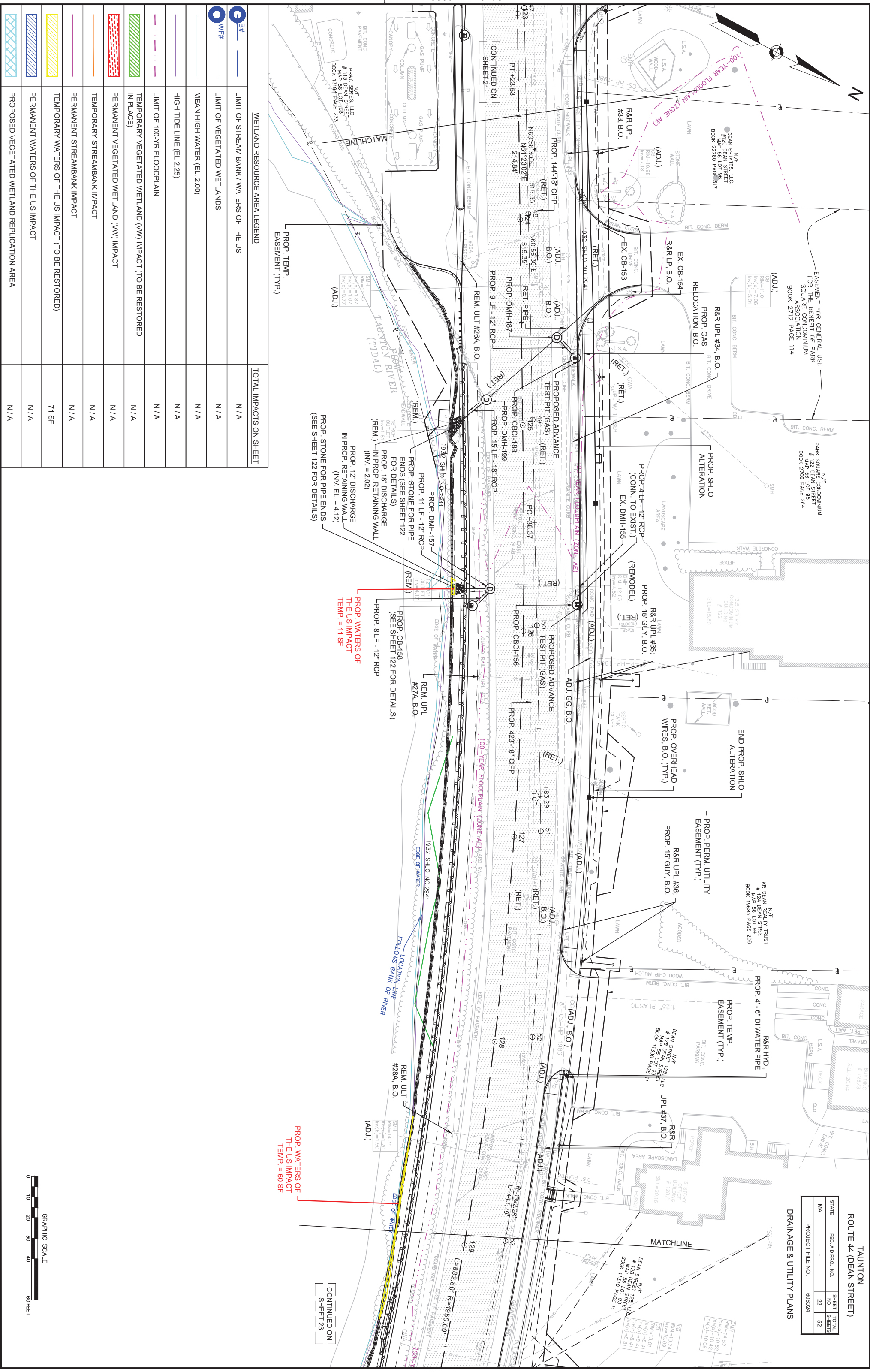




TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	52
PROJECT FILE NO.		606024	

WETLAND RESOURCE AREA LEGEND		TOTAL IMPACTS ON SHEET
	LIMIT OF STREAM BANK / WATERS OF THE US	N / A
	LIMIT OF VEGETATED WETLANDS	N / A
	MEAN HIGH WATER (EL. 2.00)	N / A
	HIGH TIDE LINE (EL. 2.25)	N / A
	LIMIT OF 100-YR FLOODPLAIN	N / A
	TEMPORARY VEGETATED WETLAND (VW) IMPACT (TO BE RESTORED IN PLACE)	40 SF
	PERMANENT VEGETATED WETLAND (VW) IMPACT	74 SF
	TEMPORARY STREAMBANK IMPACT	17 LF
	PERMANENT STREAMBANK IMPACT	40 LF
	TEMPORARY WATERS OF THE US IMPACT (TO BE RESTORED)	150 SF
	PERMANENT WATERS OF THE US IMPACT	187 SF
	PROPOSED VEGETATED WETLAND REPLICATION AREA	1,272 SF









TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	52
PROJECT FILE NO.		606024	

## DRAINAGE & UTILITY PLANS





TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	52
PROJECT FILE NO.		606024	













- LEGEND
- EXISTING TREE TO REMAIN

EXISTING TREE TO BE REMOVED

PROP. TREE PROTECTION FENCE

PROP. SEDIMENT CONTROL BARRIER

PROP. DECIDUOUS TREE

PROP. TREE TRIMMING

PROP. LIMIT OF CLEARING

PROP. LAWN SEED MIX

PROP. RIVERBANK SEED MIX

PROP. MATTING FOR EROSION CONTROL WITH RIVERBANK SEED MIX

PROP. AGED PINE BARK MULCH

PROP. WETLAND RESTORATION / REPLICATION AREA

LANDSCAPE NOTES

1. CONTRACTOR SHALL HAVE ALL SUBSURFACE UTILITIES MARKED PRIOR TO THE START OF WORK.

2. PLANT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL STAKE OUT PROPOSED PLANTING LOCATIONS FOR APPROVAL BY THE RESIDENT ENGINEER AND THE LANDSCAPE ARCHITECT PRIOR TO PLACING PLANT MATERIALS.

3. ALL PLANT MATERIALS SHALL HAVE TAGS INDICATING COMMON NAME, BOTANICAL NAME, CULTIVAR, AND SIZE. IMMEDIATELY AFTER ACCEPTANCE OF PLANTING, TAGS AND RIBBONS SHALL BE REMOVED.

4. ALL PLANTS SHALL BE MULCHED PER THE PLANS AND SPECIFICATIONS.

5. PLANTING BEDS SHALL BE WEEDED AND OTHERWISE NEATLY MAINTAINED FOR THE DURATION OF THE CONTRACT.

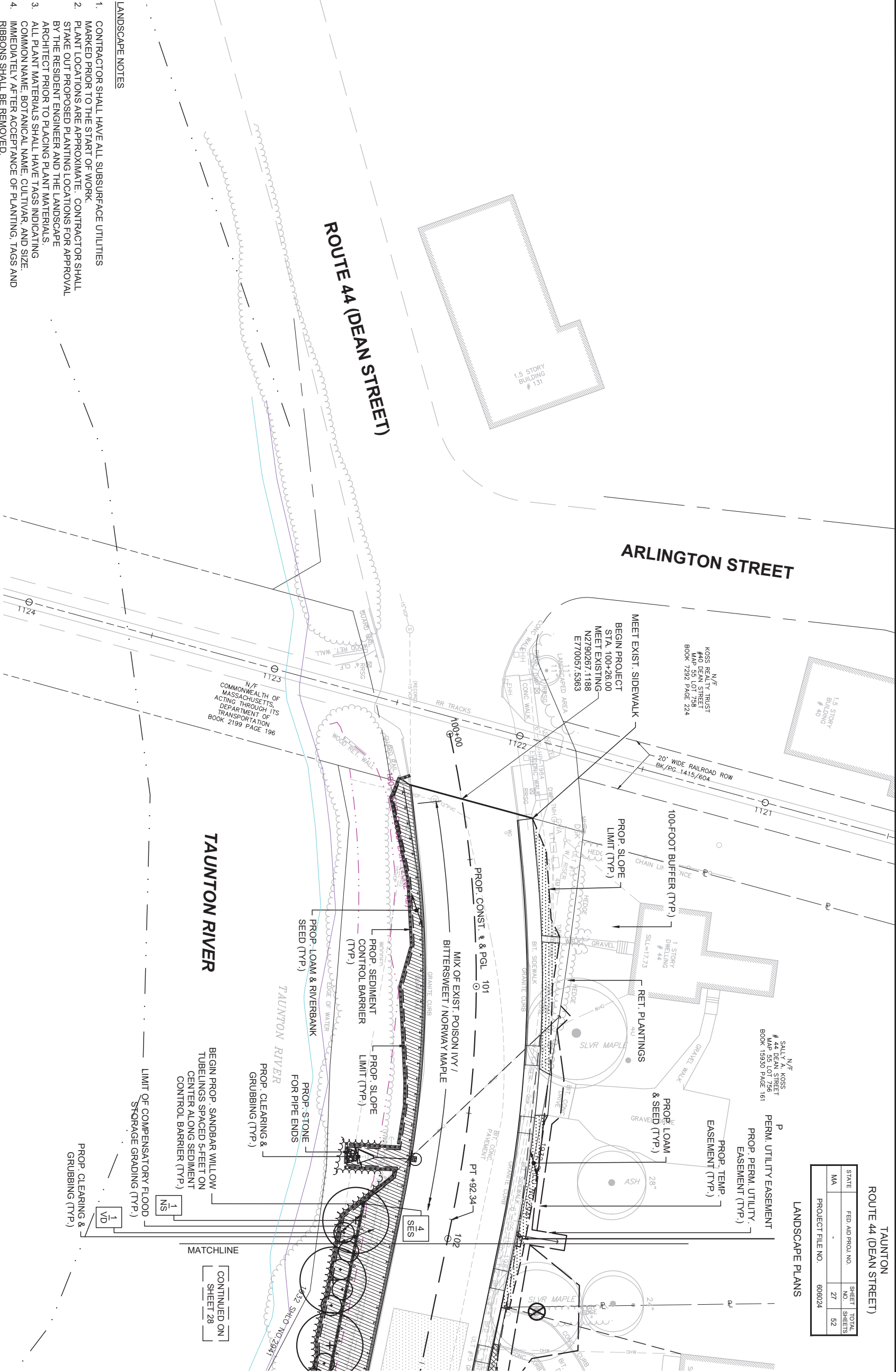
6. PLANTS AND PLANTING BEDS SHALL BE THOROUGHLY WATERED AS NECESSARY AND PER THE SPECIFICATIONS.

7. ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED UNLESS NOTED OTHERWISE.

8. ESTIMATED AREAS OF INVASIVE PLANTS ARE CALLED OUT ON THE LANDSCAPE SHEETS FOR REFERENCE. ACTUAL AREAS SHALL BE INVENTORIED ON SITE AT TIME OF CONSTRUCTION ACCORDING TO THE INVASIVE PLANT MANAGEMENT STRATEGY SPECIFICATION.

9.

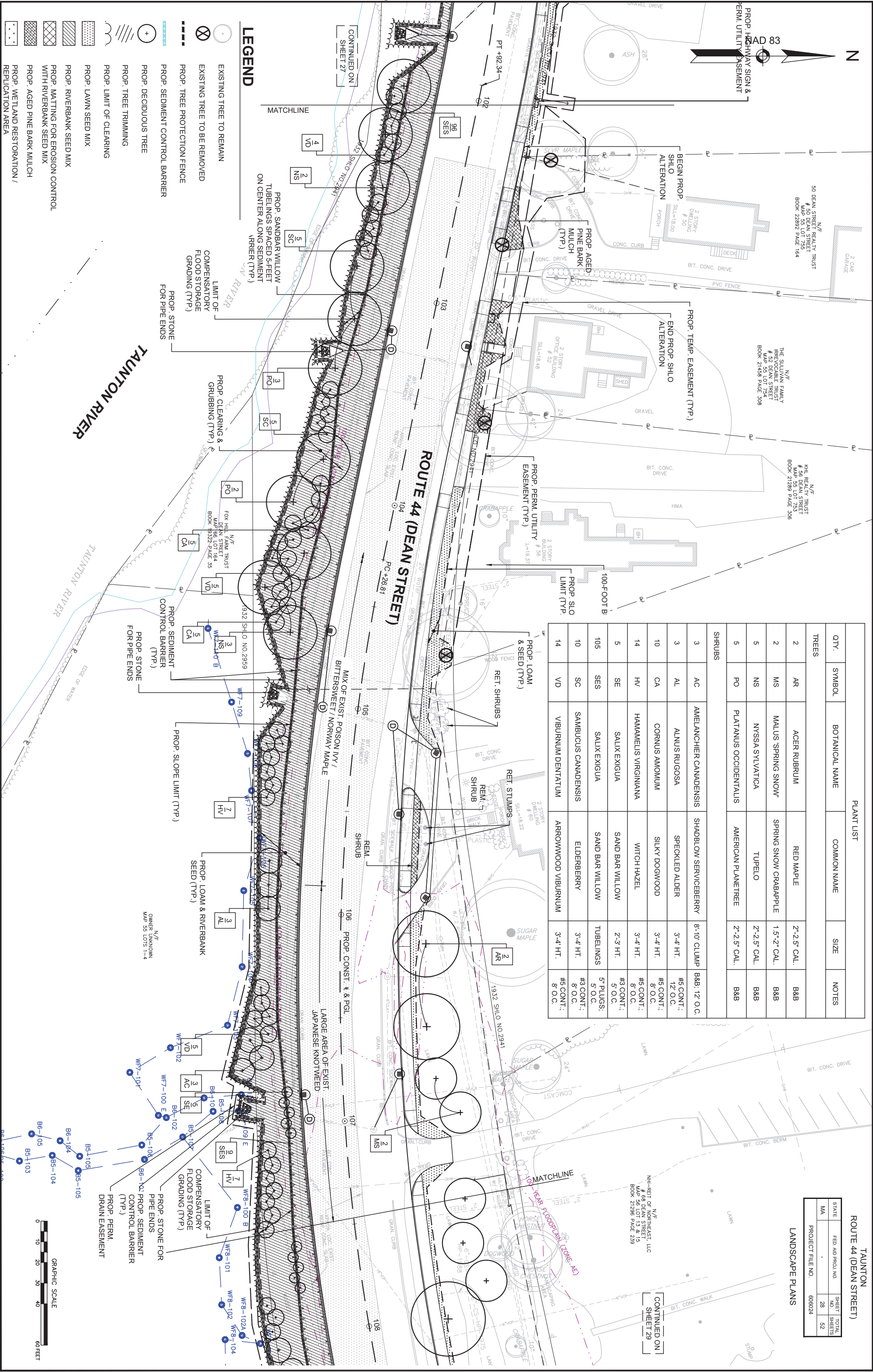
PLANT LIST					
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
TREES					
1	NS	NYSSA SYLVATICA	TUPELO	2'-2.5" CAL.	B&B
SHRUBS					
4	SES	SALIX EXIGUA	SAND BAR WILLOW	TUBELINGS	5" PLUGS; 5" O.C.
1	VD	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	3'-4' HT.	#5 CONT.; 8" O.C.



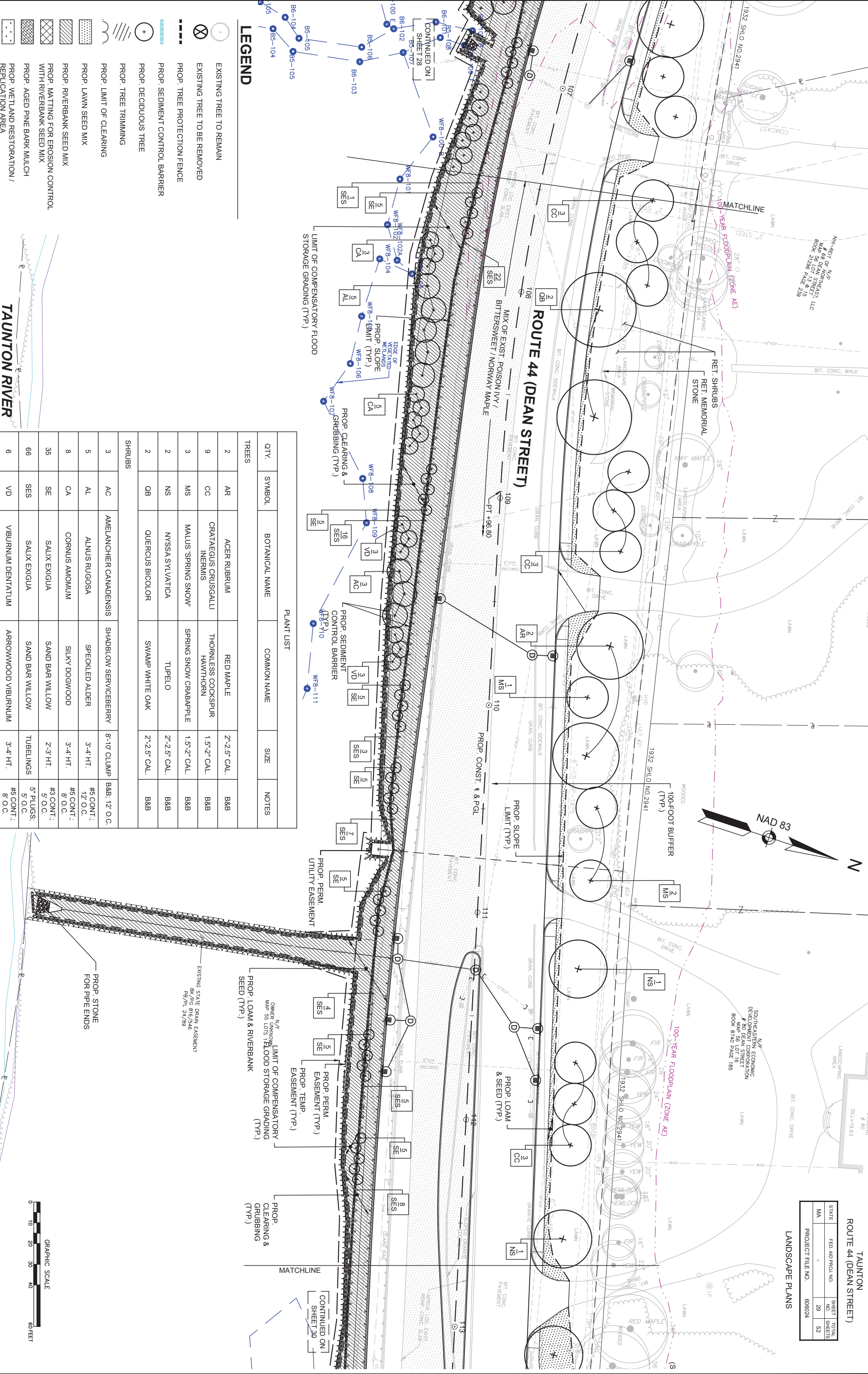
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	52
PROJECT FILE NO.		606024	

LANDSCAPE PLANS



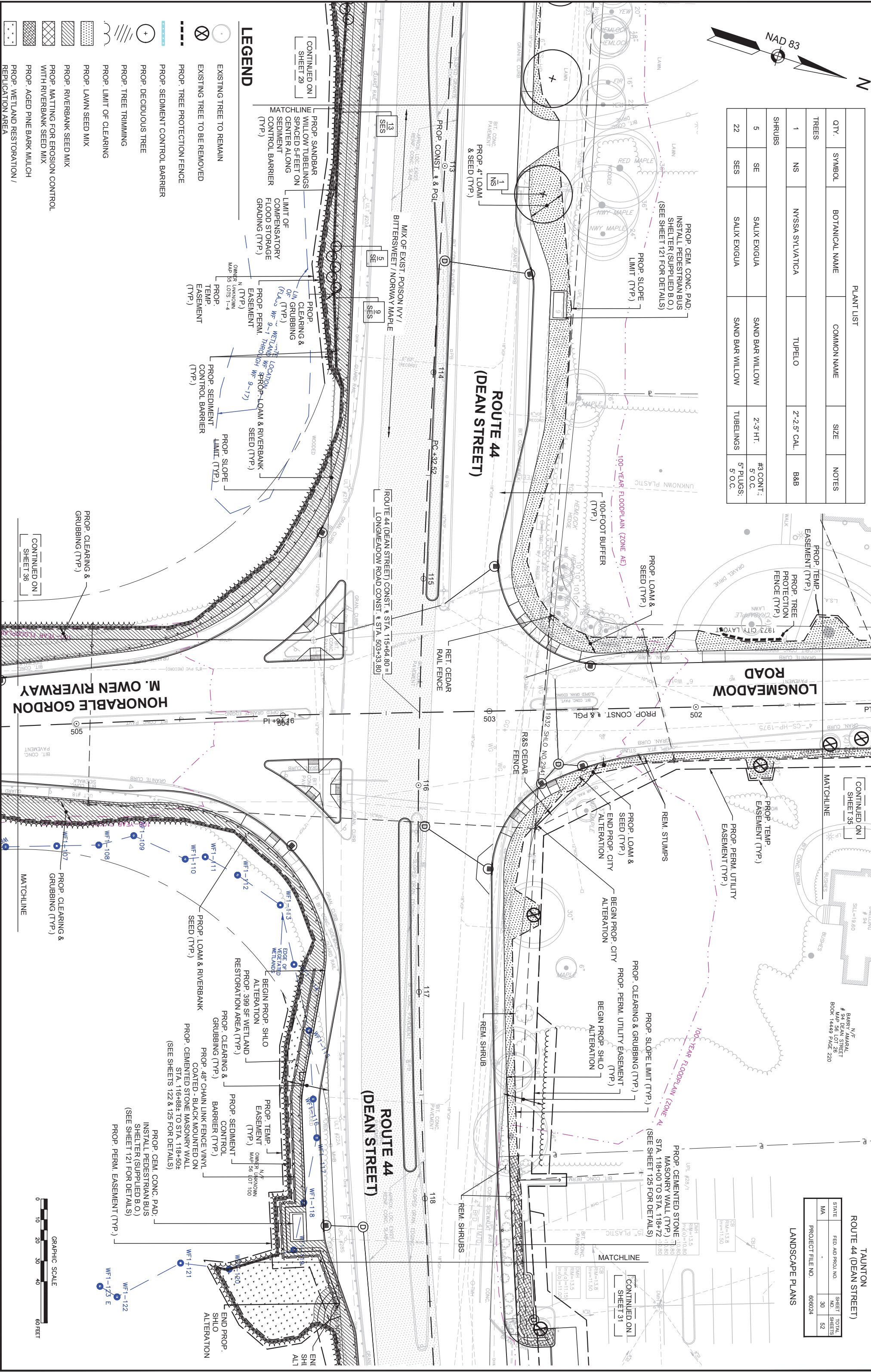
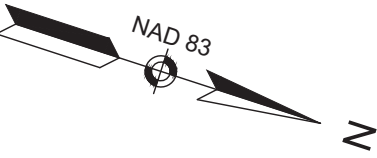






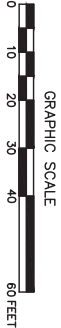


PLANT LIST					
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
TREES					
1	NS	NYSSA SYLVATICA	TUPELO	2'-2.5' CAL.	B&B
SHRUBS					
5	SE	SALIX EXIGUA	SAND BAR WILLOW	2'-3' HT.	#3 CONT.; 5' O.C.
22	SES	SALIX EXIGUA	SAND BAR WILLOW	TUBELINGS	5' PLUGS; 5' O.C.



TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	30	52
PROJECT FILE NO. 606024			

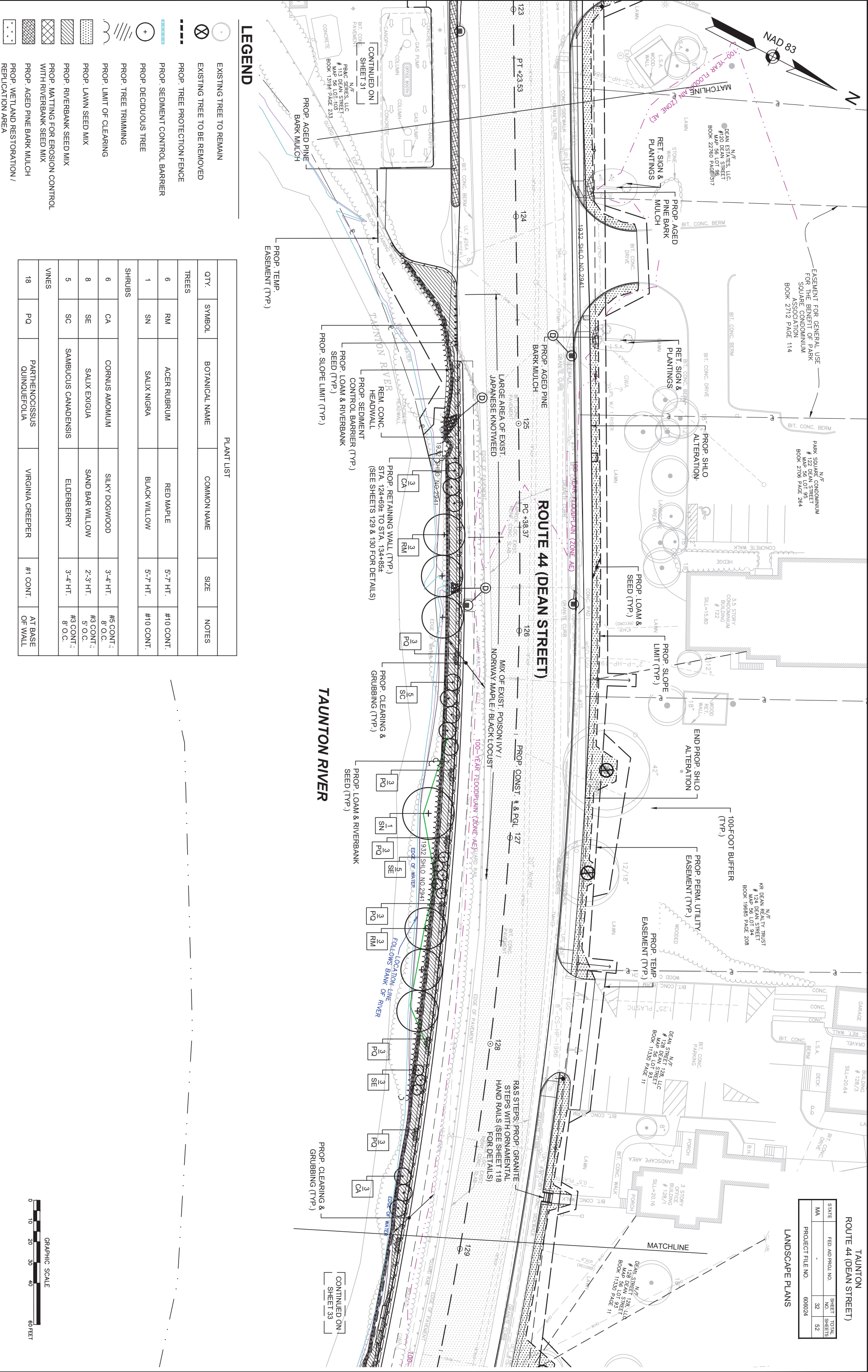
LANDSCAPE PLANS







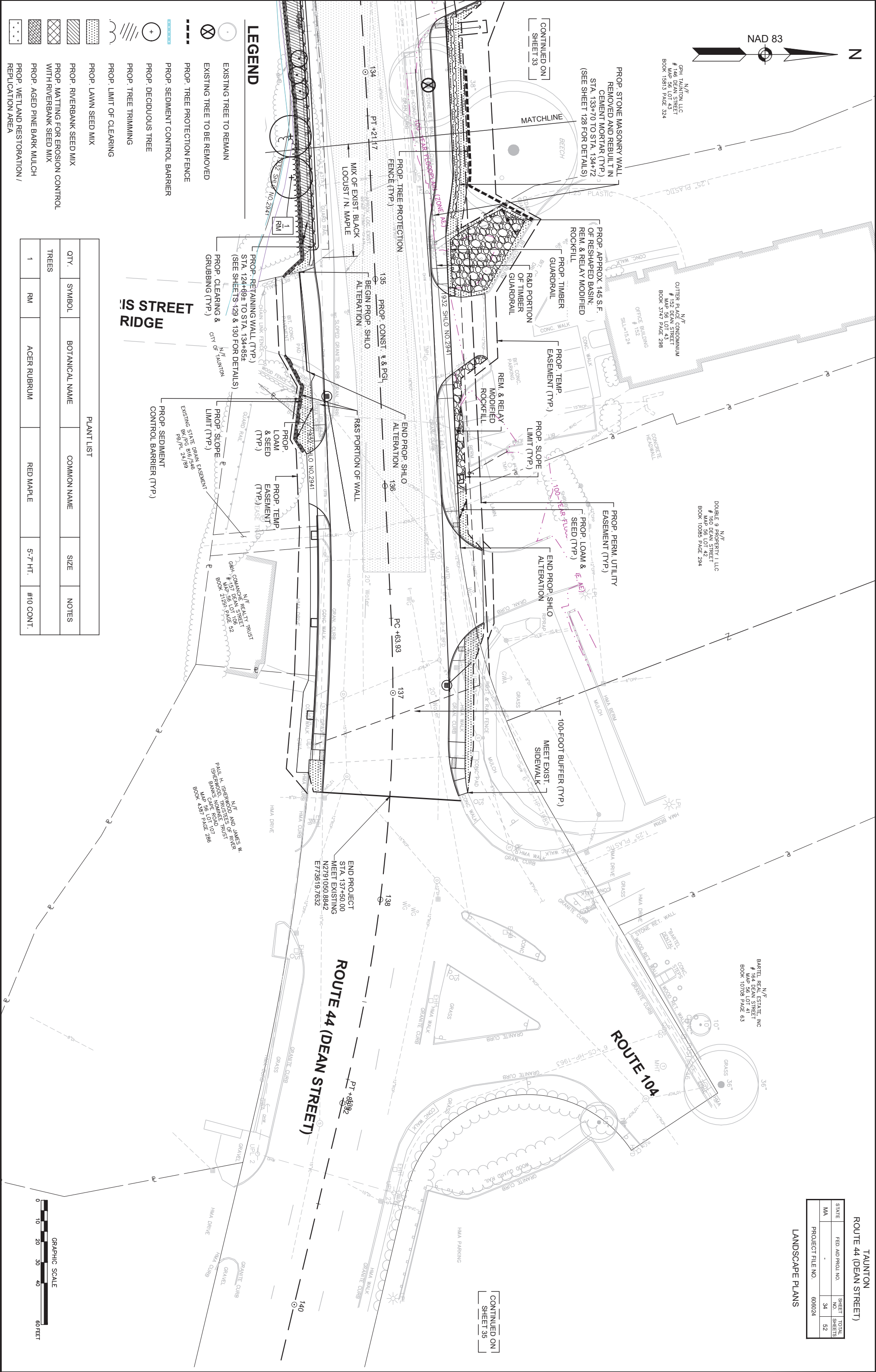










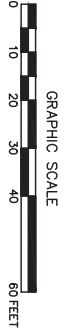


- LEGEND**
- EXISTING TREE TO REMAIN
  - EXISTING TREE TO BE REMOVED
  - PROP. TREE PROTECTION FENCE
  - PROP. SEDIMENT CONTROL BARRIER
  - PROP. DECIDUOUS TREE
  - PROP. TREE TRIMMING
  - PROP. LIMIT OF CLEARING
  - PROP. LAWN SEED MIX
  - PROP. RIVERBANK SEED MIX
  - PROP. MATTING FOR EROSION CONTROL WITH RIVERBANK SEED MIX
  - PROP. AGED PINE BARK MULCH
  - PROP. WETLAND RESTORATION / REPLICATION AREA

PLANT LIST				
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	NOTES
TREES				
1	RM	ACER RUBRUM	RED MAPLE	5-7' HT. #10 CONT.

TAUNTON ROUTE 44 (DEAN STREET)				
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	-	34	52	
PROJECT FILE NO.		606024		

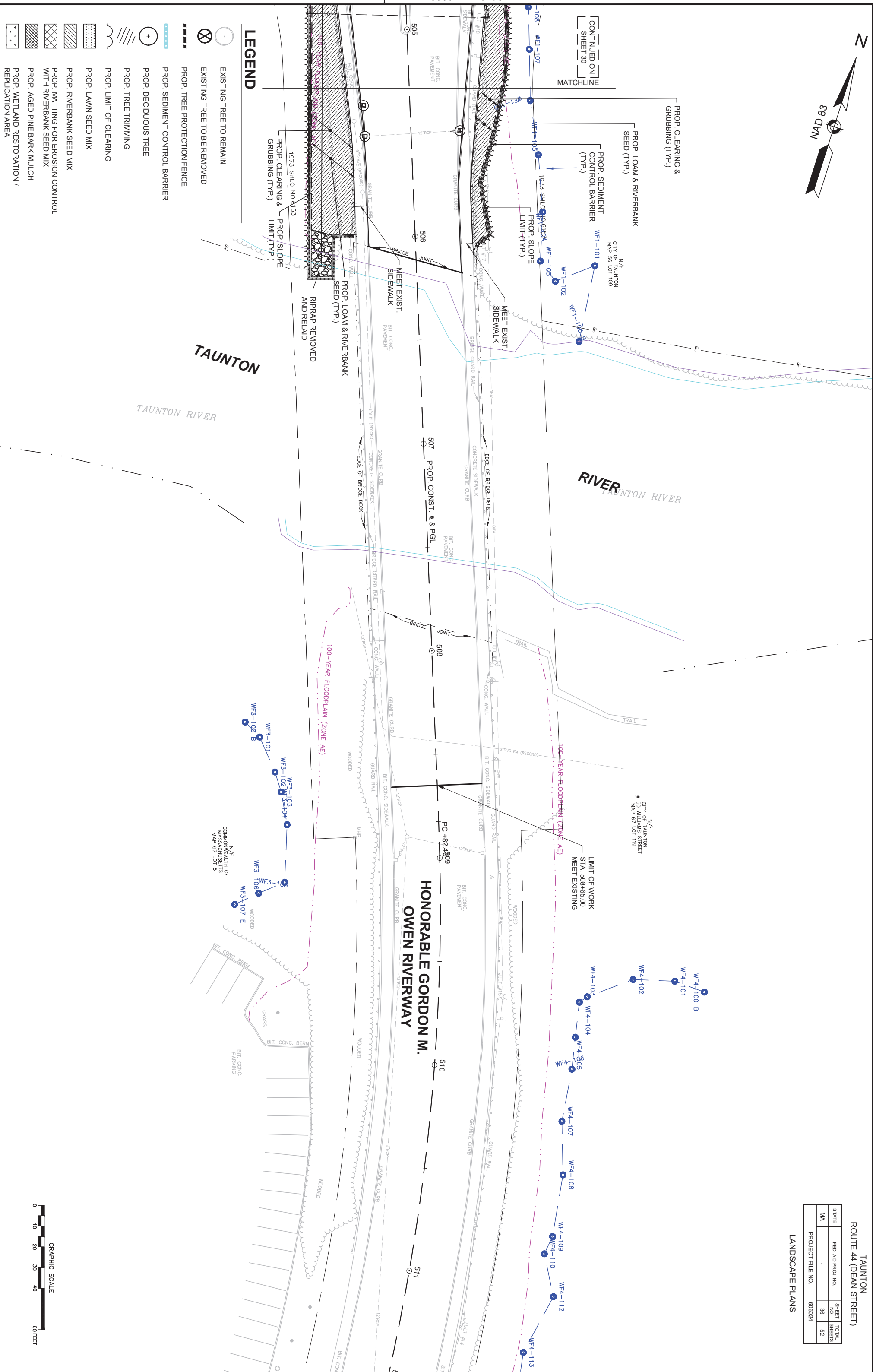
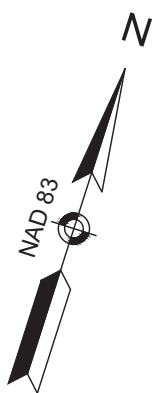
LANDSCAPE PLANS











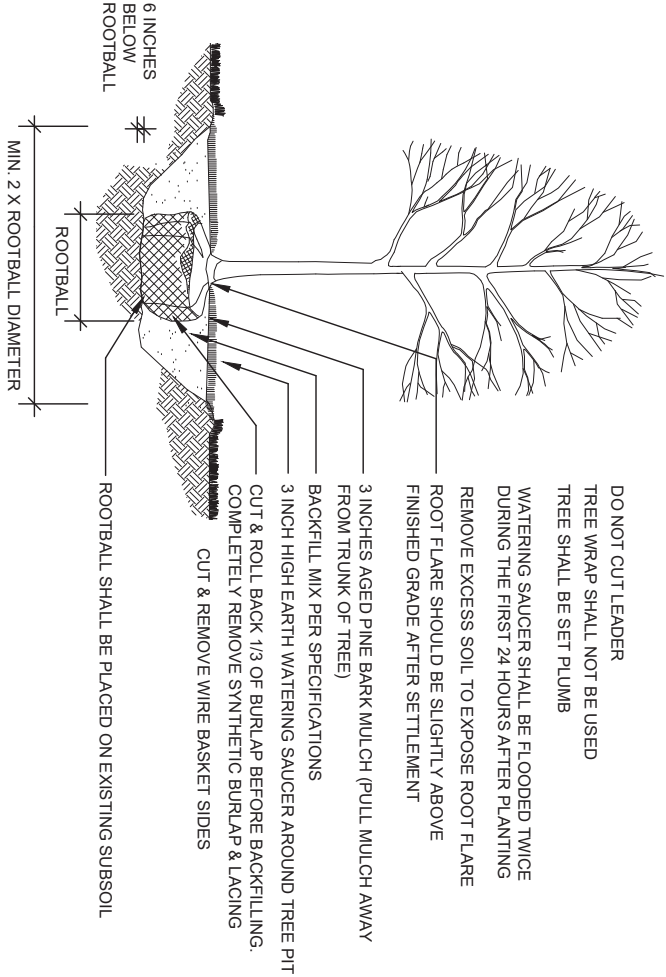
TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	52
PROJECT FILE NO.		606024	



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	52
PROJECT FILE NO.		606024	

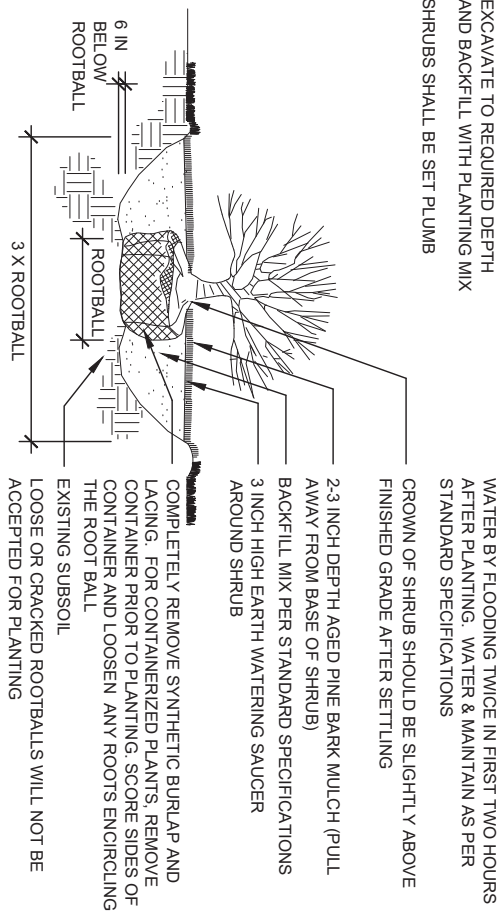
LANDSCAPE DETAILS

MASTER PLANT LIST												
QTY.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES	SHT 101	SHT 102	SHT 103	SHT 104	SHT 106	SHT 107	SHT 108
TREES												
4	AR	ACER RUBRUM	RED MAPLE	2'-2.5' CAL.	B&B	-	2	2	-	-	-	-
8	RM	ACER RUBRUM	RED MAPLE	5'-7' HT.	#10 CONT.	-	-	-	-	6	1	1
9	CC	CRATAEGUS CRUS-GALLI INERMIS	THORNLESS COCKSPUR HAWTHORN	1.5"-2" CAL.	B&B	-	-	9	-	-	-	-
5	MS	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	1.5"-2" CAL.	B&B	-	2	3	-	-	-	-
9	NS	NYSSA SYLVATICA	TUPELO	2'-2.5' CAL.	B&B	1	5	2	1	-	-	-
5	PO	PLATANUS OCCIDENTALIS	AMERICAN PLANETREE	2'-2.5' CAL.	B&B	-	5	-	-	-	-	-
2	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2'-2.5' CAL.	B&B	-	-	2	-	-	-	-
2	SN	SALIX NIGRA	BLACK WILLOW	5'-7' HT.	#10 CONT.	-	-	-	-	1	1	-
SHRUBS												
6	AC	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	8'-10' CLUMP	B&B; 12' O.C.	-	3	3	-	-	-	-
8	AL	ALNUS RUGOSA	SPECKLED ALDER	3'-4' HT.	#5 CONT.; 12' O.C.	-	3	5	-	-	-	-
9	CO	CEPHALANTHUS OCCIDENTALIS	COMMON BUTTONBUSH	3'-4' HT.	#3 CONT.; 8' O.C.	-	-	-	-	-	9	-
30	CA	CORNUS AMOMUM	SILKY DOGWOOD	3'-4' HT.	#5 CONT.; 8' O.C.	-	10	8	-	6	6	-
14	HV	HAMAMELIS VIRGINIANA	WITCH HAZEL	3'-4' HT.	#5 CONT.; 8' O.C.	-	14	-	-	-	-	-
66	SE	SALIX EXIGUA	SAND BAR WILLOW	2'-3' HT.	#3 CONT.; 5' O.C.	-	5	35	5	8	13	-
197	SES	SALIX EXIGUA	SAND BAR WILLOW	TUBELINGS	5" PLUGS; 5' O.C.	4	105	66	22	-	-	-
15	SC	SAMBUCUS CANADENSIS	ELDERBERRY	3'-4' HT.	#3 CONT.; 8' O.C.	-	10	-	-	5	-	-
21	VD	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	3'-4' HT.	#5 CONT.; 8' O.C.	1	14	6	-	-	-	-
VINES												
45	PQ	PARTHENOISSUS QUINQUEFOLIA	VIRGINIA CREEPER	#1 CONT.	AT BASE OF WALL	-	-	-	-	18	27	-



DECIDUOUS TREE PLANTING

NOT TO SCALE

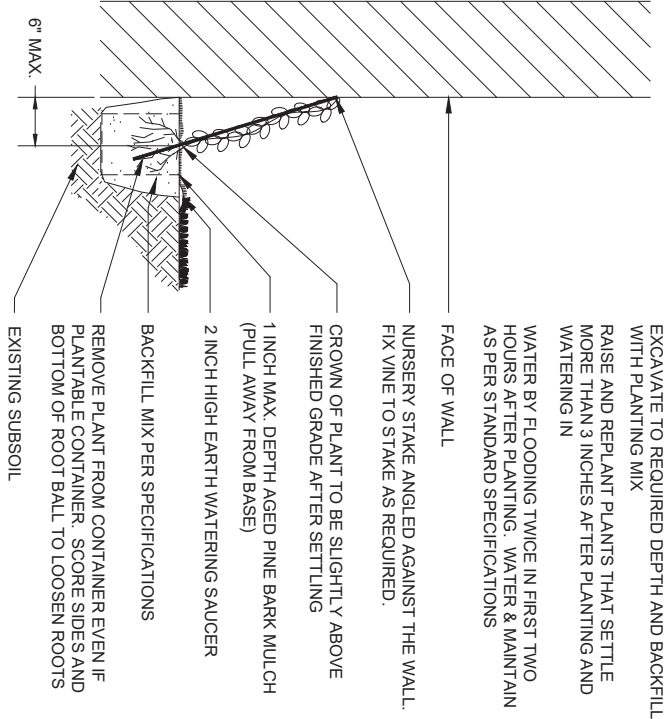


SHRUB PLANTING

NOT TO SCALE

SEEDING SCHEDULE			
LEGEND	TYPE	SUB TYPE	NOTES
	LAWN SEED MIX	LAWNS OR SLOPES AND SHOULDERS - M6.03.0	FOR USE IN YARDS AND SHOULDERS FREQUENTLY MOWN. (SEED OVER 4" LOAM FOR LAWNS)
	RIVERBANK SEED MIX	PART SHADE	FOR USE IN NO MOW / INFREQUENTLY MOWN AREAS; RIVERBANK SEED SHALL BE BROADCAST MANUALLY. (SEED AND COVER CROP OVER 4" LOAM FOR ROADSIDES)
	* WETLAND SEED MIX	PART SHADE	FOR USE IN WETLAND RESTORATION & REPLICATION AREAS. REFER TO SPECIAL PROVISIONS.

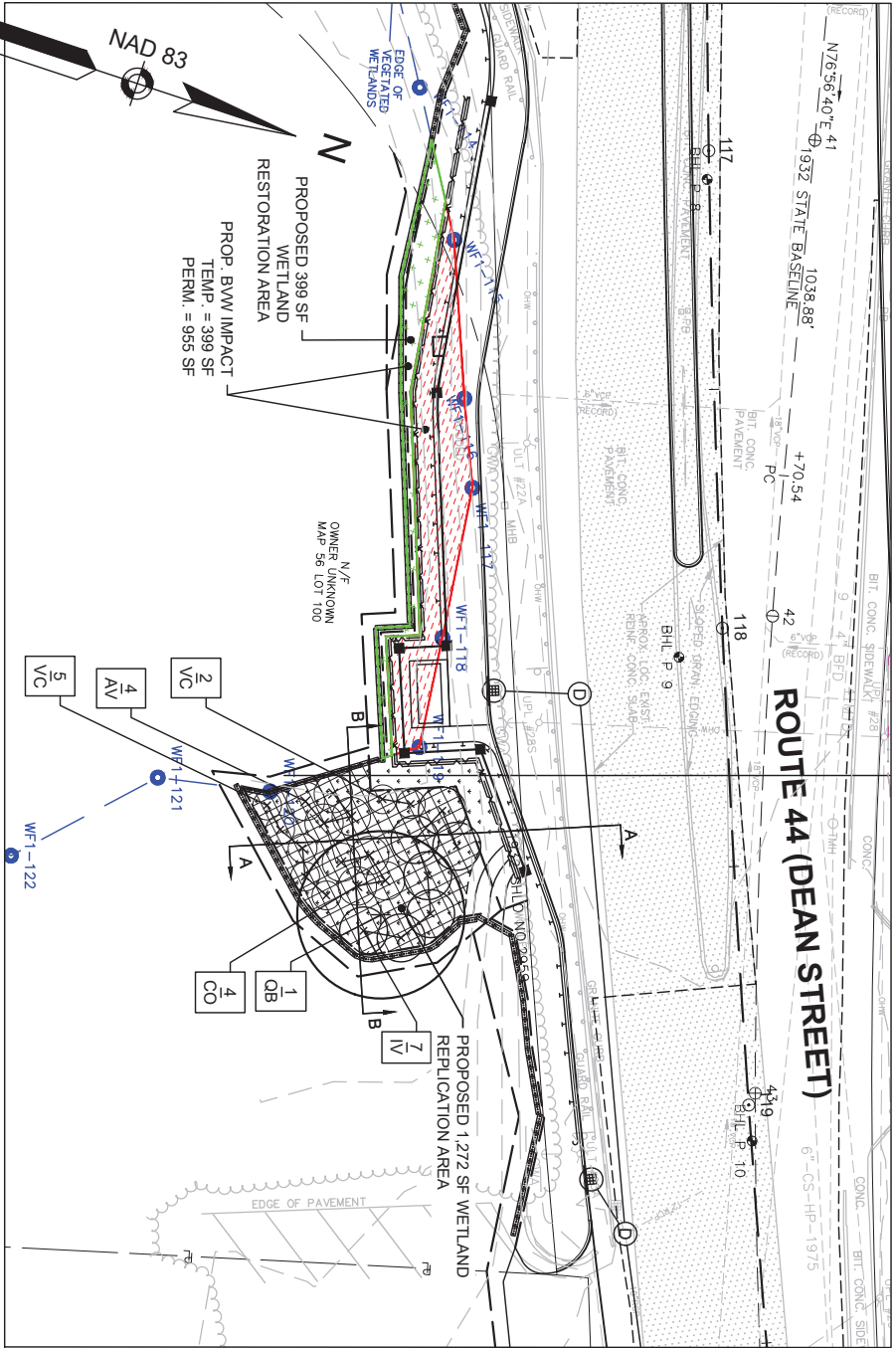
\* INCIDENTAL TO WETLAND RESTORATION & MITIGATION AREAS



VINE PLANTING

NOT TO SCALE





WETLAND REPLICATION & RESTORATION PLAN

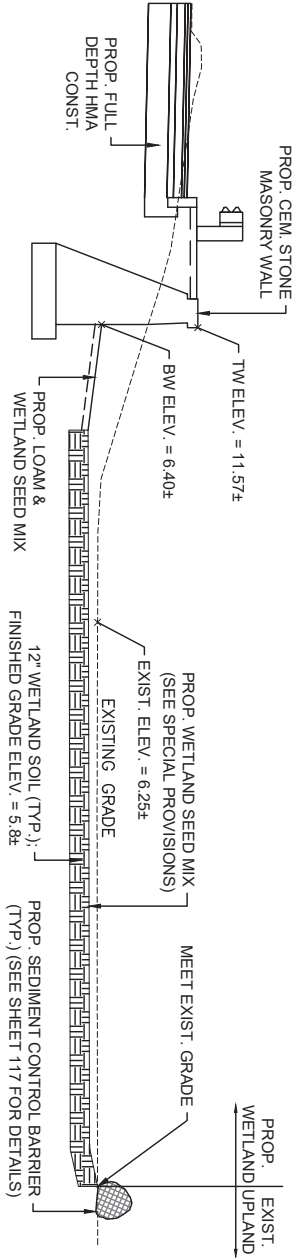
SCALE: 1" = 20'-0"

*WETLAND REPLICATION PLANT SCHEDULE				
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
4	CO	CEPHALANTHUS OCCIDENTALIS	COMMON BUTTONBUSH	3-4' HT.
6	IV	ILEX VERTICILLATA	COMMON WINTERBERRY (FEMALE)	3-4' HT.
1	IV	ILEX VERTICILLATA	COMMON WINTERBERRY (MALE)	3-4' HT.
4	AV	AZALEA VISCOSUM	SWAMP AZALEA	2-3' HT.
1	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	1"-1.5" CAL.
7	VC	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	2-3' HT.

\*WETLAND PLANTS ARE INCIDENTAL TO INLAND WETLAND REPLICATION AREAS

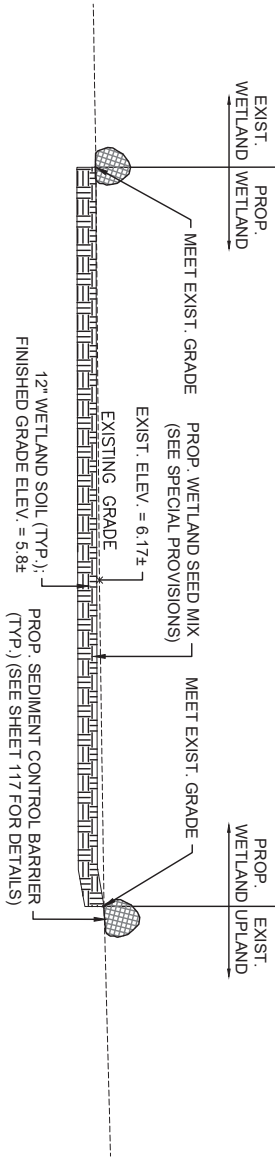
WETLAND REPLICATION & RESTORATION NOTES

- PRIOR TO ENGAGING IN CONSTRUCTION ACTIVITIES RELATED TO THE REPLACEMENT WETLAND, THE CONTRACTOR SHALL BE REQUIRED TO MEET WITH THE WETLAND SPECIALIST TO REVIEW ANY SPECIAL CONSTRUCTION AND EROSION CONTROL REQUIREMENTS.
- CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED SUCH THAT EXCAVATED WETLAND SOIL SHALL BE RELOCATED AS QUICKLY AS POSSIBLE.
- TO MINIMIZE COMPACTION OF THE INSTALLED HYDRIC SOILS, THE CONTRACTOR SHALL USE SMALL CONSTRUCTION EQUIPMENT (LESS THAN 9000 LBS OPERATING WEIGHT) AND HAND METHODS AS APPROVED BY THE WETLAND SPECIALIST AND AS DIRECTED BY THE ENGINEER WHEN GRADING AND PLANTING THE PROPOSED WETLAND REPLICATION AREA.
- SOME TREES CUT FOR WETLAND REPLICATION SHALL BE RE-USED ON SITE FOR RESTORATION PURPOSES. CUT TREES SHALL BE RE-LAND WITHIN THE WETLAND / DISTURBED AREA PER THE DIRECTION OF THE WETLAND SPECIALIST.
- WETLAND SPECIALIST SHALL LOCATE PLANTS IN WETLAND REPLICATION AND RESTORATION AREAS AS APPROPRIATE TO BEST PROTECT AND RESTORE DISTURBED AREA. COMPOST TOPSOIL SHALL BE USED IN LIEU OF MULCH AROUND PLANTS.
- APPLY WETLAND SEED MIX TO WETLAND REPLICATION AREA AS WELL AS WETLAND RESTORATION AREAS AS PER THE SPECIAL PROVISIONS.
- COMPOST FILTER TUBES SHALL BE 100% BIODEGRADABLE AND LEFT IN PLACE AT THE CONCLUSION OF WETLAND REPLICATION CONSTRUCTION. ANY NON-BIODEGRADABLE MATERIAL, IF USED, SHALL BE REMOVED AND DISPOSED OF OFF SITE AT CONTRACTOR'S EXPENSE. FILTER TUBE COMPOST SHALL BE SPREAD / RAKED AROUND TO ELIMINATE BERM.



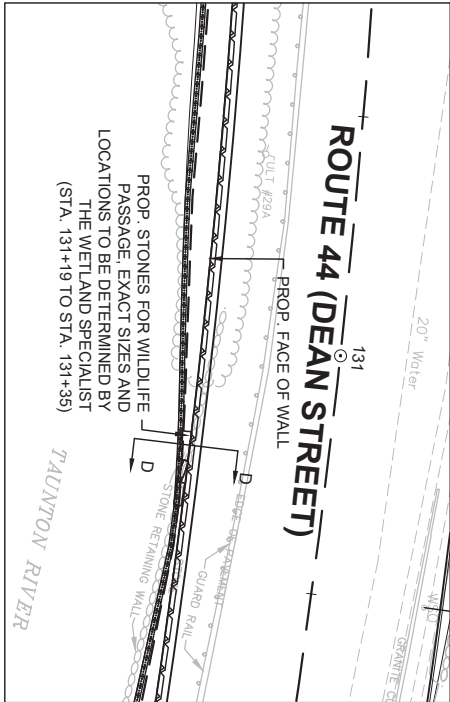
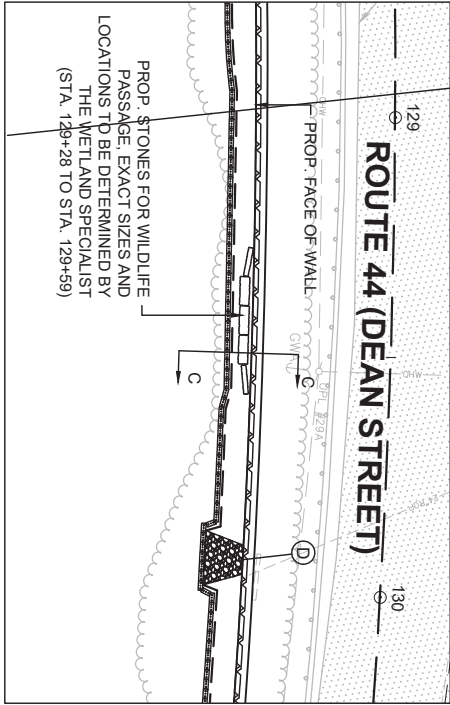
SECTION A-A

SCALE: 1" = 5'-0"



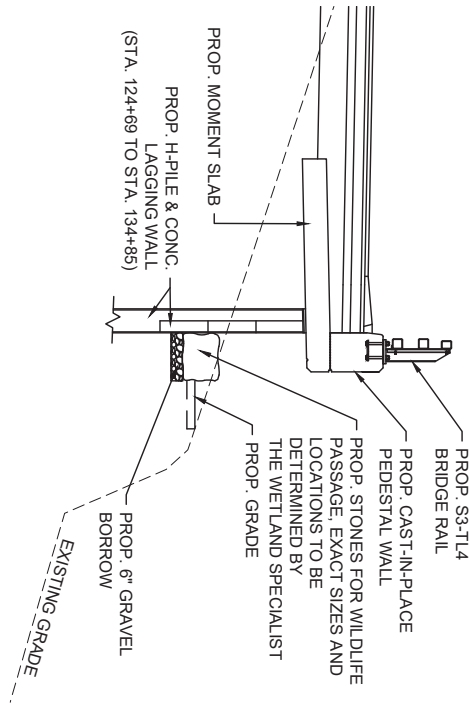
SECTION B-B

SCALE: 1" = 5'-0"



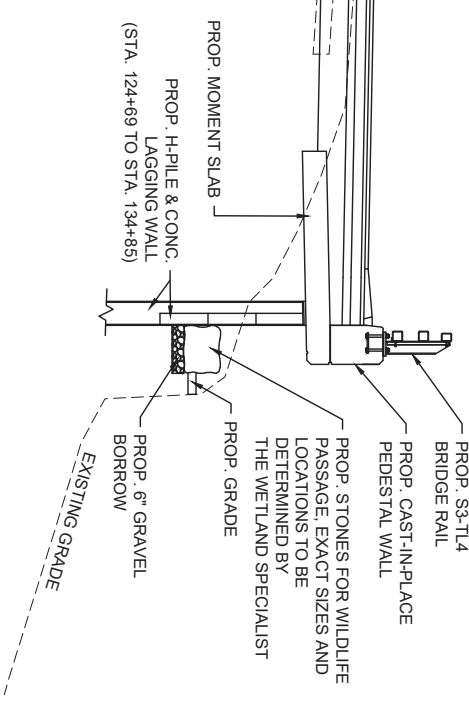
STONES FOR WILDLIFE PASSAGE - PLAN VIEW

SCALE: 1" = 20'-0"



SECTION C-C

SCALE: 1" = 5'-0"



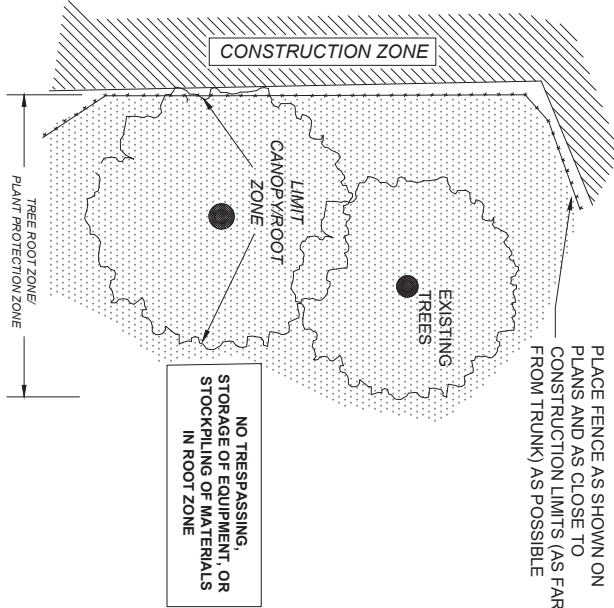
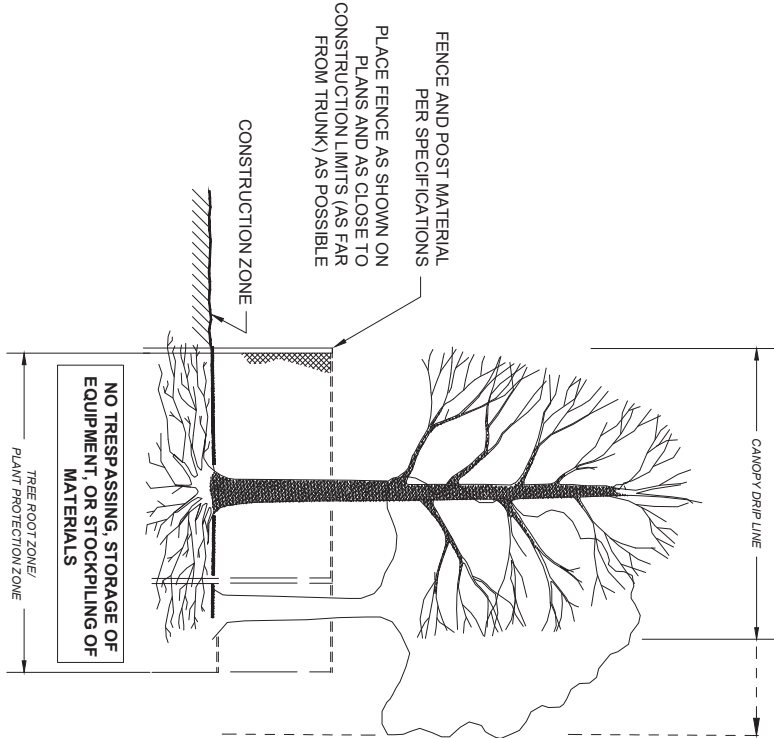
SECTION D-D

SCALE: 1" = 5'-0"

TAUNTON ROUTE 44 (DEAN STREET)				
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	-	38	52	
PROJECT FILE NO.		006024		

WETLAND REPLICATION PLAN AND DETAIL



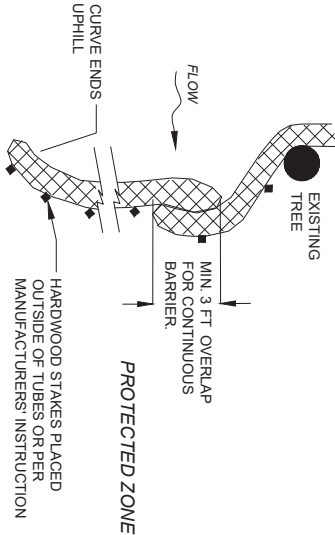


SECTION - FENCE PROTECTION OF ROOT ZONE

TREE PROTECTION - ROOT ZONE

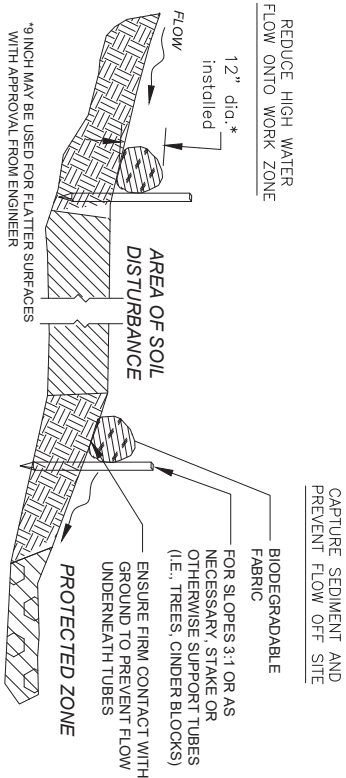
NOT TO SCALE

PLAN VIEW - FENCE PROTECTION OF ROOT ZONE



PLACE TUBE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE, ALONG CONTOURS, AND PERPENDICULAR TO FLOW.  
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

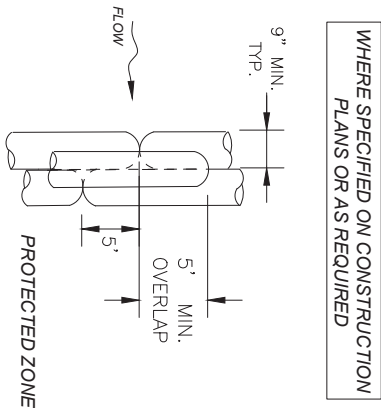
PLAN VIEW



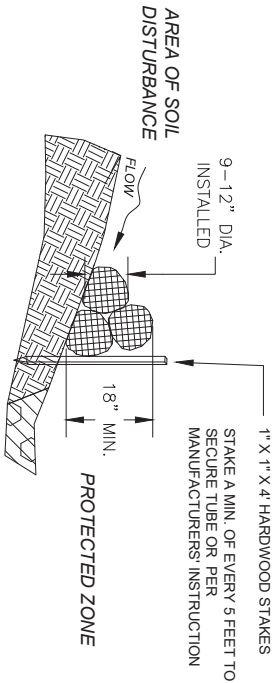
SECTION

SEDIMENT BARRIER - COMPOST FILTER TUBE

NOT TO SCALE



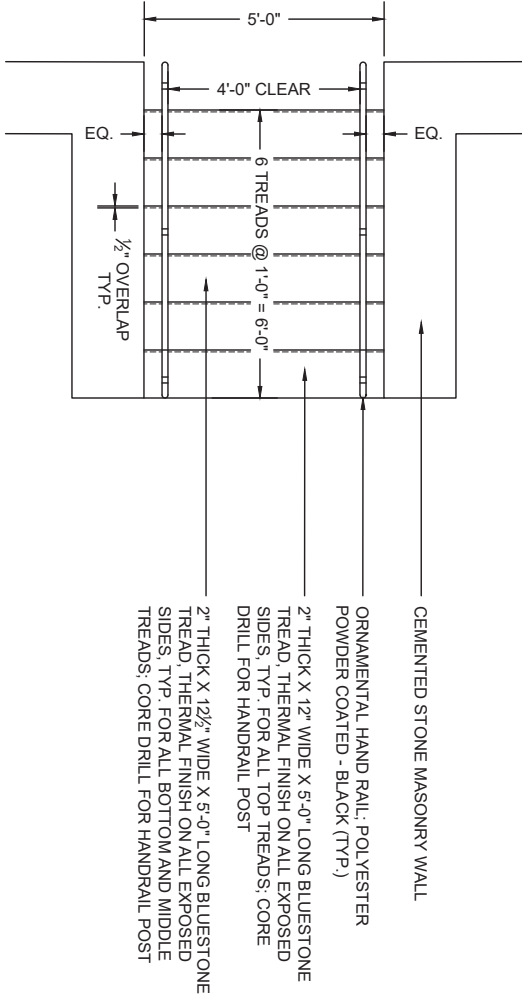
PLAN VIEW



SECTION

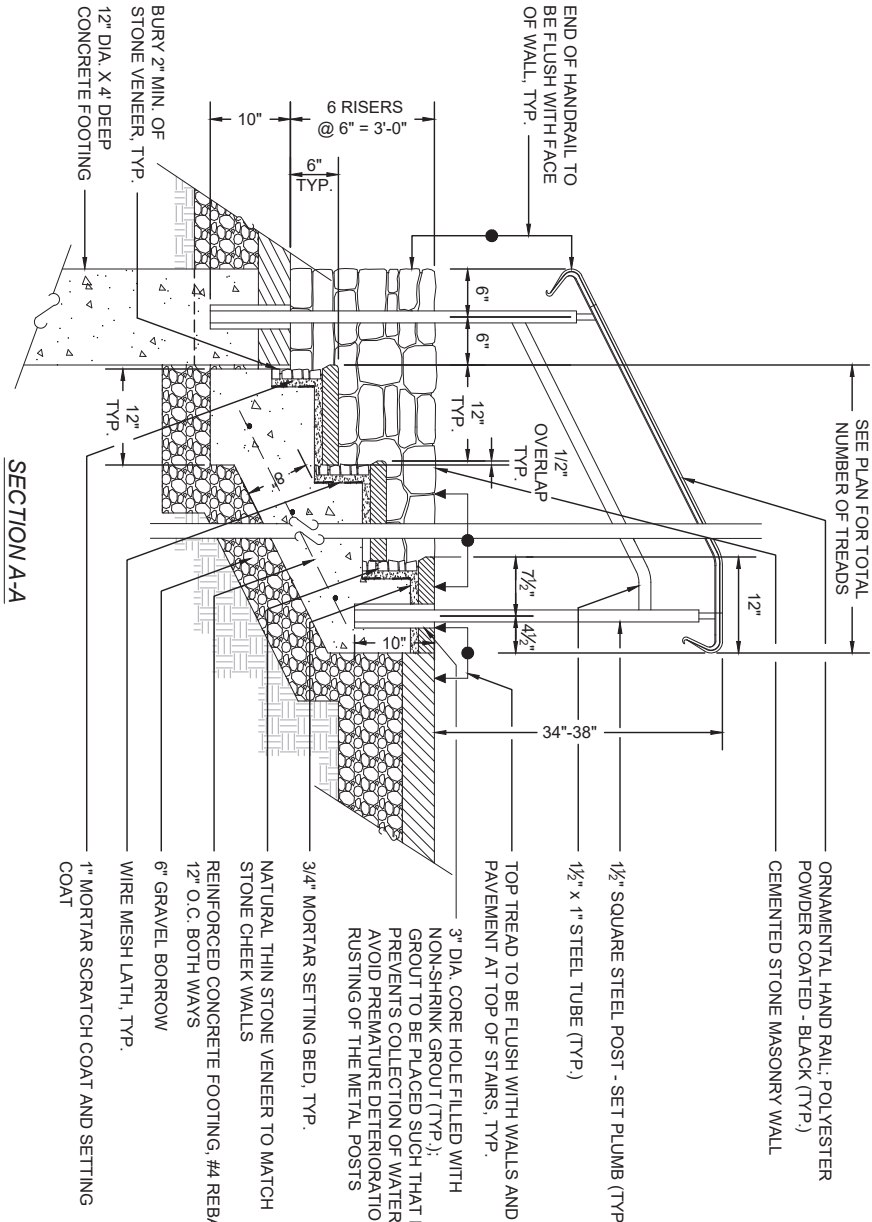
COMPOST FILTER TUBES STACKED

NOT TO SCALE



TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	52
PROJECT FILE NO. 606024			

CONSTRUCTION DETAILS

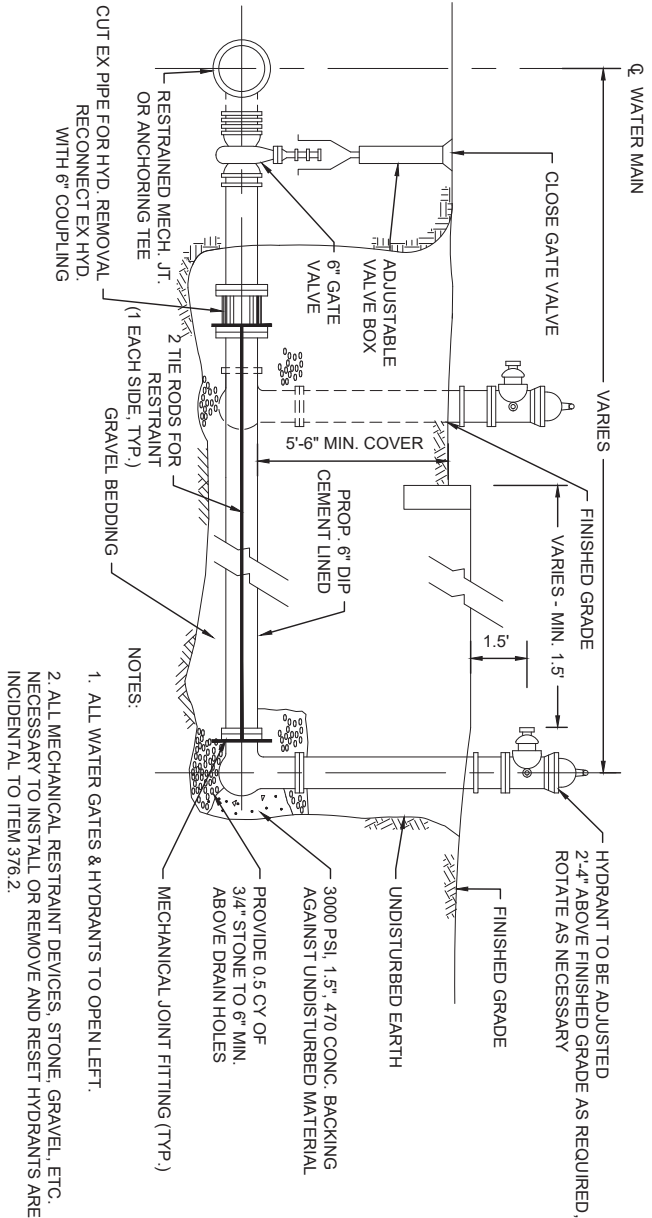


SECTION A-A

BLUESTONE STEPS WITH ORNAMENTAL HAND RAILS

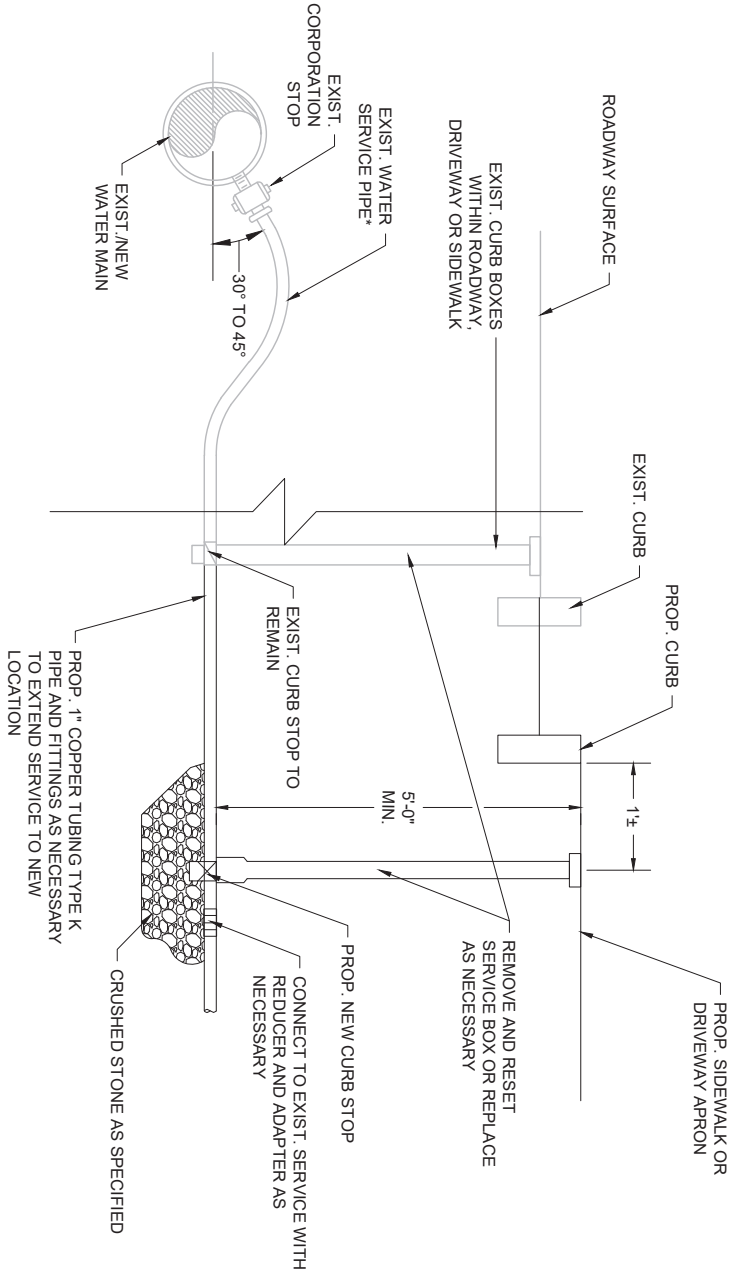
NOT TO SCALE





## HYDRANT REMOVED AND RESET

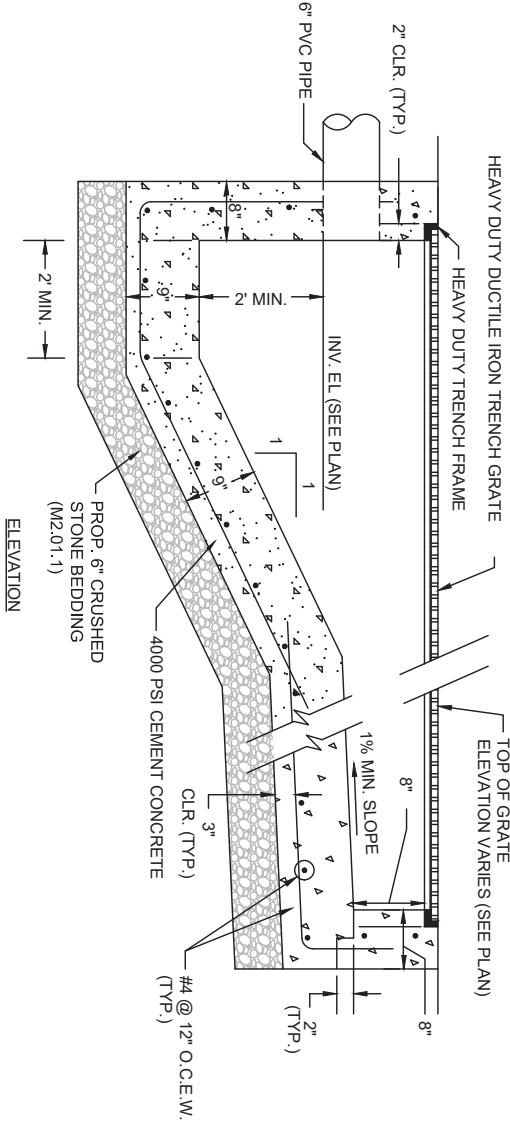
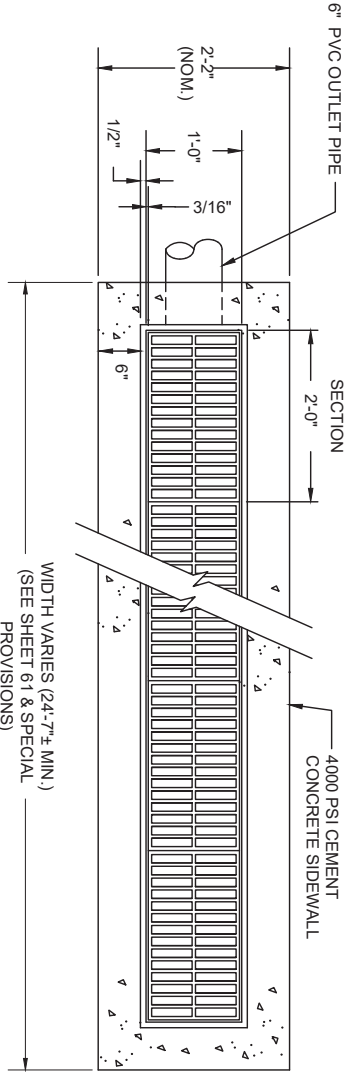
NOT TO SCALE



\* IF EXISTING WATER SERVICE LINE IS NOT COPPER, CONTRACTOR SHALL INFORM TAUNTON WATER DEPARTMENT. NO CONNECTION SHALL BE MADE UNTIL THE TAUNTON WATER DEPARTMENT DETERMINES IF THE EXISTING LINE IS SUITABLE TO BE EXTENDED OR MUST BE REPLACED TO THE MAIN.

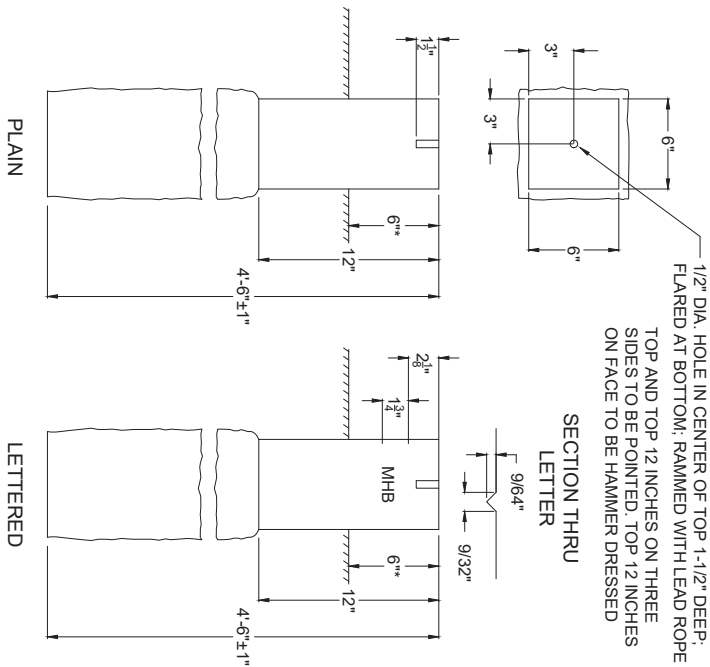
## CURB STOP RELOCATION DETAIL

NOT TO SCALE



## TRENCH DRAIN

NOT TO SCALE



### NOTES:

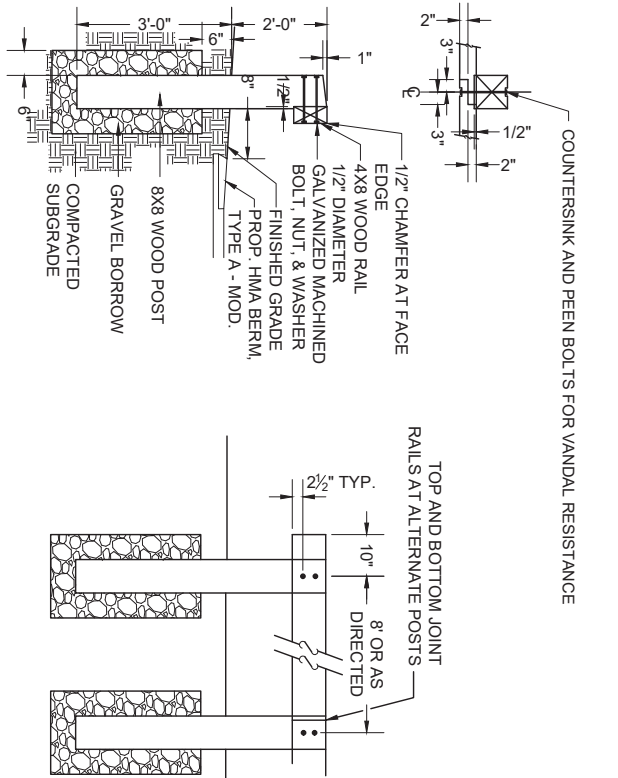
- FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHODS, SEE STANDARD SPECIFICATIONS.
- ALL BOUNDS UTILIZED TO MARK THE STATE HIGHWAY LAYOUT SHALL BE SET AT THE DIRECTION OF THE DISTRICT SURVEY ENGINEER. PRIOR TO COMMENCING THE WORK, THE CONTRACTOR SHALL NOTIFY THE DISTRICT SURVEY ENGINEER TO SCHEDULE THE WORK.

## GRANITE BOUNDS

### CONSTRUCTION DETAILS

TAUNTON ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	40	52
PROJECT FILE NO.		006024	





SECTION

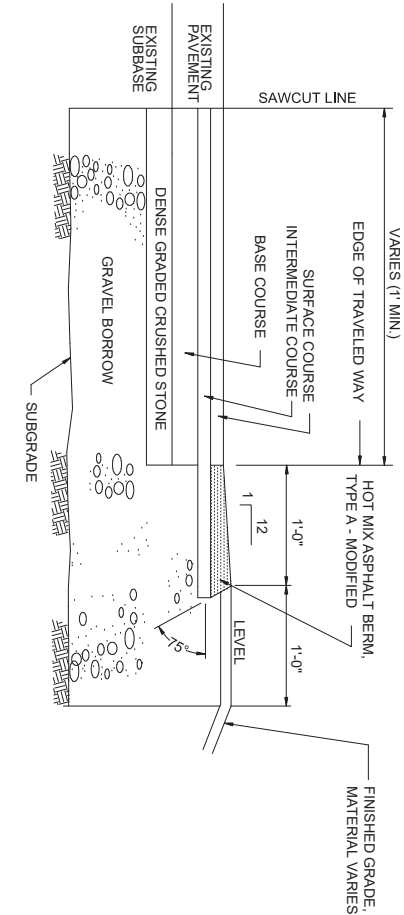
FRONT ELEVATION

PROP. TIMBER GUARDRAIL

N.T.S.

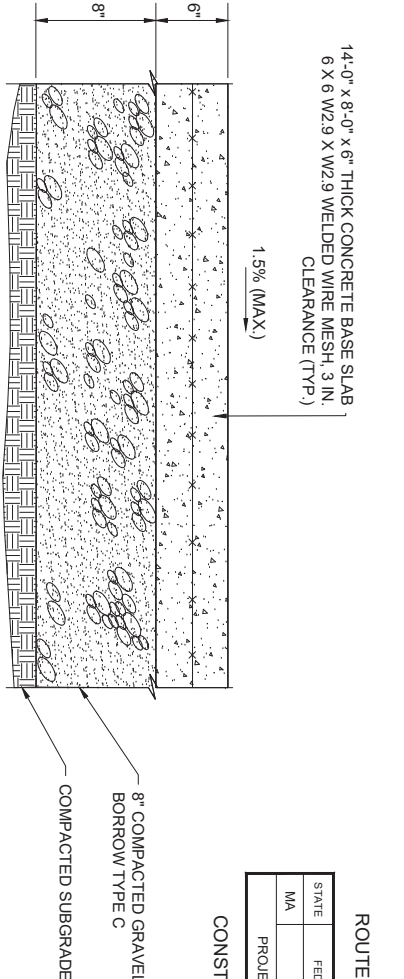
HOT MIX ASPHALT BERM, TYPE A - MODIFIED

NOT TO SCALE



CEMENT CONCRETE PAD FOR BUS SHELTERS

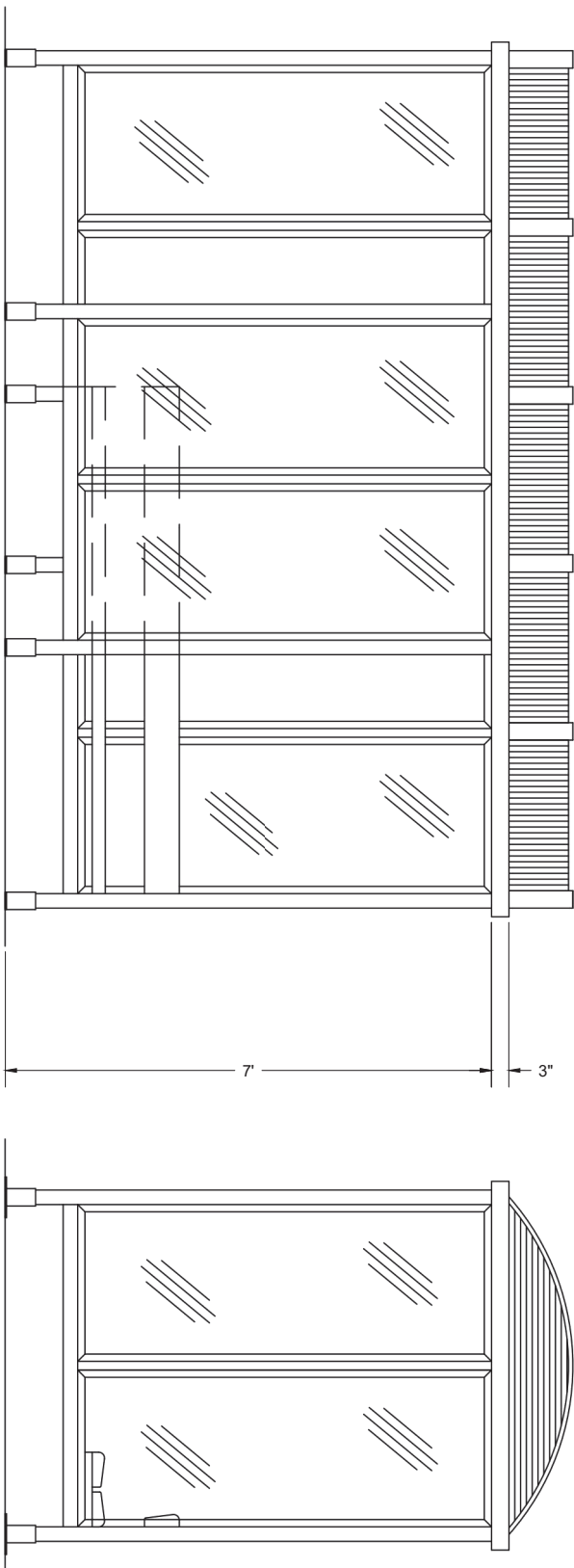
NOT TO SCALE



TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	52
PROJECT FILE NO.		606024	

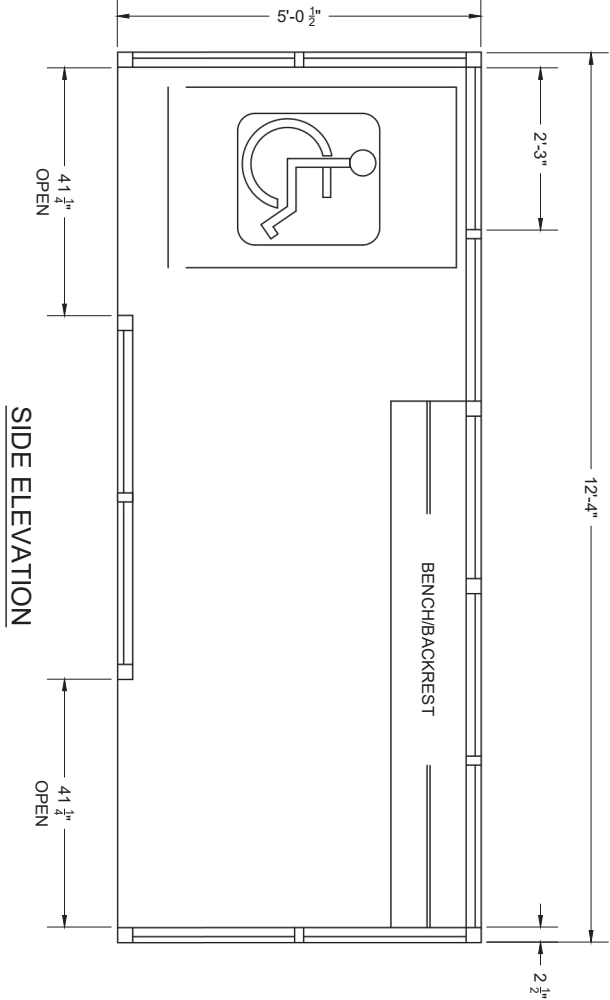
CONSTRUCTION DETAILS



FRONT ELEVATION

SIDE ELEVATION

- NOTES
- 12'-4" x 5'-0" BARREL ROOF PEDESTRIAN BUS SHELTER WITH LEFT & RIGHT FRONT OPENINGS.
  - PROVIDE 14'-0" x 8'-0" x 6" THICK REINFORCED CEM. CONC. PAD FOR EACH PEDESTRIAN BUS SHELTER.



SIDE ELEVATION

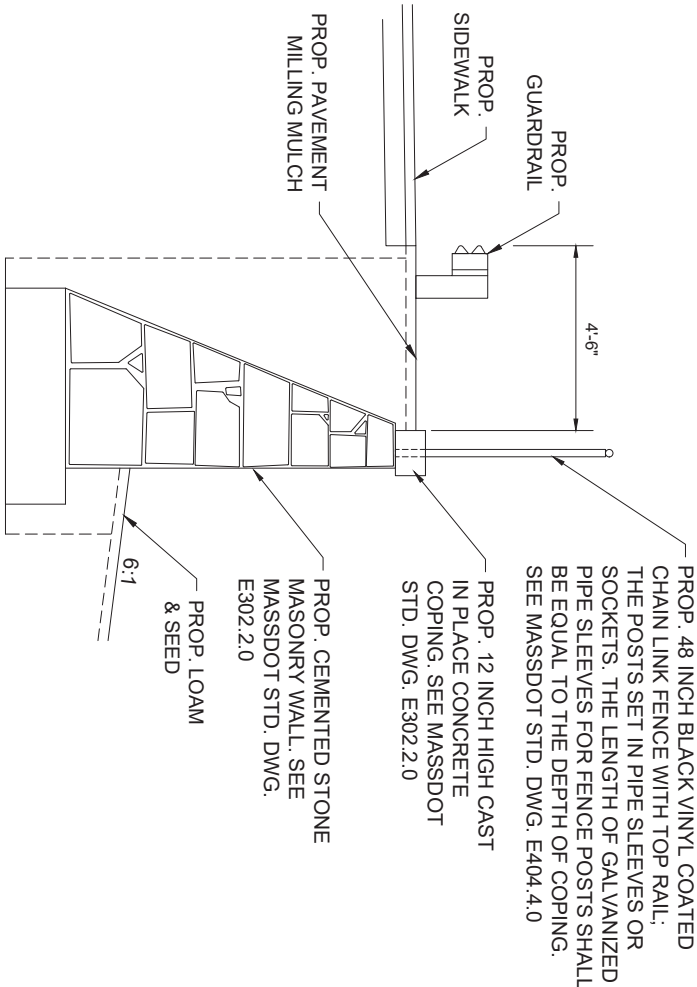
PEDESTRIAN BUS SHELTER (SUPPLIED B.O.)

NOT TO SCALE



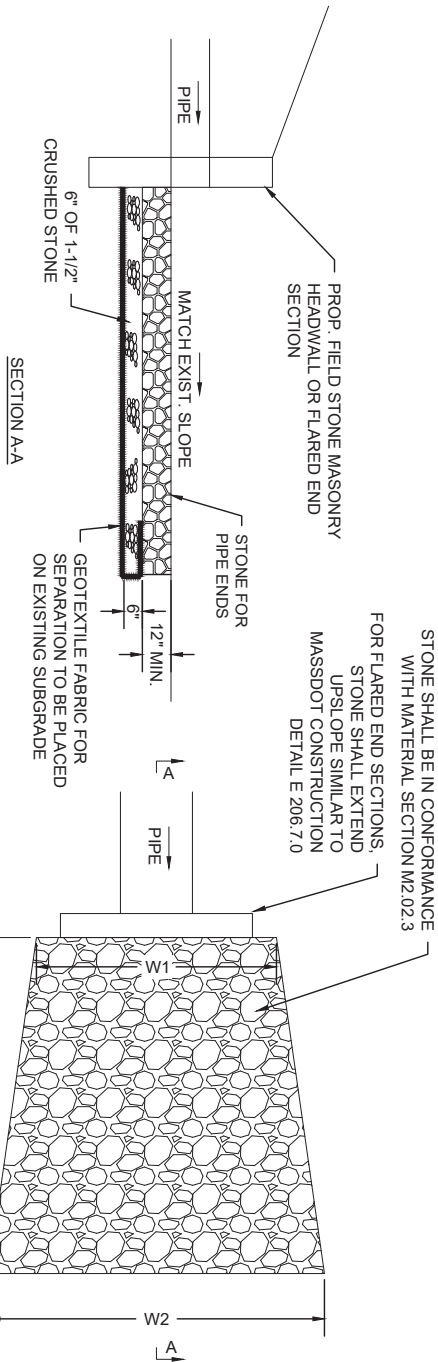
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	122	52
PROJECT FILE NO.		606024	

CONSTRUCTION DETAILS



CHAIN LINK FENCE ATTACHMENT TO  
RETAINING WALL

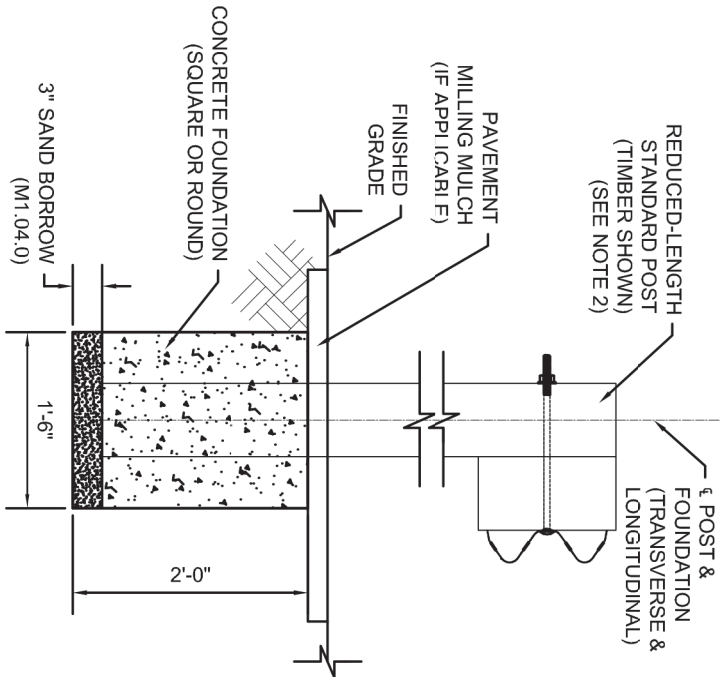
N.T.S.  
STA. 116+88± RT TO STA. 118+50± RT



STONE FOR PIPE ENDS SIZE TABLE			
	OUTFALL		
	L	W1	W2
FES-301	4.00'	3.00'	5.67'
FES-302	4.00'	3.00'	5.67'
FES-304	4.00'	3.00'	5.67'
OUTLET STA. 106+92 RT	4.00'	3.00'	5.67'
FES-306	6.00'	4.50'	8.50'
FES-306	4.00'	3.00'	5.67'
OUTLET STA. 124+98 RT	6.00'	4.50'	8.50'
OUTLET STA. 125+80 RT	4.00'	3.00'	5.67'
OUTLET STA. 129+94 RT	8.00'	6.00'	11.33'

STONE FOR PIPE ENDS

NOT TO SCALE

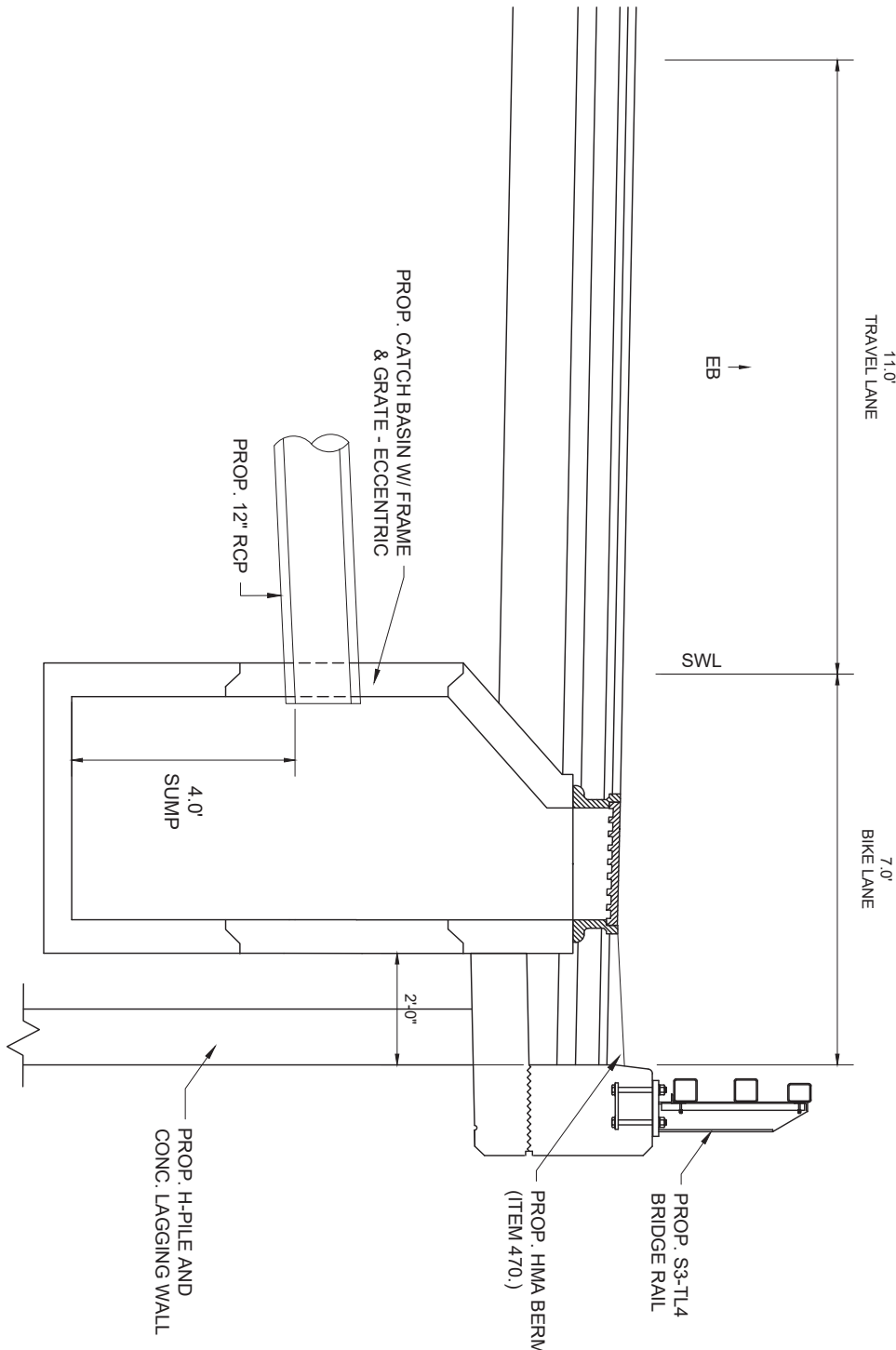


NOTES:

1. WHEN THE CONSTRUCTION OF GUARDRAIL AT THE REQUIRED POST SPACING RESULTS IN POST(S) CONFLICTING WITH UNDERGROUND UTILITIES OR OTHER UNDERGROUND OBSTRUCTIONS, AN ENCASED POST MAY BE USED WHERE A 2'-0" DEPTH WILL AVOID THE CONFLICT. INSTALL WHERE SHOWN IN THE PLANS AND/OR AS-NEEDED.
2. USE A STANDARD POST WITH REDUCED LENGTH SUCH THAT THE PANEL HEIGHT IS MAINTAINED WHILE THE POST BOTTOM TERMINATES AT THE BOTTOM OF THE CONCRETE FOUNDATION AT THE TOP OF THE 3" (MIN) SAND BORROW.
3. CONCRETE FOUNDATION SHALL BE 3500 PSI, CEMENT CONCRETE (M4.02.00). AFTER CASTING THE CONCRETE, ENSURE THE SURROUNDING SOIL MATERIAL IS COMPLETELY BACKFILLED AND TAMPED TO PROVIDE FULL PASSIVE RESISTANCE.
4. ENCASED POSTS ARE NOT PERMITTED FOR CONSECUTIVE POSTS UNLESS OTHERWISE SHOWN IN THE PLANS.

SECTION

ENCASED POST FOR SHALLOW MOUNT



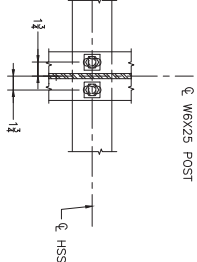
CATCH BASIN AT RETAINING WALL

N.T.S.

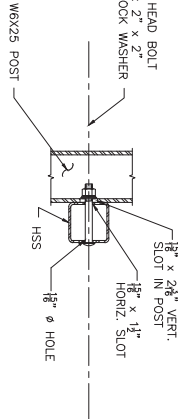


STATE	FED. AID PROJ. NO.	SHEET TOTAL
MA	S/P/H/P/C/M/O-0035(015)X	43 OF 52
PROJECT FILE NO. 606024		

STRUCTURAL DETAILS -  
S3-TL4 BRIDGE  
RAILING DETAILS



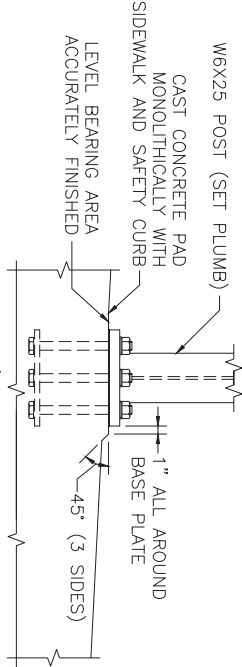
SECTION THRU POST WEB



NOTE:  
CONNECTIONS AT LOWER RAILS SHOWN.  
CONNECTIONS AT TOP RAIL SIMILAR.

TYPICAL RAIL TO POST CONNECTIONS

SCALE: 1" = 2'-0"

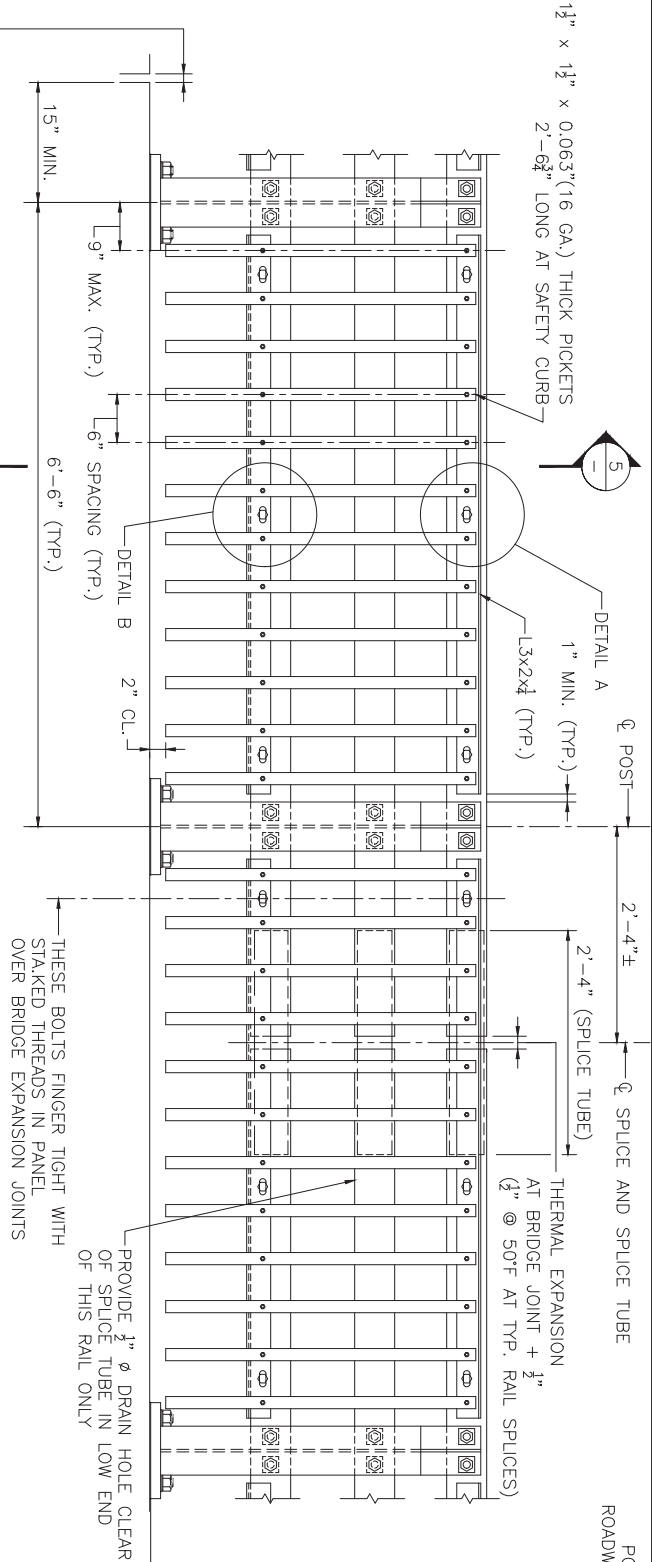


SETTING OF POSTS (PROFILE GRADE OVER 1.5%)

SCALE: 1" = 2'-0"

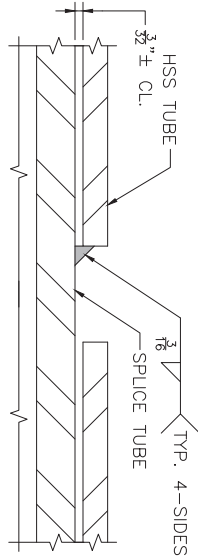
RAILING NOTES:

- RAIL POST AND BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 50. HOLLOW RAILING STRUCTURAL TUBING (HSS) SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 500 WITH A CERTIFIED  $F_y = 50$  KSI MINIMUM. THE MINIMUM HORIZONTAL BENDING RADI OF THE HSS TUBING SHALL BE 8 FEET. PICKET CARRIER ANGLES, ANCHOR PLATES, AND SPLICE TUBE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 270 GRADE 36. PICKET TUBING SHALL CONFORM TO ASTM A 513 WITH  $F_y = 36$  KSI MIN. OR A 500 GRADE B.
- ALL STEEL (EXCEPT THE  $\frac{5}{8}$ " ANCHOR PLATE AND FASTENERS) SHALL BE GALVANIZED AND PAINTED DARK BRONZE (FEDERAL STD. 595B COLOR NO. 10045). ANCHOR PLATE SHALL BE GALVANIZED ONLY. HEADS OF  $\frac{5}{8}$ "  $\phi$  ROUND HEAD BOLTS SHALL BE PAINTED TO MATCH RAIL.
- ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN AFTER STEEL IS IN PLACE.
- RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR (4) POSTS WITHOUT SPLICES WHERE POSSIBLE. RAILS SHALL BE SPLICED IN THE PANELS OVER EXPANSION JOINT.
- ENDS OF TUBE SECTIONS SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
- ALL POSTS TO BE PLUMB WHEN PROFILE GRADE EXCEEDS 1.5%. FOR PROFILE GRADES LESS THAN 1.5%, POSTS SHALL BE SET PERPENDICULAR TO GRADE.
- POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK-GROUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.
- $\frac{5}{8}$ "  $\phi$  ROUND HEAD BOLTS SHALL CONFORM TO THE CHEMICAL AND PHYSICAL REQUIREMENTS OF AASHTO M 164.



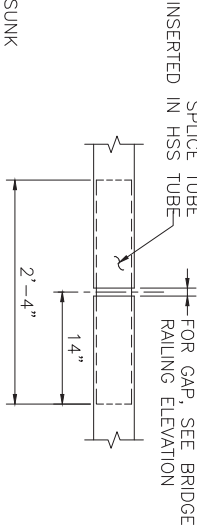
BRIDGE RAILING ELEVATION

SCALE: 1" = 2'-0"



SPICE DETAIL

FULL SIZE

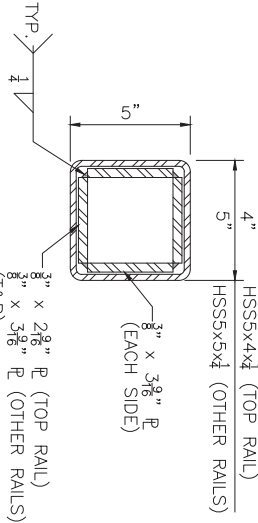


TYPICAL SPLICE

SCALE: 1" = 2'-0"

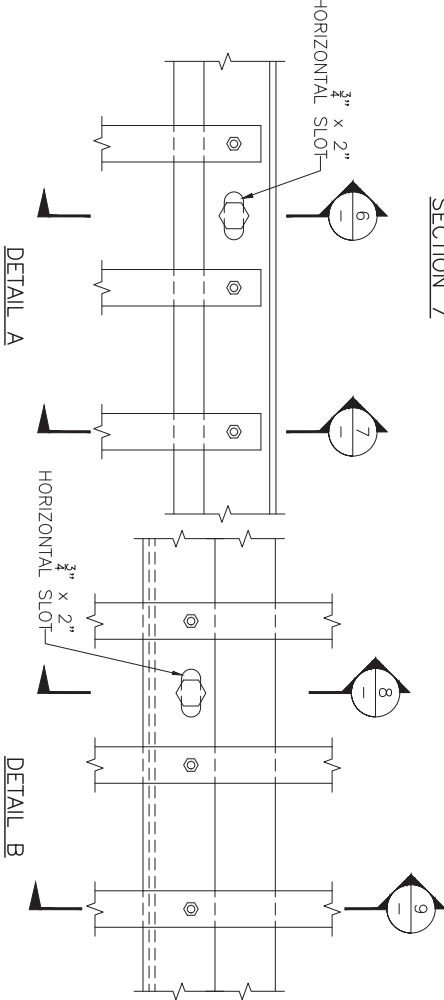
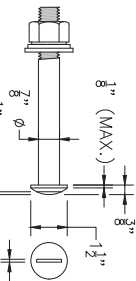
SPICE TUBE DETAILS

SCALE: 3" = 2'-0"



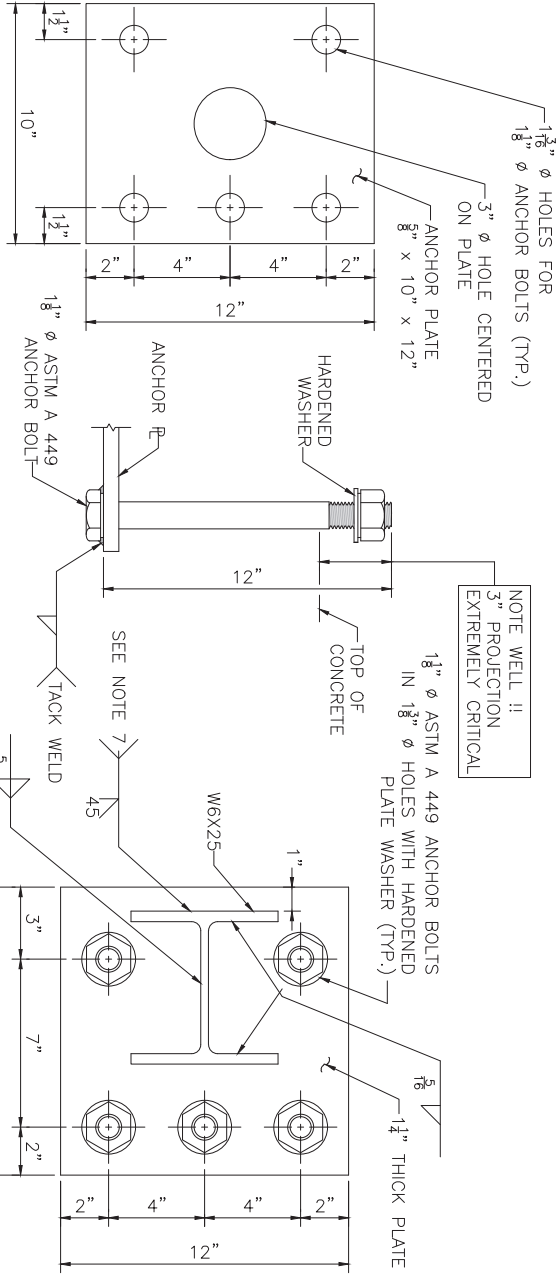
$\frac{7}{8}$ "  $\phi$  ROUND HEAD BOLT

SCALE: 3" = 1'-0"



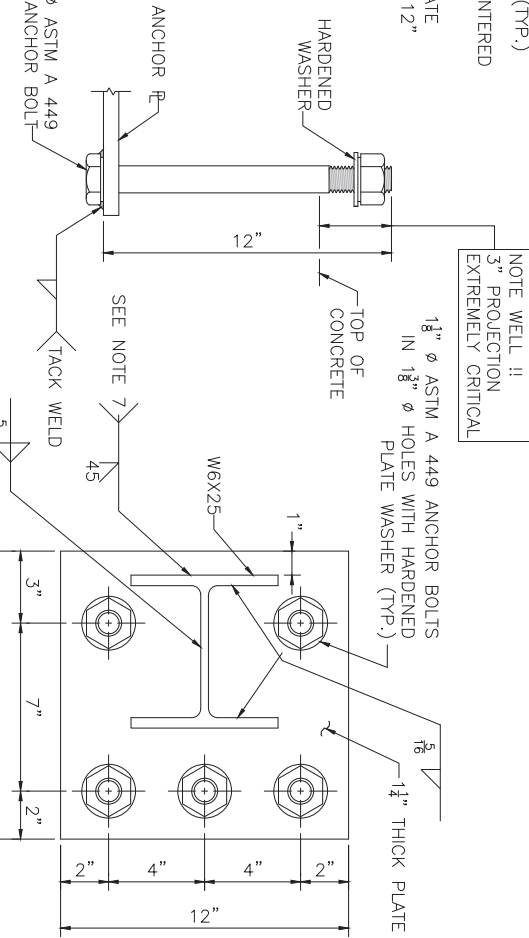
TYPICAL PICKET TO RAIL DETAILS

SCALE: 3" = 2'-0"



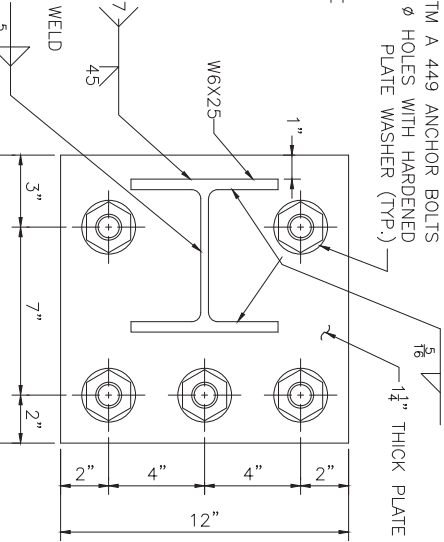
ANCHOR PLATE

SCALE: 3" = 2'-0"



ANCHOR BOLT

SCALE: 3" = 2'-0"



BASE PLATE

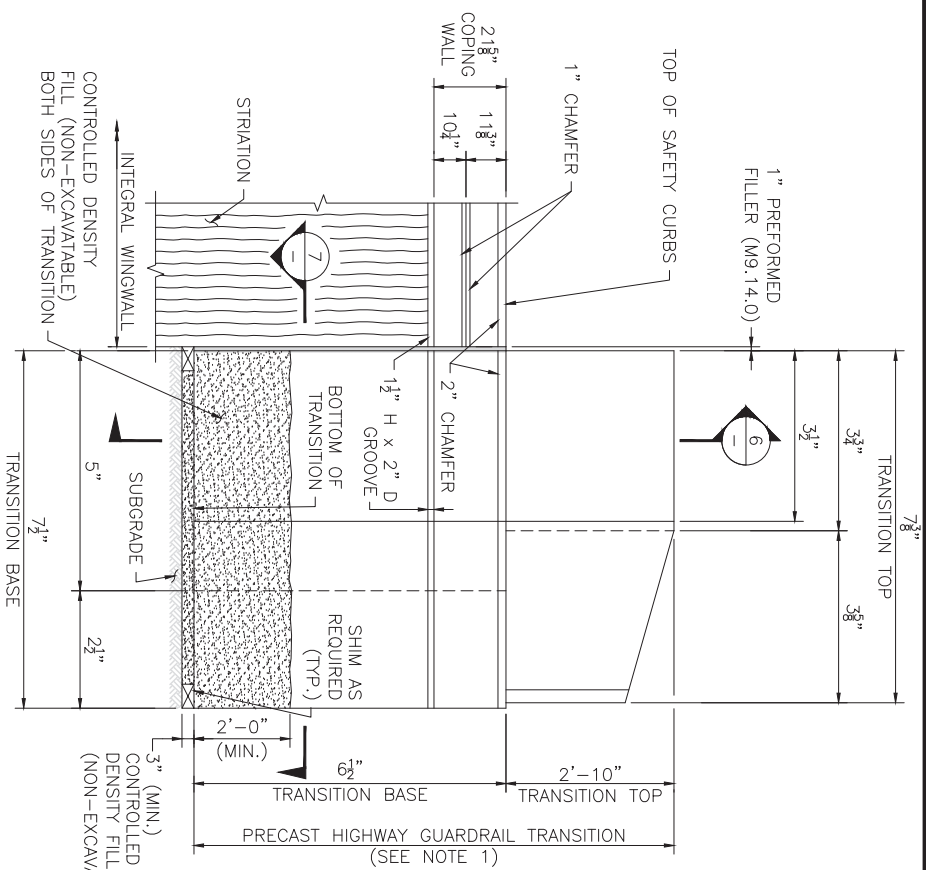
SCALE: 3" = 2'-0"





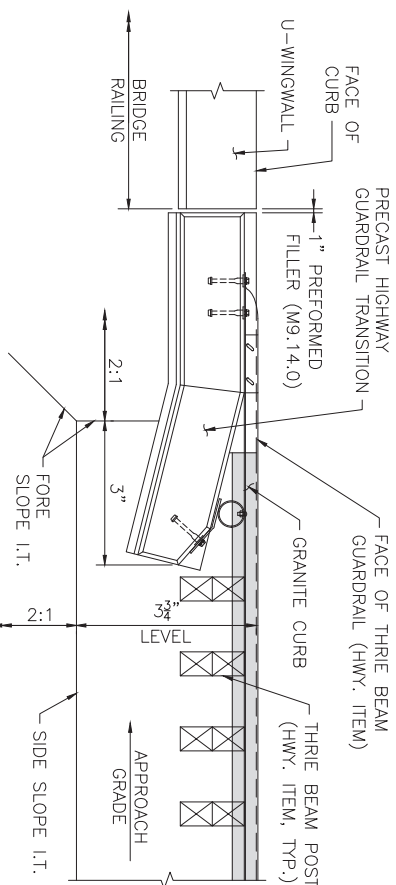
- | DATE                           | DESCRIPTION |
|--------------------------------|-------------|
| USE ONLY PRINTS OF LATEST DATE |             |
|                                |             |
|                                |             |
|                                |             |





TYPICAL PRECAST GUARDRAIL TRANSITION  
ELEVATION AT U-WINGWALL

SCALE:  $\frac{1}{2}'' = 2'-0''$

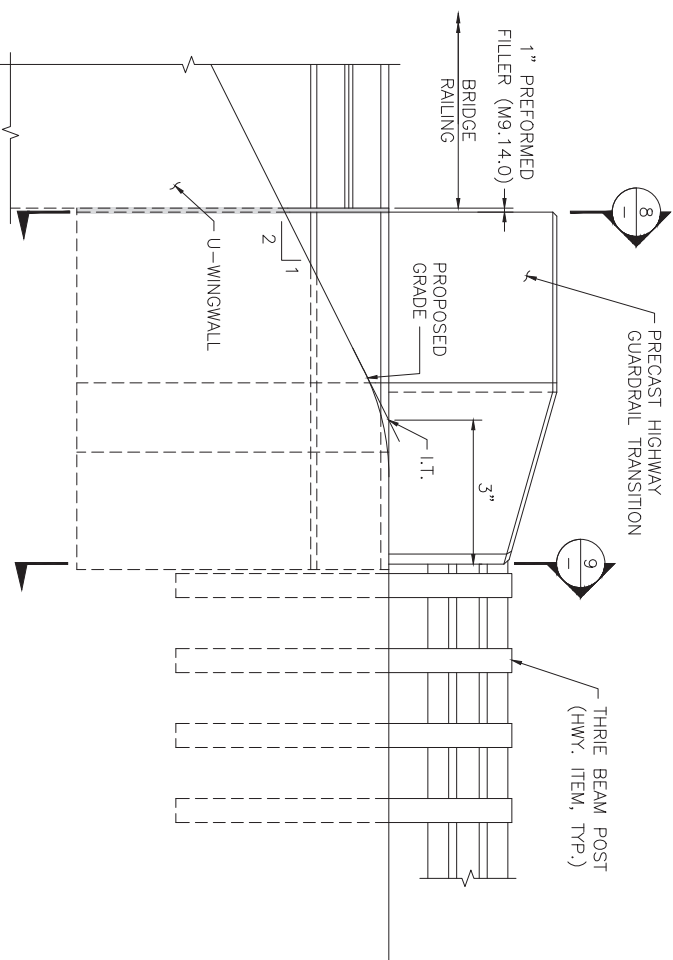


## GRADING REQUIREMENTS

SCALE:  $1'' = 2'-0''$

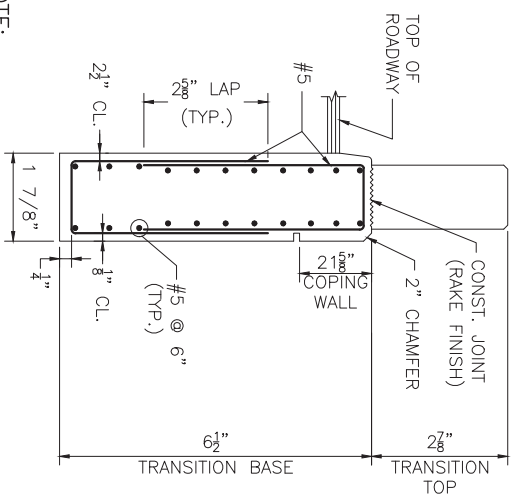
- NOTES:**
1. PRECAST GUARDRAIL TRANSITION SHALL BE 5000 PSI, 3/4" IN., 685 HP CEMENT CONCRETE.
  2. GRAVEL BORROW SHALL BE PLACED AND THOROUGHLY COMPACTED TO THE GRADE OF 3" (MIN.) BELOW THE INTENDED BOTTOM OF THE PRECAST GUARDRAIL TRANSITION BASE AND TO A HEIGHT OF 2'-0" (MIN.) ON ALL SIDES OF THE TRANSITION BASE TO FORM A TRENCH IN WHICH TO SET THE TRANSITION. WHERE NO GRAVEL BORROW IS REQUIRED BELOW THE BASE, IT SHALL BE PLACED ON UNDISTURBED SOIL.
  3. CONTRACTOR SHALL SET THE PRECAST GUARDRAIL TRANSITION TO THE REQUIRED ELEVATION AND ALIGNMENT, AND BACKFILL PRECAST GUARDRAIL TRANSITION WITH CONTROLLED DENSITY FILL (NON-EXCAVATABLE) TO THE ELEVATION SHOWN.

NOTES:



## GRADING REQUIREMENTS

SCALE:  $\frac{1}{2}'' = 2'-0''$

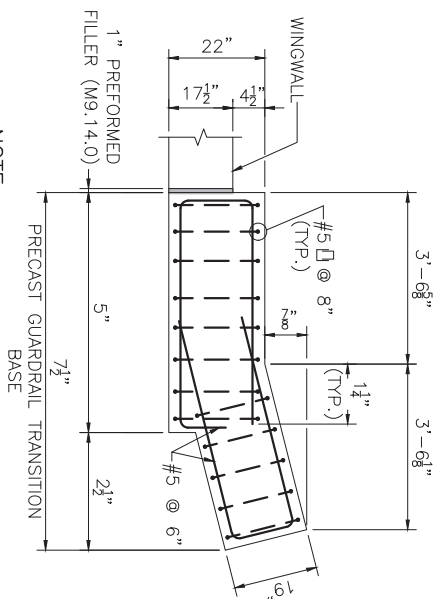


NOTE:

1. REINFORCEMENT OF THE TRANSITION TOP IS NOT SHOWN FOR CLARITY.

## SECTION 6

SCALE:  $\frac{1}{2}'' = 2'-0''$

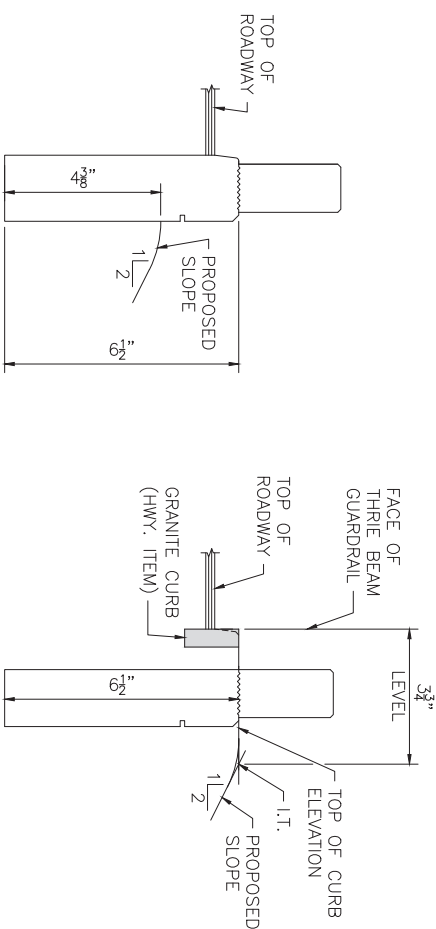


NOTE:

1. WINGWALL REINFORCEMENT AND STRIATIONS NOT SHOWN FOR CLARITY.

## SECTION 7

SCALE:  $\frac{1}{2}'' = 2'-0''$



## SECTION 8

SCALE:  $\frac{3}{8}'' = 2'-0''$

## SECTION 9

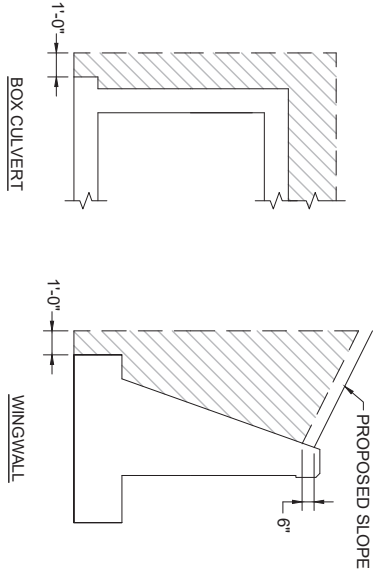
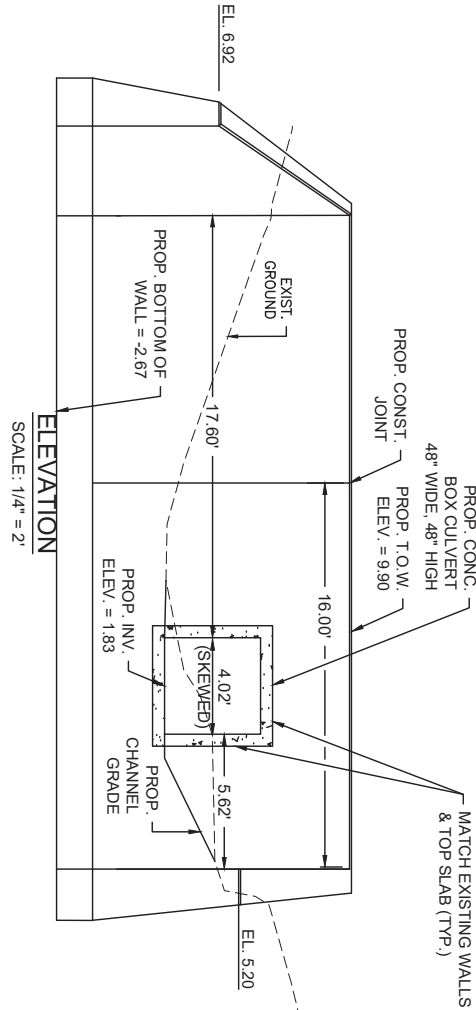
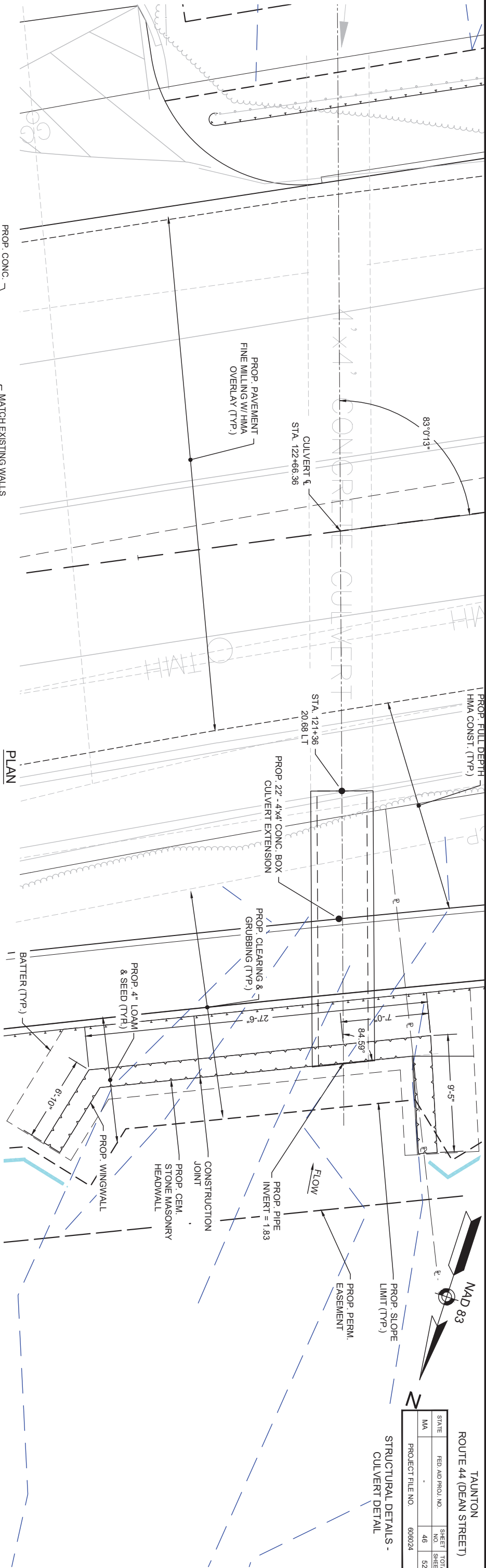
$$\frac{0.50 \text{ in}}{1 \text{ in}} = \frac{2' - 0''}{x}$$

TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	45	52
PROJECT FILE NO. 606024			

## STRUCTURAL DETAILS - PRECAST HIGHWAY GUARDRAIL TRANSITION SECTIONS

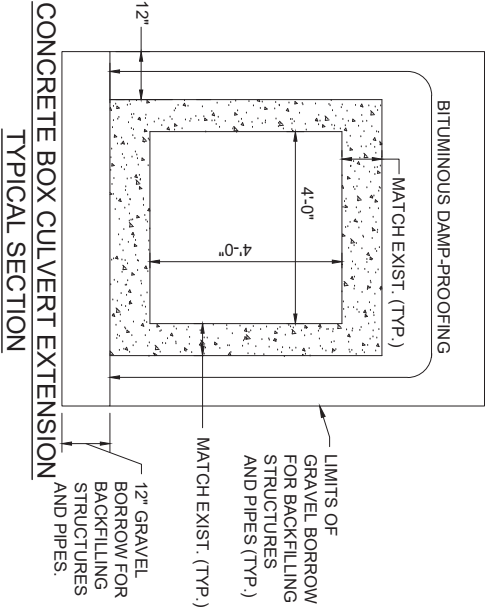
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	





NOTE:  
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.  
**LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES**

SCALE: 1/4" = 2'-0"

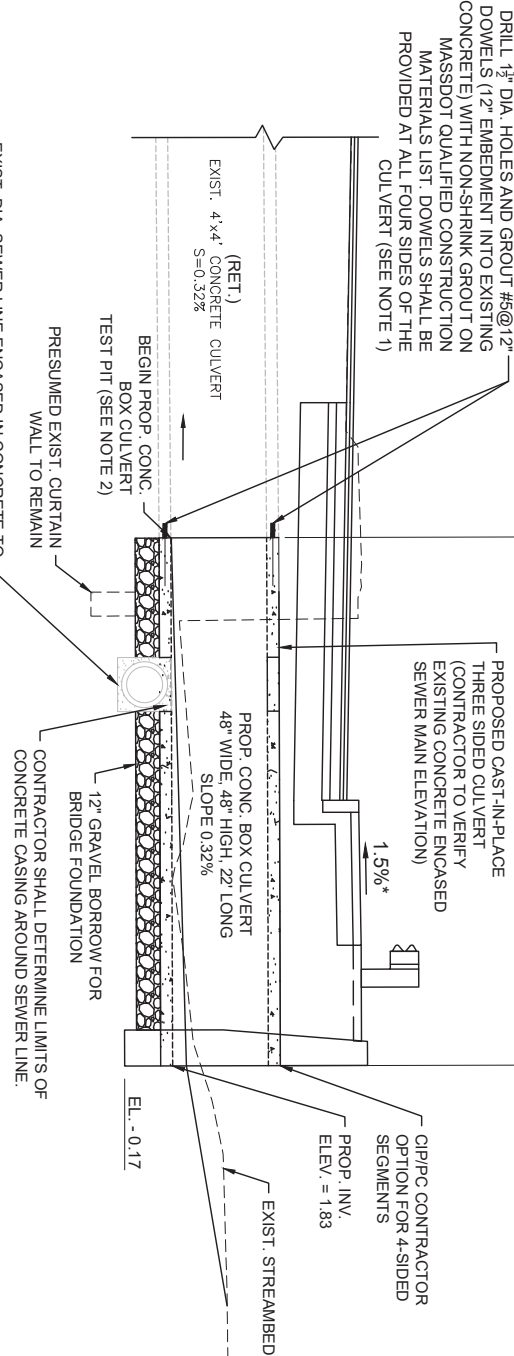


**TYPICAL SECTION**

SCALE: 1/2" = 2'-0"

PLAN

SCALE: 1/4" = 2'

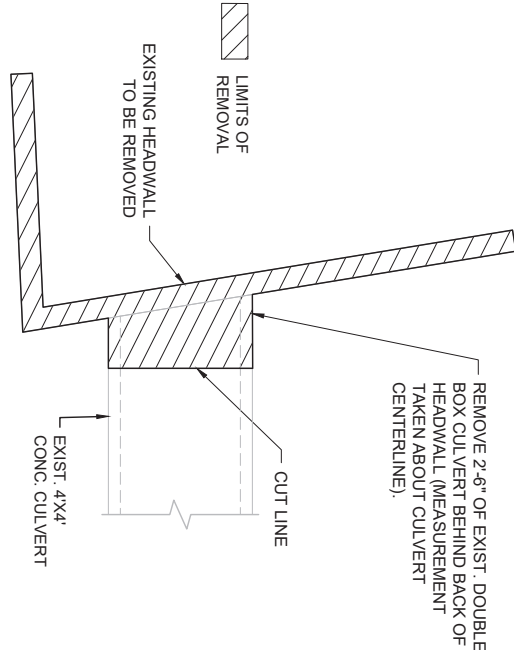


LONGITUDINAL SECTION

SCALE: 1/4" = 2'

CULVERT NOTES:

1. THE PROPOSED CULVERT SHALL BE CONTRACTOR DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS.
2. THE CULVERT END HEADWALL AND WINGWALLS SHALL BE IN ACCORDANCE WITH DRAWING E 302.2.0 OF THE MASSDOT CONSTRUCTION STANDARDS AND SHALL BE CEMENTED STONE MASONRY.
3. THE PROPOSED CULVERT EXTENSION CENTERLINE SHALL ALIGN WITH THE EXISTING CULVERT CENTERLINE.
4. AN EXISTING SEWER PIPE INTERSECTS THE PROPOSED BOX CULVERT EXTENSION. THE CONTRACTOR SHALL LOCATE THE EXISTING SEWER PIPE CONCRETE ENCASEMENT PRIOR TO THE SUBMISSION OF THE CULVERT SHOP DRAWINGS.
5. THE CULVERT EXTENSION MAY BE A CAST-IN-PLACE THREE SIDED CULVERT AT THE SEWER LINE. THE CULVERT BEYOND THE SEWER LINE MAY BE PRECAST OR CAST-IN-PLACE.
6. SUPPORT ALL UTILITIES IN PLACE, EXCEPT WHERE NOTED. INCLUDE UTILITY SUPPORT IN COST OF THE CULVERT.
7. REFER TO SPECIAL PROVISIONS FOR PRECAST CULVERT JOINT AND JOINT SEALING REQUIREMENTS.
8. CONTRACTOR SHALL VERIFY CULVERT INVERT ELEVATION.
9. PROPOSED CULVERT DIMENSIONS SHALL MATCH EXISTING CULVERT DIMENSIONS. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS.
10. APPLY BITUMINOUS DAMP-PROOFING TO TOP AND SIDES OF CULVERT EXTENSION AND 2 FEET OF EXISTING CULVERT FROM CUT LINE.



EXISTING CULVERT REMOVAL DETAIL

NOT TO SCALE

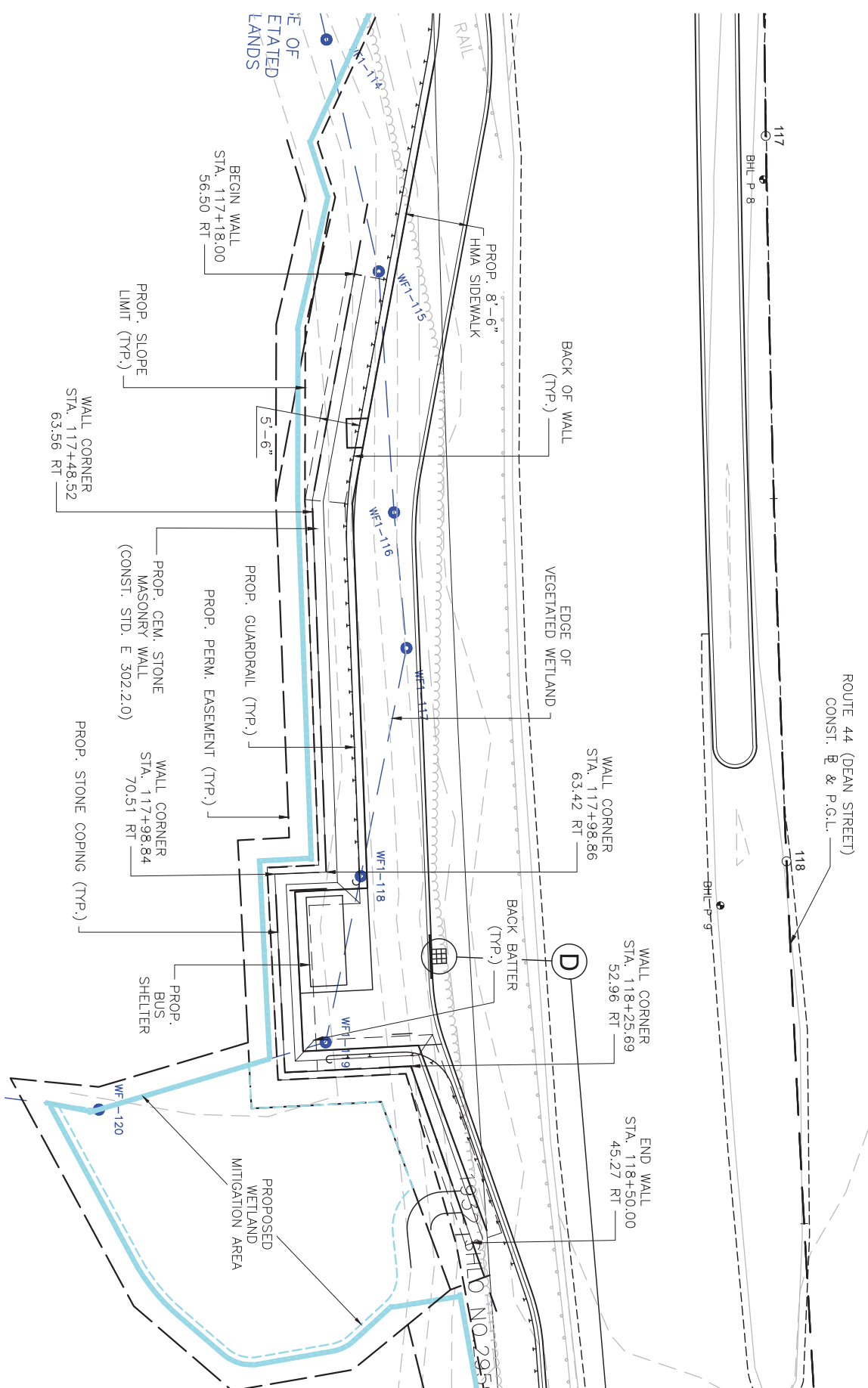
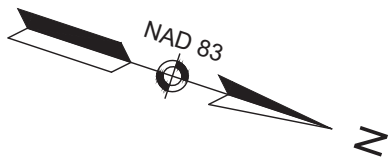
EXISTING BOX CULVERT REMOVAL NOTES:

1. REMOVE EXISTING HEADWALL AND BOX CULVERT AS SHOWN ON THE PLANS.
2. EXIST. REINFORCING SHALL BE RETAINED IN REMOVAL AREA WITHIN 10 INCHES OF CUT LINE. WHERE REINFORCING IS DAMAGED REPLACEMENT REINFORCING SHALL BE DRILLED AND GROUTED INTO EXIST. CULVERT.
3. EXIST. REINFORCING AND/OR DOWELS SHALL BE CUT AND LOCATED TO PROVIDE 2" CLEAR COVER OF CONCRETE.
4. EXISTING FOOTINGS MAY BE LEFT IN PLACE.

TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	46	52
PROJECT FILE NO.		606024	

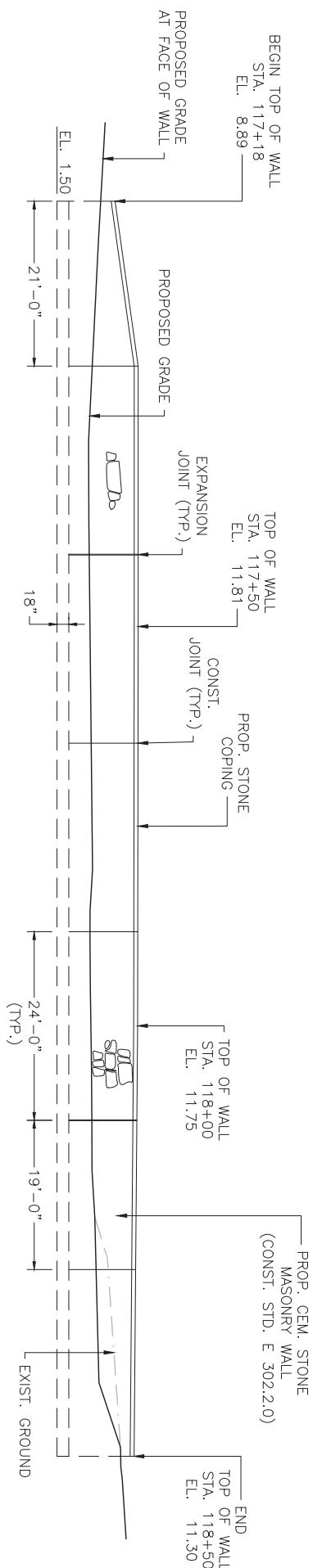
STRUCTURAL DETAILS - CULVERT DETAIL





## PLAN

SCALE: 1:20



WALL NOTES:

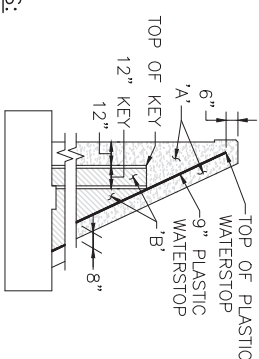
1. 4" Ø WEEP HOLES (JUST ABOVE FOOTING). PROVIDE 1 WEEP HOLE PER WALL, CENTERED ALONG WALL LENGTH, PROVIDE MIN. 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. ALL CONCRETE SHALL BE 4000 PSI, 1 ½ IN, 565 CEMENT CONCRETE.
3. COPING OVERHANG SHALL BE 2" WHERE WALL IS LESS THAN 10' IN HEIGHT AND 3" WHERE GREATER.

## DEVELOPED ELEVATION

SCALE: 1:20

TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	47	52
PROJECT FILE NO.		608024	

## STRUCTURAL DETAILS - RETAINING WALL DETAILS

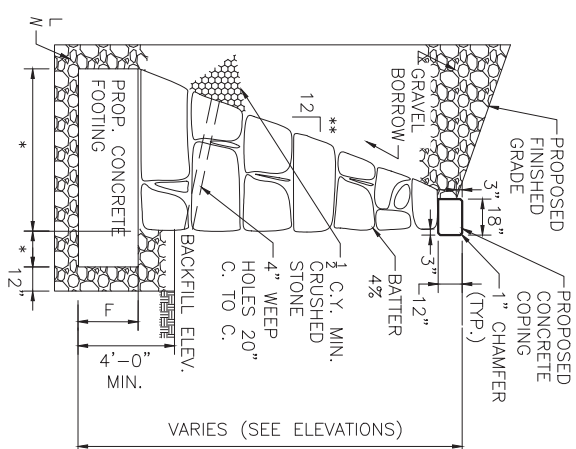


NOTES:

1. LONGITUDINAL REINFORCEMENT SHALL END 2" CLEAR OF EXPANSION JOINT.
2. 'A' - PREFORMED FILLER (IN ACCORDANCE WITH M9.14.0).  
'B' - PREFORMED FILLER (IN ACCORDANCE WITH M3.05.3 BITUMINOUS JOINT FILLER).
3. FILLER MATERIAL SHALL BE FASTENED SECURELY TO ONE SIDE OF JOINT.

VERTICAL SECTION THRU EXP. JOINT

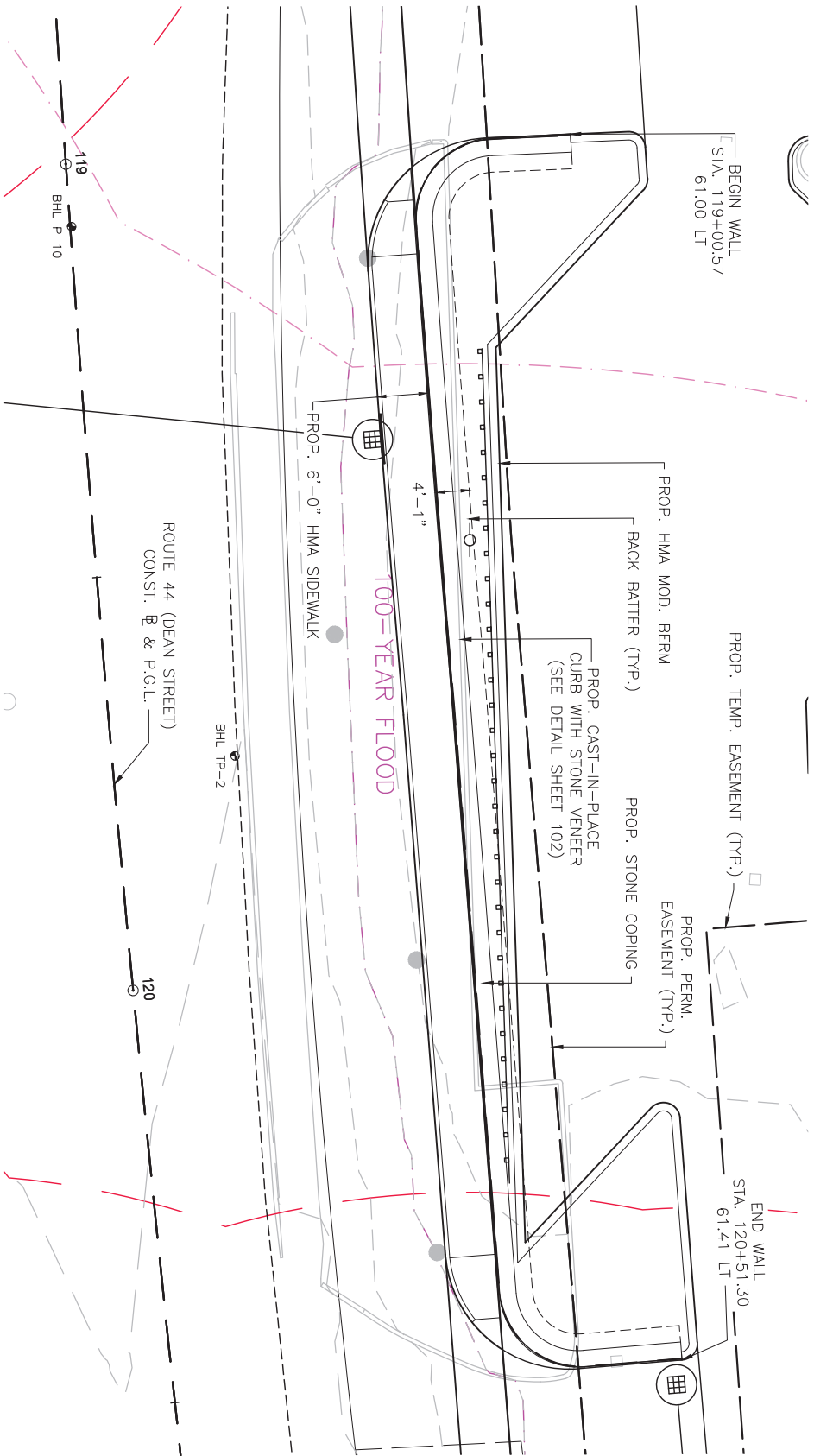
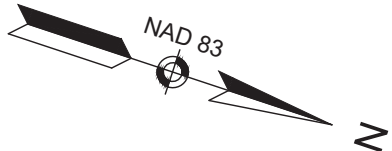
NOT TO SCALE



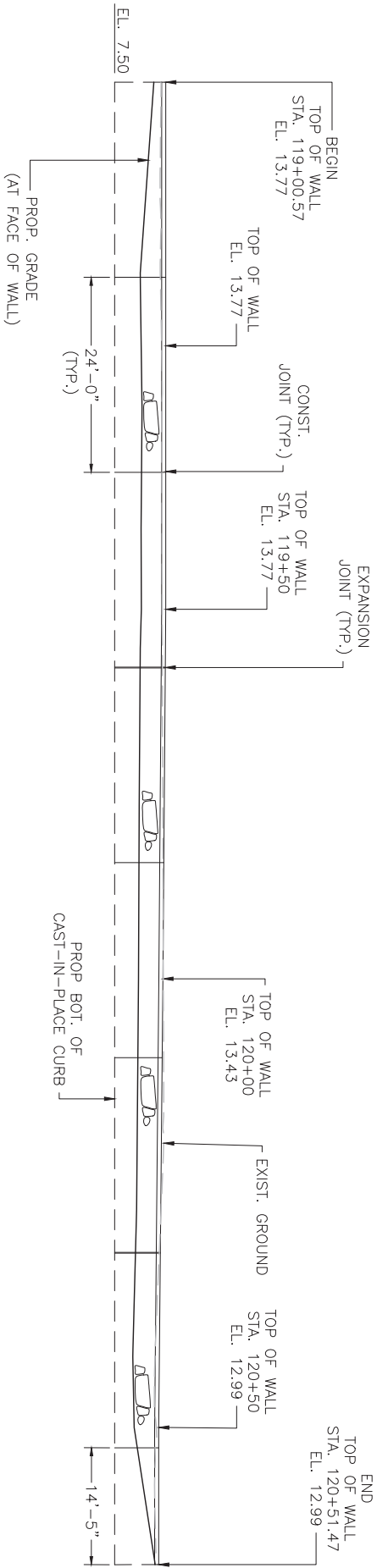
## STONE MASONRY RETAINING SECTION

SCALE:  $\frac{1}{4}" = 2'-0"$





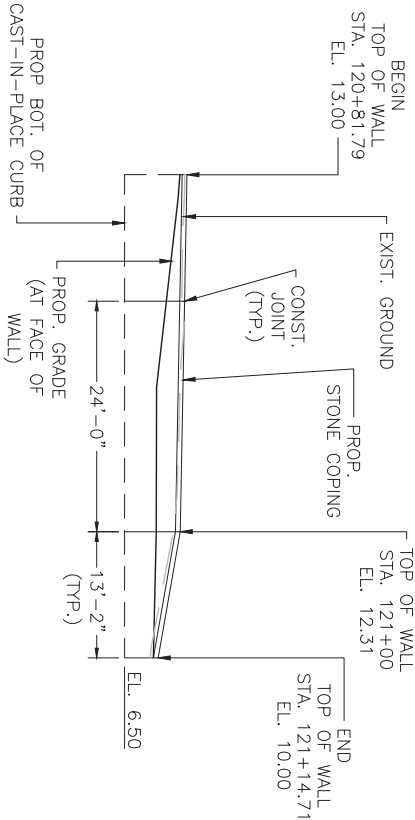
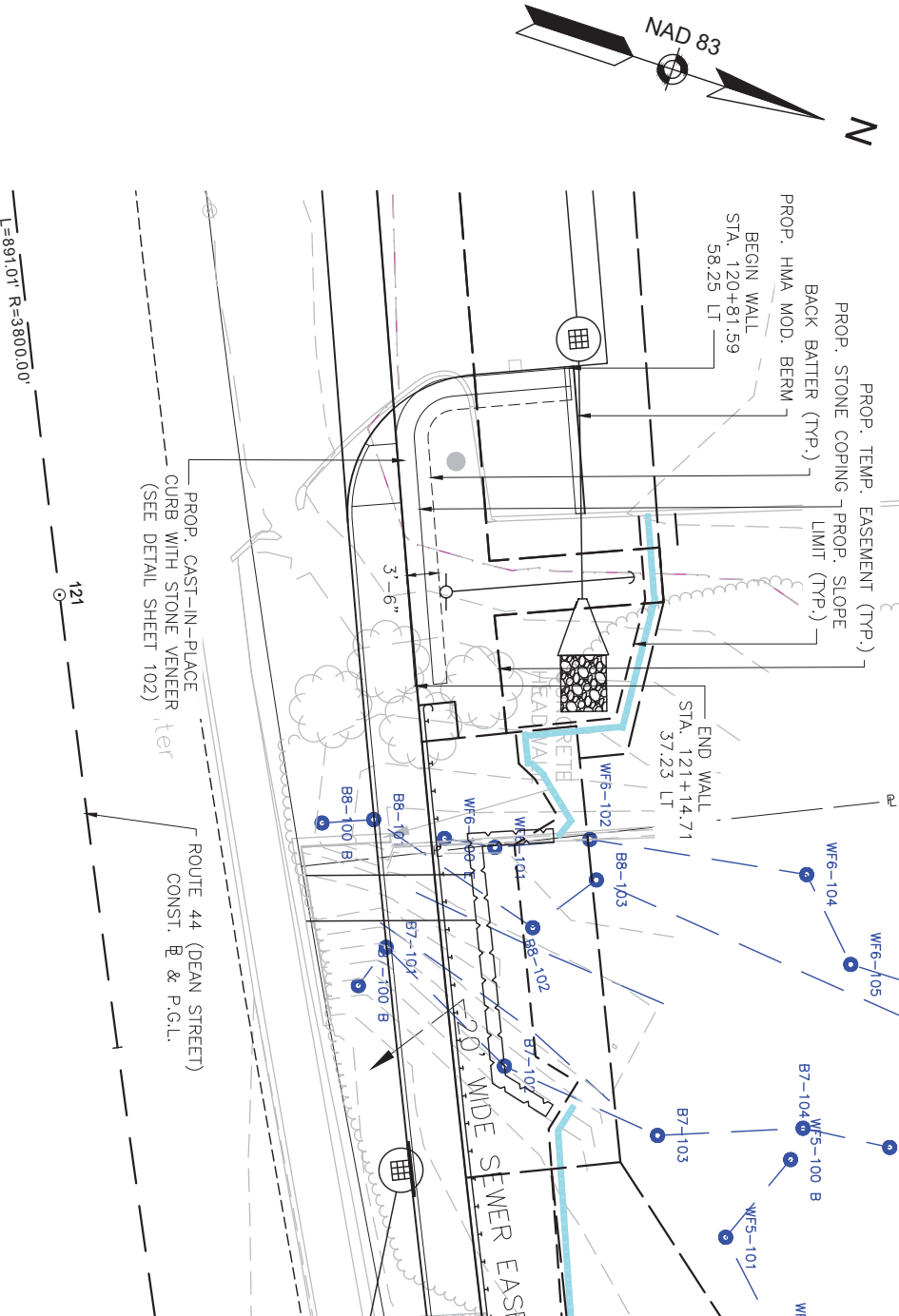
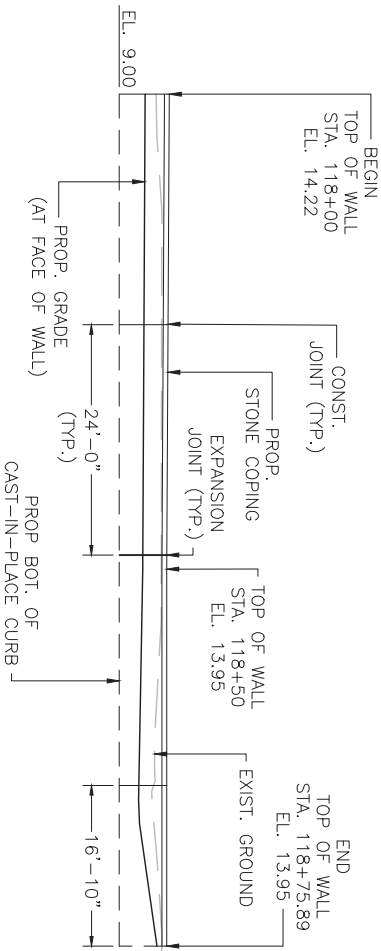
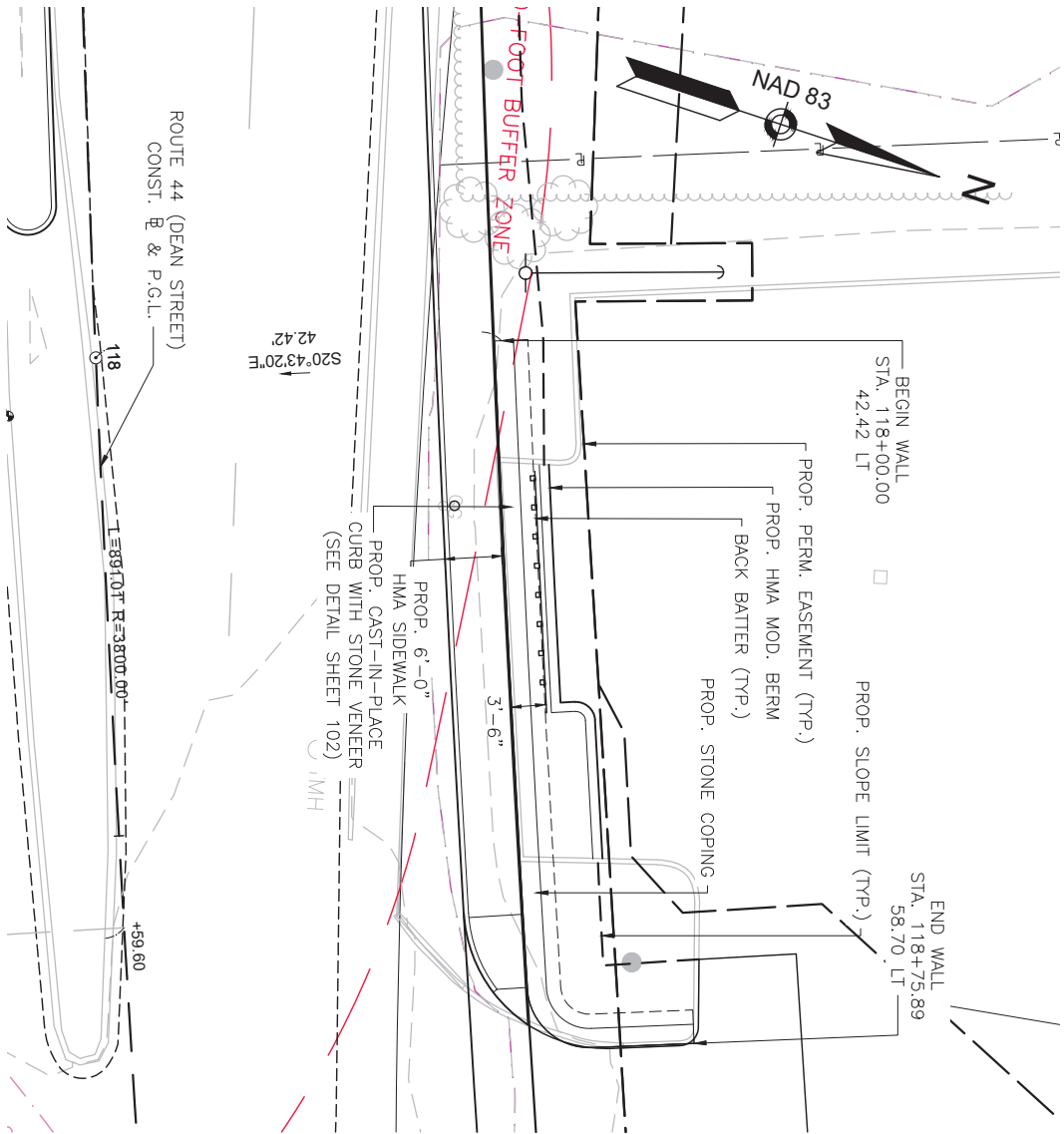
PLAN  
SCALE: 1:20



TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	48	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS

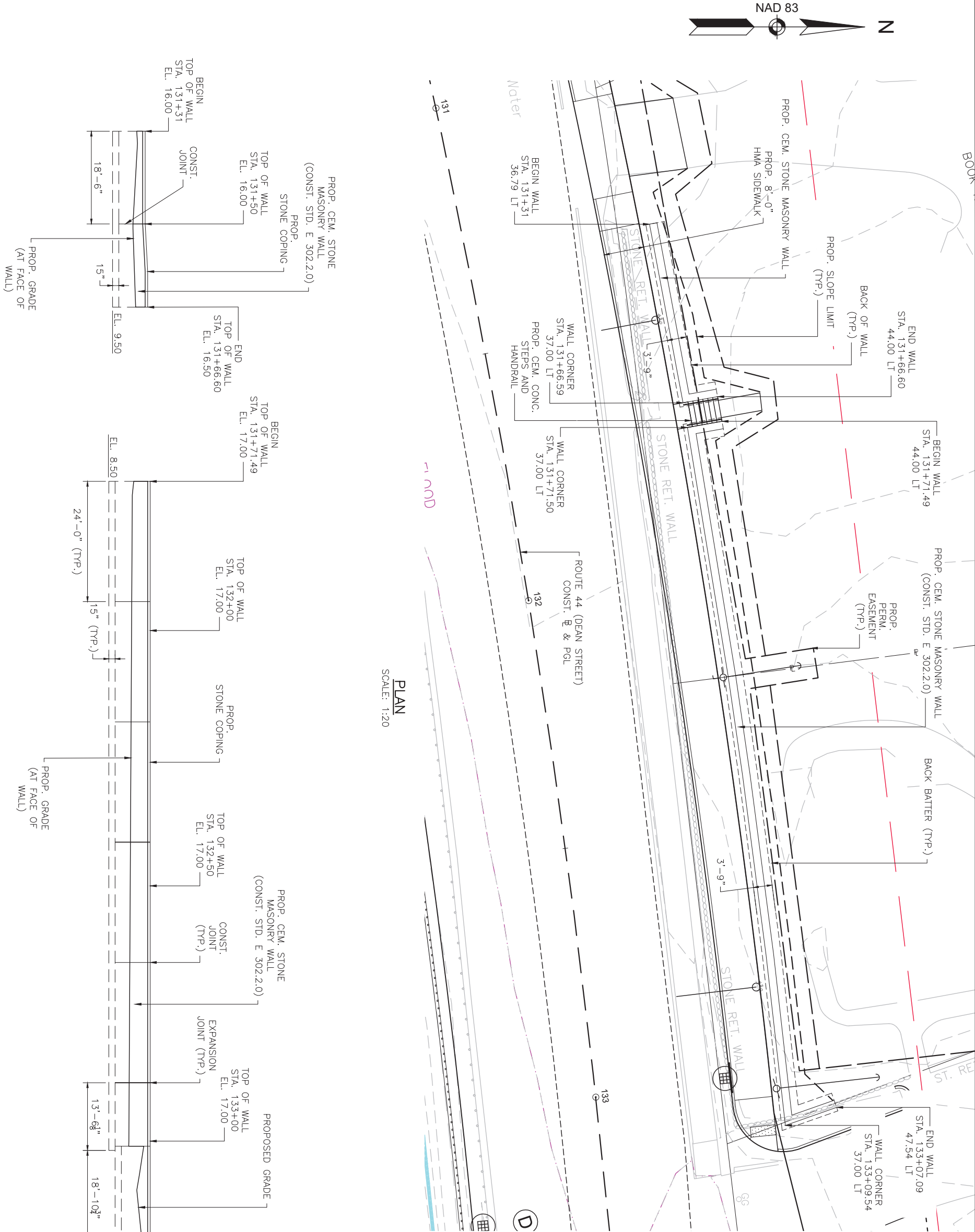




TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	49	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS

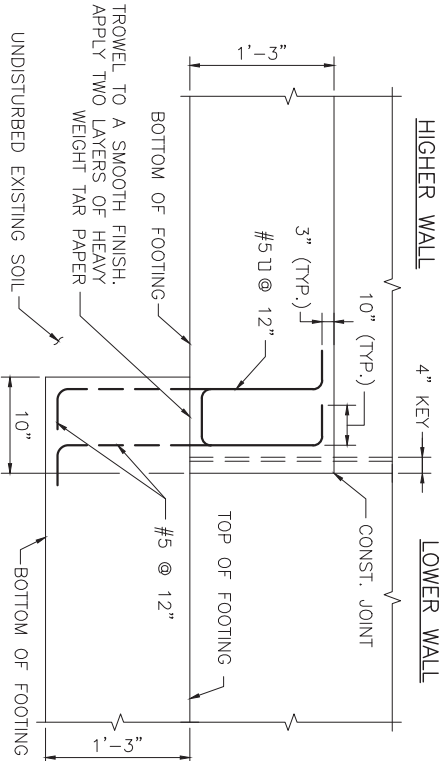




TAUNTON  
ROUTE 44 (DEAN STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	50	52
PROJECT FILE NO. 606024			

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS



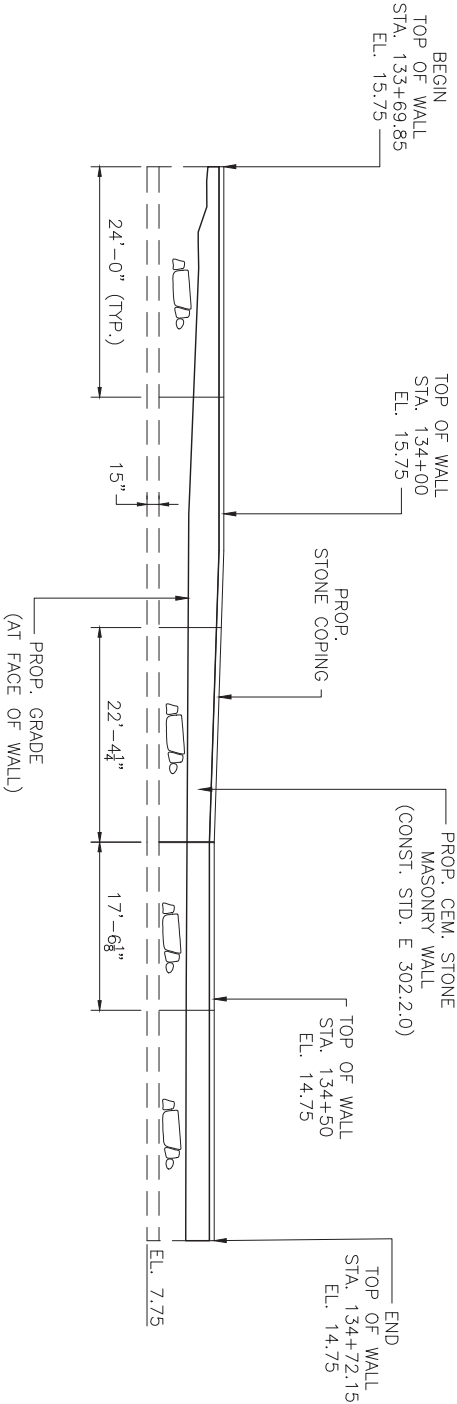
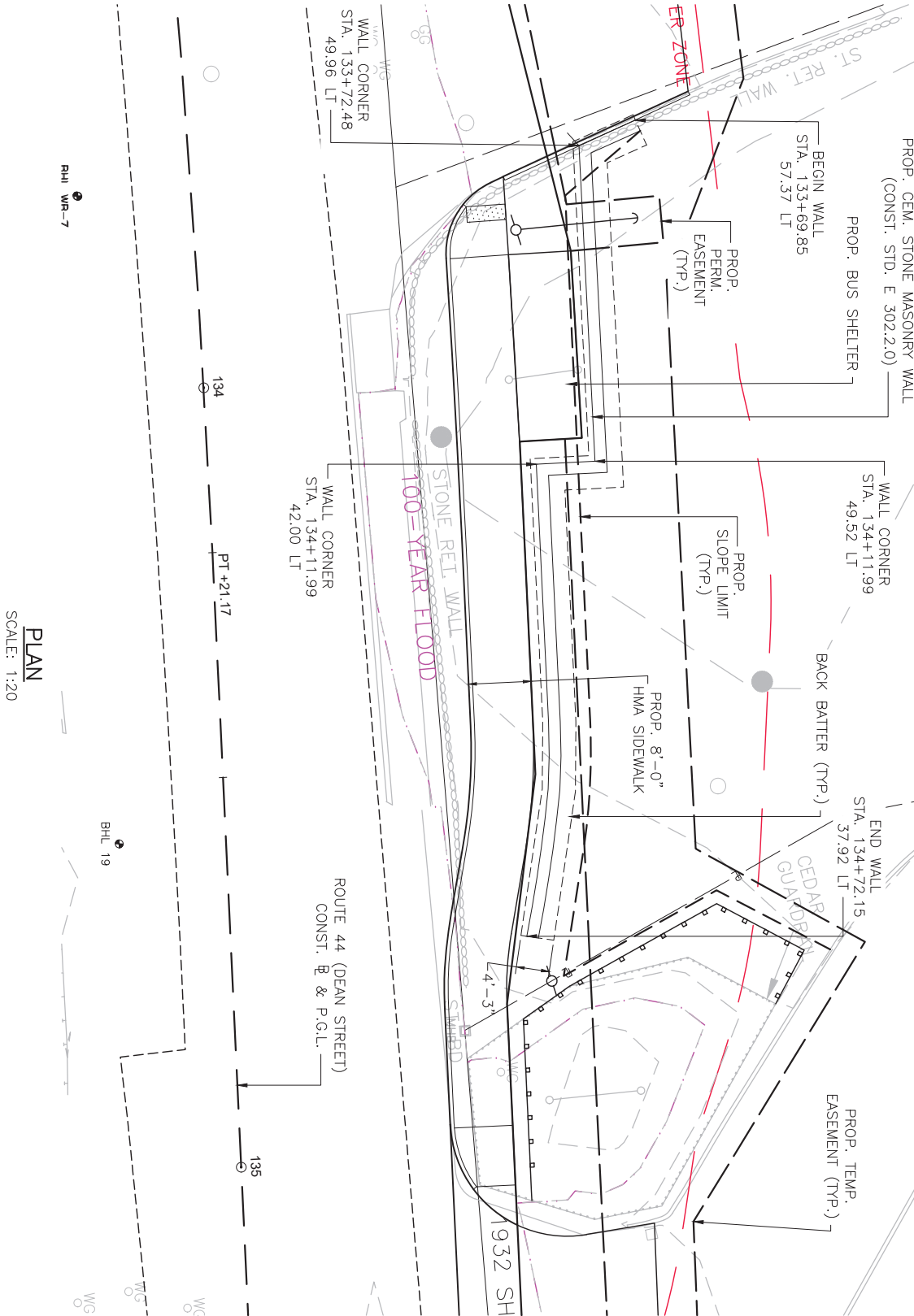
STEPPED-UP FOOTING DETAIL

SCALE: 1/2"=2'-0"

DEVELOPED ELEVATION

SCALE: 1:20





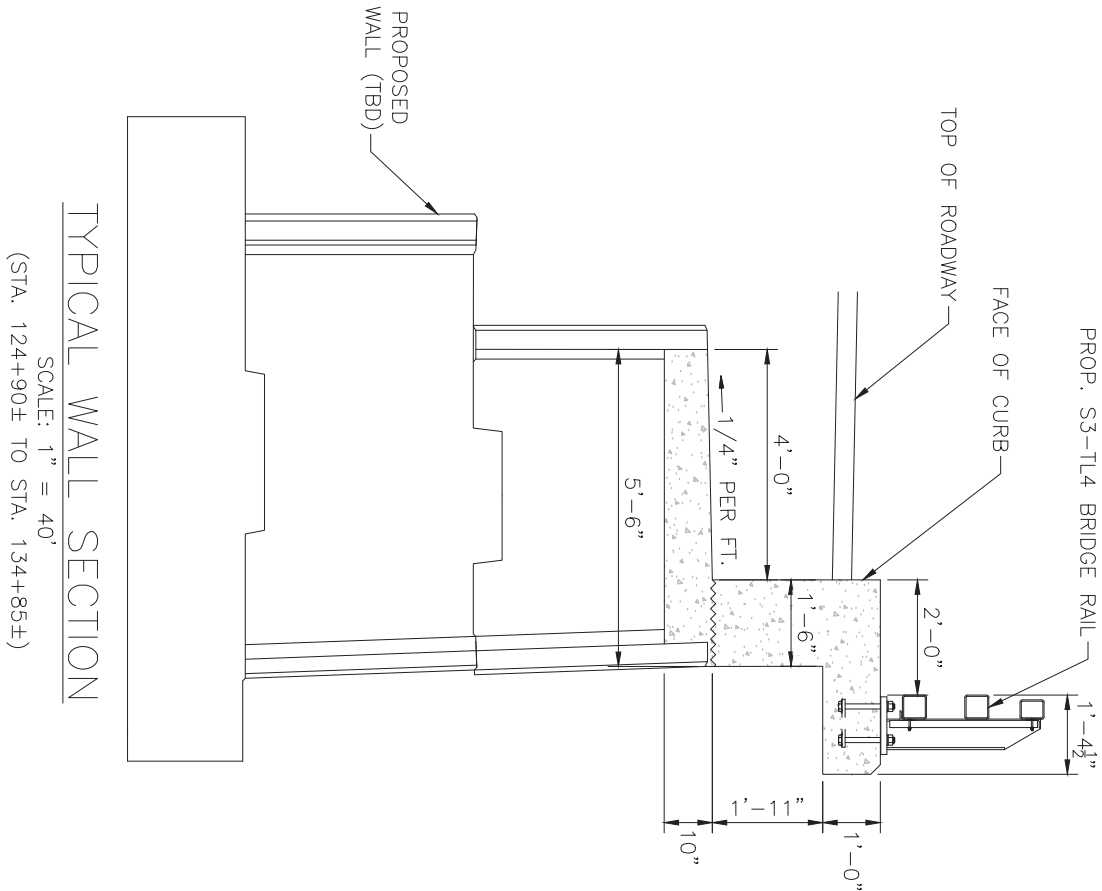
TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	51	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
RETAINING WALL DETAILS



TAUNTON			
ROUTE 44 (DEAN STREET)			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	52	52
PROJECT FILE NO.		606024	

STRUCTURAL DETAILS -  
TYPICAL WALL SECTION





## WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

```
*****
*      EMAIL TO:  cenac-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
*****
```

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

## 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:** \_\_\_\_\_

\*\*\*\*\*

A00831 - 58



**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-2021-01406

**Project Manager:** Vasconcelos

**Name of Permittee:** MassDOT – Highway Division

**Permit Issuance Date:** September 9, 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



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>
I. General Criteria	1
II. <a href="#">Jurisdiction/Authorities to Issue Permits</a>	2
III. <a href="#">Eligible Activities</a>	3
IV. <a href="#">General Conditions</a>	19
V. <a href="#">Self-Verification Notification Form</a>	34
VI. <a href="#">Content of Preconstruction Notification</a>	36
VII. <a href="#">Definitions and Acronyms</a>	40
VIII. <a href="#">Contacts and Tribal Areas of Concern</a>	47
IX. <a href="#">Historic Property Notification Form</a>	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](mailto: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 shallows<sup>1</sup>; (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 <sup>1</sup>	PCN Required <sup>1</sup>
Activities that do not require a PCN or an IP.	<ol style="list-style-type: none"> <li>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</li> <li>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 &gt;200 feet in any direction from the structure; or</li> <li>3. Impacts occur in special aquatic sites (SAS) other than non-tidal wetlands; or</li> <li>4. Stream crossing work that does not require an IP. Minor repairs are SV eligible.</li> <li>5. Dam and flood control or levee repair, rehabilitation, or replacement involves: <ol style="list-style-type: none"> <li>(a) a change in the flood elevation or permanent water surface elevation of the impoundment; or</li> <li>(b) drawdown of impoundment for construction exceeding one growing season; or</li> <li>(c) any modification that changes the character, scope, or size of the original fill design; or</li> </ol> </li> <li>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</li> <li>7. Work on tide gates without a Corps-approved operation and maintenance plan or changes affecting the hydraulic regime; or</li> <li>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</li> </ol>

<sup>1</sup> 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 <a href="#">mouth</a>, involving permanent or temporary impacts unless they are performed: (a) <math>\leq 5</math> feet waterward from the ordinary high water mark (OHW) or high tide line (HTL) and <a href="#">in the dry</a>; 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 <a href="#">Regulatory Guidance Letter No. 05-04</a> for more info.</p>	

### **GP 2. Moorings (Authority: §10)**

New moorings and mooring fields; the relocation of previously authorized<sup>2</sup> 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 facility<sup>3</sup>; (b) Moorings in a Corps [Federal anchorage](#) that are classified as a boating facility<sup>3</sup> 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"> <li>a. Authorized by a local harbormaster/municipality under MGL Chapter 91 §10A; and</li> <li>b. Single boat, single-point and non-commercial; and</li> <li>c. Not associated with a boating facility<sup>3</sup>; and</li> <li>d. Neither placed within nor impact tidal vegetated shallows (e.g., eelgrass); and</li> <li>e. Attached to boats that do not contact the substrate during any tidal cycle; and</li> <li>f. Not located within a Corps <a href="#">Federal navigation project</a> (FNP) or the <a href="#">FNP buffer zone</a>.</li> </ul> <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 authorized<sup>2</sup> 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>	

<sup>2</sup> 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.

<sup>3</sup> 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.



<b>GP 3. Structures in Navigable Waters of the U.S. (Authority: §10)</b>	
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"> <li>a. Piers span <math>\leq 75</math> feet over salt marsh and are <math>\leq 4</math> feet wide and <math>\geq 4</math> feet above the marsh substrate (the height is measured from the marsh substrate to the bottom of the lowest longitudinal support); and</li> <li>b. Floats and lifts in tidal waters and non-tidal navigable waters of the U.S. are <math>\geq 18</math> 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</li> <li>c. Piers and floats in: (i) Tidal waters total <math>\leq 600</math> SF combined; and (ii) Non-tidal <u>navigable waters</u> of the U.S. total <math>\leq 300</math> SF combined; and</li> <li>d. Piers, floats and lifts: (i) Are <math>\geq 25</math> feet from previously mapped or existing vegetated shallows, or riparian property line extensions; and (ii) Extend <math>\leq 25\%</math> of the waterway width or <math>\leq 75</math> feet waterward from OHW in non-tidal <u>navigable waters</u> of the U.S. or mean high water (MHW). See Note 1.</li> </ul> 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 <a href="http://www.nae.usace.army.mil/missions/regulatory/useful-documents-forms-and-publications">www.nae.usace.army.mil/missions/regulatory/useful-documents-forms-and-publications</a> >> Structure Placement in Navigable Waterways for guidance. 2. GC 11, Pile Driving and Removal, is particularly relevant.	

<b>GP 4. Aids to Navigation and Temporary Recreational Structures (Authority: §10)</b>	
(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><b>GP 5. Dredging (Authority: §10; navigable waters of the U.S.), Disposal of Dredged Material (Authorities: §§10, 404 &amp; 103; tidal waters of the U.S.), Beach Nourishment (Authorities: §§10 &amp; 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 &amp; 404; tidal and non-tidal waters of the U.S.)</b></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 &gt;½ acre; ≥10,000 CY; &gt;1000 SF of impacts to intertidal areas, saltmarsh, mud flats, riffle and pool complexes, or non-tidal vegetated shallows; or &gt;100 SF of impacts to tidal vegetated shallows; (b) Maintenance or improvement dredging and/or disposal with &gt;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 &gt;½ acre; or (f) Blasting.</p>	
Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
<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"> <li>a. Dredged area ≤½ acre; and</li> <li>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</li> <li>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</li> <li>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</li> <li>e. No return water from upland disposal areas.</li> </ul> <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 &lt;1/2 acre or &lt;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 <a href="http://www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit">www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit</a> &gt;&gt; right whale critical habitat. The approximate boundaries are from the MA/NH border to Chatham.</p> <p>2. See <a href="http://www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit">www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit</a> &gt;&gt; MA DMF Technical Report TR-47.</p> <p>3. See <a href="http://www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit">www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit</a> &gt;&gt; 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 <sup>1</sup>	PCN Required <sup>1</sup>
Activities in non-tidal waters that meet all of the following terms: a. ≤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 b. ≤1 cubic yard of fill per linear foot average along the bank waterward of the plane of OHW; and c. The slope of the structure is more gradual than 1V:3H in lakes/ponds; and 1V:1H in non-tidal streams; and d. No impacts to SAS.	1. Activities in non-tidal waters that are: a. >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 b. >1 cubic yard of fill per linear foot average along the bank waterward of the plane of OHW; or c. The slope of the structure is steeper than 1V:3H in lakes/ponds; and 1V:1H in non-tidal streams; or d. Impacts to SAS; or 2. The activity is located in tidal waters; or 3. Bulkheads, seawalls or similar structures for maritime activities; or 4. 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 <a href="#">in the dry</a> ; or (b) from Sep. 1 to Oct. 14. This is to protect endangered species; or 5. 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.



<b>GP 8. Residential, Commercial and Institutional Developments and Recreational Facilities (Authorities: §404)</b>	
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 <sup>1</sup>	PCN Required <sup>1</sup>
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 shallows<sup>1</sup>; or (c) New tide gates that do not meet SV 3 below.

Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
<p>Activities that meet all of the following terms:</p> <ol style="list-style-type: none"> <li>1. Cumulative permanent and temporary impacts for all <a href="#">single and complete projects</a> 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</li> <li>2. Intake structures that are dry hydrants used exclusively for firefighting activities with no stream impoundments; and</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Cumulative permanent and temporary impacts for all <a href="#">single and complete projects</a> associated with the overall project (see Note 2) in non-tidal waters of the U.S. that: (a) total &gt;5000 SF; or (b) are located in vegetated shallows or riffle and pool complexes; or</li> <li>2. The activity occurs in tidal waters or in, over or under <a href="#">navigable waters</a> of the U.S.; or</li> <li>3. Access roads involving stream and wetland crossings (see Note 3) that require a PCN per GC 19(b)-(e); or</li> <li>4. Stream channelization, relocation, impoundment, or loss of streambed occurs; or</li> <li>5. The utility line is placed within and runs parallel to or along a streambed; or</li> <li>6. There is a permanent change in preconstruction contours in waters of the U.S.; or</li> <li>7. Material resulting from trench excavation is temporarily sidecast into waters of the U.S. for &gt;3 months (material must be placed such that it is not dispersed by currents or other forces); or</li> <li>8. Activities that are not SV eligible and do not require an IP.</li> </ol>

**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 shallows<sup>1</sup>; (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 <sup>1</sup>	PCN Required <sup>1</sup>
Cumulative permanent and temporary impacts for all <a href="#">single and complete projects</a> 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"> <li>1. Cumulative permanent and temporary impacts in non-tidal waters of the U.S. for all <a href="#">single and complete projects</a> associated with the overall project (see Note 2) that: (a) total &gt;5000 SF; or (b) are located in vegetated shallows or riffle and pool complexes; or</li> <li>2. The activity occurs in tidal waters or in, over or under <a href="#">navigable waters</a> of the U.S.; or</li> <li>3. Stream and wetland crossings (see Note 3) that require a PCN per GC 19(b)-(e); or</li> <li>4. Stream channelization, relocation, or loss of streambed (see Note 4) including impoundments, occur; or</li> <li>5. Activities that are not eligible for SV and do not require an IP.</li> </ol>
<p>Notes:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>	

**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 <sup>1</sup>	PCN Required <sup>1</sup>
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"> <li>1. Permanent and temporary impacts in non-tidal waters and wetlands that are: (a) &gt;5000 SF; or (b) located in vegetated shallows or streams; or</li> <li>2. The activity occurs in non-tidal <a href="#">navigable waters</a> of the U.S.; or</li> <li>3. Stream channelization, relocation, impoundment, loss of streambed, or discharge of tailings into streams occurs; or</li> <li>4. Activities that are not eligible for SV and do not require an IP.</li> </ol>



**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 shallows<sup>1</sup>; or (c) dredging in navigable waters of the U.S. (see GP 5).

Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
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 <sup>1</sup> .	<ol style="list-style-type: none"> <li>1. Permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) &gt;5000 SF; or (b) located in vegetated shallows or riffle and pool complexes; or</li> <li>2. The activity occurs in tidal or <a href="#">navigable waters</a> of the U.S.; or</li> <li>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</li> <li>4. Activities that are not eligible for SV and do not require an IP.</li> </ol>

**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 shallows<sup>1</sup>.

Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
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"> <li>1. For land-based facilities, permanent and temporary impacts in non-tidal waters of the U.S. that are: (a) &gt;5000 SF; or (b) located in vegetated shallows or riffle and pool complexes<sup>1</sup>; or</li> <li>2. Water-based wind or hydrokinetic renewable energy generation projects, and hydropower projects; or</li> <li>3. For all activities eligible for authorization under GP 13: a) The activity occurs in tidal waters or in, over or under <a href="#">navigable waters</a> of the U.S.; or b) Stream channelization, relocation, impoundment, or loss of streambed occurs; or</li> <li>4. Activities that are not eligible for SV and do not require an IP.</li> </ol>

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 <a href="#">navigable waters</a> 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 <a href="#">in the dry</a> ; 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 impacts<sup>1</sup>; stream channelization, relocation, impoundments, or loss of streambed.

Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
≤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 Eligible<sup>1</sup>**

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 Required<sup>1</sup>**

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 Eligible<sup>1</sup>**

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 Required<sup>1</sup>**

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.



<b>GP 18. Scientific Measurement Devices (Authorities: §§10 and 404)</b> 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 <sup>1</sup> .	
Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
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.	

<b>GP 19. Survey Activities (Authorities: §§10 and 404)</b> 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 <sup>1</sup> ; 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 <sup>1</sup> .	
Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
1. Permanent impacts that are ≤1000 SF and temporary impacts that are ≤5000 SF <sup>1</sup> 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 <a href="#">navigable waters</a> 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.

Not authorized under GP 20 (IP required): (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 <sup>1</sup>	PCN Required <sup>1</sup>
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 <a href="#">navigable waters</a> 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.).

Not authorized under GP 21 (IP required): Artificial reefs; or new, or expansions of, impoundments and semi-impoundments of waters of the U.S. for the culture or holding of motile species such as lobster with an impounded area >½ acre.

Self-Verification Eligible <sup>1</sup>	PCN Required <sup>1</sup>
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 Eligible<sup>1</sup>: Devices and activities that do not require a PCN or an IP.

**PCN Required<sup>1</sup>**

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  $\leq 640$  SF in area; (c) structures (e.g., cages, racks) elevated  $\geq 2$  feet above the ocean floor with legs within a lease site with  $\leq 4$  buoys marking the corners and no other lines; or (d) floating cage strings with a single connecting line,  $\leq 2$  anchors and  $\leq 2$  end marker buoys per string within a lease site with  $\leq 4$  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  $\leq \frac{1}{2}$  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](http://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 <sup>1</sup>	PCN Required <sup>1</sup>
<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 &gt;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 &gt;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) &lt;5 feet waterward from OHW or HTL and <a href="#">in the dry</a>; 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>
<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.</p>	



#### 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](http://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](http://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 mitigation<sup>4</sup> 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.<sup>5</sup>

## **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

<sup>4</sup> 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](http://www.nae.usace.army.mil/missions/regulatory) >> Mitigation.

<sup>5</sup> See the three documents at [www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit](http://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)<sup>6</sup>, 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)<sup>7</sup>, and the NRHP<sup>6</sup>. Use of the [Historic Property Notification Form](#) (Section IX) to notify the SHPO, BUAR and applicable THPOs<sup>7</sup> 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 THPOs<sup>7</sup> 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

<sup>6</sup> See [www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permits](http://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).

<sup>7</sup> [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](http://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  $\geq 3$  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/](http://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 method<sup>8</sup> 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

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<sup>8</sup> **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](http://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](http://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 controls<sup>9</sup> (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.

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<sup>9</sup> 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, spanned<sup>10</sup>, 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](http://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.

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<sup>10</sup> 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 BMPs<sup>11</sup>, 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 manual<sup>12</sup>.

ii. Span<sup>10</sup> streams or size culverts or pipe arches such that they are at least 1.2 times bankfull width of the reference reach<sup>13</sup>. 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 spans<sup>10</sup> are required. The following depths are required to prevent streambed washout, and ensure compliance and long-term success:

1.  $\geq 2$  feet for box culverts and pipe arches<sup>14</sup>, or

2.  $\geq 2$  feet and at least 25% for round pipe culverts<sup>14</sup>.

<sup>11</sup> See [www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit](http://www.nae.usace.army.mil/missions/regulatory/state-general-permits/massachusetts-general-permit).

<sup>12</sup> See [www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity](http://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.

<sup>13</sup> The following guides located at [www.nae.usace.army.mil/missions/regulatory/stream-and-river-continuity](http://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.

<sup>14</sup> 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.<sup>15</sup> 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 methods<sup>12</sup>. 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.

<sup>15</sup> 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](http://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](http://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 spans<sup>10</sup> 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 Species<sup>16</sup>**

- a. The introduction or spread of invasive or other unacceptable plant or animal species on the project

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<sup>16</sup> See [www.nae.usace.army.mil/missions/regulatory/mitigation](http://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](http://www.nae.usace.army.mil/missions/regulatory/invasive-species). Additional information can be found at: [www.eddmaps.org/ipane](http://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”<sup>16</sup>. 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/](http://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.

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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.

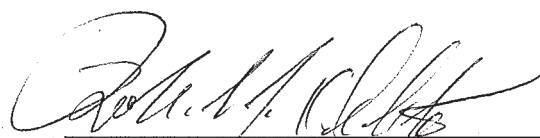
**42. Enforcement cases.** These GPs do not apply to any existing or proposed activity in Corps jurisdiction associated with an ongoing Corps or EPA enforcement action, until such time as the enforcement action is resolved or the Corps or EPA, as appropriate, determines that the activity may proceed 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](http://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](mailto: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](mailto: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](http://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](http://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](http://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](http://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](http://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](http://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](http://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](http://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](http://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](mailto: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](mailto: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](mailto: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](mailto: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](mailto:tashtesook@aol.com), [dhnthpo@gmail.com](mailto: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:** \_\_\_\_\_

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**Does the project include new construction? If so, describe (attach plans and elevations if necessary):** \_\_\_\_\_

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**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:** \_\_\_\_\_

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**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?** \_\_\_\_\_

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Signature of person submitting this form: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/Town/Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_



DOCUMENT A00832

## **Chapter 91 License Application**



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**Chapter 91 License Application**  
**for**  
**RECONSTRUCTION OF ROUTE 44 (DEAN STREET)**  
**TAUNTON, MASSACHUSETTS**  
**June 2022**

**Submitted To:**  
**MassDEP Waterways**  
**1 Winter Street, 5<sup>th</sup> Floor**  
**Boston, MA 02108**

Prepared For:



Massachusetts Department of  
Transportation – Highway Division  
10 Park Plaza, Room 4260  
Boston, MA 02116

Prepared By:



Greenman-Pedersen, Inc. (GPI)  
181 Ballardvale Street  
Wilmington, MA 01887



**Reconstruction of Route 44 (Dean Street)  
Taunton, Massachusetts  
MassDOT Project File No. 606024 – MassDEP Transmittal X287737**

**Table of Contents**

**Cover Letter**

**Chapter 91 License Application Form**

**Project Narrative**

**Supporting Documentation and Attachments**

- a) License Plans
  - Vicinity Plan
  - Existing Plan
  - Proposed Plan
  - Cross Section
- b) Locus Map
  - USGS Topographic Locus Map
  - Aerial Locus Map
- c) FEMA FIRM Map
- d) Project Abutters
- e) Photographic Documentation
- f) Historic Context
- g) MEPA Certificate
- h) Notice of Intent





June 3, 2022

MAX-2013034 Assign 10

SENT VIA ELECTRONIC MAIL

Mr. Daniel Padien  
Department of Environmental Protection  
Waterways Regulation Program  
One Winter Street, 5<sup>th</sup> Floor  
Boston, MA 02108

SUBJECT: Application for Chapter 91 Waterways License (BRP WW14)  
Proposed Pedestrian Bridge Replacement Over the Charles River  
Bridge No. N-12-078 = W-29-062  
Newton & Weston, Massachusetts

Dear Mr. Padien:

On behalf of the Massachusetts Department of Transportation (MassDOT), Greenman Pedersen, Inc. (GPI) respectfully submits the attached application for a Chapter 91 Waterways License for the proposed Reconstruction of Dean Street (Route 44) in the City of Taunton. This application is being resubmitted via EEA ePlace with additional information and revised plans. A PDF of this license application is also being provided to the MassDEP Highway Unit to facilitate review.

The project limits begin east of Arlington Street and extends to a point west of the Route 44 / Route 104 intersection for a length of 0.71 miles (3,724 feet). The project also extends onto Longmeadow Road for 0.09 miles (464 feet) and Hon. Gordon M. Owen Riverway for 0.1 miles (566 feet). The project has a total length of 0.9 miles (4,754 feet). The project generally proposes to widen Route 44 and provide a four-lane cross section throughout the corridor to improve traffic flow, intersection operations, safety, and pedestrian and bicycle access. A new sidewalk will be constructed along the westbound side of Route 44. The geometry of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection will be realigned to provide improved signage and traffic signals, reduce driver discomfort and confusion, improve traffic operations, and improve safety for pedestrians and bicyclists. These proposed improvements will require widening of the existing roadway cross section and necessitate the placement of structures, specifically retaining walls, and fill below Mean High Water (MHW) within the Taunton River, a tidal, navigable waterway of the Commonwealth. Additional details regarding the existing conditions within the project limits, proposed improvements, impacts to the Taunton River, mitigation measures, and regulatory compliance are provided in the attached project narrative and supporting documentation.

Draft Chapter 91 plans have been included with this application. Final Mylar plans will be prepared once MassDEP's initial review has been completed and all necessary revisions have been made. A copy of this application has been submitted to the City of Taunton Planning Board and Municipal Clerk for their review in accordance with 310 CMR 9.11(3)(c)(3).

The MEPA Certificate indicating that project will not require the preparation and filing of an Environmental Impact Report (EIR) was issued on January 21, 2022, and is included as Attachment G in this application. A Wetlands Protection Act Notice of Intent was filed with the Taunton Conservation Commission in on May 27, 2022. A copy of this Notice of Intent is included as Attachment H in this application. Upon issuance, a copy of the Order of Conditions (OOC) will be forwarded to MassDEP Waterways.



Mr. Daniel Padien  
June 3, 2022  
Page 2

This application is being submitted and reviewed under the MassDOT – MassDEP Interagency Services Agreement. Should you have any other questions or require additional information please contact me at (978) 570-2989 or [scampbell@gpinet.com](mailto:scampbell@gpinet.com).

Sincerely,

**GREENMAN-PEDERSEN, INC.**

A handwritten signature in blue ink, appearing to read "Sam Campbell", is positioned above the printed name and title.

Samuel Campbell  
Environmental Scientist

enclosure(s)      Chapter 91 Waterways License Application

cc: C. Hopps, MassDEP  
R. Morrison, MassDEP  
G. Mischel, MassDOT  
M. Lenker, MassDOT  
T. Dexter, MassDOT  
C. Stairs, GPI  
J. Osorio, GPI



**Reconstruction of Route 44 (Dean Street)**

Chapter 91 Waterways License Application

Taunton, MA

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**Chapter 91 License Application Form**

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**Massachusetts Department of Environmental Protection**  
**Bureau of Resource Protection - Waterways Regulation Program**  
**Chapter 91 Waterways License Application - 310 CMR 9.00**  
**Water-Dependent, Nonwater-Dependent, Amendment**

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**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



For assistance in completing this application, please see the "Instructions".

## A. Application Information (Check one)

**NOTE: For Chapter 91 Simplified License application form and information see the Self Licensing Package for BRP WW06.**

Name (Complete Application Sections)	Check One	Fee	Application #
<b>WATER-DEPENDENT -</b>			
<b>General (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$215.00	BRP WW01a
	<input type="checkbox"/> Other	\$330.00	BRP WW01b
	<input type="checkbox"/> Extended Term	\$3,350.00	BRP WW01c
<b>Amendment (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$100.00	BRP WW03a
	<input type="checkbox"/> Other	\$125.00	BRP WW03b
<b>NONWATER-DEPENDENT -</b>			
<b>Full (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$665.00	BRP WW15a
	<input type="checkbox"/> Other	\$2,005.00	BRP WW15b
	<input type="checkbox"/> Extended Term	\$3,350.00	BRP WW15c
<b>Partial (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$665.00	BRP WW14a
	<input checked="" type="checkbox"/> Other	\$2,005.00	BRP WW14b
	<input type="checkbox"/> Extended Term	\$3,350.00	BRP WW14c
<b>Municipal Harbor Plan (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$665.00	BRP WW16a
	<input type="checkbox"/> Other	\$2,005.00	BRP WW16b
	<input type="checkbox"/> Extended Term	\$3,350.00	BRP WW16c
<b>Joint MEPA/EIR (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$665.00	BRP WW17a
	<input type="checkbox"/> Other	\$2,005.00	BRP WW17b
	<input type="checkbox"/> Extended Term	\$3,350.00	BRP WW17c
<b>Amendment (A-H)</b>	<input type="checkbox"/> Residential with $\leq 4$ units	\$530.00	BRP WW03c
	<input type="checkbox"/> Other	\$1,000.00	BRP WW03d
	<input type="checkbox"/> Extended Term	\$1,335.00	BRP WW03e



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## B. Applicant Information Proposed Project/Use Information

### 1. Applicant:

Note: Please refer  
to the "Instructions"

Melissa Lenker

Name

melissa.lenker@state.ma.us

E-mail Address

10 Park Plaza, Room 4260

Mailing Address

Boston

City/Town

MA

State

02116

Zip Code

(978) 429-1772

Telephone Number

Fax Number

### 2. Authorized Agent (if any):

Samuel Campbell

Name

scampbell@gpinet.com

E-mail Address

181 Ballardvale Street

Mailing Address

Wilmington

City/Town

MA

State

01887

Zip Code

9785702989

Telephone Number

9786583044

Fax Number

## C. Proposed Project/Use Information

### 1. Property Information (all information must be provided):

Massachusetts Department of Transportation - Highway Division

Owner Name (if different from applicant)

N / A

Tax Assessor's Map and Parcel Numbers

41.90425 N

Latitude

71.07611 W

Longitude

Dean Street (US Route 44)

Street Address and City/Town

MA

State

02780

Zip Code

### 2. Registered Land

☐ Yes☒ No

### 3. Name of the water body where the project site is located:

Taunton River

### 4. Description of the water body in which the project site is located (check all that apply):

#### Type

#### Nature

#### Designation

☐ Nontidal river/stream☒ Natural☐ Area of Critical Environmental Concern☒ Flowed tidelands☐ Enlarged/dammed☐ Designated Port Area☐ Filled tidelands☐ Uncertain☐ Ocean Sanctuary☐ Great Pond☐ Uncertain☐ Uncertain



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## C. Proposed Project/Use Information (cont.)

Select use(s) from  
 Project Type Table  
 on pg. 2 of the  
 "Instructions"

5. Proposed Use/Activity description

The project proposes the reconstruction of Dean Street (Route 44) in the City of Taunton, MA. The project generally proposes to widen Route 44 and provide a four-lane cross section with pedestrian and bicycle accommodations. The proposed improvements will require the placement of structures and fill within the Taunton River.

6. What is the estimated total cost of proposed work (including materials & labor)?

\$12,777,000

7. List the name & complete mailing address of each abutter (attach additional sheets, if necessary). An abutter is defined as the owner of land that shares a common boundary with the project site, as well as the owner of land that lies within 50' across a waterbody from the project.

see attached list

Name

Address

Name

Address

Name

Address

## D. Project Plans

1. I have attached plans for my project in accordance with the instructions contained in (check one):

☒ Appendix A (License plan)

☐ Appendix B (Permit plan)

2. Other State and Local Approvals/Certifications

☐ 401 Water Quality Certificate

Date of Issuance

TBD

File Number

☒ Wetlands

JD-

File Number

☐ Jurisdictional Determination

TBD

File Number

☒ MEPA

TBD

Date

☒ EOE Secretary Certificate

☐ 21E Waste Site Cleanup

RTN Number



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**E. Certification**

All applicants, property owners and authorized agents must sign this page. All future application correspondence may be signed by the authorized agent alone.

"I hereby make application for a permit or license to authorize the activities I have described herein. Upon my signature, I agree to allow the duly authorized representatives of the Massachusetts Department of Environmental Protection and the Massachusetts Coastal Zone Management Program to enter upon the premises of the project site at reasonable times for the purpose of inspection."

"I hereby certify that the information submitted in this application is true and accurate to the best of my knowledge."



Applicant's signature

November 23, 2021

Date

Property Owner's signature (if different than applicant)

Date



Agent's signature (if applicable)

November 30, 2021

Date



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## F. Waterways Dredging Addendum

1. Provide a description of the dredging project

☐ Maintenance Dredging (include last dredge date & permit no.) ☐ Improvement Dredging

---

Purpose of Dredging

2. What is the volume (cubic yards) of material to be dredged?

---

3. What method will be used to dredge?

☐ Hydraulic ☐ Mechanical ☐ Other

4. Describe disposal method and provide disposal location (include separate disposal site location map)

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5. Provide copy of grain size analysis. If grain size is compatible for beach nourishment purposes, the Department recommends that the dredged material be used as beach nourishment for public beaches. **Note:** In the event beach nourishment is proposed for private property, pursuant to 310 CMR 9.40(4)(a)1, public access easements below the existing high water mark shall be secured by applicant and submitted to the Department.



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## H. Municipal Planning Board Notification

**Notice to Applicant:**

Section H should be completed and submitted along with the original application material.

MassDOT Highway Division

Name of Applicant

Dean Street

Project street address

Taunton River

Waterway

Taunton

City/Town

Description of use or change in use:

The project proposes the reconstruction of Dean Street (US Route 44) in the City of Taunton, MA. The project generally proposes to widen Route 44 and provide pedestrian and bicycle accommodations. The proposed improvements will require the placement of structures and fill within the Taunton River.

**To be completed by municipal clerk or appropriate municipal official:**

"I hereby certify that the project described above and more fully detailed in the applicant's waterways license application and plans have been submitted by the applicant to the municipal planning board."

Anthony Abreau

Printed Name of Municipal Official

Date

12/7/21

Anthony Abreau

Signature of Municipal Official

Planning Board  
Chairman

Title

TAUNTON

City/Town

**Note:** Any comments, including but not limited to written comments, by the general public, applicant, municipality, and/or an interested party submitted after the close of the public comment period pertaining to this Application shall not be considered, and shall not constitute a basis for standing in any further appeal pursuant to 310 CMR 9.13(4) and/or 310 CMR 9.17.



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## G. Municipal Zoning Certificate

MassDOT Highway Division

Name of Applicant

Dean Street

Project street address

Taunton River

Waterway

Taunton

City/Town

Description of use or change in use:

The project proposes the reconstruction of Dean Street (Route 44) in the City of Taunton, MA. The project generally proposes to widen Route 44 and provide a four-lane cross section with pedestrian and bicycle accommodations. The proposed improvements will require the placement of structures and fill within the Taunton River.

### To be completed by municipal clerk or appropriate municipal official:

"I hereby certify that the project described above and more fully detailed in the applicant's waterways license application and plans is not in violation of local zoning ordinances and bylaws."

Kevin Scanlon  
 Printed Name of Municipal Official

12/6/21  
 Date

[Signature]  
 Signature of Municipal Official

Planning + Construction  
Director  
 Title

Taunton  
 City/Town



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## Appendix A: License Plan Checklist

### General View

- ☒ PE or RLS, as deemed appropriate by the Department, stamped and signed, in ink, each sheet within 8 1/2 inch by 11 inch border
- ☒ Format and dimensions conform to "Sample Plan" (attached)
- ☒ Minimum letter size is 1/8 of an inch if freehand lettering, 1/10 of an inch if letter guides are used
- ☒ Sheet number with total number in set on each sheet
- ☒ Title sheet contains the following in lower left: Plans accompanying Petition of [Applicant's name, structures and/or fill or change in use, waterway and municipality]
- ☒ North arrow
- ☒ Scale is suitable to clearly show proposed structures and enough of shoreline, existing structures and roadways to define its exact location
- ☒ Scale is stated & shown by graphic bar scale on each sheet
- ☒ Initial plans may be printed on bond; final plans due before License issuance must be on 3mil Mylar.

### Structures and Fill

- ☒ All Structures and Fill shown in full BLACK lines, clearly labeling which portions are existing, which are Proposed and indicating Existing Waterways Licenses
- ☒ *Cross Section Views* show MHW\* and MLW\* and structure finish elevations
- ☐ *Dredge or Fill*, actual cubic yardage must be stated and typical cross sections shown
- ☒ All Structures and Fill shown in full BLACK lines, clearly labeling which portions are existing, which are Proposed and indicating Existing Waterways Licenses
- ☒ *Cross Section Views* show MHW\* and MLW\* and structure finish elevations
- ☒ *Dredge or Fill*, actual cubic yardage must be stated and typical cross sections shown
- ☒ Actual dimensions of structures(s) and or fill and the distance which they extend beyond MHW\* or OHW\*
- ☐ Change in Use of any structures on site must be stated

\* See 310 CMR 9.02, Waterways Regulations definitions of High Water Mark, Historic High Water Mark, Historic Low Water Mark, and Low Water Mark. *Note:* DEP may, at its discretion, accept appropriately scaled preliminary plans in lieu of the plans described above. In general, DEP will accept preliminary plans only for non-water dependent projects and projects covered by MEPA to address site design components such as visual access, landscaping & site coverage. *Anyone wishing to submit preliminary plans must obtain prior approval of the DEP Waterways Program before*



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submitting them with their application.

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## Appendix A: License Plan Checklist (cont.)

### Boundaries

- ☒ Property lines, full black lines, \_\_\_\_\_, along with abutters' names and addresses
- ☒ Mean High Water (MHW)\* or Ordinary High Water (OHW)\*, full black line \_\_\_\_\_
- ☒ Mean Low Water (MLW)\*, black dotted line, (.....)
- ☐ Historic MHW\* or OHW\* (— — — — )
- ☐ Historic MLW\* (... ..)
- ☐ State Harbor Lines, black dot-dash line ( - . - . - . ) with indication of Chapter & Act establishing them (Ch. , Acts of )
- ☒ Reference datum is National Geodetic Vertical Datum (NGVD) or (NAVD).
- ☒ Floodplain Boundaries according to most recent FEMA maps
- ☒ Proposed & Existing Easements described in metes & bounds

### Water-Dependent Structures

- ☒ Distance from adjacent piers, ramps or floats (minimum distance of 25' from property line, where feasible)
- ☒ Distance from nearest opposite shoreline
- ☒ Distance from outside edge of any Navigable Channel
- ☒ Access stairs at MHW for lateral public passage, or 5 feet of clearance under structure at MHW.

### Non Water-Dependent Structures

- ☒ Depict extent of "Water-dependent Use Zone".

*See Waterways Regulations at 310 CMR 9.51-9.53 for additional standards for non water-dependent use projects.*

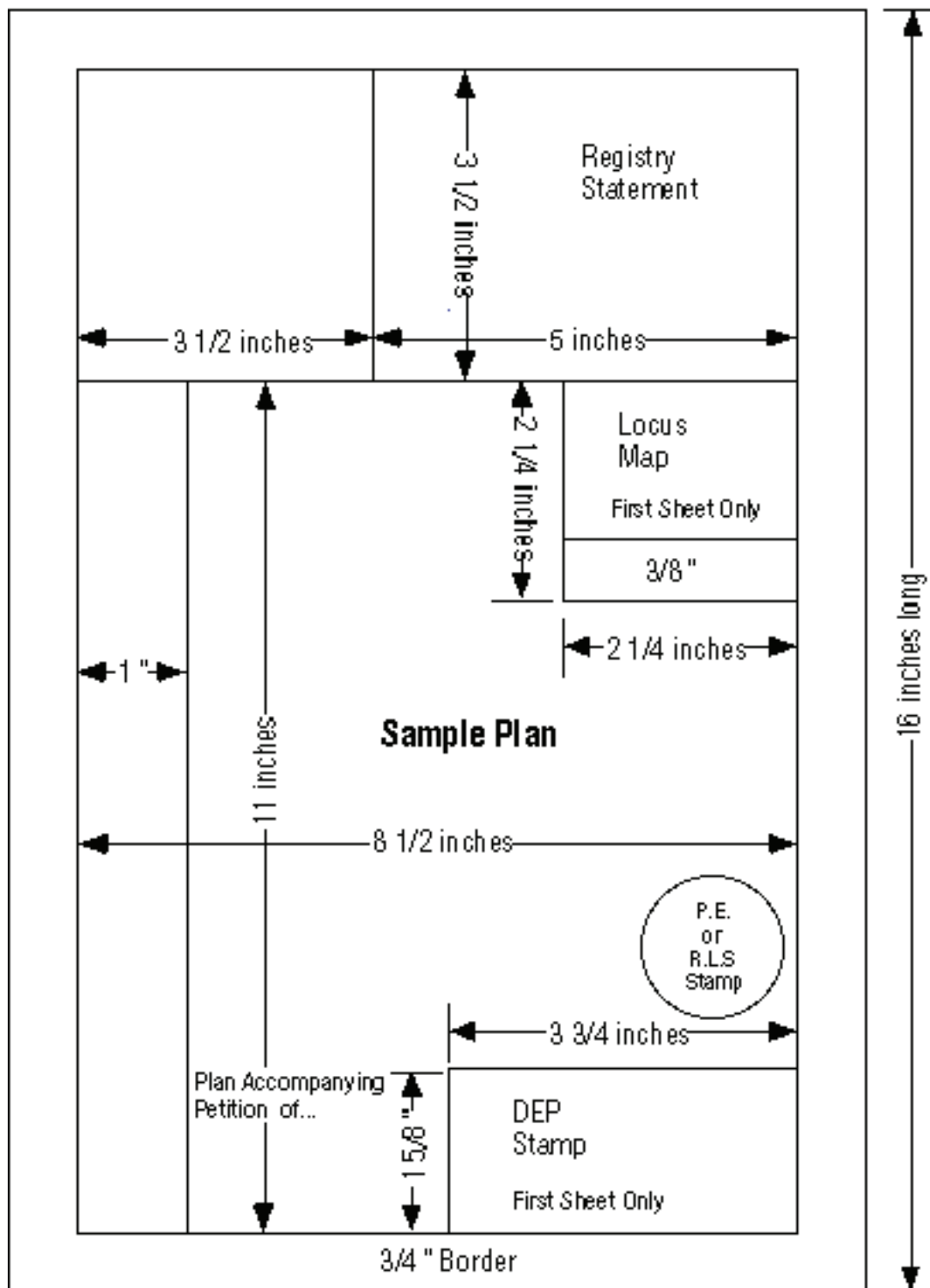
**Note:** Final Mylar project site plans will be required upon notice from the Department, prior to issuance of the Chapter 91 Waterways License.



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**Appendix A: License Plan Checklist Cont.**





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## Appendix B: Dredging Permit Plan Checklist

*For projects applying for dredging permits only, enclose drawings with the General Waterways Application that include the following information:*

### General View

- ☐ Submit one original of all drawings. Submit the fewest number of sheets necessary to adequately illustrate the project on 8-1/2 inch X 11 inch paper.
- ☐ A 1-inch margin should be left at the top edge of each drawing for purposes of reproduction and binding. A 1/2 inch margin is required in the three other edges.
- ☐ A complete title block on each drawing submitted should identify the project and contain: the name of the waterway; name of the applicant; number of the sheet and total number of sheets in the set; and the date the drawing was prepared.
- ☐ Use only dot shading, hatching, and dashed or dotted line to show or indicate particular features of the site on the drawings.
- ☐ If deemed appropriate by the Department, certification by the Registered Professional Engineer or Land Surveyor is included.

### Plan View

- ☐ North Arrow
- ☐ Locus Map
- ☐ Standard engineering scale.
- ☐ Distances from channel lines and structures if appropriate.
- ☐ Mean high water and mean low water shorelines (see definitions of "High Water Mark" and "Low Water Mark" at 310 CMR 9.02, C. 91 Regulations).
- ☐ Dimensions of area proposed to be dredged or excavated.
- ☐ Notation or indication of disposal site.
- ☐ Volume of proposed dredging or excavation.
- ☐ Ordinary high water, proposed drawdown level, and natural (historic) high water (for projects lowering waters of Great Ponds).

### Section Views

- ☐ Existing bottom and bank profiles.
- ☐ Vertical and/or horizontal scales.
- ☐ Proposed and existing depths relative to an indicated datum.



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- ☐ Elevation and details of control structure (for projects lowering waters of Great Ponds).

## Appendix C: Application Completeness Checklist

Please answer all questions in the General Waterways Application form. If a question does not apply to your project write "not applicable" (n/a) in that block. Please print or type all information provided on the form. Use black ink (blue ink or pencil are not easily reproducible, therefore, neither will be accepted). If additional space is needed, attach extra 8-1/2" x 11" sheets of paper.

- ☒ **Proper Public Purpose:** For nonwater-dependent projects, a statement must be included that explains how the project serves a proper public purpose that provides greater benefit than detriment to public rights in tidelands or great ponds and the manner in which the project meets the applicable standards. If the project is a nonwater-dependent project located in the coastal zone, the statement should explain how the project complies with the standard governing consistency of the policies of the Massachusetts Coastal Zone Management Program, according to 310 CMR 9.54. If the project is located in an area covered by a Municipal Harbor Plan, the statement should describe how the project conforms to any applicable provisions of such plan pursuant to 310 CMR 9.34(2).
- ☒ **Plans:** Prepared in accordance with the applicable instructions contained in Appendix A-B of this application. For initial filing, meet the requirements of 310 CMR 9.11(3)(b)(3).
- ☒ **Applicant Certification:** All applications must be signed by "the landowner if other than the applicant. In lieu of the landowner's signature, the applicant may provide other evidence of legal authority to submit an application for the project site." If the project is entirely on land owned by the Commonwealth (e.g. most areas below the current low water mark in tidelands and below the historic high water mark of Great Ponds), you may simply state this in lieu of the "landowner's signature".
- ☒ **Municipal Zoning Certification:** If required, applicants must submit a completed and signed Section E of this application by the municipal clerk or appropriate municipal official or, for the initial filing, an explanation of why the form is not included with the initial application. If the project is a public service project subject to zoning but will not require any municipal approvals, submit a certification to that effect pursuant to 310 CMR 9.34(1).
- ☒ **Municipal Planning Board Notification:** Applicants must submit a copy of this application to the municipal planning board for the municipality where the project is located. Submittal of the complete application to DEP must include Section H signed by the municipal clerk, or appropriate municipal official for the town where the work is to be performed, except in the case of a proposed bridge, dam, or similar structure across a river, cove, or inlet, in which case it must be certified by every municipality into which the tidewater of said river, cove, or inlet extends.
- ☒ **Final Order of Conditions:** A copy of one of the following three documents is required with the filing of a General Waterways Application: (1) the Final Order of Conditions (with accompanying plan) under the Wetlands Protection Act; (2) a final Determination of Applicability under that Act stating that an Order of Conditions is not required for the project; or (3) the Notice of Intent for the initial filing (if the project does not trigger review under MEPA).
- ☒ **Massachusetts Environmental Protection Act (MEPA):** MGL 30, subsections 61-61A and 301 CMR 11.00, submit as appropriate: a copy of the Environmental Notification Form (ENF) and a Certificate of the Secretary of Environmental Affairs thereon, or a copy of the final Environmental Impact Report (EIR) and Certificate of the Secretary stating that it adequately and properly complies with MEPA; and any subsequent Notice of Project change and any determination issued thereon in accordance with MEPA. For the initial filing, only a copy of the ENF and the Certificate of the Secretary thereon must be submitted.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Waterways Regulation Program  
**Chapter 91 Waterways License Application** - 310 CMR 9.00  
 Water-Dependent, Nonwater-Dependent, Amendment

X287737

Transmittal No.

**Note:** If the project is subject to MEPA, the Chapter 91 Public Notice must also be submitted to MEPA for publication in the "Environmental Monitor". MEPA filing deadlines are the 15<sup>th</sup> and 30<sup>th</sup> of each month.

## Appendix C: Application Completeness Checklist (cont.)

- ☐ **Water Quality Certificate:** if applicable, pursuant to 310 CMR 9.33, is included.
- ☐ **Other Approvals:** as applicable pursuant to 310 CMR 9.33 or, for the initial filing, a list of such approvals which must be obtained.

### Projects involving dredging:

- ☐ The term "dredging" means the removal of materials including, but not limited to, rocks, bottom sediments, debris, sand, refuse, plant or animal matter, in any excavating, clearing, deepening, widening or lengthening, either permanently or temporarily, of any flowed tidelands, rivers, streams, ponds or other waters of the Commonwealth. Dredging includes improvement dredging, maintenance dredging, excavating and backfilling or other dredging and subsequent refilling. Included is a completed and signed copy of Part F of the application.

### Filing your Completed General Waterways Application:

- ☐ **For all Water-Dependent applications** – submit a completed General Waterways Application and all required documentation with a *photocopy* of both payment check and DEP's *Transmittal Form for Permit Application & Payment* to the appropriate DEP Boston or regional office (please refer to Pg. 10 of the "Instructions" for the addresses of DEP Regional Offices).
- ☒ **For all Non Water-Dependent applications** – submit a completed General Waterways Application and all required documentation with a *photocopy* of both payment check and DEP's *Transmittal Form for Permit Application & Payment* to DEP's Boston office.

Department of Environmental Protection  
 Waterways Regulation Program  
 One Winter Street  
 Boston, MA 02108

- ☐ **Application Fee Payment for ALL Waterways Applications:** Send the appropriate Application fee\* (please refer to Page 1 of the "Application"), in the form of a check or money order, along with DEP's *Transmittal Form for Permit Application & Payment*:

Department of Environmental Protection  
 P.O. Box 4062  
 Boston, MA 02211

\* Under extreme circumstances, DEP grants extended time periods for payment of license and permit application fees. If you qualify, check the box entitled "Hardship Request" on the *Transmittal Form for Permit Application & Payment*. See 310 CMR 4.04(3)(c) to identify procedures for making a hardship request. Send hardship request and supporting documentation to the above address.

**NOTE:** You may be subject to a **double application fee** if your application for Chapter 91 authorization results from an enforcement action by the Department or another agency of the Commonwealth or its subdivisions, or if your application seeks authorization for an existing unauthorized structure or use.



**Reconstruction of Route 44 (Dean Street)**

Chapter 91 Waterways License Application

Taunton, MA

**Project Narrative**



**Reconstruction of Route 44 (Dean Street)  
Taunton, Massachusetts  
MassDOT Project File No. 606024 – MassDEP Transmittal X287737**

**Project Narrative**

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**Basic License Requirements Summary Table**



**Reconstruction of Route 44 (Dean Street)**

Chapter 91 Waterways License Application

Taunton, MA

**1.0 Introduction**

The Massachusetts Department of Transportation – Highway Division (MassDOT) proposes the reconstruction of Dean Street (Route 44) in the City of Taunton. The project limits begin east of Arlington Street and extend to a point west of the Route 44 / Route 104 intersection for a length of 0.71 miles (3,724 feet). The project also extends onto Longmeadow Road for 0.09 miles (464 feet) and Hon. Gordon M. Owen Riverway for 0.1 miles (566 feet). The project has a total length of 0.9 miles (4,754 feet).

The project generally proposes to widen Route 44 and provide a four-lane cross section throughout the Route 44 corridor to improve traffic flow, intersection operations, safety, and pedestrian and bicycle access. A new sidewalk will be constructed along the westbound side of Route 44. Bicycle lanes and pavement markings will be installed on the eastbound and westbound sides of Route 44. The geometry of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection will be realigned to provide improved signage and traffic signals, reduce driver confusion, improve traffic operations, and improve safety for pedestrians and bicyclists. Due to the necessity of proposed structures and limited fill within the Taunton River, this project will require a Ch. 91 Waterways License with the Massachusetts Department of Environmental Protection (MassDEP). Other anticipated permits and reviews for this project include an Environmental Notification Form (ENF) under the Massachusetts Environmental Policy Act Office (MEPA), a Section 404 Programmatic General Permit and Pre-Construction Notification for the United States Army Corps of Engineers (USACE), and a Stormwater General Permit for the National Pollution Discharge Elimination System (NPDES).

**2.0 Existing Conditions**

Within the project limits, Route 44 generally runs in an east-west alignment and is classified as an Urban Principal Arterial under the jurisdiction of MassDOT. Route 44 serves as a major connection between downtown Taunton to the west and Route 24 to the east. Route 44 is generally 28-feet wide and provides one (1) 12-foot-wide travel lane with a 2-foot-wide shoulder in each direction. Directional flow along much of the roadway is separated by a double-yellow line. Within the vicinity of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection, directional flow is separated by a raised concrete median. Route 44 has a posted speed limit of 40 miles per hour (MPH) in both directions within the project limits and is regulated by MassDOT. A sidewalk is provided along the northerly side of Route 44 throughout the project limits and along the southerly side of the roadway at its intersection with Cape Road (Route 44). Pedestrian accommodations throughout the project limits are inconsistent, in poor condition due to cracking, heaving, and utility obstructions, and do not meet current Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) standards. No bicycle accommodations are provided within the project limits.

There is an existing retaining wall that runs adjacent to the north bank of the Taunton River beginning approximately 350 feet west of the Dean Street / Cape Road intersection. The wall extends approximately 325 feet west, terminating at a point across from the driveway at 140 Dean Street. There are large boulders at the base of the existing retaining wall and some vegetation has established within the riprap fill area and between cracks in the wall.

The existing retaining wall is coincident with the southern location line of the Route 44 State Highway Layout (SHLO). The SHLO location plans from 1932 show the limits of the SHLO within the Taunton River but depict a natural bank rather than the existing retaining wall. Despite extensive research, the



**Reconstruction of Route 44 (Dean Street)**

Chapter 91 Waterways License Application

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construction date of the existing retaining wall and associated fill is unknown. Review of the *Massachusetts Chapter 91 Mapping Project Final Report*, June 9, 2006 prepared by BSC Group for the Executive Office of Environmental Affairs and Massachusetts Office of Coastal Zone Management indicates that there is evidence of filling in the form of roadway and railroad construction but no reliable historical plans for the inland and upper reaches of the Taunton River were recovered.

**2.1 Ownership**

Within the project limits, Route 44 is under the jurisdiction of MassDOT. Longmeadow Road and Hon. Gordon M. Owen Riverway are under the jurisdiction of the City of Taunton. MassDOT will be responsible for the maintenance of the proposed improvements along Route 44, including the proposed structures, specifically the retaining walls, within the Taunton River.

**2.2 Land Use**

Land uses within and adjacent to the project limits include residential, office, restaurant, and retail. The area west of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection consists primarily of residential and smaller commercial developments. The area east of the intersection is dominated by several larger commercial developments. Route 44 serves as a major connection between downtown Taunton to the west and these large, auto oriented commercial developments and Route 24 to the east.

**2.3 Taunton River**

The Taunton River is a tidal waterway up to the South Street East Bridge in Taunton, approximately 2.5 miles southeast of the project limits. Within the vicinity of the project the Taunton River has an average width of approximately 110 feet, a depth of approximately 11 feet, and generally flows southwest, eventually discharging into Mount Hope Bay. The banks of the Taunton River are primarily vegetated with red maple (*Acer rubrum*), white pine (*Pinus strobus*), Japanese knotweed (*Polygonum cuspidatum*), silky dogwood (*Cornus amomum*), multiflora rose (*rosa multiflora*), Oriental bittersweet (*Celastrus orbiculatus*), and goldenrod (*Solidago spp.*).

There are several man-made structures within and adjacent to the project limits including the Massachusetts Bay Transit Authority (MBTA) bridge over the Taunton River located west of the project limits on Route 44, the John Joseph Donahue Memorial Bridge which conveys Hon. Gordon M. Owen Riverway over the Taunton River, the existing Route 44 retaining walls (described in **Section 2.0**, above), and the abandoned Harris Street Bridge located near the eastern project limit.

On March 30, 2009, 40 miles of the Taunton River, from its headwaters at the confluence of the Town and Matfield Rivers to its confluence with the Quequechan River, were designated as Wild and Scenic. The managing agency for this reach of the Taunton River is the National Park Service (NPS) Northeast Regional Office. The NPS, in conjunction with the Taunton Wild and Scenic River Stewardship Council, work to promote public access and improve water quality and environmental conditions within the river.



**Reconstruction of Route 44 (Dean Street)**

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**3.0 Proposed Conditions**

The purpose of this project is to improve the connection between downtown Taunton and Route 24, provide public transit accommodations, enhance safety conditions, provide pedestrian and bicycle amenities, meet current ADA / AAB standards, and improve overall vehicular traffic and intersection operations.

The primary improvements proposed by this project include:

Dean Street (Route 44) Corridor

- Slightly widen and reconstruct Route 44 to provide a two-lane roadway with 12-foot vehicle lanes and 8-foot buffered bicycle lanes between the MBTA Railroad crossing and a point approximately 850 feet west of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection
- Slightly widen and reconstruct Route 44 to provide a 22-foot-wide travel lane with transition arrows and a 5-foot bicycle lane, for approximately 500-feet, to merge into a single 12-foot vehicle travel lane heading westbound. This transition occurs approximately 250 feet west of the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection.
- Slightly widen and reconstruct Route 44 to provide two 11-foot-wide travel lanes with a 5-foot bicycle lane, for approximately 300-feet, to diverge from a single 12-foot vehicle travel lane heading eastbound. This transition occurs approximately 850 feet west of the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection.
- Slightly widen and reconstruct Route 44 to provide a four-lane roadway with 11-foot vehicle lanes and 5-foot bicycle lanes between the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway and Dean Street (US Route 44) / Cape Road (US Route 44) / Dean Street (Route 104) intersections.
- Roadway reconstruction will consist of a combination of full-depth hot-mix roadway construction, pavement micromilling and hot-mix asphalt overlay depending on degree of disrepair and roadway widening. The full-depth reconstruction will address the sub-surface damage due to erosion.
- Roadway reconstruction for pavement design, horizontal and vertical curvature are factored for the design speed of 40 mph for US Route 44 within the Project limits.
- Relocation, rehabilitation, or abandonment of existing roadway utilities as needed to match new roadway cross-slope and edge of roadway.
- Construct / reconstruct a 6-foot hot-mix asphalt sidewalk with 6-inch vertical granite curbing along the northerly side of Route 44 for the limits of the Project. Existing vertical granite curbing will be removed and reset whenever possible.
- Construct / reconstruct a 5.5-foot hot-mix asphalt sidewalk with 6-inch vertical granite curbing along both sides of Longmeadow Road and Hon. Gordon M. Owen Riverway within the Project limits.



**Reconstruction of Route 44 (Dean Street)**

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- Construct a bus pull out and shelter on the eastbound side of Route 44 east of the intersection.
- Construct a bus shelter on the westbound side of Route 44 east of the intersection.
- Construct ADA/AAB-compliant ramps at all pedestrian access ramps within the Project limits.
- Reconstruct affected private driveways and side street approaches with full-depth hot-mix asphalt to match reconstructed curb line and roadway cross-slope.
- Construct retaining walls along the westerly side of Longmeadow Road as well as the northerly and southerly sides of Route 44 as needed for private property and adjacent wetlands to reinforce the roadway. Steel guardrails will be installed along the southerly side of Route 44 behind the proposed and existing sidewalk as needed.
- Install MUTCD-compliant regulatory and warning signage.
- Retime traffic signal phases and provide pedestrian signal improvements at the Dean Street (US Route 44) / Cape Road (US Route 44) / Dean Street (Route 104) intersection; and
- Proposed tree protection, replacement of loam and seed affected by construction easements, and runoff protection will be provided throughout the Project to limit construction impacts.
- Construct a wetland replication area west of the Route 44 / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection. The wetland replication area will be constructed south of Route 44, adjacent to the existing wetland and will be planted with native species including Common Winterberry (*Ilex verticillate*), Swamp White Oak (*Quercus bicolor*), and Highbush Blueberry (*Vaccinium corybosum*).
- Construct compensatory flood storage area, including excavation and grading, adjacent to the western project limits. Compensatory flood storage area will be planted with live stakes and seeded to ensure appropriate stabilization.

Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway

- Widen Dean Street (US Route 44) to provide an 11-foot exclusive left-turn lane, a through lane, a shared through/right-turn lane, and a 5-foot bicycle lane in each direction. A channelized right-turn movement will be provided on the eastbound approach, which will be signalized.
- Reconstruct the Hon. Gordon M. Owen Riverway northbound approach to provide an exclusive left-turn lane, a through lane, a 5-foot bicycle lane, and a channelized right-turn lane, which will be signalized.
- Reconstruct the Longmeadow Road southbound approach to provide an exclusive left-turn lane, a shared through/right-turn lane and a 5-foot bicycle lane.
- Replace existing traffic signal equipment, signal posts, mast arms, emergency vehicle preemption, with a fully actuated traffic signal including the channelized right-turn lanes which are MUTCD- and ADA-compliant.
- Removal of existing traffic signals and reconstruct raised medians along Route 44.



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- Implement leading protected-permitted left-turn phases on all approaches to formalize current side street turning movements and improve safety. Provide a protected overlap phase for the northbound channelized right-turn lane.
- Modify the vehicle and pedestrian clearance intervals to meet MUTCD guidelines.
- Install vehicle and bicycle video detection cameras at all approaches including advanced detection zones along US Route 44 eastbound and westbound.
- Install painted green bicycle boxes and transition areas to provide cyclists a safe place to execute left-turn movements at the signalized intersection.
- Install thermo-plastic pavement markings imbedded into the surface course for lane striping and MUTCD-compliant designation arrows in advance of and at the intersection approaches.
- Install MUTCD-compliant regulatory and warning signage; and
- Install new crosswalks with ADA-compliant curb ramps with tactile warning devices and MUTCD-compliant striping and signage at all crosswalks.

Dean Street (US Route 44) / Dean Street (Route 104) / Cape Highway (US Route 44)

- Modify traffic signal phase timings as well as vehicle and pedestrian clearance intervals to meet MUTCD guidelines.
- Install vehicle detection loops in the roadway with new service connections into existing pull boxes along US Route 44 eastbound.

Retaining Wall Construction

The project proposes to construct a new, soldier pile retaining wall with precast form liner finish on the lagging that will begin at a point approximately 1000 feet east of the Dean Street (US Route 44) / Longmeadow Road / Hon. Gordon M. Owen Riverway intersection and be constructed to an elevation of 11 to 12 feet. The wall will extend approximately 1000 feet east, terminating at the abandoned Harris Street Bridge. The proposed retaining wall is necessary to accommodate the widening that will result from the proposed roadway improvements and construction of pedestrian and bicycle accommodations. The soils below the existing roadway primarily consists of clay and fine sands. These conditions are resulting in the existing roadway and retaining wall sinking or slumping towards the Taunton River. This settling has caused pavement cracking and deterioration resulting in poor travel conditions and a need for increased maintenance. This proposed retaining wall will not only accommodate the proposed roadway improvements but also resolve these structural issues. The proposed retaining wall will be a soldier pile and lagging wall supported on H-piles and will feature tiebacks anchored into bedrock to provide lateral support. Temporary dewatering will be necessary to facilitate the construction of the proposed retaining walls, specifically in areas where the proposed wall intersects the existing granite block masonry wall. The intent is to leave as much of the existing wall in place to minimize impacts within and adjacent to the Taunton River. The limits of both the proposed retaining wall and dewatering are shown on the attached license plans.



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**4.0 Waterways Impacts & Mitigation**

The construction of the proposed retaining wall will result in 1,348 square feet of fill within the Taunton River. Additionally, the temporary dewatering necessary to construct the retaining walls will occupy approximately 1,941 square feet within the Taunton River. The temporary water controls will consist of sheet piles and will remain in place only as long as necessary to construct the proposed retaining wall. It is not anticipated that the construction of the proposed retaining wall will have a detrimental impact on public access to or navigation within the Taunton River. No dredging is proposed within the Taunton River.

**5.0 Jurisdiction**

The portions of the work proposed as part of this project are located within the Taunton River, a navigable waterway, and as such are subject to the jurisdiction of M.G.L. Chapter 91 and the Waterways Regulations (310 CRM 9.00).

**6.0 Basic License Requirements**

In accordance with the requirements of 310 CMR 9.31(1-2), the project complies with the basic requirements for license issuance. Table 1, included on the following page, provides a summary of and demonstrates the projects compliance with these requirements.

**7.0 Summary**

The proposed reconstruction of Route 44 in the City of Taunton will require the placement of fill and structures within the Taunton River, a tidal, navigable waterway. The project has been designed to minimize work within the Taunton River to the extent practicable and feasible and will not impede public access to or navigation within the Taunton River. The project will comply with all of the basic requirements for license issuance including compliance with all applicable environmental programs of the Commonwealth. The proposed project and associated improvements will provide a greater benefit than detriment to the public and therefore are presumed to qualify for licensure under M.G.L. Chapter 91 and the Massachusetts Waterways Regulations (310 CMR 9.00).



9.31: Summary of License and Permit Requirements		Demonstration of Project Compliance
<b>9.31 (1) Basic Requirements: No license or permit shall be issued by the Department for any project subject to 310 CMR 9.03 through 9.05 and 9.09 unless said project:</b>		See Below.
<b>(a) includes only fill and structures for uses that have been categorically determined to be eligible for license, according to the provisions of 310 CMR 9.32;</b>		The project does not propose to construct any fill or structures that the Department has determined categorically do not meet the statutory tests for approval under M.G.L. c. 91 or are otherwise not in keeping with the purposes of 310 CMR 9.00. In accordance with 310 CMR 9.32 (2)(c) the project proposes structures and fill related to the improvement of an existing public roadway including improvements to the existing substandard Route 44 – Longmeadow Road – Hon. Gordon M. Owen Riverway intersection. As described in the project narrative the intersection currently experiences operational and safety deficiencies. All reasonable measures have been taken to avoid, minimize, and mitigate encroachments into the Taunton River; therefore, the project is eligible for license according to the provisions of 310 CMR 9.32.
<b>(b) Complies with applicable environmental regulatory programs of the Commonwealth According to the provisions of 310 CMR 9.33;</b>		See Below.
<b>310 CMR 9.33 (1) All projects must comply with applicable environmental regulatory programs of the Commonwealth including but not limited to:</b>	<b>(a) Massachusetts Environmental Policy Act, M.G.L. c. 30, §§61 through 62H and 310 CMR 11.00: MEPA Regulations.</b>	An Environmental Notification Form for the project was submitted to the MEPA Office November 15, 2021 and the Secretary of Energy Environmental Affairs issued the Certificate (EEA#16483) on December 22, 2021. The Secretary determined that the project, as currently designed, does not require an Environmental Impact Report. A copy of the Certificate has been included with this application as Attachment G.
	<b>(b) Wetlands Protection Act, M.G.L. c. 131 § 105 and c. 131, § 40, and 310 CMR 10.00 Wetlands Protection.</b>	The applicant filed a Notice of Intent for the proposed exploratory borings within the Taunton River in May 2021 and an Order of Conditions was issued in July 2021. The applicant filed a Notice of Intent for the proposed alteration of jurisdictional wetland resource areas associated with the reconstruction of Route 44 on May 27, 2022. A copy of this Notice of Intent has been included with this application. A copy of the Order of Conditions will be forwarded upon receipt.
	<b>(c) Wetlands Restriction Acts, M.G.L. c. 130, § 105 and c. 131, § 40A, and 310 CMR 12.00: Adopting Coastal Wetland Orders and 310 CMR 13.00: Adopting Inland Wetlands Orders. All projects shall comply with wetland restriction orders recorded pursuant to these statutes.</b>	Property and deed research conducted by the applicant indicates that there are no recorded wetland restriction orders within the project limits and as such 310 CMR 9.33 (1)(c) is not applicable.
	<b>(d) Areas of Critical Environmental Concern, M.G.L. c. 21A, §2(7) AND St. 1974, c. 806, §40(E), and 301 CMR 12.00: Areas of Critical Environmental Concern.</b>	The project is not located within an Area of Critical Concern and therefore 310 CMR 9.33 (1)(d) is not applicable. There are three (3) Areas of Critical Environmental Concern located approximately 2 – 2.5 miles north and west of the project limits on Route 44 including the Three Mile River Watershed, Canoe River Aquifer, and Hockomock Swamp. The project will not result in any work within or impacts to these areas.
	<b>(e) Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26 through 53, and 314 CMR 3.00: Surface Water Discharge Permit Program, 314 CMR 5.00: Ground Water Discharge Permit Program, 314 CMR 7.00: Sewer System Extension and Connection Permit Program, 314 CMR 9.00: 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the United States Within the Commonwealth, and 310 CMR 15.00: The State Environmental Code, Title 5: Standard Requirements for the Siting, Construction, Inspection, Upgrade and Expansion of On-site Sewage Treatment and Disposal Systems and for the Transport and Disposal of Septage.</b>	The project will comply with the Massachusetts Clean Waters Act. The project does not include any surface or groundwater discharge or the connection or extension of a sewer system and therefore 314 CMR 3.00, 5.00, and 7.00 are not applicable. The project will result in less than 5,000 square feet of alteration to areas subject to jurisdiction under the Wetlands Protection Act, is not located within an Outstanding Resource Water, and will not result in greater than 100 cubic yards of dredging and therefore the Order of Conditions will serve as the Water Quality Certification for the project. The project does not include siting, construction, inspection, upgrade, or expansion of on-site sewage treatment or disposal and, therefore, 310 CMR 15.00 is not applicable.



	<b>(f) Ocean Sanctuaries Act, M.G.L. c. 132A, §§ 13 through 16 and 18, and 302 CMR 5.00: Ocean Sanctuaries. No license or permit shall be issued for any structure or fill that is expressly prohibited in M.G.L. c. 132A, §§ 1 through 16.</b>	The project is not located within an Ocean Sanctuary and therefore 310 CMR 9.33(1)(f) is not applicable.
	<b>(g) Marine Fisheries Laws, M.G.L. c. 130, and 322 CMR 1.00: Enforcement of Rules and Regulations.</b>	The project does not propose any work within or impacts to Marine Fisheries and therefore 310 CMR 9.33(1)(g) is not applicable.
	<b>(h) Scenic Rivers Act, M.G.L. c. 21, § 17B, and 302 CMR 3.00: Scenic and Recreational Rivers Orders.</b>	The Taunton River was designated as a Wild and Scenic River on March 30, 2009. The managing agency for this reach of the Taunton River is the National Park Service (NPS), Northeast Regional Office. MassDOT has coordinated with the NPS and the proposed work within the Taunton River received a Section 4(f) de minimis impact determination on February 24, 2022.
	<b>(i) Massachusetts Historical Commission Act, M.G.L. c. 9, §§ 26 through 27C, as amended by St. 1982, c. 152 and St. 1988, c. 254, and 950 CMR 71.00: Protection of Properties Included in the State Register of Historic Places. For projects for which a Project Notification Form must be submitted pursuant to 950 CMR 71.07: Review of Projects the applicant shall file said form with the Massachusetts Historical Commission.</b>	The State Historic Preservation Officer (SHPO) issued concurrence with MassDOT Cultural Resources Unit's (CRU) finding of No Adverse Effect under Section 106 of the National Historic Preservation Act of 1966 on June 6, 2021. The project will not result in the demolition or disturbance of any historic buildings or other cultural / archaeological resources.
<b>(c) conforms to applicable provisions of a municipal harbor plan, if any, and local zoning law, according to the provisions of 310 CMR 9.34;</b>		The project is not located within an area subject to a municipal harbor plan
<b>(d) complies with the applicable standards governing the preservation of water-related public rights, according to the provisions of 310 CMR 9.35;</b>		The project will not interfere with the public's right to navigation, free passage over or through water, access to common landings, fishing and fowling, or on-foot passage within flowed tidelands and complies with the applicable standards of 310 CMR 9.35. The project will result in a minor encroachment into the Taunton River along the northern bank west of the Route 44 – Long Meadow Road – Honorable Gordon M. Owen Riverway Intersection. During construction a portion of the Taunton River may be occupied by a barge / floating work platform and dewatering measures, however, an open channel will be maintained for navigation throughout the duration of construction.
<b>(e) complies with the applicable standards governing the preservation of water-dependent uses, according to the provisions of 310 CMR 9.36;</b>		There are no other existing water-dependent uses within or adjacent to the project limits that will be negatively impacted by the project. The project will not result in any detriment to the availability or suitability of existing tidelands for future water-dependent uses in accordance with the provisions of 310 CMR 9.36.
<b>(f) complies with the applicable standards governing engineering and construction of structures, according to the provisions of 310 CMR 9.37;</b>		The project complies with the standards governing engineering and construction of structures according to the provisions of 310 CMR 9.37. The infrastructure proposed as part of this project, including all roadways and walls, have been designed and reviewed by a team of civil, structural, and geotechnical engineers.
<b>(g) complies with the applicable standards governing the use and design of boating facilities for recreation or commercial vessels, according to the provisions of 310 CMR 9.38 and 9.39;</b>		The project does not include any commercial or recreation boating facilities and therefore 9.31(1)(g) is not applicable.
<b>(h) complies with the standards governing dredging and disposal of dredge materials, according to the provisions of 310 CMR 9.40; and</b>		The project does not include any dredging or disposal of dredge material and therefore 9.31(1)(h) is not applicable.
<b>(i) does not deny access to its services and facilities to any person in a discriminatory manner, as determined in accordance with the constitution of the Commonwealth of Massachusetts, of the United States of America, or with any statute, regulation, or executive order governing the prevention of discrimination.</b>		The project consists of the reconstruction of a public roadway and includes safety and accessibility improvements for pedestrians and bicyclists. The project also includes improvements to public transit accommodations and the construction or reconstruction of ADA / AAB compliant wheelchair ramps and pedestrian crossings. The project will not deny access to its services or facilities to any person in a discriminatory manner.
<b>9.31 (2) No license or permit shall be issued by the Department for any project on tidelands or Great Ponds, except for water-dependent use projects located entirely on private tidelands, unless said project serves a proper public purpose which provides greater benefit than detriment to the rights of the public in said lands. In applying 310 CMR 9.31(2), the department shall act in accordance with the following provisions.</b>		The project has a proper public of providing improvements in functionality, operations, safety, and accessibility for vehicular traffic, public transit, pedestrians, and bicyclists along project roadways. Please see below for a summary of the project's compliance with the necessary provisions.
<b>(a) Water-dependent Use Projects – The Department shall presume 310 CMR 9.31 (2) is met if the project is a water-dependent use project.</b>		The project is not a water-dependent use project and therefore 9.31(2)(a) is not applicable.



<i>(b) Nonwater-dependent Use projects – The Department shall presume 310 CMR 9.31(2) is met if the project is a non-water dependent use project which:</i>		See below.
	<b>1. complies with the standards for conserving and utilizing the capacity of the project site to accommodate water-dependent use, according to the applicable provisions of 310 CMR 9.53;</b>	The project consists entirely of infrastructure facilities and therefore 9.31(2)(b)1 is not applicable, please refer 9.31(2)(b)3.
	<b>2. if located in the coastal zone, complies with the standard governing the consistency with the policies of the Massachusetts Coastal Zone Management Program, according to 310 CMR 9.54; and</b>	The project is not located within the coastal zone and, as such, 9.31(2)(b)2 is not applicable.
	<b>3. if consisting entirely of infrastructure facilities, to which 310 CMR 9.31(2)(b)1 does not apply, complies with the special mitigation and public access standards governing such facilities, according to 310 CMR 9.55</b>	The project complies with the standards of 310 CMR 9.55 and will not result in any detriment to the water-related interests of the public within the project limit. The project will preserve existing areas of protected open space along the Taunton River and improve public access through the construction of pedestrian and bicycle accommodations along Route 44.