

## COMMONWEALTH OF MASSACHUSETTS




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**CONTRACT DOCUMENTS  
AND SPECIAL PROVISIONS**

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PROPOSAL NO.	609054-125644
P.V. =	\$5,455,000.00
PLANS	YES

FOR

**Federal Aid Project No. STP/CMQ/TAP-0033(037)X  
Reconstruction of Foster Street**

**in the Town of**

**LITTLETON**

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

This Proposal to be opened and read:

**TUESDAY, MAY 7, 2024 at 2:00 P.M.**

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DOCUMENT 00010

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DOCUMENT 00104

**NOTICE TO CONTRACTORS**

Electronic proposals for the following project will be received through the internet using Bid Express until the date and time stated below and will be posted on [www.bidx.com](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.

**TUESDAY, MAY 7, 2024 at 2:00 P.M. \*\***

**LITTLETON**

**Federal Aid Project No. STP/CMQ/TAP-0033(037)X  
Reconstruction of Foster Street**

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

PROJECT VALUE = \$5,455,000.00

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 WORCESTER.

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 \$637.50 per ton, Portland cement \$425.53 per ton, diesel fuel \$3.155 per gallon, and gasoline \$2.695 per gallon, and Steel Base Price Index 436.7. MassDOT posts the **Price Adjustments** on their Highway Division's website at <https://www.mass.gov/massdot-contract-price-adjustments>

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

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

Prospective bidders and interested parties can access this information and more via the internet at [WWW.COMMBUYS.COM](http://WWW.COMMBUYS.COM).

BY: Monica G. Tibbits-Nutt, Secretary and CEO, MassDOT  
Jonathan L. Gulliver, Administrator, MassDOT Highway Division  
SATURDAY, MARCH 30, 2024

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## DOCUMENT 00210

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

July 1, 1981, updated October 2016

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

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

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

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

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

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

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

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to:

- (1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and
- (2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

- (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, § 39O: 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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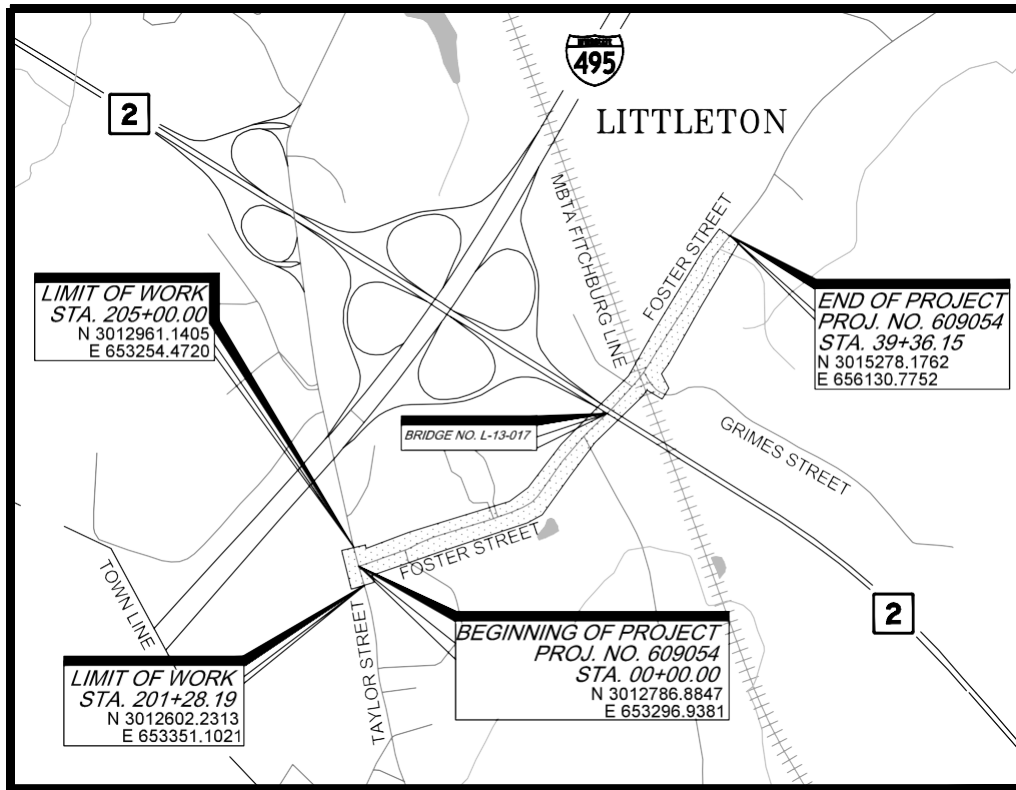
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DOCUMENT 00331

**LOCUS MAP**

**LITTLETON**

**Federal Aid Project No. STP/CMQ/TAP-0033(037)X  
Reconstruction of Foster Street**



**LENGTH OF PROJECT = 3936.15 FEET = 0.745 MILES  
(FOSTER 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=
<b>(use back for additional comments)</b>							<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/Date

Contractor 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): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





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
<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 1.5=
<b>5. Field Supervision/ Superintendent</b>								x 1=
<b>6. Contract Compliance</b>								x 1=
<b>7. Equipment</b>								x 0.5=
<b>8. Payment of Accounts</b>								x 0.5=
<b>(use back for additional comments)</b>								<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: \_\_\_\_\_

\_\_\_\_\_



DOCUMENT 00710

**GENERAL CONTRACT PROVISIONS**

Revised: 02/14/24

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2024, 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 00713

**Subsection 701**

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

(March 31, 2022)

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

Replace this Subsection with the following:

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

**DESCRIPTION**

**701.20: General**

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

**MATERIALS**

**701.30: General**

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

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

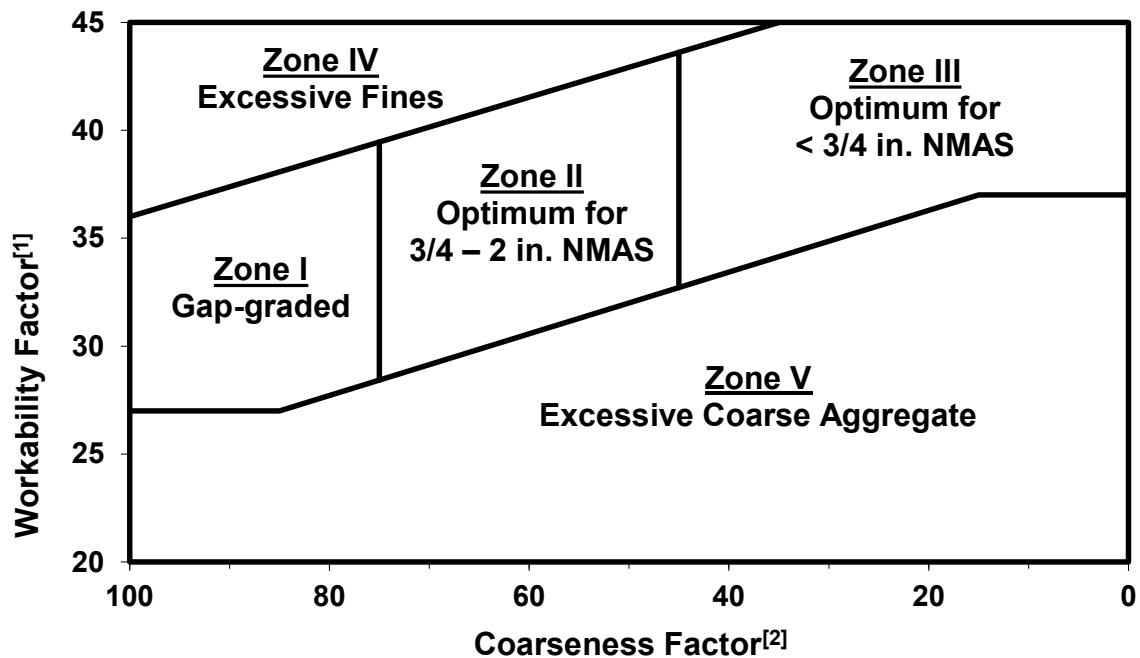
**2. Shilstone Workability-Coarseness Chart.**

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	≤ 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***

<b>Type</b>	<b>Description</b>
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***

<b>Type</b>	<b>Description</b>
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*

<b>Operation</b>	<b>Foreman</b>	<b>Activity</b>
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**

<b>Operation</b>	<b>Operators<sup>[1]</sup></b>	<b>Activity</b>
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)**

<b>Operation</b>	<b>Operators<sup>[1]</sup></b>	<b>Activity</b>
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 ( $^{\circ}$ 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 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
	A Foreman shall be present throughout the entire duration of the construction operation with at least one of the following personnel certifications. <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 00719

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

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

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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.

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

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

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

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

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

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

## 2. DBE PARTICIPATION

### a. Goal

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

Design-Bid-Build Projects: DBE Participation Goal \_ \_ %

*(One half of this goal shall be met in the form of Subcontractor construction activity)*

Design-Build Projects: DBE Design Participation Goal \_\_\_ % and DBE Construction Participation Goal %

*(One half of the Construction Goal shall be met in the form of Subcontractor construction activity)*

### b. Bidders List

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

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

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

### **3. CONTRACTOR ASSURANCES**

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

### **4. REQUIRED SUBCONTRACT PROVISIONS**

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

### **5. ELIGIBILITY OF DBES**

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

#### **a. Massachusetts DBE Directory**

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

Contractors are encouraged to make use of the DBE Directory maintained by SDO on the Internet.

This listing is updated daily and may be accessed at the SDO's website at:

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

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

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

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

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

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

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

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

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

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

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

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

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

- (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.



- (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/the two bidders with the lowest price per quality score point, 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/the two bidders with the lowest price per quality score point, shall each submit, with their Schedules of Participation, fully completed, signed Letters of Intent (Document B00854) from each of the DBEs listed on the Schedule. The Letters of Intent shall be in the form attached and shall identify specifically the contract activity the DBE proposes to perform, expressed as contract item number, if applicable, description of the activity, NAICS code, quantity, unit price and total price. In the event of discrepancy between the Schedule and the Letter of Intent, the Letter of Intent shall govern.
- d. Evidence of good faith efforts will be evaluated by MassDOT in the selection of the lowest responsible bidder.

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

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

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

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

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

## 8. COMPLIANCE

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

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

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

**n. Prompt Payment.**

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

**9. SANCTIONS**

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

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

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

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



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

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

## 11. LIST OF ADDITIONAL DOCUMENTS.

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

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

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

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

**ATTACHMENTS**

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

**I. GENERAL**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### 6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### 10. Assurances Required:

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

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

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

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

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

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

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

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

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

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

### III. NONSEGREGATED FACILITIES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## 2. Withholding (29 CFR 5.5)

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

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

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

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

### 3. Records and certified payrolls (29 CFR 5.5)

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

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

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

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

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

### 3. Withholding for unpaid wages and liquidated damages

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

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

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

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

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

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

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

### VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

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

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

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

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

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

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

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

## VII. SAFETY: ACCIDENT PREVENTION

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

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

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

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

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

## VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

### 1. Instructions for Certification – First Tier Participants:

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

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

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

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

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

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

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

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

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

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

\* \* \* \* \*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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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.



DOCUMENT 00811

**SPECIAL PROVISIONS**  
**MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES**

Revised: 02/03/2023

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

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

**Base Price**

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

**Period Price**

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

**Price Adjustment Determination, Calculation and Payment**

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

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

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

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

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

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

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DOCUMENT 00812

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

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

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

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

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

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

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

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

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

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

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DOCUMENT 00813

**SPECIAL PROVISIONS**  
**PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL**

March 14, 2024

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

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

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

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

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

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

Base Prices and Period Prices are defined as follows:

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

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

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

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

The index used for the calculation of Period Prices is the U.S. Department of Labor Bureau of Labor Statistics Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four (4) months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a “(P)”.

Period Prices are determined as follows:

Period Price = Base Price X Index Factor

Index Factor = Period Price Index / Base Price Index

Example of a Period Price Calculation:

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

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

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

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

Period Price = Base Price X Index Factor = \$0.82/Pound X 0.950 = \$0.78/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	\$0.68
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note below.)	\$0.93
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	\$0.93
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	\$0.97
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	\$1.03
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	\$0.96
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	\$1.03
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	\$0.96
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	\$1.07
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	\$0.97
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	\$1.07
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	\$0.97
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	\$1.12
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	\$1.19
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	\$1.82
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	\$1.07
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	\$0.97
18	ASTM A276 Type 316 Stainless Steel	\$5.43
19	ASTM A240 Type 316 Stainless Steel	\$5.43
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	\$1.87
21	ASTM A53 Grade B Structural Steel Pipe	\$1.20
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	\$1.20
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	\$0.95
24	ASTM 252, Grade 2 Permanent Steel Casing	\$0.95
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	\$1.02
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	\$1.79
27	ASTM A572 / A572M, Grade 50 Sheetpiling	\$1.79
28	ASTM A36/36M, Grade 50	\$1.03
29	ASTM A570, Grade 50	\$1.02
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	\$1.03
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	\$1.20
32	AREA 140 LB Rail and Track Accessories	\$0.61

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

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DOCUMENT 00814

**SPECIAL PROVISIONS**  
**PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES**

January 12, 2009

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

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

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

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

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

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

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

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

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

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DOCUMENT 00820

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

I. Definitions

For purposes of this contract,

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

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

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

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

II. Equal Opportunity, Non-Discrimination and Affirmative Action

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

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

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

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

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

### III. Minority and Women Workforce Participation

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

#### IV. Liaison Committee

At the discretion of the agency that administers the contract for the construction project there may be established for the life of the contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the agency or agencies administering the contract for the construction project, hereinafter called the administering agency, a representative from the Office of Affirmative action, and such other representatives as may be designated by the administering agency. The Contractor (or his/her agent, if any, designated by him/her as the on-site equal employment opportunity officer) shall recognize the Liaison Committee as an affirmative action body, and shall establish a continuing working relationship with the Liaison Committee, consulting with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

#### V. Reports and Records

The Contractor shall prepare projected workforce tables on a quarterly basis when required by the administering agency. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and also, when updated, to the administering agency and the Liaison Committee when required.

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

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

The Contractor will provide all information and reports required by the administering agency on instructions issued by the administering agency and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the administering agency to effect the employment of personnel. This provision shall apply only to information pertinent to the Commonwealth's supplementary non-discrimination, equal opportunity and access and opportunity contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the administering agency and shall set forth what efforts he has made to obtain the information.

#### VI. Access to Work Site

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

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

In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under this contract relative to non-discrimination and equal opportunity.

## VIII. Sanctions

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

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

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

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

## IX. Severability

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

X. Contractor's Certification

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

XI. Subcontractor Requirements

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

Contract No: 125644 Project No. 609054 Federal Aid No.: STP/CMQ/TAP-0033(037)X

Location: LITTLETON

Project Description: Reconstruction of Foster 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/consttag.pdf> or <http://www.wdol.gov/dba.aspx#0>.
4. This company  has,  has not, participated in a previous contract or subcontract subject to the Equal Opportunity clauses set forth in 41 CFR Part 60-4 and Executive Order 11246, and where required, has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs or the EEO Commission all reports due under the applicable filing requirements.
5. This company is in full compliance with applicable Federal and Commonwealth of Massachusetts laws, rules, and regulations and is not currently debarred or disqualified from bidding on or participating in construction contracts in any jurisdiction of the United States. See : <https://www.mass.gov/service-details/contractors-and-vendors-suspended-or-debarred-by-massdot>
6. This company is properly registered and in good standing with the Office of the Secretary of the Commonwealth.

Signed this \_\_\_\_\_ Day of \_\_\_\_\_, 20\_\_\_\_, Under The Pains And Penalties Of Perjury.

Firm: \_\_\_\_\_

Address: \_\_\_\_\_

(Print Name and Title)

Telephone Number: \_\_\_\_\_

Federal I.D. Number: \_\_\_\_\_

(Authorized Signature)

Estimated Start Date: \_\_\_\_\_

Estimated Completion Date: \_\_\_\_\_

Estimated Dollar Amount: \_\_\_\_\_

(Date)

DOCUMENT 00860

**COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS**

Revised February 20, 2019

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

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

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

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

The Prevailing Wage Rate generally includes the following:

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

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

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

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

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

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

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

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

STATEMENT OF COMPLIANCE

Date: \_\_\_\_\_

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

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

\_\_\_\_\_  
(Contractor or Subcontractor)

on the \_\_\_\_\_  
(MassDOT Project Location and Contract Number)

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

Signature \_\_\_\_\_

Title \_\_\_\_\_

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

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

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

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

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

DOCUMENT 00861

# STATE PREVAILING WAGE RATES

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MAURA HEALEY  
Governor

KIM DRISCOLL  
Lt. Governor

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

**Prevailing Wage Rates**

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

LAUREN JONES  
Secretary

MICHAEL FLANAGAN  
Director

**Awarding Authority:** MassDOT Highway Division  
**Contract Number:** 125644 **City/Town:** LITTLETON  
**Description of Work:** LITTLETON – FAP No. STP/CMQ/TAP-0033(037)X Reconstruction of Foster Street (609054)

**Job Location:** LITTLETON - Foster 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>	01/01/2024	\$38.95	\$15.07	\$18.67	\$0.00	\$72.69
	06/01/2024	\$39.95	\$15.07	\$18.67	\$0.00	\$73.69
	12/01/2024	\$39.95	\$15.07	\$20.17	\$0.00	\$75.19
	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.02	\$15.07	\$18.67	\$0.00	\$72.76
	06/01/2024	\$40.02	\$15.07	\$18.67	\$0.00	\$73.76
	12/01/2024	\$40.02	\$15.07	\$20.17	\$0.00	\$75.26
	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.14	\$15.07	\$18.67	\$0.00	\$72.88
	06/01/2024	\$40.14	\$15.07	\$18.67	\$0.00	\$73.88
	12/01/2024	\$40.14	\$15.07	\$20.17	\$0.00	\$75.38
	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 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>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
	06/01/2024	\$39.94	\$9.65	\$17.14	\$0.00	\$66.73
	12/01/2024	\$41.27	\$9.65	\$17.14	\$0.00	\$68.06
	06/01/2025	\$42.66	\$9.65	\$17.14	\$0.00	\$69.45
	12/01/2025	\$44.04	\$9.65	\$17.14	\$0.00	\$70.83
	06/01/2026	\$45.48	\$9.65	\$17.14	\$0.00	\$72.27
	12/01/2026	\$46.92	\$9.65	\$17.14	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2023	\$40.80	\$14.50	\$11.05	\$0.00	\$66.35
	06/01/2024	\$41.80	\$14.50	\$11.05	\$0.00	\$67.35
	12/01/2024	\$42.80	\$14.50	\$11.05	\$0.00	\$68.35
	06/01/2025	\$43.80	\$14.50	\$11.05	\$0.00	\$69.35
	12/01/2025	\$44.80	\$14.50	\$11.05	\$0.00	\$70.35
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
	06/01/2024	\$39.94	\$9.65	\$17.14	\$0.00	\$66.73
	12/01/2024	\$41.27	\$9.65	\$17.14	\$0.00	\$68.06
	06/01/2025	\$42.66	\$9.65	\$17.14	\$0.00	\$69.45
	12/01/2025	\$44.04	\$9.65	\$17.14	\$0.00	\$70.83
	06/01/2026	\$45.48	\$9.65	\$17.14	\$0.00	\$72.27
12/01/2026	\$46.92	\$9.65	\$17.14	\$0.00	\$73.71	
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

**Classification**

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

**Apprentice - BOILERMAKER - Local 29**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

**Notes:**

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

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

**Classification**

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

**Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Lowell**

**Effective Date - 02/01/2024**

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

**Effective Date - 08/01/2024**

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

**Notes:**

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

<b>BULLDOZER/GRADER/SCRAPER</b>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>CAISSON &amp; UNDERPINNING BOTTOM MAN</b>	12/01/2023	\$45.48	\$9.65	\$18.22	\$0.00	\$73.35
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$46.96	\$9.65	\$18.22	\$0.00	\$74.83
	12/01/2024	\$48.43	\$9.65	\$18.22	\$0.00	\$76.30
	06/01/2025	\$49.93	\$9.65	\$18.22	\$0.00	\$77.80
	12/01/2025	\$51.43	\$9.65	\$18.22	\$0.00	\$79.30
	06/01/2026	\$52.98	\$9.65	\$18.22	\$0.00	\$80.85
	12/01/2026	\$54.48	\$9.65	\$18.22	\$0.00	\$82.35

For apprentice rates see "Apprentice- LABORER"

<b>CAISSON &amp; UNDERPINNING LABORER</b>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2024	\$47.12	\$9.83	\$19.97	\$0.00	\$76.92
	09/01/2024	\$48.37	\$9.83	\$19.97	\$0.00	\$78.17
	03/01/2025	\$49.62	\$9.83	\$19.97	\$0.00	\$79.42
	09/01/2025	\$50.87	\$9.83	\$19.97	\$0.00	\$80.67
	03/01/2026	\$52.12	\$9.83	\$19.97	\$0.00	\$81.92
	09/01/2026	\$53.37	\$9.83	\$19.97	\$0.00	\$83.17
	03/01/2027	\$54.62	\$9.83	\$19.97	\$0.00	\$84.42

**Apprentice - CARPENTER - Zone 2 Eastern MA**

**Effective Date - 03/01/2024**

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

**Effective Date - 09/01/2024**

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

**Notes:**

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	10/01/2023	\$25.55	\$7.02	\$4.80	\$0.00	\$37.37
CARPENTERS-ZONE 3 (Wood Frame)	10/01/2024	\$26.65	\$7.02	\$4.80	\$0.00	\$38.47
	10/01/2025	\$27.75	\$7.02	\$4.80	\$0.00	\$39.57
	10/01/2026	\$28.85	\$7.02	\$4.80	\$0.00	\$40.67

All Aspects of New Wood Frame Work

**Apprentice - CARPENTER (Wood Frame) - Zone 3**

**Effective Date - 10/01/2023**

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

**Effective Date - 10/01/2024**

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

**Notes:**

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

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

CEMENT MASONRY/PLASTERING	01/01/2024	\$49.33	\$13.00	\$23.57	\$1.30	\$87.20
BRICKLAYERS LOCAL 3 (LOWELL)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - CEMENT MASONRY/PLASTERING - Lowell**

**Effective Date - 01/01/2024**

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

**Notes:**

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

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

CHAIN SAW OPERATOR LABORERS - ZONE 2	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
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For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	12/01/2023	\$56.13	\$15.00	\$16.40	\$0.00	\$87.53
	06/01/2024	\$57.45	\$15.00	\$16.40	\$0.00	\$88.85
	12/01/2024	\$58.93	\$15.00	\$16.40	\$0.00	\$90.33
	06/01/2025	\$60.26	\$15.00	\$16.40	\$0.00	\$91.66
	12/01/2025	\$61.73	\$15.00	\$16.40	\$0.00	\$93.13
	06/01/2026	\$63.06	\$15.00	\$16.40	\$0.00	\$94.46
	12/01/2026	\$64.54	\$15.00	\$16.40	\$0.00	\$95.94

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4	12/01/2023	\$35.62	\$15.00	\$16.40	\$0.00	\$67.02
	06/01/2024	\$36.47	\$15.00	\$16.40	\$0.00	\$67.87
	12/01/2024	\$37.42	\$15.00	\$16.40	\$0.00	\$68.82
	06/01/2025	\$38.27	\$15.00	\$16.40	\$0.00	\$69.67
	12/01/2025	\$39.22	\$15.00	\$16.40	\$0.00	\$70.62
	06/01/2026	\$40.08	\$15.00	\$16.40	\$0.00	\$71.48
	12/01/2026	\$41.03	\$15.00	\$16.40	\$0.00	\$72.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

DELEADER (BRIDGE) PAINTERS LOCAL 35 - ZONE 2	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36





Proposal No. 609054-125644

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
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 103</i>	03/01/2024	\$61.86	\$13.00	\$22.21	\$0.00	\$97.07
	09/01/2024	\$63.78	\$13.00	\$22.26	\$0.00	\$99.04
	03/01/2025	\$64.98	\$13.00	\$22.30	\$0.00	\$100.28
	09/01/2025	\$66.89	\$13.00	\$22.36	\$0.00	\$102.25
	03/01/2026	\$68.09	\$13.00	\$22.39	\$0.00	\$103.48
	09/01/2026	\$70.00	\$13.00	\$22.45	\$0.00	\$105.45
	03/01/2027	\$71.19	\$13.00	\$22.49	\$0.00	\$106.68
	09/01/2027	\$73.11	\$13.00	\$22.54	\$0.00	\$108.65
	03/01/2028	\$74.31	\$13.00	\$22.58	\$0.00	\$109.89

**Classification**

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

**Apprentice - ELECTRICIAN - Local 103**

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$24.74	\$13.00	\$0.74	\$0.00	\$38.48
2	40	\$24.74	\$13.00	\$0.74	\$0.00	\$38.48
3	45	\$27.84	\$13.00	\$16.67	\$0.00	\$57.51
4	45	\$27.84	\$13.00	\$16.67	\$0.00	\$57.51
5	50	\$30.93	\$13.00	\$17.17	\$0.00	\$61.10
6	55	\$34.02	\$13.00	\$17.67	\$0.00	\$64.69
7	60	\$37.12	\$13.00	\$18.17	\$0.00	\$68.29
8	65	\$40.21	\$13.00	\$18.68	\$0.00	\$71.89
9	70	\$43.30	\$13.00	\$19.18	\$0.00	\$75.48
10	75	\$46.40	\$13.00	\$19.69	\$0.00	\$79.09

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$25.51	\$13.00	\$0.77	\$0.00	\$39.28
2	40	\$25.51	\$13.00	\$0.77	\$0.00	\$39.28
3	45	\$28.70	\$13.00	\$16.69	\$0.00	\$58.39
4	45	\$28.70	\$13.00	\$16.69	\$0.00	\$58.39
5	50	\$31.89	\$13.00	\$17.20	\$0.00	\$62.09
6	55	\$35.08	\$13.00	\$17.70	\$0.00	\$65.78
7	60	\$38.27	\$13.00	\$18.21	\$0.00	\$69.48
8	65	\$41.46	\$13.00	\$18.71	\$0.00	\$73.17
9	70	\$44.65	\$13.00	\$19.22	\$0.00	\$76.87
10	75	\$47.84	\$13.00	\$19.74	\$0.00	\$80.58

**Notes :**  
App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

**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
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - ELEVATOR CONSTRUCTOR - Local 4</b>						
<b>Effective Date - 01/01/2022</b>						
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 <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2023	\$50.30	\$14.50	\$16.15	\$0.00	\$80.95
	05/01/2024	\$51.54	\$14.50	\$16.15	\$0.00	\$82.19
	11/01/2024	\$52.83	\$14.50	\$16.15	\$0.00	\$83.48
	05/01/2025	\$54.27	\$14.50	\$16.15	\$0.00	\$84.92
	11/01/2025	\$55.56	\$14.50	\$16.15	\$0.00	\$86.21
	05/01/2026	\$57.00	\$14.50	\$16.15	\$0.00	\$87.65
	11/01/2026	\$58.29	\$14.50	\$16.15	\$0.00	\$88.94
	05/01/2027	\$59.72	\$14.50	\$16.15	\$0.00	\$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2023	\$51.87	\$14.50	\$16.15	\$0.00	\$82.52
	05/01/2024	\$53.12	\$14.50	\$16.15	\$0.00	\$83.77
	11/01/2024	\$54.42	\$14.50	\$16.15	\$0.00	\$85.07
	05/01/2025	\$55.87	\$14.50	\$16.15	\$0.00	\$86.52
	11/01/2025	\$57.17	\$14.50	\$16.15	\$0.00	\$87.82
	05/01/2026	\$58.62	\$14.50	\$16.15	\$0.00	\$89.27
	11/01/2026	\$59.92	\$14.50	\$16.15	\$0.00	\$90.57
	05/01/2027	\$61.37	\$14.50	\$16.15	\$0.00	\$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Proposal No. 609054-125644

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2023	\$24.93	\$14.50	\$16.15	\$0.00	\$55.58
	05/01/2024	\$25.66	\$14.50	\$16.15	\$0.00	\$56.31
	11/01/2024	\$26.42	\$14.50	\$16.15	\$0.00	\$57.07
	05/01/2025	\$27.27	\$14.50	\$16.15	\$0.00	\$57.92
	11/01/2025	\$28.03	\$14.50	\$16.15	\$0.00	\$58.68
	05/01/2026	\$28.88	\$14.50	\$16.15	\$0.00	\$59.53
	11/01/2026	\$29.64	\$14.50	\$16.15	\$0.00	\$60.29
	05/01/2027	\$30.49	\$14.50	\$16.15	\$0.00	\$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$61.86	\$13.00	\$22.21	\$0.00	\$97.07
	09/01/2024	\$63.78	\$13.00	\$22.26	\$0.00	\$99.04
	03/01/2025	\$64.98	\$13.00	\$22.30	\$0.00	\$100.28
	09/01/2025	\$66.89	\$13.00	\$22.36	\$0.00	\$102.25
	03/01/2026	\$68.09	\$13.00	\$22.39	\$0.00	\$103.48
	09/01/2026	\$70.00	\$13.00	\$22.45	\$0.00	\$105.45
	03/01/2027	\$71.19	\$13.00	\$22.49	\$0.00	\$106.68
	09/01/2027	\$73.11	\$13.00	\$22.54	\$0.00	\$108.65
	03/01/2028	\$74.31	\$13.00	\$22.58	\$0.00	\$109.89
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$49.49	\$13.00	\$20.19	\$0.00	\$82.68
	09/01/2024	\$51.02	\$13.00	\$20.24	\$0.00	\$84.26
	03/01/2025	\$51.98	\$13.00	\$20.27	\$0.00	\$85.25
	09/01/2025	\$53.51	\$13.00	\$20.32	\$0.00	\$86.83
	03/01/2026	\$54.47	\$13.00	\$20.34	\$0.00	\$87.81
	09/01/2026	\$56.00	\$13.00	\$20.39	\$0.00	\$89.39
	03/01/2027	\$56.95	\$13.00	\$20.42	\$0.00	\$90.37
	09/01/2027	\$58.49	\$13.00	\$20.46	\$0.00	\$91.95
03/01/2028	\$59.45	\$13.00	\$20.49	\$0.00	\$92.94	
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$44.47	\$15.00	\$16.40	\$0.00	\$75.87
	06/01/2024	\$45.53	\$15.00	\$16.40	\$0.00	\$76.93
	12/01/2024	\$46.71	\$15.00	\$16.40	\$0.00	\$78.11
	06/01/2025	\$47.77	\$15.00	\$16.40	\$0.00	\$79.17
	12/01/2025	\$48.94	\$15.00	\$16.40	\$0.00	\$80.34
	06/01/2026	\$50.00	\$15.00	\$16.40	\$0.00	\$81.40
	12/01/2026	\$51.18	\$15.00	\$16.40	\$0.00	\$82.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$25.48	\$9.65	\$17.14	\$0.00	\$52.27
	06/01/2024	\$26.51	\$9.65	\$17.14	\$0.00	\$53.30
	12/01/2024	\$26.51	\$9.65	\$17.14	\$0.00	\$53.30
	06/01/2025	\$27.59	\$9.65	\$17.14	\$0.00	\$54.38
	12/01/2025	\$27.59	\$9.65	\$17.14	\$0.00	\$54.38
	06/01/2026	\$28.71	\$9.65	\$17.14	\$0.00	\$55.50
	12/01/2026	\$28.71	\$9.65	\$17.14	\$0.00	\$55.50
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FLOORCOVERER FLOORCOVERERS LOCAL 2168 ZONE I	03/01/2024	\$54.73	\$8.83	\$20.27	\$0.00	\$83.83
	09/01/2024	\$56.23	\$8.83	\$20.27	\$0.00	\$85.33
	03/01/2025	\$57.73	\$8.83	\$20.27	\$0.00	\$86.83
	09/01/2025	\$59.23	\$8.83	\$20.27	\$0.00	\$88.33
	03/01/2026	\$60.73	\$8.83	\$20.27	\$0.00	\$89.83
	09/01/2026	\$62.23	\$8.83	\$20.27	\$0.00	\$91.33
	03/01/2027	\$63.73	\$8.83	\$20.27	\$0.00	\$92.83

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

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$24.63	\$8.83	\$1.76	\$0.00	\$35.22
2	45	\$24.63	\$8.83	\$1.76	\$0.00	\$35.22
3	55	\$30.10	\$8.83	\$3.52	\$0.00	\$42.45
4	55	\$30.10	\$8.83	\$3.52	\$0.00	\$42.45
5	70	\$38.31	\$8.83	\$16.75	\$0.00	\$63.89
6	70	\$38.31	\$8.83	\$16.75	\$0.00	\$63.89
7	80	\$43.78	\$8.83	\$18.51	\$0.00	\$71.12
8	80	\$43.78	\$8.83	\$18.51	\$0.00	\$71.12

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$25.30	\$8.83	\$1.76	\$0.00	\$35.89
2	45	\$25.30	\$8.83	\$1.76	\$0.00	\$35.89
3	55	\$30.93	\$8.83	\$3.52	\$0.00	\$43.28
4	55	\$30.93	\$8.83	\$3.52	\$0.00	\$43.28
5	70	\$39.36	\$8.83	\$16.75	\$0.00	\$64.94
6	70	\$39.36	\$8.83	\$16.75	\$0.00	\$64.94
7	80	\$44.98	\$8.83	\$18.51	\$0.00	\$72.32
8	80	\$44.98	\$8.83	\$18.51	\$0.00	\$72.32

Notes: Steps are 750 hrs.

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

FORK LIFT/CHERRY PICKER OPERATING ENGINEERS LOCAL 4	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$35.62	\$15.00	\$16.40	\$0.00	\$67.02
	06/01/2024	\$36.47	\$15.00	\$16.40	\$0.00	\$67.87
	12/01/2024	\$37.42	\$15.00	\$16.40	\$0.00	\$68.82
	06/01/2025	\$38.27	\$15.00	\$16.40	\$0.00	\$69.67
	12/01/2025	\$39.22	\$15.00	\$16.40	\$0.00	\$70.62
	06/01/2026	\$40.08	\$15.00	\$16.40	\$0.00	\$71.48
	12/01/2026	\$41.03	\$15.00	\$16.40	\$0.00	\$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

**Apprentice - GLAZIER - Local 35 Zone 2**

**Effective Date - 01/01/2024**

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

**Effective Date - 07/01/2024**

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

**Notes:**

Steps are 750 hrs.

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

HOISTING ENGINEER/CRANES/GRADALLS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68

**Classification**

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

**Apprentice - OPERATING ENGINEERS - Local 4**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$30.27	\$15.00	\$0.00	\$0.00	\$45.27
2	60	\$33.02	\$15.00	\$16.40	\$0.00	\$64.42
3	65	\$35.77	\$15.00	\$16.40	\$0.00	\$67.17
4	70	\$38.52	\$15.00	\$16.40	\$0.00	\$69.92
5	75	\$41.27	\$15.00	\$16.40	\$0.00	\$72.67
6	80	\$44.02	\$15.00	\$16.40	\$0.00	\$75.42
7	85	\$46.78	\$15.00	\$16.40	\$0.00	\$78.18
8	90	\$49.53	\$15.00	\$16.40	\$0.00	\$80.93

**Effective Date - 06/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$30.98	\$15.00	\$0.00	\$0.00	\$45.98
2	60	\$33.80	\$15.00	\$16.40	\$0.00	\$65.20
3	65	\$36.61	\$15.00	\$16.40	\$0.00	\$68.01
4	70	\$39.43	\$15.00	\$16.40	\$0.00	\$70.83
5	75	\$42.25	\$15.00	\$16.40	\$0.00	\$73.65
6	80	\$45.06	\$15.00	\$16.40	\$0.00	\$76.46
7	85	\$47.88	\$15.00	\$16.40	\$0.00	\$79.28
8	90	\$50.70	\$15.00	\$16.40	\$0.00	\$82.10

**Notes:**

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

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2024	\$57.22	\$14.59	\$27.50	\$2.98	\$102.29
	08/01/2024	\$58.97	\$14.59	\$27.50	\$2.98	\$104.04
	02/01/2025	\$60.72	\$14.59	\$27.50	\$2.98	\$105.79
	08/01/2025	\$62.57	\$14.59	\$27.50	\$2.98	\$107.64
	02/01/2026	\$64.52	\$14.59	\$27.50	\$2.98	\$109.59

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103	03/01/2024	\$61.86	\$13.00	\$22.21	\$0.00	\$97.07
	09/01/2024	\$63.78	\$13.00	\$22.26	\$0.00	\$99.04
	03/01/2025	\$64.98	\$13.00	\$22.30	\$0.00	\$100.28
	09/01/2025	\$66.89	\$13.00	\$22.36	\$0.00	\$102.25
	03/01/2026	\$68.09	\$13.00	\$22.39	\$0.00	\$103.48
	09/01/2026	\$70.00	\$13.00	\$22.45	\$0.00	\$105.45
	03/01/2027	\$71.19	\$13.00	\$22.49	\$0.00	\$106.68
	09/01/2027	\$73.11	\$13.00	\$22.54	\$0.00	\$108.65
	03/01/2028	\$74.31	\$13.00	\$22.58	\$0.00	\$109.89

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>	02/01/2024	\$57.22	\$14.59	\$27.50	\$2.98	\$102.29
	08/01/2024	\$58.97	\$14.59	\$27.50	\$2.98	\$104.04
	02/01/2025	\$60.72	\$14.59	\$27.50	\$2.98	\$105.79
	08/01/2025	\$62.57	\$14.59	\$27.50	\$2.98	\$107.64
	02/01/2026	\$64.52	\$14.59	\$27.50	\$2.98	\$109.59
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING - WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.61	\$9.65	\$17.14	\$0.00	\$65.40
	06/01/2024	\$39.94	\$9.65	\$17.14	\$0.00	\$66.73
	12/01/2024	\$41.27	\$9.65	\$17.14	\$0.00	\$68.06
	06/01/2025	\$42.66	\$9.65	\$17.14	\$0.00	\$69.45
	12/01/2025	\$44.04	\$9.65	\$17.14	\$0.00	\$70.83
	06/01/2026	\$45.48	\$9.65	\$17.14	\$0.00	\$72.27
	12/01/2026	\$46.92	\$9.65	\$17.14	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2023	\$53.50	\$14.75	\$19.61	\$0.00	\$87.86
	09/01/2024	\$56.92	\$14.75	\$19.61	\$0.00	\$91.28
	09/01/2025	\$60.34	\$14.75	\$19.61	\$0.00	\$94.70
	09/01/2026	\$63.76	\$14.75	\$19.61	\$0.00	\$98.12

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston**

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

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.75	\$14.75	\$14.32	\$0.00	\$55.82
2	60	\$32.10	\$14.75	\$15.37	\$0.00	\$62.22
3	70	\$37.45	\$14.75	\$16.43	\$0.00	\$68.63
4	80	\$42.80	\$14.75	\$17.49	\$0.00	\$75.04

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.46	\$14.75	\$14.32	\$0.00	\$57.53
2	60	\$34.15	\$14.75	\$15.37	\$0.00	\$64.27
3	70	\$39.84	\$14.75	\$16.43	\$0.00	\$71.02
4	80	\$45.54	\$14.75	\$17.49	\$0.00	\$77.78

**Notes:**  
Steps are 1 year

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

IRONWORKER/WELDER IRONWORKERS LOCAL 7 (LAWRENCE AREA)	03/16/2024	\$49.56	\$8.35	\$26.70	\$0.00	\$84.61
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**Apprentice - IRONWORKER - Local 7 Lawrence**

**Effective Date - 03/16/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.74	\$8.35	\$26.70	\$0.00	\$64.79
2	70	\$34.69	\$8.35	\$26.70	\$0.00	\$69.74
3	75	\$37.17	\$8.35	\$26.70	\$0.00	\$72.22
4	80	\$39.65	\$8.35	\$26.70	\$0.00	\$74.70
5	85	\$42.13	\$8.35	\$26.70	\$0.00	\$77.18
6	90	\$44.60	\$8.35	\$26.70	\$0.00	\$79.65

**Notes:**

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

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 2	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
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For apprentice rates see "Apprentice- LABORER"

LABORER LABORERS - ZONE 2	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
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**Classification**

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

**Apprentice - LABORER - Zone 2**

**Effective Date - 12/01/2023**

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

**Notes:**

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

LABORER (HEAVY & HIGHWAY)	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2024	\$39.19	\$9.65	\$17.14	\$0.00	\$65.98
	12/01/2024	\$40.52	\$9.65	\$17.14	\$0.00	\$67.31
	06/01/2025	\$41.91	\$9.65	\$17.14	\$0.00	\$68.70
	12/01/2025	\$43.29	\$9.65	\$17.14	\$0.00	\$70.08
	06/01/2026	\$44.73	\$9.65	\$17.14	\$0.00	\$71.52
	12/01/2026	\$46.17	\$9.65	\$17.14	\$0.00	\$72.96

**Apprentice - LABORER (Heavy & Highway) - Zone 2**

**Effective Date - 12/01/2023**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.72	\$9.65	\$17.14	\$0.00	\$49.51
2	70	\$26.50	\$9.65	\$17.14	\$0.00	\$53.29
3	80	\$30.29	\$9.65	\$17.14	\$0.00	\$57.08
4	90	\$34.07	\$9.65	\$17.14	\$0.00	\$60.86

**Effective Date - 06/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.51	\$9.00	\$16.89	\$0.00	\$49.40
2	70	\$27.43	\$9.00	\$16.89	\$0.00	\$53.32
3	80	\$31.35	\$9.00	\$16.89	\$0.00	\$57.24
4	90	\$35.27	\$9.00	\$16.89	\$0.00	\$61.16

**Notes:**

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

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

For apprentice rates see "Apprentice- LABORER"

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

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.95	\$9.65	\$17.20	\$0.00	\$64.80
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 2</i>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	02/01/2024	\$47.89	\$11.49	\$21.37	\$0.00	\$80.75
	08/01/2024	\$49.57	\$11.49	\$21.37	\$0.00	\$82.43
	02/01/2025	\$50.61	\$11.49	\$21.37	\$0.00	\$83.47
	08/01/2025	\$52.33	\$11.49	\$21.37	\$0.00	\$85.19
	02/01/2026	\$53.41	\$11.49	\$21.37	\$0.00	\$86.27
	08/01/2026	\$55.17	\$11.49	\$21.37	\$0.00	\$88.03
	02/01/2027	\$56.29	\$11.49	\$21.37	\$0.00	\$89.15

**Classification**

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

**Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile**

**Effective Date - 02/01/2024**

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

**Effective Date - 08/01/2024**

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

**Notes:**

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

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

**Classification**

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

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

**Effective Date - 02/01/2024**

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

**Effective Date - 08/01/2024**

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

**Notes:**

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

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 2) <i>MILLWRIGHTS LOCAL 1121 - Zone 2</i>	01/01/2024	\$42.76	\$10.08	\$21.47	\$0.00	\$74.31
	01/06/2025	\$45.09	\$10.08	\$21.47	\$0.00	\$76.64
	01/05/2026	\$47.42	\$10.08	\$21.47	\$0.00	\$78.97

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
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**Apprentice - MILLWRIGHT - Local 1121 Zone 2**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.52	\$10.08	\$5.50	\$0.00	\$39.10
2	65	\$27.79	\$10.08	\$6.50	\$0.00	\$44.37
3	75	\$32.07	\$10.08	\$18.97	\$0.00	\$61.12
4	85	\$36.35	\$10.08	\$19.97	\$0.00	\$66.40

**Effective Date - 01/06/2025**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$24.80	\$10.08	\$5.50	\$0.00	\$40.38
2	65	\$29.31	\$10.08	\$6.50	\$0.00	\$45.89
3	75	\$33.82	\$10.08	\$18.97	\$0.00	\$62.87
4	85	\$38.33	\$10.08	\$19.97	\$0.00	\$68.38

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

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

<b>MORTAR MIXER</b> <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
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For apprentice rates see "Apprentice- LABORER"

<b>OILER (OTHER THAN TRUCK CRANES,GRADALLS)</b> <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$24.41	\$15.00	\$16.40	\$0.00	\$55.81
	06/01/2024	\$25.01	\$15.00	\$16.40	\$0.00	\$56.41
	12/01/2024	\$25.67	\$15.00	\$16.40	\$0.00	\$57.07
	06/01/2025	\$26.27	\$15.00	\$16.40	\$0.00	\$57.67
	12/01/2025	\$26.93	\$15.00	\$16.40	\$0.00	\$58.33
	06/01/2026	\$27.52	\$15.00	\$16.40	\$0.00	\$58.92
	12/01/2026	\$28.19	\$15.00	\$16.40	\$0.00	\$59.59

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>OILER (TRUCK CRANES, GRADALLS)</b> <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$29.86	\$15.00	\$16.40	\$0.00	\$61.26
	06/01/2024	\$30.58	\$15.00	\$16.40	\$0.00	\$61.98
	12/01/2024	\$31.38	\$15.00	\$16.40	\$0.00	\$62.78
	06/01/2025	\$32.10	\$15.00	\$16.40	\$0.00	\$63.50
	12/01/2025	\$32.90	\$15.00	\$16.40	\$0.00	\$64.30
	06/01/2026	\$33.62	\$15.00	\$16.40	\$0.00	\$65.02
	12/01/2026	\$34.42	\$15.00	\$16.40	\$0.00	\$65.82

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

<b>OTHER POWER DRIVEN EQUIPMENT - CLASS II</b> <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2024**

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

**Effective Date - 07/01/2024**

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

**Notes:**  
Steps are 750 hrs.

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

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2024	\$46.96	\$9.95	\$23.95	\$0.00	\$80.86
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. <i>PAINTERS LOCAL 35 - ZONE 2</i>	07/01/2024	\$48.16	\$9.95	\$23.95	\$0.00	\$82.06
	01/01/2025	\$49.36	\$9.95	\$23.95	\$0.00	\$83.26



**Classification**

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

**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New**

**Effective Date - 01/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.48	\$9.95	\$0.00	\$0.00	\$33.43
2	55	\$25.83	\$9.95	\$6.66	\$0.00	\$42.44
3	60	\$28.18	\$9.95	\$7.26	\$0.00	\$45.39
4	65	\$30.52	\$9.95	\$7.87	\$0.00	\$48.34
5	70	\$32.87	\$9.95	\$20.32	\$0.00	\$63.14
6	75	\$35.22	\$9.95	\$20.93	\$0.00	\$66.10
7	80	\$37.57	\$9.95	\$21.53	\$0.00	\$69.05
8	90	\$42.26	\$9.95	\$22.74	\$0.00	\$74.95

**Effective Date - 07/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.08	\$9.95	\$0.00	\$0.00	\$34.03
2	55	\$26.49	\$9.95	\$6.66	\$0.00	\$43.10
3	60	\$28.90	\$9.95	\$7.26	\$0.00	\$46.11
4	65	\$31.30	\$9.95	\$7.87	\$0.00	\$49.12
5	70	\$33.71	\$9.95	\$20.32	\$0.00	\$63.98
6	75	\$36.12	\$9.95	\$20.93	\$0.00	\$67.00
7	80	\$38.53	\$9.95	\$21.53	\$0.00	\$70.01
8	90	\$43.34	\$9.95	\$22.74	\$0.00	\$76.03

**Notes:**

Steps are 750 hrs.

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

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2024	\$45.02	\$9.95	\$23.95	\$0.00	\$78.92
PAINTERS LOCAL 35 - ZONE 2	07/01/2024	\$46.22	\$9.95	\$23.95	\$0.00	\$80.12
	01/01/2025	\$47.42	\$9.95	\$23.95	\$0.00	\$81.32

**Classification**

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

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

**Effective Date - 01/01/2024**

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

**Effective Date - 07/01/2024**

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

**Notes:**

Steps are 750 hrs.

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

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

**Classification**

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

**Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW**

**Effective Date - 01/01/2024**

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

**Effective Date - 07/01/2024**

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

**Notes:**

Steps are 750 hrs.

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

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2024	\$43.62	\$9.95	\$23.95	\$0.00	\$77.52
PAINTERS LOCAL 35 - ZONE 2	07/01/2024	\$44.82	\$9.95	\$23.95	\$0.00	\$78.72
	01/01/2025	\$46.02	\$9.95	\$23.95	\$0.00	\$79.92

**Classification**

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

**Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT**

**Effective Date - 01/01/2024**

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

**Effective Date - 07/01/2024**

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

**Notes:**

Steps are 750 hrs.

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

<b>PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)</b>	12/01/2023	\$37.86	\$9.65	\$17.14	\$0.00	\$64.65
<i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	06/01/2024	\$39.19	\$9.65	\$17.14	\$0.00	\$65.98
	12/01/2024	\$40.52	\$9.65	\$17.14	\$0.00	\$67.31
	06/01/2025	\$41.91	\$9.65	\$17.14	\$0.00	\$68.70
	12/01/2025	\$43.29	\$9.65	\$17.14	\$0.00	\$70.08
	06/01/2026	\$44.73	\$9.65	\$17.14	\$0.00	\$71.52
	12/01/2026	\$46.17	\$9.65	\$17.14	\$0.00	\$72.96

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

<b>PANEL &amp; PICKUP TRUCKS DRIVER</b>	01/01/2024	\$38.78	\$15.07	\$18.67	\$0.00	\$72.52
<i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2024	\$39.78	\$15.07	\$18.67	\$0.00	\$73.52
	12/01/2024	\$39.78	\$15.07	\$20.17	\$0.00	\$75.02
	01/01/2025	\$39.78	\$15.57	\$20.17	\$0.00	\$75.52
	06/01/2025	\$40.78	\$15.57	\$20.17	\$0.00	\$76.52
	12/01/2025	\$40.78	\$15.57	\$21.78	\$0.00	\$78.13
	01/01/2026	\$40.78	\$16.17	\$21.78	\$0.00	\$78.73
	06/01/2026	\$41.78	\$16.17	\$21.78	\$0.00	\$79.73
	12/01/2026	\$41.78	\$16.17	\$23.52	\$0.00	\$81.47
	01/01/2027	\$41.78	\$16.77	\$23.52	\$0.00	\$82.07

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59

**Apprentice - PILE DRIVER - Local 56 Zone 1**

**Effective Date - 08/01/2020**

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

**Notes:**  
 % 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

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

PIPEFITTER & STEAMFITTER <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
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**Apprentice - PIPEFITTER - Local 537**

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$26.11	\$12.70	\$9.05	\$0.00	\$47.86
2	45	\$29.38	\$12.70	\$21.80	\$0.00	\$63.88
3	60	\$39.17	\$12.70	\$21.80	\$0.00	\$73.67
4	70	\$45.70	\$12.70	\$21.80	\$0.00	\$80.20
5	80	\$52.22	\$12.70	\$21.80	\$0.00	\$86.72

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$26.83	\$12.70	\$9.05	\$0.00	\$48.58
2	45	\$30.19	\$12.70	\$21.80	\$0.00	\$64.69
3	60	\$40.25	\$12.70	\$21.80	\$0.00	\$74.75
4	70	\$46.96	\$12.70	\$21.80	\$0.00	\$81.46
5	80	\$53.66	\$12.70	\$21.80	\$0.00	\$88.16

**Notes:**

\*\* 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.  
 Refrig/AC Mechanic \*\*1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

**Apprentice to Journeyworker Ratio:\*\***

PIPELAYER LABORERS - ZONE 2	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
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For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21

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

PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12	03/03/2024	\$67.74	\$14.32	\$19.11	\$0.00	\$101.17
	09/01/2024	\$69.54	\$14.32	\$19.11	\$0.00	\$102.97
	03/02/2025	\$71.34	\$14.32	\$19.11	\$0.00	\$104.77

**Classification**

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

**Apprentice - PLUMBER/GASFITTER - Local 12**

**Effective Date - 03/03/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$23.71	\$14.32	\$6.88	\$0.00	\$44.91
2	40	\$27.10	\$14.32	\$7.82	\$0.00	\$49.24
3	55	\$37.26	\$14.32	\$10.65	\$0.00	\$62.23
4	65	\$44.03	\$14.32	\$12.53	\$0.00	\$70.88
5	75	\$50.81	\$14.32	\$14.41	\$0.00	\$79.54

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$24.34	\$14.32	\$6.88	\$0.00	\$45.54
2	40	\$27.82	\$14.32	\$7.82	\$0.00	\$49.96
3	55	\$38.25	\$14.32	\$10.65	\$0.00	\$63.22
4	65	\$45.20	\$14.32	\$12.53	\$0.00	\$72.05
5	75	\$52.16	\$14.32	\$14.41	\$0.00	\$80.89

**Notes:**

\*\* 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr  
Step4 with lic\$69.00, Step5 with lic\$76.87

**Apprentice to Journeyworker Ratio:\*\***

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2024	\$65.28	\$12.70	\$21.80	\$0.00	\$99.78
	09/01/2024	\$67.08	\$12.70	\$21.80	\$0.00	\$101.58
	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38

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

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

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21

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

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

POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$39.36	\$9.40	\$16.89	\$0.00	\$65.65
	06/01/2024	\$40.69	\$9.40	\$16.89	\$0.00	\$66.98
	12/01/2024	\$42.02	\$9.40	\$16.89	\$0.00	\$68.31
	06/01/2025	\$43.41	\$9.40	\$16.89	\$0.00	\$69.70
	12/01/2025	\$44.79	\$9.40	\$16.89	\$0.00	\$71.08
	06/01/2026	\$46.23	\$9.40	\$16.89	\$0.00	\$72.52
	12/01/2026	\$47.67	\$9.40	\$16.89	\$0.00	\$73.96

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$35.62	\$15.00	\$16.40	\$0.00	\$67.02
	06/01/2024	\$36.47	\$15.00	\$16.40	\$0.00	\$67.87
	12/01/2024	\$37.42	\$15.00	\$16.40	\$0.00	\$68.82
	06/01/2025	\$38.27	\$15.00	\$16.40	\$0.00	\$69.67
	12/01/2025	\$39.22	\$15.00	\$16.40	\$0.00	\$70.62
	06/01/2026	\$40.08	\$15.00	\$16.40	\$0.00	\$71.48
	12/01/2026	\$41.03	\$15.00	\$16.40	\$0.00	\$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 170 - J.G. MacLellan (Lowell)</i>	01/01/2024	\$29.50	\$11.17	\$6.45	\$0.00	\$47.12
	05/01/2024	\$30.00	\$11.17	\$6.55	\$0.00	\$47.72
	01/01/2025	\$30.00	\$11.57	\$6.55	\$0.00	\$48.12
	05/01/2025	\$30.50	\$11.57	\$6.65	\$0.00	\$48.72
	01/01/2026	\$30.50	\$11.97	\$6.65	\$0.00	\$49.12
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

ROOFER (Inc.Roofing Waterproofing &Roofing Damproofg) <i>ROOFERS LOCAL 33</i>	02/01/2024	\$50.03	\$12.78	\$21.45	\$0.00	\$84.26
	08/01/2024	\$51.53	\$12.78	\$21.45	\$0.00	\$85.76
	02/01/2025	\$52.78	\$12.78	\$21.45	\$0.00	\$87.01
	08/01/2025	\$54.28	\$12.78	\$21.45	\$0.00	\$88.51
	02/01/2026	\$55.53	\$12.78	\$21.45	\$0.00	\$89.76

**Apprentice - ROOFER - Local 33**

**Effective Date - 02/01/2024**

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

**Effective Date - 08/01/2024**

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

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

**Apprentice to Journeyworker Ratio:\*\***

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

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2024	\$57.22	\$14.59	\$27.50	\$2.98	\$102.29
	08/01/2024	\$58.97	\$14.59	\$27.50	\$2.98	\$104.04
	02/01/2025	\$60.72	\$14.59	\$27.50	\$2.98	\$105.79
	08/01/2025	\$62.57	\$14.59	\$27.50	\$2.98	\$107.64
	02/01/2026	\$64.52	\$14.59	\$27.50	\$2.98	\$109.59

**Classification**

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

**Apprentice - SHEET METAL WORKER - Local 17-A**

**Effective Date - 02/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$24.03	\$14.59	\$6.13	\$0.00	\$44.75
2	42	\$24.03	\$14.59	\$6.13	\$0.00	\$44.75
3	47	\$26.89	\$14.59	\$12.11	\$1.61	\$55.20
4	47	\$26.89	\$14.59	\$12.11	\$1.61	\$55.20
5	52	\$29.75	\$14.59	\$13.09	\$1.72	\$59.15
6	52	\$29.75	\$14.59	\$13.34	\$1.73	\$59.41
7	60	\$34.33	\$14.59	\$14.75	\$1.91	\$65.58
8	65	\$37.19	\$14.59	\$15.73	\$2.03	\$69.54
9	75	\$42.92	\$14.59	\$17.69	\$2.26	\$77.46
10	85	\$48.64	\$14.59	\$19.15	\$2.47	\$84.85

**Effective Date - 08/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$24.77	\$14.59	\$6.13	\$0.00	\$45.49
2	42	\$24.77	\$14.59	\$6.13	\$0.00	\$45.49
3	47	\$27.72	\$14.59	\$12.11	\$1.63	\$56.05
4	47	\$27.72	\$14.59	\$12.11	\$1.63	\$56.05
5	52	\$30.66	\$14.59	\$13.09	\$1.75	\$60.09
6	52	\$30.66	\$14.59	\$13.34	\$1.76	\$60.35
7	60	\$35.38	\$14.59	\$14.75	\$1.94	\$66.66
8	65	\$38.33	\$14.59	\$15.73	\$2.06	\$70.71
9	75	\$44.23	\$14.59	\$17.69	\$2.30	\$78.81
10	85	\$50.12	\$14.59	\$19.15	\$2.52	\$86.38

**Notes:**  
Steps are 6 mos.

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

SPECIALIZED EARTH MOVING EQUIP < 35 TONS	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.53	\$15.07	\$18.67	\$0.00	\$73.27
	06/01/2024	\$40.53	\$15.07	\$18.67	\$0.00	\$74.27
	12/01/2024	\$40.53	\$15.07	\$20.17	\$0.00	\$75.77
	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	03/01/2024	\$69.75	\$10.90	\$23.20	\$0.00	\$103.85
	10/01/2024	\$71.55	\$10.90	\$23.20	\$0.00	\$105.65
	03/01/2025	\$73.35	\$10.90	\$23.20	\$0.00	\$107.45

**Apprentice - *SPRINKLER FITTER - Local 550 (Section A) Zone 1***

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$24.41	\$10.90	\$12.80	\$0.00	\$48.11
2	40	\$27.90	\$10.90	\$13.60	\$0.00	\$52.40
3	45	\$31.39	\$10.90	\$14.40	\$0.00	\$56.69
4	50	\$34.88	\$10.90	\$15.20	\$0.00	\$60.98
5	55	\$38.36	\$10.90	\$16.00	\$0.00	\$65.26
6	60	\$41.85	\$10.90	\$16.80	\$0.00	\$69.55
7	65	\$45.34	\$10.90	\$17.60	\$0.00	\$73.84
8	70	\$48.83	\$10.90	\$18.40	\$0.00	\$78.13
9	75	\$52.31	\$10.90	\$19.20	\$0.00	\$82.41
10	80	\$55.80	\$10.90	\$20.00	\$0.00	\$86.70

**Effective Date - 10/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$25.04	\$10.90	\$12.80	\$0.00	\$48.74
2	40	\$28.62	\$10.90	\$13.60	\$0.00	\$53.12
3	45	\$32.20	\$10.90	\$14.40	\$0.00	\$57.50
4	50	\$35.78	\$10.90	\$15.20	\$0.00	\$61.88
5	55	\$39.35	\$10.90	\$16.00	\$0.00	\$66.25
6	60	\$42.93	\$10.90	\$16.80	\$0.00	\$70.63
7	65	\$46.51	\$10.90	\$17.60	\$0.00	\$75.01
8	70	\$50.09	\$10.90	\$18.40	\$0.00	\$79.39
9	75	\$53.66	\$10.90	\$19.20	\$0.00	\$83.76
10	80	\$57.24	\$10.90	\$20.00	\$0.00	\$88.14

**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**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2024	\$49.49	\$13.00	\$20.19	\$0.00	\$82.68
	09/01/2024	\$51.02	\$13.00	\$20.24	\$0.00	\$84.26
	03/01/2025	\$51.98	\$13.00	\$20.27	\$0.00	\$85.25
	09/01/2025	\$53.51	\$13.00	\$20.32	\$0.00	\$86.83
	03/01/2026	\$54.47	\$13.00	\$20.34	\$0.00	\$87.81
	09/01/2026	\$56.00	\$13.00	\$20.39	\$0.00	\$89.39
	03/01/2027	\$56.95	\$13.00	\$20.42	\$0.00	\$90.37
	09/01/2027	\$58.49	\$13.00	\$20.46	\$0.00	\$91.95
03/01/2028	\$59.45	\$13.00	\$20.49	\$0.00	\$92.94	

**Classification**

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

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103**

**Effective Date - 03/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.27	\$13.00	\$0.67	\$0.00	\$35.94
2	45	\$22.27	\$13.00	\$0.67	\$0.00	\$35.94
3	50	\$24.75	\$13.00	\$16.16	\$0.00	\$53.91
4	50	\$24.75	\$13.00	\$16.16	\$0.00	\$53.91
5	55	\$27.22	\$13.00	\$16.57	\$0.00	\$56.79
6	60	\$29.69	\$13.00	\$16.97	\$0.00	\$59.66
7	65	\$32.17	\$13.00	\$17.38	\$0.00	\$62.55
8	70	\$34.64	\$13.00	\$17.78	\$0.00	\$65.42
9	75	\$37.12	\$13.00	\$18.18	\$0.00	\$68.30
10	80	\$39.59	\$13.00	\$18.58	\$0.00	\$71.17

**Effective Date - 09/01/2024**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$22.96	\$13.00	\$0.69	\$0.00	\$36.65
2	45	\$22.96	\$13.00	\$0.69	\$0.00	\$36.65
3	50	\$25.51	\$13.00	\$16.16	\$0.00	\$54.67
4	50	\$25.51	\$13.00	\$16.16	\$0.00	\$54.67
5	55	\$28.06	\$13.00	\$16.57	\$0.00	\$57.63
6	60	\$30.61	\$13.00	\$16.97	\$0.00	\$60.58
7	65	\$33.16	\$13.00	\$17.38	\$0.00	\$63.54
8	70	\$35.71	\$13.00	\$17.78	\$0.00	\$66.49
9	75	\$38.27	\$13.00	\$18.18	\$0.00	\$69.45
10	80	\$40.82	\$13.00	\$18.58	\$0.00	\$72.40

**Notes:**

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

TERRAZZO FINISHERS	02/01/2024	\$61.34	\$11.49	\$23.59	\$0.00	\$96.42
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2024	\$63.44	\$11.49	\$23.59	\$0.00	\$98.52
	02/01/2025	\$64.74	\$11.49	\$23.59	\$0.00	\$99.82
	08/01/2025	\$66.89	\$11.49	\$23.59	\$0.00	\$101.97
	02/01/2026	\$68.24	\$11.49	\$23.59	\$0.00	\$103.32
	08/01/2026	\$70.44	\$11.49	\$23.59	\$0.00	\$105.52
	02/01/2027	\$71.84	\$11.49	\$23.59	\$0.00	\$106.92

**Classification**

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

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

**Effective Date - 02/01/2024**

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

**Effective Date - 08/01/2024**

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

**Notes:**

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

<b>TEST BORING DRILLER</b> <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$48.33	\$9.65	\$18.22	\$0.00	\$76.20
	06/01/2024	\$49.81	\$9.65	\$18.22	\$0.00	\$77.68
	12/01/2024	\$51.28	\$9.65	\$18.22	\$0.00	\$79.15
	06/01/2025	\$52.78	\$9.65	\$18.22	\$0.00	\$80.65
	12/01/2025	\$54.28	\$9.65	\$18.22	\$0.00	\$82.15
	06/01/2026	\$55.83	\$9.65	\$18.22	\$0.00	\$83.70
	12/01/2026	\$57.33	\$9.65	\$18.22	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

<b>TEST BORING DRILLER HELPER</b> <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.45	\$9.65	\$18.22	\$0.00	\$72.32
	06/01/2024	\$45.93	\$9.65	\$18.22	\$0.00	\$73.80
	12/01/2024	\$47.40	\$9.65	\$18.22	\$0.00	\$75.27
	06/01/2025	\$48.90	\$9.65	\$18.22	\$0.00	\$76.77
	12/01/2025	\$50.40	\$9.65	\$18.22	\$0.00	\$78.27
	06/01/2026	\$51.95	\$9.65	\$18.22	\$0.00	\$79.82
	12/01/2026	\$53.45	\$9.65	\$18.22	\$0.00	\$81.32

For apprentice rates see "Apprentice- LABORER"

<b>TEST BORING LABORER</b> <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2023	\$44.33	\$9.65	\$18.22	\$0.00	\$72.20
	06/01/2024	\$45.81	\$9.65	\$18.22	\$0.00	\$73.68
	12/01/2024	\$47.28	\$9.65	\$18.22	\$0.00	\$75.15
	06/01/2025	\$48.78	\$9.65	\$18.22	\$0.00	\$76.65
	12/01/2025	\$50.28	\$9.65	\$18.22	\$0.00	\$78.15
	06/01/2026	\$51.83	\$9.65	\$18.22	\$0.00	\$79.70
	12/01/2026	\$53.33	\$9.65	\$18.22	\$0.00	\$81.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$54.43	\$15.00	\$16.40	\$0.00	\$85.83
	06/01/2024	\$55.71	\$15.00	\$16.40	\$0.00	\$87.11
	12/01/2024	\$57.15	\$15.00	\$16.40	\$0.00	\$88.55
	06/01/2025	\$58.43	\$15.00	\$16.40	\$0.00	\$89.83
	12/01/2025	\$59.87	\$15.00	\$16.40	\$0.00	\$91.27
	06/01/2026	\$61.15	\$15.00	\$16.40	\$0.00	\$92.55
	12/01/2026	\$62.59	\$15.00	\$16.40	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.82	\$15.07	\$18.67	\$0.00	\$73.56
	06/01/2024	\$40.82	\$15.07	\$18.67	\$0.00	\$74.56
	12/01/2024	\$40.82	\$15.07	\$20.17	\$0.00	\$76.06
	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
	01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$56.56	\$9.65	\$18.67	\$0.00	\$84.88
	06/01/2024	\$58.04	\$9.65	\$18.67	\$0.00	\$86.36
	12/01/2024	\$59.51	\$9.65	\$18.67	\$0.00	\$87.83
	06/01/2025	\$61.01	\$9.65	\$18.67	\$0.00	\$89.33
	12/01/2025	\$62.51	\$9.65	\$18.67	\$0.00	\$90.83
	06/01/2026	\$64.06	\$9.65	\$18.67	\$0.00	\$92.38
	12/01/2026	\$65.56	\$9.65	\$18.67	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2023	\$58.56	\$9.65	\$18.67	\$0.00	\$86.88
	06/01/2024	\$60.04	\$9.65	\$18.67	\$0.00	\$88.36
	12/01/2024	\$61.51	\$9.65	\$18.67	\$0.00	\$89.83
	06/01/2025	\$63.01	\$9.65	\$18.67	\$0.00	\$91.33
	12/01/2025	\$64.51	\$9.65	\$18.67	\$0.00	\$92.83
	06/01/2026	\$66.06	\$9.65	\$18.67	\$0.00	\$94.38
	12/01/2026	\$67.56	\$9.65	\$18.67	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$48.63	\$9.65	\$18.67	\$0.00	\$76.95
	06/01/2024	\$50.11	\$9.65	\$18.67	\$0.00	\$78.43
	12/01/2024	\$51.58	\$9.65	\$18.67	\$0.00	\$79.90
	06/01/2025	\$53.08	\$9.65	\$18.67	\$0.00	\$81.40
	12/01/2025	\$54.58	\$9.65	\$18.67	\$0.00	\$82.90
	06/01/2026	\$56.13	\$9.65	\$18.67	\$0.00	\$84.45
	12/01/2026	\$57.63	\$9.65	\$18.67	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						

Proposal No. 609054-125644

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2023	\$50.63	\$9.65	\$18.67	\$0.00	\$78.95
	06/01/2024	\$52.11	\$9.65	\$18.67	\$0.00	\$80.43
	12/01/2024	\$53.58	\$9.65	\$18.67	\$0.00	\$81.90
	06/01/2025	\$55.08	\$9.65	\$18.67	\$0.00	\$83.40
	12/01/2025	\$56.58	\$9.65	\$18.67	\$0.00	\$84.90
	06/01/2026	\$58.13	\$9.65	\$18.67	\$0.00	\$86.45
	12/01/2026	\$59.63	\$9.65	\$18.67	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	01/01/2024	\$39.24	\$15.07	\$18.67	\$0.00	\$72.98
	06/01/2024	\$40.24	\$15.07	\$18.67	\$0.00	\$73.98
	12/01/2024	\$40.24	\$15.07	\$20.17	\$0.00	\$75.48
	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53
WAGON DRILL OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY &amp; HIGHWAY)</i>	12/01/2023	\$38.11	\$9.65	\$17.14	\$0.00	\$64.90
	06/01/2024	\$39.44	\$9.65	\$17.14	\$0.00	\$66.23
	12/01/2024	\$40.77	\$9.65	\$17.14	\$0.00	\$67.56
	06/01/2025	\$42.16	\$9.65	\$17.14	\$0.00	\$68.95
	12/01/2025	\$43.54	\$9.65	\$17.14	\$0.00	\$70.33
	06/01/2026	\$44.98	\$9.65	\$17.14	\$0.00	\$71.77
	12/01/2026	\$46.42	\$9.65	\$17.14	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$55.03	\$15.00	\$16.40	\$0.00	\$86.43
	06/01/2024	\$56.33	\$15.00	\$16.40	\$0.00	\$87.73
	12/01/2024	\$57.78	\$15.00	\$16.40	\$0.00	\$89.18
	06/01/2025	\$59.08	\$15.00	\$16.40	\$0.00	\$90.48
	12/01/2025	\$60.53	\$15.00	\$16.40	\$0.00	\$91.93
	06/01/2026	\$61.83	\$15.00	\$16.40	\$0.00	\$93.23
	12/01/2026	\$63.28	\$15.00	\$16.40	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS &amp; GASFITTERS LOCAL 12</i>	03/03/2024	\$67.74	\$14.32	\$19.11	\$0.00	\$101.17
	09/01/2024	\$69.54	\$14.32	\$19.11	\$0.00	\$102.97
	03/02/2025	\$71.34	\$14.32	\$19.11	\$0.00	\$104.77
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"						



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> For apprentice rates see "Apprentice- LINEMAN"	08/30/2020	\$22.25	\$9.25	\$1.82	\$0.00	\$33.32
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

**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 Timetables

Timetable

Goals (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 Areas

<u>STATE:</u>	<u>Goals (percent)</u>
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 MA Hampden, MA Hampshire	4.8
Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket	3.6
Non-SMSA Counties: MA Franklin	5.9



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### 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 control, 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 1**

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.

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**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: MA20240021 03/22/2024

Superseded General Decision Number: MA20230021

State: Massachusetts

Construction Type: Highway

County: Middlesex County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658.

Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

<p> If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<p> . Executive Order 14026 generally applies to the contract.  . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.</p>
<p> If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<p> . Executive Order 13658 generally applies to the contract.  . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.</p>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/05/2024
1	01/19/2024
2	03/22/2024

\* ELEC0103-007 03/01/2024

	Rates	Fringes
ELECTRICIAN.....	\$ 61.86	36.14
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ENGI0004-026 12/01/2023		

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1.....	\$ 48.73	29.25+A
GROUP 1.....	\$ 55.03	32.45
Group 2.....	\$ 48.23	29.25+A
GROUP 2.....	\$ 54.43	32.45

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

- A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid Loader; Broom/Sweeper; Gradall; Loader; Paver (Asphalt, Aggregate, and Concrete)  
 Group 2: Bulldozer; Grader/Blade; Milling Machine; Roller

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IRON0007-031 09/16/2023		
	Rates	Fringes
IRONWORKER (ORNAMENTAL, REINFORCING, AND STRUCTURAL).....	\$ 53.70	36.21
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LABO0039-002 06/01/2018		
	Rates	Fringes
LABORER		
Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 33.50	22.92
Landscape.....	\$ 33.25	22.92
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PAIN0035-023 07/01/2023

	Rates	Fringes
PAINTER (Steel).....	\$ 55.51	35.10

SUMA2014-011 01/11/2017

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 47.93	19.46
CEMENT MASON/CONCRETE FINISHER...	\$ 56.70	21.08
LABORER: Common or General.....	\$ 36.58	19.40
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 41.78	18.37
LABORER: Guardrail Installation.....	\$ 37.70	15.37
OPERATOR: Crane.....	\$ 57.61	0.00
OPERATOR: Forklift.....	\$ 64.67	0.00
OPERATOR: Mechanic.....	\$ 48.14	17.02
OPERATOR: Piledriver.....	\$ 44.46	16.94
OPERATOR: Post Driver (Guardrail/Fences).....	\$ 41.49	23.07
PAINTER: Spray (Linestriping)....	\$ 40.87	13.86
PILEDRIVERMAN.....	\$ 45.65	23.33
TRAFFIC CONTROL: Flagger.....	\$ 23.00	20.44
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper.....	\$ 44.49	12.41
TRUCK DRIVER: Concrete Truck....	\$ 33.69	15.79
TRUCK DRIVER: Dump Truck.....	\$ 38.92	9.73
TRUCK DRIVER: Flatbed Truck.....	\$ 48.53	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017.

If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking.

Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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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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DOCUMENT A00801

**SPECIAL PROVISIONS**

**LITTLETON**

**Federal Aid Project No. STP/CMQ/TAP-0033(037)X  
Reconstruction of Foster 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**

All work under this Contract shall be done in conformance with the *2024 Standard Specifications for Highways and Bridges*, the *2017 Construction Standard Details*, the *Traffic Management Plans and Detail Drawings*, *MassDOT Work Zone Safety Temporary Traffic Control*, the *1990 Standard Drawings for Signs and Supports*; the *2015 Overhead Signal Structure and Foundation Standard Drawings*, the *2009 Manual on Uniform Traffic Control Devices (MUTCD) with Revisions 1, 2, and 3 and the November 2022 Massachusetts Amendments to the MUTCD*; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; *The American Standard for Nursery Stock*; the *Littleton Electric Light & Water Department (LELELWD) Water Rules and Regulations*, the Plans and these Special Provisions.

The Work to be done under this contract shall consist of the removal of the existing roadway pavement on Foster Street down to the existing sub-base, a distance of approximately 3,936 feet. Associated work shall include excavation of the existing subbase, full depth box widening in some sections, sidewalk replacement, ADA improvements, construction of a shared-use path along Foster Street for connectivity between the Taylor Street Trail and northerly travel along Foster Street.

The associated work along Taylor Street, Bulkeley Road, Grimes Lane, and Balsam Lane includes pavement repair, pavement milling and overlay, full depth box widening, sidewalk replacement, ADA improvements, pavement markings, landscape/planting improvements and providing all incidental materials and labor necessary for operation of the traffic control signage in accordance with the project plans and specifications.

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

## **RAILROAD INSURANCE REQUIREMENTS**

The insurance requirements set forth in this section are in addition to the requirements of the Standard Specifications.

Railroad Operations Directorate: Section F:

The Contractor shall furnish, with respect to the operations of the Contractor or any of the Contractor's SubContractors performing within the Railroad right-of-way, broad form Railroad Protective Liability Insurance covering all work performed under this Contract in the amount of not less than \$5,000,000 per occurrence, \$10,000,000 aggregate combined bodily injury and property damage. The Contractor shall carry Worker's Compensation Insurance, including Employers Liability Insurance as provided by Massachusetts General Laws, Chapter 152, as amended, covering all work performed by him under the Contract. The Contractor shall carry Umbrella Liability Coverage with limits of not less than \$10,000,000 per occurrence, covering all work performed by him under this Contract. Automobile Liability Insurance: The Contractor shall provide Automobile Liability Insurance to include the use of all vehicles; owned, leased, hired and non-owned, with limits not less than \$1,000,000 combined single limit covering all work performed under the Contract.

2. Such insurance shall be written on an occurrence basis.

3. The MBTA and applicable railroads shall be the named insureds on such insurance. Additional named insured are listed below. Original policies and certificates shall be made out to the MBTA and applicable railroads and mailed to:

MBTA:           Treasurer-Controller  
                  Massachusetts Bay Transportation Authority  
                  10 Park Plaza  
                  Boston, MA 02116  
                  Tel. (617) 222-3064

                  Keolis: General Counsel  
                  Keolis Commuter Services, LLC  
                  470 Atlantic Avenue  
                  Boston, MA 02210

4. The Contractor shall furnish to the MBTA and railroad companies a signed original of the Railroad Protective Liability Policy prior to entry upon the railroad right-of-way.

5. Such policies shall provide 30 days' notice to each named insured by the insurance company before any change or cancellation of the policies.

6. Such Railroad Protective Insurance policies may be provided in forms commonly referred to as AAR/AASHTO or ISO/RIMA but not Oregon.

Questions regarding insurance should be directed to the MBTA's Risk Manager at 617-222-3064.

The Contractor shall be aware of the latest MBTA insurance limits / requirements. See the following link for more information:

<https://www.mbtarealty.com/licenses.html>

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

This contract has an agreement with the *Town of LITTLETON*; whereas when the construction costs for the contract scope exceed the total participating contract bid price by more than ten percent (10%), the *Town* shall be responsible for the amount over 110% of the total participating contract bid price.

**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.

**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 **2.9 million** 18-kip (80-kn) ESALs.

**SAWCUTS**

Sawcuts shall be made in the existing pavement at areas of new or reset curb, limits of full depth pavement construction, drainage trenches within existing roadway, any locations called out on the plans and as directed by the Engineer. Payments for sawcuts shall be included in the unit price under the Items for which the sawcut work is associated with.

Sawcuts shall also be made at the back of all proposed HMA driveway/parking lot areas within project limits. This work shall be inclusive under the HMA Driveway Item.

**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.

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**SECTION 6.00: CONTROL OF MATERIALS****Subsection 6.01: Source of Supply and Quality**

*Replace this subsection with the following:*

The Engineer may approve material at the source of supply before delivery to the project.

The Department reserves the right to require approval of the source of supply for any material to be incorporated into the work prior to delivery or manufacture.

The Engineer reserves the right to prohibit the use of materials, products, or components which, in their opinion, may be supplied in a manner not reasonably consistent with contract requirements.

The determination of the Engineer shall be final upon all questions which pertain to supplier approval.

Fabricators of structural steel, miscellaneous steel and aluminum products, and producers of precast concrete and prestressed concrete must be on the Department's approved fabricators list on the date the bids are opened. Only approved fabricators will be allowed to perform work for the Department.

The Contractor shall furnish all materials required for the work specified in the Contract. Said materials shall meet the requirements of the specifications for the kind of work involving their use. For any materials named or described in these specifications, an approved equivalent to that named or described in the said specifications, may be furnished.

Chapter 7, Section 22, Clause 17, of the General Laws, as amended, shall apply to the purchase by the Contractor of supplies and materials to be used in the execution of this Contract.

The rules referred to require a preference in the purchase of supplies and materials, other considerations being equal, in favor first, of supplies and materials manufactured and sold within the Commonwealth, and second, of supplies and materials manufactured and sold within the United States.

All iron and steel products, manufactured products, and construction materials shall comply with all Federal Buy America and Federal Build America Buy America (BABA) requirements, where applicable.

In Contracts requiring structural steel, precast, or prestress concrete, the Contractor shall furnish approved shop drawings, and fabrication procedures to the Department's inspector at the supply source or fabrication site. Materials for permanent construction shall be new, shall conform to the requirements of these specifications, and shall be approved by the Engineer.

Materials for temporary structures or supports adjacent to traveled ways, the failure of which would compromise the safety of the public or the traveled ways, need not be new but the Contractor shall be required to submit certification by a Structural Professional Engineer that the material meets the requirements for the intended use and shall be approved by the Engineer. Any fabrication shall conform to the requirements of these specifications. These requirements shall not apply to gantry systems and supports as well as other mechanized systems.



**SECTION 6.00:** (Continued)

If testing finds that an approved supplier does not furnish a uniform product, or if the product from such source proves unacceptable at any time, the Contractor shall, at their own expense, take any and all steps necessary to furnish approved materials.

The Contractor shall submit to the Department for approval a notarized Certificate of Compliance (COC) from the Manufacturer or Supplier for each kind of manufactured or fabricated material furnished.

The COC shall certify compliance with the specifications and shall contain the following information:

1. Contract Number, City or Town, Name of Road and Federal Aid Number;
2. Name of the Contractor to which the material is supplied;
3. Kind of material supplied;
4. Quantity of material represented by the certificate;
5. Means of definitively identifying the consignment, such as invoice number, lot number, bill of lading number, label, marking, etc.;
6. Date and method of shipment;
7. Statement indicating that the material has been tested and found in conformity with the pertinent parts of the Contract;
8. Statement indicating that the material meets the requirements of Buy America and BABA, where applicable;
9. Results of all required tests including the chemical analysis in the case of metal: or in lieu of furnishing the results a statement that results of all required tests pertinent to the certificate  
and not submitted shall be maintained available by the undersigned for a period of not less than three years from date of final acceptance or not less than three years from date of final payment (whichever period is the longest shall apply);
10. Signature of a person having legal authority to bind the supplier.

These COCs shall be delivered to the contract site at the same time that the materials are delivered and before such materials are incorporated into the work. The Contractor shall attach to the COC a document listing the contract bid Item number(s), sub Item(s), or lump sum breakdown Item number(s), as applicable, under which the material will be compensated. Payment for the Item in which the materials are incorporated may be withheld until these COCs are received in a form that meets the contract requirements.

If the Contractor has new materials purchased for use on a previous Department Contract which have never been used and which comply with the specifications, these materials may be furnished and used. The Contractor shall submit their own sworn statement certifying that such materials were purchased for use on a previous Contract (naming and identifying such Contract) and shall attach the original COC.

Any cost involved in furnishing the certificate shall be borne by the Contractor.

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**SECTION 6.00:** (Continued)**Subsection 6.03: Delivery and Storage of Materials**

*Replace this Subsection with the following:*

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

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

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

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

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

**SHEETING AND BRACING**

The Contractor shall furnish, place, and remove (unless otherwise noted) all sheeting and bracing required to support the sides of all trenches or other excavations for this Project. The design of all sheeting and bracing shall be stamped and signed by a licensed MA Professional Engineer.

The Contractor shall be solely responsible for the safety of the workmen and the adjacent facilities from danger of caving and sliding. All work to be done shall be in strict accordance with the Department of Labor, Occupational Safety and Health Administration regulations and suggested practices for construction excavations and/or other applicable codes and regulations. Special precautions shall be taken to guard against any damage to or settlement of pavements, buildings, walls, pipes, ducts or other structures and facilities which are adjacent to the work.

The cost of providing and removing sheeting, shoring and bracing shall be included in the cost of the various Items of work under this Contract and no additional compensation will be allowed therefore.

## **WORK SCHEDULE**

Work on this project is restricted to a normal 8-hour day, 5-day week, 7:00 AM-3:30 PM. The time of 8 hour shift may be adjusted if approved by both the Engineer and the City in writing. If during scheduled operations traffic delays exceed 12 minutes the Contractor will be required to remove his equipment from the roadway and shall suspend his operation.

No EXISTING lanes should close during peak hours from 7 AM–9 AM and 4 PM–6 PM. The full width of roadway shall remain open outside of working hours.

No work shall be done on this contract on Saturdays, Sundays, or Holidays. The Engineer will not allow work the day before or the day after a long weekend, which involves a Holiday without prior approval.

The Contractor shall begin work on those portions of roadway so designated only after proper placement of necessary warning devices for the segment of roadway.

## **PRE-CONSTRUCTION CONFERENCE**

Following award of the Contract on a date to be announced, a pre-construction conference will be held at the Department's District Office in Worcester, MA. At that time, the Contractor will be required to submit a preliminary plan showing his schedule of operations and how he intends to provide uninterrupted flow of traffic through the area, delivery and storage of construction materials, equipment and construction parking. At least one week of notice must be given for the meeting, more notice is recommended for optimal attendance.

Present at the pre-construction conference will be representatives of municipal, State, Federal, City and other agencies; various utility companies, both public and private; and other parties involved with the Project. The Littleton Conservation Commission Agent shall be invited. The meeting will enable said representatives to apprise the Contractor regarding:

- A. Work to be performed by the Contractor including SWPPP activities, erosion control monitoring, and compliance with the Order of Conditions issued by the Littleton Conservation Commission.
- B. Work performed, being performed and to be performed by other Contractors, adjacent to and within the project limits.
- C. Work performed, being performed, and to be performed by various other agencies and utility companies.

The meeting will enable concerned parties to discuss scheduling of the work, potential problems, conflicts and impacts, and to promote a comprehensive understanding of the work to be performed, in order that full cooperation may be established and maintained between the Contractor and the various agencies and concerned parties, in accordance with Subsection 5.05, "Cooperation by Contractor", other relevant provisions of the Standard Specifications for Highways and Bridges, these Special Provisions and other contract documents.

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**PROSECUTION OF WORK AND PROVISIONS FOR TRAVEL**

(Supplementing Subsections 8.02, Schedule of Operations and 8.03, Prosecution of Work)

Before starting any work under this contract, the Contractor shall submit to the Engineer for approval a Schedule of Operations as provided in Section 8.02. The work schedule shall include a plan of his construction procedures and the safety measures he will use during the prosecution of the work as set forth in Section 850 of the Standard Specifications for Highways and Bridges.

The proposed safety measures shall include the temporary barricades, signs, cones, drums, safety fence and other safety and traffic control devices to be employed during each stage and time period of the work to maintain and protect traffic and access to abutting properties. These measures may also include removal and resetting of these devices.

As necessary and/or as directed by the Engineer, uniformed traffic police shall be employed for the protection and maintenance of traffic. Reasonable facilities shall be provided by the Contractor for the convenient and safe passage of pedestrians and vehicles through the project and also to and from properties abutting the site of improvement.

The Contractor shall schedule his operations to minimize interruption to the normal flow of traffic at all times during the period of time required for the completion of the work. Only one-half of the roadway may be closed to traffic at any given time unless directed by the Engineer.

Attention is further directed to the following provisions.

1. During working hours, bi-directional flow shall be maintained on all streets.
2. During other than working hours, all existing roadway surfaces shall remain available for vehicle travel.
3. Pedestrian access to all buildings shall be maintained at all times.
4. No detouring of traffic shall be allowed without written permission of the City. Trucks shall not be excluded from any detour roadway.
5. The Fire Department and Police Department shall be notified 48 hours prior to the start of any work that will affect the operations of their departments (e.g. the partial street closures, trenching, etc.).

Particular care should be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety. Traffic control and safety devices required only during working hour operations shall be removed at the end of each working day.

Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.

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## **OIL AND HAZARDOUS MATERIAL SPILL PREVENTION**

Measures must be taken by the Contractor to prevent spills and leaks of oils and other hazardous materials to the environment. Such measures include but are not limited to properly maintaining construction equipment, establishing fuel and hazardous material handling areas that are designed to prevent releases to the environment (include containment structures if needed), instructing personnel in proper waste handling procedures and strictly prohibiting disposal into drains, water ways or receptacles, such as dumpsters, designed for non-hazardous waste. Spills or leaks of oil or hazardous materials must be reported to the DEP in accordance with the reportable quantities and criteria for "spills" as designed by the DEP in 310 CMR 40.370. Notification to the Engineer and to DEP must be made as soon as possible, but not more than two (2) hours after a spill or leak occurs.

## **PREVENTION OF WATER POLLUTION - SANITARY PROVISIONS**

(Supplementing Subsection 7.02)

During the performance of all Work done under this contract, the Contractor shall adopt such precautions in the conduct of his operations as may be necessary to avoid contaminating water in adjacent streams, pond or channel areas. All moving of equipment and other operations likely to create silting, shall be so planned and conducted as to minimize pollution in adjacent streams, pond or channel areas. Water used for any purpose by the Contractor, which has been contaminated with soil, bitumen, salt or other pollutants shall be so discharged as to avoid affecting nearby waters. Under no circumstances shall the Contractor discharge pollutants directly into any stream or pond area.

When the Contractor uses water from natural sources for any of his operations, intake methods shall be such as to avoid contaminating the source of supply and maintain adequate downstream flow when the source is a stream.

## **EXCAVATION AND PATCHING OF CONDUIT TRENCHES IN PAVED SURFACES**

(Supplementing Subsection 801.60)

Whenever the existing pavement or sidewalk is to be disturbed, the existing surface shall be cut in neat true lines by mechanical means along the length of the trench, equally spaced from the center line of the trench and not more than one and one-half (1.50 ft) feet apart. The trench shall then be excavated, conduit placed and backfilled in accordance with MassDOT Specifications and Standard Drawings, to a compacted depth of one and one-half (1.5 in) inches below the existing surface to allow temporary patching to be flush with the existing surface. The trench will then be patched temporarily with one and one-half (1.5 in) inches of hot mix asphalt placed in one course, unless otherwise approved by the Engineer.

Permanent patching will not begin until, in the Engineer's judgment, final compaction and settlement of the trench area has taken place.

All abutting edges of existing pavement shall be painted with Bitumen (RS-1), immediately prior to placement of permanent patch. All trenches shall be maintained at all times from inception until final acceptance of the project.

Permanent patching shall be performed in accordance with the details shown on the plans.

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## **CONSTRUCTION PHASING - FOSTER STREET PAVEMENT RECONSTRUCTION**

Only suitable excavated sub-base material shall be retained for reuse for new base if testing can meet MassDOT material specifications for use as roadway sub-base as reclaimed pavement borrow. Unsuitable sub-base material shall be hauled off-site and disposed of. After the Contractor has removed the existing pavement on Foster Street he/she shall verify that previous utility trenches are thoroughly compacted with conforming materials. New material including dense graded crushed stone and gravel borrow will be brought in for the new sub-base. The new sub-base will be fine-graded and compacted to the proposed roadway profile.

It is important that the granular surface be exposed to traffic/weather for as short a period of time as possible. All drainage work and other subsurface repairs should be completed prior to the removal of pavement.

The Contractor shall refer to the Temporary Traffic Control Plans on sheet numbers 51-56 of the Contract plans. This phasing shall be strictly adhered to. The Contractor shall submit a work plan showing conformance to the proposed pavement removal operations prior to any removal of existing pavement on Foster Street. The Contractor may propose an alternative plan if the safety and convenience to the public is not compromised. Approval of this traffic management plan shall be at the sole discretion of the Town of Littleton DPW and MassDOT.

## **MAINTENANCE AND CLEANING OF ROADS**

Existing roadways intended to be used for hauling earth and rock excavated materials shall be cleaned and maintained by the Contractor during the length of the Project. The Contractor shall be responsible for providing street sweepers and operators for sweeping of haul road paved surfaces. Sweeping services shall be provided on an hourly basis at the discretion of Engineer. Street sweepers shall be self-propelled, diesel powered units with brushes and a water spray, less than three years old. The Contractor shall remove debris from the work area and deposit sweepings at locations as directed by the Engineer. The Contractor shall also be responsible for repairing roadways and bridges damaged by construction vehicles. Compensation for maintenance and cleaning of roads will not be paid for separately but shall be considered incidental to the work.

## **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 **#204-0991**.

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## **ENVIRONMENTAL PERMITTING**

The Contractor is advised that if field conditions and/or Contractor-suggested methodologies warrant either amending or obtaining environmental permits, the Contractor must notify the Resident Engineer prior to commencement of the proposed activity. A MassDOT District 3 Environmental Engineer will coordinate all contact with local, state or federal environmental agencies. The Contractor is further advised that all schedule delays as a result of filing for and obtaining or modifying permits are not subject to a claim. The Contractor may also be required to submit additional information and plans with respect to proposed work subject to environmental regulations.

### **Pre-Construction Meeting**

Order C-1 stipulates that The Littleton Conservation Agent (978)540-2428 shall be given at least one week's notice and an invitation to attend the Pre-Construction Meeting and that the person designated by the Contractor to inspect and report on material stockpiling and erosion controls be present at the meeting.

### **Littleton Conservation Commission: Order of Conditions (Document A00861)**

This project is subject to the Massachusetts General laws, Chapter 131, Section 40 as amended, and has been issued an Order of Conditions ("Order") by the Littleton Conservation Commission. The Order and Notice of Intent are to be considered part of this contract and a copy of the Order and all plans/attachments shall be on-site while activities regulated by the Order are being performed. The Contractor is hereby notified that they will be responsible and held accountable for performing any/all work necessary to satisfy and comply with the entire Order and Notice of Intent. Arrangements to view the Notice of Intent in-person can be made by calling the Littleton Conservation Commission at (978)540-2428. If the Contractor wishes to obtain physical copies of the NOI, they shall do so at their own expense. The Contractor is advised that no additional compensation will be allowed for work required to establish, achieve, and maintain compliance with the Order, as payment for the work shall be included in the respective bid Items, unless specified elsewhere.

### **Tree Plantings**

Per Order C-20 a list of the proposed tree plantings shall be provided to the Engineer and Conservation Agent before purchase. The Contractor's attention is called to the three mitigation conditions included in the Order, M-1 through M-3, describing replacement tree monitoring, reporting, and the target survivorship rate.

### **Wetland Flagging**

The Contractor shall be responsible for refreshing and maintaining the flagging the boundaries of all wetlands as shown on the plans in the vicinity of the work areas be marked by wooden stakes or flagging. Once in place, the wetland boundary shall be maintained by the Contractor until a Certificate of Compliance has been issued by the Conservation Commission.

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## **FINE TUNING, ADJUSTMENT AND TESTING PERIOD**

After the Contractor has finished installing the signal equipment at all intersections and after the Contractor has set the signal equipment to operate as specified in the contract documents, the fine tuning, adjusting and testing period shall begin. The Contractor shall advise the Engineer, City and Department in writing of the date of the beginning of the fine-tuning and testing period. During this period, the Contractor, under the direction of the Engineer will make necessary adjustments and tests to ensure safe and efficient operation of the equipment. This period shall not be less than 30 days. The contract completion date shall take this testing period into consideration. No request for final acceptance will be considered until successful completion of the testing period.

## **FINAL INSPECTION AND ACCEPTANCE**

Upon successful completion of the 30-day testing period wherein the street lighting and railroad crossing gate and RRFB beacon installation has operated for 30 days without failure, the Contractor shall notify the Engineer. The Engineer will make a final inspection of the installation in the presence of the Department, the Town and the Contractor. An inspection check will be made to insure that all equipment, materials, installation and operations are in accordance with the construction contract, plans and specifications. Items to be checked will include, but not be limited to luminaires, fixtures, conduit, hand holes, signs, and pavement markings, and street hardware (posts, bases, housings, mast arms, brackets, pull boxes, etc.).

The Engineer will notify the Contractor in writing of any Items in which the inspection reveals that the work is incomplete, defective, or does not otherwise meet the project specifications. The Contractor shall perform the corrective actions necessary to achieve final acceptance by the City. These corrective actions shall be done by and at the expense of the Contractor, and within 15 days of the date of the inspection report, unless otherwise approved in writing by the Department.

## **PUBLIC SAFETY AND CONVENIENCE**

(Supplementing Subsection 7.09, Public Safety and Convenience)

The Contractor shall be required without additional compensation to provide safe and convenient access to all abutters during the prosecution of the work. Necessary access for fire apparatus and other Emergency vehicles shall be maintained at all times. The Contractor shall pay particular attention to the project's Transportation Management Plan, which shall be detailed and followed relative to construction work staging and safe maintenance of traffic.

Drainage structures shall not be constructed until the required castings are at the project location. The castings shall be installed immediately after completion of the structures and the drainage structures at no time shall be left unprotected during the construction.

Sweeping and cleaning of surfaces beyond the limits of the project caused by vehicular tracking of materials during the various phases of the work shall be considered as incidental to the work being performed under the Contract and there will be no additional compensation.



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## **PROTECTION OF UTILITIES AND PROPERTY**

(Supplementing Subsection 7.13, Protection and Restoration of Property)

The Contractor, in constructing or installing facilities alongside or near sanitary sewers, storm drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls or other structures, shall, at his expense, sustain them securely in place, cooperating with the officers and agents of the various utility companies and municipal departments which control them, so that the services of these structures shall be maintained. He shall also be responsible for the repair or replacement, at his own expense, of any damage to such structures caused by his acts or neglect, and shall leave them in the same condition as they existed prior to the commencement of work.

In case of damage to utilities, the Contractor shall promptly notify the Owner and shall, if requested by the Engineer, furnish laborers to work temporarily under the Owner's direction in providing access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the utility company that suffers the loss. The cost of such repairs shall be borne by the Contractor, without compensation therefore.

If, as the work progresses, it is found that any of the utility structures are so placed as to render it impracticable in the judgment of the Engineer, to do the work called for under this Contract, the Contractor shall protect and maintain the services in such utilities and structures and the Department will, as soon thereafter as it reasonably can, cause the position of the utilities to be changed or take such other action as it deems suitable and proper.

If live service connections are to be interrupted by excavation of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall also be plugged off or otherwise made secure by the utility company involved.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in protecting or repairing property as specified in this section shall be considered as included in the prices paid for the various contract Items of work and no additional compensation will be allowed therefore.

## **MBTA FLAGGING**

The Contractor shall provide a minimum two week notice for flagging support for MBTA bridges and railroads. This applies only to bridges and railroads operated by Keolis Commuter Services (KCS). This two week notice does not apply to Emergency work, only to routine or scheduled work activities. The contact person for advance request for flagging services is Rich Arnold, MBTA Railroad Operations Department, Phone number (617)-222-3635, email address: [rarnold@mbta.com](mailto:rarnold@mbta.com).

## **MBTA COMMUTER RAIL**

Keolis Commuter Service (KCS) operates the commuter rail for the MBTA. All references to MBTA in the provisions will mean Keolis Commuter Service (KCS).

## **MBTA RAILROAD COORDINATION / ACCESS TO MBTA PROPERTY**

The Contractor shall be required to coordinate the work of this Contract with the MBTA and Keolis Commuter Services Co. (“KCS”) through the MassDOT Resident Engineer and MassDOT designated Field Staff. A majority of the prerequisites for the Contractor to perform work on or adjacent to MBTA transit lines may be found in the “MBTA Special Instructions” provided herein. The Contractor shall be required to comply with the all applicable requirements of the latest edition of the MBTA Special Instructions available at the time of Contract Award.

The Contractor will have to perform construction related activities on, over, under, within or adjacent to railroad property owned or controlled by the MBTA. Any work that will affect Commuter Rail operations, involve work on, over, under, within or adjacent to the commuter rail right of way must be coordinated with MBTA Railroad Operations and KCS and shall comply with the latest version of the MBTA Railroad Operations Directorate.

An owner or Contractor who wishes permission to enter upon or perform work over, on, under or adjacent to MBTA property shall submit to the offices of the MBTA’s designated representative, a request in writing, a minimum of forty-two (42) days prior to the owner or the Contractor’s planned commencement of any of the above stated activities.

## **MBTA COORDINATION – SUBSTITUTE BUSING**

Substitute bus transportation will be required for weekend MBTA Commuter Rail shutdowns. The Contractor must coordinate with MBTA Operations Department for provision of bus service. The Contractor shall contact MBTA Operations Dept. a minimum of 6 weeks prior to any planned rail shutdown. The MBTA will be responsible for planning, procuring, and administering the necessary substitute bus transportation services and operations based on the Contractor’s approved work schedule.

Prime Contact:  
Eric Ciborowski  
32 Cobble Hill Road  
Somerville, MA 02143  
617-634-2567  
[ECIBOROWSKI@MBTA.com](mailto:ECIBOROWSKI@MBTA.com)

Secondary Contact:  
Delrico Gomes  
32 Cobble Hill Road  
Somerville, MA 02143  
857-366-0404  
[DGOMES@MBTA.COM](mailto:DGOMES@MBTA.COM)

The Contractor shall be required to attend the MBTA Weekly Track Outage Schedule Coordination Meetings held Wednesdays at 10:00 am at 32 Cobble Hill Road in the small classroom located in the training area at the rear of the building.

## **NORTHERN LONG-EARED BAT PROTECTION**

The U.S. Fish and Wildlife Service (USFWS) has listed the northern long-eared bat (NLEB) as endangered under the Endangered Species Act (ESA) and the following requirements exist to protect the bat and its habitat. This project has been consulted with the USFWS through the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA) Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat revised February 5, 2018.

On July 10-15, 2022, Tetra Tech, 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 2022 survey guidelines. The survey did not detect northern long-eared bat, and as stated within the survey guidelines, the survey is valid for five years. Due to the 5-year validity of the negative presence/absence survey, it is recommended that the Contractor conduct all activities that could result in stressors to the bats such as tree removal/trimming, bridge and/or structure removal/maintenance, lighting, or use of percussive, by July 10, 2027. 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 A00872). 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.

## **HOLIDAY WORK RESTRICTIONS**

(Supplementing Subsection 7.09)

The District Highway Director (DHD) may authorize work to continue during these specified time periods if it is determined by the District that the work will not negatively impact the traveling public. DHD may allow work in those areas on a case by case basis and where work is behind barrier and will not impact traffic

Below are the holiday work restrictions:

### New Years Day (Federal Holiday)

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

### Martin Luther King's Birthday (Federal Holiday)

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

### President's Day (Federal Holiday)

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

### Evacuation Day (Suffolk County State Holiday)

No work restrictions due to traffic concerns.

### Patriot's Day (State Holiday)

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

### Mother's Day

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

### Memorial Day (Federal Holiday)

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

## **HOLIDAY WORK RESTRICTIONS** (Continued)

### 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.

### 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.

## **NOTICE TO OWNERS OF UTILITIES**

(Supplementing Subsection 7.13)

Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of publicly or privately owned utilities of his/her intention to commence operations affecting such utilities at least one week in advance of the commencement of such operations. The Contractor shall, at that time, submit a copy of such notice with the Engineer.

Before the Contractor begins any work or operation that might damage subsurface structures, he/she shall carefully locate all such structures and conduct his operations so as to avoid any damage to them.

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 3

Select the Town of LITTLETON and then locate the utility

The utility contact list is for guidance only and is not guaranteed to be complete or up to date.

### **Notification Of Public Officials**

Town officials are shown at website <https://www.mass.gov/lists/massachusetts-cities-and-towns> and select the required City/Town website.

State Police are shown at website <https://www.mass.gov/info-details/massachusetts-state-police-troop-boundaries>. Select the area of jurisdiction to find the local station.

The Contractor shall inform the following officials in each area that he is assigned to work in:

Superintendent, Department of Public Works, or Town Engineer. Superintendent, Water Department, Superintendent, Sewer Departments. Police Department, Fire Department, Electric Company, Railroads.

The Contractor shall make his own investigation to assure that no damage to existing structures, rainage lines, traffic signal conduits, and other utilities will occur as a result of construction operations.

**NOTICE TO OWNERS OF UTILITIES** (Continued)**LITTLETON - Pole Data**

<u>Municipality</u>	<u>Pole Set Responsibility</u>	<u>Updated</u>
LITTLETON	Littleton Electric Light	2/21/2008

**District Utility/Constructability Engineer**

<u>County</u>	<u>District</u>	<u>Contact</u>	<u>Phone</u>	<u>Email</u>
Middlesex	3	Ross Goodale	857-368-3204	Ross.A.Goodale@dot.state.ma.us

**Utility Data****Electric**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Littleton Electric Light Water Dept.	&39 Ayer Road-PO Box 2406	Littleton	MA	01460	3/24/2011

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Pat Laverty	978-540-2222		plaverty@lelwd.com11/17/2020

**Gas**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
National Grid Gas	170 Data Dr	Waltham	MA	02451	12/19/2023

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Melissa Owens	781-907-2845		Melissa.Owens@nationalgrid.com9/4/2012

**Telephone**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Verizon	385 Myles Standish Blvd.	Taunton	MA	02780	11/8/2013

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Karen Mealey	774-409-3160		karen.m.mealey@verizon.com8/29/2012

**Water**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Littleton Electric Light Water Dept.	&39 Ayer Road-PO Box 2406	Littleton	MA	01460	3/24/2011

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Savas Danos	978-540-2222		3/19/2012

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

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
None					

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
No Sewer			4/13/2009

**Railroad**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
MBTADocument Group	Control500 Arborway	Boston	MA	02130	4/16/2020

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Connor Campbell			ccampbell12@mbta.com2/27/2023

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
CSX Transportation	2000 West Cabot Blvd - Suite 130	Langhorne	PA	19047	5/31/2023

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Michael Sliper			Michael_Sliper@csx.com5/31/2023

**Cable**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Comcast Cable Corporation	PO Box 6505, 5 Omni Way	Chelmsford	MA	01824	8/8/2018

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Wendy Brown	978-848-5163		Wendy_Brown@comcast.com7/13/2023

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
AT&T / Communications America, c/o Siena Engineering Group	Teleport50 Mall Road - Suite 203	Burlington	MA	01803	4/15/2014

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Erica Hudson	781-221-8400	7041	erica.hudson@sienaEngineeringgroup.com7/18/2023

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Lumen	1025 Eldorado Blvd.	Broomfield	CO	80021	9/18/2020

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Renoy Thomas	516-712-3041		relocations@lumen.com9/18/2020

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Crown Castle	80 Central Street	Boxborough	MA	01719	1/18/2018



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

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Mark Bonanno	508 616 7818		mark.bonanno@crowncastle.com7/17/2018

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
MCI-Verizon Business	P.O. Box 600	Charlton	MA	01507	2/22/2017

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Stephen Parretti	508-248-1305		stephen.parretti@verizon.com2/3/2023

**Fire Alarm**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Littleton Fire Department	20 Foster Street	Littleton	MA	01460	

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Keith Dunn	978-952-2302		3/19/2012

**DPW**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Littleton Hwy. Dept.	PO Box 1305	Littleton	MA	01460	3/16/2010

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Jim Clyde	978-540-2670		3/19/2012

**Other**

<u>Company</u>	<u>Address</u>	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Updated</u>
Verizon Wireless Small Cell	20 Alexander Drive	Wallingford	CT	06492	10/27/2022

<u>Contact</u>	<u>Office</u>	<u>Extension</u>	<u>Email</u>
Liz Glidden			elizabeth.glidden@verizonwireless.com10/24/2022

The Contractor shall notify "Mass. DIG SAFE" and procure a DIG SAFE number for each location prior to disturbing existing ground in any way.

"DIG-SAFE" Call Center: Tel: 1-888-344-7233

The Contractor will cooperate fully with all utility companies private or public, and will notify all such companies at least seventy-two (72) hours prior to excavating in the vicinity of any utility. It is understood that the Contractor has considered in his bid the existence of the various utilities and that no additional compensation will be allowed for any delays, inconvenience, or damage sustained by him due to any interference by said utilities.

At locations where the proposed drainage crosses the existing gas mains care should be taken during excavation to avoid undermining or damaging the existing gas mains. If the existing gas main is required to be undermined, the Contractor shall keep the trench width to a minimum and provide in-place support to gas mains as approved by the representative of the utility or as directed by the Engineer.

## **COORDINATION WITH NATIONAL GRID**

The Contractor shall call National Grid Damage Prevention – Meghan Kelley (339)-203-0490 two weeks prior to planned work near National Grid’s underground utilities. National Grid’s general guidelines for working around gas utilities are appended to this document. To report any damage to a gas line, call National Grid at 1-800-233-5325 immediately.

The Contractor is responsible for the following policies described in NATIONAL GRID – GENERAL GUIDELINES FOR WORKING AROUND GAS UTILITIES & DAMAGE PREVENTION – DOCUMENTS #01003 & #01011 for working near underground utilities (MassDOT Document A00807):

- 1.) “General Guidelines for Working Around Gas Utilities”
- 2.) “DAM01011: Excavation and Excavation Notification Requirements for Underground Facilities”
- 3.) “DAM01003: Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities”

All test pit excavation for this project shall be performed according to the Special Provision found in Item 141.101, Test Pit for Exploration-Vacuum Truck.

## **COORDINATION WITH MBTA/KEOLIS**

The plans do not call for work located directly on or within the MBTA Commuter Rail Tracks, however work is shown on the plans located on MBTA property adjacent to the active commuter rail track at-grade crossing on Foster Street. The Contractor is responsible for ensuring compliance with any MBTA/Keolis standard policies for safe work zones located near an active rail line.

Within 30 days of contract award, the Contractor shall contact the MBTA notifying them of the planned construction work and proposed construction schedule. The Contractor shall keep MBTA updated monthly or at the frequency requested by MBTA as to construction activities and schedule. The Contractor shall coordinate with Keolis through MBTA. Both the Keolis track signal group and the Keolis electrical/power supply group shall be coordinated with through MBTA. Any interruption in power supply near the rail road track crossing must be coordinated 60 days in advance with MBTA/Keolis.

Utility work to be performed by MBTA/Keolis includes but is not limited to the following:

Removing and resetting signal crossing gates and installing wiring, foundation, and structure of new signal crossing gate(s). The Contractor is limited to installing new underground conduit only for a relocated signal crossing gate as shown on the plans.

## **NATIONAL GRID EMERGENCY TELEPHONE NUMBERS**

### **GAS:**

Emergency: 1-800-233-5325

New Service: 1- 877-696-4743

Customer Support: 1-800-732-3400

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## **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.

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**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.

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**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.



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**COMPLIANCE WITH THE NATIONAL DEFENSE AUTHORIZATION ACT**

(Supplementing Subsection 7.01)

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

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

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

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

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

**BIDDERS LIST**

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

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

**BUILD AMERICA BUY AMERICA PREFERENCE**

On Federally-aid projects the Buy America (23.CFR § 635.410) and Build America, Buy America Act (Pub. L. No. 117-58, §§ 70901-52). requires the following,

- (1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, must occur in the United States. Foreign steel and iron can be used if the cost of the materials does not exceed 0.1% of the total Contract cost or \$2,500, whichever is greater. The action of applying a coating to a covered material (i.e., steel and iron) is deemed a manufacturing process subject to Buy America. Coating includes epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of a material subject to requirements of Build America, Buy America. Steel used for temporary support of excavation, including H piles, soldier piles, and sheeting when the steel is required to be left in place is subject to requirements of Build America, Buy America. Temporary steel, shall remain in place when it falls within the influence zone of the soil supporting any structure or railroad tracks.
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and
- (3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. “Construction materials” includes an article, material, or supply—other than an Item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of:
  - non-ferrous metals,
  - plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables),
  - glass (including optic glass),
  - lumber; or
  - drywall.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

**NOTE:** The requirements for manufactured products indicated in paragraph (2) above are not in effect for this contract.

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## **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.

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**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.

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**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.

**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.

**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

**SECTION 722** (Continued)

**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

**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 Subsection 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.

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**SECTION 722** (Continued)**B. Scheduler Requirements**

For all schedule types, if the Contractor plans to use outside scheduling services, the scheduler shall be approved as a Sub-Contractor 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.

**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.



**SECTION 722** (Continued)**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.

**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

**SECTION 722** (Continued)

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. Sub-Contractor 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
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 punch list 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 Subsection 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.

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**SECTION 722** (Continued)**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.

**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.

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**SECTION 722** (Continued)**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.

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.

**SECTION 722** (Continued)

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.
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.

**SECTION 722** (Continued)

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.

**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;

**SECTION 722** (Continued)

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.

**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 high-lighted 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.

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**SECTION 722** (Continued)**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.

**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.



**SECTION 722** (Continued)**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.

**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.

**SECTION 722** (Continued)**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.

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 Sub-sections 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 102.001****TREE TRIMMING CREW****HOUR**

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

The purpose of this Item is to provide final tree work separate from and in addition to clearing and operations for construction of the path. Work under this Item shall occur after installation of the path pavement. The work to be performed under this Item shall consist of trimming/pruning trees not paid for separately and shall include the removal of hanging or downed trees/limbs which pose a risk to the path user as required by the Engineer or MassDOT Landscape Architect before the project work is complete and turned over to the municipality.

**SUBMITTALS**

All work performed under this Item shall be supervised by a Massachusetts Certified Arborist, International Society of Arboriculture Tree Worker, or equivalent, with proof of certification submitted to the Engineer prior to the commencement of work.

**METHODS**

All pruning and tree work shall be in conformance with the most current version of the American National Standards Institute (ANSI) Standard Z-133.1 and A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance.

The Contractor or certified arborist shall conduct a site walk-through with the representative of MassDOT Landscaping Section prior to the start of tree trimming work to establish final approval of tree trimming crew work area limits.

All cut trees/limbs shall be flush cut at their base or trunk and removed from the road or path limits unless otherwise directed. All wood chip material shall be removed from the site and disposed per the Standard Specifications, unless otherwise directed by the Engineer.

The minimum tree trimming crew shall consist of the following: a supervisor and two tree-trimmers/laborers. The crew shall be equipped with all necessary equipment needed to complete the work including, powered lift equipment/tree truck, pickup trucks, chippers, gas powered chain saws, hand saws, pole saws, brush cutters, loppers, shears, pruners, branch trimmers, ladders, tree-climbing equipment, shovels, dump vehicle with attached box container, log truck, etc.

**METHOD OF MEASUREMENT**

Item 102.001 will be measured for payment by the HOUR for a tree trimming crew totaling three workers including a certified arborist and two laborers. Time shall be measured as time spent on the project doing actual tree trimming work by the tree trimming crew and shall NOT include travel time to and from the Contractor's place of business.

**BASIS OF PAYMENT**

Item 102.001 will be paid for at the Contract unit price per HOUR, which price shall include all labor, materials, equipment, the offsite transport and disposal of cut trees limbs or other vegetation, the cost of all arrangements and methods required to protect from harm all existing overhead or underground installations, and all incidental costs required to complete the work.

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

This Item consists of providing a map and documentation of existing invasive plant species in the project limits to serve as a record in the event that invasive species appear on site during construction. This Item does not include the creation of an invasive plant species treatment strategy or removal plan. The map and documentation of existing plant species shall be submitted for review and approval.

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.

The individual performing the work must demonstrate expertise with invasive plant identification and submit qualifications as described below.

**QUALIFICATIONS**

Individual shall be from the same company as that providing services for Item 102.3 Herbicide Treatment of Invasive Plants and shall submit the following, if not submitted under Item 102.3:

- 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.

**SUBMITTALS****Hourly Work Breakdown**

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, creation of a map of existing invasive plant species.

**Map of Existing Invasive Plant Species**

The map of existing plant species shall be completed in coordination with the Roadway Contractor and the Engineer and shall include the following as appropriate to the project:

**I. Map and Description of Existing 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 (i.e., population extends off ROW, small population and eradication deemed feasible if necessary within contract schedule, etc.).

**II. Photo Documentation**

- a. Electronic copies of digital photos with date and time verification shall be provided with the existing conditions map.



**ITEM 102.33** (Continued)**METHODS****Initial Site Walk**

A minimum of 30 days prior to any construction activities and soil disturbance, the individual performing the work shall walk the site with the Contractor, the Engineer and the MassDOT Landscape Architect. During the site walk, the Contractor shall identify limits of work and, as necessary, mark locations of areas designated for clearing and grubbing and individual plants targeted for removal. The Contractor shall be responsible for marking delineated areas and plants to be preserved or removed. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item. The individual performing the work under Item 102.33 shall identify, make a written record or sketch of, and photograph existing invasive plant species.

**IPMS Follow-up Amendment**

The IPMS may be amended via a task amendment with the Contractor to address additional concerns or adjust to conditions if required by the MassDOT Landscape Architect. 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 a follow-up task amendment is executed, and if required by the MassDOT Landscape Architect and Engineer, an Interim Site Monitoring and an accompanying report shall be conducted.

**Final Inspection**

If a follow-up task amendment is executed, and if required by the MassDOT Landscape Architect and Engineer, a final inspection and report documenting the status of the invasive plants 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-construction conditions, notations on a plan or aerial image of the project area, a written summary of changes to invasive plant locations and populations before and after construction.

**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.

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**ITEM 102.511      TREE PROTECTION – ARMORING AND PRUNING      EACH**

The work under this Item shall conform to the relevant provisions of Subsection 771 and shall be for furnishing and installing temporary tree trunk protection and for minor limb pruning or removal of lower tree limbs to prevent injury to the tree from construction equipment and activities.

Trunk armoring is for instances where construction activity (the use of heavy equipment) comes close enough to potentially damage the tree trunk or limbs. It is to be used where shown on the plans and as required by the Engineer.

**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.

**MATERIALS**

Trunk armoring shall be such that it prevents damage to the trunk from construction equipment. Selected material shall be such that installation and removal will not damage the trunk.

Acceptable materials include 2x4 wood cladding with wire or metal strapping, or, for instances when duration of construction activities is less than three months, corrugated plastic pipe mounted with duct tape. Height of cladding shall be from base of tree (including root flare) to the bottom of the first branch, eight feet above the ground, or as required by the Engineer. Material and methods shall be approved by the Engineer.

Other materials or methods may be acceptable if approved by MassDOT Landscape Design or by an Arborist (if included in the contract).

**METHODS OF WORK**

Prior to construction activities, the Engineer, the Contractor, the Town Tree Warden, and the Arborist (if included in the contract), shall review trees noted on the plans to be protected. Final decision as to trees armored and/or pruned shall be per the Engineer.

Care shall be taken to avoid damage to the bark during installation and removal of armoring. Trunk armoring shall be replaced and maintained such that it is effective for as long as required and shall be removed immediately upon completion of work activities adjacent to trees.

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

**ITEM 102.511** (Continued)**DAMAGES**

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.

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.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 102.511 will be measured and paid at the contract unit price per EACH. This price shall be full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract.

In the event of tree damage, the cost of Arborist services, of remediation measures, and/or tree removal will be borne by the Contractor.

Payment under this Item will be scheduled throughout the length of contract:

40% of value shall be paid upon installation of trunk armoring and completion of pruning work, if required.

60% shall be paid at the end of construction operations that would damage the tree and after protection materials have been removed and properly disposed of by the Contractor. In the event of repairable damages, payment shall be made after the completion of remediation measures.

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

**ITEM 102.513****AIR EXCAVATION AND ROOT PRUNING****FOOT**

Item 102.513 Air Excavation And Root Pruning is for the services of excavating soil with an air pressure tool in order to expose tree roots, and for associated services and materials necessary to complete the work of pruning, backfilling with existing soil, watering, mulching, and fertilizing. This Item shall include the furnishing and operating the air excavating tool.

Associated Item: All references to Arborist herein shall refer to the Arborist under Item 102.55 Arborist. Arborist shall meet the requirements as specified under that Item and shall be compensated under that Item.

Trees to be air spaded shall be those shown on the plans and/or as determined necessary by the Engineer per the recommendations of the Arborist.

**REFERENCES**

The standards from American National Standards Institute (ANSI): A300 (Part 8)-2013 Root Management with special attention to Section 84 shall apply to this work. If requested, the Contractor shall provide to the Engineer one copy of this reference. Provision of reference shall be incidental to this Item.

**METHODS**

Air excavation and pruning work shall be performed by or overseen by the Arborist.

Air excavation of soil and root pruning shall occur any time prior to equipment work within the root zone of marked trees.

Air excavation shall be done along the limit of proposed excavation. Trench shall be of sufficient width to observe and cut roots and shall be to the depth of proposed excavation. Immediately following air excavation, roots shall be pruned.

Following pruning, roots shall immediately be fully covered with backfill and immediately watered. Roots shall continue to be watered and fertilized as directed by the Arborist.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 102.513 will be measured and paid per FOOT where air spading, pruning, watering, and fertilizing are performed. This Item will include full compensation for all labor, equipment, materials, and incidentals required for the satisfactory completion of the work.

Arborist services shall be as per Item 102.55, Arborist and be compensated under that Item.

**ITEM 102.533**

**TREE CARE - WATERING**

**GALLON**

The work under this Item shall conform to the relevant provisions of Subsections 440 and 771 of the Standard Specifications and the following:

The purpose of this Item is to provide watering for tree care during and after root pruning as directed by the Arborist. Watering shall occur during daytime hours only.

**MATERIAL**

The water to be used shall be water from an approved source.

**SUBMITTALS**

Schedule for watering shall be determined in consultation with the arborist. Expected schedule shall be submitted to the Engineer. Source of the water shall be approved by the Engineer and included in the submittal.

Contractor shall submit metered record of water used or other measure approved by the Engineer. The Record must show date of watering and quantity used.

**METHODS**

At least one day prior to watering on site, the Contractor shall notify the Engineer.

Watering equipment shall be approved by the Engineer prior to watering under this Item. Equipment shall be such that there is no water leaking from the tank, hoses, or any other parts. Water shall be pumped and have a minimum flow of 95 PSI. Gravity fed watering shall not be accepted under this Item.

If water runs off root zone area due to slope, too high a flow rate, slow infiltration, or any other reason, water will not be approved for payment.

The Watering method shall not damage plants or seeded areas or cause erosion.

All damages shall be repaired at the Contractor's expense.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 102.533, Tree Care - Watering shall be measured for payment by the GALLON and shall be based on the submittals described herein.

Item 102.533, Tree Care - Watering will be paid at the Contract unit price per GALLON, which price shall be full compensation for all labor equipment, materials and incidental costs required to complete the work.

**ITEM 102.55****ARBORIST****HOUR****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 required 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
  - review and modify, if necessary, tree protection measures shown on the drawings
  - submit a marked-up Construction Plan that briefly notes recommendations and decisions made in the field;
- 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
- Special Care
  - Determine and recommend the need for tree pruning for health and aesthetics
  - Determine and recommend the need for fertilization
  - Determine and recommend the need for watering

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

**METHOD OF MEASUREMENT**

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

**BASIS OF PAYMENT**

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

The Arborist's time performing work separately under the following Items shall be paid for separately under that Item.

Item 102.001 Tree Trimming Crew

Item 102.33, Invasive Plant Management Strategy

Item 102.511 Tree Protection - Armoring and Pruning,

Item 102.513 Tree Protection - Air Excavation and Root Pruning,

Item 102.533 Tree Care - Watering

Item 755.86, Seasonal Tree Monitoring Report

**ITEM 129.2****OLD PAVEMENT EXCAVATION****SQUARE YARD**

The Work under this Item shall conform to the relevant provisions of Subsections 120 & 415 of the Standard Specifications and the following:

This Item includes the removal of existing asphalt pavement as shown on the drawings and as specified herein. The work area shall include the existing curb to curb width of Foster Street, Grimes Lane and other miscellaneous asphalt pavement excavation per the plans that may be encountered during the course of the work within the roadway only. The Contractor shall only remove pavement a maximum of 900' segment lengths at a time so as to limit disruption to traffic operations at the two major intersections simultaneously.

Existing pavement is to be excavated by milling. Only suitable excavated sub-base material shall be retained for reuse if testing can meet MassDOT material specifications for use as roadway sub-base as reclaimed pavement borrow. Non-suitable material shall be removed and discarded off-site. New material including dense graded crushed stone and gravel borrow will be brought in to complete the proposed subbase per the pavement design in the plans.

Work shall include the removal of the existing asphalt pavement surface to its full depth (varying from 4" to 6" on Foster Street). All excavated material shall become the property of the Contractor and shall be removed from the site and disposed of legally.

**METHOD OF MEASUREMENT**

Item 129.2, Old Pavement Excavation will be measured for payment per the actual quantity of SQUARE YARDS of material excavated.

**BASIS OF PAYMENT**

Item 129.2, Old Pavement Excavation will be paid at the contract unit price per SQUARE YARD, which price shall be considered full compensation for all labor, material and equipment, the removal and disposal of unwanted material, stockpiling and transporting of the material suitable to be reused as sub-base, and any incidental Items needed to complete the work.

Removal of residential driveways/aprons shall be paid for separately under Item 120.



**ITEM 141.101      TEST PIT FOR EXPLORATION-VACUUM TRUCK      CUBIC YARD**

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

Test pits shall be excavated as shown on the plans and as directed by the Engineer. The Contractor shall take special care during the excavation to avoid damage to any existing structure, conduit, or utility service main.

**METHODS**

Item 141.101 shall be performed with a vacuum excavator truck for the purpose of minimizing the risk of accidental damage to underground utilities including a high-pressure gas main in the project limits. Hand excavation may be required in some locations to ensure no damage to surrounding utilities.

**METHOD OF MEASUREMENT**

Item 141.101 will be measured for payment per CUBIC YARD of material excavated.

**BASIS OF PAYMENT**

Item 141.101 will be paid for at the contract unit price per CUBIC YARD, which price shall be full compensation for all excavation (including hand excavation).

The contract unit price shall include all backfilling when the materials are obtained from excavation, all clearing and grubbing (except as may be otherwise provided on the plans or in the Specifications), disposal of surplus material, and the furnishing of all equipment, tools, storage, labor and incidentals required to complete the work.

Backfilling when not obtained from excavation performed for Item 141.101 will be paid separately at the contract unit price for the type of material used.

**ITEM 141.2****TEST PIT FOR GROUNDWATER****CUBIC YARD**

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

Test pits shall be excavated at the locations shown on the plans for Item 205.01, Leaching Basin to determine if groundwater elevation is suitable prior to ordering of the structure. The Contractor shall take special care during the excavation to avoid damage to any existing structure, conduit, or utility service main.

**SUBMITTALS**

The Contractor shall submit the credentials of a licensed soil evaluator in Massachusetts and a written description of the ground water elevation test method to the design Engineer for approval prior to the commencement of the test.

The licensed soil evaluator shall submit the test results of the determined groundwater elevation in a brief technical memo for submittal to the design Engineer.

**METHODS**

Item 141.2 shall be performed with a vacuum excavator truck for the purpose of minimizing the risk of accidental damage to underground utilities including a high-pressure gas main in the project limits. Hand excavation may be required in some locations to ensure no damage to surrounding utilities.

The ground water elevation tests shall be performed at the locations shown on the plans for installation of Item 205.01 Leaching Basin. The groundwater elevation test shall be performed by a licensed soil evaluator in Massachusetts. The licensed soil evaluator shall prepare the test results in a brief technical memo for submittal to the design Engineer. The design Engineer will review the ground water test elevation results and determine if the location shown on the plans is suitable for installation of Item 205.01 Leaching Basin. If the groundwater test results are suitable, the design Engineer will give authorization to proceed with ordering of the Leaching Basin structure. If the groundwater test results are not suitable, the design Engineer will provide an alternate location for an additional test pit for groundwater.

**METHOD OF MEASUREMENT**

Item 141.2, Test Pit For Groundwater will be measured for payment per CUBIC YARD of material excavated and approved by the Engineer.

**BASIS OF PAYMENT**

Item 141.2, Test Pit For Groundwater will be paid at the contract unit price per CUBIC YARD, which price shall be full compensation for all excavation (including hand excavation). The unit price shall include all backfilling when the materials are obtained from excavation, all clearing and grubbing (except as may be otherwise already provided on the plans), disposal of surplus material, and the furnishing of all equipment, tools, storage, labor and work incidental thereto.

Backfilling when not obtained from excavation performed for Item 141.2 will be paid for separately at the contract unit price for the type of material used.

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**ITEM 153.01      CONTROLLED DENSITY FILL FOR WATER MAIN      CUBIC YARD**

The Work under this Item shall conform to the relevant provisions of Section 300 and Section M of the Standard Specifications and the relevant provisions of the Littleton Electric Light & Water Department (LELELWD) and the following:

The Work shall consist of the abandonment of water mains including cutting, capping, and filling with Controlled Density Fill (CDF). The Contractor shall furnish all materials, transport of materials, equipment, and labor necessary to abandon the designated water mains in-place at the limits shown on the plans.

Material and Installation Specifications for Constructing Water Mains and Service Materials for the Littleton Electric Light & Water Department (LELELWD) is available at the link below.

<https://www.leLELWD.com/water-department/>.

**MATERIALS**

Controlled Density Fill conforming to MassDOT material specification M.08.0: Controlled Density Fill. Type 1E, Very flowable (Excavatable).

All caps, plugs and or clamps needed to complete the work.

**SUBMITTALS**

The Contractor shall submit the following to the resident Engineer for review by MassDOT and Littleton Water Department.

- A. Submittals for the CDF material shall conform to the relevant procedures outlined in Section M of the MassDOT Standard Specifications.
- B. Technical information for equipment and operational procedures including projected CDF injection rate, pressure, method of controlling pressure, bulkhead and vent design, and number of stages of CDF application.
- C. At least 30 days prior to commencing CDF abandonment activities, submit plan for abandonment, describing proposed abandonment and filling sequence and other information pertinent to completion of Work.
  1. The Contractor shall submit for approval to the resident Engineer and LELWD proposed method for filling the pipes.
  2. Contractor's method shall take into consideration the removal of air from pipelines and the prevention of loss of fill material to the environment.
  3. Contractor's submittal shall include acceptable information on caps, plugs, pumping equipment, proposed method for maintaining utilities to remain in service, proposed method of abandoning laterals and cleanouts.
  4. The submittal shall also include an outline of safety precautions to be taken to reduce the risk that the existing Asbestos Concrete pipe does not contaminate the environment, harm worker health, or fail structurally during the abandonment procedure.

**ITEM 153.01** (Continued)

5. Certifications and years of experience of the Contractor(s) performing the abandonment work.

**METHODS**

Water mains to be abandoned must be properly dewatered in accordance with all local, state and federal environmental regulations governing the disposal of chlorinated water.

A. Existing Pipes (Larger than 2-inch Diameter)

Existing pipes indicated in the Contract Documents to be abandoned shall be plugged at the designated locations and abandoned as follows:

1. Pipes shall be closed with an approved cap or plug with reaction blocking as approved by the resident Engineer and Littleton Water Department.
2. Pipes, once closed as required above, shall be filled with CDF to the satisfaction of resident Engineer and Littleton Water Department.

- B. Any Existing Pipes Two (2) Inches and Smaller in Diameter Unless specifically called for in the Contract Documents to be removed, pipelines two (2) inches and smaller in diameter shall be abandoned in place, shall not be required to be filled with CDF, and shall have their end scrimped, capped, or plugged, as approved by resident Engineer and the Littleton Water Department.

**METHOD OF MEASUREMENT**

Item 153.01, Controlled Density Fill For Water Main will be measured for payment per CUBIC YARD of CDF placed.

**BASIS OF PAYMENT**

Item 153.01, Controlled Density Fill For Water Main will be paid at the contract unit price per CUBIC YARD, which price shall be full compensation for placing the CDF and for all materials, equipment, transport of materials, and labor necessary to complete the work.

Abandonment of pipe two (2) inches and smaller in diameter shall not be measured for payment and the cost shall be considered incidental to other Items of Work; no separate payment will be made.

**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 Sub-Contractors 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.

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.

**ITEM 180.01** (Continued)

**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 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**      **HOUR**

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.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

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), semi-volatile 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.

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<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.

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**ITEMS 181.11 thru 181.14** (Continued)**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:

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 thru 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.

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**ITEMS 181.11 thru 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.

**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.

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**ITEMS 181.11 thru 181.14** (Continued)

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 base plan 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.

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.

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**ITEMS 181.11 thru 181.14** (Continued)

## 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.

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.

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**ITEMS 181.11 thru 181.14** (Continued)**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 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 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 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 181.13 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 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 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

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

Massachusetts Department of Labor and Industries Regulations, (DLI) including but not limited to:

454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

**ITEM 182.1** (Continued)

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

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

Massachusetts Division of Industrial Safety 45 CMR 10.00

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

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

**BASIS OF PAYMENT**

Payment will be at the contract LUMP SUM price 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 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 required to the fact that existing asbestos shall be inspected and tested prior to removal, to determine if special removal and disposal is required. The Contractor shall follow all the rules and regulations stated in "ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS". If asbestos is present, the Contractor shall follow all the rules and regulations stated in the section "REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS", under this Item. The Contractor should notify and coordinate his/her efforts with the proper utility accordingly.

**REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS**

This section specifies the requirements for the handling and removal of asbestos containing material. The Contractor must perform all asbestos handling and removal work in accordance with these specifications and the following additional requirements.

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

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

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

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

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

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

454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

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

**ITEM 182.2** (Continued)

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

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

All asbestos material shall be removed and properly disposed of by a Contractor or SubContractor with a current Massachusetts Abatement Contractors License issued by the Department of Labor Standards. Work shall be supervised by a competent person as required by OSHA in 29 CFR 1926 to ensure regulatory compliance. This person must have completed a course at an EPA Training Center or equivalent course in asbestos abatement procedures, have had a minimum of four years on-the-job training and meet any additional requirements set forth in 29 CFR 1926 for a Competent Person. This person must also be certified by the Commonwealth as an Asbestos Supervisor and Asbestos Project Designer as required by 454 CMR 28.00.

Asbestos removal work shall be coordinated with all other work under the contract and shall be completed prior to performing any activities which could disturb the asbestos material or produce airborne asbestos fibers.

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

**NOTIFICATION AND PERMITS**

The Contractor shall prepare a formal pre-notification form at least ten (10) days prior to the start of asbestos removal work. This form must be submitted to the appropriate Regional Office of the Massachusetts Department of Environmental Protection and to the U.S. Environmental Protection Agency Region I Air and Hazardous Material Division. A copy of the submitted forms must be provided to the Engineer and kept at the work site.

Prior to starting any work, the Contractor shall also obtain any required asbestos removal permit(s) from the city/town. A copy of the permit(s) must be provided to the Engineer and posted at the work site.

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 work spaces.
2. Proper protective clothing and respiratory protection prior to entering the work spaces.
3. Safe work practices including provisions for communications; exclusion of eating, drinking, smoking, or use of procedures or equipment that would in any way reduce the effectiveness of respiratory protection or other Engineering controls.
4. Proper exit practices from the work space through the showering and decontamination facilities.
5. Removing asbestos containing material in ways that minimize release of fibers.
6. Packing, labeling, loading, transporting and disposing of contaminated material in a way that minimizes or prevents exposure and contamination.
7. Emergency evacuation of personnel, for medical or safety (fire and smoke) so that exposure will be minimized.
8. Safety from accidents in the work space, especially from electrical shocks, slippery surfaces and entanglements in loose hoses and equipment.
9. Provisions for effective supervision and OSHA - specified personnel air monitoring for exposure during work.

**REQUIRED SUBMITTALS**

The Contractor shall submit to the Engineer the following listed Items at least ten (10) calendar days prior to the start of asbestos work. No asbestos removal work activities shall commence until these Items are reviewed by the Engineer, unless otherwise waived. Submittals shall be clearly labeled and in sufficient detail to enable the Engineer to form an opinion as to its conformity to the specifications.

1. Name, experience and DLS certification of proposed Supervisors and Foreman responsible for asbestos work.
2. Summary of workforce by disciplines and a notarized statement documenting that all proposed workers, by name, have received all required medical exams and have been properly trained and certified for asbestos removal work, respirator use and appropriate Massachusetts DLS, EPA and OSHA standards.

**ITEM 182.2** (Continued)

3. Notarized statement that workers are physically fit and able to wear and use the type of respiratory protection proposed for the project. Notarized certification signed by an officer of the abatement contracting firm that exposure measurements, medical surveillance and worker training records are being kept in conformance with 29 CFR 1926.
4. Written plan of action and standard operating procedures (HASP) to include: location and layout of decontamination areas; sequencing of asbestos work; detailed schedule of work activities by date and interface with other project activities which affect work performance; methods used to assure safety and security; worker protection and exposure monitoring; contingency and Emergency evacuation procedures; detailed description of methods to be employed to control pollution; waste handling procedures.
5. Written respiratory protection program specifying level of protection intended for each operation required by the project and details of daily inspection and maintenance elements.
6. Copies of the U.S. EPA, State and local asbestos removal pre-notification forms. If applicable, lists and copies of all permits, licenses, or manifests which will be applied for and used.
7. Name, location and applicable approval certificates for primary and secondary landfill for disposal of asbestos-containing or asbestos contaminated waste. Name, address and licenses number(s) of hauler permitted to transport waste. (Submit copies of completed manifests upon disposal).

The Contractor must provide copies of daily inspection and record logs upon request of the Engineer, at any time during project. This information will include but is not limited to work area entry data, respirator inspections and maintenance, HEPA-exhaust inspections and maintenance and other work applicable activities or reports of accidents or unusual events.

**METHOD OF MEASUREMENT**

ITEM 182.2 will be measured for payment 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 201.3**

**SPECIAL CATCH BASIN**

**EACH**

The Work under this Item shall be in accordance with the relevant provisions of Subsection 201 of the Standard Specifications and the following:

**MATERIALS**

This Item is for an enlarged stormwater catch basin structure. Catch basin shall be constructed as shown on the plans and details.

**METHOD OF MEASUREMENT**

Item 201.1, Special Catch Basin will be measured for payment per Subsection 201.80.

**BASIS OF PAVEMENT**

Item 201.1, Special Catch Basin will be paid at the contract unit price per EACH, which price shall be full compensation for all special frames and grates, and all material, labor, tools, equipment, transport and incidentals required to complete the work.

**ITEM 205.01****LEACHING BASIN****EACH**

The Work under this Item shall conform to the relevant provisions of Subsection 201 of the Standard Specifications, MassDOT standard construction detail E 205.2.0 Concrete Block Leaching Basin or a pre-cast cement concrete equivalent approved by the design Engineer and the following:

Before ordering structures under Item 205.01, the Contractor must complete work under Item 141.2 Test Pit for Groundwater to confirm that the locations for the Leaching Basins shown on the plans have groundwater elevations suitable for the Leaching Basins.

**SUBMITTALS**

The Contractor shall submit shop drawings for the proposed Leaching Basin Structure including all proposed construction materials, manufacturers, and specifications to the design Engineer.

**MATERIALS**

Cement concrete blocks, precast structures, and or geotextile fabrics must be from a manufacturer included on MassDOT's Qualified Construction Materials List (QCML) for the proposed material. <https://www.mass.gov/massdot-qualified-construction-materials>

**METHOD OF MEASUREMENT**

Item 205.01, Leaching Basin will be measured for payment per EACH basin installed complete in place.

**BASIS OF PAYMENT**

Item 205.01, Leaching Basin will be paid at the contract unit price per EACH installed complete in place, which price shall include all incidental materials, work, transportation/hauling, and temporary storage needed to complete the work.

Payment for any concrete collars shall be included in the contract unit price of the structure involved. When directed, the castings of drainage structures will be set to a temporary grade, and the unit will be considered complete in place and paid for at the contract unit price for the type of structure involved.

When the casting or structure and casting is adjusted to final grade the work shall be done and payment will be made under Item 220 Drainage Structure Adjusted.

Any test pit excavation required to perform groundwater tests shall be paid for separately under Item 141.2, Test Pit for Groundwater.

If the material for backfill is obtained from borrow it will be paid for at the contract unit price per CUBIC YARD or TON for the kind of borrow required.

Frames and covers will be paid under Item 221, Frame and Cover.



**ITEM 223.1****FRAME AND GRATE (OR COVER)  
REMOVED AND STACKED****EACH**

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

Work under this Item shall also include the removing and stacking of castings that are within the roadway surface prior to the pavement milling operation and also stacking of existing castings that are to be permanently removed from the project as called out on the plans.

The existing castings on all drainage manholes, sewer manholes and catch basins that are within the designated pavement milling operation area shall be removed and stacked within the project limits. A steel plate, gravel borrow and 3" of hot mix asphalt shall be furnished and placed on the structures so that the existing roadway pavement can be milled. The throats of all curb inlets shall be kept open to allow for drainage. Existing castings will not be stored along the edge of the road. The Contractor is responsible for the temporary storage of the castings until they are reset. No additional compensation will be allowed for transportation or storage of the castings.

For rebuilt/remodeled structures within the milled limits, these will have their castings stacked under 223.1 and plated accordingly, and the final placement of a casting will be paid under Item 220 Drainage Structure Adjusted.

Castings on Town structures called on the plans as **ADJ.** (Adjusted) that are not reusable shall be removed under Item 223.1 and shall remain the property of the Town and transported to the Department of Public Works yard at 39 Ayer Rd in Littleton, MA and placed per the direction of the DPW director without additional compensation. The replacement casting shall be payable under Item 222.1.

Castings on Town structures called on the plans as **R&S** (Remove and Stack) shall be removed and stacked under Item 223.1 and shall remain the property of the Town and transported to the Department of Public Works yard at 39 Ayer Rd in Littleton, MA and placed per the direction of the DPW director without additional compensation.

**METHOD OF MEASUREMENT**

Item 223.1, Frame And Grate (Or Cover) Removed And Stacked will be measured for payment per EACH Frame And Grate (Or Cover) removed and stacked and approved by the Engineer.

**BASIS OF PAYMENT**

Item 223.1, Frame And Grate (Or Cover) Removed And Stacked will be paid at the contract unit price per EACH, which price shall be full compensation for all labor, equipment and material needed to remove and stockpile the existing castings within the project limits or transport unusable castings to the Town DPW for recycling. The furnishing, placing and subsequent removal of steel plates and gravel borrow shall also be included under this Item.

The hot mix asphalt shall be payable under Item 472.

<b><u>ITEM 303.061</u></b>	<b><u>6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 303.081</u></b>	<b><u>8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 303.101</u></b>	<b><u>10 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 309.01</u></b>	<b><u>DUCTILE IRON FITTINGS FOR WATER PIPE</u></b>	<b><u>POUND</u></b>
<b><u>ITEM 336.101</u></b>	<b><u>1 INCH POLYETHELENE WATER LINE</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 336.102</u></b>	<b><u>2 INCH POLYETHELENE WATER LINE</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 350.061</u></b>	<b><u>6 INCH GATE AND GATE BOX</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 350.081</u></b>	<b><u>8 INCH GATE AND GATE BOX</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 350.101</u></b>	<b><u>10 INCH GATE AND GATE BOX</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 363.101</u></b>	<b><u>1 INCH CORPRATION COCK</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 363.102</u></b>	<b><u>2 INCH CORPRATION COCK</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 371.08</u></b>	<b><u>8 INCH COUPLING</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 371.10</u></b>	<b><u>10 INCH COUPLING</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 376.01</u></b>	<b><u>HYDRANT-TOWN STANDARD</u></b>	<b><u>EACH</u></b>

## 1. DESCRIPTION

### 1.1 General:

This part of the specifications shall govern for all materials used in the construction of water distribution facilities under the jurisdiction of the Littleton Water Department (LELWD). Projects that would necessarily involve materials other than those included in this specification shall be subject to the approval of the Water Department Superintendent. Complete specifications covering all materials not included herein shall be submitted for approval. Any material used other than materials herein specified shall be of the kind and type normally used in the construction of water distribution facilities.

1.1.1 All products included in this section shall conform to the requirements of the most recent LWD standards publications, "Material and Installation Specifications for Constructing Water Mains", available at: <https://www.lelwd.com/wp-content/uploads/2015/10/Water-Main-Specs.pdf>, and "Material and Installation Specifications for Constructing Water Services", available at: <https://www.lelwd.com/wp-content/uploads/2015/10/LWD-Water-Service-Specs.pdf>. Call LWD at (978) 540-2222 to ensure the most recent standards have been downloaded.

### 1.2 Reference Standards:

- A. ANSI A21.4/AWWA C104 – Cement Mortar Lining For Ductile Iron Pipe and Gray Iron Pipe and Fittings for Water.
- B. ANSI A21.10/AWWA C110 – Gray Iron and Ductile Iron Fittings, 3” through 48”, for Water and Other Liquids.
- C. ANSI A21.11/AWWA C111 – Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
- D. ANSI A21.51/AWWA C151 – Ductile Iron Pipe.
- E. ANSI B.16 – Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800
- F. ASTM A126 – Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
- G. ASTM B62 – Composition Bronze or Ounce Metal Castings.
- H. AWWA C502 – Dry Barrel Fire Hydrants.

**ITEMS 303.061 thru 376.01** (Continued)

- I. AWWA C600 – Installation of Cast Iron Water Mains.
- J. AWWA C150 – Thickness Design for Ductile Iron Pipe.
- K. AWWA C509 – Resilient-Seated Gate Valves.
- L. AWWA C550 – Protective Interior Coatings for Valves and Hydrants.

**MATERIALS**

2. DUCTILE IRON WATER MAINS

2.1 General - Only pipe materials listed in this section shall be used for main extensions unless specifically authorized in writing by the Superintendent.

2.2 Ductile Iron Pressure Pipes:

2.2.1 Ductile Iron Pipe shall be designed in accordance with AWWA C150 and ANSI A21.51/AWWA C151, Class 52 CLDI with Zinc Coating and shall have push-on joints where specified. Pipe shall be double cement-lined with seal coat inside and out conforming to ANSI A21.4/AWWA C104. Push-on joints and rubber gaskets.

2.2.2 The pipe manufacturer shall supply LELWD with certificates of compliance with these specifications and certification that each piece of ductile iron pipe has been tested at the foundry with Ball Impression Test, Ring Bending, or other approved test for ductility upon request.

2.2.3 Ductile iron pipe may be rejected for failure to meet any of the requirements of this specification.

2.2.4 Any water main installed within 50 feet of the spread footings of the Route 2 overpass bridge shall be concrete encased. Concrete encasement paid for under Item #903.

3. SERVICE LINES

3.1 Description:

The service line is the line from the main to the outlet valve at the customer's meter. It shall consist of the corporation stop at the main, the tubing or pipe, the curb stop and curb box. Per the plans, the existing curb stop and curb box may be reused at various locations. Work downstream of the curb stop is not included in the scope of this project.

3.1.1 Polyethylene Service line: Tubing for services shall be polyethylene designed for 200 psi service. Pipe shall be in accordance with AWWA C901 standard for Polyethylene Pressure Pipe, tubing and fittings.

3.1.2 For service lines larger than two inches in diameter, any pipe approved in section for water mains shall be used.

3.3.3 Rejection: PB tubing may be rejected for failure to meet any of the requirements of this specification.

**ITEMS 303.061 thru 376.01** (Continued)

## 4 FITTINGS

## 4.1 Description:

All fittings used in the construction of water lines shall be “Underwriters Laboratory” (UL) approved. All materials listed in this section shall be manufactured in North America, unless specifically authorized in writing by the Superintendent.

## 4.2 Fittings for Ductile Iron Pipe:

4.2.1 Fittings shall be Cast Iron, 250 psi pressure rating, or Ductile Iron, 350 psi pressure rating, conforming to ANSI A21.10/AWWA C110 with mechanical joints. Compact Ductile Iron Fittings conforming to ANSI A21.53/AWWA C153 will be acceptable. Joints shall be furnished with ductile iron retaining glands. Retaining glands shall be grip ring pipe restrainers meeting LWD specifications or an approved equal. Glands using set screws will not be acceptable. Fittings shall be double cement-lined and seal-coated inside and out in accordance with ANSI A21.4/AWWA C104. Tees for hydrant branches and for stubs for future use shall have mechanical joints on the run with a plain-end having an integral rotating gland on the branch (Anchor-tees). The gland will anchor mechanical joint pipe or valve ends to the plain end of the pipe.

4.2.2 All Ductile and Cast-Iron Pipe and fittings shall be clean, sound, and without defects. The castings shall be smooth and free from pinholes, excess iron, etc. The coatings shall be continuous, smooth and neither brittle nor sticky.

## 4.3 Brass Water Service Fittings / Service Boxes:

4.3.1 General - Stops and Fittings furnished under these specifications shall be of the size and type specified, with all parts of brass, conforming to Alloy Number 4 A (ASTM Designation B 62) which has a nominal composition of 85% copper and 5% each of tin, lead, and zinc, plus or minus 1%. All stops, cocks, and fittings shall be full size openings, throughout, of the size specified. All castings shall be smooth, free from burrs, scales, blisters, sand holes, and defects of every nature that would make them unfit for the use for which they are intended. Nuts shall be smooth cast, with symmetrical, hexagonal wrench flats.

4.3.2 Corporations shall be AWWA corporation valve inlet thread by compression fitting, meeting the requirements of ANSI/AWWA C800-89, from a manufacturer meeting LELWD’s specifications or an approved equal. They shall be designed to rotate about the axis of the flow passageway within a circle of rotation small enough to properly clear the inside of any standard tapping machine of appropriate size.

4.3.3 Curb Stops shall be compression fitting meeting the requirements on ANSI/AWWA C800-89 from a manufacturer meeting LWD’s specifications or an approved equal.

4.3.4 Service Boxes shall be Erie Box Plug Style with 3/8” Stainless Steel Rod with standard 4.5-5.5 feet boxes with a standard plug cover with brass pentagon plug. Each box will be fitted with a 3/8” service rod and the box shall be manufactured in U.S.A. meeting LELWD specifications.

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**ITEMS 303.061 thru 376.01** (Continued)

## 5. WATER MAIN VALVES

## 5.1 Resilient Seated Gate Valves:

5.1.1 Valves shall be Resilient Wedge Gate Valve, from a manufacturer meeting LELWD specification or approved equivalent and also meeting AWWA C509 of the latest revision. All bolts shall be stainless steel. Valves shall have an unobstructed water way when fully opened equal in diameter to at least ¼” greater than the nominal valve sizes. Valves shall have mechanical joint end. Valves used in conjunction with tapping sleeves shall have a flange end and be from a manufacturer meeting LELWD specification or approved equal.

5.1.2 All internal surfaces shall be coated with epoxy to a minimum thickness of 4 mils. Said coating shall be non-toxic, impart no taste to water and shall conform to AWWA C 550 of latest revision.

5.1.3 Valves shall be provided with two O-ring stem seals. Both O-rings shall be located above the thrust collar. The sealing mechanism shall provide a dual seal with zero leakage at the water working pressure when installed with the line flow in either direction and shall consist of a ductile iron gate having a vulcanized synthetic rubber coating with no rubber metal seams or edges in the water way when in the fully closed position.

5.1.4 All valves shall be seat tested at the rated working pressure in accordance with Section 6 of AWWA C-509. Valve shall be rated at 200 psi working pressure and 400 psi test pressure.

5.1.5 Valves shall OPEN LEFT.

## 5.2 Tapping Sleeve and Valve:

5.2.1 Tapping sleeve shall meet AWWA C223 and be from a manufacturer meeting LELWD’s specifications or an approved equal.

5.2.2 The mechanical joint sleeve shall have longitudinal compound rubber gaskets which shall fit against the rubber end gaskets thus affecting a totally enclosed rubber water-tight seal.

5.2.3 Tapping sleeve shall have a flange with “O” ring seal and drilled to correspond to that of the tapping sleeve to insure proper alignment.

## 5.3 Valve Boxes:

5.3.1 Valve boxes shall be standard cast-iron, asphalt coated, adjustable, sliding type, together with cast-iron covers with the word “Water” plainly cast in relief on the top surface. All Valve Boxes shall be manufactured in North America.

5.3.2 The bottom section shall have a minimum I.D. of 5- ¼”. The top section shall have a minimum diameter of 6-½”. There shall be a minimum 6” overlap between sections.

5.3.3 The bottom section shall be 36” in length for all gate valves. The top section shall be at least 26” in length and have a plain bottom. No three-piece combinations shall be acceptable.

5.4.5 Valve boxes shall be completely and thoroughly coated with bitumastic paint.

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**ITEMS 303.061 thru 376.01** (Continued)**6. FIRE HYDRANTS****6.1 General:**

Hydrants – From a manufacturer meeting LELWD’s specifications or an approved equal. All Hydrants will be “OPEN LEFT”. Hydrants shall conform to the requirements of AWWA C-502, and be designed for 150 psi working pressure tested to 300 psi hydrostatic

6.1.2 Hydrants shall be able to be rotated 360 degrees. They shall have a positive closing, self-cleaning drain valve and drainage area shall be completely bronze or brass lined.

6.1.3 Hydrants shall be painted yellow to match the Town’s standard color. In addition, two columns will be installed to protect hydrants from vehicular traffic and snow plows. Columns shall be painted yellow to match hydrants.

6.1.4 Hydrant Extension – MUST BE approved by Littleton Water Dept. and shall be provided by the same manufacturer as hydrants. Extension shall include barrel, rod, coupling, bolts, gaskets, and all other accessory equipment for a complete installation.

**7. THRUST BLOCKS**

7.1 Blocks – Thrust blocks shall be Solid Precast Concrete Block, conforming to M4.02.00 of the MassDOT Standard Specifications, and shall be placed between back of fitting and trench wall, in a manner to prevent blow-off of the fitting.

7.2 Rodding – In areas where thrust blocks are unable to be used to properly restrain the fittings, threaded rods shall be used to anchor the connection to the main.

**8. PIPE BEDDING AND BACKFILL****8.1 Bedding:**

8.1.1 Bedding sand conforming to MassDOT standard specification M1.04.0, Sand Borrow, shall be used for ductile or plastic pipe. Sand shall be free of stones. A minimum 8” – 12” of bedding sand shall be laid beneath the pipe and extend 12”-18” over the pipe as specified in the Construction Section. Bedding sand shall extend to the width of the trench.

**8.2 Backfill:**

8.2.1 Backfilling shall be done with ordinary borrow meeting MassDOT standard specification M1.01.0. The ordinary borrow may be reused from the trench excavation provided the material meets the standard. If needed, additional ordinary borrow material meeting the standard shall be used to supplement the trench excavated material. No material of a perishable, spongy, or otherwise unsuitable nature shall be used in backfilling.

**9. TRACE WIRE****9.1 Trace wire:**

Shall be laid with all non-metallic pipe as per LELWD standard details. Trace shall be fourteen (14) gauge single strand plastic coated copper trace wire.

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**ITEMS 303.061 thru 376.01** (Continued)**CONSTRUCTION OF WATER MAINS****10 – GENERAL**

10.1 This part of the specification shall govern the construction procedures used in the installation of water line facilities under the jurisdiction of the Littleton Water Dept. Construction procedures other than those outlined in this specification shall meet with the approval of the Utility. Complete specifications covering any unusual or special construction procedure shall be submitted for approval and approval must be received prior to beginning any construction operations.

**11. EXCAVATION AND BACKFILL****11.1 Description:**

This section covers the excavation and backfill of water lines, and appurtenances.

**11.2 Trench Excavation:**

11.2.1 The sides of the excavation shall be cut as such a slope that will prevent caving. In areas where soil conditions permit normal excavation of the trench, the sides shall be cut as nearly vertical as possible from the bottom of the trench to a point 12” above the top of the pipe when it is laid to grade. Maximum and minimum widths of the trench shall be according to Subsection 140 of the MassDOT standard specifications.

11.2.2 In caving ground or in wet, saturated, or flowing materials, the sides of the excavation shall be adequately sheeted and braced so as to maintain the excavation free from slides or cave-ins and safe for workmen. Sheeting and shoring shall not be removed until the excavation has been backfilled to a sufficient depth to prevent caving.

**11.3 Trench Bottom:**

The entire length of the water line shall be founded on bedding specified in the Pipe Bedding and Backfill Materials section of these specifications.

11.3.1 Disposal of Excavated Materials: Excavated material shall be piled adjacent to the work to be used for backfilling as required. Excavated materials which are unsuitable for backfilling and excess material shall be legally disposed of at Contractor’s expense.

**11.4 Use of Explosives:**

National Grid Gas has required vibration monitoring for this project under Item 757 Vibration Monitoring. In the event the use of explosives is necessary for the efficient prosecution of the work, the Contractor shall notify the Superintendent in advance of their use and shall exercise every precaution to prevent damage to adjoining improvements or property by reason of their use. Any damage to private property resulting from the use of explosives shall be the liability of the Contractor. In all cases where the explosives are necessary, a permit from the local government agency shall be obtained prior to their use.

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**ITEMS 303.061 thru 376.01** (Continued)

## 11.5 Backfilling:

## 11.5.1 Water Lines:

11.5.1.1 Backfilling of water lines shall include the refilling and consolidation of the fill in the excavation up to the surrounding ground surface or road grade at crossings. It is essential that the complete backfill be done in such a manner to minimize voids in the backfill.

11.5.1.2 Backfilling up to the point 12" above the top of the pipe shall be done with the backfill material specified in the Pipe Bedding and Backfill Section of these specifications. No materials of perishable, spongy or otherwise unsuitable nature shall be used in backfilling.

## 11.5.1.3 Backfill of Pipe:

Rigid pipe (ductile iron) shall be backfilled with the materials specified in the Pipe Bedding and Backfill Section of these specifications of the proper moisture content to obtain a support under the lower ½ of the pipe, compacted to a density of 90% AASHTO T-180 modified or better. The intent is to cradle the pipe so that the fill length of each joint is uniformly supported on firm bedding and the weight of pipe and fill is borne uniformly by the lower ½ of the pipe barrel.

Tamping of fill below the spring line of the pipe may be by hand tamps provided the required density is obtained.

Where trenches are not under existing or proposed paved areas, backfill shall proceed with the same select materials hand placed to a point 12" over the top of the pipe. Backfill may then proceed by whatever commonly used construction methods are consistent with the integrity of the pipeline. Backfill outside the existing or proposed paved areas shall be left slightly over full to allow for settlement.

Where trenches are under existing or proposed paved areas, the entire trench up to a point 2' below existing or proposed subgrade shall be backfilled with the specified materials and compacted to a density of 90% AASHTO T-180 modified or better. The remaining 2' shall be similarly backfilled, but the minimum compaction shall be 95% AASHTO T-180 modified.

The backfill of materials in trenches under existing or proposed paved areas shall be compacted with mechanical devices manufactured for that purpose from two feet above the top of the pipe to the top of the existing or proposed subgrade.



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**ITEMS 303.061 thru 376.01** (Continued)**12. DEWATERING OF TRENCHES****12.1 Description:**

This section covers the dewatering of trenches to the extent that bedding material and water pipe can be placed on dry, firm trench bottom.

**12.2 Wellpointing:**

Wellpointing where required to keep the excavation dry and the subgrade stable, shall be installed when the excavation is within a minimum of two (2) feet of the water table, except as hereinafter provided, and shall be in continuous operation until backfill is completed to this level. When construction equipment is to be operated in an area that has been excavated and wellpointing is required to keep trench excavation dry and the subgrade stable, the wellpoint shall be installed when the excavation is within a minimum of five (5) feet of the water table.

There shall be sufficient pumping equipment, in good working order, available at all times, to remove any water that accumulates when the pipe line crosses natural drainage channels, the work shall be conducted in such a manner that unnecessary damage or delays in the prosecution of the work shall be prevented. Provision shall be made for the satisfactory disposal of surface water pumped so as to prevent damage to public or private property.

**12.3 Trench Dewatering:**

Dewatering of trenches other than by wellpointing shall be accomplished by whatever means elected by the Contractor, however, bedding material or pipe may not be placed in wet or unstable trenches. Soil that cannot be properly dewatered shall be excavated and dry material tamped in place to such a depth as may be required to provide a firm trench bottom.

**12.4 Surface Runoff:**

Surface runoff water shall be diverted away from the trenches. Such diversion shall be into existing drainage structures such as storm sewers, ditches or streams. Diversion of surface runoff shall be in such a manner to prevent flooding of streets or private property.

**12.5 Disposition of Water from Dewatering:**

All water removed from the trenches by wellpointing or any other means shall be pumped, piped or drained into existing drainage structures. The disposition of water from dewatering operations shall be accomplished in a manner that will prevent the flooding of public or private property.

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**ITEMS 303.061 thru 376.01** (Continued)**13 SHEETING AND SHORING****13.1 Description:**

This section covers the sheeting and shoring to protect the safety of workers, provide suitable means for constructing the water line, and to protect public or private property, including existing utilities. All sheeting and shoring must be designed and stamped by a MA licensed professional Engineer,

**13.2 Cave-ins:**

Where trench cave-ins are a possibility, adequate sheeting and/or shoring shall be provided so as to maintain the trench free from slides or cave-ins and safe for workmen.

**13.3 Existing Structures:**

Where existing buildings, other utilities, streets, or other structures are in close proximity to the trench, adequate protection shall be provided by the use of sheeting and shoring to protect the structure from possible damage.

In the case of streets or utilities, the Contractor may elect to remove the street or utility provided that the removal and subsequent replacement meets with the approval of the Town of Littleton, the utility owner, or whoever has jurisdiction of the structure. In all cases, it shall be the responsibility of the Contractor to protect public and private property and any person or person who might, as a result of the Contractor's work, be injured.

**14 PIPE LAYING****14.1 Description:**

This section covers the laying of pipe for water lines. Each joint of pipe shall be inspected carefully before being placed in the trench. Any joint found to be cracked or otherwise so damaged as to impair its usefulness shall be plainly marked in such a manner that the markings will not rub or wash off. Damaged joints shall be removed from the site as soon as feasible.

**14.2 Pipe Laying:**

14.2.1 All pipe and fittings shall be installed to the line and grade as detailed on the plans. Subject to the approval of the Engineer, other fittings may be added to or substituted for those shown on the plans, should the need arise during construction. This permissive stipulation in no way shall relieve the Contractor of the responsibility for furnishing and installing all fittings required for the complete and proper installation of main as detailed on the plans.

- Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe be laid in water and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Full responsibility for the diversion of drainage and for dewatering of trenches during construction shall be borne by the Contractor.

**ITEMS 303.061 thru 376.01** (Continued)

- All dirt and other foreign matter shall be removed from the inside of pipe and fittings before they are lowered into the trench. They shall be kept clean during and after laying, care shall be taken to keep dirt out of the jointing space.
- Spigot and bells shall be cleaned thoroughly before the application of lubricant and attachment of the gasket shall be in strict accord with the joint.
- All fittings shall be tightened using torque wrenches to the manufacturer's specifications.
- At the end of each day's work, and when pipe laying is discontinued for an appreciable period, open ends of pipe shall be closed with a cast plug or cap firmly secured in place.
- All pipe and fittings shall be lowered carefully into the trench in such manner as to prevent damage to pipe, fittings, or linings. Neither pipe nor fittings shall be dropped or dumped into the trench.
- Cutting of pipe, where needed, shall be done in a neat and workmanlike manner without damage to pipe or pipe lining.
- Deflections shall not exceed the maximum recommended by the pipe manufacturer.
- All non-metallic pipes shall have trace wire meeting requirements of Section 9 "Trace Wire" of these specifications as per LELWD standard details.
- Backfilling shall not be undertaken until the water main installation has been inspected and approved by LELWD.

## 14.3 Early Warning Tape:

Early warning tape or wire shall be installed in trench on top of pipe bedding sand.

## 15. TAPS

## 15.1 Service Taps:

## 15.1.1 General:

## Taps:

Taps for transmission of water or air from the main into system service accessories are defined as follows:

- a. Standard internal pipe threaded holes in the wall of water mains; these taps may be either manufactured into the pipe or installed in the field.
- b. Tap installations that are made by clamping a bronze service clamp equipped with a sealed threaded port on the periphery of the main then drilling through the pipe wall to complete each service port.
- c. When a direct tap is made, pipe dope or Teflon tape shall be applied to the threaded part of the corporation stop.
- d. Services will only be provided from dedicated easements, alley and right-of-ways.
- e. Taps will be located in such a manner to provide the shortest distance and most direct line to the meter.
- f. Effort should be made to allow for the corporation to be set at either 10 o'clock or 2 o'clock.

## 15.1.2 Tapping Ductile Iron Pipe:

Ductile iron pipe four (4) inches in diameter and smaller shall be tapped by the use of a tapping saddle made of bronze or stainless.

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**ITEMS 303.061 thru 376.01** (Continued)

## 16.2 Main Taps:

## 16.2.1 Wet Taps:

Wet connections shall be used for all connections except where directed by the Engineer. Wet connections shall be made with a tapping sleeve and valve conforming to Tapping Valves and Sleeve materials section of these specifications. Either air driven or manual tapping machines may be used. The pipe to be tapped shall be cleaned thoroughly and wire brushed to remove rust and other foreign matter. The tapping sleeve shall be put on and tightened down securely. The valve shall be put on the sleeve and braced against movement. Then the tap shall be made.

## 16.2.2 Dry Taps:

Dry connections shall only be made when directed by the Engineer and/or when a fitting must be added to an existing line. For dry connections, the existing line must be shut off and drained.

This should be done so that the down time of the line shall be as short as possible.

After a line has been drained, the line shall be cut and the fitting put in and blocked. The section of line cut into shall be tested and sterilized as would a new line.

## 17 HYDRANTS

## 17.1 Description:

This section covers construction methods used in setting fire hydrants. All fire hydrants shall conform to the Fire Hydrants materials section of these specifications.

## 17.2 Excavation:

Excavation for fire hydrants shall be neat and shall leave the back of trench and bottom of trench undisturbed earth for concrete blocking.

## 17.3 Installation:

Fire hydrants shall be installed as per LELWD standard details. A standard six-inch gate valve shall be between the main and hydrant, as per LELWD standard details. Six (6) inch Ductile iron water line, meeting requirements of the Ductile Iron Pressure Pipe section of these specifications shall be used to install fire hydrants.

## 17.4 Backfill:

Backfill shall be per LELWD standard details. Concrete locking shall be put underneath and behind the hydrant. At least seven (7) cubic feet of crushed stone, conforming to M2.01.04 of the MassDOT Standard specifications, average  $\frac{3}{4}$  inch diameter, shall be placed around hydrant as per standard details for drainage of hydrant barrel.

Geotextile fabric, approved for application code 2, included on MassDOT's Qualified Construction Materials List (QCML), shall be placed above stone to provide a separation barrier between backfill and stone. The MassDOT QCML can be found at <https://www.mass.gov/info-details/geotextile-fabrics-m-9500>.

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**ITEMS 303.061 thru 376.01** (Continued)**18. PAVEMENT REPAIRS****18.1 Description:**

This section covers the construction methods to be used in the repair of roads, streets, or other public rights-of-way.

**18.2 Permanent Repairs:**

18.2.1 Asphalt concrete (HMA) construction shall meet specifications of the plans based on the location of the trench and the proposed HMA design for the proposed finished surface at location of the trench.

**18.3 Temporary Surfacing:**

Methods of temporary surfacing shall meet with the requirements of the Sheeting and Shoring section of these specifications. Temporary HMA for patching shall conform to Subsection 472 of the MassDOT standard specifications.

**19 CONSTRUCTION WITHIN TOWN RIGHT-OF-WAY****19.1 Town Streets:**

Littleton Highway Department and MassDOT (when applicable) shall be notified prior to any street cuts. Proper permitting shall be obtained prior to the opening of any Town streets. If Town streets have to be closed, the Littleton Fire, Police and Highway department shall be notified of closing. Proper barricades, warning signs, lights and watchmen shall be employed. Work shall be prosecuted in such a manner that one-half of the traveled portion of the road is open to traffic unless approved by Littleton Police Dept. in writing. Right-of-way shall be left in a neat and orderly manner and left in as good or better shape than it was before construction.

**19.2 Easements:**

Easements shall be left in a neat and orderly manner. Easements shall be left in as good or better shape than that before construction.

**20 – EXISTING STRUCTURES****20.1 General:**

No trees or existing structures shall be removed unless approved by the Superintendent. All existing structures, improvements, and utilities shall be adequately protected, at the expense of the Contractor, from damage that might otherwise occur due to construction operations. The Contractor shall be liable for damage to any utilities resulting from his operation. During construction, all fire hydrants, valve boxes, fire or police call boxes, and other existing utility controls shall be left intact, unobstructed and accessible.

**ITEMS 303.061 thru 376.01** (Continued)

21 STERILIZATION

21.1 Description:

This section covers methods for sterilization of water lines and facilities. Before water lines are sterilized, they must first be pressure tested according to the requirements of Part TW – “Testing of Water Mains” of these specifications. Water lines also must be flushed to remove dirt and other foreign matter.

21.2 Flushing:

A service tap must be put on one end of the water line to allow entry of flushing water and sterilization water. The tap shall be done according to the requirements of CW8 – “Service Taps” of these specifications. Flushing shall be done with clean water from the Town’s system until water leaving the other end of the main is clear.

21.3 Sterilization:

Chlorine shall be used to sterilize the pipe line by the following method:

The amount of chlorine applied shall be such as to provide a dosage of not less than fifty (50) parts per million. The chlorinating material shall be introduced to the water lines and distribution system in a manner approved by the Engineer. After a contact period of not less than eight (8) hours, the system shall be flushed with clean water until the residual chlorine content is not greater than 0.2 parts per million. All valves in the lines being sterilized shall be opened and closed several times during the contact period.

The cost of furnishing the chlorine, labor, tools, equipment, and tests of chlorine content and bacteriological tests will be at the expense of the Contractor. No water mains shall be placed in service until a satisfactory test report has been received from an approved laboratory.

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**ITEMS 303.061 thru 376.01** (Continued)**TESTING OF WATER MAIN SECTION****22 GENERAL**

22.1 This part of the specifications stipulates test requirements for materials, construction methods, and leakage, pressure and bacteriological tests of the water lines. Testing for materials and construction methods shall be at the Developer's option except as stipulated herein. The Littleton Water Department may require tests as outlined in these specifications for materials and construction procedures if, in the opinion of the Water Department, the quality of materials and the construction procedures do not meet the requirements stipulated herein.

In all cases, leakage, pressure and bacteriological tests shall be performed on water lines as specified in these standard specifications.

**23 HYDROSTATIC TESTING****23.1 Ductile Iron Pipe:**

As soon as a continuous section of new water main has been installed, the Contractor shall proceed immediately to complete all testing and sterilizing, make all connections, and place those sections in service. The Contractor shall furnish all labor, materials, tools, and equipment necessary to bulkhead and seal off the line for testing, coordinate with the Littleton Water Dept. to flush & fill the newly constructed main with water. Unless otherwise indicated, the pipeline shall be tested with a hydrostatic pressure of not less than two hundred (200) pounds per square inch maintained over a continuous period of not less than two (2) hours by an independent third-party Contractor who performs water main pressure testing on a regular basis. After a successful continuous pressure period of two (2) hours has been completed, the Contractor shall chlorinate (see section 21 – Sterilization) the water main using a third-party Contractor. The cost of testing, finding, and repairing the leaks and retesting shall be at the expense of the Contractor. The water required to fill the lines will be furnished by the Owner, without charge to the Contractor.

**24. BACTERIOLOGICAL TEST**

24.1 After a section of water main has been sterilized and flushed according to Section CW19 – “Sterilization” of these specifications, the Utility shall be notified to pick up a sample. A bacteriological test shall be run to determine whether coliform organisms are present. If coliform organisms are found the line will have to be resterilized as per Section 21.3 of these specifications.

The Contractor will be notified as to the results of the test. The test requires 48 hours to complete.

**ITEMS 303.061 thru 376.01** (Continued)**AS BUILT DRAWINGS**

## 25 GENERAL

25.1 This part of the specifications stipulates test requirements for the provision of as built drawings of work to be provided to the Littleton Water Dept. All costs associated with providing accurate as-built drawings to LELWD shall be the responsibility of the Contractor. Diagrams of the as built drawings are provided in the Littleton Water Dept. Standard Specifications dated 2015 referenced herein and available at <https://www.leLELWD.com/water-department>.

## 26 SERVICE AS BUILT

26.1 At the completion of the installation, the Contractor shall provide to Littleton Water Dept an AS BUILT drawing depicting the following:

- Curb Stop
- Water Line with Designation as to the size.

All AS BUILT Drawings shall have a minimum of two (2) ties from permanent structures (i.e. building corner, hydrant, gate cover, manhole cover, catch basin, hydrant, property bound).

## 27 WATER MAIN AS BUILT

27.1 As-Built Drawings – Water Infrastructure As-Built Drawings shall be in accordance with the standards established by LELWD and shall show complete details of the installation of the Main and appurtenances as required, including, but not limited to,

- 1) The location of the Main with respect to property lines,
- 2) The size, make, and location with respect to street corners of all valves and fire hydrants, manholes, and clean outs,
- 3) The limits and location of any and all special encasements or backfill materials including average depth of cover at such location,
- 4) A detailed diagram of all special installations at utility, drainage, and roadway crossings,
- 5) Location of other utilities encountered.
- 6) Flow line and rim elevation for all manholes.
- 7) Size and material of main,
- 8) Location and size of easements. The Applicant shall provide the Water Department with a full size, reduced, and digital copy of the final set of As-built plans prior to water service acceptance.



**ITEMS 303.061 thru 376.01** (Continued)

27.1.1 The digital copy of approved as-built plans must follow the five requirements listed below:

1. All plans and specifications must be submitted on electronic media (CD or DVD\_ROM using an IBM-PC or compatible file format). Acceptable file formats include: AutoCAD\*.dwg, AutoCAD \*.dxf, ArcView \*.shp, or ArcGIS Geodatabase \*.mdb. The files must be identical to the printed plan and contain all information included on the written plan.
2. All digital mapping data must be delivered in the Massachusetts State Plane Coordinate system with a horizontal datum of NAD83 and vertical datum of NGVD88.
3. Each feature type must be organized in the CAD or GIS data structure as a separate layer using logical layer names. For example, there must be separate CAD layers for buildings, roads, parcel lines, and wetlands. Having all these features in a single CAD layer or GIS file will not be accepted.
4. Documentation of the data format must be provided with a description of the CAD layers and a list of the types of features placed in each layer. Submission of multiple files must also include a list of the files and their purpose.
5. The data submitted must include documentation on the method used to gather the data, the name of the person(s) responsible for preparing the data, contact information, an estimation of the horizontal and vertical accuracy, and the date of data capture. All media shall be free from any and all defects and viruses and labeled as to their contents.

**COMPENSATION**

The work under Items 303.061, 303.81, 303.101, 336.101 will be paid at the contract unit price per FOOT complete in place, which price shall be full compensation for all labor, equipment, tools, transportation, and other incidentals necessary for the completion of the work. Trench bedding and backfill material, wellpointing, trench dewatering, sheeting and shoring shall be inclusive of these Items.

Class B Trench Excavation shall be paid separately under Item 142.

Class B Rock excavation shall be paid separately under Item 144.

Temporary HMA for Patching shall be paid for separately under Item 472, Hot Mix Asphalt for Miscellaneous Work.

Concrete encasement shall be paid for under Item 903.

The work under Items 350.061, 350.081, 350.101, 363.101, 363.102, 371.08, 371.10, and 376.01 will be paid at the contract unit price per EACH installed in place, which price shall be full compensation for all labor, equipment, tools, transportation, and other incidentals necessary for the completion of the work.

The price for Item 376.01, Hydrant – Town Standard shall include compensation for the supply and installation of concrete blocks, crushed stone, and fabric.

**ITEM 358.1****GATE BOX REMOVED AND STACKED****EACH**

The work under this Item shall conform to the relevant provisions of Subsection 220 & Section 300 of the Standard Specifications and the following:

Existing gate boxes that are not reusable shall have their castings disposed of under this Item. The replacement boxes shall be payable under Items 350.061, 350.081, or 350.101.

**METHODS**

Work under this Item shall include the removing and stacking of castings that are within the roadway surface prior to the pavement milling operation. The Contractor also has the option of lowering the castings to a minimum depth of 6" below the proposed cold plane grade.

The existing gate boxes within the designated pavement milling operation area shall be removed and stacked within the project limits. A steel plate, gravel borrow and 3" of hot mix asphalt shall be furnished and placed on the structures so that the existing roadway can be milled. Existing gate boxes may not be stored along the edge of the road. The Contractor is responsible for the temporary storage of the castings until they are reset.

**METHOD OF MEASUREMENT**

Item 358.1, Gate Box Removed and Stacked will be measured for payment per EACH unit complete and accepted by the Engineer.

**BASIS OF PAYMENT**

Item 358.1, Gate Box Removed and Stacked will be paid at the contract unit price per EACH, which price shall be full compensation for all labor, materials, equipment, and incidentals necessary to complete the work.

The work includes the removal and stock piling of the existing castings within the project limits; and the furnishing, placing and the subsequent removal of any steel plates.

Hot mix asphalt that is used shall be payable under Item 472, Temporary Asphalt Patching.

No additional compensation will be allowed for transportation and storage of the castings.

The final placing of the existing castings will be included in the payment under Item 358, Gate Box Adjusted.

**ITEM 376.3**

**HYDRANT – REMOVED AND STACKED**

**EACH**

The Work under this Item shall conform to the relevant provisions of Subsection 376 of the Standard Specifications and the following:

The work consists of removing existing hydrants and transporting them to the Littleton Water Department (LELWD) yard at 39 Ayer Road, Littleton MA. Hydrants shall be handled such that no damage to hydrants will occur.

**METHOD OF MEASUREMENT**

Item 376.3 will be measured for payment per EACH hydrant transported to and accepted at the LELWD yard.

**BASIS OF PAYMENT**

Item 376.3 will be paid at the contract unit price per EACH, which price shall be full compensation for all labor, equipment, tools, transportation, related excavation, grading, compacting and other incidentals necessary for the completion of the work.

Should LELWD decide that the hydrants are not re-usable or that they do not want to keep them, the Contractor shall dispose of or salvage the hydrants with no additional compensation.

**ITEM 402.12 DENSE GRADED CRUSHED STONE FOR SHOULDERS CUBIC YARD**

The Work under this Item shall conform to the relevant provisions of Subsection 402 of the Standard Specifications and the following:

This material is to be used as directed by the Engineer to match the elevation of the finished pavement edge.

This material shall meet the requirements of M2.01.7 with the exception of the fine aggregate which shall consist of stone screenings and the following grading requirements:

SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES
1"	100
3/4"	95-100
1/2"	75-93
3/8"	60-85
#4	35-55
#8	15-30
#50	8-20
#200	5-15

Dense Graded Crushed Stone for Shoulders shall be constructed immediately following the final surface paving.

If the Resident Engineer determines that an unsafe condition exists, due to low shoulders, it shall also be necessary to place the stone for shoulders immediately after the intermediate course is applied to the shared-use path.

**METHOD OF MEASUREMENT**

Item 402.12, Dense Graded Crushed Stone for Shoulders will be measured for payment per CUBIC YARD of stone placed.

**BASIS OF PAYMENT**

Item 402.12, Dense Graded Crushed Stone for Shoulders will be paid at the contract unit price per CUBIC YARD, which price shall be full compensation for all labor, equipment, tools and other incidentals necessary for the satisfactory completion of the work such as placing, grading, compacting and finishing the dense graded crushed stone per the typical and cross sections.

**ITEM 470.2**

**HOT MIX ASPHALT BERM TYPE A - MODIFIED**

**FOOT**

The Work under this Item shall conform to the relevant provisions of Subsection 470 of the Standard Specifications and the following:

The work consists of placing a modified asphalt berm formed to the dimensions shown on the typical sections at the edge of existing pavement in locations identified on the plans. In general, the modified berm shall be 1 foot wide and not exceed 4” in height.

**METHOD OF MEASUREMENT**

Item 470.2, Hot Mix Asphalt Berm Type A - Modified will be measured for payment per FOOT of berm installed complete in place.

**BASIS OF PAYMENT**

Item 470.2, Hot Mix Asphalt Berm Type A - Modified will be paid at the contract unit price per FOOT complete in place, which price shall include full compensation for all labor, equipment, tools, transportation, asphalt curb forms, and all related excavation, grading and compacting and other incidentals necessary for the completion of the work.

**ITEM 590.**  
**ITEM 594.****CURB REMOVED AND STACKED**  
**CURB CORNER REMOVED AND DISCARDED****FOOT**  
**FOOT**

The Work under these Items shall conform to the relevant provisions of Subsection 580 of the Standard Specifications and the following:

All curb to be removed and stacked shall be carefully delivered to the Littleton Department of Public Works at 39 Ayer Road and stacked as directed by a DPW employee. The curb shall remain the property of the Town.

The Contractor is responsible for notifying the Town representative when the curbing will be available.

**CONSTRUCTION METHODS**

The existing curb shall be removed without damage.

**METHOD OF MEASUREMENT**

Item 590., Curb Removed and Stacked will be measured for payment by the actual length (FOOT) of curb removed and stacked as measured along the face of the curb in place prior to removal.

Item 594., Curb Removed and Discarded will be measured for payment by the actual length (FOOT) of discarded curb determined to be unsuitable for re-use and stacking, or not wanted by the Town.

**BASIS OF PAYMENT**

Item 590., Curb Removed and Stacked will be paid at the contract unit price per FOOT, which price shall be considered full compensation for all materials, tools, equipment and labor incidental to and necessary for the completion of the work, including the temporary storage, protection, loading, transporting, unloading and stacking of curb as required.

Item 594., Curb Removed and Discarded will be paid at the contract unit price per FOOT, which price shall be considered full compensation for all materials, tools, equipment and labor incidental to and necessary for the completion of the work, including the temporary storage, protection, loading, transporting, unloading and stacking of curb as required.

**ITEM 655.03**

**TIMBER FENCE - THREE RAIL**

**FOOT**

The work under this Item shall conform to the relevant provisions of Section 600 of the Standard Specifications and the following:

The work under this Item shall include the fabrication and installation of timber fence - three rail as dimensioned and where shown on the plans, as directed by the Engineer and as follows:

**MATERIALS**

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

Gravel Borrow	M1.03.0 – Type b
Wooden Rails and Posts	M9.05.3
Timber Preservatives	M9.05.5

Galvanized connections, bolts, washers, and nuts shall conform to AASHTO M 232.

**CONSTRUCTION**

Two (2) bolts shall be used per each rail to post connection except at butt joints where four (4) bolts shall be used (2 per rail).

All connections, screws, bolts, anchors, nuts, and washers shall be galvanized and are considered incidental to this Item.

All posts and rails shall be ACQ treated. Posts shall have a preservative retention level of 0.60 and rails shall have a minimum preservative retention level of 0.40.

**Timber Fence – Three Rail Fabrication and Erection**

All posts for timber rail fence shall be machine driven provided that posts are not damaged in the process. If a post cannot be machine driven, it shall be set plumb in mechanically excavated or cored holes and secured in gravel borrow footings according to the plans. Posts shall be spaced as shown on the plans. In setting the posts, precautions shall be taken to ensure proper offset, alignment and leveling to prevent bending or twisting of the rail.

Where fence begins or ends at a flare, the flared section shall be included in the measurement of the applicable fence type.

**ITEM 655.03** (Continued)**METHOD OF MEASUREMENT**

Item 655.03, Timber Fence - Three Rail will be measured for payment by the FOOT of fence installed, complete in place. When there is a transition section between two types of fences, the transition section shall be measured as part of the Three Rail Timber Fence.

**BASIS OF PAYMENT**

Item 655.03, Timber Fence - Three Rail will be paid at the Contract unit price per FOOT, which price shall be full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for the gravel borrow, wooden rail and posts, timber preservatives for post buried ends, timber post sleeves, grout, steel tubes and all required hardware and connection plates, but all costs in connection therewith shall be included in the Contract unit price.

**ITEM 675.2****LANDSCAPE BOULDER BARRIER  
REMOVED AND DISCARDED****EACH**

The Work under this Item shall conform to the relevant provisions of Subsections 120 & 140 of the Standard Specifications and the following:

The work under this Item shall include the discard of landscape boulders where shown on the plans, as directed by the Engineer and as follows:

**METHOD OF MEASUREMENT**

Item 675.2 will be measured for payment by per EACH boulder removed and discarded.

**BASIS OF PAYMENT**

Item 675.2 will be paid at the Contract unit price per EACH, which price shall be full compensation for all excavation, backfilling, transportation, handling of stone, erection, and all materials and equipment to complete the work to the satisfaction of the Engineer.



**ITEM 675.201**

**LANDSCAPE BOULDER BARRIER  
REMOVED AND RESET**

**EACH**

The Work under this Item shall conform to the relevant provisions of Subsections 120 & 140 of the Standard Specifications and the following:

The work under this heading consists of carefully removing, storing, and resetting of boulders from offsets established along the roadway to new offsets that are specified in the plans or as specified by the Engineer. The work shall be done in accordance with these specifications, and in close conformity with the lines and grades shown on the plans or established by the Engineer.

**MATERIALS**

The boulders shall be salvaged and reset at the locations specified in the plans.

The Contractor shall take care not to damage the existing boulders during the removal and resetting of the boulders, to retain the character and natural appearance of the existing boulders.

The Contractor shall provide a secure location for stockpiling boulders prior to reconstruction, so that boulders will not be damaged, lost or stolen.

**METHOD OF MEASUREMENT**

Item 675.201 will be measured for payment per EACH individual boulder removed and reset, complete in place.

Any boulder removed and reset for the convenience of the Contractor will not be measured for payment.

**BASIS OF PAYMENT**

Item 675.201 will be paid at the contract unit price per EACH, which price shall be full compensation for removing, relocating, re-setting, re-aligning, and transporting the boulder and also all labor, equipment, worker protection, environmental compliance, materials, tools, and any incidentals required to complete the work to the satisfaction of the Engineer.

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**ITEM 691.01                    BALANCE STONE WALL REMOVED AND REBUILT                    FOOT**

The work under this Item shall conform to the relevant provisions of Subsections 685, 690 & 901 of the Standard Specifications and the following:

The work under this heading consists of carefully removing, storing, and resetting the fieldstone rubble masonry stones of the existing balance stone walls located within the project area as shown on the plan. The work Item also applies to exposed stone boulders partially embedded in the roadside earthen embankment without mortar at locations including but not limited to the shoulder of Grimes Lane. The work shall be done in accordance with these specifications, and in close conformity with the lines and grades shown on the plans or established by the Engineer.

Balance stone walls to be removed and reset as identified on the plans. The reconstructed walls shall maintain the appearance and character of the existing dry-laid balance stone walls to as great a degree as possible.

The work shall include the total volume of adjusted masonry, disassembly of existing masonry, and reconstructing masonry wall complete as shown on the plans and as directed by the Engineer. Stones which are reused and rebuilt in their original location do not require cleaning. By contrast, stones transported for reuse to another location within the project must be cleaned of lichen and stains. The work shall include but not be limited to digging and trenching, labor, tools, equipment and all incidentals required to complete the work as stated herein, shown on the contract plans, and as directed by the Engineer.

Any fieldstone rubble balance walls noted on plans as 'Remove & Discard' shall be handled per the special provision of Item 691.1.

**MATERIALS**

The stones in the existing walls shall be salvaged and reset as new stone balance walls. Any supplemental stones that are required shall be field stones which match the size, color, and texture of the existing stones as closely as is feasible. Preference shall be given to stockpiled stones from walls removed within the project area.

The Contractor shall take care not to damage the existing stones during the disassembly and reconstruction of the balance stone walls, to retain the character and natural appearance of the finished walls. The Contractor shall provide a secure location for stockpiling stone prior to reconstruction, so that stones will not be damaged, lost or stolen.

**CONSTRUCTION METHODS**

The stonework shall be set up by masons who, in the opinion of the Engineer, are experienced in this class of work. At least one of the masons shall have 10 years or more experience constructing non-mortared dry-laid balance stone walls. Prior to the disassembly of the existing wall, photographs of the existing conditions of the wall shall be taken to serve as a guide for its reconstruction. The Contractor shall take care not to damage the existing stones during the disassembly and reconstruction of the wall.

**ITEM 691.01** (Continued)

The stones shall be laid in a two-over-one, one-over-two pattern so as to break joints and all vertical spaces shall be packed full of spalls or chinking stones. No spalls or chinking shall be allowed in the beds and at least 25% of the stones in the face shall be headers evenly distributed throughout the wall.

Remove vegetation and excavate a trench up to 12 inches deep as needed for stable unfrozen soil. Place the bottom row of stones in the trench. All the stones from the existing walls to be rebuilt shall be removed and used to rebuild the new walls. New stones may also be used as necessary to provide rebuilt walls of uniform appearances and cross-sectional dimensions throughout their length. The open spaces about the base of the wall shall be filled with the materials excavated from the trench and all surplus excavation shall be used as directed on the slopes of the new embankment.

**METHOD OF MEASUREMENT**

Item 691.01, Balance Stone Wall Removed and Rebuilt will be measured for payment per FOOT of wall removed and rebuilt, complete and to the satisfaction of the Engineer.

Walls will be measured in place and shall be the length of balance stone wall rebuilt.

**BASIS OF PAYMENT**

Item 691.01, Balance Stone Wall Removed and Rebuilt will be paid at the contract unit price per FOOT, which price shall be full compensation for all labor, equipment, worker protection, environmental compliance, materials, tools, material testing, transportation/hauling and any incidentals required to complete the work to the satisfaction of the Engineer.

Excavation at the new location will be paid at the contract unit price per CUBIC YARD under either of Items 141., Class A Trench Excavation or 144., Class B Rock Excavation.

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**ITEM 691.1      BALANCE STONE WALL REMOVED AND DISCARDED      FOOT**

The Work under this Item shall conform to the relevant provisions of Subsection 690 of the Standard Specifications and the following:

This work shall consist of the removing and discarding of existing balance stone walls in accordance with these specifications, and in close conformity with the lines and grades shown on the plans or established by the Engineer.

**CONSTRUCTION METHODS**

The Contractor shall be responsible for the removal of the existing balance stone wall. The stones shall be removed from the site and transported to the Town DPW laydown yard at 39 Ayer Rd in Littleton with the exception that removed stones under Item 691.1 may be used as supplemental stone material for Item 691.01 Balance Stone Walls Removed and Rebuilt if suitable for re-use as described under that Item.

The open spaces about the base of the wall shall be filled with the materials excavated from the trench and all surplus excavation shall be used as directed on the slopes of the new embankment.

**METHOD OF MEASUREMENT**

Item 691.1, Balance Stone Wall Removed and Discarded will be measured for payment per FOOT of wall removed, as measured along the face of the wall in place prior to removal.

**BASIS OF PAYMENT**

Item 691.1, Balance Stone Wall Removed and Discarded will be paid at the contract unit price per FOOT, which price shall be full compensation for the transport/hauling and delivery to the Town DPW laydown yard of all excess material and stones.

The contract unit price shall also include payment for all transportation, labor, material, tools, equipment, and incidentals required to complete the work.

**ITEM 697.1****SILT SACK****EACH**

The 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 required 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 Subsection 227 of the Standard Specifications.

**COMPENSATION**

Silt sacks will be measured and paid at the Contract unit price per EACH, complete in place; which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for removal and disposal of the sediment from the insert, but all costs in connection therewith shall be included in the Contract unit price.

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**ITEM 698.3            GEOTEXTILE FABRIC FOR SEPARATION            SQUARE YARD**

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

The work under this Item shall consist of placing a geotextile fabric in the construction of the 1.5:1 modified rock fill slopes. See plan for locations as shown on the plans.

**MATERIALS**

The geotextile fabric shall be selected from the MassDOT Qualified Construction Materials List at <https://mass.gov/service-details/qualified-construction-materials-list>. The geotextile fabric shall conform to the requirements of Subsection M9.50.0 of the Standard Specifications and AASHTO M 288, Class 3, for fabric rated for separation and slope stability. Construction and installation shall be in accordance with AASHTO M 288 including Appendix A and the following.

**CONSTRUCTION**

Fabric shall be placed in intimate contact with the crushed stone. 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.

**METHOD OF MEASUREMENT**

Item 698.3, Geotextile Fabric for Separation will be measured for payment by the SQUARE YARD, installed complete in place. No additional payment will be made for overlapping material.

**BASIS OF PAYMENT**

Item 698.3, Geotextile Fabric for Separation will be paid at the Contract unit price per SQUARE YARD, which price shall be full compensation for all labor, materials, equipment and incidental costs required to complete the work.

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<b><u>ITEM 701.</u></b>	<b><u>CEMENT CONCRETE SIDEWALK</u></b>	<b><u>SQUARE YARD</u></b>
<b><u>ITEM 701.2</u></b>	<b><u>CEMENT CONCRETE PEDESTRIAN CURB RAMP</u></b>	<b><u>SQUARE YARD</u></b>

The work under these Items shall conform to the relevant provisions of Subsection 701 of the Standard Specifications and the following:

In addition to the requirements of Section 701 the work shall include the application of a liquid penetrant/sealer to protect concrete surfaces from chloride intrusion. The material shall meet the requirements of section M 9.15.0 and appear on the most current version of the Qualified Construction Materials List (QCML) for penetrating sealer found at:

<https://www.mass.gov/qualified-construction-materials-list-qcml>

### **CONSTRUCTION METHODS**

Application of the penetrant/sealer shall be done in accordance with the manufacturer's instructions which shall be submitted to the Engineer 30 days in advance of any work done under these Items. Unless otherwise allowed by the manufacturer's instructions all concrete shall be fully cured, clean, dry, and have no chemical films or coatings applied before application of the penetrant/sealer.

Concrete placed under these Items shall be cured using a 3-day moist cure. Curing compounds will not be allowed. Following the moist cure the concrete shall be cured for an additional length of time as required by the manufacturer before applying the penetrant/sealer, typically 28 days.

Detectable Tactile warning surface shall conform to the requirements of MassDOT as shown on the 2017 Massachusetts Department of Transportation Highway Division Construction Standard Details, Drawing Number E 107.6.5 and shall be "brick red" in color.

### **METHOD OF MEASUREMENT**

Items 701, and 701.2 will be measured for payment per SQUARE YARD of sidewalk and curb ramp installed complete in place.

### **BASIS OF PAYMENT**

Items 701, and 701.2 will be paid at the contract unit price per SQUARE YARD, which price shall be full compensation for all labor, equipment, and materials required to complete the work.

Payment for the penetrant/sealer will be incidental to the work and no additional compensation will be made.

No separate payment will be made for the detectable warning panels, but all costs in connection therewith shall be included in the contract unit price.

**ITEM 740. ENGINEERS FIELD OFFICE AND EQUIPMENT-TYPE A MONTH**

The work under this Item shall conform to the relevant provisions of Subsection 740 of the Standard Specifications and the following:

Two computer systems and a 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 able to perform 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.

**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 755.86**

**SEASONAL TREE MONITORING REPORT**

**LUMP SUM**

This work under this Item shall satisfy the requirements of the Littleton Conservation Commission Order of Conditions for the project, specifically Orders M-1 through M-3 that require Once Annual Seasonal Tree Monitoring and Reporting.

Please see Document A00861 (Order of Conditions) for the specific language.

**SUBMITTALS**

The Contractor shall submit the credentials of a certified arborist who will perform the tree monitoring and reporting to the Engineer and the Littleton Conservation Agent. The arborist shall be an International Society of Arboriculture (ISA) certified Arborist or a Massachusetts Certified Arborist.

The report(s) shall be submitted to the Engineer and Conservation Agent by October 30th each fall during the work contract duration.

**METHODS**

The report must be authored and signed by a Massachusetts Certified Arborist. The tree inspection report(s) shall be formatted as a brief technical memo listing the tree plantings inspected, the species, the plan station location, a photograph of each tree, and an assessment of current health status.

**BASIS OF PAYMENT**

Item 755.86 will be paid at the contract LUMP SUM price, which price shall be considered full compensation for all work detailed above, including field work and report preparation, required revisions, and revisions/addenda required during construction.

**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. The Contractor shall be fully responsible for compliance with the most recently issued CGP and any subsequent revisions. Should a fine or penalty be assessed against it, or MassDOT, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a fourteen (14) day review period commencing from the date on which EPA enters the Notice into their database. Based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

The CGP also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The Plan will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. The Contractor shall prepare the SWPPP and update it as necessary. The Contractor shall submit the Plan to the Engineer for approval at least four (4) weeks prior to any site activities. It is the responsibility of the Contractor to comply with the CGP conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to the project and to include in the SWPPP the methods and means necessary to comply with applicable conditions of said permits.

**ITEM 756.** (Continued)

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, regulations, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

Included in the CGP conditions is the requirement for inspection of all erosion controls and site conditions on a weekly basis as well as after each incidence of rainfall exceeding 0.25 inches in twenty-four hours. For multi-day storms, EPA requires that an inspection must be performed during or after the first day of the event and after the end of the event. The CGP requires that inspections be performed by a qualified individual as outlined in the CGP. MassDOT requires proof of completion of a 4 hour minimum sedimentation and erosion control training class current to the latest CGP. This individual can be, but not limited to, someone that is either a certified inspector, certified professional, or certified storm water inspector. The documentation shall be included as an appendix in the SWPPP. The inspector's qualifications shall be submitted to the Engineer for approval prior to beginning any work. This individual shall be on-site during construction to perform these inspections. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. The Standard Specifications require adequate erosion control for the duration of the Contract. All control measures must be properly selected, installed, and maintained in accordance with manufacturer specifications and good Engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or is no longer adequate, it is the responsibility of the Contractor to replace or modify the control for site conditions at no additional cost to the Department. Contractor must maintain all control measures and other protective measures in effective operating condition and shall consider replacement of erosion controls for each construction season.

This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, and preparation of monthly reports. In addition, any erosion controls beyond those specified in bid Items which are selected by the Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this Item.

**ITEM 756.** (Continued)

The CGP provides specific requirements for temporary and final stabilization. This shall be incorporated into the project schedule. The permit defines specific deadline requirements for Initial Stabilization (“immediately”, i.e., no later than the end of the next work day following the day when earth-disturbing activities have temporarily or permanently ceased) and for Complete Stabilization Activities (no later than 14 calendar days after the initiation of stabilization). Stabilization criteria for vegetative and non-vegetative measures are provided in the CGP.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etc. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer’s Final Estimate. The permittee shall use EPA’s website to prepare and submit the NOT.

**COMPENSATION**

Payment for all work under this Item shall be made at the contract unit price, LUMP SUM, which shall include all work detailed above, including Plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees.

Payment of fifty (50) % of the contract price shall be made upon acceptance of the NPDES Stormwater Pollution Prevention plan. Payment of forty (40) % of the contract price shall be made in equal installments over the expected duration of stormwater pollution prevention measures. Payment of the final ten (10) % of the contract price shall be paid upon satisfactory submissions of a Notice of termination (NOT) when final stabilization has been achieved.

**ITEM 757.**

**VIBRATION MONITORING**

**LUMP SUM**

The Work under this Item shall conform to the requirements of the following documents appended to this contract: “DAM01011: Excavation and Excavation Notification Requirements for Underground Facilities,” “DAM01003: Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities,” & “General Guidelines for Working Around Gas Utilities” as issued by National Grid – see Document A00807.

The Item addresses the need for vibration monitoring regarding construction activities that include blasting, hammering, and excavating in the vicinity of underground facilities required by National Grid.

**SUBMITTALS**

The Contractor shall submit a vibration monitoring plan document detailing proposed vibration monitoring for applicable work around National Grid utilities. The vibration monitoring plan document will be reviewed by the Engineer, MassDOT and National Grid for approval.

**METHODS**

The vibration monitoring shall conform to the relevant National Grid guidelines appended to this contract and shall include the use of one or more seismographs to ensure that measured peak particle velocity (PPV) of the soil does not exceed a maximum of 5 in./sec. Real time monitoring of the seismograph(s) is required during work activity is required per National Grid’s guidelines.

**BASIS OF PAYMENT**

Item 757, Vibration Monitoring will be paid at the contract LUMP SUM price, which price shall be full compensation for all labor, equipment, correspondence, and meetings required to plan and perform the Vibration Monitoring including all required revisions/addenda during construction.

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**ITEM 765.21                      ANNUAL COVER CROP FOR NATIVE SEEDING                      POUND**

The Work under this Item shall conform to the relevant provisions of Subsection 765 of the Standard Specifications and the following.

Work consists of furnishing and applying the appropriate annual grass to be seeded as a cover crop in conjunction with upland native seeding and at the rate specified herein.

A cover crop shall be used for following conditions:

- when specified under Application Rate for the permanent native upland seed mix
- for slopes 2:1 or steeper and an annual is not already specified as part of the permanent mix
- when seeding out of season and the native seed mix does not already specify an annual
- as required to prevent erosion until the permanent seed is established

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**

Item 765.21, Annual Cover Crop for Native Seeding will be measured for payment per POUND of seed, complete in place.

Item 765.21, Annual Cover Crop for Native Seeding will be paid at the contract unit price per POUND upon approval of seed bag tags or other documentation of correct application rate and species, and upon acceptance of a satisfactory stand of annual grasses three weeks following seeding.

Application and care of cover crop will be paid for separately under Item 765.635, Native Seeding and Establishment.

**ITEM 765.490      NEW ENGLAND ROADSIDE WET MEADOW SEED MIX      POUND**

Work under this Item shall consist of furnishing the mix(es) specified below in the required quantity.

**SUBMITTALS**

- 1) Pre-Verification of Seed Availability. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species in the required quantities and for the anticipated date of seeding. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. Species not expected to be available should be noted and substitutions recommended.
- 2) Final Verification of Seed Availability. No earlier than 21 days prior to ordering, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species and in the required quantities. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section. Substitutions or changes in the mix at this time must be approved by MassDOT Landscape Design Section.
- 3) Seed Worksheet provided herein shall be submitted to the Engineer prior to ordering seed to determine the number of pounds of Pure Live Seed required.
- 4) Seed Tags. The Contractor shall submit original seed tags from each bag of seed used on the project or ensure that each tag is photo documented by the Engineer while on the unopened bag.

Number of tags submitted must correspond to number of bags delivered.

Species listed on the seed tag shall match the Final Verification of Seed Availability (Submittal #2) unless approved otherwise. Tag must include: variety and species name; lot number; purity; percentage of inert matter; percentage of weeds, noxious seeds, and other crop seeds; germination, dormant or hard seed; total viability; origin of seed; germination test date, net weight, and name and address of seller. The origin of seed must be listed on the seed tag for all species in the mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

- 5) Verification of Seed Delivery. Prior to payment, Contractor shall submit the Seed Delivery Verification form contained within the contract or the Supplier's Verification on company letterhead or a bill of lading. Supplier verification must include all information requested on the Verification form within this contract. The bill of lading must include variety and species name, lot number, net weight shipped, date of sale, invoice, project or seeding location, and name and address of Supplier. All information must be filled in and complete for acceptance. Information must match the seed tags and quantity of seed used on the job. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.
- 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.



**ITEM 765.490** (Continued)

**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.

**NEW ENGLAND ROADSIDE WET MEADOW SEED MIX**

	<b>Botanical Name</b>	<b>Common Name</b>	<b>% PLS by Weight</b>
<u>Grass</u>	Elymus riparius	Riverbank Wild Rye	25.00%
	Elymus virginicus	Virginia Wild Rye	20.00%
	Festuca rubra	Red Fescue	10.00%
	Panicum virgatum	Switch Grass	10.00%
	Panicum virgatum	Switch Grass	8.00%
	Carex scoparia	Blunt Broom Sedge	5.00%
	Cornus amomum	Silky Dogwood	2.00%
			<b>85.00%</b>
<u>Herb/Forb</u>	Carex lurida	Lurid Sedge	4.00%
	Iris versicolor	Blue Flag	2.00%
	Asclepias incarnata	Swamp Milkweed	2.00%
	Viburnum dentatum	Arrow Wood Viburnum	2.00%
	Aster novae-angliae (Symphyotrichum novae-anglia)	New England Aster	1.50%
	Eupatorium perfoliatum	Boneset	1.00%
	Eupatorium maculatum (Eutrochium maculatum)	Spotted Joe Pye Weed	1.00%
	Sambucus canadensis	Elderberry	0.50%
	Scirpus atrovirens	Green Bulrush	0.50%
	Aster umbellatus (Doellingeria u.)	Flat Topped/Umbrella Aster	0.50%
			<b>15.00%</b>
			<b>100%</b>

**ITEM 765.490** (Continued)

**Application Rate**

Mix X: 35 lbs/acre PLS. Option 1: In addition, apply 30 pounds per acre of cover crop (grain oats or grain rye) as appropriate to the season.

Any species substitution 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**

Item 765.490, New England Roadside Wet Meadow Seed Mix will be measured for payment by the POUND of Pure Live Seed delivered and complete in place.

**BASIS OF PAYMENT**

Item 765.490, New England Roadside Wet Meadow Seed Mix will be paid at the contract unit price per POUND of Pure Live Seed delivered upon approval of all Seed Submittal Documentation. Overseeding required to correct poor germination or establishment shall be incidental to the Item.

Cover crop not included as part of the permanent mix composition will be paid for under Item 765.21, Annual Cover Crop.

Application and care of native seed mix will be paid for separately under Item 735.635 Native Seeding and Establishment.

**ITEM 765.490** (Continued)

***NATIVE SEED WORKSHEET***

Project Description: \_\_\_\_\_

Project No: \_\_\_\_\_

Contractor: \_\_\_\_\_

Contract No: \_\_\_\_\_

Seed Mix Number & Description: \_\_\_\_\_

**Contractor: Complete Prior To Ordering**

Pounds of Seed Required Per Contract:

\_\_\_\_\_ lbs./acre for \_\_\_\_\_ Acre(s) OR \_\_\_\_\_ SY

Additional 50% increase if required (out of season or seeding over 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 765.490** (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**

The work under this Item shall conform to the relevant provisions of Subsections 765 and 767 of the Standard Specifications and the following:

The work 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.

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**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.

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**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 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.

The 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.



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**ITEM 765.635** (Continued)

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 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**

Item 765.635, Native Seeding and Establishment will be measured for payment by the SQUARE YARD, complete in place.

Item 765.635, Native Seeding and Establishment will be paid at the Contract unit price per SQUARE YARD upon Conditional, Interim, and Final Acceptances as described above. This price shall include all submittals, seeding, rolling to ensure seed-to-soil contact, weed control 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.

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**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.

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**ITEM 767.121** (Continued)**Sedimentation Fence**

Materials and Installation shall be per Subsections 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 Subsection 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The Contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (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:

**ITEM 767.121** (Continued)

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grass mix).
- Sedimentation fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Item 767.121 will be measured and paid for at the contract unit price per FOOT of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Additional barrier such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damaged by construction activities shall be repaired or replaced as required by the Engineer at the Contractor's expense.

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**ITEM 767.78      COMPOSTED MULCH OVER MODIFIED ROCK      SQUARE YARD**

This Work under this Item shall conform to the relevant provisions of Subsections 765 & 767 of the Standard Specifications and the following:

The purpose of this Item is to provide compost mulch for mixing with seed, to be placed on designated modified rockfill slopes in areas where establishment of vegetation in the rock slope is desired.

**MATERIALS**

**Composted mulch**

Composted Mulch shall be an aged organic substance meeting the requirements of M1.06.0 of the Supplemental Standard Specifications. No manure, bio-solids, kiln dried wood, or construction debris shall be allowed.

Organic matter content shall be between 20-100% (dry weight basis) as determined by ASTM D2974 (method A) Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils.

Moisture content shall be <15% by dry weight (<60% by wet weight) as measured by ASTM D2216 Standard Test Method for Laboratory Determination of Water Content of Soil and Rock and ASTM D2974 (cited above).

Particle size as measured by sieving shall be as follows:

<u>Sieve Size</u>	<u>%Passing</u>
2 in	100%
¾ in	70-100%
#4	30-75%
#20	20-40%

Soluble salts shall be <5.0 mmhos/cm (dS/m). The pH shall be between 5.5 and 8.0.

**Seed**

Seed shall be a native mix as specified under Item 765.490, New England Roadside Wet Meadow Seed Mix.

**CONSTRUCTION METHODS**

Methods of installation shall be reviewed and approved by the Engineer prior to placement of material.

**ITEM 767.78** (Continued)

Placement of compost mulch shall be as shown on the plans and as directed by the Engineer. Compost mulch material shall be applied pneumatically. Material shall be placed so that settled material is at or slightly below the surface plane of the stone. Contractor shall ensure that there will be adequate quantity, including adjustment for settlement.

Seeding shall be done at the same time as compost topsoil is being applied and shall be by broadcast method as specified under the seeding Item and such that a very thin blanket of material covers the seed.

**METHOD OF MEASUREMENT**

Item 767.78, Composted Mulch Over Modified Rock will be measured for payment per SQUARE YARD of mulch applied.

**BASIS OF PAYMENT**

Item 767.78, Composted Mulch Over Modified Rock will be paid for at the Contract unit price per SQUARE YARD, which price shall be full compensation for all labor, materials, equipment, site preparation, and all incidental costs required to complete the work.

Seed shall be compensated at the contract unit price for the seeding Item.

Modified Rockfill shall be compensated separately under Item 986.

<b><u>ITEM 776.525</u></b>	<b><u>MAPLE – RED – KARPICK 2-2.5 INCH CALIPER</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 777.138</u></b>	<b><u>OAK –PIN 2-2.5 INCH CALIPER</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 777.241</u></b>	<b><u>OAK – SCARLET 2-2.5 INCH CALIPER</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 777.671</u></b>	<b><u>BLACK GUM – 2-2.5 INCH CALIPER</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 778.399</u></b>	<b><u>CHOKE CHERRY – 1.5-2 INCH CALIPER</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 781.284</u></b>	<b><u>HAWTHORN- COCKSPUR 1.5-2 INCH CALIPER</u></b>	<b><u>EACH</u></b>
<b><u>ITEM 782.537</u></b>	<b><u>REDBUD – EASTERN 6-8 FEET CLUMP –</u></b>	<b><u>EACH</u></b>
	<b><u>1.5 INCH CALIPER</u></b>	
<b><u>ITEM 783.031</u></b>	<b><u>SERVICEBERRY – ROBIN HILL</u></b>	<b><u>EACH</u></b>
	<b><u>1.5-2 INCH (SINGLE STEM)</u></b>	
<b><u>ITEM 787.045</u></b>	<b><u>RHODODENDRON – WHITE CATAWBA 3 GAL.</u></b>	<b><u>EACH</u></b>

The work under these Items shall conform to the relative provisions of Subsection 771 of the Standard Specifications and the following:

Prior to planting the Contractor shall inspect, verify, and provide photo documentation of all plant stock to the resident Engineer. Written notification of any species substitutions must be provided to the resident Engineer including a justification for substitutions for review and approval prior to installation.



<b><u>ITEM 824.221</u></b>	<b><u>RECTANGULAR RAPID FLASHING BEACON (SOLAR) LOC. 1</u></b>	<b><u>LUMP SUM</u></b>
<b><u>ITEM 824.222</u></b>	<b><u>RECTANGULAR RAPID FLASHING BEACON (SOLAR) LOC. 2</u></b>	<b><u>LUMP SUM</u></b>
<b><u>ITEM 824.223</u></b>	<b><u>RECTANGULAR RAPID FLASHING BEACON (SOLAR) LOC. 3</u></b>	<b><u>LUMP SUM</u></b>

The Work under these Items shall conform to the relevant provisions of Section 800 of the Standard Specifications, the Plans, and the following:

The work shall include furnishing and installing a solar-powered, pedestrian actuated, rectangular rapid flashing beacon (RRFB) system at the locations shown in the plans. RRFBs are intended to provide supplemental warning to approaching vehicles of the potential for pedestrians to be crossing in an adjacent crosswalk.

NO.	STATION/OFFSET	PLAN SHEET
1	203+82/28' LT 203+93/29' RT	41
2	21+11/21' RT 21+24/14' LT	45
3	38+46/16' RT 38+46/15' LT	48

**MATERIALS**

An RRFB system shall, at a minimum, consist of the following Items, which shall be included in the LUMP SUM price:

- (2) concrete foundations;
- (2) 15' traffic signal posts and pedestals; Painted Black
- (2) APS pushbutton systems;
- (4) dual rectangular yellow LED beacons in NEMA enclosures;
- (2) 9"x12" R10-25 (PUSH BUTTON TO TURN ON WARNING LIGHTS) signs;
- (4) 30"x30" W11-15 (Pedestrian Warning) signs;
- (2) 24"x12" W16-7PR and (2) 24"x12" W16-7PL (Diagonal Downward Arrow) signs;
- (2) solar panels;
- (2) NEMA Type 3R or higher enclosures to house:
  - Electrical components, including wiring and solid-state circuit boards;
  - On-board user interface;
  - Battery; and
  - Frequency hopping spread spectrum (or other alternate FCC approved) wireless activation unit with a minimum 150' range; and
  - All mounting and supporting hardware and wiring necessary to complete a working system.(mounting hardware factory painted black)

RRFB controller and LED beacons, APS pushbutton systems, and traffic signal posts and pedestals shall be listed on the Qualified Traffic Control Equipment List. Pedestals shall be cast iron.

**ITEMS 824.221, 824.222 & 824.223** (Continued)

All signs shall be MUTCD-compliant. R10-25 signs shall have a black border and legend on a white background. W11-15, W16-7PR, and W16-7PL signs shall have a black border and legend on a fluorescent yellow-green background. All sign sheeting materials shall be per Subsection 828.41.

R10-25 signs may be integrated into the APS pushbutton system as a single unit or mounted separately on Type A aluminum.

W11-2, W16-7PR, and W16-7PL signs shall be Type A aluminum per Subsection 828.42.

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

The solar panels shall be affixed to an aluminum plate and bracket, adjustable at an angle of 45° to 60° and each assembly shall be mounted on a 360° rotatable pole cap mount to facilitate adjustment for maximum solar collection and optimal battery strength. The solar panel assemblies shall be rated for 90 mph wind conditions.

The batteries shall conform to Battery Council International specifications and have a capacity allowing up to 30 days of autonomy without sunlight and varying with ambient temperature and number of activations. The batteries shall be rated for a minimum lifespan of 3 years. Batteries shall be replaceable independently of other components.

The solar panels and battery shall have a minimum operating temperature range of -40° to 122°F (-40° to 50°C).

The Contractor shall provide shop drawings and calculations to confirm solar panel sizing and battery/solar energy storage will meet the functional requirements of the system.

**FUNCTIONAL REQUIREMENTS**

The RRFB system shall remain dark until pedestrian actuation.

Upon actuation, all LED beacons shall activate and flash in a rapidly flashing sequence. Each sequence shall last 800 milliseconds and there shall be 75 sequences per minute. The sequence shall be the same for each pair of LED beacons in an enclosure and shall be as follows:

**ITEMS 824.221, 824.222 & 824.223** (Continued)

1. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.
2. Both RRFB indications shall be dark for approximately 50 milliseconds.
3. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.
4. Both RRFB indications shall be dark for approximately 50 milliseconds.
5. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.
6. Both RRFB indications shall be dark for approximately 50 milliseconds.
7. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.
8. Both RRFB indications shall be dark for approximately 50 milliseconds.
9. Both RRFB indications shall be illuminated for approximately 50 milliseconds.
10. Both RRFB indications shall be dark for approximately 50 milliseconds.
11. Both RRFB indications shall be illuminated for approximately 50 milliseconds.
12. Both RRFB indications shall be dark for approximately 250 milliseconds.

The flash rate of each individual RRFB indication, as applied over the full flashing sequence, shall not be between 5 and 30 flashes per second.

All RRFBs within the system shall commence and cease operation simultaneously.

The length of the flashing cycle upon actuation and the minimum allowable time between actuations shall be per the plans. These settings shall be user-programmable through the on-board user interface. No-fee wireless (Wi-Fi, Bluetooth®, etc.) may be used as an alternative programming method.

Each APS pushbutton shall have a tactile arrow and locator tone. The tactile arrow shall be oriented to point in the direction of the crosswalk. The locator tone shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals. The locator tone shall be set 2 to 5 dBA above ambient sound, shall automatically adjust intensity, but cap at a maximum volume of 100 dBA. The tone shall be audible whenever the LED modules are not active.

Upon activation of the LED modules, a speech message shall state, "Yellow lights are flashing." This message shall be stated twice. No vibrotactile or percussive indications shall be used.

If a pushbutton is pressed before the minimum time between actuation intervals is met, a speech message shall state, "Wait," and the locator tone shall resume until the LED modules activate.

**ITEMS 824.221, 824.222 & 824.223** (Continued)

**CONSTRUCTION METHODS**

No work shall commence until the shop drawings are approved.

Layout and design of the RRFB system shall conform to the plans.

Foundation installations shall be per Subsection 801.62. The top of the foundation shall be ¼” to 1” proud of the sidewalk and chamfered at 45 degrees. Gaps between the sidewalk and foundation shall be no larger than ¼” and grouted with preformed joint filler.

The Contractor shall diagnose and replace any part of the pedestrian activated warning system that is found to be defective in workmanship, material, or manner of functioning within six months of final acceptance by the Engineer. This requirement does not supersede the one-year warranty period on materials specified in Subsection 815.20.

**BASIS OF PAYMENT**

The RRFB system shall be paid at their respective contract LUMP SUM prices, which prices shall be considered full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

**ITEM 847.11****TIMBER SIGN POST****EACH**

The Work to be done under this Item shall comply with the relevant provisions of Subsection 840 of the Standard Specifications and the following:

The work shall consist of setting timber sign posts for wayfinding and traffic control signs as shown on the plans.

**MATERIAL**

Posts shall be 8' tall pressure treated white pine 4" x 4". All bolts and hardware used to connect signs to posts shall be galvanized. Posts should be driven at a minimum of 24" into undisturbed soil.

The pressure treated timber shall have treated lumber quality mark tags from the American Wood Protection Association (AWPA) and the International Code Council Evaluation System (ICC-ES). The post shall be approved for AWPA use category 4B for ground contact. The preservative shall be a waterbourne copper based dissolved preservative system, Copper Azole (CA-C). Acceptable examples are made under the trade names:

1. Wolmanized Outdoor: <<https://www.conradfp.com/pressure-treatment-ca-c.php>>
2. Naturewood: <<http://www.koppersperformancechemicals.com/naturewood/>>
3. Preserve: <<https://www.treatedwood.com/products/preserve>>

**METHOD OF MEASUREMENT**

Item 847.11, Timber Sign Post will be measured for payment per EACH post installed.

**BASIS OF PAYMENT**

Item 847.11, Timber Sign Post will be paid at the contract unit price per EACH, which price shall be full compensation for all labor, materials, tools and incidentals required to complete the work.

The Contractor shall not be paid for removing and resetting sign posts for his own convenience after their initial installation.



**ITEM 852.11**  
**ITEM 852.12****TEMPORARY PEDESTRIAN BARRICADE**  
**TEMPORARY PEDESTRIAN CURB RAMP****FOOT**  
**EACH****DESCRIPTION**

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.

**ITEMS 852.11 & 852.12** (Continued)

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.

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.

**COMPENSATION**

Payment for Temporary Pedestrian Barricade 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 Ramp 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 861.044**                      **4 INCH REFLECTORIZED YELLOW LINE**                      **FOOT**  
**(PAINTED)**

The Work under this Item shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

This Item shall be for placement of 4" wide painted yellow lines (dashed and solid) on the shared- use path portion of the project as shown on the plans.

**MATERIALS**

The material shall be water-borne reflective paint intended for outdoor use as pavement marking and recommended by the manufacturer as being adherent to HMA surfaces. The material shall be included on the MassDOT Qualified Construction Materials List for Water- Borne Traffic Paint.

The MassDOT QCML can be found at the website below. <https://www.mass.gov/service-details/qualified-construction-materials-list>

**METHOD OF MEASUREMENT**

Item 861.044, 4 Inch ReflectORIZED Yellow Line (Painted) will be measured for payment per FOOT of line painted and approved by the Engineer.

**BASIS OF PAYMENT**

Item 861.044, 4 Inch ReflectORIZED Yellow Line (Painted) will be paid per FOOT of line painted not including the space between broken or dashed lines, which price shall be full compensation for all material, labor, tools and incidentals required to complete the work.



**ITEM 865.****CROSS WALKS REFLECTORIZED  
WHITE (THERMOPLASTIC)****SQUARE FOOT**

The Work under this this Item shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

This Item shall be for placement of 12” wide white reflectORIZED crosswalk markings with 24” between markings placed as shown on the plans.

**METHOD OF MEASUREMENT**

Item 865 will be measured for payment by the total SQUARE FOOT area of material applied and shall be the actual number of square feet applied as directed and approved by the Engineer.

**BASIS OF PAYMENT**

Item 865 will be paid at the contract unit price per SQUARE FOOT of material applied, which price shall be full compensation for all labor, materials, tools, equipment, testing and incidentals required to complete the described work to the satisfaction of the Engineer.

**ITEM 865.01****HIGH FRICTION SURFACE TREATMENT -  
GREEN (BIKE LANES)****SQUARE FOOT**

This work shall consist of furnishing and placing a green-colored High Friction Surface Treatment (HFST) on asphalt or concrete pavement.

The HFST shall be comprised of surface preparation and a minimum of a single layer using a Binder Resin System which holds a surface applied aggregate firmly in place. The Binder Resin System shall include Polymeric or Methyl Methacrylate (MMA) Resins.

**QUALIFICATION OF INSTALLER****A. General**

The installer shall submit a minimum of three projects with the owner’s contact information on which a cumulative minimum of 5,000 square yards of HFST has been placed within the past three years. An installer who does not meet this minimum shall be allowed if they are certified by the manufacturer to install and a manufacturer’s representative is onsite during installation.

**B. Quality Control (QC) Plan**

The QC plan shall be project specific detailing installer’s key personnel, equipment, materials, proposed methods of installation, materials blending procedures, monitoring of ambient temperature, proposed methods of curing and corrective action plan. The QC plan shall also specify that either mark-up panels with approved colors and/or shop drawings showing the same shall be submitted to the Engineer for approval prior to installation of the HFST. The Contractor shall submit a QC plan to the Engineer for approval at least 30 days prior to placement. Any deviation from the approved QC plan shall be cause for immediate suspension of operations.

**ITEM 865.01** (Continued)**MATERIALS**

## A. General

Resin Binder Systems shall be recommended by the manufacturer as suitable for use on the intended pavement surface and for the potential range of atmospheric exposure.

The Contractor shall furnish and install a Resin Binder System that meets the criteria in Table 1:

<b>Table 1 - Resin Binder System</b>					
<b>Property</b>		<b>Test Method</b>		<b>Requirements</b>	
				<b>Polymeric Resin</b>	<b>MMA</b>
Ultimate Tensile Strength		AASHTO M-235		2000-5000 psi	1500-5000 psi
Elongation at break point		AASHTO M-235		30-70%	30-70%
Compressive Strength		ASTM C-579		1600 psi min.	1600 psi min.
Compressive Strength		AASHTO M-235		1000 psi min. at 3 hours 5000 psi min. at 7 days	1000 psi min. at 3 hours 2000 psi min. at 7 days
Water Absorption		AASHTO M-235		1% max.	1% max.
Durometer Hardness (Shore D)		ASTM D-2240		60-80	40-75
Viscosity		ASTM D-2556		Class C: 7-30 poises	Class C: 12-20 poises
Gel Time		AASHTO M-235		Class C: 10 minutes min.	Class C: 10 minutes, min.
Cure Rate (Dry through time)		ASTM D-1640		3 hrs. max.	3 hrs. max.
Adhesive Strength at 24 hours		ASTM D-4541		250 psi min. or 100% substrate failure	250 psi min. or 100% substrate failure

Independent laboratory reports per formulation shall be provided, documenting that the resin binder meets the requirements of this specification. A sample of the resin binder or components lot/batch shall be provided a minimum of 14 days prior to the commencement of work.

**ITEM 865.01** (Continued)

At the request of the Engineer, the manufacturer of the Resin Binder System shall certify that the Resin Binder System meets the requirements of this specification. Such certification shall consist of either a copy of the manufacturer's test report or a statement by the manufacturer, accompanied by a copy of the current test results, that the Resin Binder System has been sampled and tested. Such certification shall indicate the date of testing and shall be signed by the manufacturer.

**B. Aggregate**

The Contractor shall furnish and install a high friction aggregate that is clean, dry and free from deleterious material. The high friction aggregate shall be Calcined Bauxite.

The calcined bauxite aggregate shall meet the properties shown in Table 2:

<b>Table 2 - Calcined Bauxite Aggregate</b>		
<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Polish Stone Value	AASHTO T-279	65 min.
Resistance to Degradation	AASHTO T-96	20% max.
Aggregate Grading	AASHTO T-27	No. 4 Percent Passing 100% min. No. 6 Percent Passing 95% min. No. 16 Percent Passing 5% max.
Moisture Content	AASHTO T-255	0.2% max.
Aluminum Oxide	ASTM C-25	87% min.

All aggregates shall be furnished in appropriate packaging that is clearly labeled and protects the aggregate from any contaminants on the jobsite and from exposure to rain or other moisture.

Unless the HFST is on the MassDOT Qualified Products List, the manufacturer shall provide a 50 lb bag of aggregate accompanied to the DOT for approval a minimum of 14 days prior to the commencement of work. On all projects and regardless of the HFST status on the MassDOT Qualified Products List, the manufacturer of the aggregate shall certify that the aggregate meets the requirements of this specification. Such certification shall consist of either a copy of the manufacturer's report or a statement by the manufacturer, accompanied by a copy of the current test results, that the aggregate has been sampled and tested. Such certification shall indicate the date of testing and shall be signed by the manufacturer.

**C. Color**

The color of the HFST material shall be green, as specified in the Federal Highway Administration (FHWA) Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14), dated April 15, 2011. Green pigment used for this purpose shall be applied to the Resin Binder System and the aggregate. The Contractor shall certify that any Resin Binder System and/or aggregate treated with green pigment shall conform to the above material requirements of this specification.

**ITEM 865.01** (Continued)**EQUIPMENT AND APPLICATION REQUIREMENTS**

## A. Construction Requirements

A manufacturer's representative of the Resin Binder System shall be present at the jobsite during all construction operations relating to the preparation and placement of the HFST. All construction operations relating to the HFST shall meet the recommendations of the manufacturer's representative. Final approval of all HFST placement operations will be given by the Engineer.

## B. Weather Limitations

Resin Binder system shall not be placed on any wet surface or when the ambient temperature or the temperature of the pavement is below the manufacturer's recommendations or when the anticipated weather conditions would prevent the proper application of the surface treatment as directed by the manufacturer's representative.

## C. Surface Preparations

The surface shall be thoroughly cleaned immediately prior to installation of the HFST. The surface shall be clean, dry and free of all dust, oil, debris and any other material that might interfere with the bond between the resin binder material and the existing surface as recommended by the manufacturer's representative. HFST may not be placed on any new HMA pavement that has been placed in the previous 30 days with motor vehicle traffic or 60 days without motor vehicle traffic.

The Contractor shall pre-treat joints and crack greater than ¼ inch in width and depth with the mixed Resin Binder System. Once the resin binder in the pre-treated areas has gelled, the installation of the HFST may proceed.

Surface preparation work, surface temperature and placement of the HFST shall be in conformance with the binder supplier's specifications and as approved by the manufacturer's representative.

All existing edge line pavement markings that are adjacent to the HFST location shall be covered and protected as approved by the Engineer prior to performing surface preparation. HFST shall not be placed over existing pavement markings or rumble strips. Lane line pavement markings that conflict with the HFST installation shall be removed by methods approved by the manufacturer's representative. Any existing edge line pavement markings that are damaged during the HFST application process shall be replaced at the Contractor's expense per direction of the Engineer.

**ITEM 865.01** (Continued)

HFST shall be allowed to cure for the minimum duration as recommended by the binder component supplier's specifications and during that time the application area shall be closed to all vehicles and Contractor's equipment traffic. After placement and cure of the HFST, the Contractor shall test the finished surface in accordance with ASTM D7234 to detect unbonded areas.

Excess and loose aggregate shall be removed from the traveled way and shoulders in such a way that the HFST is not damaged or disturbed. Excess aggregate that can be reused shall be reclaimed by a Vacuum sweeper. The recovered aggregate shall be clean, uncontaminated and dry, if it is to be re-used in the HFST application.

Utilities, drainage structures, curbs and any other structures within or adjacent to the treatment location shall be protected against the application of the HFST materials.

HFST shall not be applied to newly placed asphalt pavement surfaces that are less than 30 days old, unless the surface is sandblasted as approved by the manufacturer's representative, prior to application.

**D. Surface Friction Test**

The surface friction of the completed HFST shall meet a minimum requirement of 65 FN40R from the ASTM E274 test. MassDOT-Highway Division will perform this test within 7 calendar days after completion of the HFST.

Any surface that fails to conform to the above friction requirement must be removed and replaced at the Contractor's expense within 24 hours after being notified by the Engineer.

**ITEM 865.01** (Continued)

## E. Application Methods

HFST shall be applied in accordance with the manufacturer's recommendations. The HFST can be applied by either mechanical or manual techniques as follows: mechanical application shall be required for all travel lanes and shoulders, mechanical or manual application is required for smaller surface areas requiring hand work such as small areas of HFST application, crosswalks, narrow median or smaller areas of special delineation and as approved by the Engineer.

The Resin Binder System shall be blended and mixed in the ratio per the manufacturer's specification (+/- 2% by volume) and shall be continuously applied once blended. The Resin Binder System shall be applied at a uniform thickness of 50-65 mils (25-32 square feet per gallon). Coverage rate is based upon expected variances in the surface profile of the pavement.

The operation shall proceed in such a manner that will not allow the mixed material to separate, cure, dry, be exposed or otherwise harden in such a way as to impair retention and bonding of the high friction aggregate.

The high friction aggregate shall be immediately applied at a rate of 12-15 pounds per square yard (achieving saturation) in such a manner that there is no disruption to the leveled binder. It is the responsibility of the Contractor to ensure full embedment of the high friction aggregate. Wet spots shall be covered with the high friction aggregate prior to the gelling of the Resin Binder System.

Walking, standing on, or any form of contact or contamination with the wet uncured Resin Binder System, prior to application of the aggregate, will result in that section of Resin Binder System being removed and replaced at the Contractor's expense.

**METHOD OF MEASUREMENT**

Item 865.01 will be measured for payment by the total SQUARE FOOT area of HFST material and shall be the actual number of square feet applied as directed and approved by the Engineer.

**BASIS OF PAYMENT**

Item 865.01 will be paid at the contract unit price per SQUARE FOOT of HFST material applied, which price shall be full compensation for all labor, materials, tools, equipment, testing and incidental Items necessary to complete the described work to the satisfaction of the Engineer.

**ITEM 865.16****PREFORMED THERMOPLASTIC  
BIKE LANE MARKINGS – WHITE****EACH**

Work under this Item shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

The purpose of these Items is to provide and install precut 90 mil thick colored bike lane markings with the intent of having a longer effective life span to reduce Town maintenance. All pavement marking materials supplied under this Item shall be lead chromate free and listed on the MassDOT Qualified Construction Materials List.

**SUBMITTALS**

Product data from manufacturer shall be submitted prior to any construction or application. This data shall show conformance to material specifications stated below.

**MATERIALS**

The green markings and white symbols within green area shall be one of the following or approved equal:

- 1) PreMark by Ennis-Flint  
Item 865.16: Bicycle Rider Bike Lane Green 4'w x 7'h - PM6902766(+)  
Bike Straight Arrow Bike Lane Green 4'w x 7'h - PM6902763
- 2) RAE Preformed Thermoplastic Products:  
Item 865.16: Item #PR-TH-4065 & 4067
- 3) SWARCO Preformed Thermoplastic Markings:  
Item 865.16: Item # 3572 & 4067

The markings must be composed of an ester modified rosin resistant to degradation by motor fuels, lubricants etc. in conjunction with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a finished product and meets the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. The thermoplastic material conforms to AASHTO designation M249-79 (98), with the exception of the relevant differences due to the material being supplied in a preformed state.

**Pigments:**

White: The material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.

Other Colors: The pigments must be heavy-metal free.

Heating indicators: The top surface of the material (same side as the factory applied surface beads) shall have regularly spaced indents. These indents shall act as a visual cue during application that the material has reached a molten state so satisfactory adhesion and proper bead embedment has been achieved and a post-application visual cue that the installation procedures have been followed.

**ITEM 865.16** (Continued)

**Skid Resistance:** The surface of the preformed thermoplastic material shall contain factory applied non-skid material with a minimum hardness of 8 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303.

**Thickness:** The material must be supplied at a minimum thickness of 90 mils (2.29 mm) or 125 mils (3.15 mm).

**Retroreflectivity:** The preformed retroreflective marking materials upon application shall exhibit adequate and uniform nighttime retroreflectivity. The marking materials shall have the following retroreflectivity as measured using a Delta LTL 2000 or LTL-X Retroreflectometer:

White preformed reflective marking materials—minimum of 275 mcd·m<sup>-2</sup>·lx<sup>-1</sup>

**Note:** Initial retroreflection and skid resistance are affected by the amount of heat applied during installation. When ambient temperatures are such that greater amounts of heat are required for proper installation, initial retroreflection and skid resistance levels may be affected.

**Environmental Resistance:** The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

**Abrasives:** The abrasives and surface beads must be applied in an alternating arrangement across the surface of the material so that the surface is covered in what is best described as a “checkerboard” pattern of glass beads and abrasive materials. The abrasive material must have a minimum hardness of 8 (Mohs scale).

**METHOD OF CONSTRUCTION**

**Asphalt:** The materials shall be applied using the propane torch method recommended by the manufacturer. The material must be able to be applied without minimum requirements for ambient and road temperatures and without any preheating of the pavement to a specific temperature. The material must be able to be applied without the use of a thermometer. The pavement shall be clean, dry and free of debris. Supplier must enclose application instructions with each box/package.

**PACKAGING:** The preformed thermoplastic markings shall be placed in protective plastic film with cardboard stiffeners where necessary to prevent damage in transit. Linear material must be cut to a maximum of 3' long pieces. Legends and symbols must also be supplied in flat pieces. The cartons in which packed shall be non-returnable and shall not exceed 40" in length and 25" in width, and be labeled for ease of identification. The weight of the individual carton must not exceed seventy (70) pounds. A protective film around the box must be applied in order to protect the material from rain or premature aging



**ITEM 865.16** (Continued)

**METHOD OF MEASUREMENT**

Item 865.16 – Preformed Thermoplastic Bike Lane Markings – White will be measured by EACH symbol applied. (Arrow =1, bike =1, total per location is typically 2 EA)

**BASIS OF PAYMENT**

Item 865.16 – Preformed Thermoplastic Bike Lane Markings – White will be paid per EACH symbol applied, which price shall include all labor, materials, equipment and incidental work necessary to apply the pavement markings.

<b><u>ITEM 868.106</u></b>	<b><u>6 INCH WET REFLECTORIZED RECESSED WHITE LINE (THERMOPLASTIC)</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 868.112</u></b>	<b><u>12 INCH WET REFLECTORIZED RECESSED WHITE LINE (THERMOPLASTIC)</u></b>	<b><u>FOOT</u></b>
<b><u>ITEM 869.106</u></b>	<b><u>6 INCH WET REFLECTORIZED RECESSED WHITE LINE (THERMOPLASTIC)</u></b>	<b><u>FOOT</u></b>

Work to be completed under these Items shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

Work shall consist of grooving a slot in the pavement surface and the furnishing and installation of wet reflective thermoplastic pavement markings.

**MATERIALS**

Wet reflective thermoplastic pavement markings shall consists of a liquid binder, first drop beads or elements to provide dry and wet retroreflectivity, and second drop glass beads to improve the durability of the pavement marking, reduce track-free times, and provide supplementary dry retroreflectivity.

The Contractor shall use one of the following binders or approved equivalents:

1. Ennis-Flint Hydrocarbon Thermoplastic;
2. Integrated Traffic Systems iTherm® Hydrocarbon;
3. Ozark Materials Hydrocarbon Thermoplastic; or
4. SWARCO Hydrocarbon Thermoplastic.

The Contractor shall use one of the following first drop beads or elements, or approved equivalents:

1. 3M™ All Weather Series 90S Elements;
2. Ennis-Flint HP300 Glass Beads;
3. Potters VISIMAX® Glass Bead System; or
4. SWARCO MEGALUX-BEADS®.

**ITEMS 868.106, 868.112 & 869.106** (Continued)

Second drop beads shall be manufactured from glass of a composition that is highly resistant to traffic wear and to the effects of weathering. If coating is required to meet the performance requirements, the second drop beads shall be coated to ensure satisfactory embedment and adhesion. Second drop beads retained on a No. 40 U.S. Standard Mesh Sieve shall have a minimum crush strength of 30 lbs. when tested in accordance with ASTM D1213.

Second drop beads shall have a minimum refractive index of 1.51 when tested in accordance with AASHTO M247.

Second drop beads passing the No. 30 sieve shall have a minimum of 75 percent true spheres when tested in accordance with ASTM D1155. All second drop beads retained on the No. 20 and No. 30 sieves shall have a minimum of 80 percent true spheres as determined by ASTM D1155. Second drop beads shall meet the following gradation requirements when tested in accordance with ASTM D1214:

U.S. Standard Sieve No.	Percent Retained
20	3-10
30	15-35
50	45-75
70	0-10
Pan	0-5

**CONSTRUCTION METHODS****Installation of Groove**

Prior to cutting out the grooves for all recessed lines, the Contractor shall use a chalk line or other suitable method to layout the proposed pavement markings on the surface course so that the Engineer can inspect the locations. Once the Engineer has inspected and approved the proposed striping layout, the grooves for the proposed pavement markings may be cut. No pavement grooving shall be done without the prior approval of the Engineer.

Groove position shall be a minimum of 4 inches from the edge of the pavement marking to any longitudinal pavement joints. The groove shall not be installed on bridge joints, on drainage structures, or in other areas identified by the Engineer. The groove shall not be installed continuously for intermittent pavement markings, but only where markings are to be applied.

The use of gang stacked diamond cutting blades to grind a smooth square slot is required for producing all grooves. The spacers between blade cuts shall be such that there will be less than a 10 mil rise in the finished groove between the blades. The acceptability of the surface texture will be determined by the Engineer.

The diamond grinder shall have an articulating head so that the slots are installed correctly on grades and super elevated sections.

**ITEMS 868.106, 868.112 & 869.106** (Continued)

Grooves that are ground deeper or wider than the specified allowable limits shall be repaired per the direction of the Engineer at no additional cost. Grooves that are ground too shallow, too narrow, or with unacceptable rises between blade cuts shall be reground to the correct size, depth, and surface finish at no additional cost. Slots ground out of alignment shall be patched using an approved method and materials.

Grooves shall be 1 inch  $\pm$  ¼ inch wider than the pavement marking material. Groove depth shall be 150 mils  $\pm$  5 mils, unless otherwise approved by the Engineer. Depth shall be consistent across the full width of the groove. Depth plates shall be provided by the Contractor to the Engineer to assure that desired groove depth is achieved.

Grooves shall be clean, dry and free of laitance, oil, dirt, grease, paint or other foreign contaminants. Shrouds and a vacuum apparatus shall be included as part of the grinder to remove larger pieces of pavement that are ground out. If water is used to clean the groove or the grooving process takes place during rainfall, a minimum of 24 hours of dry time is required prior to the placement of pavement markings.

After the depth, width, length, and surface condition has been approved by the Engineer, an air lance shall be used to remove fine particles from the groove. Air compressors shall initially be blown out away from the application area to prevent compressor condensation build-up from entering the groove. The Contractor shall prevent traffic from traversing the grooves and re-clean grooves, as necessary, prior to application of pavement markings at no additional cost to the Department.

All grooves must be given final approval by the Engineer prior to the placement of pavement markings.

**Installation of Wet Reflective Thermoplastic**

Installation of wet reflective thermoplastic pavement markings shall conform to the Manufacturer's specifications and the following:

Application rate for binder and all beads and elements shall consider final pavement surface composition and smoothness in advance of application to ensure proper wet film thickness and embedment of all beads and elements. The Contractor shall provide the Engineer with documentation from the Manufacturer with all recommended application rates in advance of any pavement marking installation.

The minimum uniform wet thickness for the thermoplastic binder shall be 90 mils  $\pm$  5 mils. The line thickness shall be met across at least the middle ⅔ of the pavement marking width. Depth plates shall be provided by the Contractor to the Engineer to assure that desired thickness is achieved.

The finished white color shall be free from tint, with good opacity and visibility under both daylight and artificial light. The finished yellow color shall be defined by Federal Test Standard 595 - Color Chip Number 13538, using Federal Test Standard 141 (Method 4252). The finished lines shall be uniform in color and have clean, well-defined edges.

**ITEMS 868.106, 868.112 & 869.106** (Continued)

First and second drop beads and/or elements shall be applied in a manner that does not induce rolling or bouncing, to ensure that exposed portions of beads are free of binder material. Beads and elements should be embedded in the binder to a depth of approximately 50% of their diameter.

Drop rate for first drop bead or element shall be per the Manufacturer’s specifications.

Drop rate for second drop glass bead shall be 6.4-10.2 lbs. per gallon.

Newly installed pavement markings shall be protected from tracking during the setting period per Subsection 860.63.

Once the installed pavement markings have been open for traffic for a minimum of 48 hours, the Contractor shall perform retroreflectance readings per the measurement and sampling procedures contained in ASTM D7585 (Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments) using the Referee Evaluation Protocol found in section 6.4. The following tests shall be performed during the measurement and sampling process:

1. ASTM E1710 (*Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer*); and
2. ASTM E2177 (*Standard Test Method for Measuring the Coefficient of Retroreflected Luminance (R<sub>L</sub>) of Pavement Markings in a Standard Condition of Wetness*).
- 3.

The average initial retroreflectance readings shall exceed the following minimum values:

	*White Markings	*Yellow Markings
ASTM E1710 (Dry)	475 mcd/lux/m <sup>2</sup>	375 mcd/lux/m <sup>2</sup>
ASTM E2177 (Wet Recovery)	375 mcd/lux/m <sup>2</sup>	300 mcd/lux/m <sup>2</sup>

\*Observation Angle = 1.05°, Entrance Angle = 88.8°

Pavement markings with measured average initial retroreflectance readings that do not meet the specified minimum values using the procedures outlined in subsection 6.4.5 of ASTM D7585 shall be removed by a method approved by the Engineer and reapplied at no additional cost.

**ITEMS 868.106, 868.112 & 869.106** (Continued)

**Pavement Marking Asset Management**

Upon completion of the pavement marking installation, the following data shall be tabulated by the Contractor:

1. Retroreflectance readings, including date(s), time(s), and location(s) where readings took place;
2. Liquid binder type(s) and application rate;
3. Reflective element type and drop rate;
4. Date of groove installation;
5. Lot, batch number, or any other material identifiers and manufacturing information;
6. Date and time of final liquid marking installation;
7. Highway location (including direction) of installation;
8. Air and pavement temperature during application;
9. Measured material application thickness, depth of groove; and
10. Any other pertinent information that may assist MassDOT with Quality Control.

Results for all readings shall be provided within 10 business days of testing to the Engineer, with a second copy sent to:

State Traffic Engineer  
Attention: Pavement Marking Installation & Testing  
10 Park Plaza, Room 7210  
Boston, MA 02116

The cost to prepare and submit this data shall be considered incidental to the cost of the Items.

**METHOD OF MEASUREMENT**

Wet reflective recessed thermoplastic pavement markings will be measured per FOOT, complete in place, as specified under Subsection 860.80.

**BASIS OF PAYMENT**

Wet reflective recessed thermoplastic pavement markings will be paid at their respective contract unit prices per FOOT.

The contract prices shall include all material, labor, and equipment required or incidental to the satisfactory completion of the work.

**ITEM 874.2**

**TRAFFIC SIGN REMOVED AND RESET**

**EACH**

The work to be done under this Item shall conform to the relevant provisions of Subsections 828 840 of the Standard Specifications and the following:

The work shall consist of removing certain traffic signs as shown on the plans and resetting at locations as directed. Traffic signs removed and reset are to be reset using new posts as specified in Item 847.12, except as otherwise directed by the Engineer where existing posts of adequate type and construction may be used. Any signs that are shown to be removed and reset that will be impacted during other construction activities shall be removed and stored in a secure location until the construction activity near the proposed reset sign location is completed.

**METHOD OF MEASUREMENT**

Item 874.2, Traffic Sign Removed and Reset will be measured for payment per EACH and the quantity to be paid for will be the quantity actually removed and reset and accepted by the Engineer.

**BASIS OF PAYMENT**

Item 874.2, Traffic Sign Removed and Reset will be paid for at the contract unit price per EACH, which price shall be full compensation for removal, erecting on new posts, and all labor, materials, equipment, tools and incidentals required for the proper completion of this Item.

Payment will also include any signs that need to be temporarily stored offsite while other construction activities take place. The Contractor shall not be paid for removing and resetting signs multiple times within areas of construction for convenience.

New sign posts for any reset signs as shown on the plans shall be paid separately under Item 847.12

**ITEM 874.4**

**TRAFFIC SIGN REMOVED AND STACKED**

**EACH**

The work to be done under this Item shall consist of the dismantling, removing, transporting and stacking of all existing street, warning, regulatory, guide, and miscellaneous signs and their supports, as directed by the Engineer.

Also included is the excavation of the existing foundations. If in the opinion of the Engineer, the existing foundation will not interfere with new construction, it may be removed to a depth of 6 inches below the existing ground, the hole backfilled with gravel and compacted, and the existing surfaces restored or replaced in kind.

**METHODS**

All re-usable sign material within the Town of Littleton Layout, in the opinion of the Engineer, shall be delivered to the Department of Public Works at 39 Ayer Rd, Littleton, MA.

The existing signs shall not be removed until the new signs and structures replacing them are ready for traffic unless otherwise directed by the Engineer.

**METHOD OF MEASUREMENT**

Item 874.4, Traffic Signs Removed and Stacked will be measured for payment per EACH sign removed and stacked and accepted by the Engineer.

**BASIS OF PAYMENT**

Item 874.4, Traffic Signs Removed and Stacked will be paid at the contract unit price per EACH, which price shall be full compensation for dismantling, removing, transporting and stacking of the signs and their supports, excavation and disposal of the existing foundation, supplying and placing of gravel backfill and compaction, and the restoration or replacement in kind of disturbed surfaces.

**ITEM 874.85**

**PRIVATE SIGN REMOVED AND RESET**

**LUMP SUM**

The work shall consist of removing and resetting, as directed, the Business Entrance Sign at 265 Foster Street and the Littleton/Rte. 495 Commuter Rail Parking Lot Entrance Sign.

The existing poles are to be maintained and reset in the specified location, unless the Engineer determines that the poles are in inadequate condition and/or need to be placed in another location. The signs shall be reconstructed at the new location similar to the existing condition.

**BASIS OF PAYMENT**

Item 874.75, Private Sign Removed and Reset will be paid for at the contract LUMP SUM price, which price shall be full compensation for removal, resetting, and all other incidental work for the proper completion of this Item, including the new sign foundation.

The Contractor shall not be paid for removing and resetting signs multiple times within areas of construction for convenience.

Any damage to the signs shall be repaired or the signs replaced in kind by the Contractor at no additional cost.

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



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EWO NO.  
PROJECT NO. 609054

SHEET 1 OF 26 SHEETS

THE COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF TRANSPORTATION – HIGHWAY DIVISION  
TEN PARK PLAZA, BOSTON, MA

**-ESTIMATE OF QUANTITIES - DETAIL SHEET-**

TOWN-CITY Littleton ROAD Foster Street  
YEAR 2024 CLASS N/A  
Sta 0+00 to Sta 39+36 DATE March 1st

<u>Excavation</u>		<u>Gravel Fill</u>	
Earth Excavation	7000 Cu Yards	Gravel for Roadway	3346 Cu Yards
Class “A” Rock Excavation	170 Cu Yards	Gravel for Driveways	58 Cu Yards
Class “B” Rock Excavation	120 Cu Yards	Gravel for Sidewalks & Ramps	171 Cu Yards
Class “A” Trench Excavation	170 Cu Yards	+ 25% Swell	895 Cu Yards
Class “B” Trench Excavation	1570 Cu Yards		
Embankment + 15%	1212 Cu Yards		

**PAVEMENT NOTES:**

PROPOSED PAVEMENT MILLING AND OVERLAY – FOSTER STREET

1-1/2” PAVEMENT FINE MILLING  
1-1/2” SUPERPAVE SURFACE COURSE – 9.5

MILLING TO BE VARIABLE DEPTH (INCREASING) AT PROJECT LIMITS TO MEET PROPOSED GRADE ON TAYLOR STREET

MILLING TO BE VARIABLE DEPTH (DECREASING) AT SAWCUT TRANSITION ON FOSTER STREET EAST OF BALSAM LN

PROPOSED FULL DEPTH PAVEMENT RECONSTRUCTION

SURFACE: 1-1/2” SUPERPAVE SURFACE COURSE – 9.5 OVER  
INTERMEDIATE: 1-3/4” SUPERPAVE INTERMEDIATE COURSE – 12.5 OVER  
3-1/2” SUPERPAVE INTERMEDIATE COURSE – 19.0 OVER  
SUBBASE: 4” DENSE GRADED CRUSHED STONE  
8” GRAVEL BORROW, TYPE b.

PROPOSED SHARED-USE PATH FULL DEPTH PAVEMENT

SURFACE: 1-1/2” SUPERPAVE SURFACE COURSE – 9.5 (SSC – 9.5) OVER  
INTERMEDIATE: 2-1/2” SUPERPAVE INTERMEDIATE COURSE – 19.0 OVER  
SUBBASE: 8” GRAVEL BORROW, TYPE b.

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SHEET 2 OF 26 SHEETS

TOWN Littleton  
YEAR 2024

ROAD Foster St  
DATE January 12th

PROPOSED HOT MIX ASPHALT SIDEWALK OR DRIVEWAY

SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE – 9.5 (SSC - 9.5) OVER  
2-1/2" SUPERPAVE INTERMEDIATE COURSE – 12.5 (SIC – 12.5)

FOUNDATION: 8" GRAVEL BORROW, TYPE b.

PROPOSED CEMENT CONCRETE SIDEWALK

SURFACE: 4" CEMENT CONCRETE  
AIR ENTRAINED 4000psi, 3/4", 610

FOUNDATION: 8" GRAVEL BORROW, TYPE b.

PROPOSED CEMENT PEDESTRIAN CURB RAMP

SURFACE: 6" CEMENT CONCRETE  
AIR ENTRAINED 4000psi, 3/4", 610

FOUNDATION: 8" GRAVEL BORROW, TYPE b.

NOTES: ASPHALT EMULSION FOR TACK COAT AND HMA JOINT SEALANT SHALL BE APLLIED PER SECTION 450 QA OF THE SPECIAL PROVISIONS.

HMA FOR PATCHING SHALL BE USED FOR ALL PERMANENT PARTIAL, AND FULL DEPTH PAVEMENT REPAIRS OF UNSOUND PAVEMENT PER SECTION 450 IN AREAS OUTSIDE OF PROPOSED FULL DEPTH EXCAVATION OR RECONSTRUCTION ROADWAY AREAS.

HMA FOR MISCELLANEOUS WORK SHALL BE USED FOR ALL TEMPORARY CONSTRUCTION, TAPER RAMPS, CURB CUT RAMPS, TEMPORARY TRENCH REPAIR, ETC.

Plan No.'s \_\_\_\_\_

Estimated by \_\_\_\_\_

Profile No.'s \_\_\_\_\_

Reviewed by \_\_\_\_\_

Calc. Book No. \_\_\_\_\_

Submitted by \_\_\_\_\_

District Highway Director

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EWO NO.  
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SHEET 3 OF 26 SHEETS

TOWN Littleton  
YEAR 2024

ROAD Foster St  
DATE January 12th

**101. CLEARING AND GRUBBING**

At the following locations and any locations called out on the construction plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>From</u>		<u>To</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster St	4+35	RT	6+23	RT
Foster St	7+62	LT	10+93	LT
Foster St	7+10	RT	9+90	RT
Foster St	12+00.00	LT	14+80.00	LT
Foster St	10+61.09	RT	13+11.79	RT
Foster St	12+82.08	RT	14+08.50	RT
Foster St	19+10.18	RT	19+94.87	RT
Foster St	24+23.72	RT	24+66.44	RT
Foster St	32+40	LT	38+75	LT

**102. SELECTIVE CLEARING AND THINNING**

At the following locations and any locations called out on the construction plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>From</u>		<u>To</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	1+15	LT	13+32	LT
Foster Street	14+25	RT	25+80	RT
Foster Street	18+15	LT	18+35	LT
Foster Street	31+00	RT	31+20	RT
Foster Street	32+25	LT	37+20	LT
Foster Street	38+40	RT	39+30	RT
Taylor Street	203+00	LT	203+20	LT

**102.001 TREE TRIMMING CREW**

For trimming of trees/limbs over the project limits and any locations called out on the construction plans and/or as specified by the Engineer, including as directed at overhead wires.

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SHEET 4 OF 26 SHEETS

TOWN Littleton  
YEAR 2024

ROAD Foster St  
DATE January 12th

**102.511**      **INDIVIDUAL TREE PROTECTION – ARMORING AND PRUNING**

For protection and trimming of trees/limbs over the shared use path at the following locations and any locations called out on the construction plans and/or as specified by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Taylor Street	203+86	39'	RT
Taylor Street	203+86	38'	RT
Foster Street	7+96	34'	LT
Foster Street	10+59	20'	RT
Foster Street	11+08	20'	RT
Foster Street	11+90	34'	LT
Foster Street	12+17	35'	LT
Foster Street	12+32	20'	RT
Foster Street	12+45	17'	RT
Foster Street	13+07	19'	RT
Foster Street	13+72	39'	LT
Foster Street	14+50	39'	LT
Foster Street	14+76	39'	LT
Foster Street	15+19	33'	LT
Foster Street	15+66	38'	LT
Foster Street	15+91	32'	LT
Foster Street	15+96	20'	RT
Foster Street	18+61	28'	RT
Foster Street	18+66	25'	RT
Foster Street	18+86	32'	RT
Foster Street	18+89	25'	RT
Foster Street	19+75	36'	LT
Foster Street	19+85	35'	LT
Foster Street	19+92	35'	LT
Foster Street	20+26	33'	LT
Foster Street	33+24	20'	RT

**102.513**      **AIR EXCAVATION AND ROOT PRUNING**

For excavating soil with an air pressure tool in order to expose tree roots, and for associated services and materials necessary to complete the work of pruning, backfilling with existing soil, watering, mulching, and fertilizing as called out on the construction plans and/or as specified by the Engineer.

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DATE January 12th

**102.55      ARBORIST**

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

**103.      TREE REMOVED - DIAMETER UNDER 24 INCHES**

As shown on Construction Plan Sheets at the following stations and/or where directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster St	17+04	18	RT

Trees Removed on private property outside of the limits of clearing and grubbing

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster St	12+17	35	LT
Grimes Lane	300+94	20	LT

**104.      TREE REMOVED - DIAMETER 24 INCHES AND OVER**

As shown on Construction Plan Sheets at the following stations and/or where directed by the Engineer.

Trees Removed within the public layout outside of the limits of clearing and grubbing

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster St	16+79	20	RT
Foster St	34+50	35	LT

Trees Removed on private property outside of the limits of clearing and grubbing

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	3+38	38'	LT
Foster Street	3+69	40'	LT
Foster Street	3+94	39'	LT

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SHEET 6 OF 26 SHEETS

TOWN Littleton  
YEAR 2024

ROAD Foster St  
DATE January 12th

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**129.2**      **OLD PAVEMENT EXCAVATION**

For roadway surface reconstruction at Wisdom Way, and/or as directed by the Engineer.

**141.**      **CLASS A TRENCH EXCAVATION**

To be used for removal of culverts, paved waterways, masonry headwalls, and drainage pipe removals if they are outside the limits of new proposed pipe trench, and as directed by the Engineer.

**141.101**      **TEST PIT FOR EXPLORATION-VACUUM TRUCK**

To be used at various locations near gas mains for locating existing utilities, and as directed by the Engineer.

**141.2**      **TEST PIT FOR GROUNDWATER**

To be used at various locations near proposed leaching basins for locating groundwater level, and as directed by the Engineer.

**142.**      **CLASS B TRENCH EXCAVATION**

To be used for trench excavation for drainage and water pipe installation with depths greater than 5 feet from the bottom of pavement box (or existing ground if lower) to the bottom barrel of pipe.

**144.**      **CLASS B ROCK EXCAVATION**

For all rock removed when encountered during Class B trench excavation required for construction of, drainage structure and pipes, water pipes, retaining structures, walls, slopes, electrical conduit and/or as directed by the Engineer.

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**146. DRAINAGE STRUCTURE REMOVED**

For removal of CB's at the following locations, as needed for old existing structures to be replaced, and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	7+10	7'	RT
Foster Street	7+08	14'	LT
Foster Street	14+10	16'	RT
Foster Street	16+83	20'	LT
Foster Street	23+76	7'	RT
Foster Street	23+77	25'	LT
Foster Street	31+44	24'	LT
Foster Street	31+73	24'	LT
Foster Street	31+74	13'	LT

**151. GRAVEL BORROW**

To be used with the following:

- Proposed full depth reconstruction
- Proposed hot mix asphalt driveway
- Proposed cement concrete walk/wheel chair ramp
- Proposed hot mix asphalt walk surface
- Subbase for permanent and temporary utility trenches
- Subbase for two foot shoulders along shared-use path
- As needed for backfill and/or where directed by the Engineer.

All gravel borrow is to be Type b.

**152. PROCESSED GRAVEL**

To be used to restore driveway at 285 Foster Street as shown on plans and/or as directed by the Engineer.

**153.01 CONTROLLED DENSITY FILL FOR WATER MAIN**

To be used for filling abandoned AC water main.

<u>Street Name</u>	<u>From</u> <u>Station</u>	<u>Side</u>	<u>To</u> <u>Station</u>	<u>Side</u>
Foster Street	0+00		39+30	

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TOWN Littleton  
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**156. CRUSHED STONE**

Shall be used as needed for drainage manholes, catch basins, drainage pipes, water pipes, and as needed for miscellaneous drainage work during realignment, and/or as directed by the Engineer.

**170. FINE GRADING AND COMPACTING**

To be used with the following:

- Proposed full depth reconstruction
- Proposed hot mix asphalt driveway
- Proposed cement concrete walk/wheel chair ramp
- Proposed hot mix asphalt walk surface
- Subbase for permanent and temporary utility trenches
- As directed by the Engineer

**201. CATCH BASIN**

New catch basin as specified at the following locations on the Drainage and Utility Plan Sheets, and as directed by the Engineer.

From Plans	Station	Offset	Side
PR-CB-01	202+70	22	RT
PR-CB-02	202+43	29	RT
PR-CB-03	3+30	11	RT
PR-CB-04	6+81	11	RT
PR-CB-05	13+99	11	RT
PR-CB-06	14+05	11	LT
PR-CB-07	16+89	11	LT
PR-CB-10	24+05	11	LT
PR-CB-12	25+89	11	RT
PR-CB-13	25+89	11	LT
PR-CB-15	31+73	30	LT
PR-CB-16	31+69	15	LT
PR-CB-17	35+95	11	RT
PR-CB-18	0+37	25	LT



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**201.3**      **SPECIAL CATCH BASIN**

New double grate catch basin as specified at the following locations on the Drainage and Utility Plan Sheets, and as directed by the Engineer.

<u>From Plans</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
CBDB-1	6+81.53	11.01	LT

**202.**      **MANHOLE**

As needed for existing CB's that are unable to be CIT to DMH and as directed by the Engineer.

<u>From Plans</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
PR-DMH-01	3+29	2.8	LT
PR-DMH-02	4+80	11.3	LT
PR-DMH-03	6+82	2.5	LT
PR-DMH-04	7+17	7.8	LT
PR-DMH-05	14+12	6.8	LT
PR-DMH-06	16+82	11.0	LT
PR-DMH-07	22+69	9.1	LT
PR-DMH-08	23+79	9.0	LT
PR-DMH-09	24+39	9.3	LT
PR-DMH-10	25+80	9.4	LT
PR-DMH-11	0+27	2.7	LT

**202.2**      **MANHOLE (9 TO 14 FOOT DEPTH)**

As needed for existing CB's that are unable to be CIT to DMH and as directed by the Engineer.

<u>From Plans</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
DMH-12	31+62	4.6	RT

**204.**      **GUTTER INLET**

New gutter inlet as specified at the following locations on the Drainage and Utility Plan Sheets, and as directed by the Engineer.

<u>From Plans</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
GI-01	3+29	11.01	LT
GI-02	24+05	11.00	RT
GI-04	35+98	13.74	LT

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**205.01 LEACHING BASIN.**

New leaching basin as specified at the following locations on the Drainage and Utility Plan Sheets, and as directed by the Engineer.

<u>From Plans</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
LB-01	6+80	21	LT
LB-02	14+05	11	LT
LB-03	16+90	11	LT
LB-04	22+60	11	LT
LB-05	25+89	11	LT

**220. DRAINAGE STRUCTURE ADJUSTED**

For CBs and MHS requiring 6” or less of elevation change at the following locations and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	8+70.3	5.8	LT
Foster Street	10+28.5	5.4	LT
Foster Street	10+39.6	11	LT
Foster Street	10+39.8	11	RT
Foster Street	29+69	41.5	LT
Foster Street	31+72	10.9	RT
Foster Street	33+60	2.5	RT
Foster Street	35+89.7	4.2	RT
Foster Street	38+78.7	2.2	RT

**220.3 DRAINAGE STRUCTURE CHANGE IN TYPE**

Convert CB to DMH at the following locations and/or as directed by the Engineer:

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	23+76.50	24.57	LT

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**220.5 DRAINAGE STRUCTURE REMODELED**

Included as contingency. To be used if utility conflicts necessitate or as directed by Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	10+28	3.4'	LT
Foster Street	10+38	11.2'	RT
Foster Street	10+38	11.6'	LT
Foster Street	14+10	9.6'	RT
Foster Street	16+81	10.6'	RT
Foster Street	31+61	4.7'	RT
Foster Street	31+71	13.1'	RT
Foster Street	33+59	5.56'	RT
Foster Street	35+94	10.5'	RT
Foster Street	35+89	5.0'	RT
Foster Street	35+98	11'	LT
Foster Street	38+90	2.1'	RT
Taylor Street	202+90	23.91'	RT

**222.1 FRAME AND GRATE – MASSDOT CASCADE TYPE**

To be installed with all proposed drainage structures, drainage structures change in type, and as indicated on Drainage and Utility Plans and/or as directed by the Engineer.

**223.1 FRAME AND GRATE (OR COVER) REMOVED AND STACKED**

Remove and stack all existing grates and covers to be replaced with Items #221 and 222.1, as called out on the Drainage & Utility Plans and/or as directed by the Engineer.

**227.3 REMOVAL OF DRAINAGE STRUCTURE SEDIMENT**

For cleaning of existing catch basins and manholes. Assume standard 4' diameter catch basin with 2.5' standard sump depth. Assume standard 4' diameter manhole with 1' sump depth.

**227.31 REMOVAL OF DRAINAGE PIPE SEDIMENT**

Shall be used for cleaning blocked existing drainage pipes being retained and/or as directed by the Engineer.

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SHEET 12 OF 26 SHEETSPROJECT NO. 609054TOWN LittletonROAD Foster StYEAR 2024DATE January 12th**227.4**      **MASONRY PLUG**

For pipes shown to be abandoned as shown on the Drainage and Utility Plans and/or as directed by the Engineer.

**241.12**      **12 INCH REINFORCED CONCRETE PIPE**

As shown on the Drainage and Utility Plans and as directed by the Engineer. If Existing pipes shown to be removed are within the limits of new pipe trench excavation than the removal cost of the old pipes shall be included in the unit cost of the new pipe. If pipes shown to be removed are outside the limits of new pipe trench (as determined by the Engineer) than removal cost shall be paid under Item 141. Class A Trench Excavation

**241.15**      **15 INCH REINFORCED CONCRETE PIPE**

As shown on the Drainage and Utility Plans and as directed by the Engineer. If Existing pipes shown to be removed are within the limits of new pipe trench excavation then the removal cost of the old pipes shall be included in the unit cost of the new pipe. If pipes shown to be removed are outside the limits of new pipe trench (as determined by the Engineer) than removal cost shall be paid under Item 141. Class A Trench Excavation.

**303.061**      **6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**

As needed for proposed hydrants or hydrants designated to be Removed and Reset and as directed by the Engineer.

**303.081**      **8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**

As needed for water main systems that will be connecting to existing water main systems and as directed by the Engineer.

**303.101**      **10 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**

As needed for the water main replacement and as directed by the Engineer.

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**309.01**      **DUCTILE IRON FITTINGS FOR WATER PIPE**

To be installed with Item #303.06 and 303.08 as well as capping of any abandoned water services or lines as part of hydrant R&R operations, and/or as directed by the Engineer.

<b><u>Street Name</u></b>	<b><u>Station</u></b>	<b><u>Offset</u></b>	<b><u>Side</u></b>	<b><u>Type</u></b>
Foster Street	0+25.63	9.23	LT	10" 22.5° Bend
Foster Street	0+37.49	3.77	LT	10" 22.5° Bend
Foster Street	3+65	7.7	LT	10" x 8" Tee
Foster Street	3+65	23	RT	8" Sleeve
Foster Street	5+02.02	5.09	LT	10" x 6" Tee
Foster Street	9+03.93	2.98	RT	10" x 6" Tee
Foster Street	11+05.14	3.66	RT	10" x 6" Tee
Foster Street	13+31.33	2.51	RT	10" 11.25° Bend
Foster Street	14+49.28	2.89	RT	10" 11.25° Bend
Foster Street	15+23.05	2.5	RT	10" 11.25° Bend
Foster Street	19+16.19	6.14	LT	10' x 6" Tee
Foster Street	21+05.11	4.31	LT	10' x 8" Tee
Foster Street	24+53+87	7.21	LT	10" 22.5 Bend
Foster Street	24+64.03	3.06	LT	10" 22.5 Bend
Foster Street	25+02.22	3.69	LT	10" 22.5 Bend
Foster Street	25+10.60	7.07	LT	10" 22.5 Bend
Foster Street	25+68.26	5.28	LT	10" 7° Bend
Foster Street	26+30.00	3.12	RT	10" X10" Tee
Foster Street	26+37.01	29	LT	10" X10" Tee
Foster Street	26+98.58	22.01	RT	10" 11.5° Bend
Foster Street	27+73.46	13.97	RT	10' x 8" Tee
Foster Street	27+78.29	7.2	RT	10" 11.25° Bend
Foster Street	28+09+14	3.04	RT	10" 11.25° Bend
Foster Street	28+23.09	1.85	RT	10" x 6" Tee
Foster Street	33+38.44	5.31	LT	10" x 6" Tee
Foster Street	38+66.59	7.91	LT	10" 22.5° Bend
Foster Street	39+27.81	7.79	RT	10" 11.25° Bend
Foster Street	39+09.67	3	RT	10" x 6" Tee

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ROAD Foster St  
DATE January 12th

**350.061**      **6 INCH GATE AND GATE BOX**

As shown on the Drainage and Utility Plans and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	5+02.11	6.65	LT
Foster Street	9+03.94	2.96	RT
Foster Street	11+05.11	1.69	LT
Foster Street	19+16.20	6.11	LT
Foster Street	23+00.00	6.79	LT
Foster Street	28+26.5	3.66	RT
Foster Street	33+38.44	5.30	LT
Foster Street	39+08.00	17.00	RT

**350.081**      **8 INCH GATE AND GATE BOX**

As shown on the Drainage and Utility Plans and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	3+64	6.13	LT
Foster Street	21+04	1.00	LT
Foster Street	37+98	3.00	LT

**350.101**      **10 INCH GATE AND GATE BOX**

As shown on the Drainage and Utility Plans and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	26+32	2.0	LT
Foster Street	26+35	23.0	LT
Foster Street	27+78	8.0	RT
Foster Street	39+28	7.5	RT
Foster Street	9+05	3.5	RT
Foster Street	19+18	6.3	LT
Foster Street	28+25	2.0	LT
Foster Street	33+42	8.0	LT
Foster Street	39+11	3.8	RT

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**358. GATE BOX ADJUSTED**

As shown on the Drainage and Utility Plans and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	0+25	9.3	LT
Foster Street	24+69	3.1	LT
Foster Street	24+97	3.7	LT
Foster Street	27+73	19.3	RT

**358.1 GATE BOX REMOVED AND STACKED**

As shown on the Drainage and Utility Plans and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	3+59	11	LT
Foster Street	5+02	18	LT
Foster Street	11+05	16	LT
Foster Street	28+21	6.6	RT
Foster Street	33+34	12.4	RT
Foster Street	37+99	7.8	RT

**363.101 1 INCH CORPORATION COCK**

As needed for any service connections impacted by curbing and sidewalk construction activities and/or as directed by the Engineer.

**363.102 2 INCH CORPORATION COCK**

As needed for any service connections impacted by curbing and sidewalk construction activities and/or as directed by the Engineer.

**371.08 8 INCH COUPLING**

As shown on the Drainage and Utility Plans and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	21+04.56	1.49	RT
Foster Street	39+33.79	7.84	LT

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**376.01**      **HYDRANT – TOWN STANDARD**

As shown on Utility Plans at the following location, as needed, and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	9+03.94	28.69	LT
Foster Street	19+16.20	31.34	LT
Foster Street	23+00.00	29.5	LT
Foster Street	28+24.91	24.55	RT
Foster Street	33+38.44	19.62	RT
Foster Street	39+18.84	18.98	RT

**376.3**      **HYDRANT - REMOVED AND STACKED**

As shown on Utility Plans at the following location, as needed, and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	9+57	23	LT
Foster Street	19+15	31	LT
Foster Street	28+21	16	RT
Foster Street	33+36	20	RT
Foster Street	39+14	19	RT

**384.**      **CURB STOP**

As shown on Utility Plans at the following location, as needed, and as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Offset</u>	<u>Side</u>
Foster Street	14+94	14.2	RT
Foster Street	16+20	20.6	RT
Foster Street	17+94	13.5	RT
Foster Street	28+29	31.2	LT
Foster Street	35+23	23.6	RT
Foster Street	39+25	19.5	RT

**402.**      **DENSE GRADED CRUSHED STONE FOR SUB-BASE**

For full depth roadway reconstruction areas greater than 4' in width where Item 403. cannot be used, under concrete pavers type-b walkways, and as needed during re-alignment as shown on Construction Plans and/or as directed by the Engineer.



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**402.12      DENSE GRADED CRUSHED STONE FOR SHOULDERS**

For full depth roadway/shared use path shoulder (2' on left side per typical sections, 4" depth) construction areas as shown on Construction Plans and/or as directed by the Engineer.

**451.      HMA FOR PATCHING**

For pavement repair in pavement overlay areas that need patching prior to the overlay as well as for permanent trench repair during underground utility work and as directed by the Engineer.

**452.      ASPHALT EMULSION FOR TACK COAT**

Place over base course for full depth reconstruction areas coverage at the rate of 0.05 gal/sy as well as over milled areas at a rate of 0.07 gal/sy and/or as directed by the Engineer.

**453.      HMA JOINT SEALANT**

To be applied at to the entire vertical face of all transverse joints, all vertical faces during patching, and along vertical longitudinal joints in the surface course of pavement and/or as directed by the Engineer.

**470.2      HOT MIX ASPHALT BERM, TYPE A – MODIFIED**

To be used for roadside waterway construction and other misc work as directed the Engineer.

	<u>From</u>		<u>To</u>	
<u>Street Name</u>	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	4+20	RT	14+76	RT
Foster Street	14+91	RT	16+05	RT
Foster Street	16+19	RT	17+82	RT
Foster Street	17+98	RT	18+93	RT
Foster Street	19+07	RT	20+66	RT
Foster Street	20+87	RT	20+96	RT
Foster Street	21+22	RT	22+51	RT
Foster Street	25+00	RT	27+26	RT
Foster Street	31+78	RT	33+84	RT
Foster Street	34+17	RT	37+68	RT
Foster Street	38+79	RT	39+76	RT

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**472. TEMPORARY ASPHALT PATCHING**

To be used for temp. pavement, temporary access to driveways and walkways, temporary patching utility trenches, temporary WCR's, temporary ramps from the milled roadway surface to the smooth roadway surface, and other misc work as directed the Engineer.

**594. CURB REMOVED AND STACKED**

Remove and stack all existing granite curb that is to be replaced. See construction plans, grading, and tie plans for locations and/or as directed by the Engineer.

**620.12 GUARDRAIL, TL-2 (SINGLE FACED)**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>From</u>		<u>To</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	9+46	LT	10+84	LT
Foster Street	11+94	LT	17+28	LT
Foster Street	23+26	LT	26+04	LT
Foster Street	35+90	RT	37+20	RT
Foster Street	28+49	RT	32+83	RT
Foster Street	21+22	RT	23+34	RT
Foster Street	24+52	RT	25+62	RT
Grimes Lane	300+48	RT	301+41	RT

**620.32 GUARDRAIL CURVED, TL-2 (SINGLE FACED)**

To be installed where curve radius is 60' or less at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>From</u>		<u>To</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	21+13.37	RT	21+28.25	RT

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**627.82**      **GUARDRAIL TANGENT END TREATMENT, TL-2**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>
Foster Street	9+46	LT
Foster Street	10+84	LT
Foster Street	11+94	LT
Foster Street	17+28	LT
Foster Street	21+22	RT
Foster Street	23+26	LT
Foster Street	24+52	RT
Foster Street	25+62	RT
Foster Street	26+04	LT
Foster Street	26+71	LT
Foster Street	27+44	LT
Foster Street	28+49	RT
Foster Street	35+91	RT
Grimes Lane	300+48	LT
Grimes Lane	301+41	LT

**627.92**      **GUARDRAIL FLARE END TREATMENT, TL-2**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>	<u>Quantity</u>
Foster Street	21+08.81	RT	1
Grimes Lane	300+48.1	LT	1
Foster Street	32+82.80	RT	1

**628.21**      **TRANSITION TO NCHRP 350 GUARDRAIL**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	36+86	RT	37+19	LT

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**628.22      TRANSITION TO RIGID BARRIER (SINGLE FACED)**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>	<u>Quantity</u>
Foster Street	22+94.53	RT	1

**630.      HIGHWAY GUARD REMOVED AND RESET**

For removal and resetting of existing guardrail at the following locations and/or as directed by the Engineer.

<u>Street Name</u>	<u>From Station</u>	<u>Side</u>	<u>To Station</u>	<u>Side</u>
Foster Street	37+19.57	RT	37+83.54	RT

**630.2      HIGHWAY GUARD REMOVED AND DISCARDED**

For removal and stacking of existing guardrail at the following locations and/or as directed by the Engineer.

**655.      TIMBER FENCE – THREE RAIL**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>From Station</u>	<u>Side</u>	<u>To Station</u>	<u>Side</u>
Foster Street	11+78.00	LT	14+60.26	LT
Foster Street	16+40.65	LT	17+10.00	LT
Foster Street	18+01.00	LT	18+46.00	LT
Foster Street	24+48.11	LT	25+22.47	LT
Foster Street	28+00.00	LT	28+52.26	LT

**669      FENCE REMOVED AND STACKED**

For removal and stacking of existing guardrail at the following locations and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	24+77.0	RT	14+60.26	LT

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**675.2**      **LANDSCAPE BOULDER BARRIER REMOVED AND DISCARDED**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>
Foster Street	14+08.0	LT
Foster Street	17+15.0	RT
Foster Street	29+98.0	LT

**675.201**      **LANDSCAPE BOULDER BARRIER REMOVED AND RESET**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Street Name</u>	<u>From</u>		<u>To</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	26+07.0	RT	27+05.0	RT

**685.**      **STONE MASONRY WALL IN CEMENT MORTAR**

To be installed at the following locations and as shown on the Construction Plans and/or as directed by the Engineer.

<u>Streetname</u>	<u>From STA</u>	<u>To STA</u>
Foster Street	17+94	18+94

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**691.01**      **BALANCE STONE WALL REMOVED AND REBUILT**

For removal and resetting of existing stone masonry wall at the following locations and/or as directed by the Engineer.

<u>Street Name</u>	<u>To</u>		<u>From</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	0+47	LT	4+49	LT
Foster Street	5+10	RT	6+34	RT
Foster Street	6+54	RT	6+86	RT
Foster Street	6+83	LT	9+22	LT
Foster Street	10+86	RT	12+53	RT
Foster Street	11+92	LT	14+08	LT
Foster Street	14+58	LT	16+19	LT
Foster Street	17+13	LT	18+00	LT
Foster Street	35+18	RT	35+48	RT
Foster Street	37+28	RT	37+40	RT

**710.4**      **BOUND - PLAIN GRANITE**

As needed for damaged or destroyed bounds and/or as directed by the Engineer.

**711.**      **BOUND REMOVED AND RESET**

For any bounds that need to be removed during construction and reset after completion and/or as directed by the Engineer.

**715.**      **RURAL MAIL BOX REMOVED AND RESET**

As needed for sideslope grading during construction and as directed by the Engineer.

**751.**      **LOAM FOR ROADSIDES**

For misc. cleanup adjacent to construction, and as shown on the Construction Plans, Planting Plans, Landscape Details, and/or as directed by the Engineer.

**751.1**      **LOAM FOR LAWNS**

For existing disturbed lawn areas, proposed lawn areas, and as shown on the Construction Plans, Planting Plans, Landscape Details, and/or as directed by the Engineer.

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**755.86 SEASONAL TREE MONITORING REPORT**

For submission of seasonal tree monitoring report by contractor and/or as directed by the Engineer

**756. NPDES STORM WATER POLLUTION PREVENTION PLAN**

For submission of SWPP permit by contractor and/or as directed by the Engineer.

**757. VIBRATION MONITORING**

For vibration monitoring regarding construction activities that include excavating in the vicinity of underground facilities required by National Grid.

**767.78 COMPOSTED MULCH OVER MODIFIED ROCK**

Includes providing composted mulch for mixing with seed, to be placed on designated rip rap slopes in areas where establishment of vegetation in the rock slope is desired, and/or as directed by the Engineer.

**769. PAVEMENT MILLING MULCH UNDER GUARDRAIL**

As shown on the Construction Plans, Landscape Details, and/or as directed by the Engineer.

<u>Street Name</u>	<u>From</u>		<u>To</u>	
	<u>Station</u>	<u>Side</u>	<u>Station</u>	<u>Side</u>
Foster Street	9+45.75	LT	10+84.01	LT
Foster Street	11+93.72	LT	17+27.63	LT
Foster Street	19+72.51	LT	20+31.39	LT
Foster Street	23+25.80	LT	26+03.87	LT
Foster Street	21+22.68	RT	23+34.48	RT
Foster Street	24+52.20	RT	25+62.14	LT
Foster Street	26+70.62	LT	27+44.29	LT
Foster Street	28+49.08	RT	32+82.88	RT
Foster Street	35+90.33	LT	37+83.47	LT

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SHEET 24 OF 26 SHEETSPROJECT NO. 609054TOWN LittletonROAD Foster StYEAR 2024DATE January 12th**824.221**      **PEDESTRIAN ACTIVATED FLASHING BEACON (SOLAR) LOC. 1**

As specified at the following locations, Sign and Marking Plans, Sign Summary Sheet, and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>
Taylor Street	203+82.19	LT
Taylor Street	203+93.23	RT

**824.222**      **PEDESTRIAN ACTIVATED FLASHING BEACON (SOLAR) LOC. 2**

As specified at the following locations, Sign and Marking Plans, Sign Summary Sheet, and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>
Foster Street	38+45.66	RT
Foster Street	38+45.52	LT

**824.223**      **PEDESTRIAN ACTIVATED FLASHING BEACON (SOLAR) LOC. 3**

As specified at the following locations, Sign and Marking Plans, Sign Summary Sheet, and/or as directed by the Engineer.

<u>Street Name</u>	<u>Station</u>	<u>Side</u>
Foster Street	21+15	RT
Foster Street	21+15	LT



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**847.11**      **SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY – WOOD**

As specified on Pavement marking and Signing plans/Sign Summary Sheet for proposed signs and where existing signs are to be removed and reset using new posts and/or as directed by the Engineer.

**847.12**      **SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY – STEEL**

As specified on Pavement marking and Signing plans/Sign Summary Sheet for proposed signs and where existing signs are to be removed and reset using new posts and/or as directed by the Engineer.

**854.1**      **PAVEMENT MARKING REMOVAL – PAINT**

For removal of existing pavement markings outside the limits of paving as shown on the Pavement Marking and Signing Plans and/or as directed by the Engineer.

**903.**      **3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE**

As specified for the proposed water main encasement in the vicinity of the Bridge No. L-13-017 and/or as directed by the Engineer.

**986.**      **MODIFIED ROCK FILL**

As needed at existing swale, and/or as specified by the Engineer.

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

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DOCUMENT A00806

# **MBTA RAILROAD SPECIAL PROVISIONS**

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**MASSACHUSETTS  
BAY  
TRANSPORTATION  
AUTHORITY**

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**RAILROAD OPERATIONS DIRECTORATE**

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The attached Specifications are required for any construction and/or related activities on, over, under, within or adjacent to railroad property owned or controlled by the Massachusetts Bay Transportation Authority. They are intended to provide general guidelines and safeguards. Attachment "A" of Construction Guidelines and Procedures contains a summary of MBTA Railroad Operations Specifications which may be required. It is the responsibility of the Contractor to obtain all the necessary specifications for each project.

AUGUST 2014



**MASSACHUSETTS BAY  
TRANSPORTATION  
AUTHORITY**

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RAILROAD OPERATIONS DIRECTORATE

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GUIDELINES AND PROCEDURES  
FOR CONSTRUCTION ON  
MBTA RAILROAD PROPERTY

AUGUST 2014

## SECTION 1. SCOPE

- 1.01 These specifications provide general safeguards to railroad property owned or controlled by the Massachusetts Bay Transportation Authority and to railroad operations upon that property during the performance of construction and/or related activities on, over, under, within or adjacent to the railroad property. They are intended as guidelines and do not represent all legal requirements which are or may be associated with construction and/or related activities. The MBTA reserves the right to require additional information and clarification and to make unilateral changes to these specifications at any time, at its sole discretion.

## SECTION 2. DEFINITIONS

### MBTA

Massachusetts Bay Transportation Authority; Massachusetts Realty Group, Designated Representative of MBTA Real Estate

### RAILROAD COMPANY

The particular reference for the purpose of these specifications is the railroad company which maintains and/or operates or has trackage rights on the subject MBTA Railroad Property, including, but not limited to:

- Massachusetts Bay Transportation Authority (MBTA)
- Keolis Commuter Services
- Providence and Worcester Railroad (PW)
- National Railroad Passenger Corporation ("Amtrak")
- CSX Transportation ("CSX")
- Pan Am Railways (PAR) and subsidiaries The Boston and Maine Corporation (BM), The Springfield Terminal Railway Company (ST), its affiliates, successors and assigns
- Bay Colony Railroad Corporation (BLCR)

### MBTA RAILROAD PROPERTY

All railroad rights of way and adjacent owned and/or controlled by the MBTA.

### OWNER

The individual, utility, government, or corporation having title to the structure to be constructed upon, over or adjacent to the railroad property owned or controlled by the MBTA.

UTILITY

Public or private communication, water, sewer, electric, gas and petroleum companies or other entity governed by the Massachusetts Department of Public Utilities.

GOVERNMENT

Federal, State, Town, City, County and other forms of government.

CORPORATION

Any firm duly incorporated under laws of a state government.

INDIVIDUAL

Any party not defined by "Owner, Utility, Government or Corporation".

CONTRACTOR

The individual, partnership, firm, corporation or any combination thereof, or joint venture, contracting with a Utility, Government, Firm, Company, Corporation or Individual for work to be done on, over, under, within or adjacent to MBTA Railroad Property.

OWNER OR ITS CONTRACTOR

As used in these specifications, does not affect the responsibilities of either party for work conducted on, over, under, within or adjacent to MBTA Railroad Property.

CONSTRUCTION DRAWINGS

Original drawings, submitted to the Engineer by the Contractor pursuant to the Work, including, but not limited to: stress sheets, working drawings, diagrams, illustrations, schedules, performance charts, brochures, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel, or other supplementary plans or similar data which are prepared by the Contractor or a Subcontractor, manufacturer, supplier or distributor, and which the Contractor is required to submit for review and approval by the MBTA. Working Drawings: Contractor prepared plans for temporary



structures and facilities. Working Drawings for elements of work which may affect safety of persons or property included but are not limited to Contractor's plans for temporary structures such as decking, temporary bulkheads, support of utilities, and for such other work as may be required for construction but which do not become an integral part of completed project.

### SECTION 3. SUBMITTALS

#### 3.01 INITIAL CONTACT

- A. The MBTA owns the majority of the railroad lines in eastern Massachusetts. Many of these railroad lines are operated for passenger service, using a Railroad Company as an operating and maintaining Contractor. Some of the railroad lines are used for freight-only service, operated and maintained by other Railroad Company(s). In most instances, both passenger and freight service are operated over the same railroad lines.
- B. All of the MBTA railroad lines are maintained by a designated Railroad Company(s), excepting rapid transit and light rail lines. The maintaining Railroad Company(s) has rights and responsibilities, in addition to the MBTA's property owner's rights.
- C. To obtain further information concerning License Agreements, Easements, Licenses for Entry and performance of construction related activities which affect MBTA Railroad Property, a written request may be forwarded to:

License Administrator  
Massachusetts Realty Group  
20 Park Plaza, Suite 1120  
Boston, MA 02116

or you may access the website at [www.mbtarealty.com](http://www.mbtarealty.com)

The License Administrator is also the contact person for information concerning rapid transit and light rail lines.

### SECTION 4. PLANS AND SPECIFICATIONS

- 4.01 SCOPE: It is the intent of the MBTA to eliminate or minimize any risk involved with construction or related activities on, over, under, within or adjacent to MBTA Railroad Property. Therefore, MBTA approval and

frequently one or more Railroad Company(s) approval of construction plans and specifications for all phases of a proposed project affecting MBTA Railroad Property is required.

- 4.02 GENERAL: If requested by the License Administrator, the applicant must provide six (6) sets of plans and specifications to the License Administrator. These plans and specifications must meet the approval of the Railroad Company(s) and the MBTA prior to the start of construction. These plans are to be prepared in sizes as small as possible (no smaller than 11" x 17") and are to be folded to an 8-1/2 inch by 11 inch size (folded dimensions) with a 1-1/2 inch margin on the left side and a 1 inch margin on the top.
- A. After folding, the title block and other identification of the plans shall be visible at the lower right corner, without the necessity of unfolding. Each plan shall bear an individually identifying number and an original date, together with subsequent revision dates, clearly identified on the plan.
  - B. All plans are to be individually folded or rolled and where more than one plan is involved, they shall be assembled into complete sets before submission to the MBTA.
- 4.03 PLANS: The plans are to show all the work which may affect MBTA Railroad Property, and contain a location map and plan view of the project, with appropriate cross sections and sufficient details. The proposed construction or related activities must be (orated with respect to top of rail (vertical) and center line of track (horizontal). The plan must also include railroad stationing, property lines and subsurface soil conditions. The subsurface information is to be in the form of boring logs with the borings located on the plan view. The plans must be stamped by a Professional Engineer registered in the state of Massachusetts. (The purchase of railroad valuation plans may be arranged by contacting MBTA Engineering offices at (617) 222-6178).
- 4.04 SPECIFICATIONS: The specifications summarized on Attachment "A" attached hereto are the Standard Specifications of the MBTA Railroad Operations Department and apply to all types of construction work affecting MBTA Railroad Property.
- A. In addition to "Maintenance and Protection of Railroad Traffic" and "Insurance Specifications" which are required for all work on, over, under, within or adjacent to MBTA Railroad Property, certain other Specifications contained in Attachment "A" shall be incorporated into construction/engineering submittals when deemed necessary by the MBTA and/or Railroad Company(s). (The purchase

of additional specifications may be arranged by contacting MBTA offices at (617) 222-3448 or visiting Massachusetts Realty Group website at [www.mbtarealty.com](http://www.mbtarealty.com).

#### SECTION 5. SUBMISSION REVIEW

- 5.01 An initial submission of six (6) sets of plans and specifications for MBTA review must be forwarded to the License Administrator, along with a completed MBTA Application for Entry (Attachment "B"). The submission will be circulated for review and comment to MBTA departments which may be impacted by the proposed project. If approved by the MBTA, the Railroad Company(s) will review.
- 5.02 The applicant is advised that the MBTA's initial review process requires a minimum forty-five (45) day period, prior to the Railroad Company(s) involvement, and additional processing time may be required for specific documents (See Section 9).

#### SECTION 6. INSPECTIONS/PAYMENTS

- 6.01 The MBTA may inspect all projects affecting MBTA Railroad Property at least twice, at the applicant's sole expense. The actual number of MBTA inspections will depend on the size and complexity of the project.
- 6.02 The MBTA may utilize Railroad Company inspectors and flagmen for daily inspection and protection of rail traffic during the term of the construction period or related activities. The Owner or Contractor will be responsible for advance payment of all associated fees.
- 6.03 Advance payments to the MBTA for construction/engineering review of plans and specifications by MBTA staff must be submitted when initial contact is made with the License Administrator. Payments shall be in the form of check or money order, made payable to the Massachusetts Bay Transportation Authority.
- 6.04 Advance payments covering the services for Railroad Company(s) construction/engineering review of plans and specifications, or services of an inspector or flagman, will be paid directly to the Railroad Company(s). The MBTA will advise when such services are required, and the Railroad Company(s) will advise of the amount of the required advance payment.

#### SECTION 7. EXAMINATION OF PLANS OR PROPERTY

- 7.01 The Contractor/Applicant shall have no claim for any differences between MBTA valuation plans and the actual conditions encountered in the field.

SECTION 8. INSURANCE AND INDEMNIFICATION

- 8.01 Prior to entry upon MBTA Railroad Property, insurance will be provided to and approved by the MBTA and affected Railroad Company(s), as outlined in "Insurance Specifications."
- 8.02 Additionally, all MBTA Licenses and Letters of Authorization contain a clause for Indemnifying MBTA and the Railroad Company(s) from and against any and all liabilities, losses, damages, costs, expenses, causes of action, suits, claims, demands and/or judgments of any nature whatsoever that may be imposed upon or incurred by or asserted against the MBTA or the Railroad Company(s).

SECTION 9. LEGAL DOCUMENTS FOR TEMPORARY AND PERMANENT INSTALLATIONS

- 9.01 The nature of entry upon or installation within MBTA Railroad Property will determine the authorizing document to be issued. Listed below are brief descriptions of MBTA documents:
  - A. **License for Entry:** Authorizes short-term entry for purposes of survey, Inspection, test borings, access, etc. One time administrative/engineering/legal review and access fees.
  - B. **License Agreement:** Authorizes installations, subject to termination clause, if Applicant chooses not to pursue an Easement. One time administrative/engineering/legal review fee as well as annual rental fee.
  - C. **Easement:** Authorizes permanent installations in form suitable for recording at Registry Deeds. All easements are non-exclusive and subject to relocation at the Owner's expense, for Mass transportation purposes:
    - 1. Easements must receive MBTA Board of Directors approval, which involves considerable time. Once approved by the Board of Directors and upon payment in full to the MBTA, a License for Construction is issued. Upon final inspection and acceptance of the installation by the MBTA the Easement document is issued.
    - 2. Permanent Subsurface Easement widths are limited to a maximum three-foot distance on either side of the occupation.

3. a) A one-time administrative/engineering/legal review fee, in addition to value of easement, as established by independent appraisal conducted at the Applicant's expense.
  - b) If easement size is minimal, as determined by the MBTA, a fixed fee, encompassing administrative/engineering/legal review fee.
- D. **Letter of Authorization**: Authorizes installations and construction activities in association with Master License Agreements. One-time administrative/engineering/legal review as well as access and/or annual fees.



ATTACHMENT "A"

SUMMARY OF MBTA RAILROAD OPERATIONS SPECIFICATIONS

I. GUIDELINES AND PROCEDURES FOR CONSTRUCTION ON MBTA RAILROAD PROPERTY

This general specification outlines the immediate design requirements and methodology for progressing construction activities on MBTA Railroad Property.

II. MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC

This specification will be included in ALL work requirements on MBTA Railroad Property, and covers rules, requirements, and protective services or any construction-related activity on MBTA Railroad Property. Supplemental specifications are listed below.

III. INSURANCE SPECIFICATIONS

This specification details the required insurance coverages and limits of the MBTA and Railroad Company(s).

IV. PIPELINE OCCUPANCY SPECIFICATIONS

This specification details requirements for all pipeline borings/jacking's and open cuts on or adjacent to MBTA Railroad Property, as well as requirements for Drawing submittals.

V. SPECIFICATIONS FOR WIRE CONDUIT AND CABLE OCCUPATIONS

This specification details requirements for clearances and installations of parallel and overhead crossings on MBTA Railroad Property, as well as requirements for Drawing submittals.

VI. BRIDGE ERECTION DEMOLITION AND HOISTING OPERATIONS

This specification details plan preparation for demolition and/or hoisting and erection of structures on and over MBTA Railroad Property.

VII. TEMPORARY SHEETING AND SHORING

This specification details requirements for plan preparation and calculations necessary for sheeting and shoring for construction on or adjacent to MBTA Railroad Property.

VIII. BLASTING SPECIFICATIONS

This specification outlines submittals, details and requirements for blasting on or adjacent to MBTA Railroad Property.

IX. TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION

This specification outlines criteria for plan preparation related to protection of MBTA Railroad Property when work takes place on overhead structures.

X. INDUSTRIAL SIDE TRACK SPECIFICATIONS

This specification outlines minimal requirements for materials and installation submission for private railroad side tracks up to MBTA property line and/or clearance point. Other provisions, site-specific, may be required, including signal protection maintenance and protection of railroad traffic.

XI. RIGHT OF WAY FENCING SPECIFICATIONS

This specification details the requirements for the materials, construction and installation of standard right of way fence.

XII. TEST BORING SPECIFICATIONS

This specification outlines procedures and requirements for the performance of test borings on MBTA Railroad Property.

XIII. FIBER OPTIC CABLE SPECIFICATIONS

This specification details requirements for design and installation of fiber optic cables on MBTA Railroad Property; and is modified by site-specific requirements, including the construction methodology, location and type of fiber optic cables and protection conduits.

XIV. RAILROAD OPERATIONS BOOK OF STANDARD PLANS, TRACK AND ROADWAY, MW-I SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF TRACK

Certain construction activities may require obtaining this comprehensive package if rail construction details and requirements are related to the track operation.

XV. COMMUTER RAIL DESIGN STANDARDS



ATTACHMENT "B"

**MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
APPLICATION FOR ENTRY UPON MBTA RAILROAD, TRANSIT,  
OR OTHER PROPERTY**

Date\_\_\_\_\_

1. Name of Applicant: \_\_\_\_\_

2. Type of Entity (Partnership, Corporation, Proprietorship, Public Authority, etc.):  
\_\_\_\_\_

3. Mailing Address: \_\_\_\_\_

4. Contact info:\_\_\_\_\_

5. If incorporated, state of incorporation:\_\_\_\_\_

6. Proposed license term commencement date:\_\_\_\_\_

7. Agents for applicant for service of notice or process: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Administrative Fee: 1,000.00 paid with application

9. If plan reviews by The MBTA Design and Construction are deemed necessary the following fee shall apply:

Design and Construction Plan Review Fee: 1,600.00 Paid with Application Fee

10. Applicant shall submit Drawings in pdf form and one set of paper Drawings to License Administrator

11. If applicant is self-insured, please provide limits of self-insurance and attach copies of authorizing legislation or certification thereof: \_\_\_\_\_  
\_\_\_\_\_

12. If applicant is authorized by public authority to enter into such license agreement, please provide:

Motion, Resolution, or Ordinance No.: \_\_\_\_\_

Date of Adoption: \_\_\_\_\_

Adopted by: \_\_\_\_\_

13. Is the applicant seeking permission to perform environmental testing and/or assessment on Authority property?

\_\_\_\_\_

a) Is the proposed testing and/or assessment required by the Massachusetts Contingency Plan ("MCP")?

\_\_\_\_\_

b) What is the Release Tracking number and current status of the MCP work?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

14. Name, title and email of applicant's officer authorized to sign agreement: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Project Description**

1. Brief description of construction (including types of pipes and other attachments or ancillary facilities to be installed on MBTA Railroad Property): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Brief description of purpose of entry and/or installation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Space Requirements**  
**[To Be Provided]**

**Technical Information**

- 1. Is this occupancy within the limits of a public road? \_\_\_\_\_  
Attach copies of applicant's franchise to occupy such space.
- 2. If occupancy is under, over, through, or attached to undergrade or overhead bridge, who owns such bridge? \_\_\_\_\_  
\_\_\_\_\_

3. Type of occupancy (facility):  
a) Exact Length of MBTA Railroad Property to be burdened by occupancy: \_\_\_\_\_  
\_\_\_\_\_

b) Width of excavation facility on MBTA Railroad Property:  
\_\_\_\_\_

c) Number of manholes: \_\_\_\_\_

**A. Aerial or underground wire and cable:**

(1) Telephone and other communication cables:

Number of cables: \_\_\_\_\_

Number of pairs/cable: \_\_\_\_\_

Are these composite coaxial cables? \_\_\_\_\_

(2) Power Cables:

Number of cables/size: \_\_\_\_\_

Number of volts per conductor: \_\_\_\_\_

Are these pipe-type cables consisting of one or more high voltage cables encased in steel pipe under inert oil pressure? \_\_\_\_\_

(3) Fiber optic cables:

Number of cables: \_\_\_\_\_

Number of distribution cables: \_\_\_\_\_

Number of transmission cables: \_\_\_\_\_

Number of strands in each cable: \_\_\_\_\_

Number of repeater stations on MBTA Railroad Property: \_\_\_\_\_

Systems (check one):

Transmission \_\_\_\_\_

Distribution \_\_\_\_\_

Sensor \_\_\_\_\_

(4) Number of spare or unoccupied ducts to be installed: \_\_\_\_\_

**B. Pipes and Sewers**

(1) Circular line carrying no pressure:

Number of pipes: \_\_\_\_\_

Number of inches of inside nominal diameter per pipe: \_\_\_\_\_

(2) Circular lines under pressure and carrying non-flammable, non-explosive, or non-combustible supporting materials, except coal and slurry:

Number of pipes: \_\_\_\_\_

Number of inches of inside nominal diameter per pipe: \_\_\_\_\_

(3) Circular lines under pressure and carrying flammable, explosive, or combustible supporting material:

Number of pipes: \_\_\_\_\_

Number of inches of inside nominal diameter per pipe: \_\_\_\_\_

(4) Non-circular pipe: \_\_\_\_\_

(5) Will a pipe tunnel be constructed? \_\_\_\_\_

(6) Will pipe be supported by MBTA structures, bridges, etc.? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

(7) Will pipe be attached to MBTA structures, bridges, etc.? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

**C. Ancillary Facilities**

Number of wooden poles to be installed on MBTA Railroad Property:

\_\_\_\_\_

Other wooden supporting structures: \_\_\_\_\_

\_\_\_\_\_

Steel supporting structures: \_\_\_\_\_

Explain: \_\_\_\_\_

Number of braces, stub poles: \_\_\_\_\_

Number of guy wires anchored on MBTA Railroad Property: \_\_\_\_\_

Number of span guy wires crossing MBTA Railroad Property: \_\_\_\_\_

**D. Attachments**

(1) Attachment of aerial wires and cables to poles or other structures of MBTA used in wire line construction or support:

Number of wires attached to MBTA cross-arm: \_\_\_\_\_

Voltage of wire: \_\_\_\_\_

Number of wires attached to applicant's cross-arm or bracket: \_\_\_\_\_

Voltage of wire: \_\_\_\_\_

Number of cross-arms or brackets attached to MBTA poles: \_\_\_\_\_

(2) Attachment of aerial wires and cables to building or structures other than those used in wire line construction or support:

Number of wires or cables attached to MBTA's building or structures:

\_\_\_\_\_

(3) Attachment of cable terminals to poles, buildings, or structures including highway bridges, railroad bridges over highways, or other bridges of MBTA:

Number of cable terminals, loading coils, transformers, or like devices attached:

\_\_\_\_\_

Explain: \_\_\_\_\_

**E. Guy wire crossings and overhanging cross-arms and power wires of pole lines outside MBTA right-of-way.**

Number of guy wires crossing MBTA Railroad property but not anchored thereon: \_\_\_\_\_

Number of cross-arms overhanging MBTA Railroad Property from poles located outside thereof: \_\_\_\_\_

Number of cross-arms on any poles: \_\_\_\_\_

It is hereby understood and agreed that the undersigned applicant will bear any and all costs associated with MBTA's preliminary and final engineering review in connection with this application. Any charges in excess of the initial advance payment will be billed directly to the address indicated in Item #3 above.

Agent: \_\_\_\_\_

For: \_\_\_\_\_  
Name of Applicant

By: \_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Date)

REVENUE ENFORCEMENT AND PROTECTION PROGRAM CERTIFICATION

Pursuant to M.G.L. Ch. 62C, Sec. 49A, I certify under penalties of perjury that I (my company), to my best knowledge and belief, have (has) filed all state tax returns and paid all state taxes required under law.

\_\_\_\_\_  
Social Security Number or  
Federal Identification Number

\_\_\_\_\_  
Signature of Individual or Corporate Name

By: \_\_\_\_\_  
Corporate Officer  
(If applicable)

Date: \_\_\_\_\_



EMPLOYER'S CERTIFICATE OF COMPLIANCE WITH  
MASSACHUSETTS EMPLOYMENT SECURITY LAW

Pursuant to G. L. C. 151A, Sec. 19A (b), I \_\_\_\_\_

on behalf of (Name of Employer) \_\_\_\_\_,

D.E.T. ID Number \_\_\_\_\_, certify under the penalties of perjury<sup>1</sup> that the  
aforementioned employer has complied with all laws of the Commonwealth relating to contributions  
and payments in lieu of contributions.

Signed under the penalties of perjury this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Name of Employer

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name (Printed)

\_\_\_\_\_  
Title (Printed)

<sup>1</sup> \_\_\_\_\_  
The employer may certify its compliance if it has entered into and is complying with a  
repayment agreement satisfactory to the Commissioner or there is a pending adjudicatory  
proceeding or court action contesting the amount due pursuant to G. L. C. 161A, Sec.  
19A(c).

STATEMENT REGARDING BENEFICIAL INTEREST

In compliance with the provisions of Chapter 7, Sec. 40J of the General Laws, I hereby state, under the penalties of perjury, that the true names and addresses of all persons who have or will have a direct or indirect beneficial interest in the real property subject to this Application dated

\_\_\_\_\_, 20\_\_\_,

between \_\_\_\_\_ as applicant/tenant, for premises in the building (on the site) know as \_\_\_\_\_, and located at \_\_\_\_\_

\_\_\_\_\_ are listed below.

Name and residence of all persons with beneficial interests:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_

Signed: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

ATTACHMENT "C"

REFERENCED STANDARDS AND SPECIFICATIONS

A. Wherever standards or specifications issued by a recognized industry association or regulatory body are referenced in these Specifications, the reference shall be interpreted as incorporating the referenced standard or specification in total into these Specifications as applicable. In the event of a difference between referenced standard or specifications and these Specifications, the latter shall govern.

B. Technical Reference Abbreviations - References are made to recognized standards by use of the acronyms listed below. Addresses are included for convenience, and the accuracy of the addresses is not warranted:

- AA           The Aluminum Association  
900 19th Street NW  
Washington, DC 20006
  
- AAR         The Association of American Railroads  
American Railroads Building  
50 F Street NW  
Washington, DC 20001
  
- AASHTO    American Association of State Highway and  
Transportation Officials  
444 North Capitol Street NW  
Suite 249  
Washington, DC 20001
  
- ACGIH      American Conference of Governmental Industrial  
Hygienists  
1330 Kemper Meadow Drive  
Cincinnati, OH 45240
  
- ACI         American Concrete Institute  
P. O. Box 19150  
Detroit, MI 48219
  
- AFPA        American Forest and Paper Association  
1111 19th Street, NW  
Suite 700  
Washington, DC 20036

AIA	American Insurance Association 1130 Connecticut Avenue NW Washington, DC 20036
AISC	American Institute of Steel Construction Inc. 1 East Wacker Drive Suite 1300 Chicago, IL 60601
AISI	American Iron and Steel Institute 1101 17th Street NW Suite 1300 Washington, DC 20036-4700
AITC	American Institute of Timber Construction 7012 South Revere Parkway Suite 140 Englewood, CO 80112
ANSI	American National Standards Institute 11 West 42nd Street New York, NY 10036
APA	American Plywood Association P. O. Box 11700 Tacoma, WA 98411
APHA	American Public Health Association 1015 15th Street NW Washington, DC 20005
AREA	American Railway Engineering Association 50 F Street NW Washington, DC 20001
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers' Association P. O. Box 286 Woodstock, MD 21163-0286
AWS	American Welding Society 550 NW 42nd Avenue Miami, FL 33126
AWWA	American Water Works Association, Inc. 6666 W. Quincy Avenue Denver, CO 802350
CSI	Construction Specifications Institute 601 Madison Avenue Alexandria, VA 22314-1791
FHA	Federal Highway Administration 400 7th Street SW Washington, DC 20590
FRA	Federal Railroad Administration 403 7th Street SW Washington, DC 20590
ICBO	International Conference of Building Officials 5360 Workman Mill Road Whittler, CA 90601
IIA	Incinerator Institute of America 60 East 42nd Street New York, NY 10017





**MASSACHUSETTS BAY  
TRANSPORTATION  
AUTHORITY**

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**RAILROAD OPERATIONS DIRECTORATE**

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**||**

**MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC**

AUGUST 2014





## SECTION 1. GENERAL

- 1.01 The Contractor should note that these specifications govern proposed work that involves construction on, over, under, within or adjacent to MBTA Railroad Property. Requirements must be strictly observed whenever the tracks, structures, or properties of the MBTA are involved or affected.
- 1.02 If the tracks or other facilities of the MBTA are endangered, the Contractor shall immediately perform such work as directed by the Railroad Company(s), and upon failure of the Contractor to carry out such orders immediately, the Railroad Company(s) may take whatever steps are necessary to restore safe conditions. The cost and expense to the Railroad Company(s) and/or MBTA of restoring safe conditions or of any damage to the MBTA's trains, tracks, or other facilities caused by the Contractors' or subcontractors' operations, shall be at the sole expense of the Contractor and will be collected as appropriate. This cost shall be paid for by the Contractor and may be deducted from any monies due and that may become due to the Contractor.
- 1.03 Before entering upon MBTA Railroad Property:
- A. The Owner or its Contractor shall be fully informed of all requirements of the MBTA pertaining to the specific project and shall conduct all their work accordingly. Any questions relating to the requirements of the MBTA should be directed to the Director of Engineering for MBTA Railroad Operations or their authorized representative.
  - B. The Owner or its Contractor shall execute an MBTA License for Entry, and shall provide the MBTA and Railroad Company(s) with the information required in the "Insurance Specifications".
  - C. The Owner or its Contractor shall take note that if an excavation is to be made within a 2 to 1 slope line commencing 5.5 feet from the centerline of track, they shall be required to submit the proposed method of soil stabilization for approval by the Director of Engineering for MBTA Railroad Operations.
  - D. The Owner or its Contractor shall furnish detailed plans for falsework, bracing, sheeting, or other supports adjacent to the tracks for approval by the Director of Engineering for MBTA Railroad Operations and the Railroad Company(s), and the work shall be performed in accordance with temporary "Sheeting and Shoring". All plans and calculations shall be stamped by a Registered Professional Engineer.
  - E. The Owner or its Contractor shall give written notice to the Director of Engineering for MBTA Railroad Operations and the applicable

Railroad Company(s) at least 21 days in advance of starting work or locating equipment at the site.

- F. The Owner or its Contractor shall make all necessary arrangements with the MBTA before entering upon MBTA Railroad Property.

1.04 After entering upon MBTA Railroad Property:

- A. The Owner or its Contractor shall have, in their possession on the job site, the contract plans and specifications which bear the stamp of approval of the Director of Engineering for MBTA Railroad Operations or Railroad Company(s). The Owner or its Contractor shall conduct all their work according to these plans and specifications.
- B. All work shall be performed and completed in a manner fully satisfactory to the MBTA Chief Engineering Officer or authorized representative(s). Railroad Company(s) inspection of the work shall be conducted at any time and the Owner or its Contractor shall cooperate fully with the MBTA and Railroad Company(s) representatives.
- C. All equipment used by the Owner or its Contractor on MBTA Railroad Property may be inspected by the Railroad Company(s) and shall not be used if considered unsatisfactory by the Railroad Company(s) representative. Equipment of the Owner or its Contractor to be used adjacent to tracks shall be in first class condition so as to positively prevent any failure that would cause delay in the operation of trains or damage to MBTA or railroad facilities. Equipment shall not be placed or put into operation adjacent to a track without first obtaining the permission of the Railroad Company(s).
- D. Operators of such equipment must be properly licensed and may be examined by the Railroad Company(s) representative to determine their fitness. If it is determined that they are unfit to work, then the Owner or its Contractor shall remove them from MBTA Railroad Property.
- E. If the Director of Engineering for MBTA Railroad Operations deems it necessary, the Owner or its Contractor shall furnish and erect in close proximity to the site of the work a suitable, furnished shelter with lights, heat, telephone, etc., for use by Railroad Company(s) personnel providing services to the Owner's or Contractor's work.
- F. The Owner or its Contractor's work shall be performed in such manner that the tracks, train operations and appurtenances of the MBTA and the Railroad Company(s) will be safeguarded.

- G. Open excavations shall be suitably planked and safeguarded when construction operations are not in progress.
- H. Blasting will be permitted under or adjacent to tracks only after proof that blasting is required and all methods have been approved by the Director of Engineering for MBTA Railroad Operations and the Railroad Company(s). All blasting operations must comply with the MBTA's "Blasting Specifications".
- I. The Owner or its Contractor shall be fully responsible for all damages arising from their failure to comply with the requirements of these specifications. Failure to comply may result in their removal from MBTA Railroad Property, at the MBTA's sole discretion.

## SECTION 2. RULES, REGULATIONS, AND REQUIRMENTS.

- 2.01 Railroad traffic shall be maintained at all times with safety and continuity, and the Contractor shall conduct all operations on, over, under, within or adjacent to MBTA Railroad Property within the rules, regulations, and requirements of the Railroad Company(s) and/or MBTA. The Contractor shall be responsible for acquainting themselves with such requirements as the Railroad Company(s) and/or MBTA may demand.
- 2.02 The Contractor shall obtain verification of the time and schedule of track occupancy from the Railroad Company(s) before proceeding with any construction or demolition work on, over, under, within or adjacent to MBTA Railroad Property. The work shall not proceed until the plans and method of procedure have been approved by the Director of Engineering for MBTA Railroad Operations or their authorized representative.
- 2.03 All work to be done on, over, under, within or adjacent to MBTA Railroad Property shall be performed by the Contractor in a manner satisfactory to the MBTA and the Railroad Company(s), and shall be performed at such times and in such manner, as to not interfere with the movement of trains or operations upon the tracks of the MBTA. The Contractor shall use all necessary care and precaution in order to avoid accidents, delays or interference with the MBTA's trains or other property.
- 2.04 The Contractor shall give written notice to the Railroad Company(s) at least twenty- one (21) days prior to the commencement of any work, or any portion of the work, by the Contractor or their subcontractors on, over, under, within or adjacent to MBTA Railroad Property, in order that necessary arrangements may be made by the Railroad Company(s) to protect railroad operations.

- 2.05 If deemed necessary by the Railroad Company(s), it may assign an inspector and/or engineer who will be placed on the work site during the time the Contractor or any subcontractor is performing work on, over, under, within or adjacent to MBTA Railroad Property. The cost and expense will be paid directly by the contracting party with an advance deposit to the Railroad Company(s), unless otherwise approved.
- 2.06 Before proceeding with any construction or demolition work, on, over, under, within or adjacent to the MBTA's Railroad Property, a pre-construction meeting shall be held at which time the Contractor shall submit for approval of the MBTA and Railroad Company(s), Drawings, computations, and a detailed description of the method for accomplishing the construction work, including methods of protecting railroad operations. Such approval shall not serve in any way to relieve the Contractor of complete responsibility for the adequacy and safety of the referenced methods.
- 2.07 During any demolition procedure, the Contractor must provide an approved shield to prohibit all debris from falling onto MBTA Railroad Property. A protective fence must be erected at both ends of the project to prohibit trespassers from entering MBTA Railroad Property.
- 2.08 Cranes, shovels, or any other equipment shall be considered to be fouling the track when located in such position that failure of same with or without load brings the equipment within the fouling limit. The Contractor's employees and equipment will not be permitted to work near overhead wires or apparatus.
- 2.09 The Contractor shall conduct their work and handle their equipment and materials so that no part of any equipment should foul an operated track or wire line without the written permission of the Railroad Company(s). When it becomes necessary for the Contractor to foul any track, they must give the Railroad Company(s) written notice of their intentions twenty-one (21) days in advance, so that if approved, arrangements may be made for proper protection of the Railroad Company(s).
- 2.10 The Contractor's equipment shall not be placed or put into operation adjacent to tracks without first obtaining permission from the Railroad Company(s). Under no circumstances shall any equipment or materials be placed or stored within fifteen (15) feet from the centerline of the closest track.
- 2.11 Materials and equipment belonging to the Contractor shall not be stored on MBTA Railroad Property without first having obtained permission from the Railroad Company(s), and such permission will be on the condition that the MBTA and/or Railroad Company(s) will not be liable for damage to such materials and equipment from any cause. The Contractor shall keep the

tracks adjacent to the site clear of all refuse and debris that may accumulate from construction operations, and shall leave the MBTA Railroad Property in the condition existing before construction commencement. Equipment repair, refueling or extended storage is prohibited on MBTA Railroad Property.

- 2.12 The Contractor shall consult the Railroad Company(s) in order to determine the type of protection required to insure safety and continuity of railroad operations. The railroad field engineer may assign track foremen, flagmen, signalmen or other employees deemed necessary for protective services by the Railroad Company(s), to insure the safety of trains and MBTA Railroad Property. The cost of same shall be paid directly by the contracting party with an advance deposit to the Railroad Company(s), unless otherwise approved.
- 2.13 The provision of such protective services, and other precautionary measures, shall not relieve the Contractor from liability for the cost of any and all damages caused by their operations.
- 2.14 The Railroad Company(s) will require protection during all periods when the Contractor is working on, over, under, within or adjacent to MBTA Railroad Property or as may be deemed necessary. When protection is required, the Contractor shall make the request in writing to the Railroad Company(s) at least twenty-one (21) days before such protection is required.
- 2.15 The Contractor shall not bill the Railroad Company(s) or MBTA for any work which they are proposing to perform, unless the Railroad Company(s) or MBTA authorizes the said work in writing. This work must be to the benefit of the MBTA or Railroad Company(s).
- 2.16 The Contractor, subcontractor and respective employees who will come within the limits of the MBTA Railroad Property, must first attend the Railroad Company(s) Safety Orientation Class. They are required to comply with the Railroad Company(s) Safety Requirements throughout the entire construction period. All costs associated with compliance of the Railroad Company(s) Safety Requirements will be at the sole expense of the Contractor and subcontractors.
  - A. The Contractor for the project must appoint a qualified person who will be designated as a Safety Representative. They must be approved by the Railroad Company(s) Safety Representative. The Contractor's designee will be responsible to give Safety Orientation to the Contractor's/subcontractor's employees who will come onto the MBTA's Railroad Property for short periods of time after the initial Safety Orientation Class has been given by the Railroad Company(s). The Contractor's designee will keep the Railroad Company(s) Safety Representative informed of the temporary employees who received Safety Orientation. The Railroad Company(s)

Safety Orientation Class will be repeated when employee turnover or groups of Contractor's and subcontractor's employees are such that another Railroad Company(s) Safety Orientation Class is justified.

- B. All Contractors shall follow established safety procedures and remain 15 feet or more from the closest rail of the closest track. When it becomes necessary for Contractors to encroach on this 15 foot limitation, the proper fouling procedures will be arranged with the Railroad Company(s).
  - C. Contractors will establish the 15 foot foul line by installing stakes and taping off the area prior to beginning work.
- 2.17 Upon completion of the work, the Contractor shall remove from the MBTA Railroad Property, all machinery, equipment, surplus materials, falsework, rubbish, temporary buildings and other property of the Contractor, or any subcontractor, and shall leave MBTA Railroad Property in a condition satisfactory to the MBTA and Railroad Company(s). Failure to comply will result in Railroad Company(s) forces restoring MBTA Railroad Property at the Contractor's expense.
- 2.18 The Contractor will pay the Railroad Company(s) directly, for all protective services unless otherwise approved. The services are performed to insure safe operation of trains when construction work would, in the Railroad Company(s) opinion, be a hazard.

### SECTION 3. DEFINITION OF HAZARD

- 3.01 Protection Services will be required whenever the Contractor is performing work on, over, under, within or adjacent to MBTA Railroad Property. This will include excavating, sheeting, shoring, erection, removal of forms, handling material, using equipment which by swinging or by failure could foul the track, and when any other type of work being performed, in the opinion of the Railroad Company(s), requires such service.
- 3.02 Railroad operations will be considered subject to hazard when explosives are used in the vicinity of MBTA Railroad Property during the driving or pulling of sheeting for footings adjacent to a track, when erecting structural steel across or adjacent to a track, when operations involve swinging booms or chutes that could in any way come closer than 5 feet to the center line of a track or wire line. None of these or similar operations, shall be carried on without Railroad Company(s) protective services personnel on site.
- 3.03 A signal line or communication line shall be considered fouled and subject to hazard when any object is brought closer than ten (10) feet to any wire or cable. An electrical supply line shall be considered fouled and subject to hazard when any object is brought closer than ten (10) feet to any

wire of the line.

- 3.04 As excavation approaches pipes, conduits, or other underground structures on or adjacent to MBTA Railroad Property, digging by machinery shall be discontinued and the excavation shall continue by means of hand tools. All existing pipes, poles, wires, fences, property line markers, and other structures, which the MBTA and/or Railroad Company(s) decides must be preserved in place, shall be carefully protected from damage by the Contractor or its Owner. Should such items be damaged, they shall be restored by the Railroad Company(s), at the Owner's or Contractor's sole expense to the original condition prior to construction commencement. If any excavation is taken beyond the work limit indicated on the approved Drawings or prescribed herein, the Owner or its Contractor shall backfill and compact to the satisfaction of the Railroad Company(s) at the Contractors expense.

#### SECTION 4. BACKFILL

##### 4.01 Backfilling

- A. All backfill material adjacent to any Railroad Company(s) facility shall be approved by the Railroad Company(s). Backfill material shall be free from hard lumps and clods larger than 3 inches in diameter, and free from large rocks or stumps. Uniformly fine material shall be placed next to any pipe liable to dent or break.
- B. All backfill material shall be compacted at or near optimum moisture content, in layers not exceeding 6 inches in compacted thickness by pneumatic tampers, vibrator compactors, or other approved means to the base of the railroad subgrade. Material shall be compacted to not less than 95 percent of AASHTO T 99, Method C. The Contractor will be required to supply to the job site, ballast stone (AREA #4) to be installed by the Railroad Company(s).

##### 4.02 Certification

The Owner or its Contractor shall provide testing, through the use of a testing lab or Professional Engineer, to insure that the in place density of the backfill meets or exceeds the requirements of Section 4.01(B). Written certification of the tests shall be given to the Railroad Company(s) immediately upon completion of the test.

##### 4.03 Alternate

In the case of an open cut crossing of the MBTA Railroad Property, the Owner or its Contractor may backfill with concrete having a three-day compressive strength of 1000 psi to the base of the track subgrade. This

may be used in lieu of providing the certification of proper compaction when using gravel backfill. The Owner or its Contractor will be required to supply to the job site, ballast stone (AREA #4) to be installed by the Railroad Company(s).

## SECTION 5. CLEARANCES

- 5.01 Staging falsework or forms shall at all times be maintained with a minimum vertical clearance of 226" above top of the high rail and a minimum horizontal clearance of 15' from the center line of track.

## SECTION 6. PROTECTION SERVICES

- 6.01 The MBTA shall require railroad inspection and may require railroad flagging. Prior to the start of any work on MBTA Railroad Property, the Owner or its Contractor shall submit a deposit to the amount required by the Railroad Company(s). If Railroad Company(s) expenses are greater than the amount of deposit, the Owner or its Contractor shall reimburse the Railroad Company(s) for the balance when billed, and, if the Railroad Company(s) expenses are less than the amount of deposit, the Railroad Company(s) will refund the balance to the Owner or its Contractor. The Railroad Company(s) reserves the right to request additional deposits as project work progresses.
- 6.02 If the MBTA or Railroad Company(s) determines that flagmen are necessary, the number required shall be on duty at the site during the hours of hazard described under Section 3. No work shall be performed if flagmen are required but are not on duty.
- 6.03 It shall be the responsibility of the Owner or its Contractor to keep the MBTA and Railroad Company(s) informed at all times when the Owner or its Contractor shall be working on, over, under, within or adjacent to MBTA Railroad Property and creating the hazards described under Section 3. Failure of the Owner or its Contractor to give the MBTA and Railroad Company(s) suitable advance notice of hazardous operation shall result in the shutdown of the work by the Railroad Company(s), until such time as sufficient numbers of flagmen are on duty at the site. If this becomes a repeat occurrence, the Contractor will be removed from the project.
- 6.04 The Railroad Company(s) will make its best effort to provide protective services personnel. Should the situation arise where such personnel are not available, Contractor operations must cease. The Railroad Company(s) is not liable for any monetary claims incurred during the absence of protective services personnel.



SECTION 7. INSPECTION

7.01 If deemed necessary by the Director of Engineering for MBTA Railroad Operations, the MBTA will furnish and assign an engineer(s) for inspection and the Railroad Company(s) will furnish an appropriate inspector for general inspection purposes or for general protection of MBTA Railroad Property and operations during construction. All protection services will be at the expense of the Owner or its Contractor.

SECTION 8. EXTRA-CONTRACT SERVICES

8.01 Temporary and permanent changes of tracks and all railroad utilities made necessary by the work of the Contractor, will be made by the MBTA or Railroad Company(s) at the expense of the Owner or its Contractor.

8.02 All other changes made or services furnished by the Railroad Company(s), at the request of the Owner or its Contractor, will be at the Owner's or its Contractor's expense.





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TRANSPORTATION  
AUTHORITY**

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RAILROAD OPERATIONS DIRECTORATE

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**INSURANCE SPECIFICATIONS**

The insurance outlined in these Specifications is required of the Owner or Contractor, and shall be provided by or in behalf of all subcontractors performing any portion of the work. The Owner or Contractor shall be responsible for any modifications, deviations or omissions of the required insurance as it applies to subcontractors.

All insurance policies, unless otherwise specified under Railroad Protective Liability Insurance, are to be written either on an occurrence basis or, if a claims-made form, applicable renewals must have a date retroactive to the construction start date and shall be maintained in force for one year following the acceptance of the work by the MBTA or its duly authorized representative.

With the exception of Railroad Protective Liability Insurance, all insurance policies must name the MBTA as an additional insured as its interest appears and waive any rights of subrogation against the MBTA.

Certificates of Insurance evidencing (1) either the claims-made or occurrence form coverage, (2) work description/location, (3) Owner or Contractor's corporate name, and (4) individual, company, government agency or municipality for which the work is being performed, are to be furnished to the MBTA prior to work commencement, and within fifteen (15) days of expiration of the insurance coverage, when applicable.

All policies must contain a minimum thirty (30) day written notice of cancellation clause, and provide that the Insurance Company shall notify the Owner, Contractor, MBTA and Railroad Company(s), via registered mail, of any cancellation, change or expiration of the policy.

Original Insurance Certificate(s) shall be received and approved by the MBTA before the Owner or Contractor will be allowed entry upon MBTA Railroad Property. Certificates, including any required endorsements, shall be furnished to the MBTA, c/o Risk Manager, Office of the Treasurer-Controller, Ten Park Plaza, Room 8450, Boston, MA 02116, and shall provide stated coverage and a provision that Notice of Accident (occurrence) and Notice of Claim shall be given to the Insurance Company as soon as practicable after notice to the insured(s).

Original Insurance Binders reflecting Railroad Protective Insurance shall be received and approved by the MBTA and the appropriate Railroad Company(s) prior to entry upon MBTA Railroad Property. Mailing addresses for transmittal of original Insurance Binders to the named insured Railroad Company(s) are contained on Page Four of these Specifications.

The Owner or Contractor shall indemnify, defend and save harmless the MBTA and the appropriate Railroad Company(s) from and against any and all liabilities, losses (including losses of revenue), claims, costs, damages and expenses (including reasonable attorney's fees and expenses) that may be asserted against or incurred by the MBTA and the Railroad Company(s) arising from or as a result of the Owner or Contractor's work, or its use of adjacent land. Said indemnification shall include claims, whether covered by insurance or not, including, but not limited to

Workers Compensation and similar insurance.

The Owner or Contractor shall maintain, during the life of the contract, from company (s) authorized to do business in the Commonwealth of Massachusetts and satisfactory to the MBTA:

**A. COMMERCIAL GENERAL LIABILITY INSURANCE** for personal injury, bodily injury and property damage in an amount not less than \$1,000,000 per occurrence and \$3,000,000 in the aggregate covering all work performed on over or adjacent to MBTA Railroad Property (the "work"), including:

1. All operations;
2. Contractual liability;
3. Coverage for the so-called "X, C, U" hazards, i.e., collapse of building, blasting, and damage to underground property;
4. Asbestos abatement, when applicable.

**B. AUTOMOBILE LIABILITY INSURANCE** including the use of all vehicles owned, non-owned, leased and hired, in an amount not less than \$1,000,000 combined single limit covering all the work.

**C. WORKER'S COMPENSATION INSURANCE** including Employees, Liability Insurance, as provided by Massachusetts General Laws, Chapter 152, as amended, covering all the work.

**D. UMBRELLA LIABILITY COVERAGE** in an amount not less than \$10,000,000 per occurrence covering all the work.

**E. HAZARDOUS MATERIALS INSURANCE** if the work involves hazardous materials, the following coverage is required:

1. **Pollution Liability insurance** for sudden and gradual occurrences in an amount not less than \$1,000,000 per occurrence and \$5,000,000 in the aggregate arising out of the work, including but not limited to all hazardous materials identified in the contract.
2. When applicable, the Owner or Contractor shall designate the disposal site and furnish a Certificate of Insurance from the Disposal Facility for Environmental Impairment Liability Insurance for (a) sudden and accidental occurrences in an amount not less than \$3,000,000 per occurrence and \$6,000,000 in the aggregate and (b) non-sudden occurrences in an amount not less than \$5,000,000 per occurrence and \$10,000,000 in the aggregate.

3. Certificates of insurance shall clearly state the hazardous materials exposure work being performed.

**F. RAILROAD PROTECTIVE LIABILITY INSURANCE** is specifically designed for insuring Railroads, and is purchased by the Owner or Contractor in the name of the MBTA and the Railroad Company(s). **The Railroad Company(s) is the named insured on the policy.** Railroad Protective Liability Insurance is required for any work performed within fifty (50) feet from center line of the nearest railroad track; it is not a substitute for any types of insurance outlined in these Specifications. Required limits are:

Bodily injury: not less than \$5,000,000 for all damages arising out of bodily injuries to or death of one person, and subject to that limit for each person, a total limit of \$6,000,000 for all damages arising out of bodily injury to or death of two or more persons in any one accident;

Property Damage: not less than \$10,000,000 or all damages arising out of injury to or destruction of MBTA property in any one accident, and subject to that limit per accident, a total of \$10,000,000 in the aggregate for all damages arising out of injury to or destruction of MBTA property.

Questions regarding insurance should be directed to MBTA's Risk Manager at (617) 222-3064.

Questions regarding train counts and train speeds should be directed to the appropriate Railroad Company(s) listed on Page Four.

## PROOF OF INSURANCE

### MAILING ADDRESSES:

#### MBTA

Risk Manager  
c/o Treasurer-Controller  
10 Park Plaza  
Boston, MA 02116  
cc: Massachusetts Realty Group

#### National Railroad Passenger Corporation (Amtrak)

Boston Division Office  
c/o Division Engineer  
2 South Station 5<sup>th</sup> Floor  
Boston, MA 02110

#### CSX Transportation Inc.

500 Water St.  
Jacksonville, FL 32202

#### Bay Colony Railroad Corporation

General Manager  
4 Freight House Road  
East Wareham, MA 02571

Boston and Maine Corporation  
and Springfield Terminal Railway  
Co.

Chief Engineer  
402 Amherst Street  
Suite 300  
Nashua, NH 03063-1287

Providence and Worcester  
Railroad Company

P. O. Box 1188  
Worcester, MA 01601

Keolis Commuter Services

Chief Engineering Officer  
470 Atlantic Ave.  
Boston, MA 02110



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**RAILROAD OPERATIONS DIRECTORATE**

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**IV**

**PIPELINE OCCUPANCY SPECIFICATIONS**



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## SECTION 1. GENERAL REQUIREMENTS

### 1.01 DESCRIPTION OF WORK AND LOCATION

These specifications apply to the design and construction of pipelines carrying flammable and non-flammable substances and to casings over 4-inches in diameter containing wires and cables, under, across or along MBTA Railroad Property, facilities and tracks.

### 1.02 LICENSE TO ENTER RAILROAD PROPERTY

- A. Entry upon MBTA Railroad Property for the purpose of conducting surveys, field inspections, obtaining soil information, or any other purpose associated with the design and engineering of the proposed occupancy, will be authorized by an MBTA License for Entry (See "Guidelines and Procedures for Construction on MBTA Railroad Property").
- B. Issuance of the License does not constitute authority to proceed with the actual construction.

### 1.03 WORK ON RAILROAD PROPERTY

- A. The safety and continuity of train operations shall be the first priority. The Applicant shall arrange the work so that the trains will be protected and safeguarded at all times. Whenever the work may affect the safety and movement of trains, the method, sequence and time schedule of performing such work shall be submitted to the Director of Engineering for MBTA Railroad Operations or their authorized representative for approval.
- B. The Applicant waives all claims against the Railroad Company(s) and/or the MBTA for delays or any interference occasioned by railroad traffic or railroad maintenance.
- C. All Applicant-designed temporary construction on MBTA Railroad Property shall be designed in accordance with the appropriate railroad criteria and all construction performed on, over, under, within or adjacent to MBTA Railroad Property will be subject to the inspection and approval of the Railroad Company(s) and/or MBTA.
- D. A minimum of fourteen (14) days advance written notice shall be given to the Railroad Company(s) prior to construction related activities.
- E. The Railroad Company(s) will furnish such qualified flagmen, signalmen or protection men as may be required to insure complete

protection of train operations and railroad facilities. The need for this type of service will be determined by the Railroad Company(s) on the basis of railroad regulations and the Applicant's approved construction schedule. No work shall proceed without proper protection on the site.

- F. All expenses incurred in connection with protection of railroad facilities by Railroad Company(s) employees will be borne by the Applicant. Billings for such service or expense, including labor, materials and equipment will be made directly to the Applicant for payment.
- G. During construction, railroad traffic shall be maintained at all times without interruption, except when approved in advance, in writing, by the Director of Engineering for MBTA Railroad Operations or their authorized representative.
- H. All construction operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains, nor damage, destroy, or endanger the integrity of railroad facilities. All work on or near MBTA Railroad Property shall be conducted in accordance with the Railroad safety rules and regulations. The Applicant shall secure and comply with the Railroad safety rules and shall give written acknowledgment to the Railroad Company(s) that they have been received, read, and understood by the Applicant and their employees. Construction operations will be subject to Railroad Company(s) inspection at any and all times.
- I. All cranes, lifts, or other equipment that will be operated in the vicinity of the MBTA's electrification and power transmission facilities shall be electrically grounded as directed by the Railroad Company(s).
- J. At all times when the work is progressing, a field supervisor for the work with no less than twelve (12) months experience in the operation of the equipment being used shall be present. Certification of the above must be submitted to the Railroad Company(s).
- K. Whenever equipment or personnel are working closer than fifteen (15) feet to the closest rail of an adjacent track, that track shall be considered as being obstructed. As best possible, all construction operations shall be conducted no less than this distance. Construction operations closer than fifteen (15) feet to the closest rail of a track shall be conducted only with the permission of, and as directed by, a qualified Railroad Company(s) employee present at the work site.
- L. Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangement with, and as directed by, the Director of

Engineering for MBTA Railroad Operations or their authorized representative.

- M. All tunneling, jacking and boring operations within railroad influence lines will be done on a 24 hour per day basis to minimize Railroad exposure to construction hazards.

#### 1.04 COORDINATION

The Applicant shall coordinate the work with their Contractors, subcontractors, utility companies, governmental units, and any affected Railroad Company(s) with regard to site access, establishment and use of temporary facilities, work schedules, and other elements of the specified work which require interfacing with others.

#### 1.05 LAYOUT OF WORK

The Applicant shall lay out their work true to lines and grades indicated on the Drawings and shall be responsible for all measurements in connection therewith. The Applicant will be held responsible for the execution of the work to such lines and grades indicated on the approved construction Drawings or such other lines and grades as may be directed or established by the Director of Engineering for MBTA Railroad Operations or their authorized representative.

#### 1.06 INDEMNIFICATION AND INSURANCE

See requirements in "Guidelines and Procedures for Construction on MBTA Railroad Property" and "Insurance Specifications."

#### 1.07 SCIENTIFIC OR HISTORIC ARTIFACTS

The Applicant shall immediately notify the Director of Engineering for MBTA Railroad Operations of the discovery of scientific or historical artifacts and shall protect same until identified and removed by the appropriate Authorities exercising jurisdiction.

#### 1.08 RECORD DOCUMENTS

- A. The Applicant shall furnish the Railroad Company(s) and the MBTA with one reproducible "As Built" copy of each approved Construction Drawing, marked to indicate all changes and deviations from same.
- B. All project record documents shall be received and accepted by the MBTA and the Railroad Company(s) prior to final inspection.

## SECTION 2. SUBMITTALS

### 2.01 APPLICATION FOR OCCUPANCY

The Applicant must agree, upon approval of the construction details by the Director of Engineering for MBTA Railroad Operations, to execute the MBTA Pipeline Occupancy Agreement and pay any required fees and/or rentals outlined therein. Refer to "Guidelines and Procedures for Construction on MBTA Railroad Property" for application policy.

### 2.02 SUBMISSION OF CONSTRUCTION DRAWINGS AND SPECIFICATIONS

- A. Six (6) sets of Drawings and specifications for proposed pipeline occupations shall be submitted to the AGM for Real Estate and Asset Development and meet the approval of the Railroad Company(s) and the MBTA prior to the start of construction. These plans are to be prepared in sizes as small as possible and are to be folded to an 8-1/2 inch by 11-inch size (folded dimensions) with a 1-1/2 inch margin on the left side and a 1-inch margin on the top.
1. After folding, the title block and other identification of the Drawings shall be visible at the lower right corner, without the necessity of unfolding. Each Drawing shall bear an individually identifying number and an original date, together with subsequent revision dates, clearly identified on the Drawing.
  2. All Drawings are to be individually folded or rolled and where more than one Drawing is involved, they shall be assembled into complete sets before submission to the MBTA.
- B. Drawings shall be to scale and show the following (see attached Plates).
1. Plan view of proposed pipeline in relation to all railroad facilities.
  2. Location of pipe (in feet) from nearest railroad milepost, centerline of a railroad bridge (giving bridge number), or centerline of an existing or former passenger station, or other fixed point. In all cases, the name of the City or Town and County in which the proposed facilities are located must be shown.
  3. Profile of ground on centerline of pipe from field survey showing relationship of pipe and casing to ground level, tracks and other facilities. For longitudinal occupations, the profile of adjacent track(s) must be shown.



4. All MBTA property lines. If pipeline is in a public highway, the limits of the right-of-way for the highway shall be clearly indicated with dimensions from centerline.
  5. The angle of crossings in relation to centerline of tracks.
  6. Location of valves or control stations of the pipeline.
  7. "Pipe Crossing Data Sheet" completed and out on Plan.
- C. The Drawing must be specific (both on MBTA Railroad Property and under tracks that are not on MBTA Railroad Property) as to:
1. Method of installations.
  2. Size and material of casing pipe.
  3. Size and material of carrier pipe.

These items shall not have an alternative.

- D. Once an application is approved by the Director of Engineering for MBTA Railroad Operations or their authorized representative, proposed variances from the approved plans, specifications, method of construction, etc., will be resubmitted for approval.
- E. Location and dimensions of jacking, boring, or tunneling pits shall be shown with details of their sheeting and shoring. If the bottom of the pit excavation nearest the adjacent track intersects a line from a point 5.5 feet horizontally from center line of adjacent track at the plane of the base of fall drawn on a slope of 2 horizontal to 1 vertical, submit design and details of the pit construction to the MBTA for approval complete with computations prepared by a Registered Professional Engineer. In any event, the face of the pit shall be no less than 25 feet from adjacent track, unless otherwise approved by the Director of Engineering for MBTA Railroad Operations or their authorized representative. Pits shall be fenced, lighted, and otherwise protected as directed by the Railroad Company(s).
- F. All Drawings and computations, including those submitted by Contractors, must bear the seal of a Registered Professional Engineer.
- G. Computations for all structures involving the support or protection of railroad track, embankment and facilities must be prepared by and bear the seal of a Registered Professional Engineer and shall be submitted within the construction Drawings.
- H. When computer calculations are included with design calculations, the following documentation shall be furnished:

1. A synopsis of the computer program(s) stating briefly required input, method of solution, approximations used, second order analysis incorporated, specifications or codes used, cases considered, output generated, extent of previous usage of certification of program(s) and program(s) author.
  2. Identification by number, indexing and cross-referencing of all calculation sheets, including supplemental "long-hand" calculation sheets.
  3. Fully identified, dimensioned, and annotated diagram of each member or structure being considered.
  4. Clear identification and printing of all input and output values, including intermediate values if such values are necessary for orderly review.
  5. Identification of the processing unit, input/output devices, storage requirements, etc., if such supplemental information is significant and necessary for evaluation of the submittal.
- I. Specifications shall conform to Construction Specifications Institute (CSI) 16 Division, 3-part Section Format.
- J. If other than American Railway Engineering Association (AREA), American Society for Testing and Materials (ASTM), or American National Standards Institute (ANSI) specifications are referred to for design, materials or workmanship on the Construction Drawings and specifications for the work, then copies of the applicable sections of such other specifications referred to shall accompany the Construction Drawings and specifications for the work.

### SECTION 3. TEMPORARY FACILITIES AND CONTROLS

#### 3.01 REQUIREMENTS OF REGULATORY AGENCIES

Applicant shall:

- A. Obtain and pay all costs for required permits for installation and maintenance of temporary facilities and controls.
- B. Comply with all applicable Federal, State and local codes, regulations and ordinances.
- C. Comply with regulations and requirements of all utility or service companies from which temporary utilities or services are obtained, and pay all costs incurred therewith.

### 3.02 INSTALLATION AND COORDINATION - GENERAL

Applicant shall:

- A. Install all temporary facilities and controls in a neat and orderly manner.
- B. Make all temporary facilities structurally and functionally sound throughout.
- C. Construct temporary facilities and controls to give continuous service and to provide safe working conditions.
  - 1. Enforce conformance with applicable standards
  - 2. Enforce safe practices.
- D. Modify, extend or relocate temporary facilities and controls as work progress requires.
- E. Locate temporary facilities and controls to avoid interference with, or hazards to:
  - 1. Work or movement of railroad personnel or traffic.
  - 2. Vehicular traffic.
  - 3. General Public.
  - 4. Work of other contracts.
  - 5. Railroad Passengers.
- F. Obtain easements as may be required across non-MBTA Railroad Property.
- G. Provide materials for temporary facilities and controls for the purpose intended and shall not violate requirements of applicable codes and shall not create unsafe conditions.

### 3.03 SANITARY FACILITIES

Prior to the start of work, the Applicant shall furnish necessary toilet conveniences, secluded from public observation. They shall be kept in a clean and sanitary condition and comply with the requirements and regulations of the area in which the work is performed.

### 3.04 LIGHT AND POWER

Applicant shall make their own arrangements for obtaining temporary light and power as required for the work, and shall maintain such temporary facilities in a proper and safe condition, including compliance with applicable codes.

### 3.05 TEMPORARY WATER

Applicant shall make their own arrangements for obtaining all temporary water service as required for the work.

### 3.06 TEMPORARY TRAFFIC CONTROLS

Applicant shall cooperate with the directives of the MBTA and/or Railroad Company(s) regarding vehicular traffic control and provide any temporary controls or devices required to eliminate or minimize congestion or obstruction of vehicular traffic caused by the work, including use of designated routes of ingress and egress from the work area.

### 3.07 TEMPORARY WORK AND STORAGE AREAS

- A. The areas designated by the MBTA as the temporary parking, work and storage area(s) will be provided to the Applicant in accordance with the terms of the MBTA License Agreement.
- B. All designated temporary parking, work and storage areas used by the Applicant shall be restored to their original condition prior to completion of the work, subject to inspection and approval of the MBTA and the Railroad Company(s).

### 3.08 POLLUTION ABATEMENT CONTROLS

Applicant shall:

- A. Conduct operations in a manner to minimize pollution of the environment surrounding the area of work by every means possible. Specific controls shall be provided as follows:
  - 1. Vehicles: All vehicles and material transport trucks leaving the site and entering paved public streets shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle. Trucks arriving at or leaving the site with materials shall be loaded in a manner which will prevent dropping of materials or debris on the streets. Spills of materials in public areas shall be removed immediately at no cost to the MBTA or Railroad Company(s).

2. Waste Materials: No waste or erosion materials shall be allowed to enter natural or man-made water or sewage removal systems. Erosion materials from excavations, borrow areas or stockpiled fill shall be contained within the work area. The Applicant shall develop methods for control of waste and erosion which shall include such means as filtration, settlement and manual removal to satisfy the above requirements. Do not dispose of machinery lubricants, fuels, coolants and solvents on the site. If hazardous waste is encountered, the Applicant shall dispose of it in accordance with all federal, state and local codes. Verification of proper disposal must be provided, in writing, to the MBTA and the Railroad Company(s).
  3. Burning: No burning of waste shall be allowed without prior written permission. In cases where permission is granted, burning shall be conducted in accordance with the regulations of the appropriate jurisdictional agency.
  4. Dust Control: The Applicant shall at all times control the generation of dust by their operations. Control of dust is mandatory and shall be accomplished by water sprinkling or by other methods approved by the MBTA or Railroad Company(s).
  5. Noise Control: The Applicant shall take every action possible to minimize the noise caused by their operation. When required by agencies having jurisdiction, noise producing work shall be performed during less sensitive hours of the day or week as directed by the MBTA or Railroad Company(s) or as required by local ordinance.
  6. Environmental: All local and state environmental laws will be strictly adhered to. All applications, permits, licenses, approvals, etc., will be the sole responsibility of the Applicant.
- B. Submit a program for pollution control with applicable licenses and permits for all piping carrying non-potable liquids, gases or other pollutants.

### 3.09 PROTECTION OF PERSONS AND PROPERTY

#### A. Safety Requirements

1. The Applicant must adhere to the most stringent provisions of the applicable statutes and regulations of the political subdivision in which the work is being performed. The Applicant must also observe the Department of Labor-

Occupational Safety, Health Administration provision, pertaining to the safe performance of the work, and further, the methods of performing the work must not involve undue danger to the personnel employed thereon, Railroad Company(s) employees, the public, or to public and private property. Should charges of violation of any of the above be issued to the Applicant in the course of the work, a copy of each charge shall immediately be forwarded to the Railroad Company(s). The Applicant shall pay all fines and penalties levied against him.

2. The Applicant shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection. This includes posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

B. Safety of Persons and Property - The Applicant shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the work site and all other persons who may be affected.
2. All materials and equipment, whether in storage on or off the site, under the care, custody or control of the Contractor or any of their subcontractors.
3. Other property at the site or adjacent thereto, including walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction. Any damage to such items shall be restored to original condition by the Applicant at no cost to the MBTA or Railroad Company(s).

C. First Aid

The Applicant shall maintain adequate first aid supplies at the site as prescribed by Federal, State or Local codes and regulations.

D. Use of Explosives

Non blasting methods are preferred. See "Blasting Specifications."

E. Site Security

The Applicant shall:

1. Maintain a secure work site protecting the MBTA and the Railroad Company(s) interests and property from claims arising from trespass, theft and vandalism.
2. Permit access to the work site only to employees, Contractors and those persons having business related to the work.
3. Provide security measures as required to protect Contractor or subcontractor's tools, equipment and property from damage, theft or vandalism.
4. Assume all costs for any MBTA and/or local police details required by the work.

### 3.10 VERMIN CONTROL

- A. Do not permit food scraps, lunch bags, food wrappers or other items which would attract rats or other vermin to be left lying around the site. Deposit such items in closed, rat-proof metal containers for disposal on a regular basis.
- B. The Applicant must provide vermin control as required by the MBTA or Railroad Company(s).

### 3.11 RUBBISH AND DEBRIS REMOVAL

- A. Rubbish and debris resulting from the work must be neatly piled in a single location and legally disposed of at least once a week. If rubbish or debris interferes with railroad activities, or creates a fire or safety hazard, it must be removed on a more frequent basis.
- B. Volatile waste such as mineral spirits, oil, or paint thinner shall not be disposed of in storm or sanitary drains, streams or waterways or any location upon the site.

## SECTION 4. PIPELINE OCCUPANCY GENERAL CRITERIA

### GENERAL:

#### 4.01 METHOD OF INSTALLATION:

- A In a public way:
  1. No work shall be done without a Railroad Company(s) Inspector present.
  2. Open cuts will not be allowed in or immediately adjacent to an at

grade crossing. Sleeves will be installed by the jerking method, unless otherwise approved by the Director of Engineering for MBTA Railroad Operations.

3. Jerking is the preferred method of installation in or immediately adjacent to and at grade crossing. The sleeve may be installed by the open cut method with the Applicant paying for the complete rebuilding of the crossing, pending approval of the Director of Engineering for MBTA Railroad Operations. Approval will be given only under very unusual circumstances.
4. Jacking is the preferred method of installation in or immediately adjacent to and at grade crossing scheduled for rebuilding. The sleeve may be installed by the open cut method within seven (7) calendar days of the scheduled date of the crossing reconstruction. In the case of any open cut, strict adherence shall be made to the backfill specifications which provide the MBTA with written certification from a testing lab or Professional Engineer, that the backfill density requirements of the MBTA specifications have been met or exceeded.

B. Not within a Public Way:

The preferred method of crossing the railroad is by jacking of a pipe sleeve under the railroad. Only upon written request, will an alternate of open cut be given consideration. The engineering decision shall be based upon, but not limited to, the following: (1) track usage, (2) depth of cut, (3) soil conditions, (4) physical restraints. In the event an open cut is allowed, the following items shall be adhered to, and (5) any other circumstances which may necessitate an open cut.

1. The installation is to be a continuous operation and performed according to an MBTA approved schedule.
2. No work shall be done without a Railroad Company(s) Inspector present.
3. MBTA backfill specifications by the Owner or its Contractor.
4. The Owner or its Contractor may be required to provide a non-refundable lump sum payment for "after the fact maintenance." The determination of this amount is based on the individual situation. No work will be allowed until this payment is received. This payment is not to be confused with payments for Drawings and specification review, flagging, inspection, etc. (also required from the Owner or its Contractor before they enter upon MBTA property.)



#### 4.02 GENERAL REQUIREMENTS

- A. Pipelines under or across MBTA tracks on rights-of-way shall be encased in a larger pipe or conduit called the casing pipe as indicated in Plate II.
- B. Casing pipe will be required for all pipelines carrying oil, gas, petroleum products, or other flammable, highly volatile substances which, from their nature or pressure, might cause damage if escaping on or near MBTA Railroad Property.
- C. For non-pressure sewer or drainage crossings where the installation can be made without interference to railroad operations, the casing pipe may be omitted when the pipe strength is capable of withstanding railroad loading. This type of installation must be approved by the Director of Engineering for MBTA Railroad Operations.
- D. The casing pipe shall be laid across the entire width of the right-of-way. Casing pipe shall extend beyond the right-of-way when the right-of-way line on either side of the tracks is less than the minimum length of casing specified in Section 6, Para. 6.01(E).
- E. Pipelines laid longitudinally on railroad right-of-way shall be located in accordance with Plate III. If located within 25 feet of the closest rail of any track or closer than 45 feet to nearest point of any bridge, building or other structure, the carrier pipe shall be encased.
- F. Where practicable, pipelines shall be located to cross the tracks at approximate right angles, but preferably at not less than 45 degrees.
- G. Pipelines shall not be placed within a culvert, under railroad bridges, or closer than 45 feet to any portion of a railroad bridge, building, or other structure, except in special cases, and then by special design, as approved by the Director of Engineering for MBTA Railroad Operations.
- H. Pipelines carrying liquefied petroleum gas shall, where practicable, cross the railroad where tracks are carried on embankment.
- I. Any replacement or modification of an existing carrier pipe and/or casing shall be considered a new installation, subject to the requirements of these Specifications.
- J. Where laws or orders of public authority prescribe a higher degree of protection than specified herein, the higher degree so prescribed shall be deemed a part of these Specifications.

- K. Pipelines and casings shall be suitably insulated from underground conduits carrying electric wires on MBTA Railroad Property.

#### 4.03 INSPECTION AND TESTING

For pipelines carrying flammable or hazardous materials, ANSI Codes B 31.8 and B 31.4, current at time of constructing the pipeline, shall govern the inspection and testing of the facility on MBTA Railroad Property, except that proof-testing of strength of carrier pipe shall be in accordance with the requirements of ANSI Code B 31.4, as applicable, for all pipelines carrying all liquefied petroleum gas, natural or manufactured gas, and other flammable substances.

#### 4.04 CATHODIC PROTECTION

- A. Cathodic protection shall be applied to all pipelines and casings carrying flammable substances.
- B. Where casing and/or carrier pipe is cathodically protected by other than anodes, the Director of Engineering for MBTA Railroad Operations shall be notified and suitable testing shall be made. This testing shall be witnessed by the Railroad Company(s) to insure that other railroad structures and facilities are adequately protected from the cathodic current in accordance with the recommendations of Reports of Correlating Committee on Cathodic Protection, current issue by the National Association of Corrosion Engineers.

#### 4.05 SOIL INVESTIGATIONS

- A. Soil borings (or other soil investigations approved by the Railroad Company(s)) will be performed to determine the nature of the underlying material for all pipe crossings under tracks. See Test Boring Specifications.
- B. Borings shall be made on each side of the tracks, on the centerline of the pipe crossing, and as close to the tracks as practicable.
- C. Soil borings shall be in accordance with the current issue of the American Railway Engineering Association Specifications, Chapter 1, Part 1, "Specifications for Test Borings". Soils shall be investigated by the split-spoon and/or thin-walled tube method and rock shall be investigated by the Boring method specified therein.
- D. Soil boring logs shall clearly indicate all of the following:
  - 1. Boring number as shown on boring location Drawing.

2. Elevation of ground at boring, using same datum as the pipeline Construction Drawings.
  3. Description or soil classification of soils and rock encountered.
  4. Elevations or depth from surface for each change in strata.
  5. Identification of where samples were taken and percentage of recovery.
  6. Location of ground water at time of sampling and, if available, subsequent readings.
  7. Natural dry density in lbs./sq.ft. for all strata.
  8. Unconfined compressive strength in tons/sq.ft., for all strata.
  9. Water content (percent). Liquid limit (percent) and plastic limit (percent).
  10. Standard penetration in blows/ft.
- E. The location of the carrier pipe and casing shall be superimposed on the boring logs before submission to the Director of Engineering for MBTA Railroad Operations.
- F. Soil investigation by auger, wash, or rotary drilling method is not acceptable.
- G. Soil boring logs shall be accompanied by a Drawing drawn to scale showing location of borings in relation to the tracks and the proposed pipe location, the elevation of around surface at each boring, and the elevation of the base of rail of the tracks.

#### 4.06 GROUND STABILIZATION

Soil stabilization shall take place prior to the start of jacking. Stabilization shall be achieved by dewatering, grouting or a combination of both to maintain the stability of the face of the heading.

- A. The Owner or its Contractor shall lower and maintain the ground water level a minimum of two (2) feet below the invert at all times during construction by well points, vacuum well points, or deep wells to prevent inflow of water and/or soil into the heading. Ground water observation wells shall be installed in the area to be dewatered to demonstrate that the dewatering requirements are being complied with.
- B. The grouting Contractor shall be a specialist in the field with a minimum

of five (5) continuous years of successfully grouting soils. All granular soils (silty sands, sand or sand and gravel) shall be stabilized by injection of a cement or chemical grout from the ground surface or from the pipe heading. The stabilization shall extend as far as necessary outside the periphery of the casing pipe in order to maintain a stable face at the heading.

- C. Railroad Company(s) forces will survey the crossing prior to, during and after construction. If it is necessary to align or surface the tracks as a result of construction, the Railroad Company(s) will perform the work at the expense of the Owner or the Owner's Contractor.

#### 4.07 SUPPORT OF TRACKS

- A. When jacking, boring, or tunneling, temporary track support structures shall be installed. The track support structures shall be provided by the Applicant and installed by the Railroad Company(s) at the Applicant's expense. The Contractors proposed type of temporary track support structures shall be subject to the approval of the Railroad Company(s)'
- B. All work involving rail, signals, ties and other track material will be performed by the Railroad Company(s) at the Applicant's expense.
- C. The Applicant shall deliver the track support structures to a site approved by the Railroad Company(s). Provisions for unloading shall be provided by the Applicant at no expense to the Railroad Company(s) and the Applicant shall provide the necessary labor to handle the material for pre-installation inventory.

#### 4.08 GEOTECHNICAL MONITORING

##### **THE FOLLOWING SPECIFICATIONS ARE REQUIRED FOR ALL PIPE JACKING OPERATIONS.**

- A. Jacking shall be performed on a continuous basis, 24 hours per day, and 7 days per week.
- B. The monitoring points shall be set up one week before the jacking operation begins. The MBTA and Railroad Company(s) shall be notified. Elevation readings shall begin two days prior to the start of jacking and continue for a minimum of two weeks after the completion of the jacking operation. Initial readings immediately after any surfacing operations shall serve as new baseline figures. All future elevation readings shall be compared to the adjusted baseline. If the

track deviates to a condition not acceptable to the MBTA or Railroad Company(s), corrections shall be made at the proponent's expense.

- C. Elevation readings shall be taken from the top rail of each track.
- D. Elevation readings shall be taken every four hours or two times per shift, i.e., six times per day. The readings shall be faxed to the MBTA and Railroad Company(s) on a daily basis and all information is to be presented in legible print. Additional readings may be required by the MBTA or Railroad Company(s).
- E. Stations shall be spaced at 15-1/2 foot intervals. The number of stations required shall be determined by the depth of the pipe. There shall be a minimum of two stations on either side of the centerline jacking. Additional stations may be required at the discretion of the MBTA or Railroad Company(s),
- F. Elevation readings must show the date, time, weather conditions and temperature. Each reading must also provide the following information: track number, compass direction, station number, base elevation (with date), static elevation, change in elevation (recorded in hundredths and in inches), dynamic reading and total deflection in inches. See sample sheet attached.
- G. Station "0" shall be located at the centerline of the pipe jacking with Stations 1 and being to the right and Stations -1 and -2 being to the left when standing in the gauge of the near track and looking at the receiving pit. In multiple track areas the stations as determined herein are to be carried across each track perpendicular to the near track.
- H. Elevation readings taken from the top of the rail for static measurement and the dynamic readings shall be combined and the sum compared to the adjusted baseline. This reading will demonstrate the difference in elevation caused by the jacking operation.
- I. The MBTA requires that the truck be maintained at all times within established criteria for the specific track classification. At the completion of the project the requirement for tamping and realigning the tracks, caused by the settlement from the construction activity, remains with the Contractor for the duration as specified by the MBTA in their initial review of the work plans. This tamping and track realignment will be performed by the MBTA or Railroad Company(s) at the sole expense of the Contractor.

#### 4.09 PIPELINES ON BRIDGES

- A. Pipelines carrying flammable or non-flammable substances which by their nature might cause damage if escaping on or near railroad facilities or personnel shall not be installed on bridges over railroad tracks or bridges carting railroad tracks.
- B. The Director of Engineering for MBTA Railroad Operations may approve such an installation when it is demonstrated that no practicable alternative is available.
- C. When allowed by the Director of Engineering for MBTA Railroad Operations, pipelines on bridges shall be located in a way to minimize the possibility of damage from vehicles, railroad equipment, vandalism and other external causes. Pipelines on bridges may be installed in a utility bay that is constructed between the girders of the bridge. The utility bay shall be protected from the environment by a removable shield bolted to the girders. This will allow utility companies to comply with the Code of Federal Regulations for Periodic Inspection.
- D. In the event of pipe relocation due to the reconstruction of a bridge, the installation of the new pipe must comply with the requirements in these Specifications.

#### 4.10 BONDING AND GROUNDING OF PIPELINES IN ELECTRIFIED TERRITORY

- A. Carrier pipe shall be enclosed in a metal casing that is isolated from carrier pipe by approved insulators having a dielectric value of not less than 25 kV that provide an air gap between carrier pipe and casing of not less than 2 inches.
- B. Carrier pipe supporting hangers, mountings or cradles shall provide an insulation value of not less than 25 kV and an air gap of not less than 2 inches between casing and any portion of mounting assembly.
- C. Any grounding or isolation methods used must have a minimum dielectric of 25,000 volts.

#### 4.11 ABANDONED PIPELINES OR FACILITIES

- A. For all pipeline occupations on the railroad right-of-way, the owner of the pipeline shall notify the MBTA, in writing, of the intention to abandon the pipeline. Upon abandonment the carrier pipe shall be removed and the casing shall be filled with cement grout, compacted sand or other material approved by the Director of Engineering for

MBTA Railroad Operations. If it is impractical to remove the carrier pipe, then the carrier must be filled along with the annular space between the casing and carrier.

- B. Facilities other than pipelines shall be removed or altered at abandonment to the satisfaction of the Director of Engineering for MBTA Railroad Operations.

#### 4.12 DRAINAGE

- A. Occupancies shall be designed, and constructed, so that adequate and uninterrupted drainage of railroad right-of-way is maintained. If it becomes necessary to block a ditch, pipe or other drainage facility, the applicant shall install temporary pipes, ditches or other drainage facilities as required to maintain adequate drainage, as approved by the MBTA or Railroad Company(s). Upon completion of the work, the temporary drainage facilities shall be removed and the permanent facilities restored.
- B. Water may not be pumped or disposed of onto railroad rights-of-way unless discharged into an existing drainage facility, providing discharge does not cause erosion or leave sediment.
- C. When water runoff is disposed of onto MBTA Railroad Property, it must be demonstrated to the Railroad Company(s) that the existing drainage facility can accommodate the increased runoff. Drainage calculations stamped by a Registered Professional Engineer must accompany all requests to use railroad culverts or drainage ditches.
- D. If in the estimation of the Director of Engineering for MBTA Railroad Operations or their authorized representative, the railroad culvert or drainage ditch has to be cleaned in order to allow the increased flow to safely pass through the culvert, it must be cleaned at the expense of the applicant.

### SECTION 5. CARRIER PIPE

#### GENERAL:

##### 5.01 DESIGN CRITERIA

- A. If the maximum allowable stress in the carrier pipe on either side of the occupancy of MBTA Railroad Property is less than specified herein, the carrier pipe on MBTA Railroad Property shall be designed at the same stress as the adjacent carrier pipe.

- B. Requirements for carrier pipe under railroad tracks shall apply for a minimum distance equal to that of the casing pipe.
- C. Carrier pipes within a casing shall be designed for railroad live loads as if they were not encased.
- D. All pipes, ditches and other structures carrying surface drainage on MBTA Railroad Property and/or crossing under railroad tracks shall be designed to carry the run-off from a one hundred (100) year storm. Computations indicating this design and suitable topographic plans, prepared by a Registered Professional Engineer, shall be submitted to the Director of Engineering for MBTA Railroad Operations, or their authorized representative, for approval. If the drainage is to discharge into an existing drainage channel on railroad right-of-way and/or under railroad tracks, the computations should include the hydraulic analysis of any existing structures. Submitted with the computations should be formal approval of the proposed design by the appropriate governmental agency.

## PRODUCTS:

### 5.02 GENERAL

- A. All pipes shall be designed for the external and internal loads to which they will be subjected. The dead load of earth shall be considered 120 pounds per cubic foot. Railroad live loading shall be Cooper's E-80 with 50% added for impact. On railroad right-of-way or where railroad loading will be experienced, the following shall be the minimum requirements for carrier pipes:
  - 1. Reinforced concrete pipe - ASTM Spec. C-76, Class V, Wall C.
  - 2. Ductile Iron Pipe - For Culverts and Gravity Sewers - ASTM Spec, A-142 Extra Heavy.

### 5.03 OIL AND GAS PIPES

- A. Pipelines carrying oil, liquefied petroleum gas, natural or manufactured gas and other flammable products shall conform to the requirements of the current ANSI B 31.4, with Addenda, "Liquefied Petroleum Transportation Piping Systems," ANSI B 31.8, "Gas Transmission and Distribution Piping Systems," and other applicable ANSI codes, except that the minimum allowable stresses for the design of steel pipe shall not exceed the following percentages of the specified minimum yield strength (multiplied by the longitudinal joint factor) of the pipe as defined in the ANSI Codes:



1. Steel pipe within a casing under, across and longitudinally on MBTA Railroad Property. (The following percentages apply to hoop stress):
    - a. Seventy-two percent for installation on oil pipelines.
    - b. Fifty percent for pipelines carrying liquefied petroleum gas and other flammable Liquids with low flash point.
    - c. Sixty percent for installations on gas pipelines.
  2. Steel pipe without a casing laid longitudinally on MBTA Railroad Property. (The following percentages apply to hoop stress):
    - a. Sixty percent for installations on oil pipelines.
    - b. Forty percent for pipelines carrying liquefied petroleum gas and other flammable Liquids with low flash point.
    - c. Forty percent for installations on gas pipelines.
- B. Design computations showing compliance with the requirements of Paragraph 5.03(A) above, and prepared by a Registered Professional Engineer, shall accompany the application for occupancy.
- 5.04 CAST IRON PIPE: For water and other materials under pressure shall conform to the current ANSI specifications A-21 Series 21/45 Iron strength with plain end, compression type or mechanical joints. The strength to sustain external railroad and other loadings shall be computed in accordance with the current ANSI A-21.1 "Thickness Design of Cast Iron Pipe."
- 5.05 VITRIFIED CLAY PIPE: ASTM Spec C-700, Extra Strength.
- 5.06 CORRUGATED METAL PIPE: AREA Spec Chapter I, Part 4
- 5.07 ASBESTOS CEMENT PIPE (Non-pressure): ASTM Spec. C-428, C1. 5000 Min. Pressure: AWWA Spec. C400, C1. 150 Min.
- 5.08 OTHER: Other miscellaneous piping not specified above shall be submitted to approval by the Director of Engineering for MBTA Railroad Operations.
- 5.09 SHUT-OFF VALVE
- A. Provide accessible emergency shut-off valves at each side of the railroad within distances and at locations as directed by the Chief Engineering Officer.

- B. Where pipelines are provided with automatic control stations and within distances approved by the Director of Engineering for MBTA Railroad Operations, no additional valves will be required.

#### 5.10 SIGNS

- A. Prominently identify all pipelines at rights-of-way by durable, weatherproof signs located over the centerline of the pipe. Mark pipelines at under crossings on both sides of track. Signs shall display the following:
  - 1. Name and address of pipeline Owner.
  - 2. Contents of Pipe.
  - 3. Pressure in Pipe.
  - 4. Depth below grade at point of sign.
  - 5. Emergency telephone in event of pipe rupture.
  - 6. Railroad File Number.
- B. For pipelines running longitudinally on MBTA Railroad Property, place signs over the pipe (or offset and appropriately mark) at all changes in direction the pipeline. Locate signs so that when standing at one sign, the next adjacent marker in either direction is visible. In no event shall pipeline identification signs be placed more than 500 feet apart, unless otherwise directed by the Director of Engineering for MBTA Railroad Operations.
- C. Submit details of signs (materials, size, methods of support, etc.) to the Director of Engineering for MBTA Railroad Operations for approval.

#### EXECUTION:

##### 5.11 INSTALLATION:

- A. Install carrier pipes in accordance with approved Construction Drawings, requirements of this specification, and all applicable codes and ordinances.
- B. Install carrier pipes with sufficient slack so they are not in tension.

#### SECTION 6. CASING PIPE

#### GENERAL:

## 6.01 DESIGN CRITERIA

- A. Casing pipe and joints shall be of metal and of leak-proof construction.
- B. Casing pipe shall be designed for the earth and/or other pressures present, and for railroad live load. The dead load of earth shall be considered 120 pounds per cubic foot. Railroad Live load shall be Cooper E-80 with 50g added for impact.
- C. The inside diameter of the casing pipe shall be such as to allow the carrier pipe to be removed subsequently without disturbing the casing or the roadbed. For carrier pipe less than six (6) inches in diameter, the inside diameter of the casing pipe shall be at least two (2) inches greater than the largest outside diameter of the carrier pipe joints or couplings. For carrier pipe six (6) inches and over in diameter, the inside diameter of the carrier pipe shall be at least four (4) inches greater than the largest outside diameter of the carrier pipe joints or couplings.
- D. For flexible casing pipe, a minimum vertical deflection of 3 percent of its diameter, plus 1/2 inch, shall be provided so that no loads from the roadbed, track, traffic or casing pipe itself are transmitted to the carrier pipe. When insulators are used on the carrier pipe, the inside diameter of the flexible casing pipe shall be at least two (2) inches greater than the outside diameter of the carrier pipe for pipe less than eight (8) inches in diameter; at least 3-1/4 inches greater for pipe 8 to 16 inches in diameter, and at least 4-1/2 inches greater for pipe 18 inches and over in diameter. In no event shall the casing pipe diameter be greater than is necessary to permit the insertion of the carrier pipe.
- E. Casing pipe under railroad tracks and across MBTA Railroad Property shall extend the greater of the following distances, measured at right angles to centerline of track:
  - 1. Across the entire width of MBTA Railroad Property.
  - 2. Two (2) feet beyond ditch line.
  - 3. Three (3) feet beyond toe of slope.
  - 4. A minimum distance of 25 feet each side from centerline of outside track when casing is sealed at both ends.
  - 5. A minimum distance of 45 feet from centerline of outside track when casing is open at both ends.

F. If additional tracks are constructed in the future, the casing shall be extended at the expense of the Applicant.

G. Table of Live Loads

LIVE LOADS, INCLUDING IMPACT, FOR VARIOUS HEIGHTS OF COVER  
FOR COOPER E- 80

COVER (FT)	LOAD (PSF)	COVER (FT)	LOAD (PSF)	COVER (FT)	LOAD (PSF)
2	3800	10	1100	20	300
5	2400	12	800	30	100
8	1600	15	600		

6.02 PROTECTION AT ENDS OF CASING

- A. Casings for carriers of flammable substances shall be sealed to the outside of the carrier pipe. Details of seals shall be shown on the Drawings.
- B. Casings for carriers of non-flammable substances shall have both ends of the casing blocked in such a way as to prevent the entrance of foreign material, but allowing leakage to pass in the event of a carrier break.
- C. Where ends of casing are at or above ground surface and above high water level, they may be left open, provided drainage is afforded in such a manner that leakage will be conducted away from railroad tracks and structures.

6.03 VENTS

- A. Sealed casings for flammable substances shall be properly vented. Vent pipes shall be of sufficient diameter, but in no case less than two (2) inches in diameter, and shall be attached near each end of the casing and project through the ground surface at right-of-way lines or not less than 45 feet (measured at right angles from centerline of nearest track).
- B. Vent pipes shall extend at least four (4) feet above the ground surface. Top of vent pipe shall have a down-turned elbow, properly screened, or a relief valve. Vents in locations subject to high water shall be extended above the maximum elevation of high water and shall be supported and protected in a manner approved by the Director of Engineering for MBTA Railroad Operations.
- C. Vent pipes shall be at least four (4) feet from the closest aerial electric

wires.

- D. When the pipeline is in a public highway, street-type vents shall be installed.

PRODUCTS:

6.04 STEEL PIPE

The minimum yield strength for steel pipe shall be 35,000psi. Smooth wall pipes with a nominal diameter greater than 70 inches require special approval by the Director of Engineering for MBTA Railroad Operations. See Plate V, "Table of Minimal Wall Thickness for Steel Casing Pipe."

6.05 CAST IRON PIPE

May be used for a casing, provided the method of installation is by open trench. Cast iron pipe shall conform to ASTM Specification A-142, Extra Heavy. The pipe shall be of the mechanical joint type or plain end type with compression type couplings.

6.06 CORRUGATED METAL PIPE AND CORRUGATED STRUCTURAL PLATE PIPE

May be used for casing only when emplaced by the open-cut method. Jacking or boring through railroad embankment is not permitted. Pipe shall be bituminous coated and shall conform to AREA Specifications Chapter 1, Part 4.

6.07 REINFORCED CONCRETE PIPE

Shall conform to ASTM Specification C 76, Class V, Wall C. It shall be used only in the open cut and jacking methods of installation. If concrete pipe is to be jacked into place, grout holes tapped for at least 1-1/2 inch pipe spaced at approximately 8 feet around the circumference and approximately 4 feet longitudinally shall be cast into the pipe at manufacture. Immediately upon completion of jacking operations, the installation shall be pressure grouted.

6.08 TUNNEL LINER PLATES

Shall be four flange and otherwise conform to American Railway Engineering Association Specifications Chapter 1, Part 4. In no event shall the liner plate thickness be less than 0.1046 inches. Tunnel liner plates are to be used only to maintain a tunneled opening until the carrier pipe is installed. After installation the annular space between the carrier and liner must be filled

with 1:6 cement grout or lined with 6 inches of concrete, reinforced with 6x6-6/6 wire mesh for tunnels up to 108 inches in diameter. Required thickness of lining for larger tunnels shall be determined by span and structural analysis. Manufacturer's Shop Detail Drawings and manufactures computations showing the ability of the tunnel liner plates to resist the jacking stresses shall be submitted to the Director of Engineering for MBTA Railroad Operations for approval.

## EXECUTION:

### 6.09 DEPTH OF INSTALLATION:

- A. Casing pipe under railroad tracks and across MBTA Railroad Property shall be at least 6-1/2 feet from top of rail to top of casing at its closest point. Under secondary or industrial tracks this distance shall be at least 5-1/2 feet. On other portions of MBTA Railroad Property where casing is not directly beneath any track, the depth from ground surface or from bottom of ditches to top of casing shall be at least four (4) feet, unless otherwise specified herein.
- B. Pipelines laid longitudinally on MBTA Railroad Property 50 feet or less from centerline of track shall be buried not less than five (5) feet from ground surface to top of pipe. This applies to all pipelines carrying oil, gas, petroleum products, or other flammable or highly volatile substances under pressure, and all non-flammable substances which by their nature or presence in the judgment of the Director of Engineering for MBTA Railroad Operations may be hazardous to life or property. For pipelines carrying water, sewage and non-flammable substances, the distance from surface of ground to top of pipe shall not be less than four (4) feet.
- C. Pipelines located within the line of track live load influence (as shown on Plates II and III) are subject to railroad loading and require a casing or are to be of special design approved by the Director of Engineering for MBTA Railroad Operations. All longitudinal occupation locations must be approved by the Chief Engineering Officer.
- D. The minimum cover shall be at least three (3) feet when pipeline is laid more than 50 feet from center line of track.
- E. Pipelines installed under or adjacent to any overhead structure must be a minimum of 29 feet from the bottom of the structure to the top of the casing. Such installations must comply with the above requirements.

### 6.10 METHOD OF INSTALLATION

- A. The Owner or its Contractor shall submit to the Director of Engineering for MBTA Railroad Operations, data and information demonstrating that the Contractor or their subcontractors have had successful previous experience in jacking, or using the proposed method of installation, in similar situations.
- B. Before any work is begun within the limits of jacking, the Owner or its Contractor shall have assembled all tools, materials, and equipment which will be required. When the Owner or its Contractor has started the jacking operation, they shall proceed in a continuous operation without stopping. This will minimize the tendency of the material to freeze around the pipe.
- C. A jacking shield shall be used and jacked ahead of the casing pipe. The excavation within the jacking pipe should not advance beyond the head of the pipe shield. If the stability at the face needs to be maintained from raveling or running soil, suitable temporary bulkheads, struts, and bracing shall be required. After completion of the sleeve installation the annular space around it shall be completely grouted with cement grout under pressure.
- D. Casing pipe ends shall be beveled with a single V-groove toe field welding. Pipe joints shall be butt welded and shall be a full penetration on the outside circumference of the pipe. The single V-groove butt weld shall conform to the latest A.W.S. Welding Code. All joints of the casing pipe shall be butt welded, by a certified welder, prior to being subject to the jacking operation.

Alternate method: The casing pipe may be jacked without being butt welded through the use of a continuous 1/2"x12" interior collar plate. The collar plate shall be welded completely upon completion of the jacking operation. All welding shall conform to the latest A.W.S. Welding Code, and shall be performed by a certified welder.

#### 6.11 CONSTRUCTION:

- A. The casing pipe shall be constructed so as to prevent leakage of any substance from the casing throughout its length, except where the ends are left open, or through vent pipes when the ends are sealed. The casing shall be installed so as to prevent the formation of a waterway under the railroad, shall have an even bearing throughout its length, and shall slope to one end (except for longitudinal occupancy).
- B. Casing pipes shall be installed by the following methods:

1. Jacking

- a. This method shall be in accordance with the most current edition of the American Railway Engineering Association Specifications, "Jacking Culvert Pipe Through Fills." This operation shall be conducted without hand mining ahead of the pipe and without the use of any type of boring, auguring, or drilling equipment.
- b. Bracing and backstops shall be designed and jacks of sufficient rating used so that the jacking will be continuous.

2. Drilling

This method employs the use of an oil field type rock roller bit or a plate bit made up of individual roger cutter units which are welded to the pipe casing being installed and which are turned as it is advanced. The pipe is turned for its entire length from the drilling machine to the ground being drilled. A high density slurry is injected through a small supply line to the head which acts as a cutter lubricant. This slurry is injected at the rear of the cutter units to prevent any jetting action ahead of the pipe. The drilling machine runs on a set of steel rails and is advanced (thus advancing the pipe) by a set of hydraulic jacks. The method is the same whether earth or rock is being drilled. Any other drilling methods shall be submitted to the Director of Engineering for MBTA Railroad Operations for approval.

3. Tunneling

- a. Tunneling operations shall be conducted as approved by the Railroad Company(s). Care shall be exercised in trimming the surface of the excavated section in order that the steel liner plates fit snugly against the undisturbed material. Excavation shall not be advanced ahead of the previously installed liner plates any more than is necessary for the installation of the succeeding liner plate. The vertical face of the excavation shall be supported as necessary to prevent sloughing. At any interruption of the tunneling operation, the heading shall be completely bulkheaded. Tunneling shall be conducted continuously, on a 24 hour basis until the tunnel liners extend at least one foot beyond the railroad line of influence.
- b. When tunneling, tight breasting must be maintained around the entire face. On any shutdowns (under or beyond railroad influence line, see Plate II), the entire



face shall be fully breasted and packed with hay.

- c. The tail void shall be filled with pea stone (or other approved material) simultaneously with each advancement of the shield.
- d. An ample supply of hay and/or sandbags must be kept at the site to fill any voids caused by the removal of large stones or other obstructions extending outside the shield.
- e. A uniform mixture of 1:6 cement grout shall be placed under pressure behind the liner plates, in addition to the previously placed pea stone. Grout holes, tapped for at least 1-1/2 inch pipe and spaced 3 feet around the tunnel liner, shall be placed in every other ring. Grouting shall start at the lowest dole and proceed upwards. A threaded plug shall be installed in each grout hole as the grunting is completed at that hole.
- f. Grouting shall be kept as close to the heading as possible, using grout stops behind the liner plates. If necessary, grouting shall proceed as directed by the Railroad Company(s), but in no event shall more than six lineal feet of tunnel be progressed beyond the grouting.

#### 4. Tunneling Shields

- a. All pipes 70 inches and larger in diameter shall be emplaced with the use of a tunneling shield, unless otherwise approved by the Director of Engineering for MBTA Railroad Operations. Pipes of smaller diameter may also require a shield when, at the sole discretion of the Director of Engineering for MBTA Railroad Operations, soil, or other conditions indicate its need.
- b. The shield shall be of steel construction, designed to support railroad track loading as specified in Paragraph 6.01 B herein, in addition to other loadings it must sustain. The advancing face shall be provided with a hood, extending no less than 20 inches beyond the face and extending around no less than the upper 240 degrees of the total circumference. Installations made with liner plates shall be provided with a full 360 degree shield. It shall be of sufficient length to permit the installation of at least one complete ring of liner plates within the shield before it is advanced for the installation of the next ring of liner plates, It shall conform to and not exceed the outside dimensions of the pipe being emplaced by more than one inch at any point in the periphery.

- c. The shield must be adequately braced and provided with necessary appurtenances for completely bulkheading the face with horizontal breastboards, and arrange so that the excavation can be benched as may be necessary. Excavation shall not be advanced beyond the edge of the hood, unless otherwise approved by the Railroad Company(s).
  - d. Manufacturer's Shop Detail Drawings and computations showing the ability of the tunnel liner plates to resist the jacking stresses shall be submitted to the Director of Engineering for MBTA Railroad Operations for approval.
  - e. For jacking reinforced concrete pipe, the shield shall be fabricated as a special section of reinforced concrete pipe with the steel cutting edge, hood, breasting attachments, etc., cast into the pipe. The wall thickness and reinforcing shall be designed for the jacking stresses.
  - f. Grout holes tapped for no less than 1-1/2 inch pipe, spaced at approximately 3 foot centers around the circumference of the shield (or the aforementioned special reinforced concrete section) and no more than 4 foot centers longitudinally shall be provided.
  - g. Detail Drawings sufficient to determine the adequacy of the shield, accompanied with design calculations prepared by a Registered Professional Engineer, shall be submitted to the Director of Engineering for MBTA Railroad Operations for approval and no work shall proceed until such approval is obtained.
5. Boring
- a. This method consists of pushing the pipe into the fill with a boring auger rotating within the pipe to remove the spoil. When augers, or similar devices, are used for pipe emplacement, the front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger and cutting head from leading the pipe so that there will be no unsupported excavation ahead of the pipe. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than one-half inch. The face of the cutting head shall be arranged to provide reasonable obstruction to the free flow of soft or poor material.
  - b. Drawings and descriptions of the auger stop arrangement to be used shall be submitted to the Director of Engineering for MBTA Railroad Operations for approval,

and no work shall proceed until such approval is obtained and the arrangement is inspected in the field by the Railroad Company(s).

- c. The use of water or other Liquids to facilitate casing emplacement and/or spoil removal is prohibited.
  - d. Any method which employs simultaneous boring and jacking or drilling and jacking for pipes over 8 inches in diameter which does not have the above approved arrangement WILL NOT BE PERMITTED. For pipes 8 inches and less in diameter, augering or boring without this arrangement may be considered for use only as approved by the Director of Engineering for MBTA Railroad Operations.
- C. If an obstruction is encountered during the installation which stops the forward action of the pipe, and it becomes evident that it is impossible to advance the pipe, operations shall cease and the pipe shall be abandoned in place and filled completely with grout, in accordance with Section 4, Paragraph 4.10.
- D. Bored or jacked installations shall have a bored hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe (plus coating) by more than 1 inch, grouting or other methods approved by the Railroad Company(s) shall be employed to fill such voids.
- E. Pressure grouting or freezing of the soils before or during jacking, boring, or tunneling may be required at the direction of the Railroad Company(s) to stabilize the soils, control water, prevent loss of material and prevent settlement or displacement of the embankment and/or tracks. Grout shall be cement, chemical or other special injection material selected to accomplish the necessary stabilization.
- F. The materials to be used and the method of injection shall be prepared by a Registered Professional Engineer (Geotechnical), or by an experienced and qualified company specializing in this work and submitted for approval to the Railroad Company(s) before the start of work. Proof of experience and competency shall accompany the submission.
- G. When water is expected to be encountered, pumps of sufficient capacity shall be provided and maintained at the site, and continually attended on a 24-hour basis, until in the sole judgment of the Railroad Company(s), their operation can be safely halted.

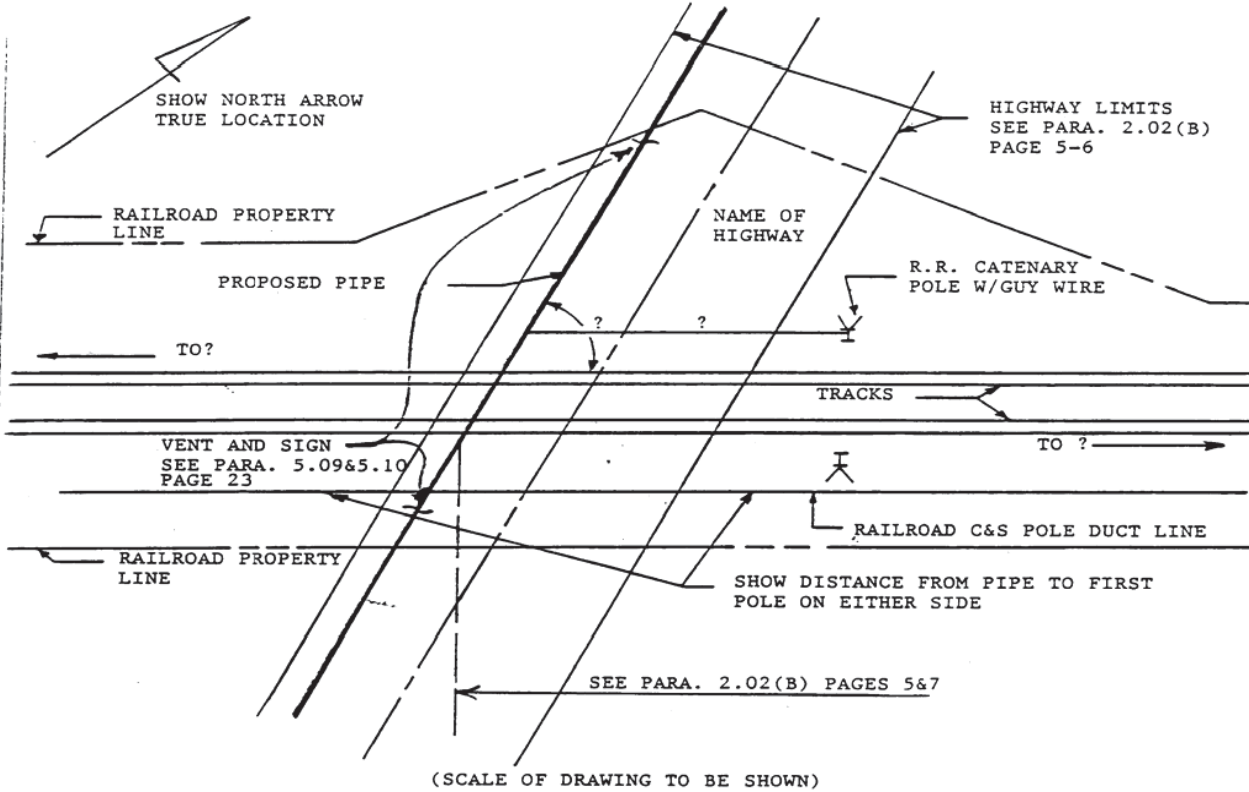
When dewatering, close observation shall be maintained to detect any settlement or displacement of railroad embankment, tracks, and facilities.

- H. Proposed methods of dewatering must be submitted to the Railroad Company(s) for approval prior to implementation. The discharge from the dewatering operations in the vicinity of the railroad shall be carefully monitored. If in the opinion of the Railroad Company(s), there is an excessive loss of fine soil particles at any time during the dewatering process, the dewatering shall be halted immediately. The dewatering operation cannot resume until the unsatisfactory condition is remedied to the satisfaction of the Railroad Company(s).

**PLATE I**

PIPE CROSSING

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWING



NOTE:

IF MANHOLES ARE PLACED ON MBTA RAILROAD PROPERTY, DETAILS OF SAME, WITH CLEARANCES TO THE CENTERLINE OF THE NEAREST TRACK ARE TO BE SHOWN ON THE DRAWINGS.

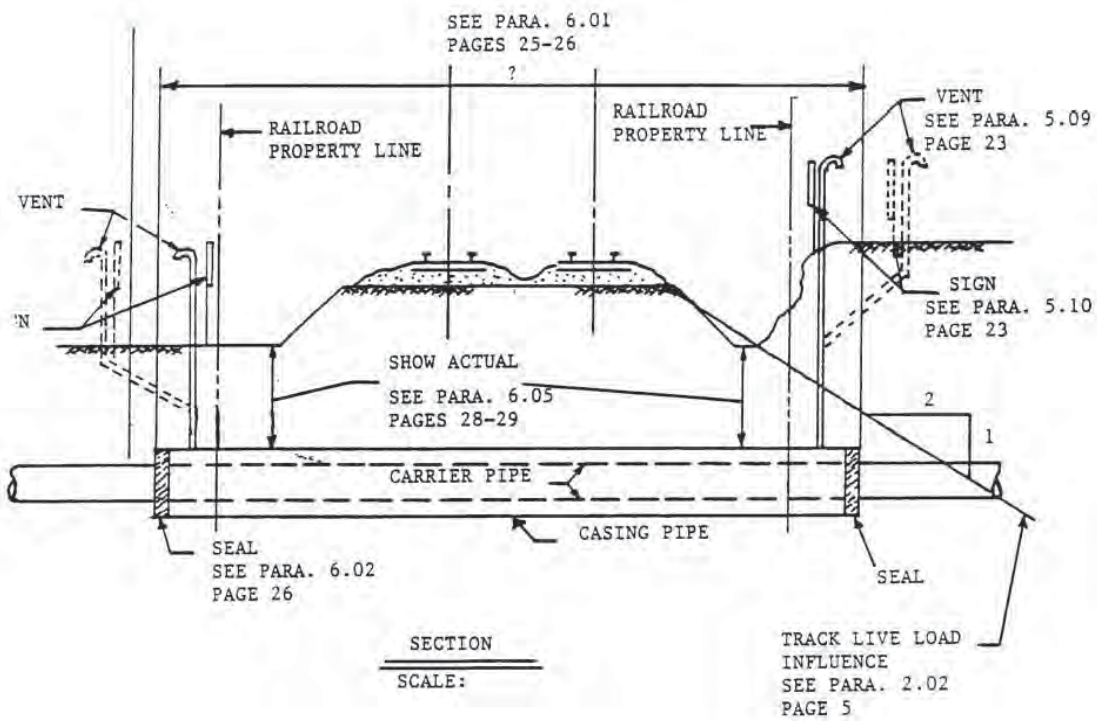
IF THE PROPOSED PIPE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SENT WITH THE REQUEST.

THE PROPOSED PIPE IS NOT WHOLLY WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.

**PLATE II**

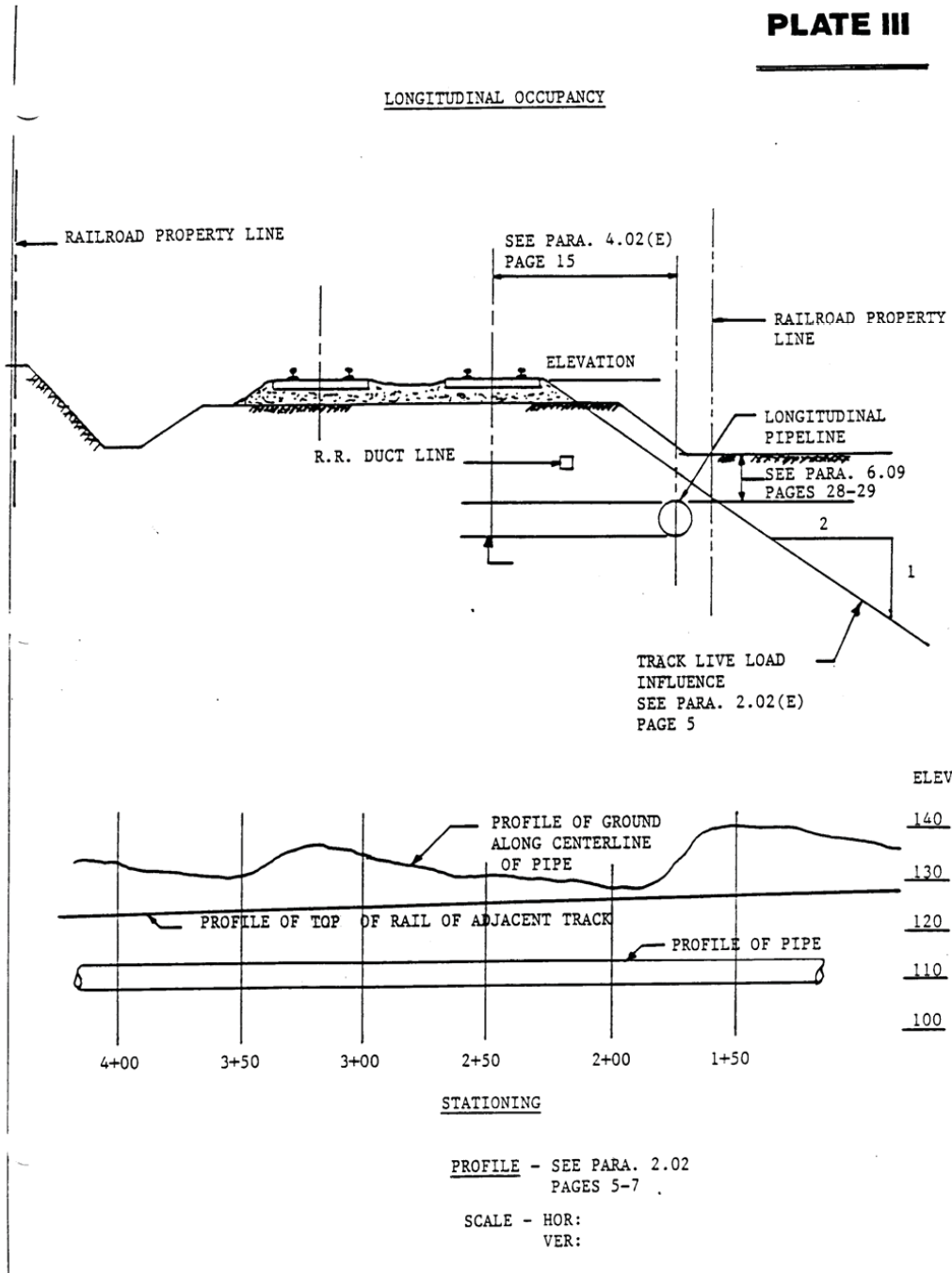
PIPE CROSSING

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWING



**PLATE III**

LONGITUDINAL OCCUPANCY



PIPE CROSSING DATA SHEET

**PLATE IV**

In addition to plan and profile of crossing, Drawings submitted for the Railroad Company(s) approval shall contain the following information:

	<u>Pipe Data</u>	
	<u>Carrier Pipe</u>	<u>Casing Pipe</u>
Contents To Be Handled	_____	_____
Normal Operating Pressure	_____	_____
Normal Size of Pipe	_____	_____
O.S. Diameter	_____	_____
I.S. Diameter Wall	_____	_____
Thickness Weight	_____	_____
Per Foot Material	_____	_____
Process of Manufacture	_____	_____
Specification	_____	_____
Grade or Class	_____	_____
Test Pressure	_____	_____
Type of Joint	_____	_____
Type of Coating	_____	_____
Details of Cathodic Protection	_____	_____
Details of Seal or Protection at Ends of Casing:	_____	_____
Method of Installation	_____	_____
Character of Subsurface: Material At the Crossing Location	_____	_____
Approximate Ground Water Level	_____	_____
Source of Information on Sub-surface conditions (Test Pits, Borings or Other)	_____	_____

NOTE: Any soil investigation made on MBTA Railroad Property, or adjacent to tracks shall be carried on under the supervision of the Railroad Company(s).



**PLATE V**

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TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE  
(FOR INFORMATION ONLY)

**PROTECTED WALL THICKNESS**

PIPE SIZE (INCHES)	WALL THICKNESS (PROTECTED)
10	0.375
12	0.375
14	0.375
16	0.375
18	0.375
20	0.375
22	0.375
24	0.375
26	0.375
28	0.406
30	0.469
32	0.501
34	0.532
36	0.532
38	0.569
40	0.569
42	0.569
44	0.594
46	0.688
48	0.688
50	0.688
52	0.813
54	0.813
56	0.876
58	0.876
60	0.876
62	0.876
64	0.876
66	0.876
68	0.876
70	0.906

NOTE: - FOR UNPROTECTED PIPE 26" AND UNDER ADD 0.032" TO PROTECTED WALL THICKNESS. FOR UNPROTECTED PIPE 28" AND OVER, ADD 0.063" TO PROTECTED WALL THICKNESS.





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**V**

SPECIFICATIONS FOR WIRE CONDUIT AND CABLE  
OCCUPATIONS



## SECTION 1. SCOPE

- 1.01 These specifications apply to the design of electric transmission wires and cables (power and communication) which are to be located over, under, across or upon property, facilities, and tracks owned by the MBTA.

## SECTION 2. LICENSE TO ENTER MBTA RAILROAD PROPERTY

- 2.01 Individuals, corporations, or municipalities desiring wire or cable occupations must agree, upon approval of the construction details by the Director of Engineering for MBTA Railroad Operations, to execute an appropriate occupational agreement and pay any required fees and/or rentals outlined therein.

- 2.02 Application for an occupancy shall be submitted in writing to:

AGM for Real Estate and Asset Development  
MBTA, 10 Park Plaza  
Boston, Massachusetts 02116

See "Guidelines and Procedures for Construction on MBTA Railroad Property."

- 2.03 All applications shall be accompanied with six (6) copies of all Construction Drawings, specifications and computations concerning the proposed occupancy.

## SECTION 3. APPROVAL OF DRAWINGS

- 3.01 Entry upon MBTA Railroad Property for the purpose of conducting surveys, field inspections, obtaining soil information, or any other purpose associated with the design and engineering of the proposed occupancy will be permitted only with a proper entry permit prepared by the MBTA Real Estate Department. The issuance of such a permit does not constitute authority to proceed with the actual construction. Construction cannot begin until the proper insurance certificate is received and a formal agreement is executed by the MBTA and permission is received by the Railroad Company(s).

- 3.02 Drawings shall be drawn to scale and show the following: (See attached plates I -VI)

- A. Plan view of crossing or occupation in relation to all Railroad Company(s) facilities. (See Plate 1)
- B. Location of wire or cane (in feet) from nearest railroad mile post, center line of a railroad bridge (giving bridge number), or center line of a passenger station. In all cases, the name of the County and City or

Town in which the proposed facilities are located must be shown.

- C. Profile of ground on center line of pole or tower line, showing clearances between top of rail and bottom of sag, as well as clearances from bottom wire or cable to top wire or cable of the MBTA's transmission, signal and communication lines and catenary. If none of these facilities are in existence at the point of crossing, the plan should so indicate. Actual under-clearances are to be shown. (See Plate V for the required clearances).
- D. Show all known property lines. If wires, cables or conduits are within public highway limits, such limits should be clearly indicated with dimensions from center line.
- E. The Drawing must be specific as to:
  - 1. Base diameter, height, class and bury of poles. Poles shall be set no closer than 13' 6" from face of pole to center line of nearest track. When necessary, however, each location will be analyzed by the MBTA to consider speed, traffic, access, etc.
  - 2. Number, size and material of power wires, as well as number of pairs in communication cables.
  - 3. Nominal voltage of line, type of current and frequency.
  - 4. Number, location, size and material of anchors and all guying for poles and arms.

NOTE: Double cross-arms are required on poles adjacent to track. Any tower designs must be accompanied by engineering computations and data.

#### SECTION 4. CONSTRUCTION REQUIREMENTS

- 4.01 Power and communication lines shall be constructed in accordance with "Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines, National Electrical Safety Code Handbook, Part 2" (current issue), with the following exceptions:
  - A. Item 3 (c), page 2.
  - B. Casing pipes to contain power or communication wires or cables having an outside diameter of over four (4) inches shall be constructed in accordance with the current issue of MBTA Railroad Operations "Pipeline Occupancy Specifications".

#### SECTION 5. LONGITUDINAL OCCUPATIONS

- 5.01 Wires and cables running longitudinally along railroad right-of-way shall be

constructed as close to MBTA property lines as possible in accordance with Plate III. For electrical power lines and cables with voltages of 34,500 or over and communication canes containing over 180 pairs, the following information must be submitted in addition to the detail of the pole top configuration as called for on Plate IV of these specifications:

- A. Voltage of circuit(s) or number of pairs. B. Phase of electrical circuit(s).
  - B. Number of electrical circuits.
  - C. Size (AWG or CM) and material of wires and cables.
- 5.02 Any facilities overhanging MBTA Railroad Property must have approval of the MBTA and appropriate rental charges will be applied.

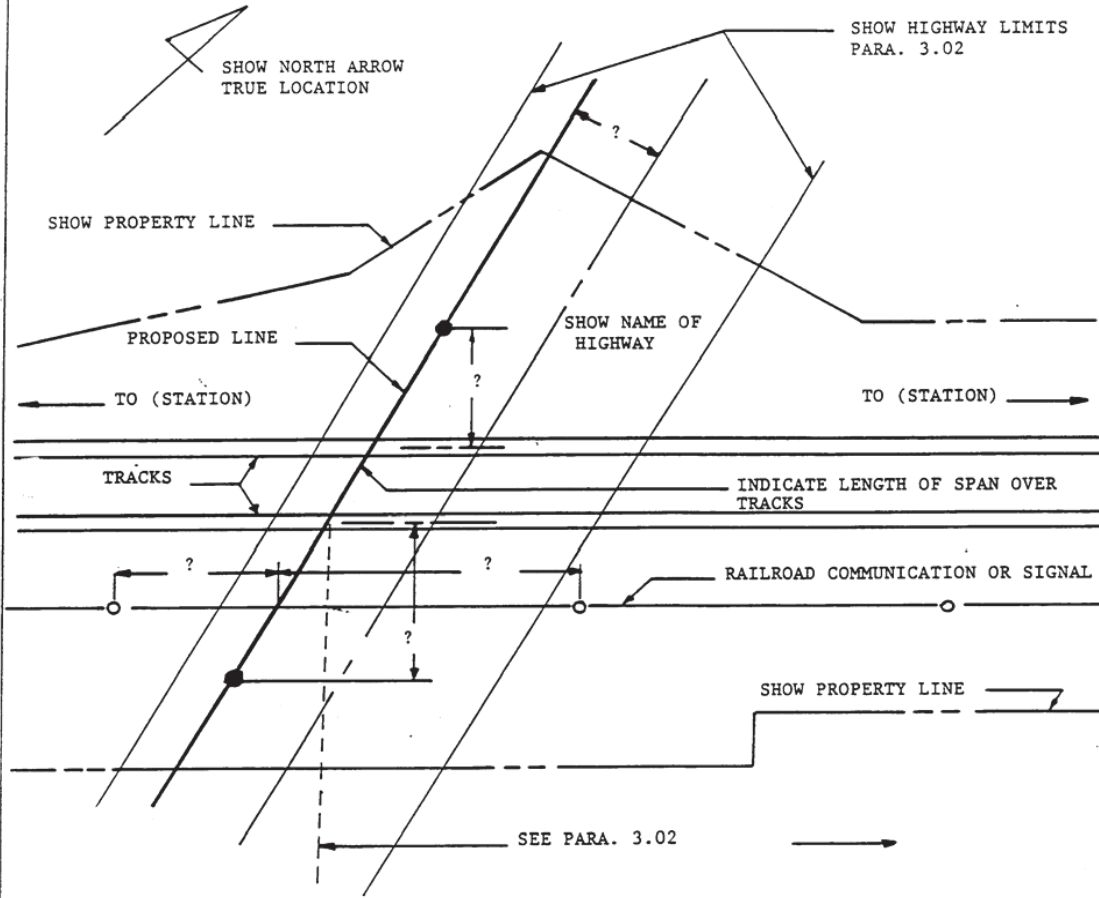
#### SECTION 6. INDUCTIVE INTERFERENCE

- 6.01 On agreements covering longitudinal occupations, provisions shall be included that hold the Applicant responsible to provide appropriate remedies, at their own expense, to correct any inductive interference with MBTA facilities.

**PLATE I**

PLAN VIEW

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWINGS  
WHEN FACILITY IS A CROSSING



SCALE OF DRAWING TO BE SHOWN

NOTE:

IF THE PROPOSED LINE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SENT WITH THE REQUEST.

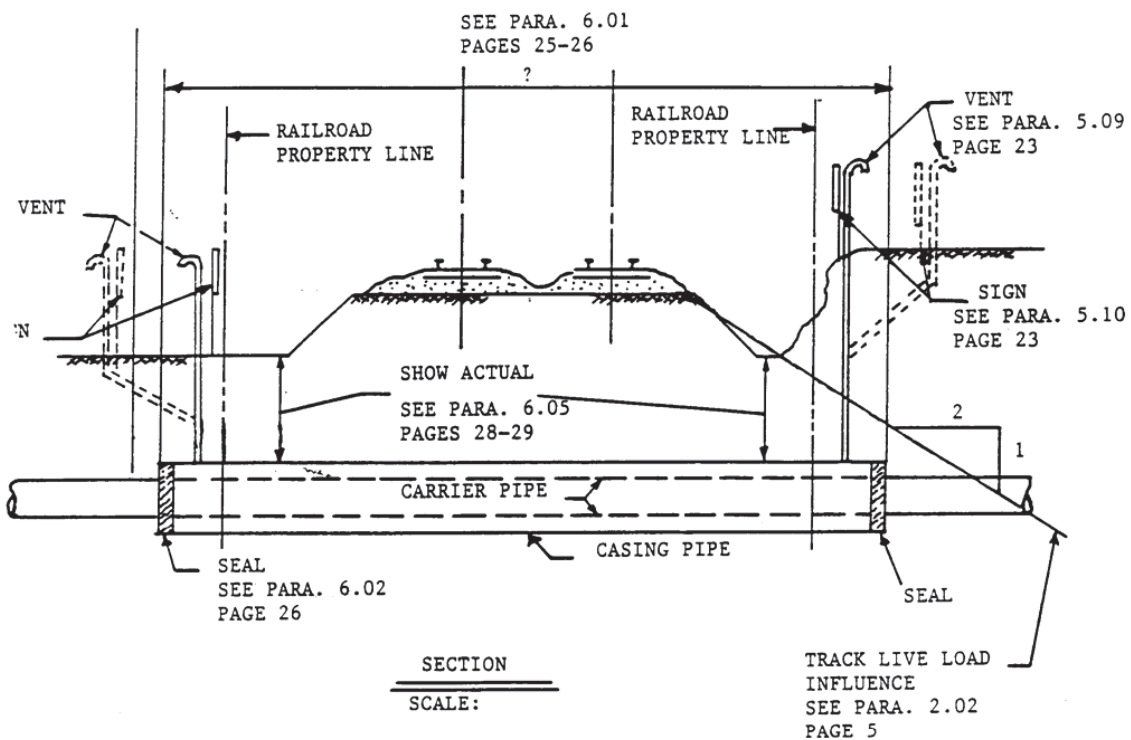
IF THE PROPOSED LINE IS NOT WHOLLY (OR PARTIALLY) WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.



**PLATE II**

PIPE CROSSING

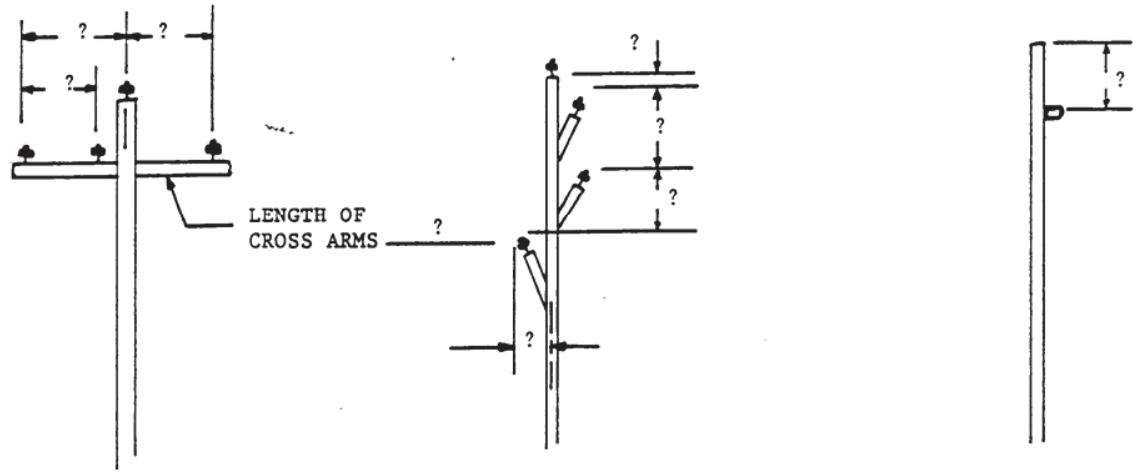
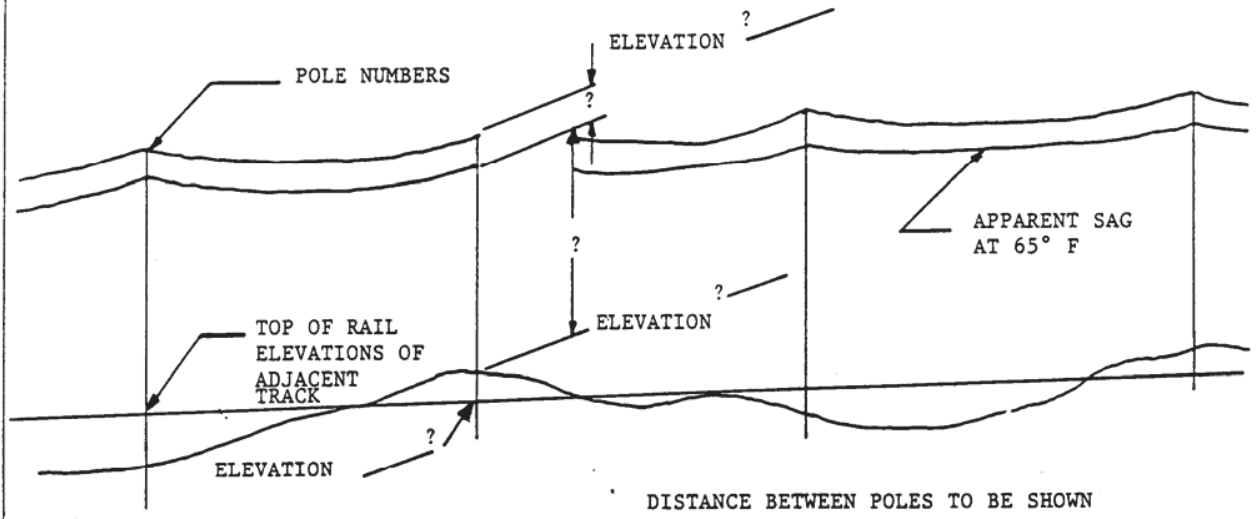
INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWING



**PLATE III**

PROFILE VIEW

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS  
IN CASES OF LONGITUDINAL OCCUPATIONS



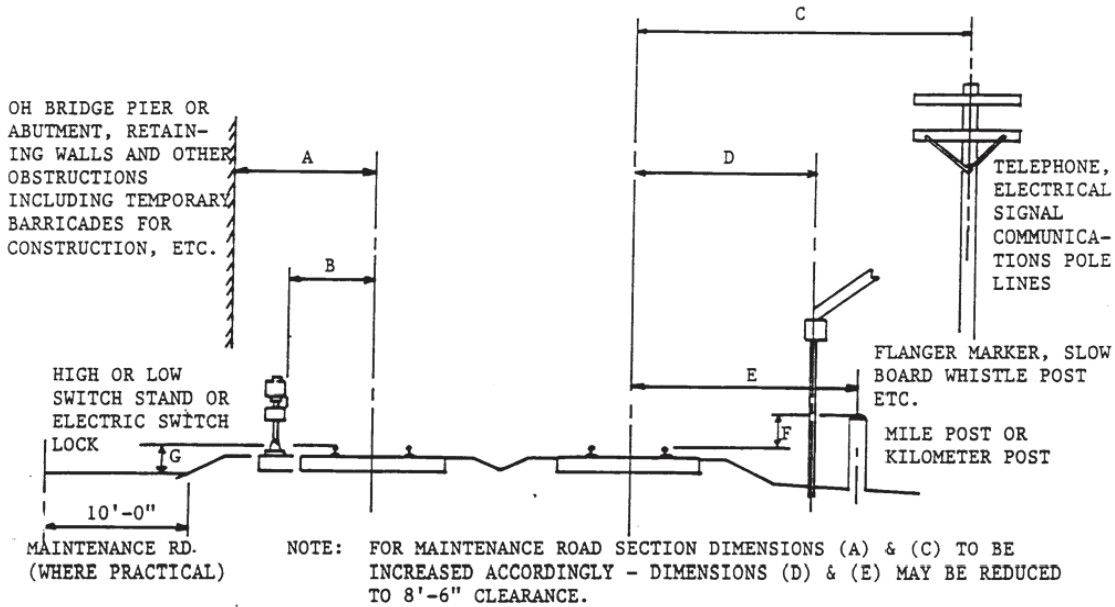
POLE TOP CONFIGURATION TO BE SHOWN SIMILAR TO SAMPLES ABOVE

NOTE: IF POWER LINE CROSSES ANY TRACK, THEN INFORMATION SHOWN ON PLATE II IS ALSO REQUIRED.

**PLATE IV**

STANDARD SIDE CLEARANCES - TANGENT TRACK

(FOR OBSTRUCTIONS OTHER THAN PASSENGER STATIONS)



DIMENSION	DESCRIPTION	
A	GENERAL MINIMUM SIDE CLEARANCE	8'-6"
	OVERHEAD BRIDGE PIERS & ABUTMENT, RETAINING WALLS & OTHER EXISTING STRUCTURES	8'-6"
B	LOW SWITCH STANDS (3'-0" MAX HEIGHT)	6'-6"
	HIGH SWITCH STANDS (OVER 3'-0" HEIGHT)	9'-0"
	ELECTRIC SWITCH LOCKS	6'-6"
C	POLE LINES - TELEPHONE, ELECTRIC, SIGNAL COMMUNICATIONS (MIN)	13'-6"
D	CENTERLINE WHISTLE POSTS, FLANGER MARKERS, SLOW OR SPEED BOARDS AND OTHER WAYSIDE SIGNS	12'-0"
	AUTOMATIC HIGHWAY CROSSING PROTECTION (MIN)	8'-6"
	AUTOMATIC HIGHWAY CROSSING PROTECTION (DESIRED)	15'-0"
E	MILE POSTS - HORIZONTAL	13'-6"
F	MILE POSTS - VERTICAL	7'-0"
G	DEPRESSION OF MAINTENANCE ROAD	

**PLATE V**

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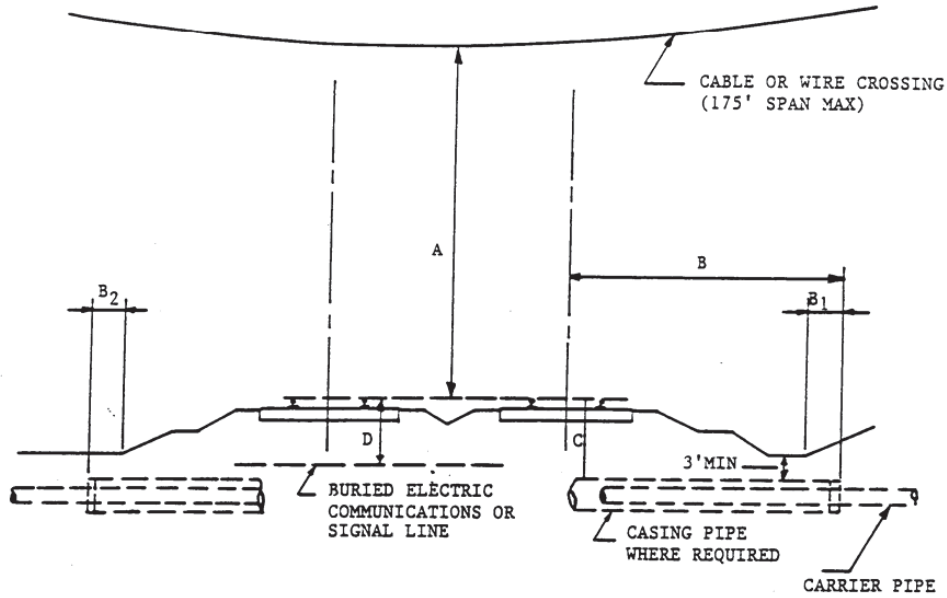
<u>VOLTAGE</u>	<u>OVERHEAD CLEARANCE</u> (Top of Rail to <u>Bottom of Sag</u> )	
0- 750	27'0"	} At 120°F Ambient Temperature
750- 15,000	28'0"	
15,000 - 50,000	30'0"	
69,000	30'8"	
115,000	32'2"	
138,000	33'0"	
345,000	39'10"	
500,000	45'0"	
745,000	53'2"	
765,000	53'10"	
Other than power lines	27'0"	

(Calculation is 30'0" + 0.4" per 1,000 volts over 50,000 volts)

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CLEARANCES FOR OVERHEAD AND BURIED UTILITY CROSSINGS

**PLATE VI**



DIMENSION	DESCRIPTION		
A	POWER LINES 0 TO 750V	27'-0"	} At 120°F Ambient Temperature
	POWER LINES 750V TO 15,000V	28'-0"	
	POWER LINES 15 TO 50KV	30'-0"	
	OTHER THAN POWER LINES	27'-0"	
B	SEALED ENDED CASINGS	25'-0"	
	OPEN ENDED CASINGS	45'-0"	
B <sub>1</sub>	END CASING BEYOND DITCH	2'-0"	
B <sub>2</sub>	END CASING BEYOND SLOPE	3'-0"	
C	CASING PIPE	4'-6"	
	CARRIER PIPE WITHOUT CASING	6'-6"	
D	BURIED ELECTRIC LINES	6'-6"	
	RAILROAD SIGNAL LINES (220V)	2'-6"	
	COMMUNICATIONS LINES	3'-6"	



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**VI**

**BRIDGE ERECTION, DEMOLITION AND HOISTING  
OPERATIONS**

Submittals for bridge erection, demolition, or other hoisting operations shall be prepared and stamped by a Registered Professional Engineer and must include the following:

1. Plan view showing locations of crane or cranes, operating radii, with delivery or disposal locations shown.
2. Crane rating sheets showing cranes to be adequate for 150% of the lift. Crane and boom nomenclature is to be indicated.
3. Drawings and computations showing weight of picks.
4. Location plan showing obstructions, indicating that the proposed swing is possible.
5. Data sheet listing type and size of slings or other connecting equipment. Include copies of catalog cuts or information sheets of specialized equipment. The method of attachment must be detailed on the erection plan. All lifting components must be adequate for 150% of the lift.
6. A complete procedure indicating the order of lifts and any repositioning or re-hitching of the crane or cranes.
7. Drawings detailing temporary support of any components or intermediate stages.
8. A time schedule (by hour and day) of the various stages, as well as a schedule for the entire lifting procedure.



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**VII**

**TEMPORARY SHEETING AND SHORING**





The following items are to be included in the design and construction procedures for all permanent and temporary facilities on, over, under, within or adjacent to MBTA Railroad Property:

1. Footings for all piers, columns, walls or other facilities shall be located and designed so that any temporary sheeting and shoring for support of adjacent track or tracks during construction will not be closer than toe of ballast slope. (See dimensions in the MBTA's Book of Standard Plans, #1000 and #1002 for tangent and curved track). Sheeting shall be required when excavation is inside of a line which extends horizontally from 5.5 feet off center line of adjacent track, then on a 2 (horizontal) to 1 (vertical) slope. This is known as the zone of influence.
2. Where physical condition of design impose insurmountable restrictions requiring the placing of sheeting closer than specified above, the matter must be submitted to the Director of Engineering for MBTA Railroad Operations for approval of any modifications.
3. When support of track or tracks is necessary during construction of above mentioned facilities, interlocking steel sheeting adequately braced and designed to carry E-80 live load plus 50% impact is required. Soldier piles and lagging will be permitted for supporting adjacent track or tracks only when required penetration of steel sheet piling cannot be obtained or when in the opinion of the Director of Engineering for MBTA Railroad Operations, or their authorized representative, steel sheet piling would be impracticable to place.
4. Exploratory trenches, three (3) feet deep and fifteen (15) inches wide in the form of an "H" with outside dimensions matching the outside of sheeting dimensions are to be hand dug, prior to placing and driving steel sheeting, in areas where railroad underground installations are known to exist. These trenches are for exploratory purposes only and are to be backfilled and compacted immediately. This work must be done in the presence of a railroad inspector.
5. Absolute use of track is required while driving sheeting adjacent to any track. Procedure for arranging the use of track shall be through the Railroad Company(s) representative on the project.
6. Cavities adjacent to sheet piling, created by driving of sheet piling, shall be filled with sand and any disturbed ballast must be restored and tamped immediately as required by the Railroad Company(s).
7. Sheet piling shall be cut off at top of tie during construction. After construction and backfilling has been completed, the piling within twelve (12) feet from centerline of track shall be cut off 24" below bottom of tie or 24" below finished grade, whichever is greater. Sheeting, used as a form on a permanent

structure, shall be cut as directed by the Railroad Company(s).

8. The excavation adjacent to the track shall be covered and protected by handrails and barricades, warning lights shall be provided by the Contractor as directed by the Railroad Company(s).
9. Graded backfill material shall be compacted at near optimum moisture content, in layers not exceeding 6 inches in compacted thickness, by pneumatic tampers, vibrator compactors, or other approved means to the base of the railroad subgrade. Material in the vicinity of sheet pile shall be compacted to not less than 95 percent of AASHTO T 99, Method C. The Contractor shall be required to supply, to the job site, ballast stone as prescribed herein to be installed by the Railroad Company(s).
10. The Contractor is to advise the Railroad Company(s) of the time schedule of each operation and obtain approval of the Railroad Company(s) for all work to be performed adjacent to MBTA tracks so that it may be properly supervised by railroad personnel.
11. All Drawings for temporary sheeting and shoring shall be prepared and stamped by a Registered Professional Engineer and shall be accompanied by complete design computations when submitted for approval.
12. Particular care shall be taken to avoid erosion or filling of the Railroad Company(s) drainage facilities. Erosion and sediment control in the vicinity of the railroad shall be as approved by the Director of Engineering for MBTA Railroad Operations. Correction of disrupted Railroad Company(s) drainage facilities shall be at the Contractor's sole expense.

MBTA REQUIREMENTS FOR GEOTECHNICAL MONITORING

**THE FOLLOWING SPECIFICATIONS ARE REQUIRED FOR ALL PILE DRIVING/EXCAVATING OPERATIONS:**

1. Pile driving shall be on a continuous basis for each pile driven. Once a pile is started, it shall be driven or cut off at an elevation not to exceed the plane across the top of the rails of any track within 8'-6" plus 2" for each degree of curvature from centerline of track to the closest edge of the edge or excavation.
2. The monitoring points shall be set up one week before the pile driving or excavation operations begin. The MBTA and the Railroad Company(s) shall be notified. Elevation readings to establish the initial baseline reading shall begin two days prior to the start of driving. Readings shall be for a minimum of two weeks after the completion of the driving or backfilling of the excavation, whichever is longer. Initial readings immediately after any surfacing operations shall serve as new baseline figures. All future elevation readings shall be compared to the adjusted baseline. If the track deviates to a condition that is unacceptable to the MBTA or Railroad Company(s), corrections shall be made at the Contractor's expense.
3. Elevation readings shall be taken from the top of each rail of each track within the "zone of influence" the excavation. See Section 1, Page 1 of this specification.
4. Elevation readings will be taken once per eight hour shift. The readings shall be faxed to the MBTA Railroad Company(s) on a daily basis and all information is to be presented in legible print. During excavation within the sheet pile protected area, the top of rail elevations shall be checked every hour. Additional readings may be required by the MBTA or Railroad Company(s).
5. Stations shall be spaced at 15-1/2 foot intervals. The number of distractions required will be determined by the length of the excavation parallel to the tracks. There will be four additional stations on each end of the pile driving/excavation operation along the track. Extra stations may be required by the MBTA or Railroad Company.
6. Elevation readings must show the date, time, weather conditions and temperature. Each reading must also provide the following information: track number, compass direction, station number, base elevation (with date), static elevation, change in elevation (recorded in hundredths and in inches), dynamic reading and total deflection in inches. See sample sheet attached.
7. Station "0" will be located at the centerline of the project with Stations 1, 2, 3, etc., being to the right and Stations -1, -2, -3, etc., being to the left when

standing on the near track and looking at the work. In multiple track areas the stations as determined herein are to be carried across each track located within any part of the zone of influence. See Plate I.

8. At each monitoring station a dynamic load measurement shall be taken. The dynamic load measurement device shall consist of a wooden stake placed firmly in the ballast and in initially in contact with the bottom of the rail. The loaded measurement is the resultant gap between the bottom of the rail and the top of the stake caused by the deflection of the rail under the load of a passing train. Based on field observations of the excavation, and at the option of the MBTA or railroad company(s), this requirement may be reduced.
9. Elevation readings taken from the top of rail for static measurement and the dynamic reading shall be combined and the sum compared to the adjusted baseline. This reading will demonstrate the difference in elevation caused by the excavation.
10. The MBTA requires that the track be maintained at all times within established criteria for the specific track classification. At the completion of the project the requirement for tamping and realigning the tracks, caused by the settlement from the construction activity, remains with the Contractor for the duration as specified by the MBTA in their initial review of the Construction Drawings. This tamping and track realignment will be performed by the MBTA or railroad company(s) at the sole expense of the Contractor.



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**VIII**

**BLASTING SPECIFICATIONS**

Blasting on, over, under, within or adjacent to MBTA Railroad Property will be permitted only in special cases where it is demonstrated to the Director of Engineering for MBTA Railroad Operations that there is no practicable alternative to perform the work.

In such cases when blasting is permitted, the Contractor must submit a detailed blasting program to the MBTA and Railroad Company(s) for approval prior to the commencement of any work. The blasting program must contain the following information:

- a. Site plan with location of nearest MBTA structure.
- b. Plan of each blast showing hole spacing and delay pattern.
- c. Diameter and depth of each hole.
- c. Amount of explosives per hole.
- d. Total pounds of explosives per day.
- e. Total amount of explosives per blast.
- f. Type of non-electric delays to be used.
- h. Amount of stemming in each hole.
- g. Type of explosive to be used.
- h. Soil and rock profile in blast zone.
- i. Scaled distance to the nearest MBTA facility.
- j. Type and location of seismograph to be used.
- m. Size of blasting mats to be used.
- k. Safety precautions to be followed.

The following general requirements are to be adhered to:

- a. Obtain the services of a qualified vibration and blasting consultant to monitor the blasting.
- b. Use a non-electric detonation system whenever possible. If electric caps are used, a check must be made for stray currents, induced current and radio frequency energy to insure that this hazardous extraneous electricity is at an acceptable safe level.
- c. Provide an open face for maximum relief of burden.
- d. Limit the maximum peak particle velocity to 1 inch per second. Depending on existing conditions, this may be modified to 2 inches per second.
- e. Maintain an initial scale distance of 60 ft. per 1-1/2 lbs. After initial blasting, scale distance may be modified to a minimum of 50 ft. per 1-1/2 lbs., if conditions permit.

Scale distance -- Distance from blast to structure (in feet)

Weight of explosives per delay (in pounds)

The Contractor shall provide for a pre-blast and post blast survey, including photographs. An inspection of all nearby MBTA facilities shall be made to determine any changes that may occur due to blasting operations.

The Contractor shall coordinate all blasting with the MBTA and Railroad Company(s) in advance to determine when the charges may be set. The Contractor is advised that the MBTA and Railroad Company(s) use two way radios for train control. The radios operate in the 160 MHz area. These radios cannot be turned off at any time.





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**IX**

**TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND  
CONSTRUCTION**

The Railroad Company(s) will determine when and where protection shields are required. The designated construction of temporary protection shields must adhere to the following specifications:

1. The construction of temporary protection shields shall be designed to prevent any dust, debris, concrete, formwork, paint, or tools from falling on MBTA Railroad Property below.
2. The temporary protection shields shall be erected prior to the start of work. The Railroad Company(s) will determine whether or not sufficient protection has been provided to perform the work over any particular area.
3. The temporary protection shields shall remain in place until all work over the railroad has been completed and shall be removed only when ordered by the Railroad Company(s).
4. To minimize the inconvenience to the users of any properties below and adjacent to the project, the Contractor shall be required to complete the actual erection and removal of the temporary shields within time limits acceptable to the Railroad Company(s).
5. The erected temporary protection shields shall not infringe on any existing minimum vertical clearance.
6. The Contractor shall be required to obtain the approval of the Railroad Company(s) before commencing any work beneath the shield. In certain areas, depending on the nature of the work, the Railroad Company(s) may require a specific method of protection.
7. The horizontal shield shall be designed to carry a live load of 100 pounds per square foot and a single concentrated load of 2,000 pounds located to produce maximum stress. The vertical shield shall be designed to carry a wide load of 30 pounds per square foot.
8. Prior to the start of construction, the Contractor shall be required to submit the details of the temporary protection shield to the Railroad Company(s), who will review and approve the details only as to the methods of erection and as to whether or not the proposed installation will provide the level of protection required at the various locations. It is the Contractor's responsibility to design these protections so that they are in conformance with all existing laws, regulations and specifications that govern this type of work. Shield plans must include a material list and shall be designed by a Registered Professional Engineer. The Drawings and calculations must bear their seal when they are submitted to the Railroad Company(s).
9. If during the actual construction, the Railroad Company(s) deems that the shield is not providing the desired level of protection or that the Contractor has failed to properly maintain the shield, all work at the

affected location shall cease until corrective measures acceptable to the Railroad Company(s) are instituted.

10. All temporary shields shall be constructed using new material.





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**X**

**INDUSTRIAL SIDE TRACK SPECIFICATIONS**



## SECTION 1. GENERAL

- 1.01 All railroad track construction shall be performed under competent supervision of personnel experienced in railroad construction and shall conform to the standards of the MBTA. The MBTA and Railroad Company(s) will inspect and approve all side tracks prior to being put in service. This specification shall be used for side tracks directly on or within 15 feet of the MBTA property line. Any construction outside of the MBTA property line shall be in compliance with the standards of the serving freight railroad.

## SECTION 2. MATERIALS

### 2.01 MATERIAL

Rails, ties, switches, frogs, etc. shall conform to the standards of the MBTA for various types of turnouts and track installations thereby insuring replacement availability.

### 2.02 RAIL

The rails shall be 100# ASCE Section or of a heavier rail section in common use, new or relay. Relay rails shall not have more than 1/4" top wear measured vertically along center line of rail and not more than 3/8" side wear measured horizontally 3/4" below the normal top of rail. Rails shall be free from kinks, excessive rust and excessive head flow. Rails having line or surface bends that cannot be spiked will be rejected. Rail shall be free of internal defects. Rail used on the limits of MBTA Railroad Property shall be equal in weight and in section to the attached main line.

### 2.03 CROSS TIES

Cross ties shall conform to MBTA specifications, minimum size shall be 7" x 8" x 8'6" and shall be treated with creosote in accordance with MBTA specifications. Relay ties may be approved after inspection by the MBTA and Railroad Company(s) prior to installation.

### 2.04 SWITCH TIMBER

Switch timber shall be new hardwood and conform to MBTA specifications 7" x 9" and of lengths required by MBTA standard turnout bill of materials. All timber shall be creosote treated as specified for cross ties. Relay timber as above.

Tie plates shall be new or relay at least 7-1/2" x 10-3/4", 1/2" thick,

double shoulder and should be canted. Tie plates must conform to MBTA specifications. Damaged plates or plates showing more than 25% reduction in section due to corrosion or wear will be rejected.

## 2.06 JOINT BARS

Joint bars shall be new or relay, 100% toeless, 24" long or equal and conform to MBTA specifications. Relay bars must be free from appreciable wear. Joint bars shall have a minimum of four holes and the holes are to fit the punching's of the rail. Holes to have a clearance of 1/16". Joint bars that cannot be drawn up to give a tight fit will be rejected. No fewer than 4 bolts per joint will be allowed.

## 2.07 BOLTS, NUTS AND WASHERS

Bolts and nuts shall be new and of a size to fit the rail punching's. They shall conform to AREA specifications for low carbon steel track bolts and nuts. Washers shall be new spring type of appropriate size and shall conform to MBTA specifications.

## 2.08 TRACK SPIKES

Track spikes shall be 6" long, 5/8" square with an oval head and conform to MBTA specifications for soft steel track spikes. Tangent track shall have at least 2 rail holding spikes per tie plate and all curves over 3" shall have 3 spikes per tie plate.

## 2.09 BALLAST

Ballast shall conform to MBTA Material Specification 9248.

## 2.10 BUMPING POSTS

Bumping posts shall be Hayes type, Durable "D" or equal, unless otherwise specified, and will conform to MBTA Material Specification 9206.

## 2.11 DERAIL

Type and quality of derail shall be specified for each individual side track requirement. Derail shall be connected into the railroad signal system, which will be performed by the Railroad Company(s) at the Owner's expense. Two pairs of insulated joints shall be installed by the Contractor at a location to be determined by the MBTA. Side tracks with a descending grade toward the main track shall require a split switch type derail.



### SECTION 3. INSTALLATION

- 3.01 The track shall be properly installed with a standard gauge of 4'8-1/2" except on sharp curves. In cases of sharp curves, gauge will be specified by the MBTA or the Railroad Company(s).
- 3.02 Ballast shall be installed on top of subgrade for a depth of at least 6" below the bottom of tie and brought up to the top of the tie at the center and slope off to 1" below top of tie at the ends. It shall then extend 1' beyond the end of the tie at that height, at which point it shall slope off at a rate of 2:1 to the sub- ballast.
- 3.03 Cross ties shall be placed not more than 24" on center on tangent track and 19 ½ " on center on curved track. When relay rails are used the unworn side shall be placed on the gauge side. Tie plates shall be installed on each cross tie. The center of the joint shall be installed so as to be suspended by two ties.
- 3.04 It shall be the responsibility of the builder of that portion of track designated as "property line to end" to connect to that portion of track designated as "clearance to property line" and provide the necessary joints or compromise joints with bolts as the weights of rail would dictate.

### SECTION 4. BONDING

- 4.01 Where track bonding is necessary, it will be performed by the Railroad Company(s) in accordance with MBTA standards.

### SECTION 5. APPROVAL

- 5.01 Plans for track installation must be approved by the MBTA and Railroad Company(s) before the design of the facility to receive rail service is finalized.

### SECTION 6. CURVATURE OF TRACK

- 6.01 The recommended curvature shall be 8<sup>0</sup> or less. The maximum allowable degree of curve is not to exceed 12<sup>0</sup> 30', unless approved by the Director of Engineering for MBTA Railroad Operations.

### SECTION 7. GRADE OF TRACK

- 7.01 The maximum allowable grade for all tracks shall not exceed 1.5% descending towards mainline or 3% descending from mainline using 100 foot vertical curves.

SECTION 8. ELEVATION

8.01 Super elevation shall not exceed 1 inch.

SECTION 9. SUBGRADE

9.01 Subgrade shall be prepared to a grade 18" - 20" below the proposed top of rail and shall be of a material that is compacted to 95% and provides for adequate drainage.

SECTION 10. ACCEPTANCE

10.01 Before track is placed into service to receive cars, it shall be inspected and approved by a qualified track inspector from the MBTA, the Railroad Company, and the freight carrier.

10.02 No exceptions to these specifications are authorized without the written approval of the Director of Engineering for MBTA Railroad Operations.



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**XI**

**RIGHT OF WAY FENCING SPECIFICATIONS**



SECTION 1. GENERAL

1.01 DESCRIPTION

This section specifies the furnishing and installing of new Type I galvanized steel or Type II aluminum coated steel chain link fence. Right of way fence shall be 6', 8' or 10' as required by site specific conditions.

1.02 SUBMITTALS

Shop Drawings

1. Include cross sectional dimension of posts, braces, rails, fittings, accessories and gate frames, design of gates, and details of gate hardware.
2. Include a layout drawing showing the spacing of posts and location of all gates, abrupt changes in grade, and all corner, gate, anchor, end and pull posts.

SECTION 2. PRODUCTS

2.01 MATERIALS

A. General

1. Steel pipe dimensions and weights: ASTM A-53, Schedule 40 (except the hydrostatic testing requirement is waived). Dimensions specified are outside diameter (O.D.).
2. Provide post with accepted semi-steel or pressed steel tops, so designed as to fit securely over post and carry top rail or spring tension wire; the base of post top fitting shall fit over the outside of post and shall exclude moisture from post. All fittings and accessories shall be hot dipped galvanized in accordance with ASTM A-53.

B. Line Post: For all post heights, unless otherwise noted, Schedule 40, 2.375" O.D. pipe weighing 3.65 lbs./ft. ASTM A-53 with a 2 oz. hot dipped galvanized coating shall be used.

C. Gate post: Furnish post to support single gate leaf, or one leaf of a double gate installation, for the following gate widths:

<u>Leaf Width</u>	<u>Gate Post</u>	<u>Sch. 40</u>
up to 6'	2.875" O.D.	5.79 lb./ft.
6' to 12'	4.000" O.D.	9.11 lb./ft.
12' to 18'	6.625" O.D.	18.97 lb./ft.
18' to 32'	8.625" O.D.	28.55 lb./ft.

D. End, Corner and Intermediate Posts

For all post heights, unless otherwise noted, Schedule 40, 2.875" O.D. pipe weighing 5.79 lbs./ft. ASTM A-53 with a 2 oz. hot dipped galvanized coating shall be used.

E. Top rail and Spring Tension Wire

1. Top Rail

- a. Schedule 40, 1.66" O.D, pipe weighing 2.27 lbs./ft. ASTM A-53 with a 2 oz. hot dipped galvanized coating.
- b. Couplings and expansion sleeves: Outside sleeve type, minimum six inches long.

2. Spring tension wire: shall be marcelled (spiraled or crimped) #7 gauge (.177 inches) plus or minus 0.005 inches in diameter. ASTM A-824. 1.2 oz. zinc per sq. ft.

F. Braces and Tension Rods

1. Compression braces: Same type and size as top rail.
2. Tension rods: 3/8" round rods with drop forged turnbuckles or other approved type of adjustment.

G. Fence Fabric

1. Type I galvanized steel ASTM A-392 Class 2 coating 2 oz.
  - a. Typical-2" diamond mesh 6 gauge (192") 2 oz.
  - b. Hot dipped galvanizing after weaving.
2. Type II aluminum coated steel ASTM A-491 size 2. 3/8" mesh.
3. Selvages: All types
  - a. Fabric shall be knuckled at both selvages.
  - b. Fabric over 60 inches high: knuckled at one selvage and twisted and barbed at the other.

H. Fabric Bands, Brace Bands and Stretcher Bars

1. Fabric Bands: 12 gauge pressed steel 7/8 inch wide.
2. Brace Bands: 11 gauge pressed steel 1 inch wide.
3. Stretcher Bars: 3/16" x 3/4" galvanized steel.

- I. Tie wire and miscellaneous Items
  - 1. Tie Wire: Galvanized steel 6 gauge (.192") for post and rails.
  - 2. Hog rings: Galvanized steel 6 gauge (.192") for spring tension wire.
  - 3. Rail and Truss Cups: Galvanized semi-steel or pressed steel.
  
- J. Barbed Wire and Extension Arms
  - 1. Barbed Wire; ASTM A121, 12-1/2 gauge, 4-point round barbs, Class 3 coating.
  - 2. Extension Arms: Projecting at an angle of approximately 45 degrees, fitted with clips or other means of attaching three strands of barbed wire, the top outside wire approximately 12 inches from the fence line and the other wires spaced uniformly between the top outside wire and the fence fabric.
  
- K. Gates
  - 1. General: Furnish gates complete with necessary hinges, latches, and drop bar locking devices; corners shall be welded or fastened and reinforced with suitable fittings.
  - 2. All gates fabricated from 1.90" O.D. Schedule 40 pipe weighing 2.72 lbs./ft. with a 2 oz. hot dipped galvanized coating.
  
- L. Concrete: Class 2500 psi concrete consisting of aggregate passing the No. 8 sieve.

### SECTION 3. EXECUTION

#### 3.01 INSTALLATION

- A. Place terminal post at each end, corner, gate post, pull post (minimum 500'), or any change in grade or direction greater than 30 degrees.
  
- B. Line posts shall be spaced on a maximum of 10 foot centers. In determining the post spacing, measure parallel to slope of finished grade. All posts to be set plumb and in line. Post spacing on radius as follows:

200'- 500' radius 8' O.C.  
100' - 200' radius 6' O.C.  
less than 100' radius 5' O.C.

- C. When fencing is installed on the top of concrete structures, use galvanized sleeve and grout posts or install with suitable galvanized flange casing and galvanized anchor bolts. Set all other posts permanently in concrete.
- D. Excavate post hole footings at least 12" in diameter for line post and 16" for terminal and gate posts up to 4" O.D. Larger gate posts require 18" diameter footings. All footings excavated to a depth of 42" with a minimum post embedment of 36". Crown top of concrete to shed water and allow curing for not less than 72 hours before proceeding with further work on the post.
- E. Brace end, corner pull, and gate posts to the nearest line post with diagonal or horizontal brace rails used as compression chambers, and with truss rods with turnbuckles used as tension members. Brace line posts horizontally and truss in both directions as required, at approved intervals.
- F. Install fabric on post side which best secures MBTA's Railroad Property. Pull fabric taut and tie to all line posts, rails, braces and spring tension wire spacing all ties at 12" intervals. Use hook shaped steel ties confined to the diameter of the pipe to which it is attached, clasping pipe and fabric firmly with both ends twisted at least 2 turns.
- G. Barbed wire and tension wire must be taut and properly secured with brace bands at each terminal and gate post.
- H. Electric Ground: Where a power line carrying more than 600 volts passes over fence, install ground rod at the nearest point directly below each point of crossing. Ground all substation fences and gates and perform other electrical grounding as indicated.

### 3.02 TOUCH-UP AND REPAIR WORK

Remove and replace fencing which is improperly located or is not true to line, grade and plumb within tolerances as indicated.







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**XII**

**TEST BORINGS SPECIFICATIONS**

## SECTION 1. GENERAL

All borings on MBTA Railroad Property are to be performed according to the following requirements:

- 1.01 Work on MBTA Railroad Property must be performed with a Railroad Company(s) inspector and/or flagman present.
- 1.02 Where access can only be gained by crossing the tracks, a temporary crossing must be used. This crossing shall adhere to the following:
  - A. The location and material must be approved in advance by the Chief Engineering Officer or Railroad Company(s).
  - B. The crossing will be constructed by Railroad Company(s) forces at the Contractor's expense.
  - C. The crossing must be protected at all times when not in use. Access shall be prohibited through the use of right-of-way gates which will be constructed by Railroad Company(s) forces at the Contractor's expense.
  - D. No crossing of the track shall be made without a railroad flagman and/or inspector present.
  - E. The crossing of tracks shall be kept to a minimum.
- 1.03 Boring locations, including positioning of the boring rig, shall be kept at least 8'-6" from the center line of track.
- 1.04 All borings must be cased to insure adequate return (of mud and water) and to avoid undermining of the track.
- 1.05 All holes shall be backfilled with cement grout to fill the voids and protect against an artesian condition.
- 1.06 The location of all utilities owned or private, shall be located and suitably marked by the Railroad Company(s) and/or the private owner at the Contractor's expense to avoid damage to the utility and/or track structure.
- 1.07 Prior to entry upon the MBTA Railroad Property, all necessary contracts, insurance policies and financial obligations shall be provided in a form acceptable to the Railroad Company(s).
- 1.08 Work within the operating right-of-way that has potential to foul the tracks, shall be restricted to periods of non-peak passenger operations.

- 1.09 While performing the work, full cooperation with the inspector and flagman is essential. The work will be terminated immediately if the safety of all traffic and personnel is jeopardized in any way.

## SECTION 2. TESTING

- 2.01 Soil borings shall be in accordance with the current issue of the American Railway Engineering Association Specifications, Chapter 1, Part 1, "Specifications for Test Borings". Soils shall be investigated by the split-spoon and/or thin-walled tube method and rock shall be investigated by the Coring method specified therein.
- 2.02 Soil boring logs shall clearly indicate all of the following:
1. Boring number as shown on boring location plan.
  2. Elevation of ground at boring.
  3. Description or soil classification of soils and rock encountered.
  4. Elevations or depth from surface for each change in strata.
  5. Identification of where samples were taken and percentage of recovery.
  6. Location of ground water at time of sampling and, if available, subsequent readings.
  7. Natural dry density in lbs./sq. ft. for all strata.
  8. Unconfined compressive strength in tons/sq. ft. for all strata.
  9. Water content (percent). Liquid Limit (percent) and plastic limit (percent).
  10. Standard penetration in blows/ft.
- 2.03 Soil boring logs shall be accompanied by a plan drawn to scale showing location of borings in relation to the tracks, the elevation of ground surface at each boring, and the elevation of the top of rail of the tracks.
- 2.04 Soil investigation by auger, wash, or rotary drilling method is not acceptable.
- 2.05 Borings shall be taken no more than two (2) feet from the field stake which marks the boring location. The stake should not be disturbed during boring operations. Lost stakes shall be reinstalled.
- 2.06 Unless a boring hole is actively being worked, it shall be securely covered or otherwise protected until permanently filled. When work at each boring hole is completed, the hole shall be properly filled.
- 2.07 Access to the boring locations must be approved by the Railroad

Company(s). When possible, access shall be from public roads. Licenses for Entry, Insurance and Flag Protection must be obtained by the Contractor in accordance with all applicable MBTA Specifications.

- 2.08 Boring operations shall be confined to each boring location to the extent possible.

The Contractor shall take necessary precautions to prevent damage to structures and facilities. The site shall be restored to a condition satisfactory to the Railroad Company(s).



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**XIII**

**FIBER OPTIC CABLE SPECIFICATIONS**

## SECTION 1. GENERAL

- 1.01 The purpose of the following standards is to provide basic information about the MBTA's requirements with respect to the design and construction of fiber optic cables on MBTA Railroad Property to fiber optic cable companies and their Contractors.
- 1.02 All work performed on or affecting MBTA Railroad Property must be designed and constructed in accordance with the Commuter Rail Design Standards (Vol. I and II), MBTA Book of Standards, Railroad Operations Specifications and the following standards. Additional job specific requirements will be contained in the MBTA's Fiber Optic License Agreement and can be obtained by contacting:

AGM for Real Estate and Asset Development  
Ten Park Plaza  
Boston, MA 02116

The Director of Engineering for MBTA Railroad Operations or their designated representative will be responsible for the approval of all work. No modifications, changes or deletions will be made without their approval.

## SECTION 2. PROJECT REVIEW AND COORDINATION

- 2.01 All Drawings and specifications shall be reviewed and approved by the MBTA and Railroad Company(s) prior to construction. The MBTA must approve the construction schedule and sufficient Railroad Company(s) personnel must be available before work begins.
- 2.02 If another fiber optic cable company has previous or exclusive rights along the proposed route, the alignment and cable location must be approved in accordance with existing agreements.
- 2.03 The fiber optic cable companies must coordinate the construction with others to minimize the disruptions to the MBTA railroad operations.

## SECTION 3. CONDUCT OF WORK

- 3.01 In order to minimize the manpower requirements of the Railroad Company(s) and afford better control, supervision, and protection, the Contractor will conduct their work sequentially and minimize the number of crews and their proximity. Crews should be confined geographically to an area that can be covered easily by a minimum number of Railroad Company(s) personnel. This can be accomplished by a block method of construction. A construction block will be used and is a 1-4 mile segment of right of way in which up to 3 fiber optic cable installation crews can work. The crews can work within the construction block, but cannot work outside of it. The construction block

must move as a unit along the right of way. The crews cannot work two blocks concurrently.

#### SECTION 4. CONSTRUCTION SCHEDULE

- 4.01 The fiber optic company or its Contractor will submit a schedule of work to the MBTA for approval. The schedule will be based on methods of construction acceptable to the MBTA and Railroad Company(s). No work shall begin prior to approval by the MBTA.
- 4.02 Any changes or modifications to the schedule proposed by the fiber optic company or its Contractor must be submitted to and approved by the MBTA prior to implementation. The MBTA, however, may be required to change or modify the construction schedule on account of its operations, maintenance requirements, or manpower shortages. In this event, the MBTA will give the fiber optic cable company as much advance notice as possible.
- 4.03 Construction schedules will be reviewed and updated every two (2) weeks or as required.

#### SECTION 5. ESTIMATE OF EXPENSES

- 5.01 An estimate of anticipated expenses will be provided based on durations provided by the fiber optic cable company or their Contractor and construction schedules approved by the Railroad Company(s). Any changes in the schedule will cause the estimate to be revised. The fiber optic cable company or their Contractor will be responsible for all of the costs incurred by the MBTA and Railroad Company(s) in support of the construction activities. This includes design review, engineering support, administration and supervision.

#### SECTION 6. BILLING

- 6.01 The fiber optic cable company or its Contractor will be required to pay for railroad protective services in advance of costs incurred.



**SECTION 01568**

**CONSTRUCTION SAFETY**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies requirements to establish a practical, sound, and effective program for the prevention of construction accidents, and to assign specific responsibilities to Contractors for program compliance.
- B. Contractors and their supervisors must control hazardous activities and conditions within their respective areas of contract responsibility.

**1.2 SUBMITTALS**

- A. Safety and Health Plan: The contractor shall, within thirty (30) days after receipt of the award of a contract, submit for approval to the MBTA, a detailed operational Safety and Health Plan.
- B. Safety Supervisor: The Contractor shall within thirty (30) days after receipt of the award of a contract submit the resume of the qualifications and work experience of the designated Safety Supervisor proposed for assignment to the Project. No construction work shall begin until the project Safety Supervisor has been approved by the MBTA. The Safety Supervisor shall have a minimum of 5 years of experience in construction safety or a related field.
- C. Monthly Accident Experience Summary: The Contractor shall submit an Accident Experience Report monthly during the course of construction to the MBTA.
- D. Industrial Industry Records: Prior to start of work, the Contractor shall submit their Injury/Illness Records for the previous 3 years. In addition, the Contractor shall submit annually to the MBTA all subsequent Illness/Injury Reports for the duration of the project.

**PART 2 - PRODUCTS**

**None**

## **PART 3 - EXECUTION**

### **3.1 SAFETY AND HEALTH PLAN**

- A. The Contractor shall submit a project Safety and Health Plan. At a minimum, the plan shall include the following sections:
- i. Emergency Action Plan
  - ii. First Aid Facilities
  - iii. Serious Accidents
  - iv. Emergency Telephone Numbers
  - v. Protection of the Public
  - vi. Site Visits
  - vii. Substance Abuse/Prevention/Testing

### **3.2 SAFETY SUPERVISOR**

- A. Complete daily safety inspections of the job site and contiguous public areas, and take any corrective actions to eliminate unsafe conditions.
- B. Establish and implement a project safety training program for supervisors and employees as applicable to their job.
- C. Attend project safety meetings.
- D. Review Foreman accident and investigation reports, and initiate corrective action to prevent reoccurrence.
- E. Maintain copies of all Contractor Safety Reports.
- F. Assist Foremen in accident investigations.
- G. Encourage establishment of incentive programs designed to recognize individual employee safety efforts and contributions towards improved safety.
- H. Prepare a Safety Audit Checklist and complete the checklist each week during the course of construction. The completed Audit Checklists shall be submitted to the Authority weekly.
- I. The Safety Supervisor needs to be on the project site when major work tasks are being performed. During work periods when the Contractor is not performing contract work, the Safety Supervisor can be absent from the project site with permission from the Authority.

### **3.3 ACCIDENT INVESTIGATION**

- A. Serious accidents shall be reported immediately to the MBTA Resident Engineer. Contractors shall issue standing orders to all supervisors directly in charge of operations that the scene of the accident shall not be disturbed, except for rescue or other emergency measures, until otherwise directed. Contractor's forces either witnessing or party to the accident shall be detained at the site to provide detailed accounting of facts.
- B. All reports shall be submitted to the MBTA. The accident investigation shall generate appropriate recommendations for corrective actions to prevent similar recurrence of similar accidents.
- C. The requirements of MBTA Safety Procedure 7.3 Contractor Safety Violation Program shall be followed by the Contractor when completing an accident report.

### **3.4 FIRST AID FACILITIES**

- A. In formulating the Health and Safety Plan, the Contractor shall provide for the establishment and staffing of appropriate first aid facilities for the treatment of on the job injuries.
- B. Off-site medical treatment of employee injuries shall be performed at medical facilities named in the Contractor's Safety Submittal.

### **3.5 EMERGENCY TELEPHONE NUMBERS**

To ensure that emergency actions are promptly taken, Contractors shall post emergency telephone numbers in conspicuous places.

### **3.6 ORIENTATION PROGRAM**

- A. The Contractor shall establish and maintain an orientation program for new employees which shall include:
  - i. For each individual the hazards present in their work assignment and in the general area in which he will be working.
  - ii. Personal protective equipment required.
  - iii. Instruction in the proper procedure for reporting unsafe job conditions which he/she may encounter.

### **3.7 RIGHT OF WAY SAFETY AWARENESS**

- A. All Contractor and sub-contractor personnel shall complete either the MBTA Rapid Transit right-of-way safety training or the MBCR Commuter Rail right-of-way safety training prior to entering the project site. ROW safety training will be required on all MBTA property including the RR track, stations, parking garages and maintenance car houses. Personnel will not be allowed on the job site unless they have attended a Right-of-Way Safety Awareness training session. Workers are required to carry their certification card while on site.

### **3.8 OSHA**

- A. The Contractor shall comply with the OSHA 1926 Construction Safety Standards that apply to the project work. The Contractor shall meet the reporting requirements, and employers with eleven (11) or more employees must meet recordkeeping requirements.
- B. All Contractor and Sub-Contractor personnel shall possess an OSHA 10 Hour Certification card when working on the project site.
- C. All fatality cases and/or serious accidents and illness shall be reported to OSHA immediately by phone to an Occupational Safety and Health Area Office. Employers must report immediately all blasting accidents.
- D. Part of the OSHA requirements is that each employer must post in a prominent location the "Safety and Health Protection on the Job" poster. The poster briefly states the intent and coverage of the Act. Failure to post this document is a citable offense under the Act.

### **3.9 PROSECUTION OF THE WORK**

- A. The Contractor shall take all reasonable precautions in the performance of the work to protect the safety and health of its employees and members of the public and shall comply with all applicable MBTA, Local, State and Federal safety and health regulations and associated reporting requirements.
- B. The Contractor Safety Supervisor is charged with sole responsibility of on-site safety management under the direction of the Contractor Project Superintendent. All potential safety hazards identified shall be promptly corrected. The Safety Supervisor shall complete daily reviews of the project site and document then results on the inspection.
- C. The MBTA shall notify the Contractor of any non-compliance and of the corrective action required. This notice, when delivered the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the non-compliance and corrective action required after receiving the notice, the contractor shall immediately take corrective action. If the contractor fails or refuses to take corrective action promptly, the MBTA may, without prejudice to other legal or contractual rights, issue an order stopping all or part of the work; and may subject contractor to safety violation assessments as deemed appropriate by the MBTA. Resumption **of work** may be issued by the MBTA Safety Department.
- D. The Contractor shall maintain an accurate record of exposure data on all accidents and incidents occurring under this contract and report this data in a manner prescribed by the MBTA.
- E. The Contractor shall be responsible for all its lower-tier sub-contractor's and vendor's compliance.
- F. Contractor management shall make a commitment for accident prevention and fire prevention. Safety shall take precedence over schedule and production. Enforcement action is mandatory.

### **3.10 WORK AUTHORIZATIONS**

A. The following work authorizations will be issued by the MBTA:

- i. Excavation
- ii. Hot Work
- iii. Confined Space Entry
- iv. Cranes and Suspended Platforms

### **3.11 WORKING NEAR THE THIRD RAIL**

A. When working on or near the third rail, when the power is off, the contractor must have a third rail high-voltage warning device on the job site approved by the MBTA Power Department. This device will warn work crews if the third rail becomes energized at any time during work activity involving the right-of-way.

### **3.12 HAZARDOUS SUBSTANCES**

A. Any Contractor who uses substances on the hazardous substances list to which workers might be exposed under either normal work conditions or reasonable foreseeable emergency conditions resulting from work place operations must provide those workers with the required hazardous substance information.

### **3.13 PERSONAL PROTECTIVE EQUIPMENT**

A. All Contractor personnel must wear the required personal protective equipment when on the job site. Personal protective equipment includes hard hats, safety vest, safety glasses and proper footwear.

### **3.14 PROTECTION OF THE PUBLIC**

A. All necessary precautions to prevent injury to the public or damage to property of others shall be taken. The public is defined as all persons not employed by or under contract or subcontract to the MBTA. Installation of temporary barriers and/or fencing designated to protect the public shall be reviewed and approved by the MBTA. Precautions shall include but not be limited to the following:

B. Work shall not be performed in any area occupied by the public unless specifically permitted by the contract or in writing by the MBTA.

### **3.15 SUBSTANCE ABUSE/PREVENTION/TESTING PROGRAM**

A. The Contractor shall establish a substance abuse policy and testing program that includes the following elements:

- Deterrence

- Treatment and Rehabilitation
- Detection
- Enforcement

The MBTA reserves the right to approve the proposed substance abuse program prior to commencing the contract.

### **3.16 CONDUCT OF TOURS**

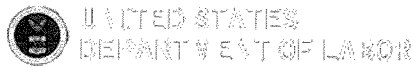
- A. Group tours must be cleared through the MBTA, allowing maximum advance notice and in compliance with MBTA Policy and Procedures.
- B. MBTA will coordinate the tour arrangements and ensure notification to the Contractors Project Manager.

### **3.17 HOUSEKEEPING**

- A. A basic concept in any effective accident prevention program is "good housekeeping." No one item has a great impact on the overall success of a safety program for a construction project. The importance of good housekeeping is such that it must be planned from the beginning of the job and carefully supervised through the final cleanup.
- B. During the course of construction, work areas, passageways and stairs, in and around buildings and structures, shall be kept clear of debris. Construction materials shall be stored in an orderly manner. Storage areas and walkways on the site shall be maintained free of depressions, obstructions and debris.

## **PART 4 - MEASUREMENT AND PAYMENT**

- A. No separate measurement or payment will be made for work required under this Section.



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 1926.1423 Fall protection.  
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 1926.1433 Design, construction and testing.  
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 1926.1435 Tower cranes.  
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 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.  
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 1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.  
 1926.1442 Severability.

Appendix A to Subpart CC of part 1926--Standard Hand Signals

Appendix B to Subpart CC of part 1926--Assembly/Disassembly--Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement

Appendix C to Subpart CC of part 1926--Operator Certification--Written Examination--Technical Knowledge Criteria

APPENDIX A TO PART 1926 -- DESIGNATIONS FOR GENERAL INDUSTRY STANDARDS INCORPORATED INTO BODY OF CONSTRUCTION STANDARDS.

**SOURCE:** 44 FR 8577, Feb. 9, 1979; 44 FR 20940, Apr. 6, 1979, unless otherwise noted.

**EDITORIAL NOTE:** At 44 FR 8577, Feb. 9, 1979, and corrected at 44 FR 20940, Apr. 6, 1979, OSHA reprinted without change the entire text of 29 CFR Part 1926 together with certain General Industry Occupational Safety and Health Standards contained in 29 CFR Part 1910, which have been identified as also applicable to construction work. This republication developed a single set of OSHA regulations for both labor and management forces within the construction industry.

**Editorial Note:** The Federal Register of August 2, 1995, page 39254 issued a Final Rule; correcting amendment. OSHA will maintain the existing fall protection requirements for steel erection activities pending rulemaking that addresses the steel erection industry. This affected 1926.104, 1926.105, 1926.107, 1926.500, and 1926.753.

[55 FR 42328, Oct. 18, 1990; 55 FR 47687, Nov. 14, 1990; 58 FR 26627, May 4, 1993; 58 FR 35077, June 30, 1993; 59 FR 215, Jan. 3, 1994; 59 FR 36695, July 19, 1994; 59 FR 40729, Aug. 9, 1994; 59 FR 40964, Aug. 10, 1994; 60 FR 5131, Jan. 26, 1995; 60 FR 39254, Aug. 2, 1995; 61 FR 5507, Feb. 13, 1996; 61 FR 9227, March 7, 1996; 61 FR 31427, June 20, 1996; 61 FR 46025, Aug. 30, 1996; 62 FR 1493, Jan. 10, 1997; 63 FR 1152, Jan. 8, 1998; 63 FR 1919, Jan. 13, 1998; 63 FR 3813, Jan. 27, 1998; 63 FR 13338, March 19, 1998; 63 FR 17093, April 8, 1998; 63 FR 20098, April 23, 1998; 63 FR 33450, June 18, 1998; 63 FR 35137, June 29, 1998; 64 FR 18810, April 16, 1999; 66 FR 5265, Jan. 18, 2001; 70 FR 76985, Dec. 29, 2005; 71 FR 2885, Jan. 18, 2006; 71 FR 16675, April 3, 2006; 75 48130, Aug. 9, 2010]

 Next Standard (1926 Subpart A)

DOCUMENT A00807

**NATIONAL GRID –  
GENERAL GUIDELINES FOR WORKING  
AROUND GAS UTILITIES  
& DAMAGE PREVENTION –  
DOCUMENTS #01003 & #01011**

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### General Guidelines for Working Around Gas Utilities

**Notice:** National Grid requests the opportunity to review design plans and construction projects prior initiation. This document intends to provide minimum guidelines to consider when planning construction, and does not remove the need to coordinate with National Grid. Additional measures may be required to maintain the integrity of all gas pipeline and ancillary items to ensure the safety of the general public and personnel on site. National Grid should be contacted and involved as early as possible to prevent delays or undue costs during construction.

#### NGRID Contacts:

Gas Leaks & Emergencies - 800-233-5325

Damage Prevention – Meghan Kelley 339-203-0490

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#### Dig Safe and General construction

Contractor must call Dig Safe to have the gas mains and services marked out before construction.

Contractor shall dig test pits to ascertain the exact locations, cover and invert elevations, clearances, and alignment of existing gas facilities as needed. Contractor shall exercise extreme caution when excavating in the vicinity of any gas facility. Hand excavation shall be performed to locate all gas facilities and whenever digging within 24" of gas facilities. If cover over gas piping is removed the required cover must be replaced.

#### Notification of Construction

National Grid requires a minimum 4-month's advanced notification prior to the start of construction to allow for the review of 3<sup>rd</sup> party design plans, the design of required gas distribution main replacement and/or upgrades in coordination with 3<sup>rd</sup> party construction, and time to line up the required resources to start standard gas projects. Depending on the classification and complexity of the gas infrastructure in question, lead times for the design of gas facilities in conflict may increase. Where non-stock material is required, National Grid cannot guarantee the procurement within a given duration. National Grid's ability to start construction will be contingent on obtaining the required permit approval from municipalities, state, and federal agencies alike.

Please also note that the safety and reliability of our gas system takes precedence. National Grid will review projects on a case-by-case basis, however standard practice is to restrict live gas work during the normal heating season of November 15<sup>th</sup> through April 15<sup>th</sup>.

#### Types of Gas Facilities

Gas mains and services are made of several different materials and contain a wide range of pressures. Typical materials used for buried gas pipe includes bare steel, coated steel, plastic, cast iron, wrought iron, ductile iron, and copper. Never assume that a pipe is not gas. At times gas lines are inserted into older lines to save excavation cost. Contact National Grid damage prevention if there are questions around any pipe being a live gas facility.

**Exposure of Gas Facilities**

If any gas mains or services become exposed, National Grid must be notified to inspect the line before backfilling. Also any damage that may have been made to the pipe or pipe coating will need to be repaired by National Grid before backfilling. See Language for Backfill and Compaction around Gas Pipes, below.

**Support In Place**

Care must be exercised when saw cutting over any gas infrastructure, the exact depth of gas mains and services vary. Undermined gas pipe must be adequately supported and protected from damage. Steel and plastic gas facilities may be supported in accordance with standard CNST-6045. Please contact National Grid prior to exposing and supporting any natural gas pipe or facility. **See appendix 1**

Cast Iron gas main requires special attention, plans should be reviewed by National Grid prior to excavation and supporting in place. Refer to Encroachments section below for additional information.

**Encroachments**

Massachusetts state law requires the replacement of encroached gas pipe per DPU ruling: 220 CMR 113, National Grid treats encroachments as an emergency. Cast iron gas pipe 8" in diameter and smaller may need to be replaced with steel or plastic pipe prior to construction to prevent encroachments from occurring. Where crossing existing cast iron facilities, the use of smaller buckets and hand tools is urged to limit trench openings to 36" in width. This will greatly reduce the number of encroachments requiring replacement and repair.

Cast iron gas pipe larger than 8" in diameter are not covered under the encroachment guidelines and cannot be encroached by law. However, National Grid does not allow more than 10 linear feet of large diameter cast iron gas main or more than (1) bell and spigot joint to be exposed and supported at a time, whichever is more restrictive.

**Protection of Exposed Pipe**

Hand excavation or vacuum excavation shall be used when exposing gas pipe or in the close vicinity of gas pipe. If a gas facility becomes exposed, contact National Grid for review and analyses prior to backfilling.

Where gas facilities are exposed, the pipe must be protected from damage. The use of tools or equipment directly on or near our pipe, as well as any construction activity that could move or damage our pipeline or pipe coating, will not be permitted by National Grid. If a gas facility becomes exposed, the use of construction blankets, plywood, rock shielding, fiberglass reinforcement protection wraps, or other means must be used to protect the gas pipe coating from debris and damage. Small nicks, holes, and discontinuation in the pipe wall/pipe coating can become a weak spot that hastens corrosion and could lead to premature failure.

**Vibration**

Low levels of vibration must be maintained when working around gas facilities. If activities may impose increased levels of vibrations on our gas pipe, contact National Grid for review. Construction activities may include, but are not





limited to pile driving, ledge removal and blasting, certain methods of soil compaction, micro-tunneling, jacking, directional drilling, etc.

### **Blasting**

National Grid must be notified of any blasting that will take place within 200 feet of a gas utility. National Grid must be supplied with a detailed blast plan for blasting in the vicinity of gas facilities. The evaluation of the blast plan by a National Grid engineer may take some time, therefore, blast plan data should be submitted at least two weeks prior to the planned blasting. As a general rule, blasting will not be permitted within 10 feet of a gas line and PPV at the nearest gas pipe shall not exceed 2 in/sec without approval from National Grid. PPV at the nearest gas main shall be monitored.

### **Clearances**

Except under special applications which may require greater clearances (steam lines, high voltage cables, etc.), underground structures and utilities installed parallel to National Grid's gas facilities must maintain a minimum of three (3) feet separation.

Except under special applications which may require greater clearances (steam lines, high voltage cables, etc.), underground structures and utilities must be installed with a minimum separation of twelve (12) inches from National Grid's gas facilities.

Contact National Grid engineer for guidance if the above separations cannot be maintained.

### **Regulator Stations**

Gas regulator stations are critical facilities and National Grid must be contacted prior to the commencement of work within 200 feet of a station. Regulator stations are typically in buried vaults accessed through either manhole covers or aluminum doors. Only authorized National Grid employees shall open a regulator station vault. Be aware that a complex nest of piping and valves often exists in the vicinity outside the vaults.

**Valves - NEVER OPERATE A GAS VALVE.** ONLY NATIONAL GRID SHALL OPERATE GAS VALVES.

Access to gas valves must be maintained throughout construction and left at grade at the end of construction. Contact Gate Valve Adjustment/Damage Prevention prior to restoration to coordinate the adjustment of road boxes. Grade adjustments overtop transmission pipeline should be coordinated with National Grid engineering prior to construction. The adjustment of road boxes, manholes, or vaults that house valves/purges/blowoffs/etc. on transmission pipeline may require design work and the procurement of non-stock items with long lead times.

### **Pipeline Markers:**

Pipeline markers and above ground signage indicating the presence of high pressure transmission pipeline **must remain in place at all times**. If the location of existing markers need to be relocated for any reason, contact National Grid Damage Prevention prior to removal.



### **Excavations Involving Transmission Pipelines**

If the proposed construction is within close proximity of high pressure transmission gas main, contact National Grid's Damage Prevention Department for specific requirements. It is recommended that:

- A National Grid representative is on site continuously during any excavation/subsurface work within 15 feet of a transmission facility.
- When working within 15' of the outside perimeter of any transmission pipeline, hand tools and vacuum excavation must be used until the exact alignment has been verified
- When working within 15' of the outside perimeter of any transmission pipeline, verification holes should be dug using hand tools/vacuum excavation at 50 ft intervals over transmission main that runs adjacent to a proposed individual construction excavation.
- Where crossing transmission gas pipe with utilities and underground structures, test holes must be dug at the crossing to confirm the depth, invert elevation, and separation.
- Once the exact alignment of transmission piping has been verified using hand tools and vacuum excavation, powered excavation may be used within 15' of the pipeline, **but no closer than the transmission pipeline Safety Zone (18" + ½ the diameter of the pipeline).**

## **Guidelines for Backfill and Compaction Around Gas Pipes Permanent Backfill and Compaction**

This work shall consist of backfilling and compacting all disturbed material at and around existing gas pipes and facilities. Size of pipe, material, length of exposed pipe, location of pipe, etc. will all follow the same set of Standards and Specifications stipulated by Nationalgrid Company. If design plans call for gas pipes to be exposed and supported (sheeting methods not used), then at the time of backfill, all disturbed material below the invert of the gas pipe shall be removed and replaced with suitable roadway or trench excavation material or bedding material. The contractor will not be allowed to replace this disturbed material with the same existing material if it has now been mixed with adjacent silty subsoil (clays) and fines. Well-graded gravel and sands will be used to replace the unsuitable material when no excess suitable material is available on site. Soils with high humus or mineral content should not be used to for backfill because they can promote electrolytic or bacterial attack.

Backfilling the gas pipe should begin immediately after the work in that location is complete. The region within 6" alongside and on top of the gas pipe shall be backfilled with padding sand (free of cinders, ash, and rock). In no case shall the material used for backfilling in this region contain any stones. Backfill shall consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of not more than 8" to 12" after compaction.

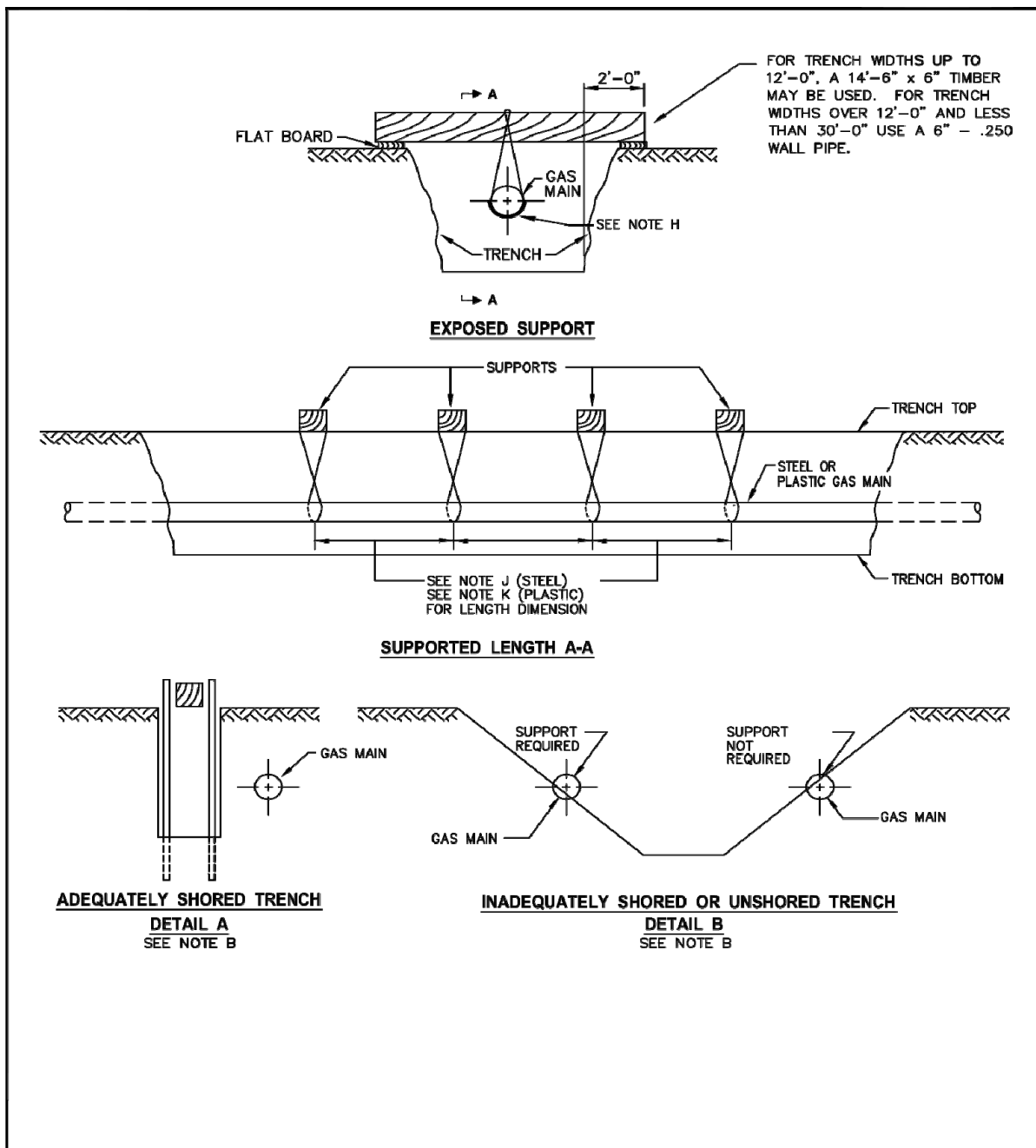
Trench spoil material shall be suitable for backfilling above the padding material as long as rocks with a diameter larger than 3" are removed. The layers shall be mechanically compacted to the industry standard of 95% or until a density comparable to the unexcavated material is achieved. In some instances, flooding with water is an acceptable method of compaction but only if the back-fill material is clean, coarse, and adequate drainage is existent. The above specified backfill material is essential in order to attain the degree of compaction necessary to avoid future settlement.

Tracing Wire, if necessary, shall be installed 2" to 6" below Plastic gas pipes. Contact National Grid if tracer wire has been damaged during excavation.

Warning Tape shall be installed approximately 12" above the gas pipe.

A minimum of 2" temporary pavement shall be applied over the trench as soon as possible.

**Appendix 1**



<p><b>nationalgrid</b></p> <p>LI-MA-NYC</p>	<p><b>SUPPORT REQUIREMENTS FOR EXPOSED &amp; UNDERMINED STEEL OR PLASTIC GAS FACILITIES</b></p>	
	<p>DATE: 07/01/2003</p> <p>DESIGN: A. GIULIANI</p> <p>DRAWN: P. DIMAIO</p>	<p>EFFECTIVE DATE: 03/07/2018</p> <p>STD. DWG. NO. <b>CNST-6045</b></p>
<p>REVISIONS    UPDATED SAP ID# AND NOTE N</p>		

SHT. 1 OF 2

**NOTES:**

- A. THIS CONSTRUCTION STANDARD SHALL BE USED TO SUPPORT PLASTIC OR STEEL GAS FACILITIES WHICH ARE UNDERMINED AND EXPOSED BY CONSTRUCTION ACTIVITY.
- B. IF AN EXCAVATION IS MADE AT ANY DISTANCE PARALLEL TO THE GAS FACILITY WITH ADEQUATE OSHA STRUCTURAL SHORING, AS SHOWN IN DETAIL "A", OR IF A STABLE SOIL CONDITION WITH SUFFICIENT COVER ABOVE THE PIPE'S CENTERLINE EXISTS, AS SHOWN IN DETAIL "B", THEN SUPPORTS ARE NOT REQUIRED. UNSTABLE SOIL IS DEFINED AS A SOIL WHICH CAN CAUSE "SOIL RUN OUT" FROM BENEATH THE PIPE (e.g., WASHOUT, SOFT CLAY, etc.) OR CAN SHIFT DUE TO CONSTRUCTION ACTIVITY, VIBRATIONS, etc.; AND CAUSE A SOIL SCENARIO TO OCCUR AS SHOWN IN DETAIL "B" TO REQUIRE PIPE SUPPORT.
- C. IF AN EXCAVATION CROSSES OR RUNS PARALLEL TO A GAS FACILITY, SUPPORTS MAY NOT BE REQUIRED IF THE EXPOSED SECTION OF PLASTIC PIPES IS 3' OR LESS AND STEEL PIPES 7' OR LESS.
- D. ALL EXCAVATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONE CALL DIG SAFE PROGRAM USING THE APPROPRIATE MARK OUT, TEST HOLES AND EXCAVATION TO AVOID DAMAGE TO PIPE OR PIPE COATINGS:
- NEW YORK STATE CODE RULE 753
  - MA CHAPTER 82 - SECTION 40, GENERAL LAWS, REGULATING NOTICE REQUIREMENTS FOR EXCAVATION IN PUBLIC WAYS
- E. USE OF THIS CONSTRUCTION STANDARD DOES NOT RELIEVE THE CONSTRUCTION AGENCY OR AUTHORITY OR THEIR RESPECTIVE CONTRACTORS OF RESPONSIBILITY FOR DAMAGES. ALL DAMAGES WILL BE REPAIRED IN ACCORDANCE WITH EXISTING STANDARDS AND THE APPROPRIATE PARTY SHALL BE BILLED FOR ALL EXPENSES.
- F. GAS FACILITIES SHOULD NOT BE UNDERMINED WITHOUT ADEQUATE SUPPORT (DETAIL A). ALL SUPPORT LINES SHALL BE TENSIONED SO THAT NO DEFLECTION WILL OCCUR WHEN THE FACILITY IS UNDERMINED. THIS TENSION SHALL BE CHECKED AT THE START AND END OF EACH DAY AND ADJUSTED AS NECESSARY.
- G. WHERE A COUPLING, GAS SERVICE, CLAMP, VALVE, DRIP LINE OR OTHER APPURTENANCE EXISTS ON THE EXPOSED SECTION OF MAIN, AN ADDITIONAL SUPPORT SHALL BE INSTALLED AT THE LOCATION.
- H. WHEN SUPPORTING AN EXPOSED FACILITY, THE PIPE COATING SHALL BE PROTECTED WITH ROCK SHIELD (ITEM [ID 9340226](#)), OR OTHER LIKE MATERIAL CUT TO A MINIMUM WIDTH OF ½ THE SUPPORTED PIPE DIAMETER. SUPPORT LINES SHALL BE A MINIMUM OF ¾" POLYPROPYLENE OR BETTER. [FRP SHEILDS MAY ALSO BE USED FOR THIS PURPOSE PROVIDED THEY EXTEND A MINIMUM OF ½ WAY UP THE PIPE TO PROTECT FROM SIDE LOADING.](#)
- I. SUPPORTS FOR GAS TRANSMISSION FACILITIES SHALL BE REVIEWED WITH GAS ENGINEERING PRIOR TO INSTALLATION.
- J. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR STEEL FACILITIES SHALL BE AS FOLLOWS: 7' SPACING FOR ¾" AND 1 ¼" STEEL

10' SPACING FOR 2" STEEL  
15' SPACING FOR 3" AND 4" STEEL  
20' SPACING FOR 6" AND LARGER STEEL


K. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR PLASTIC FACILITIES SHALL BE AS FOLLOWS :

3 ' SPACING FOR 2" AND SMALLER PLASTIC  
6' SPACING FOR 4" AND LARGER PLASTIC

L. VIBRATING MACHINES ARE ALLOWED OVER STEEL OR PLASTIC FACILITIES WITH 24" OR GREATER COVER. HAND HELD MECHANICAL TAMPER IS ACCEPTABLE OVER ANY FACILITY WITH 12" OR GREATER COVER.

M. WHEN CONSTRUCTION ACTIVITY IS COMPLETED, CLEAN FILL SHALL BE COMPACTED AROUND AND UNDER THE GAS FACILITY BEFORE REMOVING SUPPORTS.

N. [CONTACT NATIONAL GRID FOR REPLACEMENT REQUIREMENTS OF CAST IRON PIPE.](#)

	<b>Gas Policy</b> <b>Damage Prevention</b>	Doc. # <b>DAM01003</b> Page 1 of 4
	<b>Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities</b>	Revision 0 – 07/15/16

## Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities DAM01003

### 1. Purpose

The purpose of this document is to provide notification and monitoring guidelines for activities that produce vibrational and impact forces (e.g. pile driving) that occur in the vicinity of gas mains and services. For activities involving backfilling and tamping refer to excavation and backfill CNST01003, Backfill and Restoration. For activities involving blasting refer to [Requirements and Planning Related to Foreign Construction Using Blasting Near Existing Gas Facilities \[DAM01002\]](#).

### 2. Responsibilities

Damage Prevention (DP) or designee shall be responsible for:

- The timely mark out of gas facilities as prescribed in this procedure, and adherence to applicable One-Call laws.
- Notifications, as prescribed within this policy if made aware that vibration or impact activity (i.e. pile-driving) is taking place in the vicinity of gas facilities.
- The arrangement of contractor surveillance when deemed necessary

Public Works Engineering (PWE) (This is Project Engineering & Design in NE & UNY) or designee shall be responsible for:

- Notifications, as prescribed within this policy, to applicable jurisdictional departments if made aware that vibration or impact activity (i.e. pile-driving) is taking place in the vicinity of gas facilities
- Reviewing proposed vibration or impact activity (i.e. pile-driving) within 25 ft. of cast iron facilities and within 15 ft. of non-cast iron facilities
- Determination of the necessity for contractor surveillance and monitoring
- Seek input from relevant asset owner group(s) in Gas Systems Engineering, as necessary.
- Directing the performance of any monitoring required
- Developing contingency plan for gas main isolation if required and routing to Gas Control for review and approval
- Notifications to Gas Control if required
- Communicating National Grid standards and procedures to third party and municipalities


Gas Operations Engineering (GOE) or designee shall be responsible for:

- Supporting Public Works Engineering in providing necessary input, such as modeling data and mapping data in the development of the contingency plan
- Identify valve locations for isolation, and perform model analysis to simulate the isolation of the system/segment of pipe identified in the contingency operations

Engineering (Transmission, Distribution, Project, I&R) or designee shall be responsible for:

- Providing support and direction, analysis and equipment as required to ensure that vibration monitoring requirements can be adhered to and that facilities are protected
- Specifying additional requirements as deemed necessary to protect gas facilities

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FILE DAM01003: VIBRATIONAL AND IMPACT FORCES IN THE VICINITY OF UNDERGROUND GAS FACILITIES	ORIGINATING DEPARTMENT: STANDARDS, POLICIES AND CODES	SPONSOR: THOMAS BENNETT	

	<b>Gas Policy</b> <b>Damage Prevention</b>	Doc. # <b>DAM01003</b> Page 2 of 4
	<b>Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities</b>	Revision 0 – 07/15/16

Gas Construction/Field Operations, Contractors and Third-Party Excavators or designee shall be responsible for:

- Adhering to all facility verification requirements
- The performance of pre and post leakage surveys, when assigned and directed, and the associated documentation
- Performing remedial actions as directed when required
- Leak, Corrosion and/or valve repairs as required within this procedure
- Gas main/service relocation or cut-off as required

### 3. Personal & Process Safety

- All required PPE shall be worn or utilized in accordance with the current National Grid Safety Policy when performing field tasks associated with this document.



Verify that all Dig-Safe Notifications and regional Mark-Out and Locate, and pre-excavation requirements are completed before any excavations are performed.

### 4. Operator Qualification Required Tasks [Qualified or Directed & Observed]



Not all personnel shall be required to perform all tasks associated with this document. Therefore, Operations personnel shall only be required to qualify on those tasks associated with the tasks they will perform in their respective regions.

- Task 18 – Conducting Gas Leakage Surveys
- Task 21 – Line Locating and Mark-Out
- Task 70 – Properties of Natural Gas and Abnormal Operation Conditions


### 5. Content

#### 5.1. Notifications

- a. Excavators shall follow all State Dig Safe/One-Call regulations.
- b. When Public Works Engineering is aware of 3<sup>rd</sup> party construction involving vibration or impact forces within 25 ft. of gas facilities, Public Works shall notify, Damage Prevention, Gas System Operations Control Center, Transmission/Distribution Engineering and Construct/Maintain prior to the start of operations with the exact date, time and location of work.
- c. For in-house construction projects involving vibration or impact forces within 25 ft. of gas facilities, Project Management shall notify Damage Prevention, Gas System Operations Control Center, Transmission/Distribution Engineering and Construct/Maintain prior to the start of operations with the exact date, time and location of work.
- d. When Public Works is aware that 3<sup>rd</sup> party construction involving vibration or impact forces will take place within 200 ft. of a gas regulating facility, Public Works shall notify I&R with the exact date, time and location of work.
- e. For in-house construction projects involving vibration or impact forces that will take place within 200 ft. of a gas regulating facility Project Management shall notify I&R with the exact date, time and location of work.

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	<b>Gas Policy</b> <b>Damage Prevention</b>	Doc. # <b>DAM01003</b> Page 3 of 4
	<b>Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities</b>	Revision 0 – 07/15/16

- f. If protected steel main is involved, PWE shall notify Corrosion Engineering of the location and scheduling of activities to determine and perform if required any pre and post cathodic protection testing/verification.
- g. A National Grid Representative (construction inspector, qualified Gas Construction personnel, Contractor Oversight or Damage Prevention) should periodically inspect the location when operations are underway within 25 ft. of a cast iron gas main or within 15 ft. of steel or plastic gas facilities.

5.2. Contingency Planning



A contingency plan should be developed unless it is determined that it is not warranted. A contingency plan should be considered when a gas facility will remain in service throughout the procedure but whose integrity may be jeopardized due to its proximity to the operation.

- a. If required, GOE shall develop a contingency plan. Instructions for the development of emergency preparedness and contingency plans are established GEIP1 Gas Emergency Notification Procedure, GEIP2 Gas System Emergency Management Procedure, and GEIP3 Gas Emergency Operations Center (EOC) Activation and Operations Procedure. However, when developing an emergency plan consideration shall be given to:
  - 1) Establishing a means to isolate the gas facility.
    - i. Valves or line stopper devices shall be located, and accessed prior to the operations.
    - ii. An SOP should be prepared and submitted for approval only if gas main relocation or cut-off is required.
  - 2) Allocation of required manpower, equipment and materials to implement the plan.
  - 3) Coordinating, with all other affected groups and departments
  - 4) Notification to Gas Control
    - i. Applicable National Grid procedures shall serve to direct the channels of communication and reporting
  - 5) Lines of communication between National Grid and contractor personnel

Specific actions the excavator should take in an emergency.

5.3. Facility Verification and Monitoring



All Dig-Safe Notifications and regional pre-marking, mark-out and locate, and pre-excavation requirements must be completed before any excavations are performed, including required hand-dug test holes prior to any mechanical excavations.


- a. For activities within 25 ft. of Cast Iron and 15 ft. of steel and plastic gas facilities:
  - 1) Leak surveys shall be performed prior to and after work is performed.



Cast Iron gas facilities  $\leq$  8 in. diameter that are within 10 ft. should be replaced/relocated. Notify Project Engineering and Design for treatment of larger diameter facilities

- 2) When directed by PWE, Engineering or Damage Prevention, prior to commencing

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	<b>Vibrational and Impact Forces in the Vicinity of Underground Gas Facilities</b>	Revision 0 – 07/15/16

activities that involve vibrational and impact forces and after hand excavated verification of the depth and location of the gas facility, the operator should excavate an opening equal or greater in depth to bottom of the elevation of the gas facility and commence operations at this depth.

- b. When directed by PWE, Engineering or Damage Prevention, the following constraints should be followed for activities within 12 ft. of gas facilities:
- 1) Cast iron gas facilities should be monitored with a seismograph to ensure that PPV (Peak Particle Velocity) at the gas facility does not exceed 2 in./sec.
  - 2) Non-cast iron gas facilities should be monitored with a seismograph to ensure that PPV at the gas facility does not exceed 5 in./sec.
  - 3) If monitoring indicates excessive displacement and/or vibration in excess of limits, suspend activities and consider alternative methods. Contact the appropriate National Grid Engineering department for analysis and guidance. (Project Engineering/Transmission/Distribution Engineering, etc.). The following measures should be considered:
    - i. Expose 4 ft. horizontal portions of the gas main that falls within 12 ft. of any proposed pile.
    - ii. Main should be monitoring for displacement utilizing methods such as an optical survey.



Third-Party Excavators shall be billed for repairs should any damage occur to National Grid Gas Facilities.


## 6. Knowledge Base & References

Knowledge Base		References
1 - Compliance History	5 - Job Aid	1 - Regulatory – Codes
2 - Data Capture	6 - Learning & Development	2 - Technical Documents
3 - Definitions	7 - Standard Drawings	3 - Tools Catalog
4 - Document History	8 - Tools & Equipment	

## 7. Attachments

No attachments

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	<b>Gas Policy</b> <b>Damage Prevention Program</b>	Doc. # <b>DAM01011</b> Page 1 of 10
	<b>Excavation and Excavation Notification Requirements for Underground Facilities</b>	Revision 1 – 04/01/21

## Excavation and Excavation Notification Requirements for Underground Facilities (MA-RI ONLY) DAM01011

### 1. Purpose

The purpose of the procedure is to establish the requirements and recommended practices for excavating in the vicinity of underground facilities. This document applies to MA-RI ONLY.

### 2. Responsibilities

Transmission and Distribution Engineering shall be responsible for:

- Providing the requirements for transmission and distribution main excavations as specified in this procedure
- Providing guidelines to supplement the requirements for transmission main excavations as necessary.

Damage Prevention or designee shall be responsible for:

- Providing or assisting with facility locating and mark-out as required.
- Notifying Engineering when additional technical assistance is required

Construct and Maintain, Field Operations, National Grid Contractors, Complex Construction, Foreign Excavators or designee shall be responsible for:

- Providing required notifications and notices for mark-out and locating prior to excavations.
- Performing facility verifications prior to excavations.
- Notifying Damage Prevention and Gas System Operations if Excavations involve Transmission Facilities.

### 3. Personal & Process Safety


- In the event of an emergency involving danger to life, health or property as a result of damage to an underground facility, the excavator shall:
  - 1) Proceed to evacuate employees and all other endangered persons for the immediate vicinity.
  - 2) Immediately notify the local police and fire departments and the Operator of the affected facility of the exact location, nature of the emergency and of the underground facility which is affected.

### 4. Operator Qualification Required Tasks [Qualified or Directed & Observed]

Please refer to the L&D Task-to-Title Matrices by Region for the applicable OQ Requirement(s) for performing work in accordance with this document: [Operator Qualification Training Information Task-To-Title Matrices by Regions](#)

- Task 17 - Repair coating on a steel pipelines
- Task 19 - Patrolling and inspecting pipelines
- Task 21 - Line locating and mark out

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- Task 22 - Inspection of 3rd party excavations for damage prevention/cast iron encroachment
- Task 23 - Inspecting the condition of exposed metallic pipe or pipe coating
- Task 24 - Inspect pipe for damage
- Task 70 – Properties of Natural Gas and Abnormal Operation Conditions
- Task 71 - Operator Excavation and Backfilling in the Vicinity of a Pipeline



Not all personnel shall be required to perform all tasks associated with this document. Therefore, Operations personnel shall only be required to qualify on those tasks associated with the tasks they will perform.

## 5. Content

### 5.1. Emergency Excavation or Demolition


#### a. Massachusetts

- 1) In an emergency, excavation may begin after having taken all reasonable steps and precautions, consistent with the urgency of the situation, and premarked the site. Notification to the Dig Safe System shall be made at the earliest practical moment, including a description of the excavation location and work to be done. Each company with facilities in the area of the excavation shall follow established procedures to identify the location of its respective underground facilities as soon as practicable but no more than 5 hours after receiving notification of an emergency excavation whether or not the excavation has begun.
- 2) All reasonable means and precautions to avoid damage to an underground facility must be utilized and do not otherwise excuse adherence to excavation requirements.
- 3) Emergency Dig Safe markings are no longer valid after the cessation of the emergency. Further excavation at the location shall require notification to the Dig Safe/One Call Notification System and premarking.
- 4) Notice to the Dig Safe Center shall be made when the emergency has been brought to conclusion. If further excavation is to be done beyond the area that was marked due to the emergency notification, the Dig Safe Center shall be notified.

#### b. Rhode Island

- 1) In the event of an emergency, excavation, maintenance, or repairs may be made without using explosives upon notification to the Dig Safe/One Call System as soon as it is determined that an emergency exists.
- 2) The excavator shall employ any means necessary, excluding blasting, to insure that the underground public utility facilities in the area of the excavation shall not be damaged.
- 3) In the event of an emergency, public utilities shall notify the excavator within two (2) hours upon receipt of notice whether the public utility has any facilities in the vicinity of the proposed excavation.
- 4) If the public utility has any facilities in the vicinity of the proposed excavation, the public utility shall mark out their facilities no later than three (3) hours after receipt of notice from the Dig Safe/One Call System.

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5.2. Pre-Marking of Work Zone

- a. Pre-marking shall be done before an excavator has given notice of excavation to the Dig Safe/One Call notification system.
  - 1) The use of White Paint, stakes (or other suitable white marking on non-paved surfaces) is used to identify the general scope of the excavation (work area) for adequate identification by an Excavator, whether National Grid, Contractor or a Foreign Excavator.




Pre-marking is mandatory in Massachusetts and Rhode Island and shall be performed before every notification to the Dig Safe/One Call System.

- 2) When premarking in an area where white marks may interfere with traffic or pedestrian control, or when white marks might otherwise be difficult to see, the excavator may use pink but must inform the Dig Safe/One Call Center so that the notice indicates that pink has been used for pre-marking.
  - 3) When excavating to replace a guardrail or fence, an excavator may use the pre-existing guardrail or fence as the but the notice must contain a description of the excavation location sufficient to inform a company of the area to be excavated.. If the new guardrail is not collinear with the pre-existing guardrail or fence, the excavator must premark only that area to be excavated that will differ from the pre-existing guardrail or fence.
- b. Pre-Marking of the work zone shall be completed prior to notification to the Dig Safe Notification System.

5.3. Response to Locating Requests/Notifications

- a. Massachusetts
  - 1) The company shall respond within 72 hours of the initial notice and subsequent notices of excavation (exclusive of Saturdays, Sundays and legal holidays), from the time the initial notice is received by the system (or at a time the company and the excavator agree), by designating the location of the underground facilities within 15 feet in any direction of the pre-marking so that the existing facilities are to be found within a safety zone.
    - i. The safety zone shall be designated by the use of standard color-coded markings.
  - 2) Providing the required mark-outs by the company shall constitute evidence of an exercise of reasonable precaution by the company.
  - 3) In the event that the excavator has given notice at a location at which because of the length of excavation the company cannot reasonable designate the entire location of its facilities within the 72 hour period:
    - ii. The excavator shall identify for the company that portion of the excavation which is to be first made and the company shall designate the location of its facilities in that portion within 72 hours
    - iii. The excavator shall designate the location of its facilities in the remaining portion of the location within a reasonable time after.
  - 4) When an emergency notification has been given to the system, the company shall make every attempt to designate its facilities as promptly as possible.
  - 5) When requested, re-marking due to the obliteration, destruction or other removal of markings shall be completed within 24 hours.

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b. Rhode Island

- 1) The company shall respond within seventy-two (72) hours or, where applicable re-mark within forty-eight (48) hours, upon receipt of each notice of excavation, the location of all underground facilities.
- 2) If an excavator determines that a public utility facility has been mismarked, the excavator may notify the Dig Safe notification system and the appropriate public utility shall remark no later than three (3) hours after receipt of notification from the Dig Safe notification system.

5.4. Location Requests and Excavations Involving Transmission Facilities, Gas Regulator Stations and Gate Stations

a. Locations Requests Performed near Gas Regulator Stations or Gate Stations

- 1) If a location request is within 200 feet of a gas regulator station or gate station, special precautions must be observed. This applies to both above ground and buried station facilities.
  - i. Upon receipt of the location request, the locating group will contact Gas Control/I&R for assistance.
  - ii. Gas Control/I&R will review all station files for details on gauge lines, control lines, odorant lines, electric telemetering, or other buried facilities.
  - iii. Gas Control/I&R shall provide access to the station facilities for the Locator to directly locate piping.
  - iv. The Locating and Gas Control/I&R personnel should work together to locate all gas known facilities.


b. Location Requests Involving Transmission Pipelines

- 1) Damage Prevention, and where applicable, Field Operations, shall be notified for location requests involving transmission facilities.
- 2) Requests requiring additional technical assistance shall be forwarded to the Gas Transmission Engineering Department

c. Excavations Involving Transmission Pipelines

- 1) If the proposed excavation involves transmission main, contact the regional Damage Prevention Department for specific requirements. It is recommended that:
  - i. Within 15 feet of the outside perimeter or diameter, excavate test holes at a minimum of 50 ft intervals over transmission main that runs adjacent to a proposed individual construction excavation.
  - ii. Within 15 feet of the outside perimeter or diameter, whenever there is a change in cover or lateral direction of the transmission pipe, the pipe direction change be located, and done so by hand excavation. (This is to prevent possible damage to the transmission pipe in case the pipe direction changes are not accurately represented on company records.)
  - iii. Within 15 feet of the outside perimeter or diameter, excavate test holes at points along the transmission pipe where the transmission gas pipe will be crossed at any angle by a proposed trench or excavation.
  - iv. Inspection is done as frequently as necessary during and after excavation activities to verify the integrity of the pipeline.

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- v. A National Grid Lead Person is on site continuously during any excavation work within 15 feet of the outside perimeter or diameter of the underground facility.
- vi. The National Grid Lead Person/Supervisor conduct a walk through at site with the in-house crew/contractor lead person prior to the initiation of work.
- vii. The National Grid Lead Person conduct daily job briefings with the onsite in-house crew/contractor lead person.
- viii. Upon verification with hand dug test holes, powered excavations should only be used outside the Safety Zone (18" + half the diameter of the pipe on both sides).



For third party excavations it is recommended that Damage Prevention be on-site while excavation activities are taking place.

**5.5. Familiarity with Staking, Marking or other Designations**

- a. All National Grid employees that are involved with excavating should be familiar with the requirements relating to size and depth indications, color coding, center line or offset staking or marking and the location of underground facilities by designations other than staking or marking.
  - 1) Refer to Attachment 2 Uniform Color Code and Attachment 3, Uniform Identification Letters.


**5.6. Preservation of Stakes, Markings or other Designations**

- a. The excavator shall be responsible for maintaining markings or placing offset marks, using the standard color codes.. If an excavator requests remarking, it shall suspend the excavation in the area for which it requested the remarking and shall occur within 24 hours of the request (MA) or 48 hours (RI)
- b. Dig Safe Ticket/Markings shall be valid for an excavation site until one of the following events occurs:
  - 1) The excavation does not commence within 30 days of the notification;
  - 2) The markings remain clear and discernible – have not become faded, illegible or destroyed;
  - 3) A company installs new underground facilities in a marked area still under excavation; and/or
  - 4) An emergency condition is brought to conclusion which nullifies any markings installed during the emergency.
  - 5) Any changes to the original excavation as specified in the Dig Safe ticket, which require shall notification of the Dig Safe Center and request for a new Dig Safe ticket.

**5.7. Timing of Notice and Excavation**

- a. Before beginning or engaging in any non-emergency excavation or demolition within 100ft of a public utility facility, notification to the Dig Safe System shall be made at least 72 hours, exclusive of Saturdays, Sundays, and legal holidays but not more than thirty working days, not including the date of the call, before the proposed starting date of the excavation or demolition, or blasting.
- b. The excavation may not commence within 72 hours after notification to the Dig Safe Center.

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- c. A Dig Safe ticket shall be valid for 30 calendar days from the date of notification to the Dig Safe Center, as long as the markings remain clear and discernible.
- d. If there is clear evidence of the presence of an unmarked underground facility in the area of the proposed excavation or during the excavation, excavating activities shall be suspended until notification of the Dig Safe Center and the facility shall be protected.
- e. An abandoned underground facility shall not be removed without first receiving authorization and direction from the company owning the facility
  - 1) Every notification provided to the Dig Safe system concerning proposed excavation or demolition shall contain at least the following information:
    - i. Brief description of the planned excavation or demolition;
    - ii. Date and time the excavation or demolition is planned to commence.
    - iii. and should contain:
    - iv. Name of the person serving notice;
    - v. Name, address and telephone number of the excavator or excavator's company;
    - vi. Excavator's field telephone number, if one is available;
    - vii. Name of the field contact person, if any;
    - viii. Address and exact location as well as the approximate extent and dimensions of the planned work area;
    - ix. Means of excavation or demolition and whether or not explosives are to be used;
 Refer to Attachment 1, Sample Dig Safe Worksheet. Filling out this information sheet before the Dig Safe call is made will be very helpful.
- f. Initial notification to the Dig Safe System shall indicate whether any excavation will involve blasting and, if so, the date and the location at which blasting is to occur.
  - 1) Notice of an excavation by blasting shall be given to the Dig Safe Center at least 72 hours in advance and shall accurately specify the date and location of such blasting. In the case of an unanticipated obstruction requiring blasting, notice shall be given not less than four hours prior to such blasting.
  - 2) Additionally in Rhode Island excavations or blasting within 100 ft of a known public utility facility, notice shall be provided to the Dig Safe notification system (811)
- g. If there is clear evidence of the presence of an unmarked underground facility in the area of the proposed excavation or during the excavation, the excavator shall not begin excavating until notifying the Dig Safe Center and shall protect the facility.

**5.8. Powered Excavating Equipment Limitations**

- a. When excavating in close proximity to the underground facilities of any company, non-mechanical means shall be employed, as necessary, to avoid damage in locating the facility and any further excavation shall be performed employing reasonable precautions to avoid damage to any underground facilities including, but not limited to, any substantial weakening of structural or lateral support of facilities, penetration or destruction of any pipe, main, wire or conduit or the protective coating, or damage to any pipe, main, wire or conduit.

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Mechanical means may only be used for the initial penetration of pavement, rock or other such materials, so long as non-mechanical means are employed after the paving, rock or other such material has been penetrated.

- 1) After verifying the location of an underground facility by non-mechanical excavation, powered or mechanical excavating equipment should not be used closer than 4” in any direction from the facility or it’s protective coating.
  - i. Vacuum excavations are considered non-mechanical means and should be considered when available
  - ii. It is recommended that for excavations involving transmission mains, vacuum excavations should be used when available and powered or mechanical excavating equipment if utilized, be employed no closer than 12” in any direction from the facility or it’s protective coating.
- b. The use of high impact excavation equipment (including, but not limited to, jack hammers, excavator buckets, and impactors attached to backhoes) is allowed outside of safety zone provided all of the below conditions are met:
  - 1) The asset(s) to be avoided have been positively located and marks visible to the operator of the high impact excavation equipment
  - 2) The edge of the safety zone has been clearly identified and visible to the operator of the high impact excavation equipment
  - 3) If there is a potential for the high impact excavation equipment to move into the tolerance zone due to unforeseen circumstances, the buried assets should be protected from damage by use of temporary walls, shielding, or other means to prevent damage
  - 4) The use of the ‘automatic’ setting on high impact excavation equipment is not allowed within the swing radius / reach of the high impact excavation equipment
- c. In Rhode Island only, excavation must be completed within sixty (60) working days or the excavator must re-notify the Dig Safe System.

**5.9. Requirements Concerning Contact and Damage to Underground Facilities**

- a. All reasonable precautions should be taken to prevent contact or damage to underground facilities and their protective coatings.
- b. When an excavator causes any damage to an underground facility, the excavator shall:
  - 1) Call 911 immediately if the damage results in the escape of any regulated natural or other gas;
  - 2) Evacuate nearby structures if necessary;
  - 3) Report the damage to the facility owner or operator at the earliest practical moment following discovery of the damage;
  - 4) Attempt no repairs, unless directed to by the facility owner or operator;
  - 5) Call 811 or otherwise notify the Dig Safe Center
  - 6) In Massachusetts, report the damage to the MADPU within 30 days.

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- c. Any person who causes damage to any underground facility or becomes aware of such damage must notify the company owning the facility at the earliest practical moment following such contact.
- d. No backfilling should be done in the vicinity of the contact or damage until the facility Operator conducts an inspection and makes any necessary repairs.

**6. Codes (Federal, State, Local – as applicable)**

Code of Federal Regulation

- 49 CFR 196

Code of Massachusetts Regulations / Massachusetts General Laws

- 220 CMR 99.00

Rhode Island Code of Regulations / State of Rhode Island General Laws

- Rhode Island General Laws Title 39 - Public Utilities and Carriers Chapter 39-1.2

**7. Knowledge Base & References ([Click here](#))**


<b>Knowledge Base</b>		<b>References</b>
1 - Compliance History	5 - Job Aid	1 - Regulatory – Codes
2 - Data Capture	6 - Learning & Development	2 - Technical Documents
3 - Definitions	7 - Standard Drawings	3 - Tools Catalog
4 - Document History	8 - Tools & Equipment	

**8. Attachments**

Attachment 1: MA/RI Dig Safe Data Collection Form

Attachment 2: Uniform Color Code

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Attachment 1: MA/RI Dig Safe Data Collection Form



Dig Safe Ticket # \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Time \_\_\_\_\_  
 Contr I.D. \_\_\_\_\_ First/Last Name \_\_\_\_\_ Title \_\_\_\_\_  
 Phone # \_\_\_\_\_ Fax # \_\_\_\_\_ Alt # \_\_\_\_\_  
 Email address \_\_\_\_\_ Business Hours \_\_\_\_\_ to \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 State \_\_\_\_\_ Municipality \_\_\_\_\_  
 (optional) Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
 Address/Intersection \_\_\_\_\_  
 Nearest Cross St 1 \_\_\_\_\_  
 Nearest Cross St 2 \_\_\_\_\_  
 Additional Information \_\_\_\_\_  
 \_\_\_\_\_  
 Type of Work \_\_\_\_\_  
 Area of Work \_\_\_\_\_  
 Area Premarked?            Y \_\_\_\_\_            N \_\_\_\_\_  
 Start Date \_\_\_\_/\_\_\_\_ Time \_\_\_\_\_ : \_\_\_\_\_  
 Excavator Doing Work \_\_\_\_\_  
**Member Companies Notified:**

- There may be non-member utilities in the area that you need to notify.
- Electric and other utilities may not mark lines they don't own or maintain. You may need to hire a private company to locate these lines. Visit [digsafe.com](http://digsafe.com) for more information.
- The excavator is responsible to maintain marks placed by the member utilities.
- This ticket expires exactly 30 days from today in MA, NH and VT; 60 days in ME (excavation must start within 30 days).

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Attachment 2: Uniform Color Code

The following uniform color code shall be utilized for staking and marking used to designate the location of underground facilities and proposed excavation sites:

- Yellow*            Gas, oil, petroleum products, steam, compressed air, compressed gases and all other hazardous liquid or gaseous materials except water
- Red*                Electric power lines, cables or conduits
- Orange*            Communication lines or cables, including but not limited to telephone, telegraph, fire signals, cable television, civil defense, data systems, electronic controls and other instrumentation
- Blue*                Water, irrigation and slurry lines
- Green*              Storm drain and sanitary sewers including force mains and other non-hazardous materials
- Purple*             *Reclaimed water such as used for irrigation or slurry lines. Radioactive materials*
- White*              Proposed excavation site
- Pink*                *Temporary survey markings, or to distinguish from other color coded marks*

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DOCUMENT A00808

# **PROJECT UTILITY COORDINATION FORM**

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## Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

Revision	
Date:	

11/21/2023  
PRINTED

City/Town: Littleton	Project File #: 609054	Utility Pole Set: Littleton Electric Light Dept.	
Route/Street: Foster Street	Resident Engineer: Alaide Campbell	Scheduled Ad Date: 3/30/2024	Total Poles Relocated: 34
PUC Completed by: Rick Handfield		Littleton Electric Light Dept.	
Mass DOT PM: Alaide Campbell			

Utility Company	Contact	Office #	Cell #	Email	Scope, Budget, Duration Submitted		Reimbursement		Potential for District Relocation *		Utilities On Bridge/Structure		Utilities Underground (UG) /Aerial (OH)	
					Yes	No	Agreement	Non-Reimb	Notes	YES	NO	YES	NO	UG
Littleton Electric Light and Water Dept (Electric)	Joshua DeTerra	978-540-2263		<a href="mailto:jdterra@elwad.com">jdterra@elwad.com</a>	X		X				X			X
National Grid Gas	Melissa Owens	781-907-2845		<a href="mailto:Melissa.Owens@nationalgrid.com">Melissa.Owens@nationalgrid.com</a>	X		X				X			X
Verizon	Paul Styseck	413-787-1845		<a href="mailto:paul.m.styseck@verizon.com">paul.m.styseck@verizon.com</a>	X		X				X			X
Comcast	Julio Medina	603-765-3221		<a href="mailto:Julio_Medina@comcast.com">Julio_Medina@comcast.com</a>	X		X				X			X
MCI	Stephan Parretti	508-829-3381		<a href="mailto:stephan.parretti@verizon.com">stephan.parretti@verizon.com</a>	X		X				X			X
Lumen	Renoy Thomas	516-712-3041		<a href="mailto:Relocations@lumen.com">Relocations@lumen.com</a>		X					X			X
Littleton Electric Light and Water Dept (Water)	Corey Godfrey	978-540-2222		<a href="mailto:cgodfrey@elwad.com">cgodfrey@elwad.com</a>		X					X			X
National Grid Gas Damage Prevention	Meghan Kelley	339-203-0490												

**Utility Relocation Notes for MassDOT Contractor**  
 Unless otherwise noted by contract, the MassDOT Contractor is to provide the District Construction Office with 7 Calendar Days advance notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02. 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:**  
 A National Grid representative is to be on site continuously during any excavation/subsurface work within 15 feet of a transmission facility. Additional requirements below  
 - When working within 15' of the outside perimeter of any transmission pipeline, hand tools and vacuum excavation must be used until the exact alignment has been verified  
 - When working within 15' of the outside perimeter of any transmission pipeline, verification holes should be dug using hand tools/vacuum excavation at 50 ft intervals over transmission main that runs adjacent to a proposed individual construction excavation.  
 - Where crossing transmission gas pipes with utilities and underground structures, test holes must be dug at the proposed excavation location.  
 - Once the exact alignment of transmission piping has been verified using hand tools and vacuum excavation, powered excavation may be used within 15' of the pipeline, but no closer than the transmission pipeline Safety Zone (18" + 1/2 the diameter of the pipeline).

**Suggested Sequence of Relocation (Based on Consultant proposed construction staging)**  
 The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the utilities listed below along with the designer and the Littleton. The information provided is the best available information prior to project advertisement.

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

11/21/2023  
PRINTED



RESPONSIBLE PARTY	C = Contractor U = Utility Co.	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work				Access Restraint & Limitations of Operations Notes	
				Exclusion Utility on site	Concurrent Utilities	Contractor Off-Site operations on-site (while Utility is working)	Contractor Concurrent Utility are working on-site - same vicinity		
		Enabling work by the Contractor - At preconstruction meeting schedule a utility walkthrough to discuss pole locations and review tree trimming/removals. Prior to overhead utility relocations contractor will need to perform any necessary clearing & grubbing and tree removal as specified in Contract Documents. LELWD responsible for installation of new utility pole mounted lights as well as R&R of existing utility pole mounted lights. Coordinate with LELWD for any primary/secondary electric risers. Survey will need to stake utility pole locations prior to utility walkthrough. Perform test pits as required on the plans. Perform clearing and grubbing, rock excavation and tree removal prior to utility relocations from STA 32+50±LL to STA 37+00±LL. Begin coordination, as soon as possible, with MBTA/Keolis regarding the replacement of railroad crossing equipment near Grimes Lane.		Utility working with no other utilities in vicinity	Utility working with other utilities on site	No Contractor physical construction operations on-site (while Utility is working)	Contractor and Utility are working on-site - same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
Task-1		<b>UTILITY OPERATIONS - Aerial</b> <b>Littleton Electric Light and Water Dept</b> U Set new Poles and Anchors. (PH77-107 Foster St. #H59 Taylor St). Dress poles with necessary hardware U Run new conduit and cable for underground feeds. Tap temporarily until Transfer U Run new Messenger & 3-Phase spacer cable, install spacers and insulators as needed U De-energize, transfer, re-energize. (3 different sections to limit amount of each outage) U Remove old cable, equipment, and hardware <b>Sub-Total</b>	32 8 10 6 8 64	X X X X X			X X X X X	No No No No No	
Task-2		<b>Crown Castle</b> U Transfer cable on UP 59 to that pole's new location	1	X			X	No	
Task-3		<b>Verizon Business/MCI</b> U Engineer and Permitting on Foster St Littleton U Install new 48ft cable and slack loops on new poles placed by others U Splice new fiber into existing splice points U Removal of existing fiber <b>Total</b>	20 10 5 2 37	X X X X			X X X X	No No No No	
Task-3		<b>Comcast</b> U Build strand, bond ground and downguy U Build strand, bond ground and downguy U Build strand, bond ground and downguy U Build strand, bond ground and downguy U Pull and lash coaxial cables U Pull and lash coaxial cables. U Cold splice taps and amplifiers U Cold splice taps and amplifiers U Acticate cables (early mornings cut overs) U Dealish Fiber U Swap fiber to new cable plant and relash U Wreck out old cable plant. <b>Sub-Total</b>	8 8 8 8 8 8 8 8 8 96	X X X X X X X X X			X X X X X X X	No No No No No No No No	
Task-4		<b>Verizon</b> U Verizon Line Place Guywires and Anchor U Verizon Line Transfer/Relocate all Cable(s) and Associated Equipment to New Poles U Verizon Splice Join CU Pairs for Trimouts U Verizon Line Relace & Repair Lashing Wire U Verizon Contract Work-UG Conduit Redirect U Verizon Splice Trimout CU Cables to be Removed U Verizon Line Remove Copper Cables and Stubs U Verizon Line Remove Pole Associated Equipment-Terminals, Drops U Verizon Line Remove Old Guywires U Verizon Line Remove Old Anchors <b>Sub-Total</b>	6 42 13 1 7 8 24 3 1 106	X X X X X X X X			X X X X X X X	No No No No No No No	
Task-5		<b>Littleton Electric Light and Water Dept</b> U Remove Poles after all transfers complete <b>Sub-Total</b>	10 10	X			X	No	



RESPONSIBLE PARTY	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work				Access Restraint & Limitations of Operations Notes	
			Utility working with no other utilities in vicinity	Utility working with other utilities on site	No Contractor physical construction operations on-site (while Utility are working)	Contractor Off-Site	Contractor Concurrent	Potential Access Restraint (Yes/No)
C = Contractor	Enabling work by the Contractor - National Grid has requirements for coordination and notification to when working near the high pressure gas mains and the need to hand dig or utilize vacuum truck excavation when digging near the transmission lines and regulator station. Contractor to coordinate with National Grid Gas. National Grid Gas must be notified using the damage prevention phone line for any work near the regulator station. National Grid Gas damage prevention must be on site for all work occurring near gas mains. Any rock excavation to be done for widening and in close proximity to the gas line should be coordinated with National Grid Gas. National Grid Gas requires vibration monitoring for work around transmission lines. This monitoring will be coordinated by the contractor with National Grid gas and paid via the contract documents.							
C								
Task: 1	<b>UTILITY OPERATIONS - Underground</b>							
	<b>National Grid Gas</b>							
	U Dig Safe, pre-mark, test pit	1	X				X	No
	U Trench and install approx 425 FT of 8-inch 60 PSIG Plastic Gas Main	5	X				X	No
	U Excavate & Shore connections	5	X				X	No
	U Main Connections/Tie-ins	3	X				X	No
	U Transfer gas services	1	X				X	No
	U Stop/Tap/Purge/Cut/Cap	2	X				X	No
	U Backfill/compaction/restoration	3	X				X	No
	<b>Sub-Total</b>	<b>20</b>						
	<b>IMPORTANT BASIS NOTES - FOR CONTRACTOR</b>							
1	Unless otherwise specified in the MassDOT Construction Contract, or unless specifically noted within this PUC form, the Utility durations shown herein are to be planned (within the CTD and by the Contractor) as unimpeded access to the Utility company to perform Utility relocations.							
2	"Concurrent Utilities" operations noted herein, are to signify those Utility Company operations that can be worked concurrently - 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 this 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	Though Lumen does not have any utility relocations needed for this project, they are requiring that a representative be present at the start of construction due to the close proximity of their facilities to the project.							

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DOCUMENT A00810

# **MassDOT Herbicide Use Report**

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# 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:**

**Application Method:**

**Date/Time Began:**

**Date/Time End:**

**Product Used:**

Name: _____ EPA Reg. No: _____ % Active Ingredient Dry: _____ Liquid: _____ Formulation (dilution rate): _____	Name: _____ EPA Reg. No: _____ % Active Ingredient Dry: _____ Liquid: _____ Formulation (dilution rate): _____	Name: _____ EPA Reg. No: _____ % Active Ingredient Dry: _____ Liquid: _____ 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.

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# **MBTA FLAGGING REQUEST FORM**

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**Flagging Request**

Date: \_\_\_\_\_

Company/Agency: \_\_\_\_\_

Project Name: \_\_\_\_\_

Project Location: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

Email: \_\_\_\_\_ Phone: \_\_\_\_\_

Project Number: \_\_\_\_\_ Funding Source: \_\_\_\_\_

**RAILROAD OPERATIONS TRACKING NUMBER** \_\_\_\_\_

Date Needed: \_\_\_\_\_

Start/Finish: \_\_\_\_\_

Flaggers Required: \_\_\_\_\_

Scope of Work:

(Attach additional SOW, if necessary.)

Schedule:

(Attach additional info, if necessary.)

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# WORK ZONE SAFETY

*Temporary Traffic Control*

*Typical Details and  
Massachusetts Guidelines  
for MassDOT, Municipalities,  
Utilities, and Contractors*

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## INTRODUCTION

This guide has been prepared to assist in the planning and installing of temporary traffic controls in maintenance, utility, or short-term construction work areas (work lasting 10 hours or less). This guide serves to assist with the many decisions that must be made for each work site. Special planning for traffic control is necessary on a case by case basis because conditions can vary widely among work locations. **Since this guide cannot cover every situation, representative illustrations covering typical short-term construction, maintenance, and utility operations are presented.**

**All typical traffic control device setups illustrated should be considered as guides.** The traffic control devices that are shown, the arrangement or position of the devices, and the distances prescribed in the tables are based on the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) and the Massachusetts Amendments to the MUTCD (MA Amendments), but these illustrations only present minimum standards. The provision of safe work zones for all roadway users and roadway workers affected by these activities is paramount. Traffic controls may be expanded or improved upon whenever deemed necessary. Traffic movement through the work site all traffic control devices shall be periodically observed and inspected at all locations.

If necessary, Part 6 of the MUTCD and the MA Amendments, Chapter 17 (Work Zone Management) of MassDOT's Project Development & Design Guide, and the "Traffic Engineering and Safety Section" of the MassDOT web site: (<https://www.massdot.state.ma.us/highway/Departments/TrafficandSafetyEngineering.aspx>), as well as MassDOT District offices can provide additional guidance, information, and suggestions for work zone setups.

## RESPONSIBILITIES FOR TRAFFIC CONTROL

Short-term construction, maintenance, and utility work on or near the roadway creates a potentially hazardous situation, typically requiring the use of temporary traffic controls. These controls are important to protect both work crews and the road users. It is the responsibility of each maintenance foreman to establish and maintain safe and effective controls.

Usually the supervisor, working with the crew, plans the traffic control procedures for proposed work sites. The foreman is responsible for re-requesting, storing, and maintaining all traffic control devices necessary for their crews.

The foreman is responsible for placing the devices according to these guidelines. They must inspect each installation and observe traffic flow through the area. The foreman is generally authorized to make adjustments to the original installations that, in their judgment, are necessary to improve the control of traffic and establish greater safety.

All necessary traffic control devices must be installed before work begins and properly maintained during the work period. They must also be removed as soon as they are no longer relevant to the roadway conditions.

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In situations such as night time road or lane closures, detours, or other unusual conditions on state highways, the District Traffic Maintenance Engineer (DTME) should be advised. If the DTME is absent, the section foreman shall follow the instructions of the District Maintenance Engineer.

### **TRAFFIC CONTROL DEVICES**

Traffic control devices regulate the movement of road users, warn of unexpected or unusual roadway conditions, and inform them how to maneuver safely through or around the work area. All signs, channelizing devices, barricades, and other miscellaneous traffic control devices should work together to guide traffic safely and efficiently. Common temporary traffic control devices are outlined and described below.

#### **Signs**

Temporary traffic control zone (TTCZ) signs are the primary means of providing information and directions to roadway users. All signs must be retroreflective per MassDOT's latest standard.

Warning signs call attention to unexpected conditions and to situations that might not be readily apparent to road users on or adjacent to a roadway. Warning signs alert road users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations. Nearly all warning signs for construction and work areas have black legends and borders on a fluorescent orange background.

Regulatory signs shall be used to inform road users of selected traffic laws or regulations and indicate the applicability of the legal requirements. Regulatory signs typically have black legends and borders on a white background.

#### **Channelizing Devices**

When used properly, traffic cones, reflectorized plastic drums, and barricades guide traffic through the work area along an appropriate travel path. It takes roadway users a certain distance along the roadway to safely move away from the upcoming active work site. These transition distances are based on the following taper length (L) formulas:

$L = WS^2/60$  for speeds of 40 mph or less; or

$L = WS$  for speeds of 45 mph or more; where

- $L$  = minimum length of taper in feet,
- $S$  = posted speed limit or typical travel speed in miles per hour prior to the work, and
- $W$  = width of lane closure in feet.

The spacing of channelizing devices (in feet) is approximately equal to the existing speed of traffic (in mph).

#### **Warning Lights**

Rotating beacons and other flashing lights mounted on work vehicles, signs, or channelizing devices help alert roadway users to the work area. They may also be used to warn roadway users of hazards within the work area. The first 10 drums in any taper shall be equipped with sequential flashing lights.



### **Arrow Boards**

Arrow boards are a special type of sign that are highly visible work zone warning devices. They are particularly effective on highways, where both speed and volume are high. Arrow boards in the non-directional, CAUTION, mode (four corner flashing) may be used to indicate that a shoulder is closed. Arrow boards in the arrow mode shall only be used when a travel lane is dropped on a multi-lane road and one lane of traffic must merge with another. All arrow boards should be located at the beginning of each lane or shoulder closure taper without extending outside of it. Arrow boards shall flash at a rate of 25 to 40 flashes per minute. Arrow boards shall not be used to indicate a lane shift.

### **BASIC REQUIREMENTS**

In every work situation, the temporary traffic control setup must: Give roadway users sufficient advance warning of the work area; advise roadway users of the proper actions to take and travel paths to follow; and provide protection to roadway users, workers, and the work area. These three general requirements can be met as outlined below.

#### **Provide Advance Warning**

Warning devices along the approaches to a work area alert roadway Users to changes to road and operating conditions. Roadway users are usually alerted to these dangers via a sign or series of signs installed in the same order as the roadway user generally would expect to see them on long-term construction projects.

The initial project limit sign is usually a general warning such as "ROAD WORK 1500 FT". Other operational warning signs then provide the roadway user with more specific information about the situation. A minimum of three advance warning signs (the initial project limit sign and two operational warning signs) is recommended when work is located on the traveled way. Warning lights and flags can be used to attract attention to the signs. A highly visible work area helps reinforce the advance warnings.

#### **Advise and Direct Travelers**

Operational warning signs provide information to the road-way user such as the type of work being performed, special conditions to watch for, or actions to take. These include signs such as, SHOULDER WORK, RIGHT LANE CLOSED, DETOUR 500 FT, ROAD CLOSED to THRU TRAFFIC, POLICE OFFICER AHEAD, etc. All of these signs must be located far enough in advance of the work area that the roadway user has sufficient time to react to them appropriately. For projects in Urban Areas, see detail: Typical Device Spacing for minimum sign spacing.

#### **Protect Travelers, Workers, and the Work Area**

The primary protection of any work area is its own visibility. Traffic cones, reflectorized plastic drums, portable breakaway barricades, etc. are used to make the work area visible and separate workers from traffic.

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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.

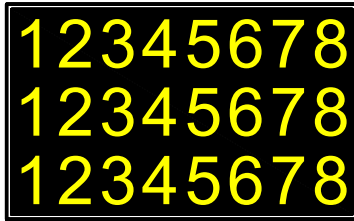
### USE OF THIS GUIDE

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:

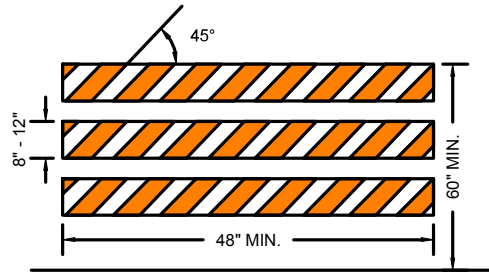
- 1) Turn to the Index. Consider the type of operations and the type of roadway upon which work will occur.
- 2) Select the figure that most closely matches the conditions where you plan to work. Remember that all diagrams represent minimum standards.
- 3) Read the title of the illustration to ensure 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.



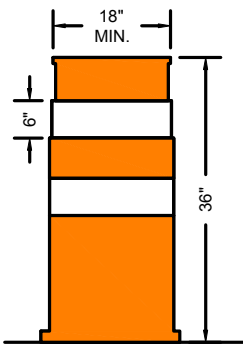
**SIGN**



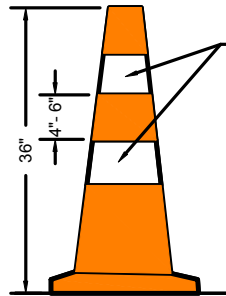
**PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)**



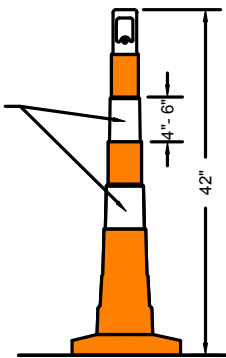
**TYPE III BARRICADE**



**DRUM**

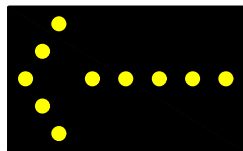


RETROFLECTIVE BANDS

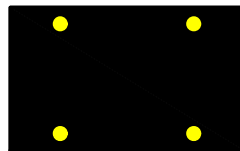


**CONES**

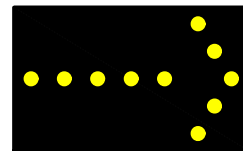
Cones may be used for all daytime operations. For night work, drums should be used to form the taper(s) and cones can be used along the tangent section of the work setup.



LEFT

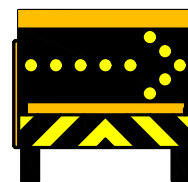


CAUTION



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.

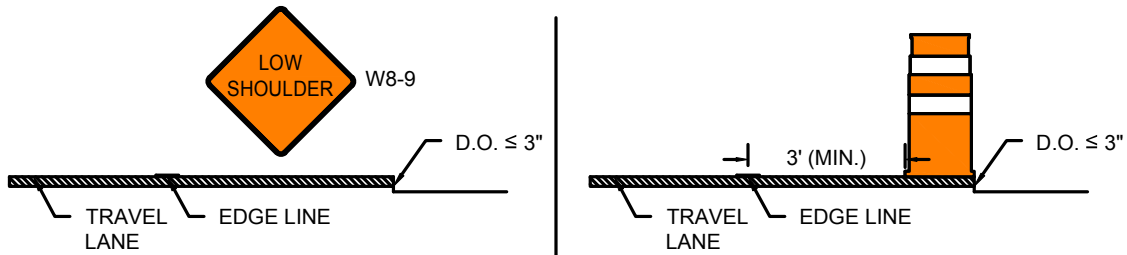


### SHORT-TERM PAVEMENT EDGE DROP-OFFS

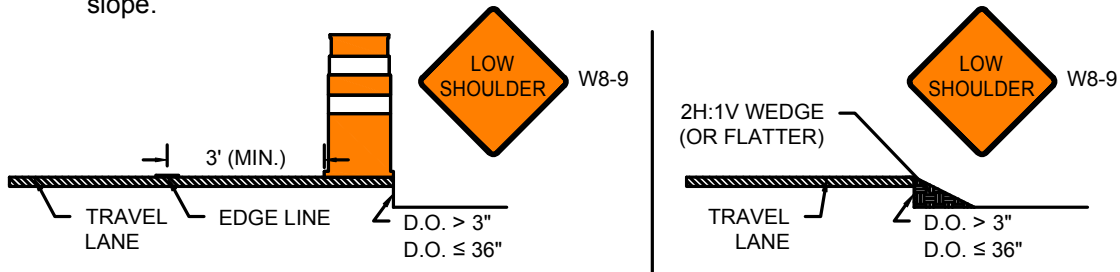
*Note that this guidance is adopted from the Roadside Design Guide, 4th Edition.*

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.

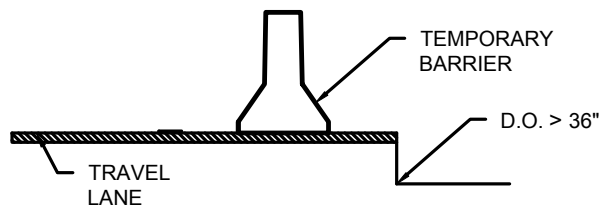
- Shoulder drop-offs 3" or less adjacent to a shoulder or active travel lane should be mitigated by:
  - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment; or
  - ✓ The placement of drums on the traffic side of the drop-off.



- 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.





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

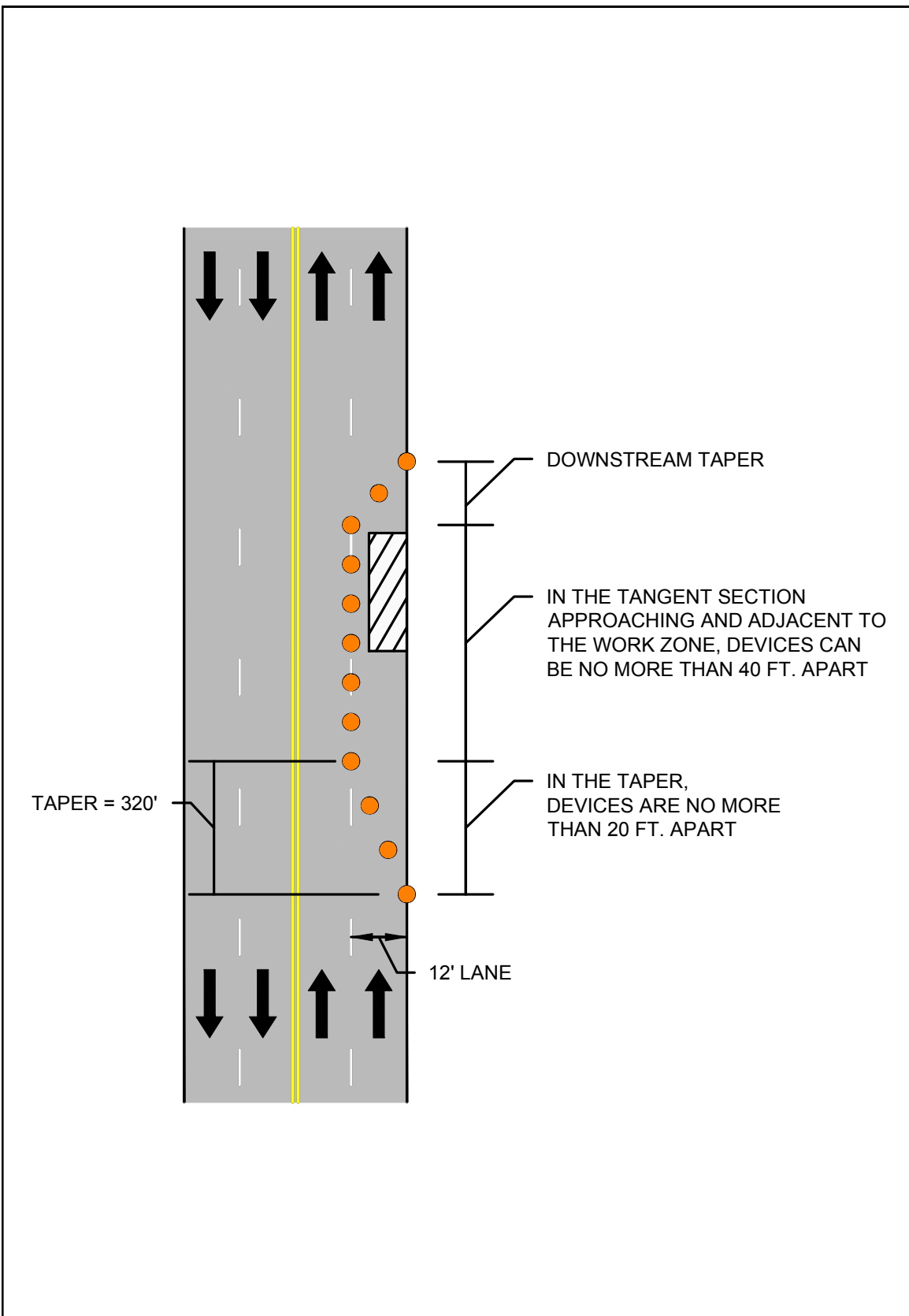
NOTES


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



 <p>PAGE 14</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FLAGGING GUIDANCE</p>
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### 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.

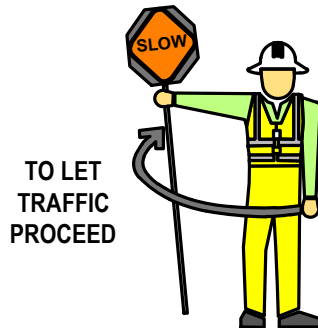


**Properly Trained Flaggers**

- 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.

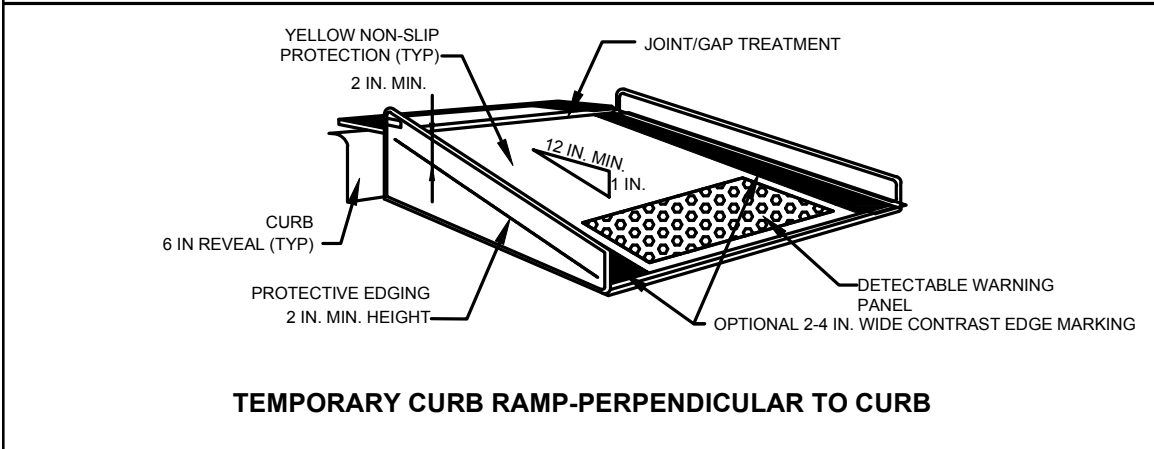
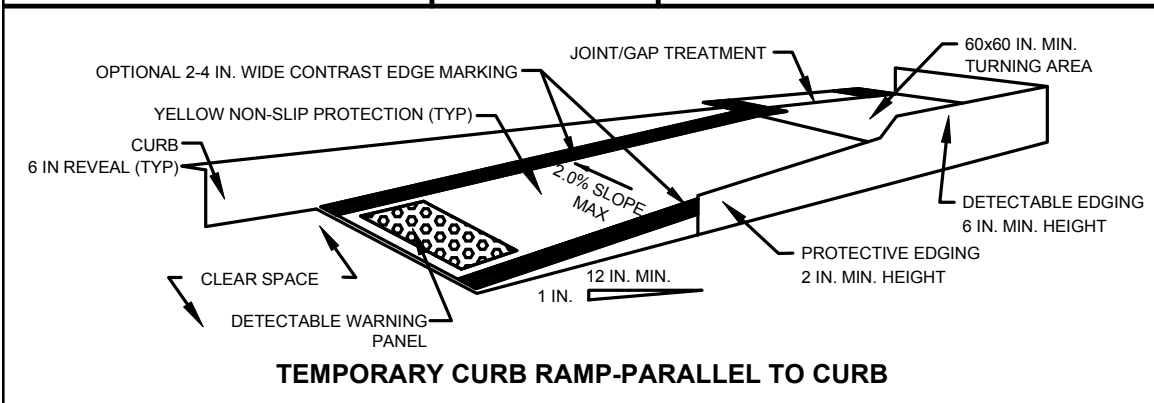


**Proper Advance Warning Signs**

- 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.

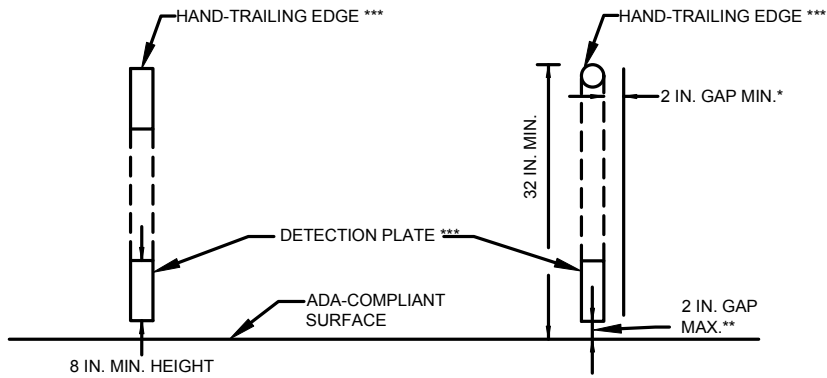


 <p>PAGE 16</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 4 TYPICAL PEDESTRIAN DEVICES (1 OF 2) NOT TO SCALE</p>
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**NOTES:**

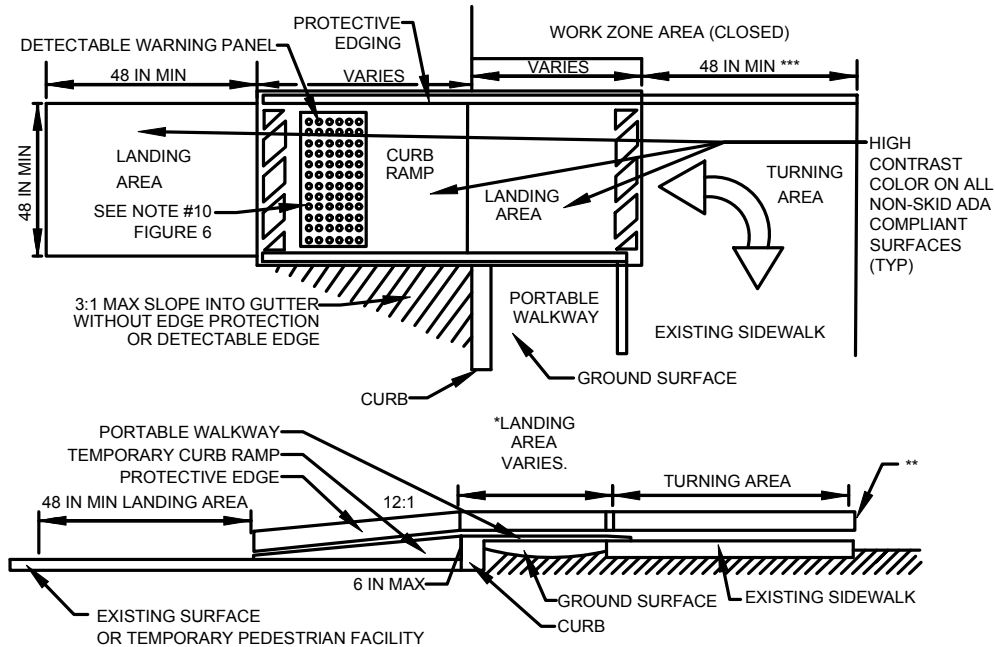
1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE, AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. PROTECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.



**CROSS SECTION VIEW**


**PEDESTRIAN CHANNELIZING DEVICE**

- \* THERE SHALL BE A 2 INCH GAP BETWEEN THE HAND-TRAILING EDGE AND ITS SUPPORT.
- \*\* A MAXIMUM 2 INCH GAP BETWEEN THE BOTTOM OF THE BOTTOM RAIL AND THE SURFACE MAY BE USED TO PROVIDE DRAINAGE.
- \*\*\* THE HAND-TRAILING EDGE AND DETECTION PLATE SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF THE PATH SUCH THAT A PEDESTRIAN USER WITH A LONG CANE CAN FOLLOW IT.



**TEMPORARY CURB RAMP**

- \* LANDING AREA USED TO OVERLAP NON-ADA COMPLIANT SURFACES.
- \*\* DETECTABLE EDGE REMOVED IF A CONTINUOUS SIDEWALK.
- \*\*\* 60 IN. IF AN OBSTRUCTION IS AT BACK OF SIDEWALK.

 Massachusetts Department of Transportation Highway Division PAGE 17	Work Zone Safety Standard Details and Drawings	FIGURE 5 TYPICAL PEDESTRIAN DEVICES (2 OF 2) NOT TO SCALE
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PAGE 18

Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
TWO LANE UNDIVIDED ROADWAY  
HALF OF ROADWAY CLOSED  
WORK NEAR CURVE










POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	50	100	20	30
45-55	500 / 1000 / 1000	100	150	40	20

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

**NOTES**

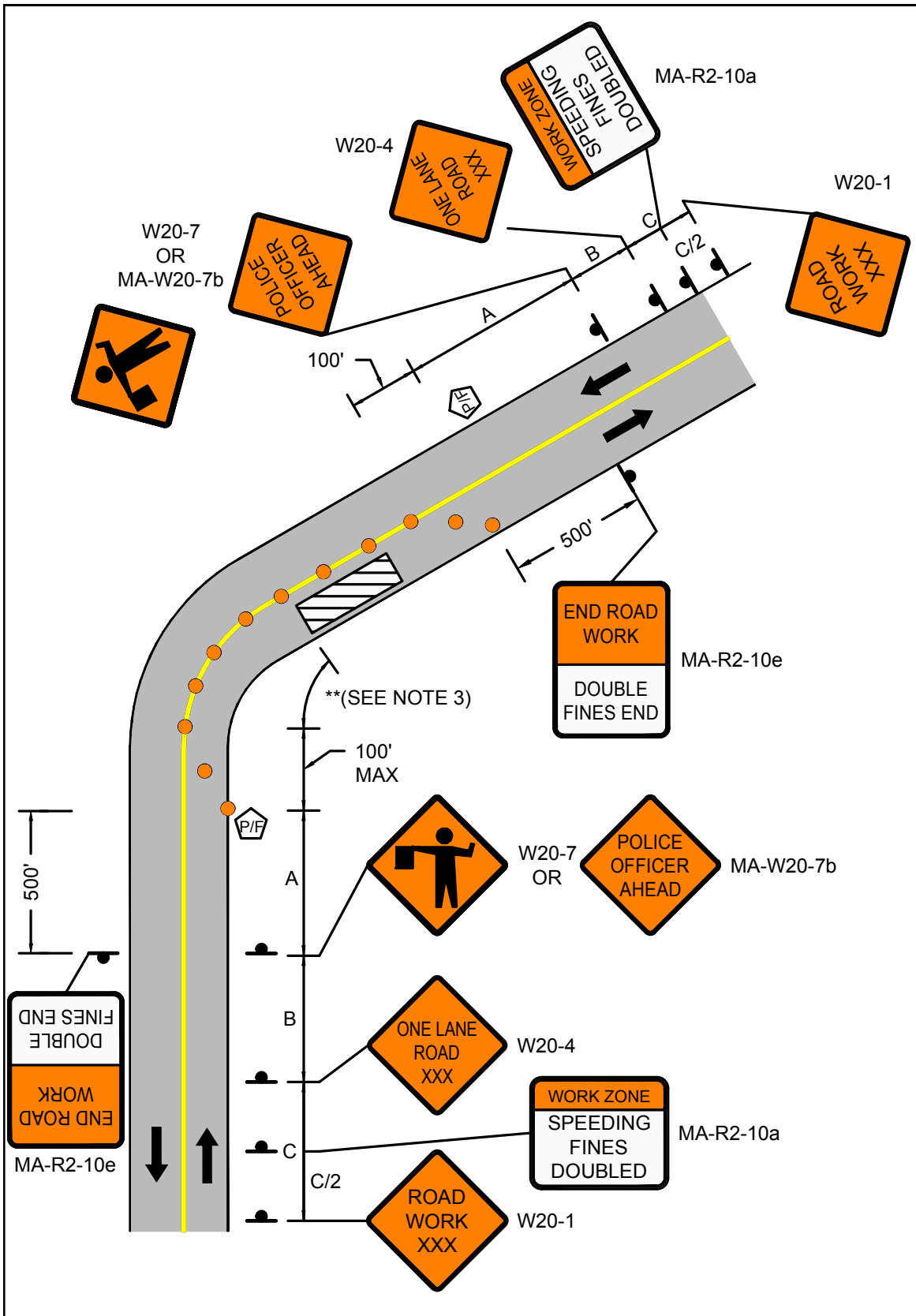
1. IF POLICE DETAIL/UNIFORMED FLAGGER SUPPORT IS REQUIRED, PROVIDE TWO UNITS.
2. MA-R2-10a LOCATED AT C/2.
3. \*\* = EXTEND ENOUGH SO TAPER IS BEFORE CURVE


**LEGEND**

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE





 <p>PAGE 19</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 6 STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED WORK NEAR CURVE</p>
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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

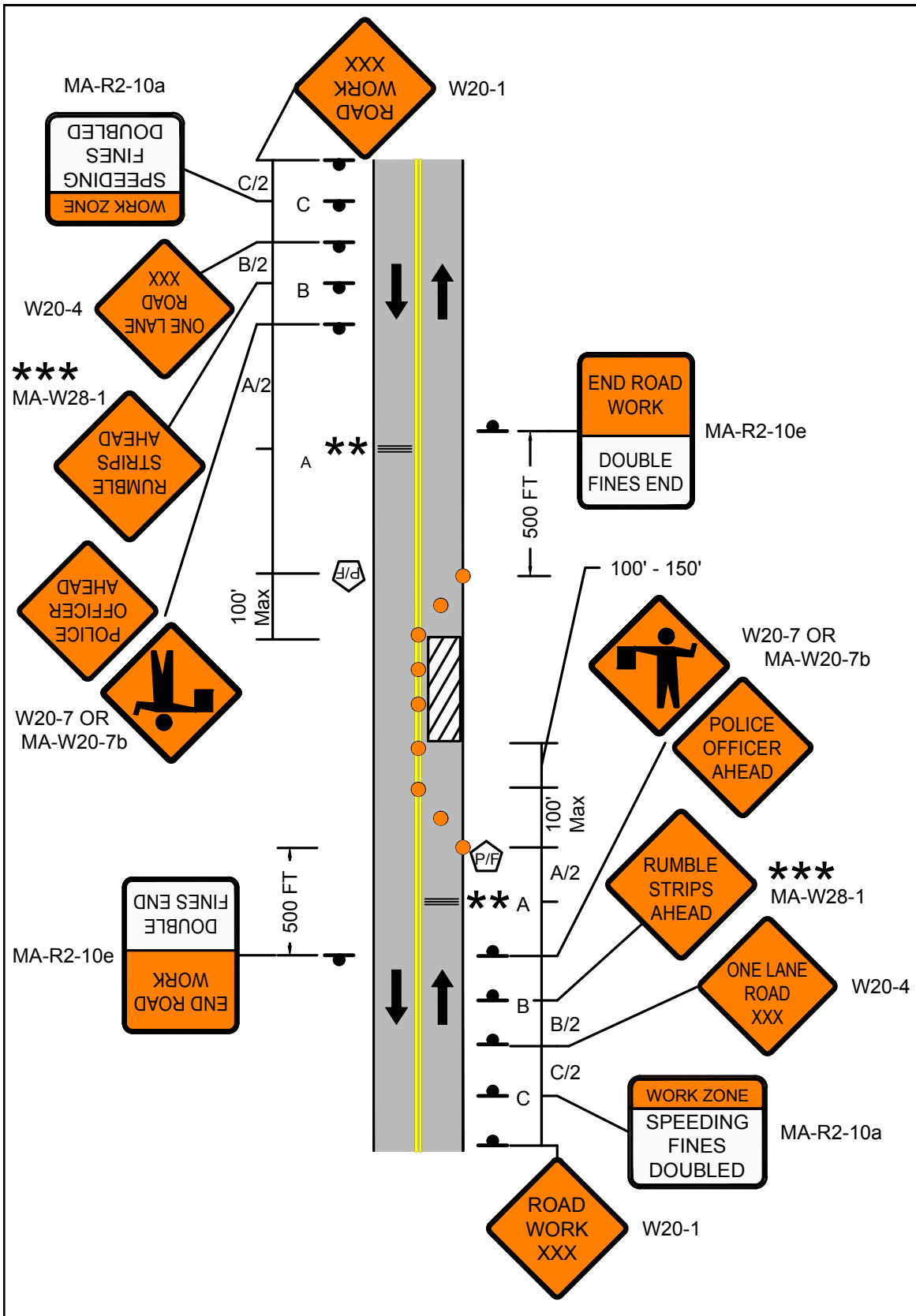
NOTES


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



 <p>PAGE 21</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 7 STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED</p>
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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
TWO LANE UNDIVIDED ROADWAY  
SHOULDER CLOSED










POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

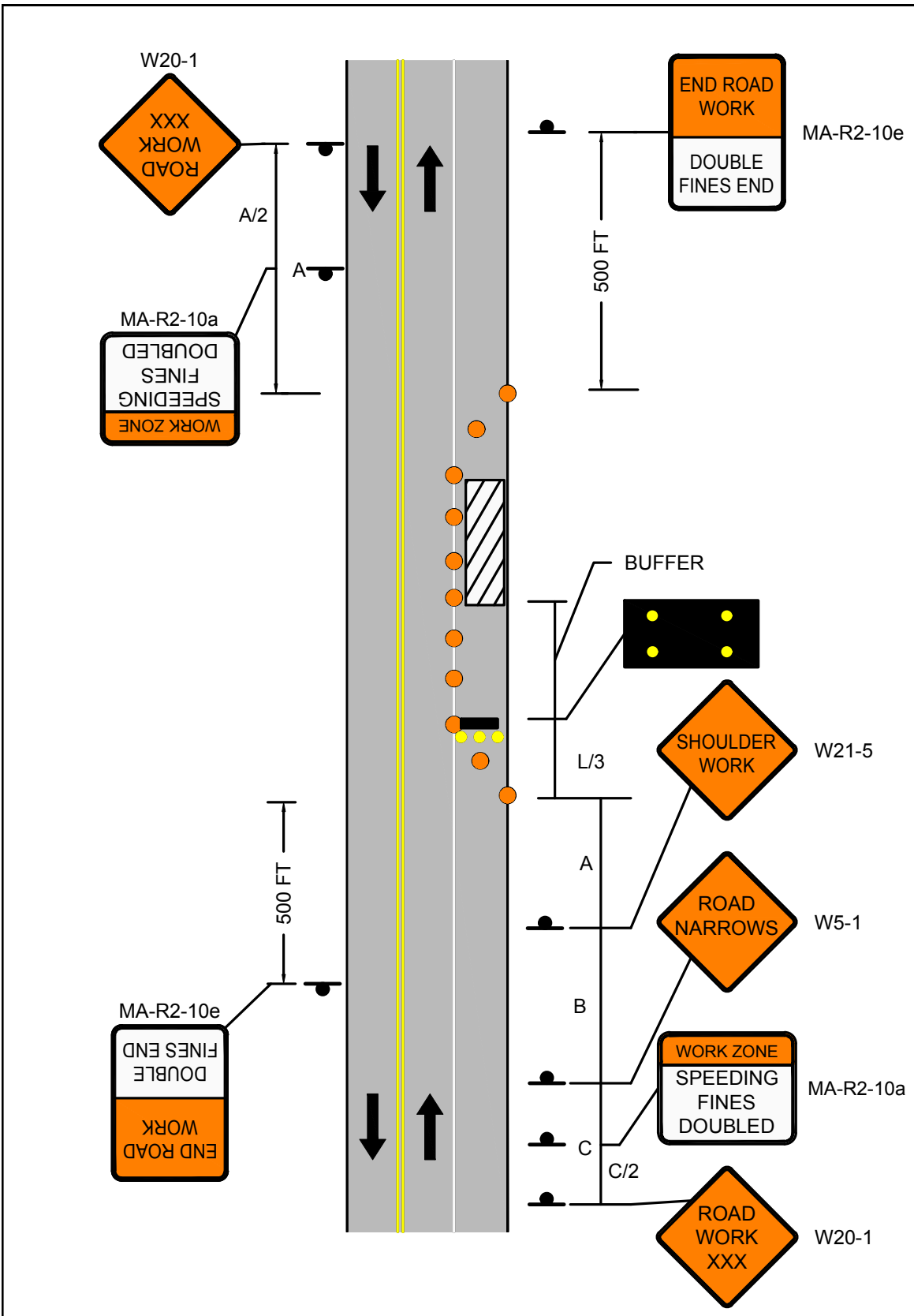
NOTES


1. MA-R2-10a at C/2 and A/2.

LEGEND

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE



 <p>PAGE 23</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 8 STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY SHOULDER CLOSED</p>
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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

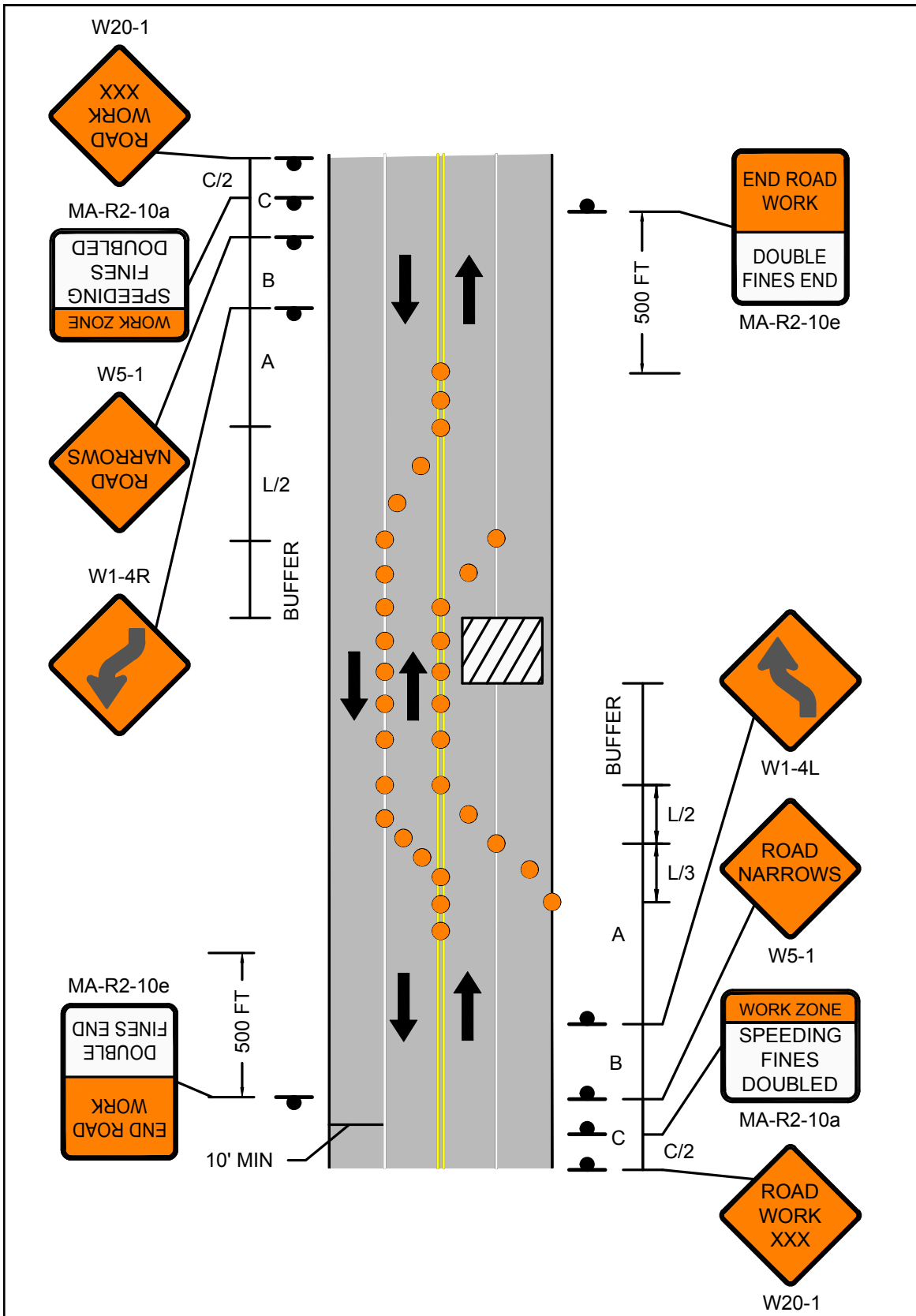
**NOTES**

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



**FIGURE 9**  
**STATIONARY OPERATIONS**  
**TWO LANE UNDIVIDED ROADWAY**  
**WITH TRAVERSABLE SHOULDER**  
**HALF OF ROADWAY CLOSED**  
**MAINTAIN TWO-WAY TRAFFIC**





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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**

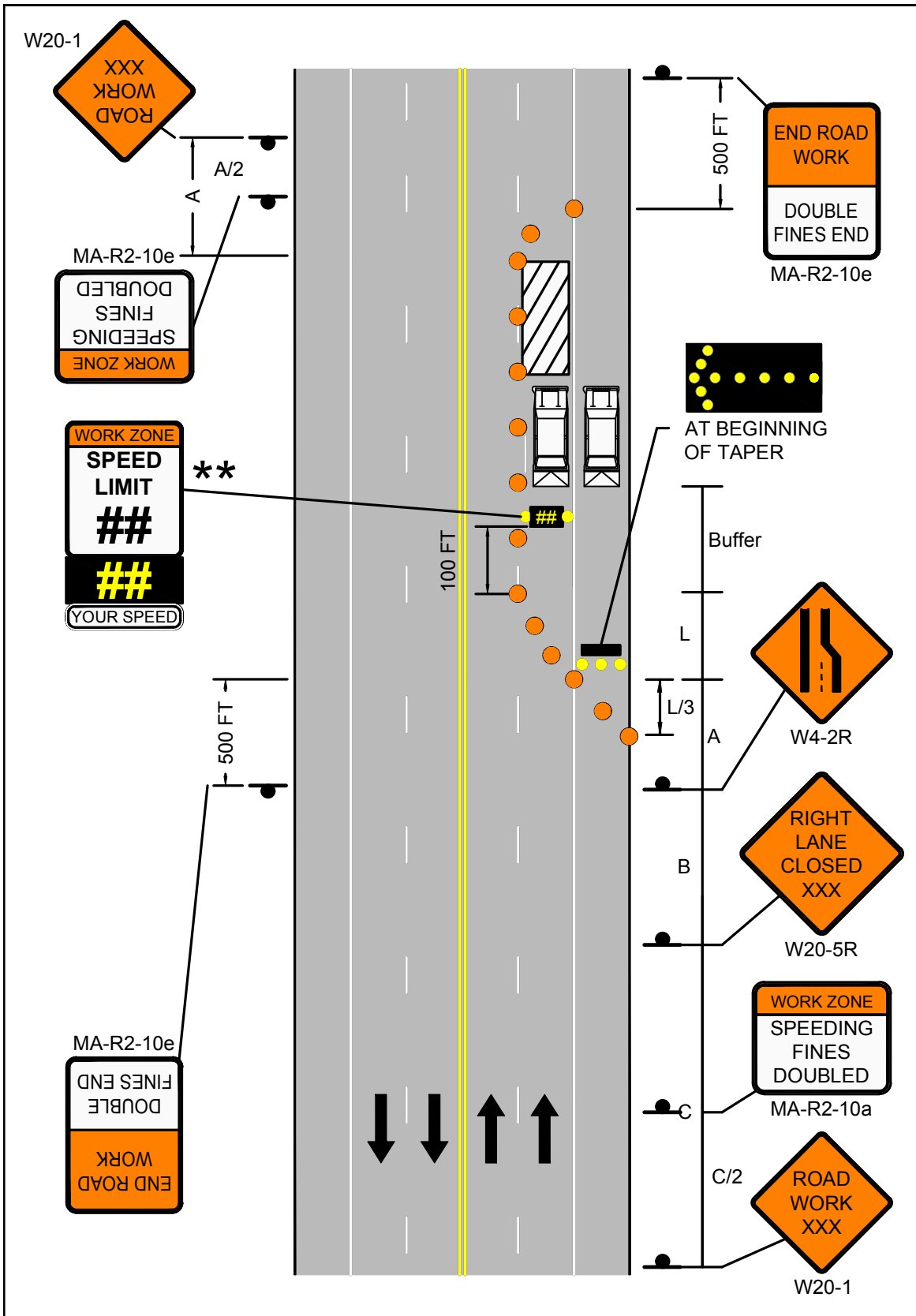
1. MA-R2-10a LOCATED AT A/2 AND C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION.


**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





 <p>PAGE 27</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 10 STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY RIGHT LANE CLOSED</p>
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Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
FOUR LANE UNDIVIDED ROADWAY  
LEFT LANE CLOSED










POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	320	305	20	105
45-55	500 / 1000 / 1000	660	495	40	80
60-65	1000 / 1600 / 2600	780	645	40	100

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

**NOTES**


1. MA-R2-10a LOCATED AT A/2 AND C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION. 2' OFFSET FROM EDGE OF TRAVEL LANE TO RADAR SPEED FEEDBACK BOARD IS REQUIRED. BOARD MAY BE MOVED FULLY OR PARTIALLY OFF PAVED SHOULDER, IF REQUIRED.

**LEGEND**

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE



 PAGE 30	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED
--	--	--

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	160	305	20	140
45-55	220	660	330	495	40	120
60-65	260	780	390	645	40	140










\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

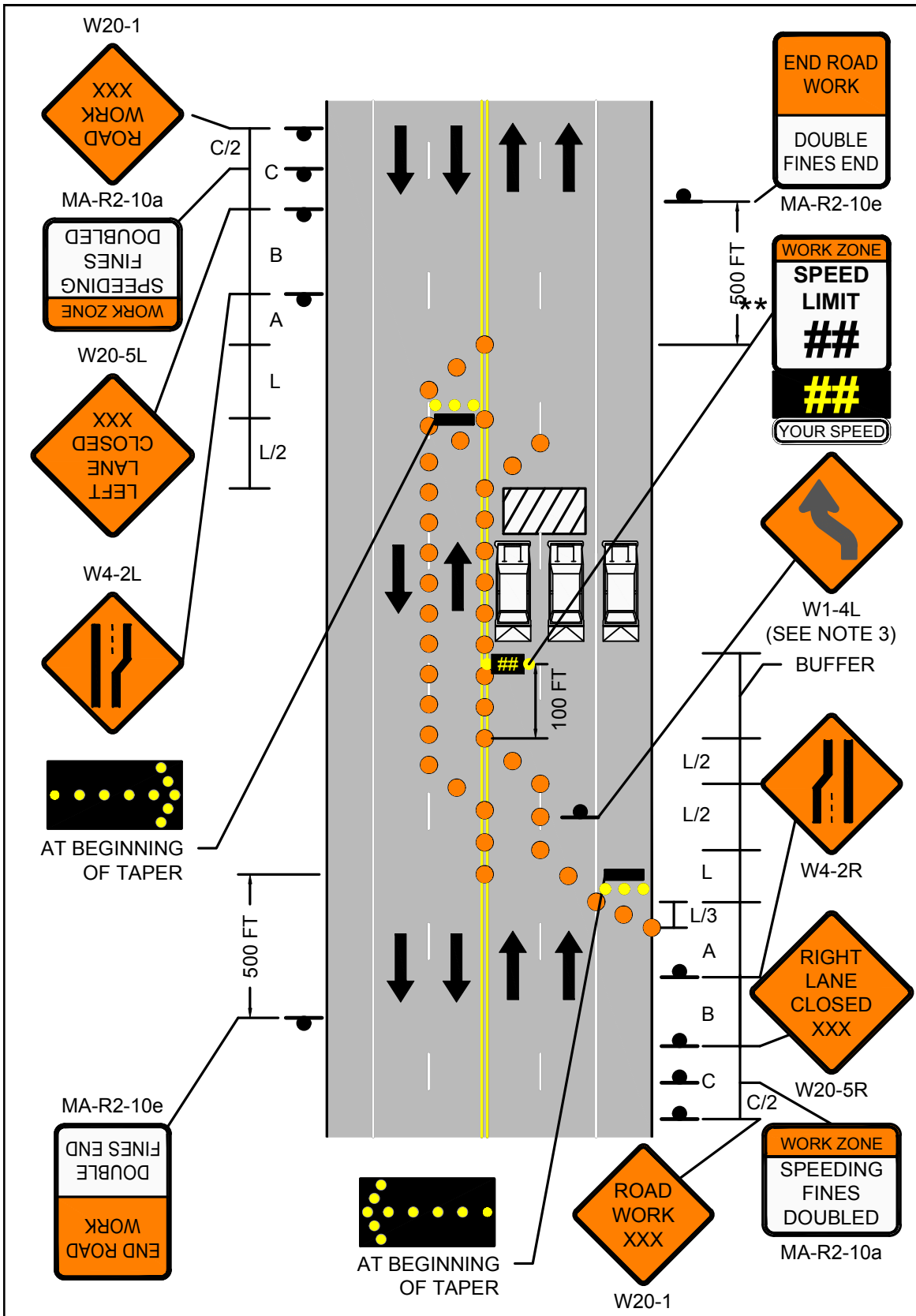
**NOTES**


1. MA-R2-10a LOCATED AT C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION.
3. W1-4L SHALL BE PLACED AT THE MIDDLE OF THE TANGENT.

**LEGEND**

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE



 <p>PAGE 31</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 12 STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED</p>
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Work Zone Safety  
Standard Details  
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STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
RIGHT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55










\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

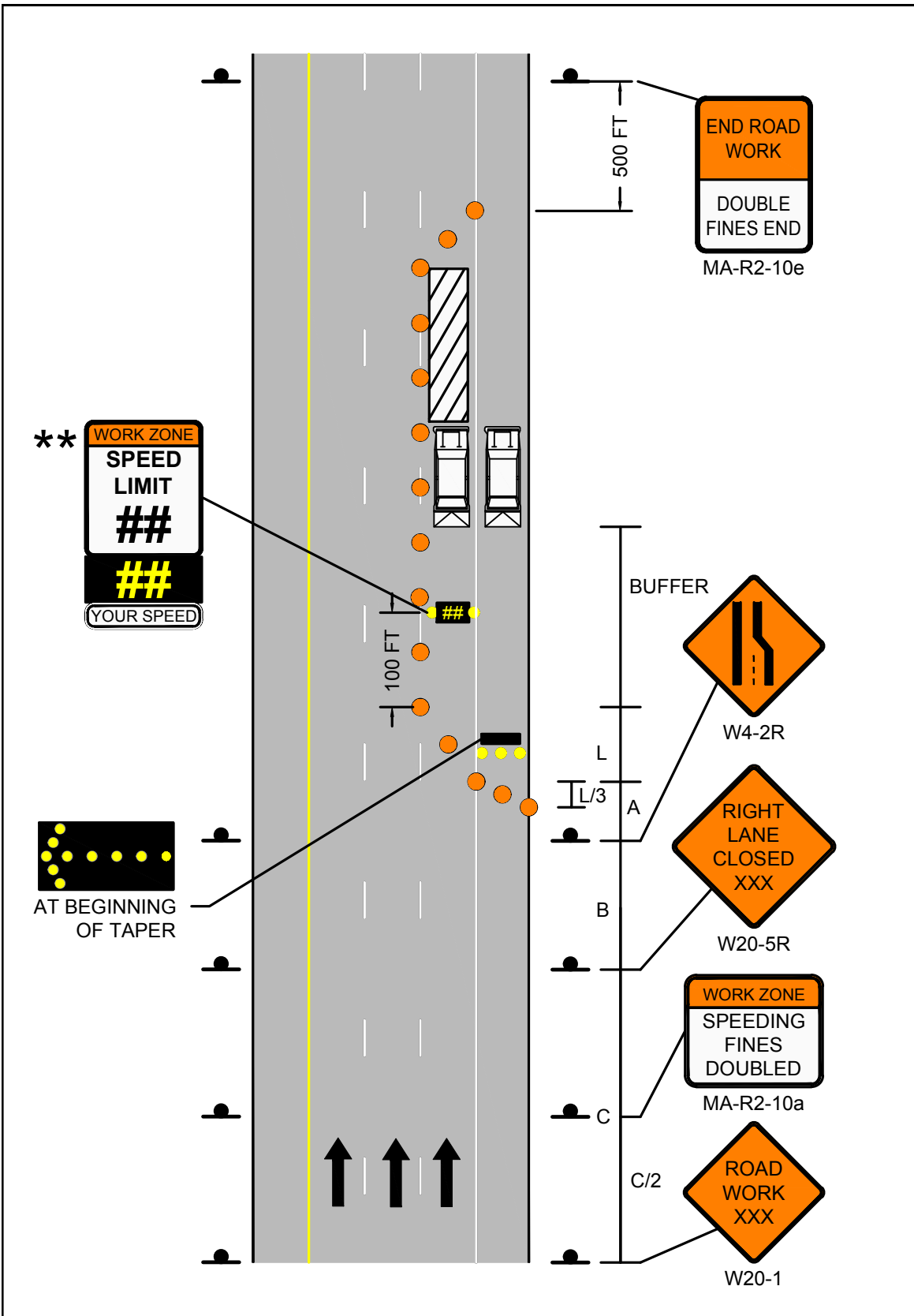
**NOTES**

1. MA-R2-10a LOCATED AT C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION.

**LEGEND**

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE





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STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
LEFT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55










\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

**NOTES**

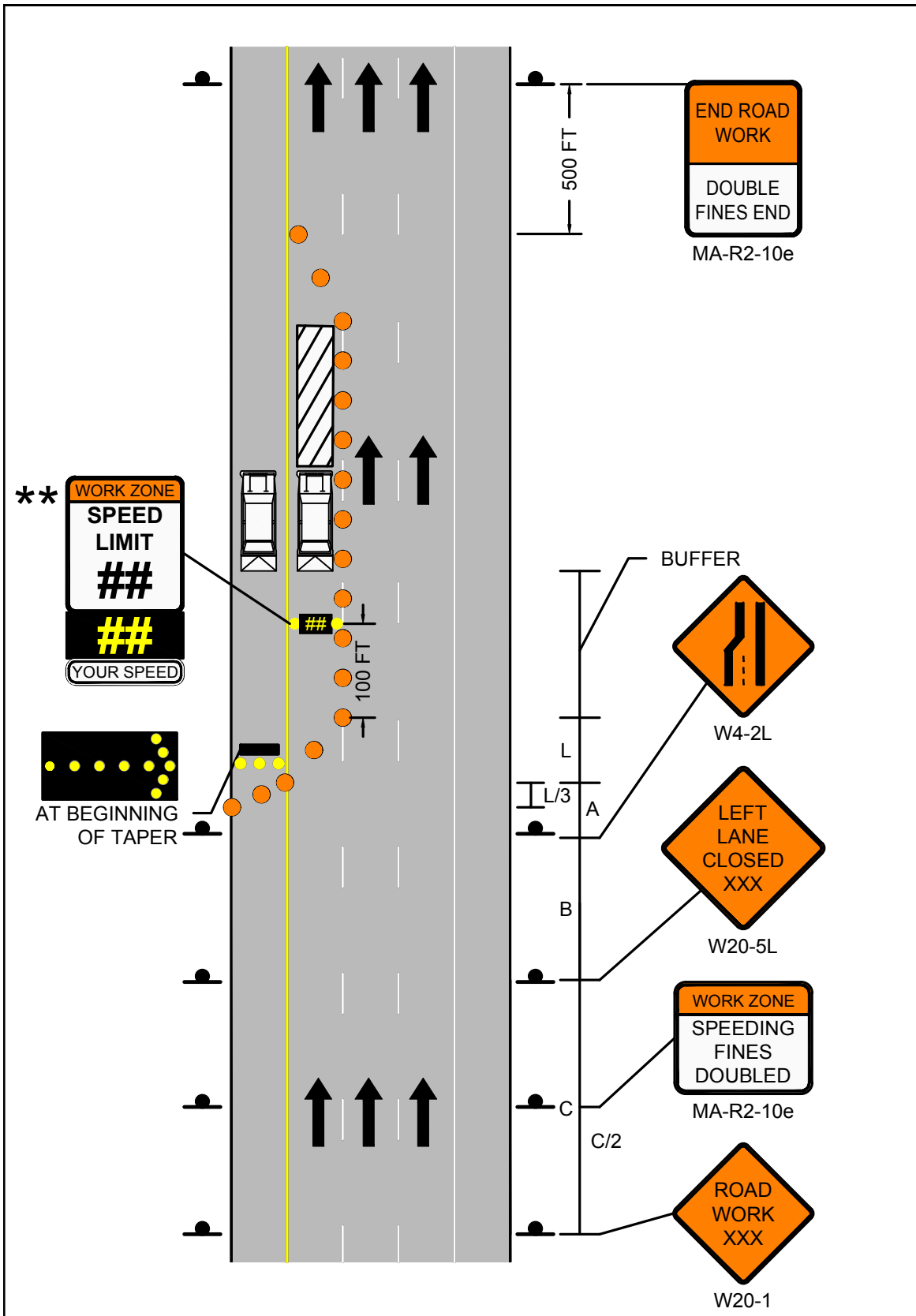
1. MA-R2-10a LOCATED AT C/2.
2. \*\*OPTIONAL AT THE ENGINEER'S DISCRETION.


**LEGEND**


-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE





 <p>PAGE 35</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 14 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY LEFT LANE CLOSED</p>
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 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 36</p>	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR RIGHT/CENTER LANES CLOSED
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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

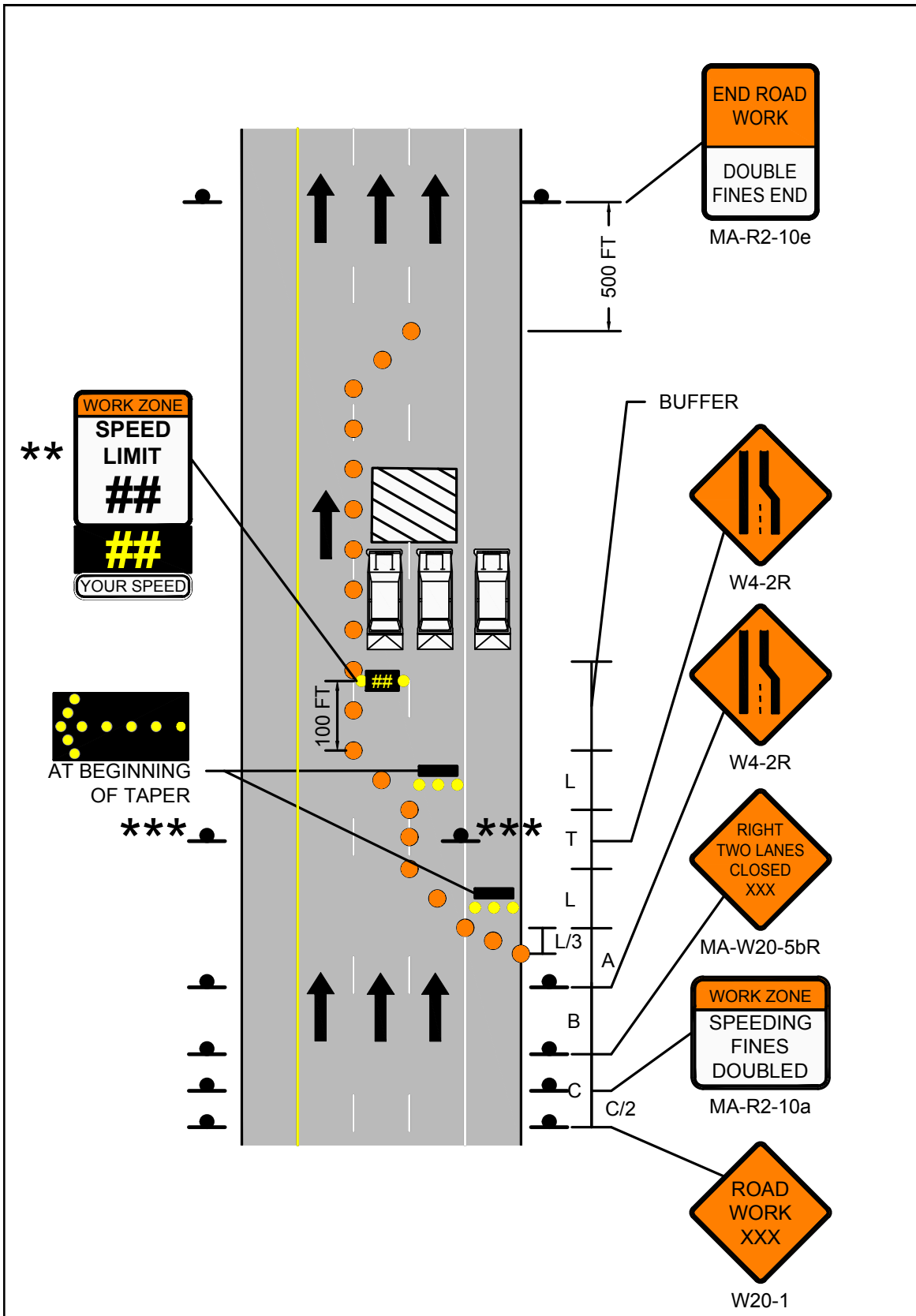
**NOTES**

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



**FIGURE 15**  
**STATIONARY OPERATIONS**  
**MULTILANE DIVIDED ROADWAY**  
**CENTER LANE OR RIGHT/CENTER**  
**LANES CLOSED**



 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 38</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR LEFT/CENTER LANES CLOSED</p>
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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

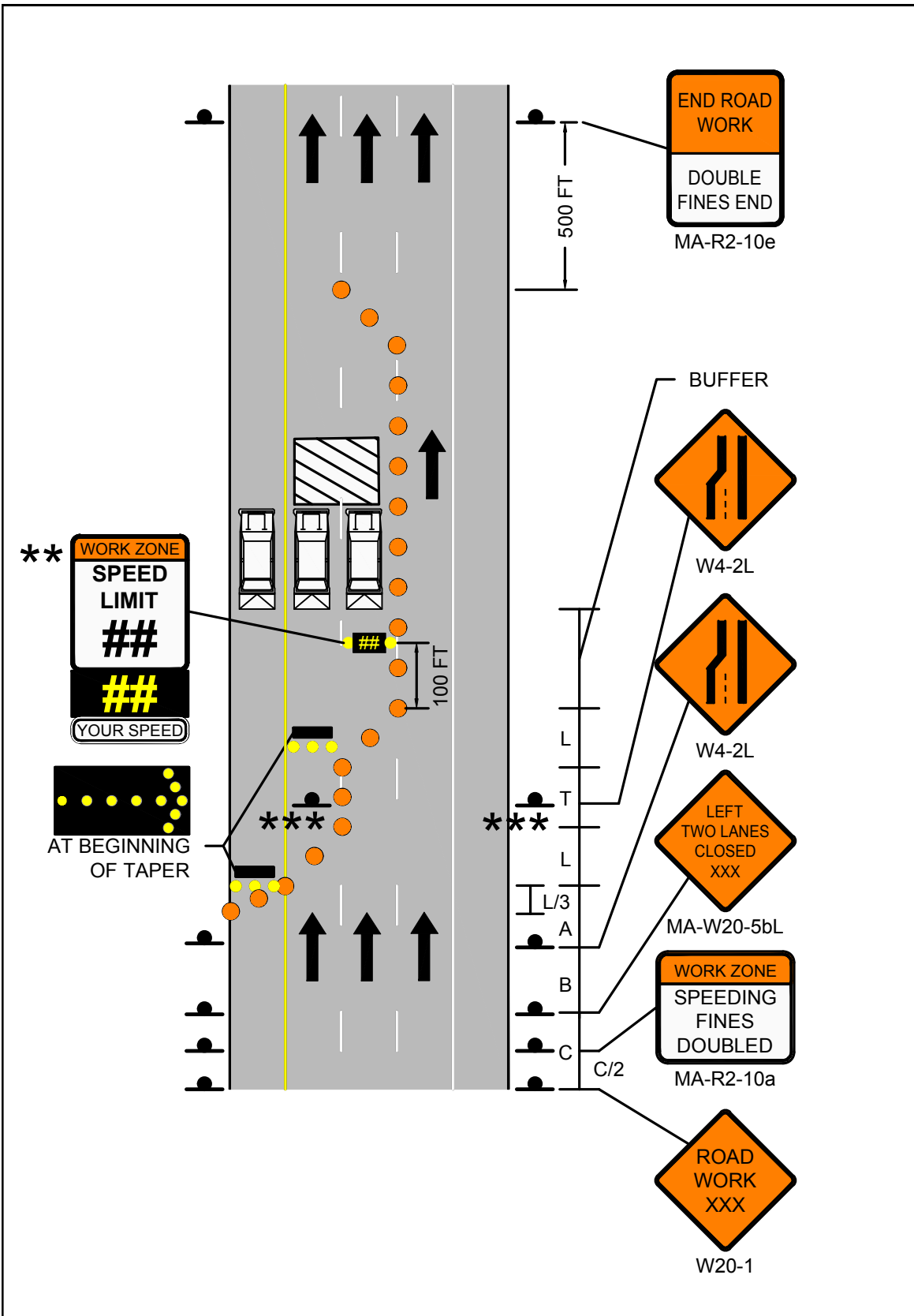
**NOTES**


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



 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 39</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 16 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR LEFT/CENTER LANES CLOSED</p>
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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.

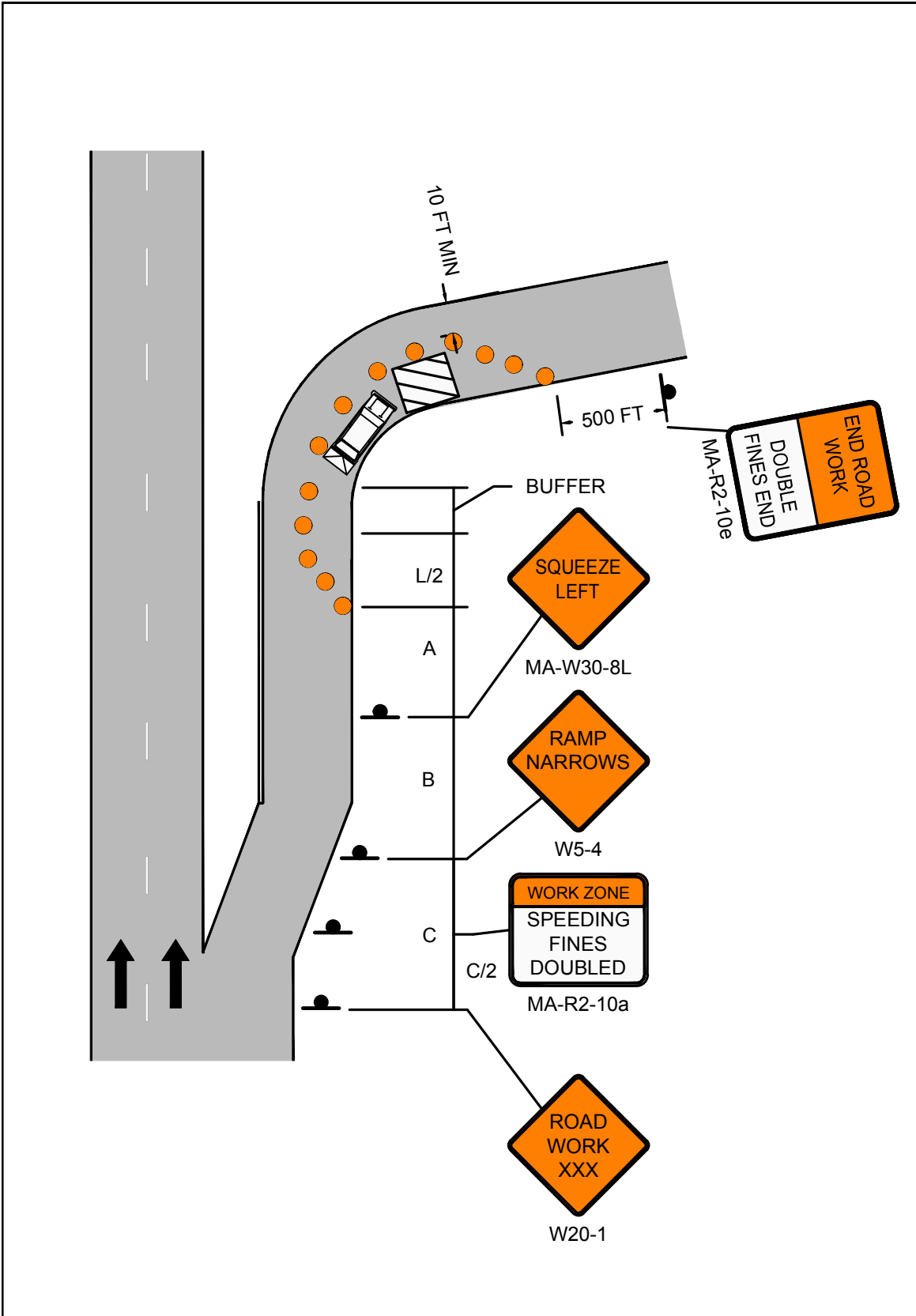
NOTES


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



 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 41</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 17 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY RIGHT SIDE OF OFF RAMP CLOSED</p>
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STATIONARY OPERATIONS  
MULTILANE DIVIDED ROADWAY  
LEFT SIDE OF OFF RAMP CLOSED










POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	160	305	20	45
45-55	500 / 1000 / 1000	330	495	40	35

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

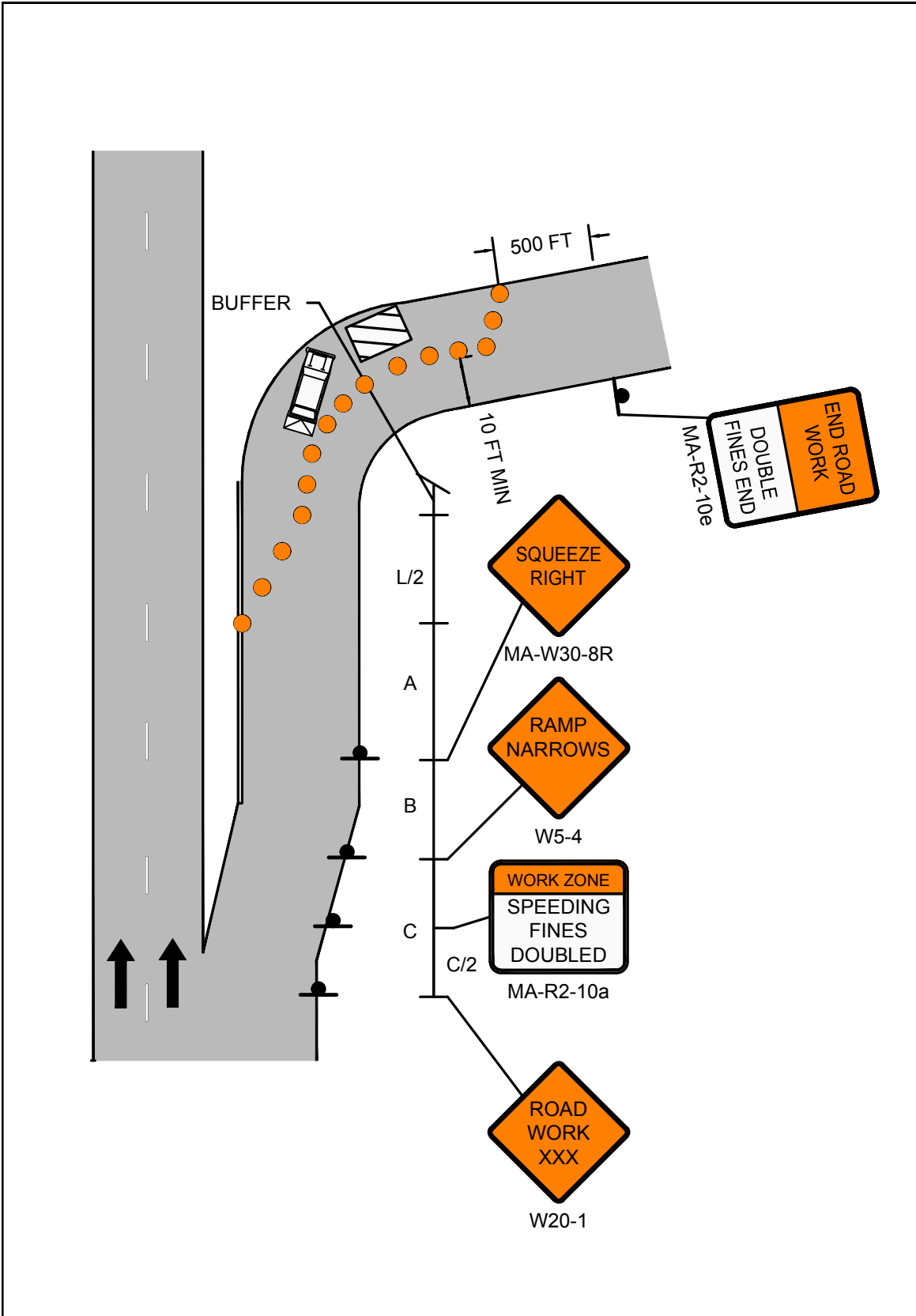
1. MA-R2-10a LOCATED AT C/2.

LEGEND

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE





	Work Zone Safety Standard Details and Drawings	FIGURE 18 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY LEFT SIDE OF OFF RAMP CLOSED PAGE 43
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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

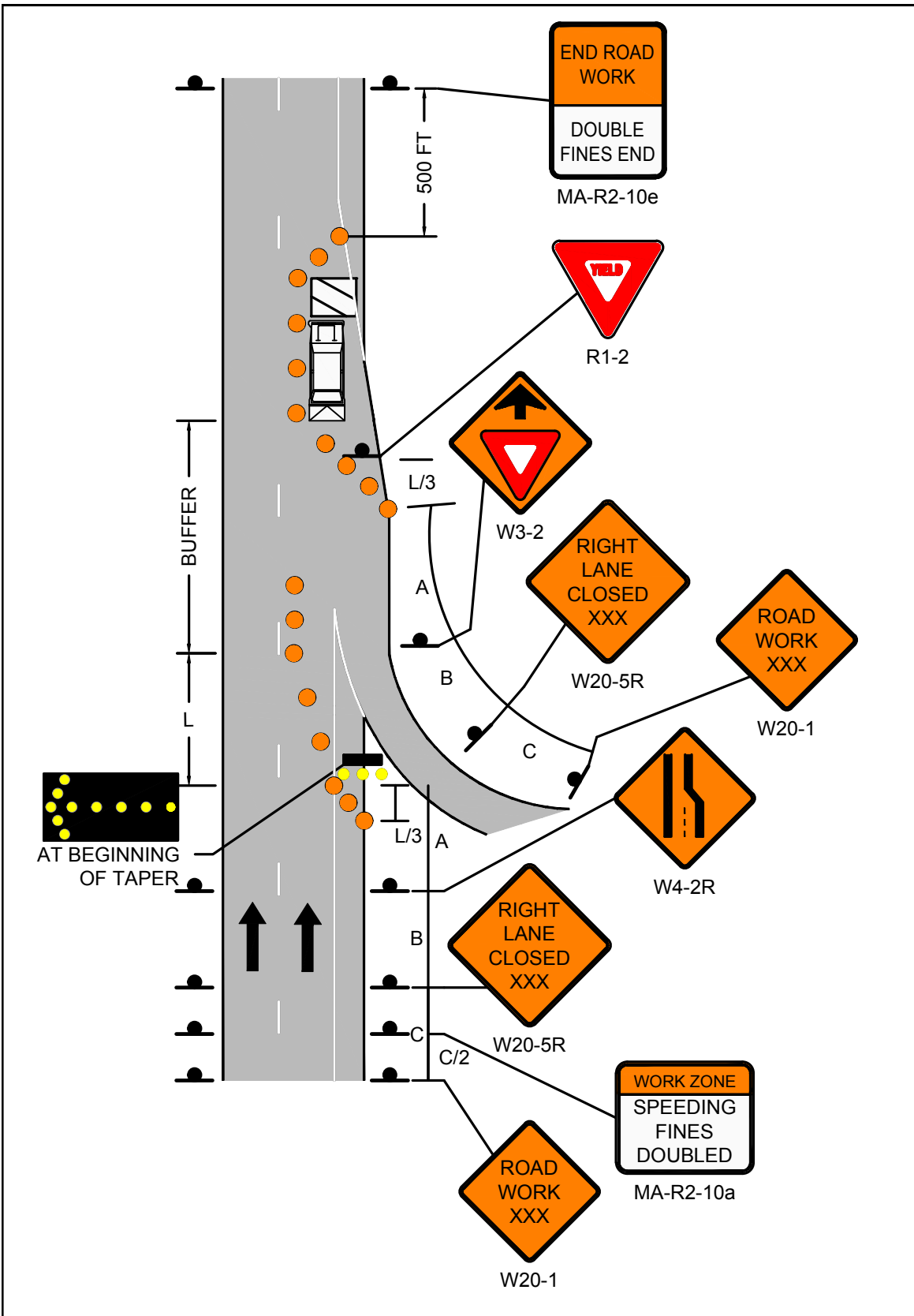
**NOTES**

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

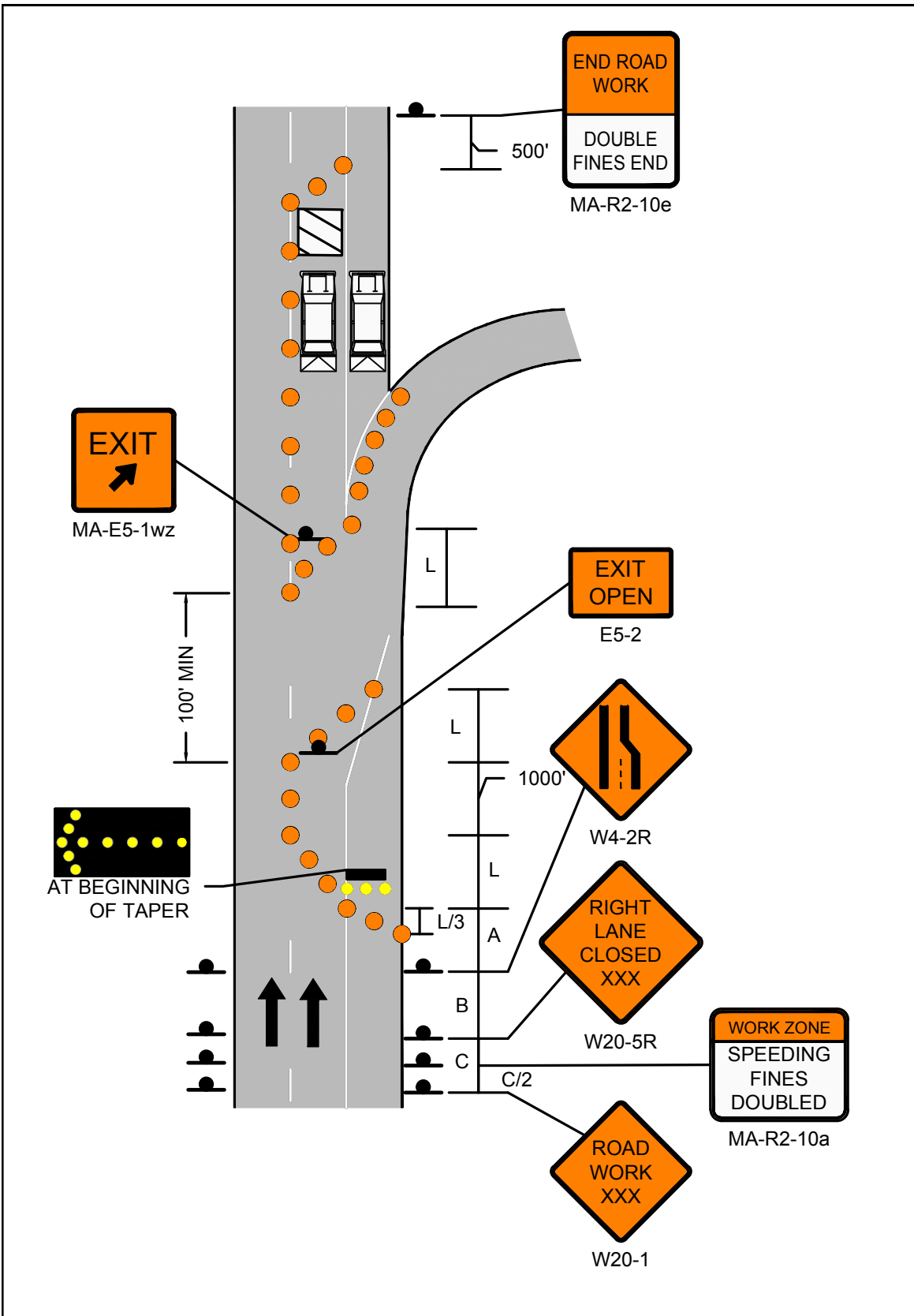
**NOTES**

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

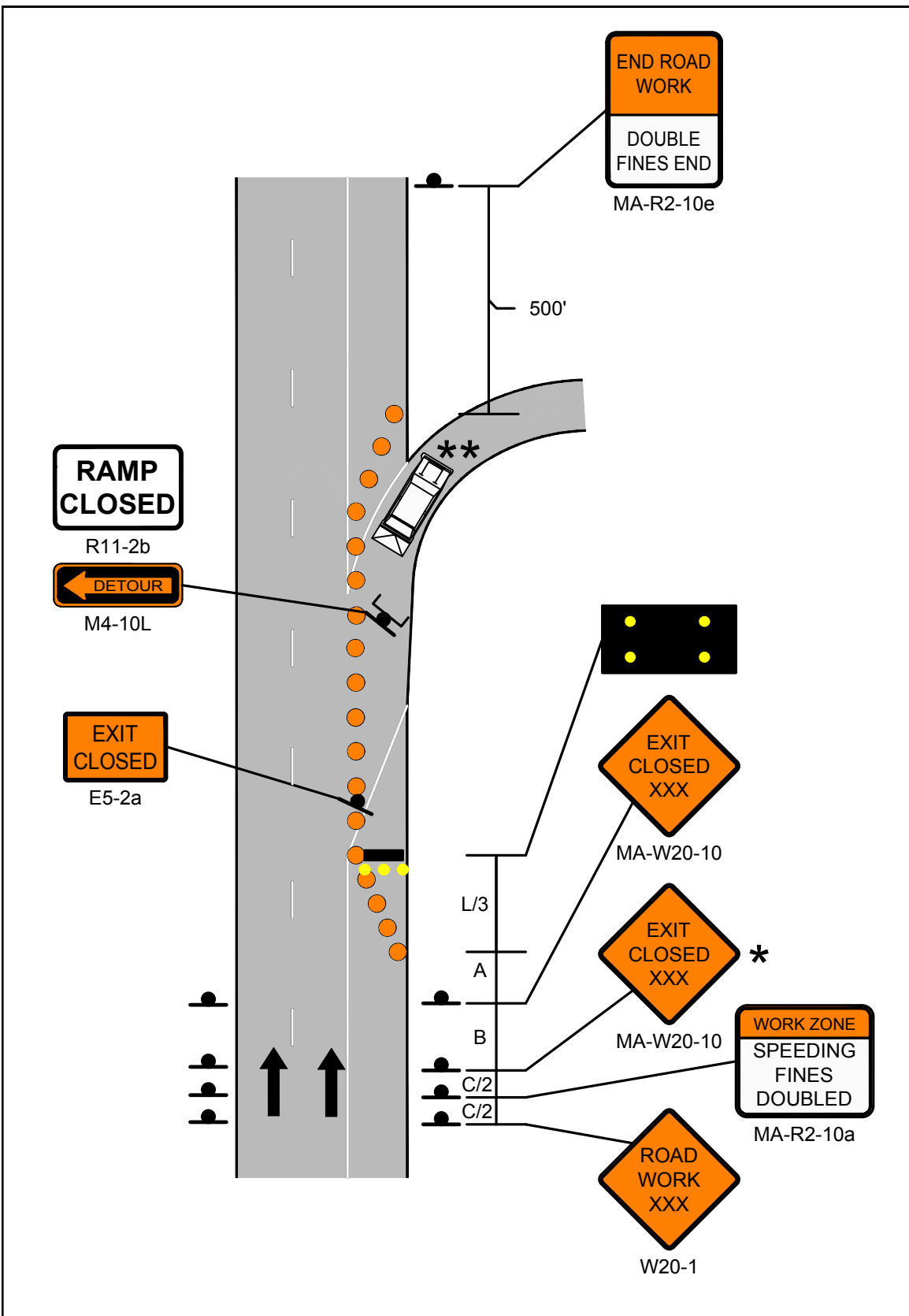
NOTES

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**

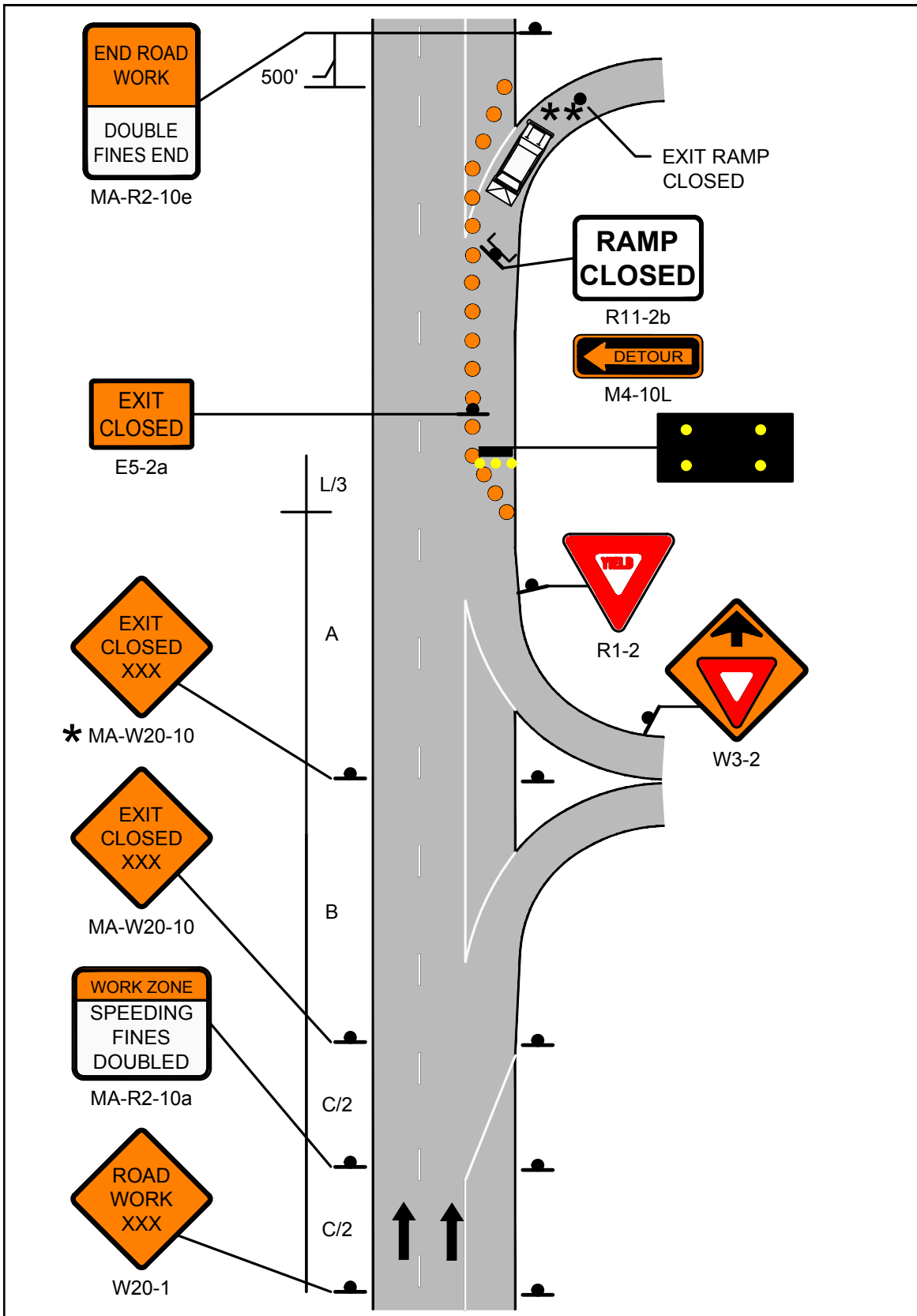
1. MA-R2-10a LOCATED AT C/2.
2. \* NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. \*\* OPTIONAL AT ENGINEER'S DISCRETION.


**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





 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 51</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 22 MULTILANE DIVIDED ROADWAY TYPICAL CLOVERLEAF RAMP CLOSURE</p>
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

Work Zone Safety  
Standard Details  
and Drawings

MULTILANE DIVIDED ROADWAY  
TYPICAL RAMP CLOSURE  
ADVANCE SIGNING

NOTES

1. IF THE CLOSED RAMP IS LOCATED DOWNSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED AT A SUFFICIENT DISTANCE IN ADVANCE OF THE DETOUR ROUTE/RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.
2. IF THE CLOSED RAMP IS LOCATED UPSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED PRIOR TO THE CLOSED RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.
3. A SUFFICIENT NUMBER OF DETOUR SIGNS (M4-9 SERIES) SHOULD BE DEPLOYED TO PROPERLY DIRECT DETOURED TRAFFIC. SIGN SPACING SHALL BE AT THE DIRECTION OF THE ENGINEER.

LEGEND

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE

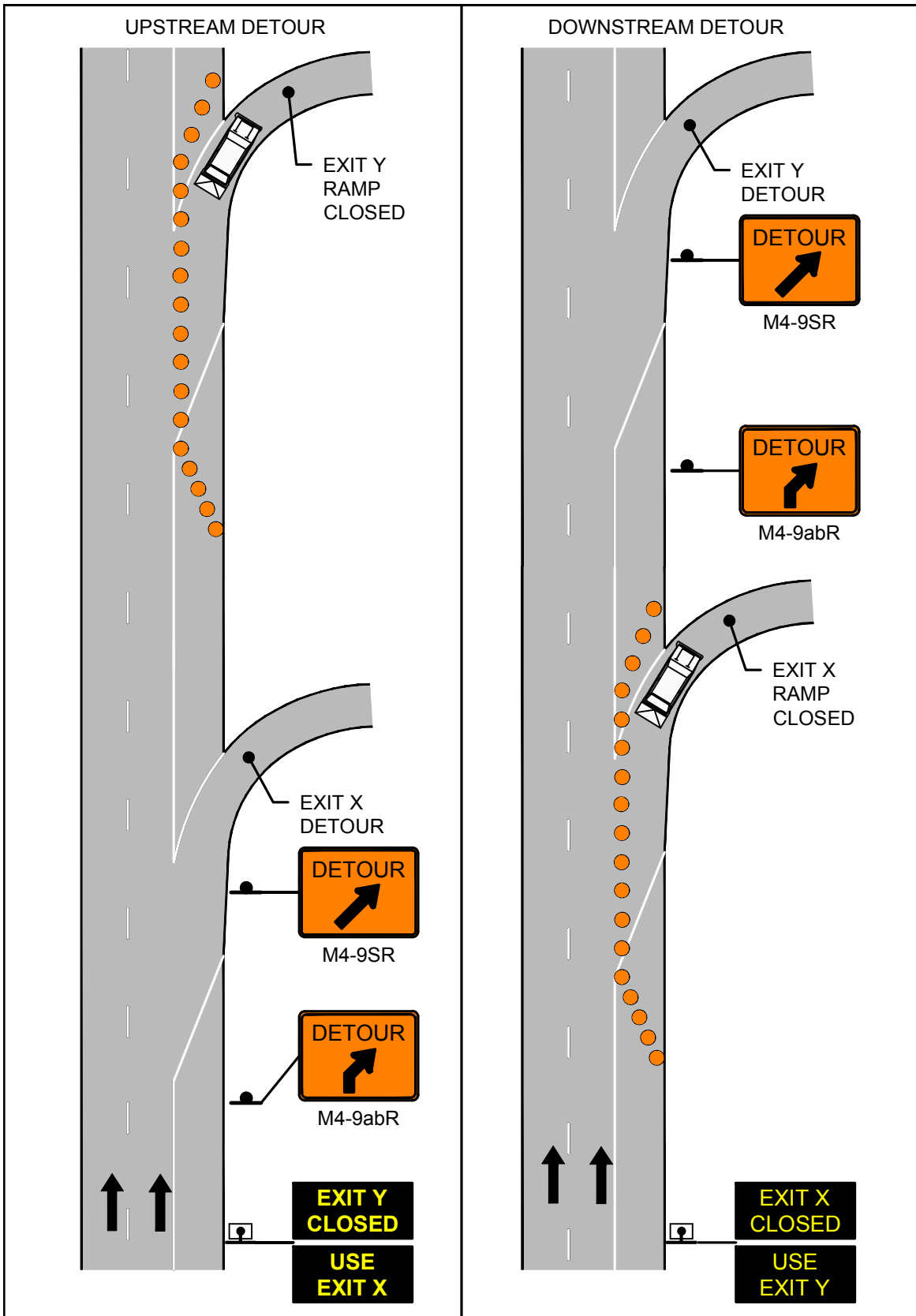


FIGURE 23  
MULTILANE DIVIDED ROADWAY  
TYPICAL RAMP CLOSURE  
ADVANCE SIGNING



FIGURE 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

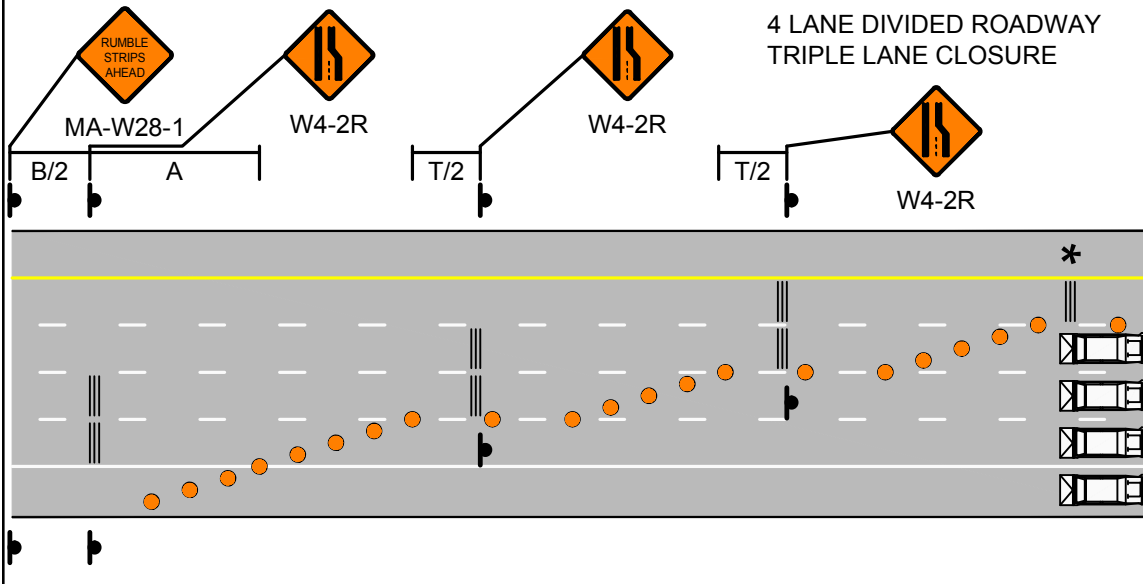
**NOTES**

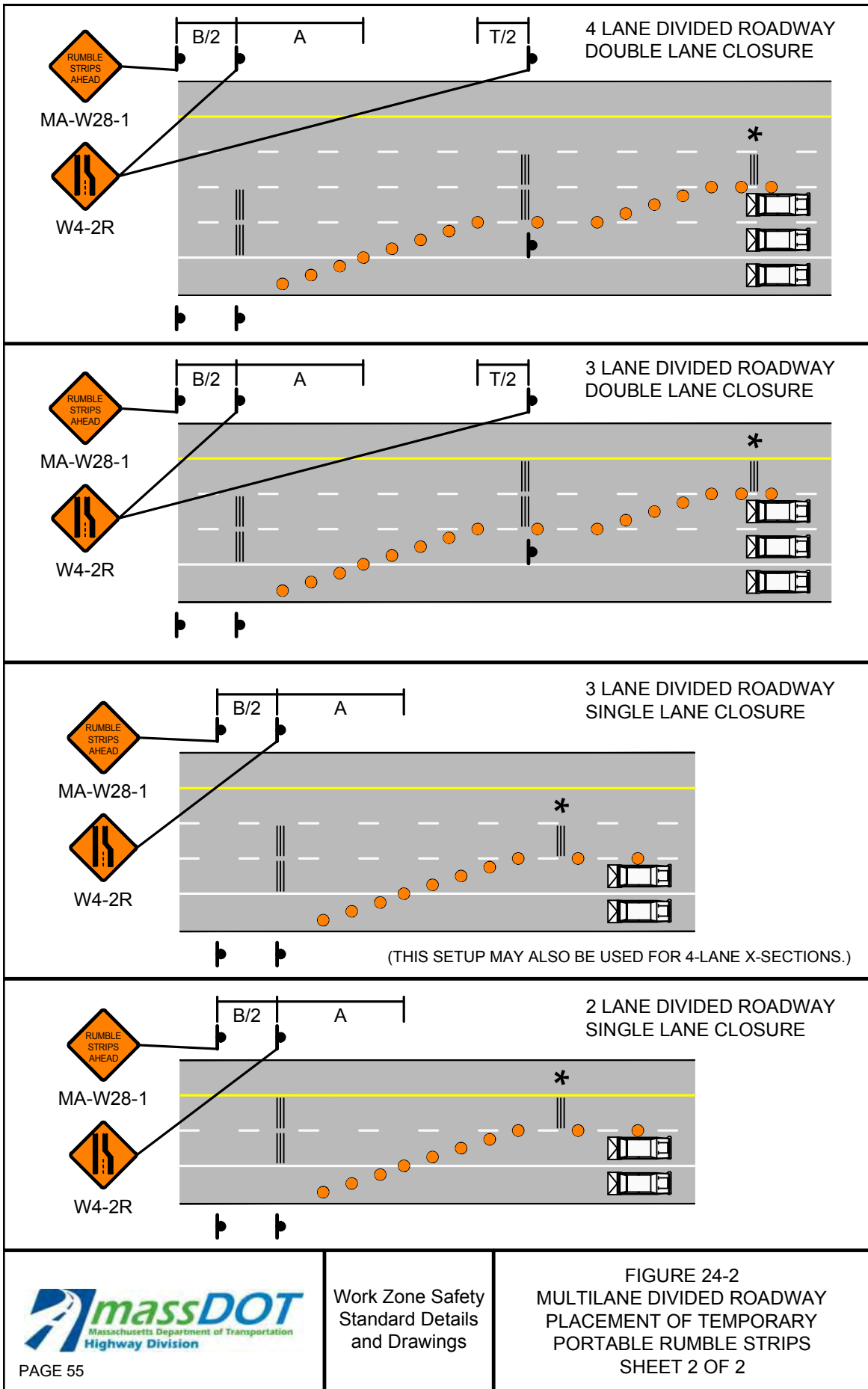
1. THE INTENTION OF THESE DETAILS IS ONLY TO DEPICT THE PLACEMENT OF TEMPORARY PORTABLE RUMBLE STRIPS (TPRS) IN RELATIONSHIP TO THE TAPER AND THE BUFFER OF A SINGLE- OR MULTI-LANE CLOSURE. THE DEPICTION OF THE NUMBER AND SPACING OF ALL OTHER TRAFFIC CONTROL DEVICES IS NOT TO SCALE. REFER TO OTHER DETAILS 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

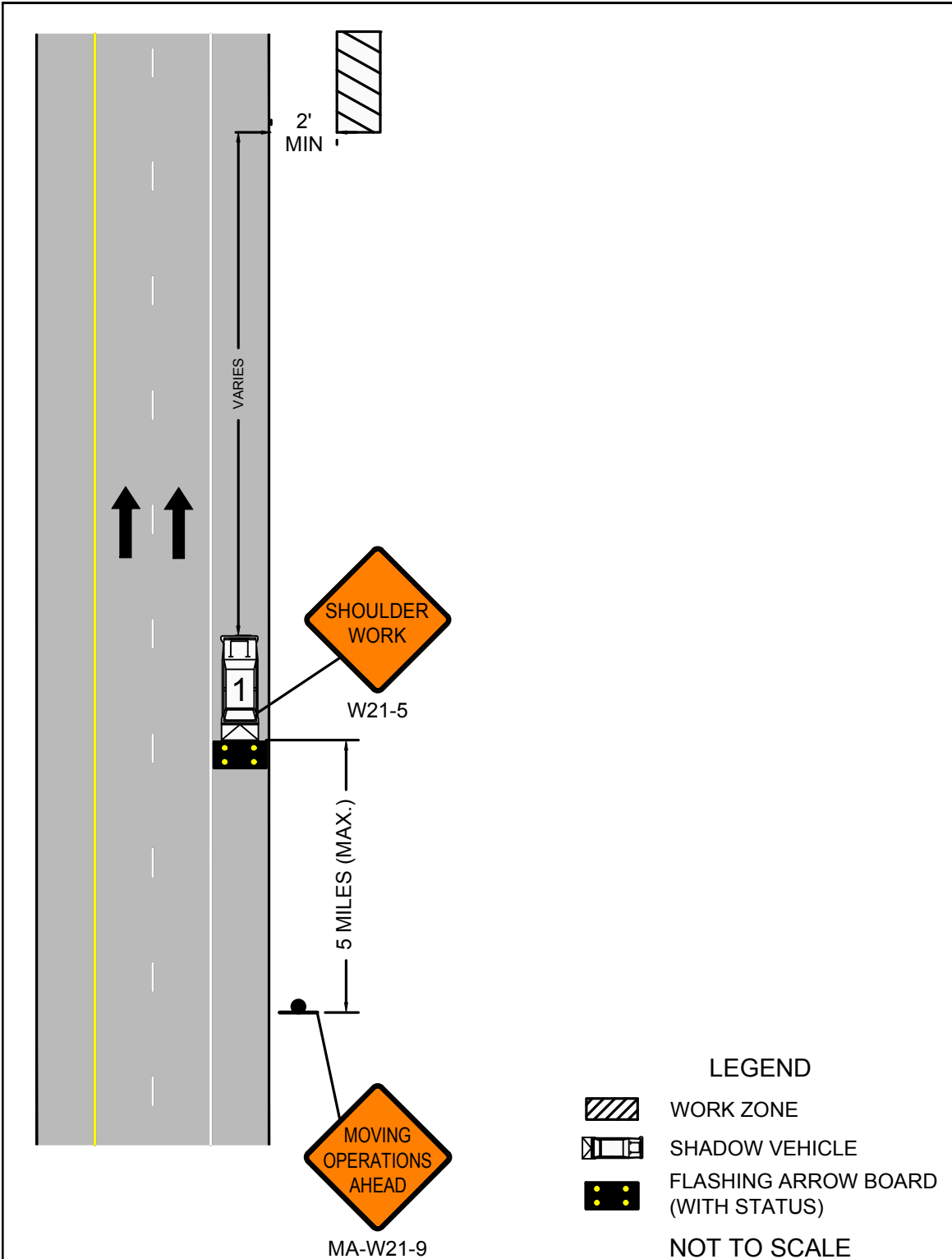




 <p>PAGE 56</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>NOTES FOR MOBILE OPERATIONS</p>
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**Notes for Mobile Operations**

- Unless otherwise stated, these notes shall apply to all Mobile Operation setups.
  - Additional, setup-specific notes may be found on individual sheets.
1. The Supervisor shall travel the designated roadway prior to scheduling the work to ensure that sufficient and appropriate traffic control devices will be available. Special consideration shall be exercised to ensure that appropriate traffic controls be placed in areas that will have limited visibility of the work areas or any associated traffic queues.
  2. Vehicles used for these operations shall be made highly visible with appropriate equipment such as flashing lights, rotating beacons, flags, signs, flashing arrow boards, and/or portable changeable message signs. Any signs mounted to these vehicles shall not obscure the visibility of other devices.
  3. All vehicles shown may not be required based upon roadway conditions. However, when needed and practical, additional shadow vehicles and equipment to warn and protect motorists and workers should be used. Based upon roadway conditions, the addition of a police detail with cruiser may be used for additional protection or warning for the traveling public.
  4. The distance between the work and shadow vehicle(s) may vary according to the terrain and other factors. Shadow vehicles are used to warn traffic of the operations ahead. Whenever adequate sight distance exists, the shadow vehicle(s) should maintain the minimum appropriate distance and maintain the same speed to prevent non-work related vehicles from entering the work convoy. If this formation cannot be maintained then additional traffic control devices should be deployed in advance of any vertical or horizontal curves that may restrict the sight distance of an oncoming vehicle to either the work vehicle or associated traffic queue.
  5. All shadow vehicles shall be equipped with a truck or trailer mounted attenuator (TMA) and a flashing arrow board.
  6. Signs should be covered or turned from view when work is not in progress.
  7. Portable changeable message signs may be used in lieu of MA-W21-9 signs and any signs mounted directly to a shadow vehicle.



**NOTES**

1. IF THE WORK AREA IS SUFFICIENTLY AWAY FROM THE EDGE OF ROADWAY (20' MINIMUM) THEN SIGNS AND VEHICLES MAY NOT BE REQUIRED.

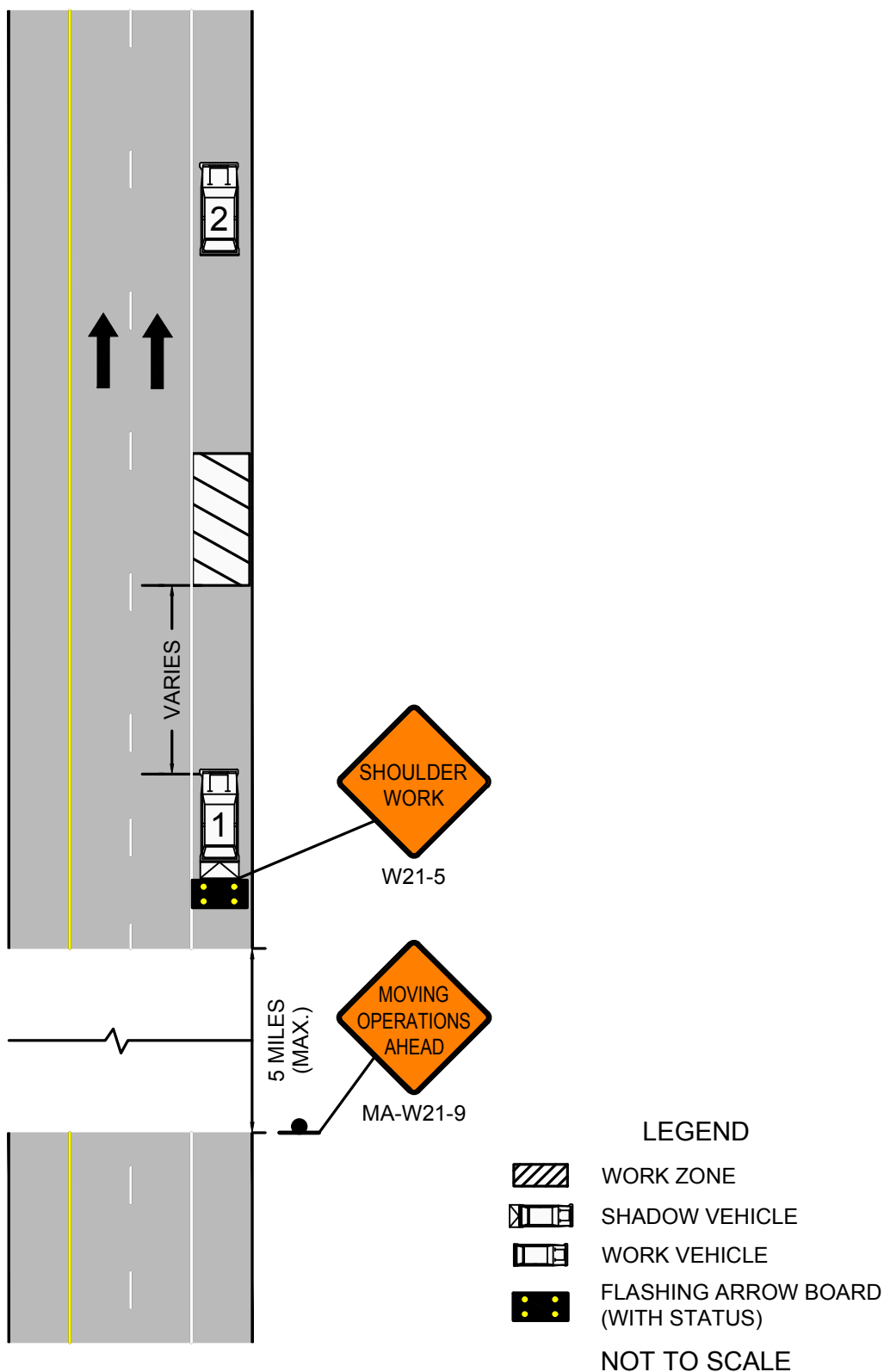
 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 57</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 25 MOBILE OPERATIONS ANY ROADWAY BEYOND RIGHT SHOULDER</p>
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Work Zone Safety  
Standard Details  
and Drawings

FIGURE 26  
MOBILE OPERATIONS  
ANY ROADWAY SHOULDER





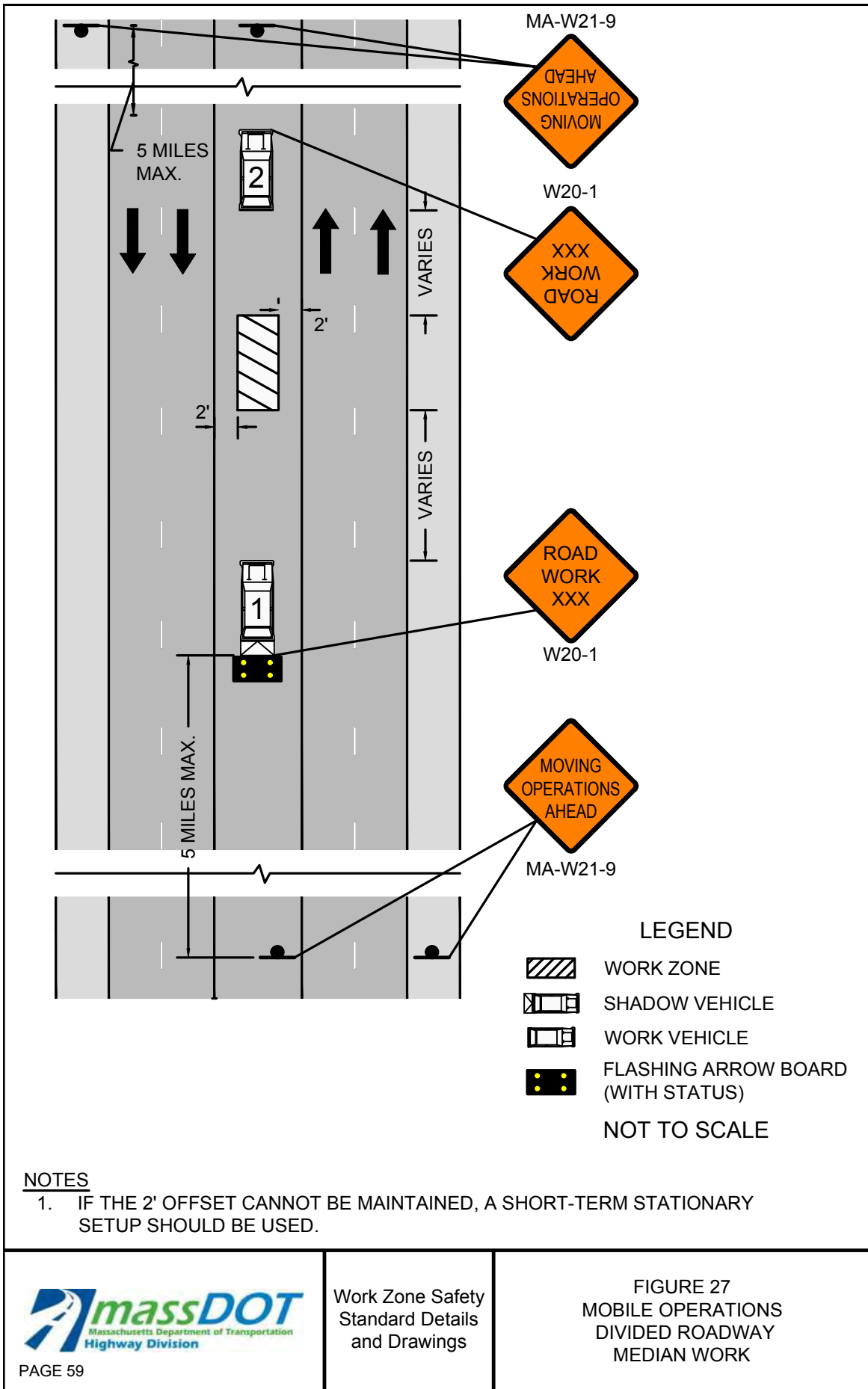
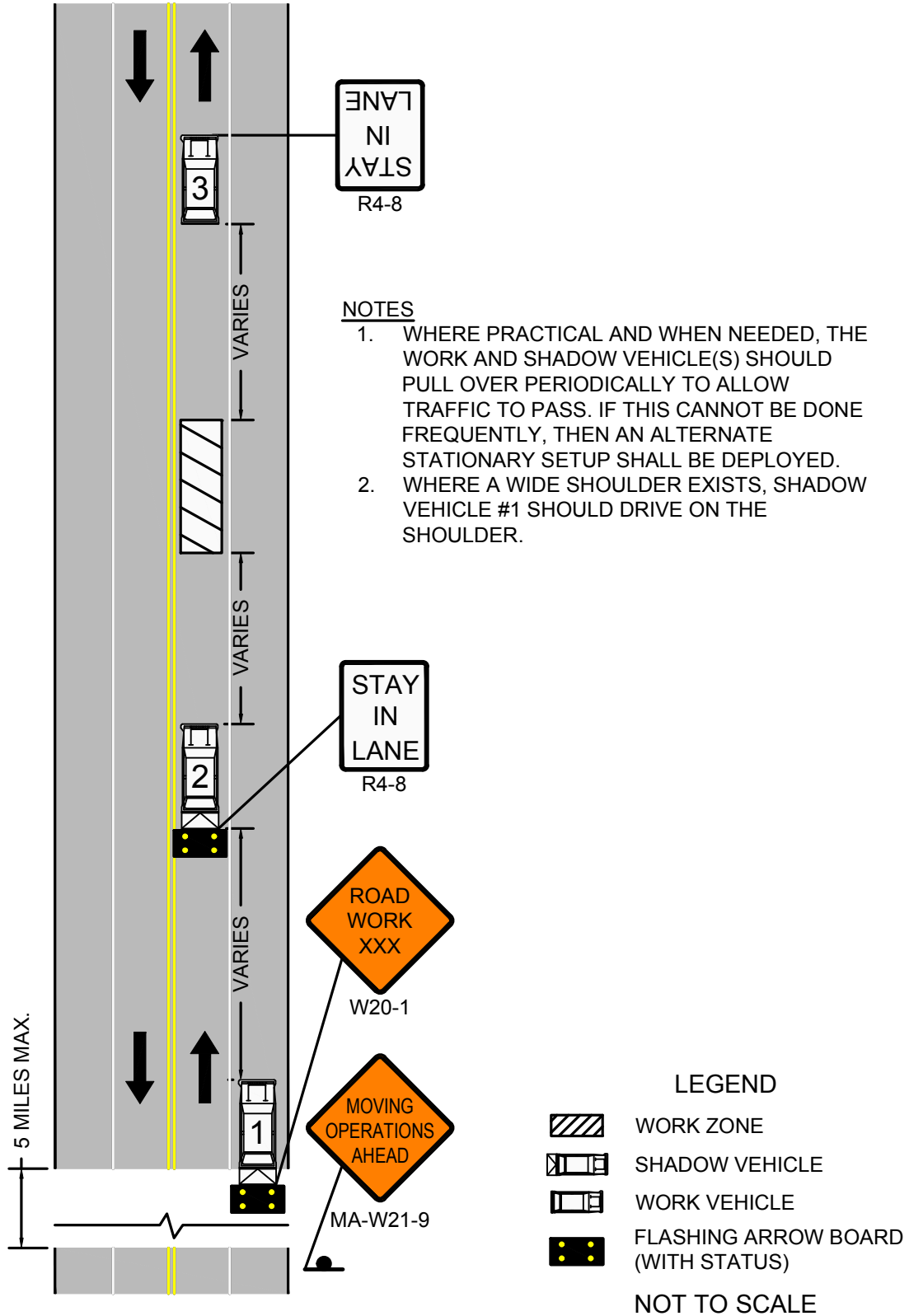




FIGURE 28  
MOBILE OPERATIONS  
UNDIVIDED TWO LANE ROADWAY  
HALF OF ROADWAY CLOSED



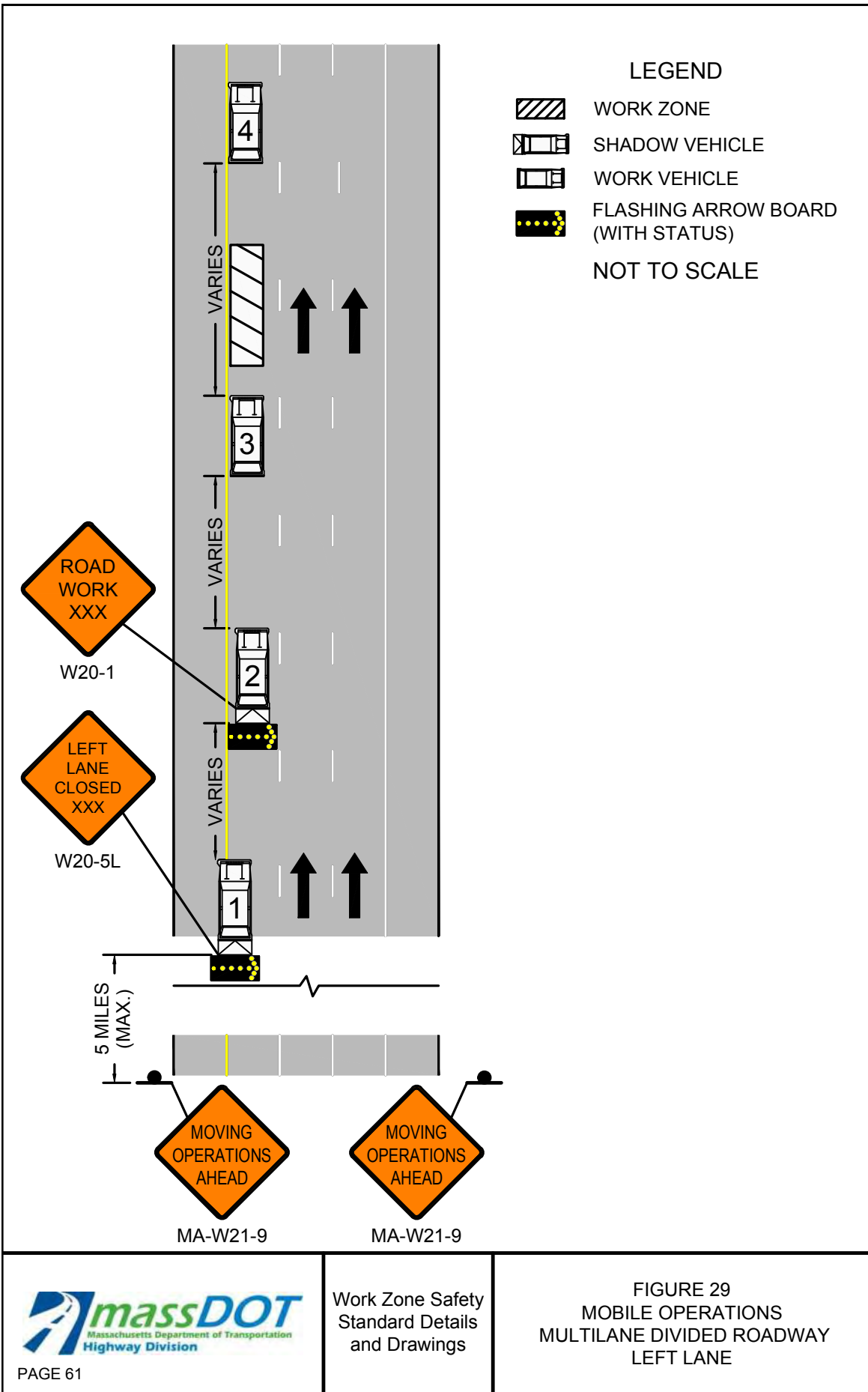
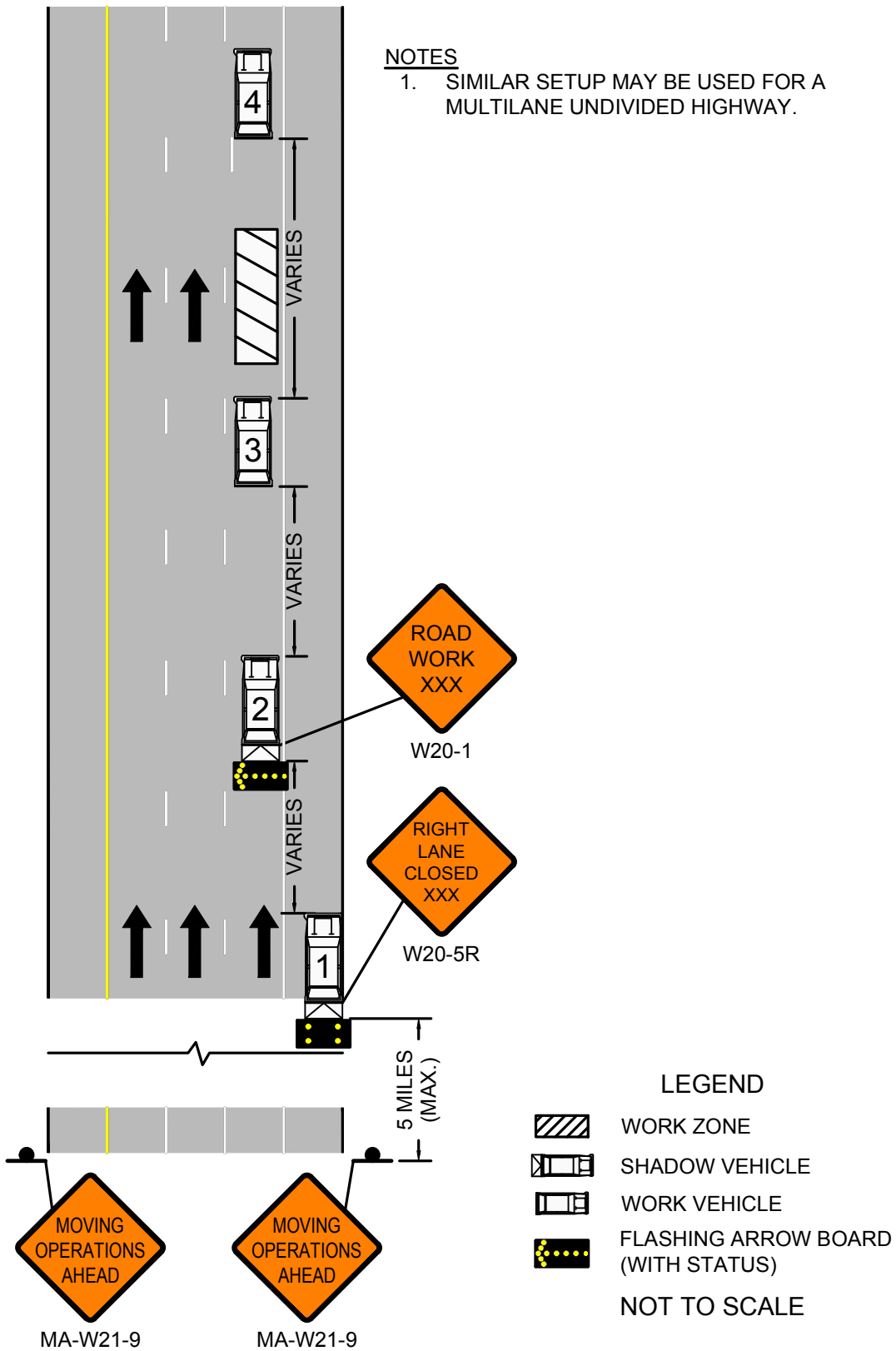
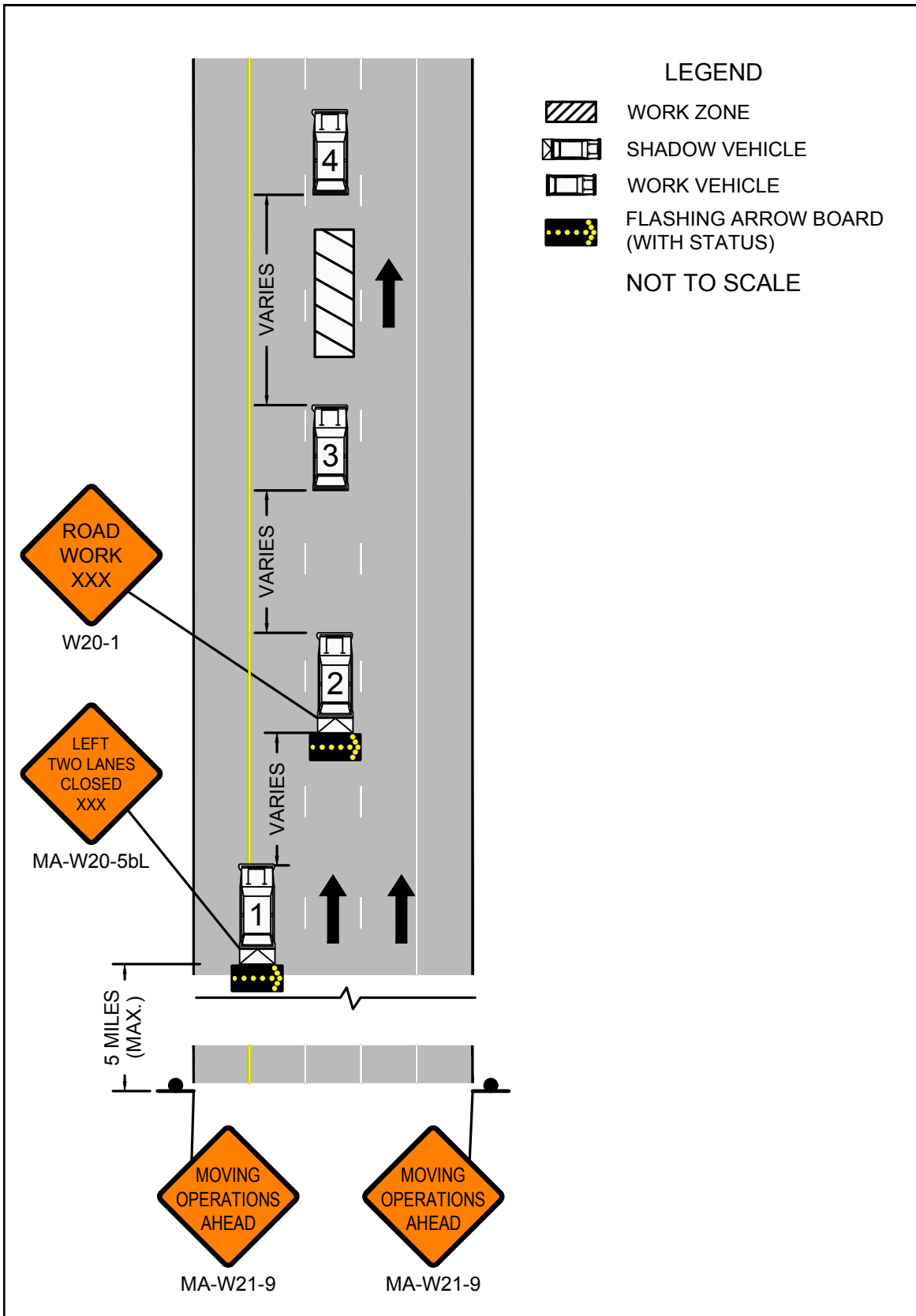
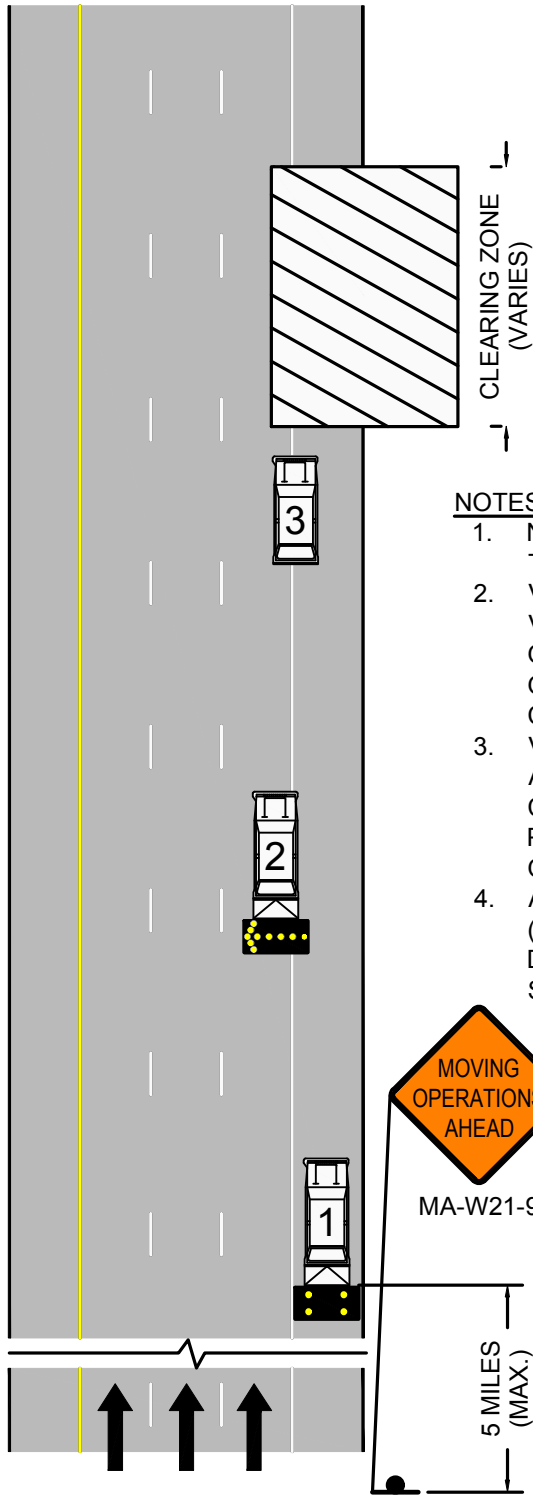




FIGURE 30  
MOBILE OPERATIONS  
MULTILANE DIVIDED ROADWAY  
RIGHT LANE











**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

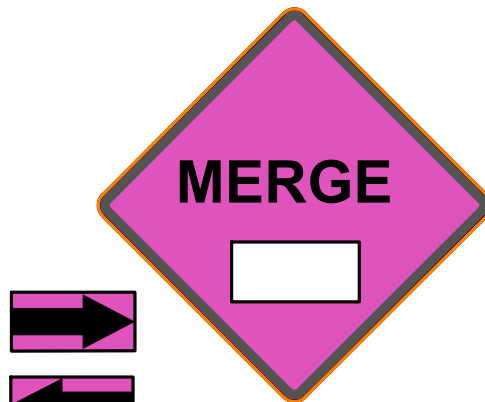
**Notes for Traffic Emergency or Incident Operations**

- 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



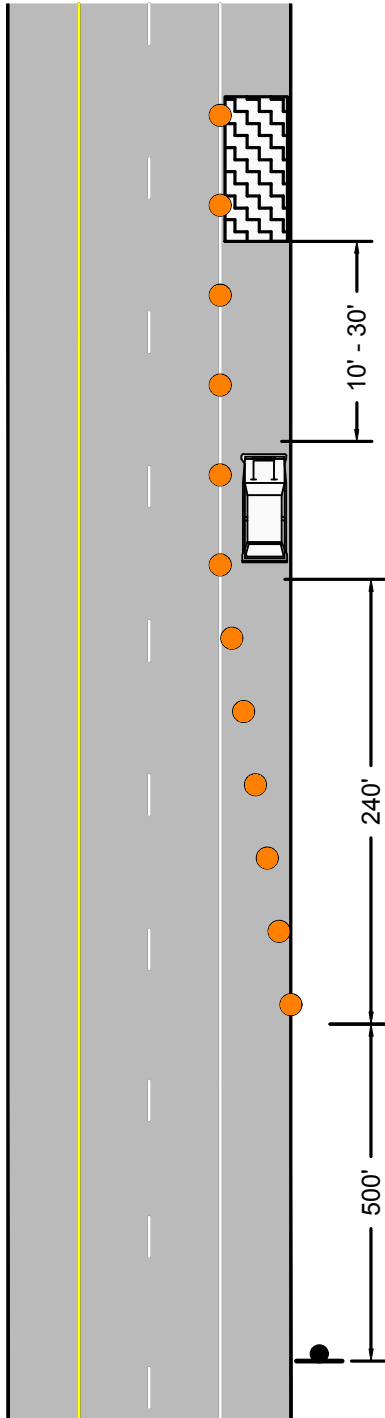


FIGURE 33  
EMERGENCY RESPONSE  
ANY ROADWAY  
SHOULDER ENCROACHMENT

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.

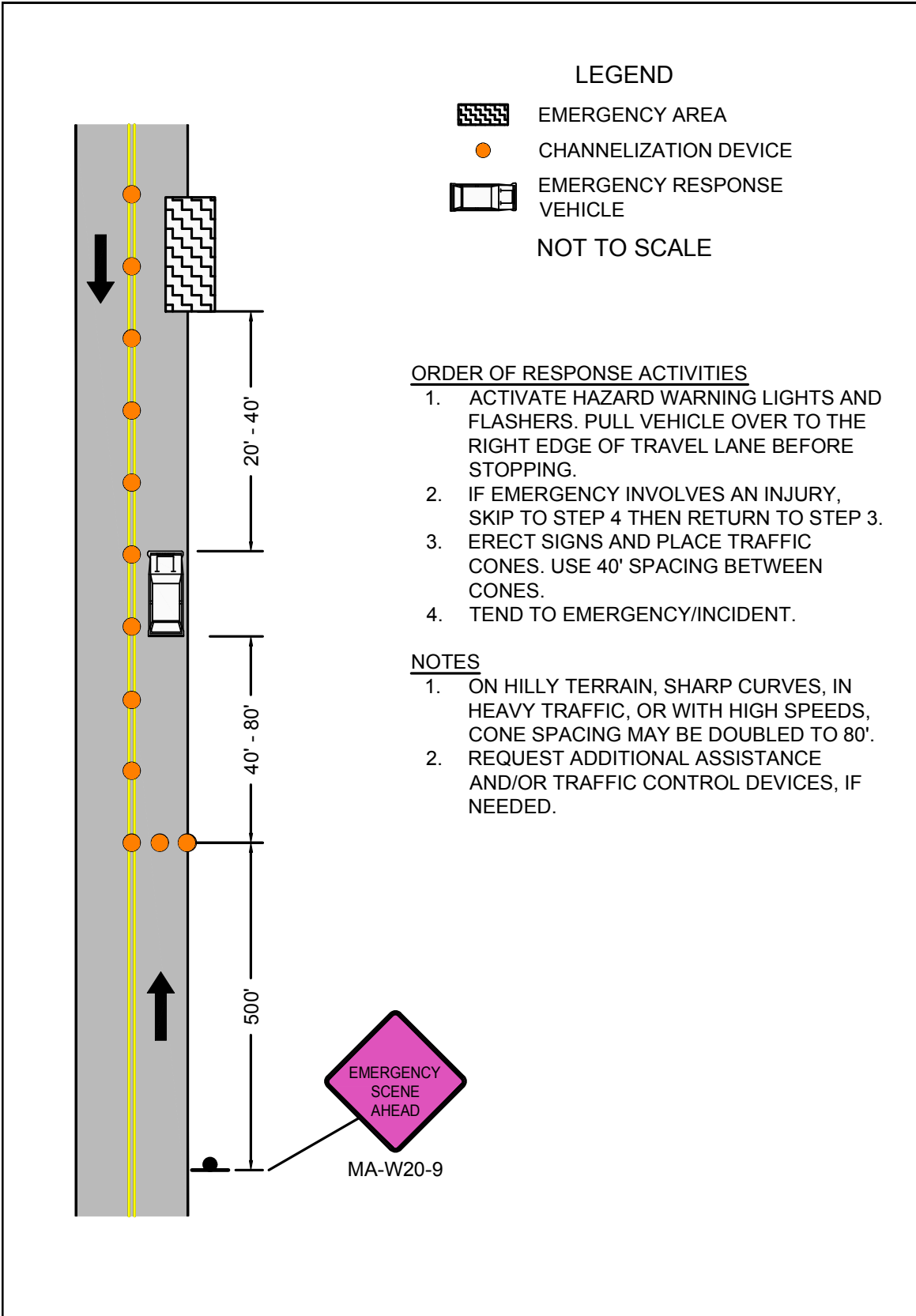
NOTES

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









 <p>Massachusetts Department of Transportation Highway Division</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p><b>FIGURE 34</b> EMERGENCY RESPONSE TWO LANE ROADWAY NO SHOULDER TRAVEL LANE ENCROACHMENT</p>
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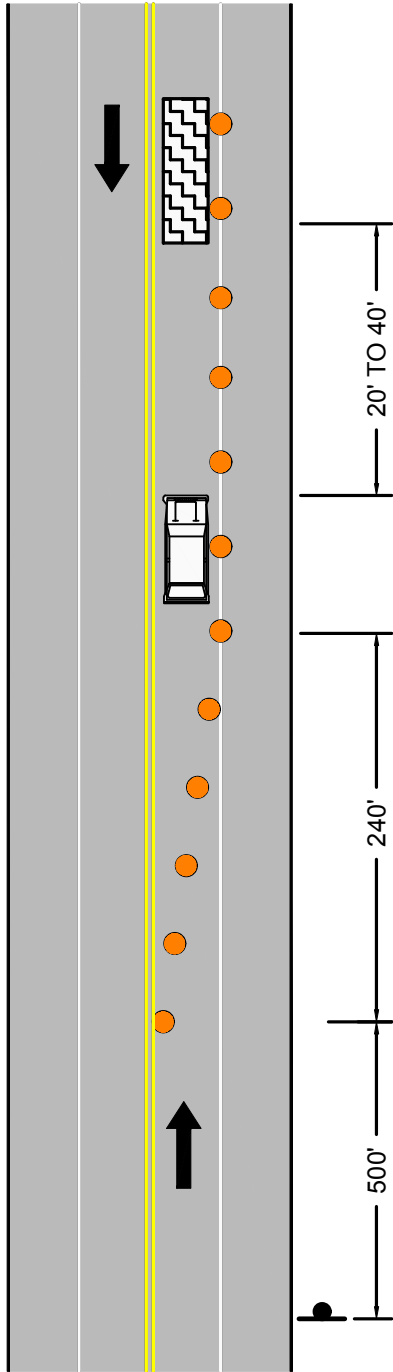


FIGURE 35  
EMERGENCY RESPONSE  
TWO LANE ROADWAY  
TRAVERSABLE SHOULDER  
SINGLE LANE ENCROACHMENT

LEGEND

-  EMERGENCY AREA
-  CHANNELIZATION DEVICE
-  EMERGENCY RESPONSE VEHICLE

NOT TO SCALE



ORDER OF RESPONSE ACTIVITIES

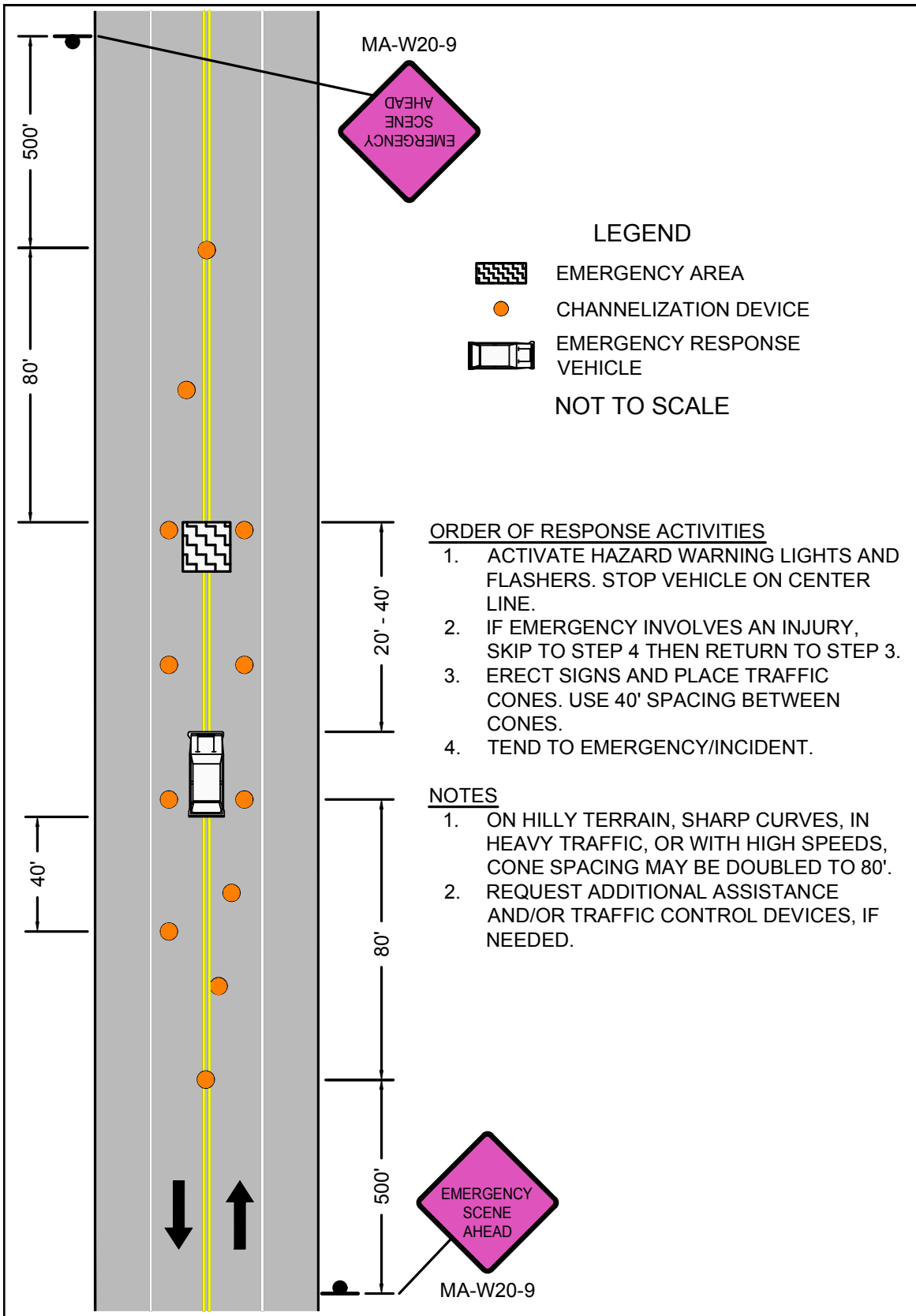
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE LEFT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

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




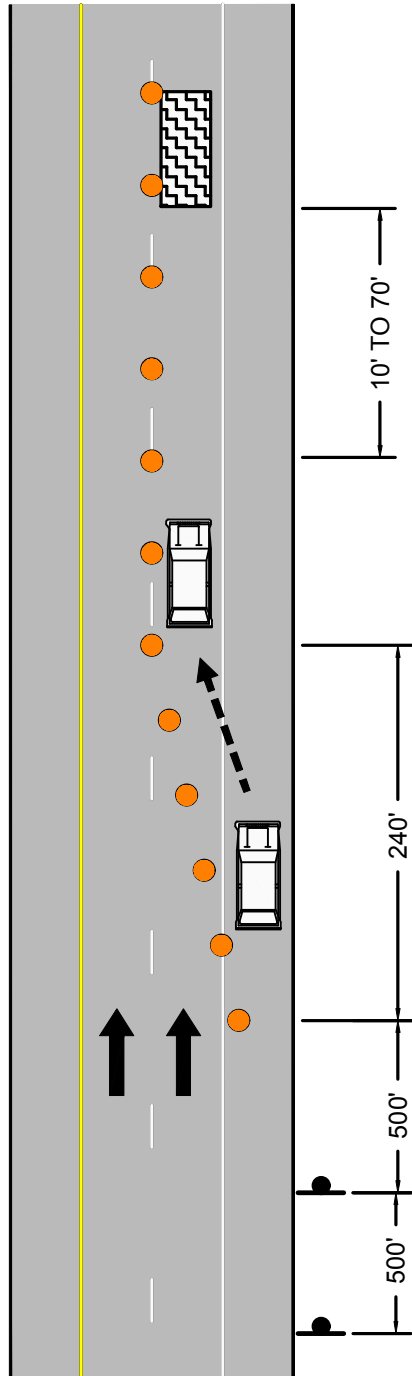




 <p>Massachusetts Department of Transportation Highway Division</p> <p>PAGE 69</p>	<p>Work Zone Safety Standard Details and Drawings</p>	<p>FIGURE 36 EMERGENCY RESPONSE TWO LANE ROADWAY TRAVERSABLE SHOULDER CENTER OF ROADWAY</p>
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FIGURE 37  
EMERGENCY RESPONSE  
MULTILANE DIVIDED ROADWAY  
RIGHT LANE



LEGEND

-  EMERGENCY AREA
-  CHANNELIZATION DEVICE
-  EMERGENCY RESPONSE VEHICLE
-  RESPONSE VEHICLE MOVEMENT

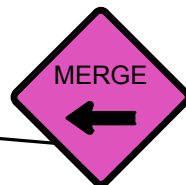
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

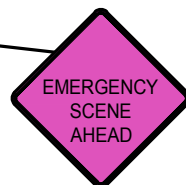
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN BREAKDOWN LANE.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 6 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. MOVE RESPONSE VEHICLE BEHIND EMERGENCY.
5. PLACE ADDITIONAL CONES.
6. TEND TO EMERGENCY.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



MA-W4-2aL



MA-W20-9

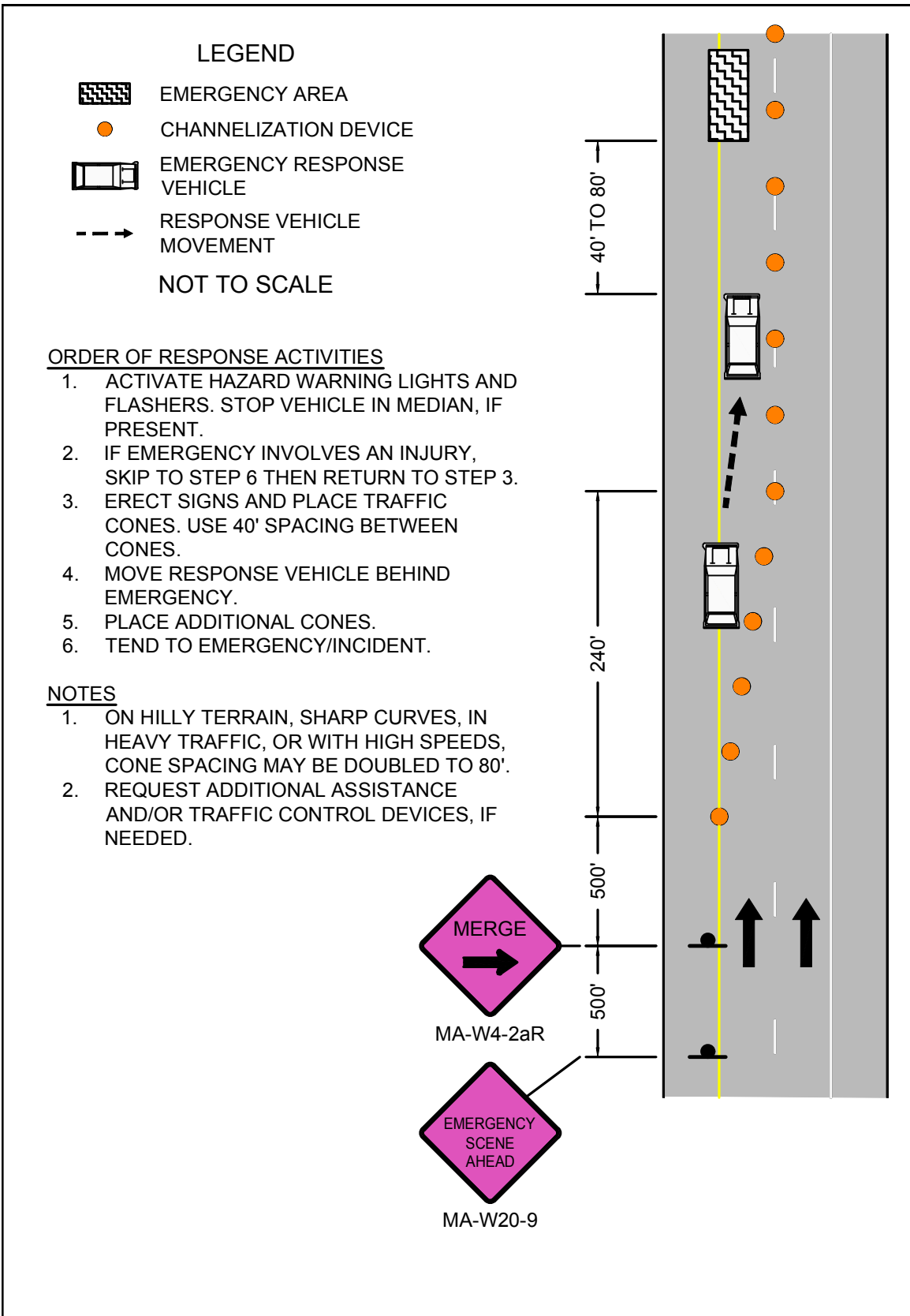
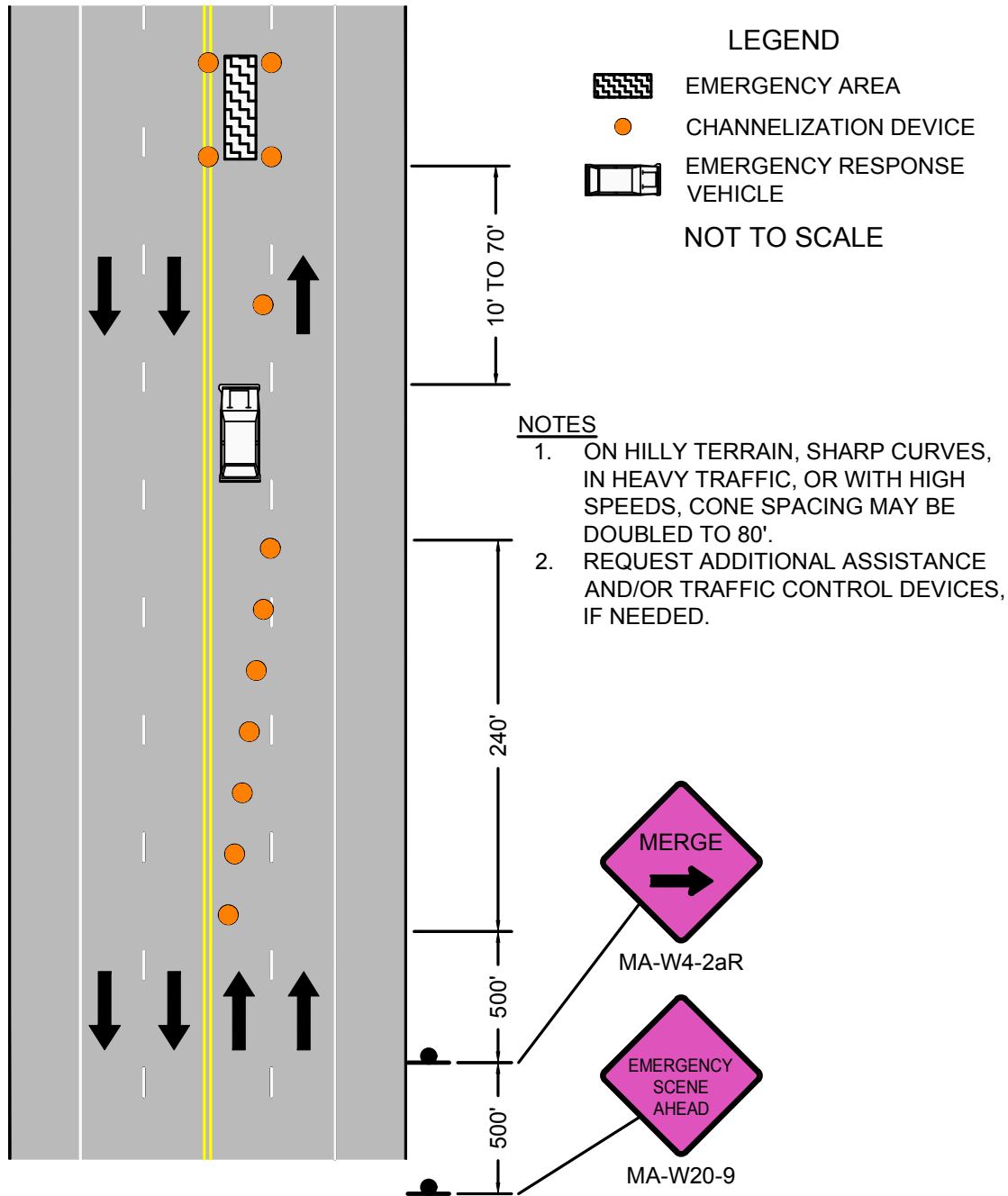




FIGURE 39  
EMERGENCY RESPONSE  
MULTILANE UNDIVIDED  
ROADWAY  
LEFT LANE



**ORDER OF RESPONSE ACTIVITIES**

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE RIGHT EDGE OF BREAKDOWN LANE OR SHOULDER OR, IF NOT PRESENT, 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.

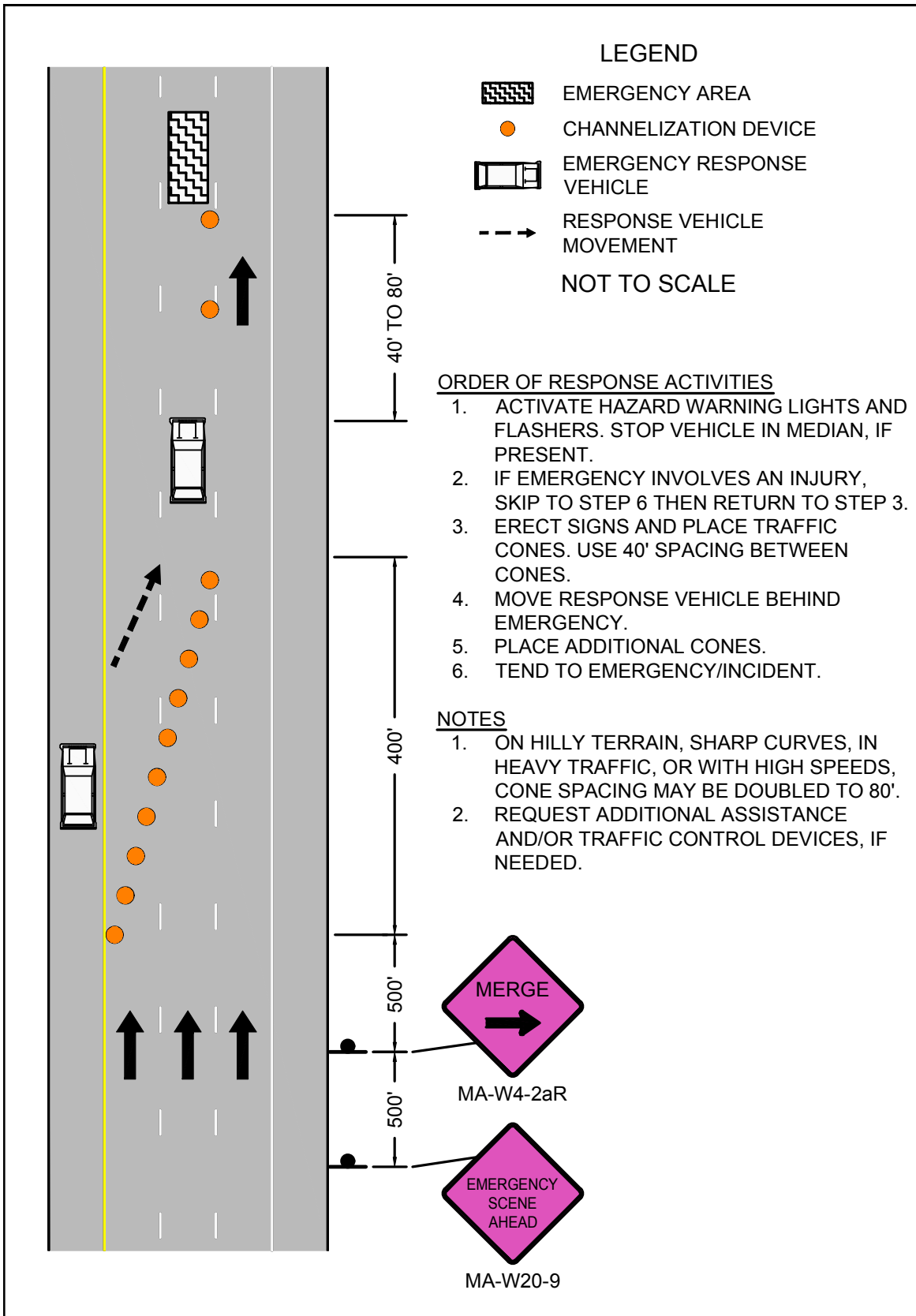
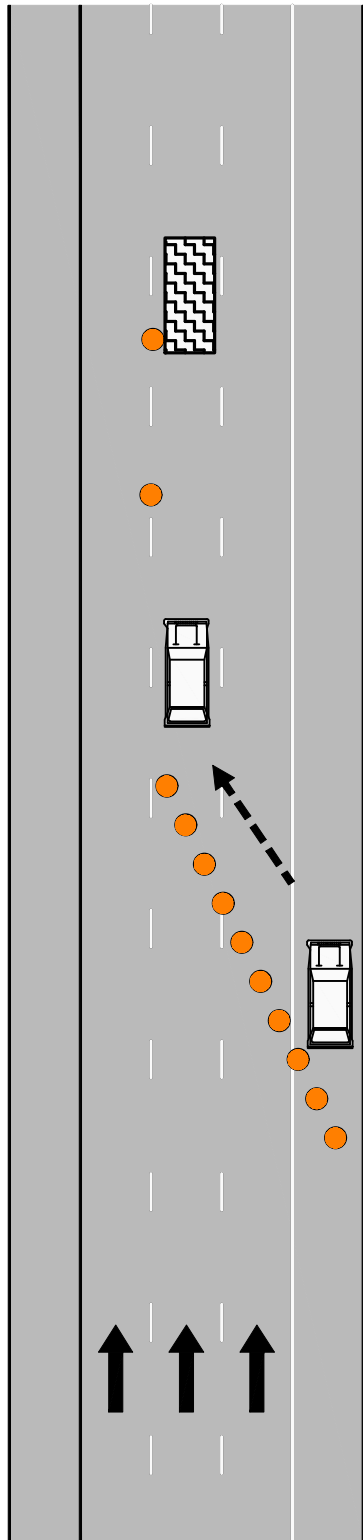








FIGURE 41  
EMERGENCY RESPONSE  
MULTILANE DIVIDED ROADWAY  
MIDDLE LANE  
APPROACH FROM RIGHT



LEGEND

-  EMERGENCY AREA
-  CHANNELIZATION DEVICE
-  EMERGENCY RESPONSE VEHICLE
-  RESPONSE VEHICLE MOVEMENT

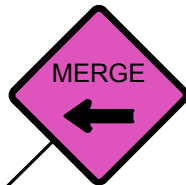
NOT TO SCALE

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



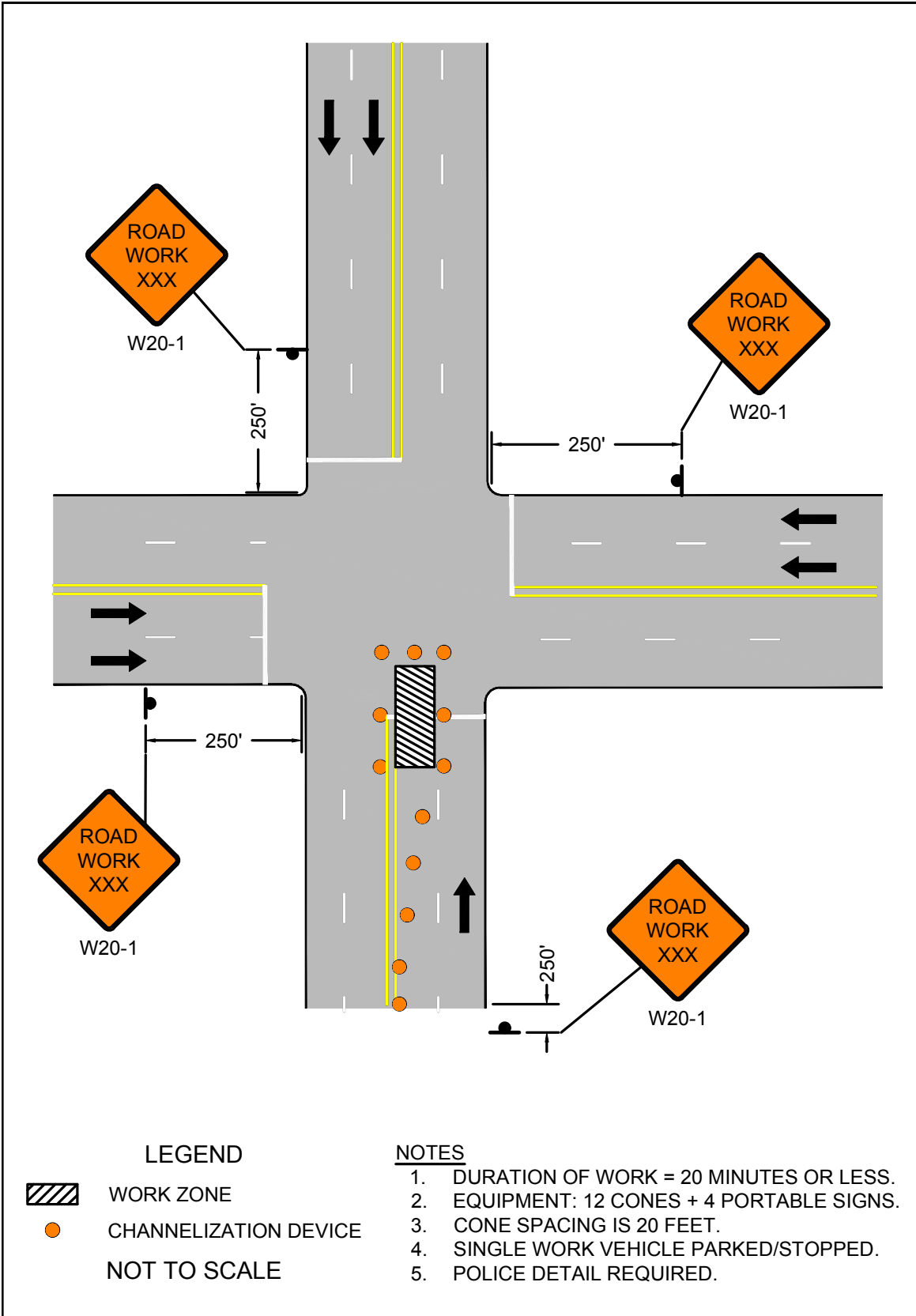
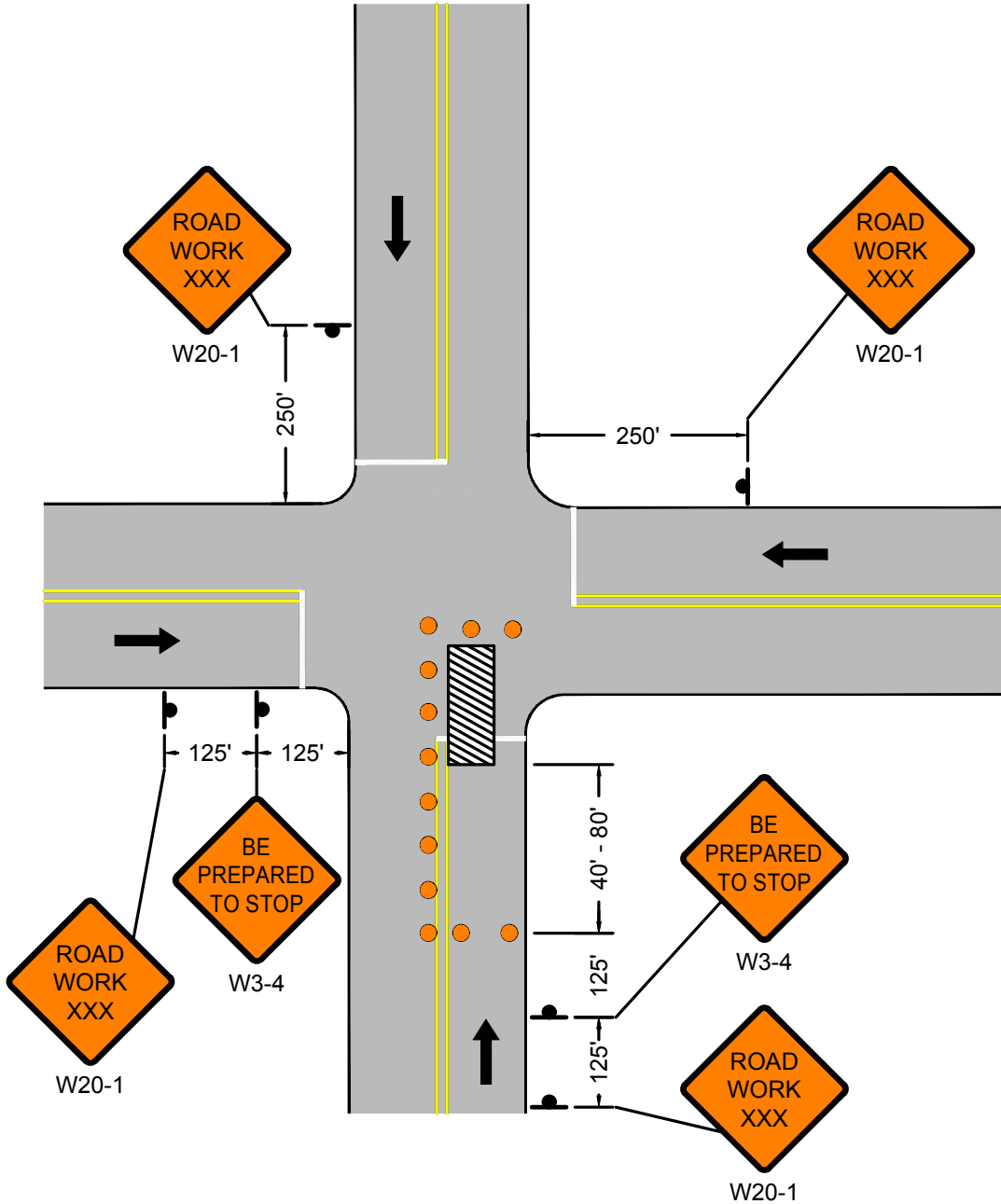






FIGURE 43  
TRAFFIC SIGNAL REPAIR WORK  
TWO LANE UNDIVIDED ROADWAY  
ONE LEG OF INTERSECTION

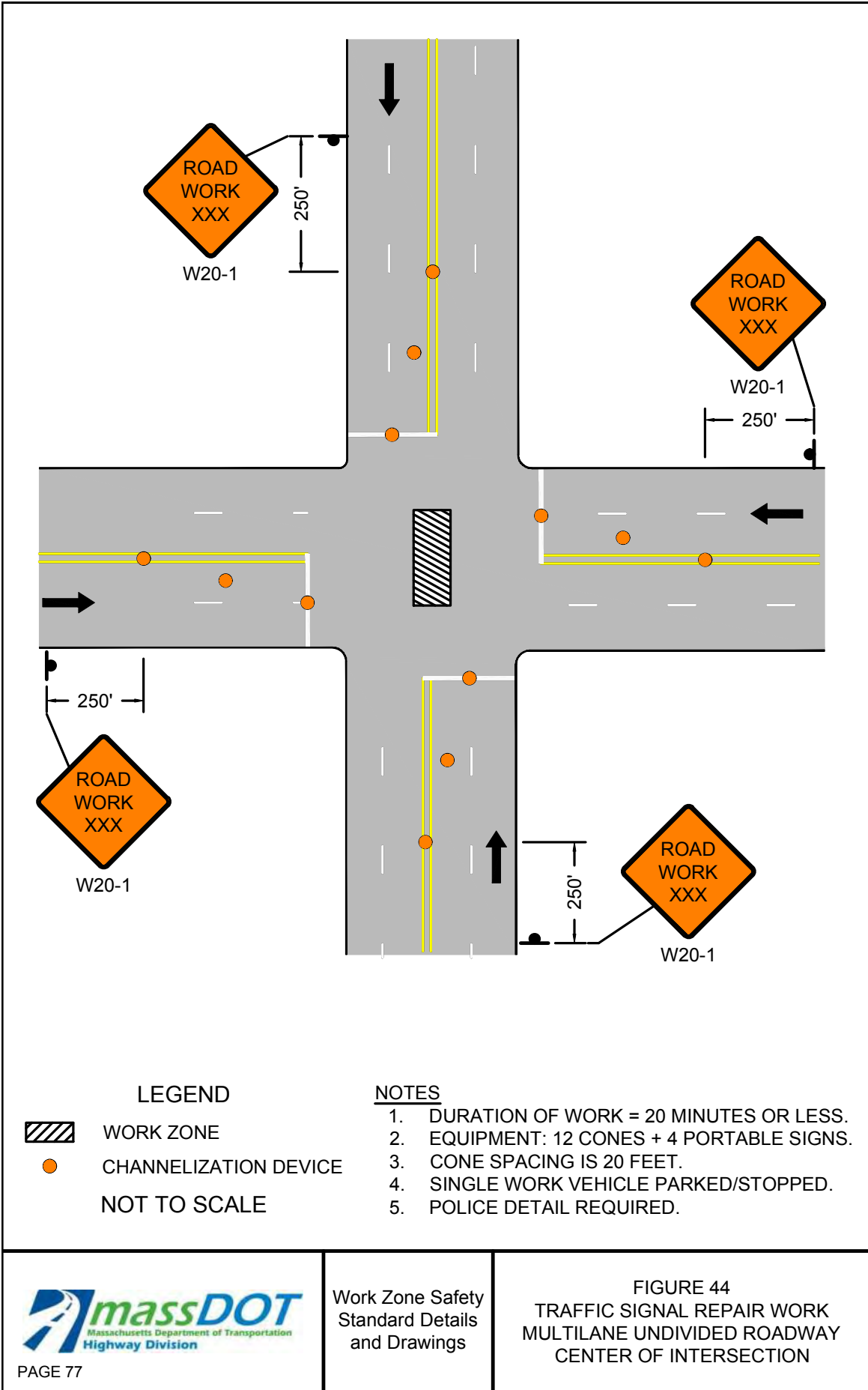


LEGEND

-  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.

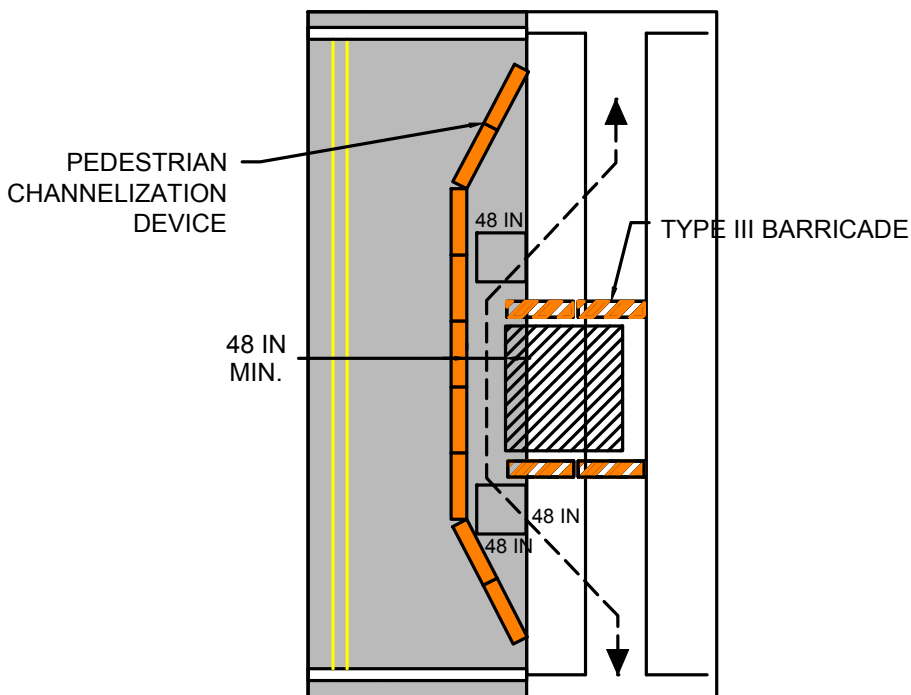




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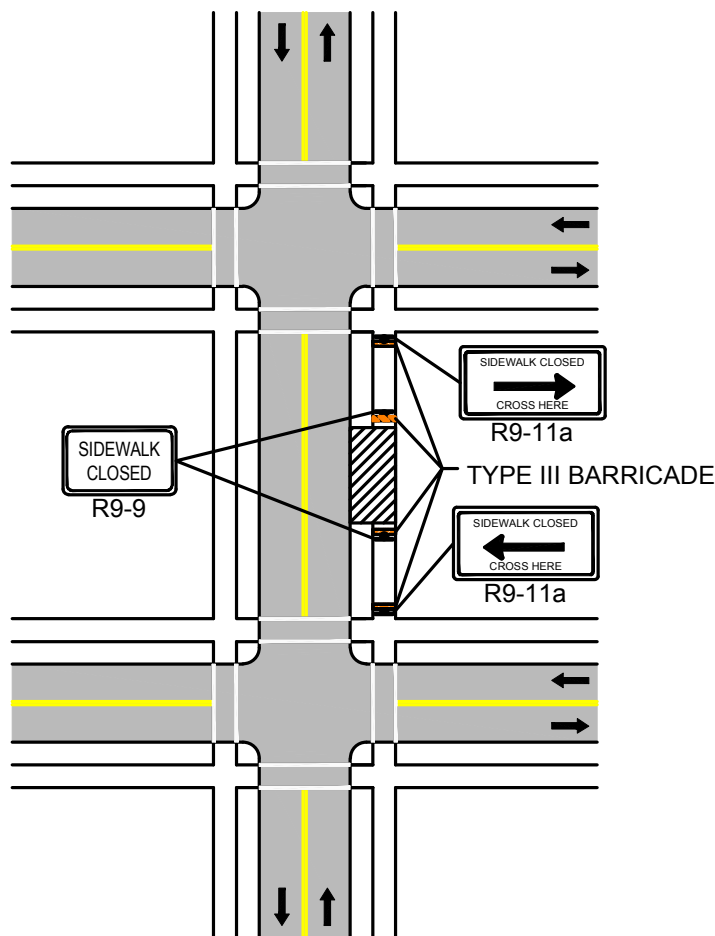
Work Zone Safety  
Standard Details  
and Drawings

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.





PAGE 80

Work Zone Safety  
Standard Details  
and Drawings

STATIONARY OPERATIONS  
BIKE LANE CLOSURE










POSTED SPEED LIMIT (MPH)	SPACING FOR BIKE ADVANCE WARNING SIGNS (FT) (A,B))	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRANSITION LENGTH (L/3)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	150 / 150	100	305	20	45
45-55	150 / 150	220	495	40	35
60-65	150 / 150	260	645	40	40

\* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

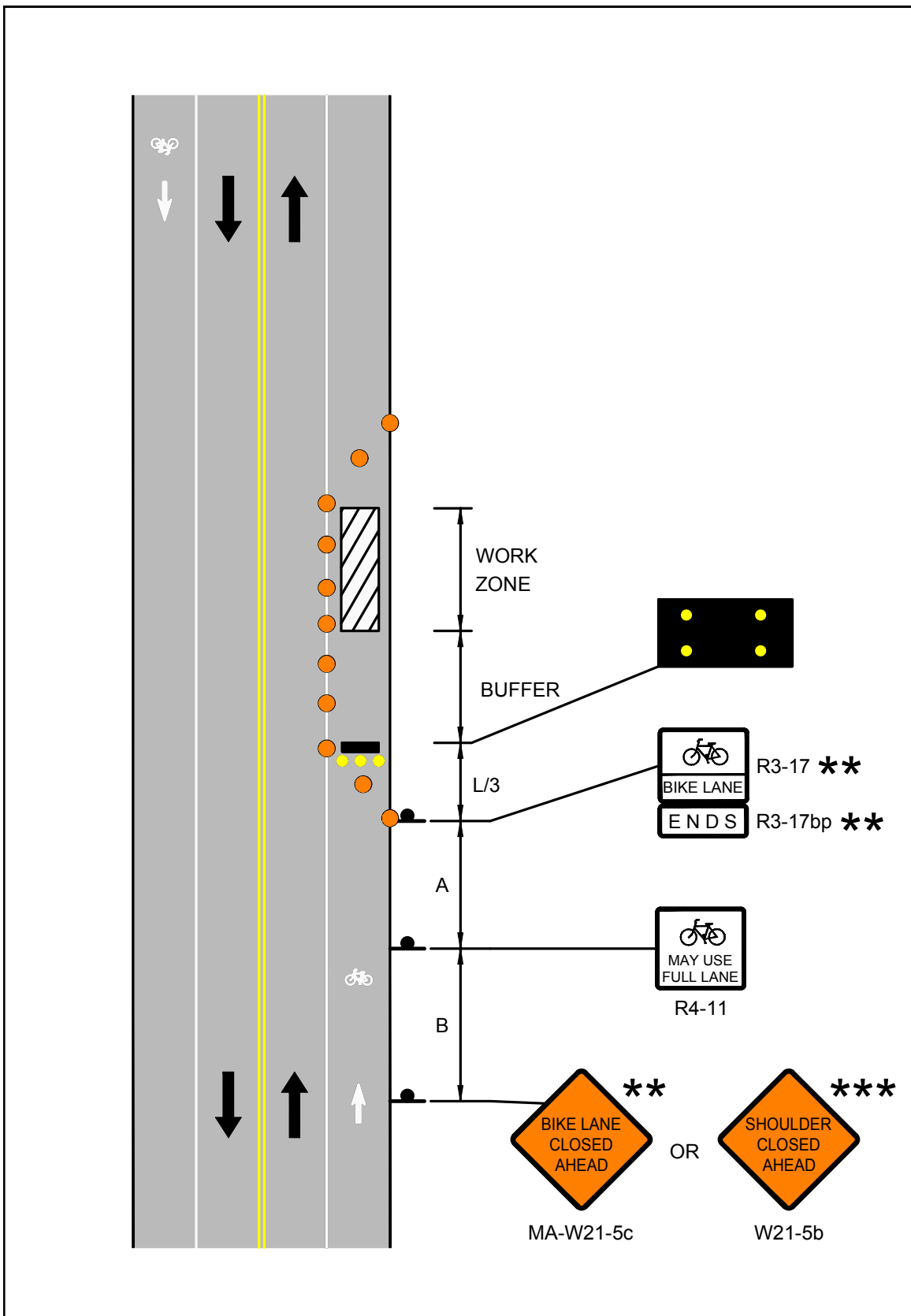
**NOTES**

1. DETAIL SHALL BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS. SIGNING SHOWN ONLY FOR BIKE TRAFFIC. FOLLOW ALL OTHER RELEVANT DETAILS FOR TTC DEVICES FOR VEHICULAR TRAFFIC.
2. **\*\*** SIGN SHALL BE USED ONLY IF THERE IS A MARKED BIKE LANE.
3. **\*\*\*** SIGN SHALL BE USED ONLY IF THERE IS NO MARKED BIKE LANE.

**LEGEND**

-  WORK ZONE
-  CHANNELIZATION DEVICE
-  FLASHING ARROW BOARD
-  PORTABLE CHANGEABLE MESSAGE SIGN
-  TRUCK MOUNTED ATTENUATOR
-  RADAR SPEED FEEDBACK BOARD
-  POLICE DETAIL OR UNIFORMED FLAGGER
-  TEMPORARY PORTABLE RUMBLE STRIP
-  TYPE III BARRICADE

NOT TO SCALE





**Safety is everyone's business**

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: LITTLETON Project File Number: 609054

Contract Number: 125644

Project Description: Reconstruction of Foster 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 A00860

**MASSACHUSETTS DEPARTMENT OF  
ENVIRONMENTAL PROTECTION**

**& TOWN OF LITTLETON  
CONSERVATION COMMISSION**

**NOTICE OF INTENT FILING**

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## NOTICE OF INTENT

**Submitted to the  
Town of Littleton, MA  
Conservation Commission  
for the  
Reconstruction of Foster Street Project  
in Littleton, MA**

**MassDOT Project #609054**

September 11, 2023

*Prepared for:*

Town of Littleton  
37 Shattuck Street, PO BOX 1305  
Littleton, MA 01460

*Prepared by:*



**FUSS & O'NEILL**

1550 Main Street, Suite 400  
Springfield, MA 01103

20170044.A21



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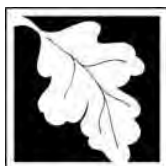




# 1 MassDEP WPA Form 3







**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Littleton
City/Town

**Important:**  
 When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



**Note:**  
 Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

**A. General Information**

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Foster Street	Littleton	01460
a. Street Address	b. City/Town	c. Zip Code
Latitude and Longitude:	42.519123	-71.502669
	d. Latitude	e. Longitude
1425	R10 2 1	
f. Assessors Map/Plat Number	g. Parcel /Lot Number	

2. Applicant:

Stephen	Jahnle	
a. First Name	b. Last Name	
Department of Public Works		
c. Organization		
39 Ayer Rd		
d. Street Address		
Littleton	MA	01460
e. City/Town	f. State	g. Zip Code
978-540-2670	sjahnle@littletonma.org	
h. Phone Number	j. Email Address	
	i. Fax Number	

3. Property owner (required if different from applicant):  Check if more than one owner

Town of Littleton		
a. First Name	b. Last Name	
Town of Littleton-Department of Public Works		
c. Organization		
39 Ayer Rd		
d. Street Address		
Littleton	MA	01460
e. City/Town	f. State	g. Zip Code
978-540-2670		
h. Phone Number	j. Email address	
	i. Fax Number	

4. Representative (if any):

Dan	Delany, P.E.	
a. First Name	b. Last Name	
Fuss & O'Neill		
c. Company		
1550 Main Street, Suite 400		
d. Street Address		
Springfield	MA	01103
e. City/Town	f. State	g. Zip Code
800-286-2469	ddelany@fando.com	
h. Phone Number	j. Email address	
	i. Fax Number	

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

N/A	N/A	N/A
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid



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**A. General Information (continued)**

6. General Project Description:

Work includes pavement reclamation and full depth reconstruction along Foster Street, construction of a 10 foot wide shared-use path, addition of curbing in select areas, installation of a new underground water main, new catch basins, realignment of the Grimes Lane & Foster Street intersection, and the addition of midblock crosswalks.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- 1.  Single Family Home
- 2.  Residential Subdivision
- 3.  Commercial/Industrial
- 4.  Dock/Pier
- 5.  Utilities
- 6.  Coastal engineering Structure
- 7.  Agriculture (e.g., cranberries, forestry)
- 8.  Transportation
- 9.  Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1.  Yes  No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(3)(f)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

NA (roadway right of way)

a. County

b. Certificate # (if registered land)

c. Book

d. Page Number

**B. Buffer Zone & Resource Area Impacts (temporary & permanent)**

- 1.  Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- 2.  Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands

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**B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)**

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Bank	0 1. linear feet	0 2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	0 1. square feet	0 2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	0 1. square feet 0 3. cubic yards dredged	0 2. square feet

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
d. <input type="checkbox"/> Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced

- f.  Riverfront Area
1. Name of Waterway (if available) - **specify coastal or inland**
2. Width of Riverfront Area (check one):
- 25 ft. - Designated Densely Developed Areas only
  - 100 ft. - New agricultural projects only
  - 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: \_\_\_\_\_ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet \_\_\_\_\_ b. square feet within 100 ft. \_\_\_\_\_ c. square feet between 100 ft. and 200 ft. \_\_\_\_\_

5. Has an alternatives analysis been done and is it attached to this NOI?  Yes  No

6. Was the lot where the activity is proposed created prior to August 1, 1996?  Yes  No

3.  Coastal Resource Areas: (See 310 CMR 10.25-10.35)

**Note:** for coastal riverfront areas, please complete **Section B.2.f.** above.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands

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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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Document Transaction Number

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Littleton

---

City/Town

**B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)**

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:  
 Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	_____	
	1. square feet	
	_____	
	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	_____	_____
	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	_____	_____
	1. square feet	2. cubic yards dune nourishment
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	_____	
	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	_____	
	1. square feet	
h. <input type="checkbox"/> Salt Marshes	_____	_____
	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	_____	
	1. square feet	
	_____	
	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	_____	
	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	_____	
	1. cubic yards dredged	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	
	1. square feet	
4. <input type="checkbox"/> Restoration/Enhancement	If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.	
	_____	_____
	a. square feet of BVW	b. square feet of Salt Marsh
5. <input type="checkbox"/> Project Involves Stream Crossings		
	_____	_____
	a. number of new stream crossings	b. number of replacement stream crossings



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**C. Other Applicable Standards and Requirements**

- This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

**Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review**

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to [http://maps.massgis.state.ma.us/PRI\\_EST\\_HAB/viewer.htm](http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm).

- a.  Yes  No

**If yes, include proof of mailing or hand delivery of NOI to:**

**Natural Heritage and Endangered Species Program**  
**Division of Fisheries and Wildlife**  
**1 Rabbit Hill Road**  
**Westborough, MA 01581**

- 04/18/2023  
 b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); OR complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review\*

1.  Percentage/acreage of property to be altered:

(a) within wetland Resource Area \_\_\_\_\_  
percentage/acreage

(b) outside Resource Area \_\_\_\_\_  
percentage/acreage

2.  Assessor's Map or right-of-way plan of site

2.  Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work \*\*

(a)  Project description (including description of impacts outside of wetland resource area & buffer zone)

(b)  Photographs representative of the site

\* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <https://www.mass.gov/mass-endangered-species-act-mesa-regulatory-review>).

Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

\*\* MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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**C. Other Applicable Standards and Requirements (cont'd)**

(c)  MESA filing fee (fee information available at <https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review>).  
 Make check payable to “Commonwealth of Massachusetts - NHESP” and **mail to NHESP** at above address

*Projects altering 10 or more acres of land, also submit:*

- (d)  Vegetation cover type map of site
- (e)  Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

- 1.  Project is exempt from MESA review.  
 Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, <https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat>; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)
- 2.  Separate MESA review ongoing. a. NHESP Tracking # \_\_\_\_\_ b. Date submitted to NHESP \_\_\_\_\_
- 3.  Separate MESA review completed.  
 Include copy of NHESP “no Take” determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?  
 a.  Not applicable – project is in inland resource area only      b.  Yes     No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -  
 Southeast Marine Fisheries Station  
 Attn: Environmental Reviewer  
 836 South Rodney French Blvd.  
 New Bedford, MA 02744  
 Email: [dmf.envreview-south@mass.gov](mailto:dmf.envreview-south@mass.gov)

Division of Marine Fisheries -  
 North Shore Office  
 Attn: Environmental Reviewer  
 30 Emerson Avenue  
 Gloucester, MA 01930  
 Email: [dmf.envreview-north@mass.gov](mailto:dmf.envreview-north@mass.gov)

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP’s Boston Office. For coastal towns in the Southeast Region, please contact MassDEP’s Southeast Regional Office.

c.  Is this an aquaculture project?      d.  Yes     No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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City/Town

**C. Other Applicable Standards and Requirements (cont'd)**

**Online Users:**  
 Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
  - a.  Yes  No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
  - b. ACEC

---

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
  - a.  Yes  No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
  - a.  Yes  No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
  - a.  Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
    1.  Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
    2.  A portion of the site constitutes redevelopment
    3.  Proprietary BMPs are included in the Stormwater Management System.
  - b.  No. Check why the project is exempt:
    1.  Single-family house
    2.  Emergency road repair
    3.  Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

**D. Additional Information**

- This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

**Online Users:** Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1.  USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2.  Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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**D. Additional Information (cont'd)**

3.  Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4.  List the titles and dates for all plans and other materials submitted with this NOI.

<u>MassDOT # 609054 Plan and Profile of Foster St. Permitting Plan Set</u>	
a. Plan Title	
<u>Fuss &amp; O'Neill</u>	<u>Dan Delany, PE</u>
b. Prepared By	c. Signed and Stamped by
<u>04/28/2023</u>	<u>1"=20'</u>
d. Final Revision Date	e. Scale
_____	
f. Additional Plan or Document Title	g. Date

5.  If there is more than one property owner, please attach a list of these property owners not listed on this form.

6.  Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7.  Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8.  Attach NOI Wetland Fee Transmittal Form

9.  Attach Stormwater Report, if needed.

**E. Fees**

1.  Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payor name on check: First Name	7. Payor name on check: Last Name





Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

### WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

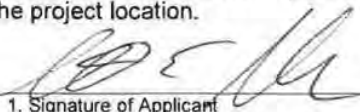
Littleton

City/Town

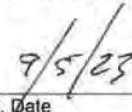
#### F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.



1. Signature of Applicant



2. Date

3. Signature of Property Owner (if different)



5. Signature of Representative (if any)

4. Date

9/18/23

6. Date

#### For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

#### For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a copy of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

#### Other:

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.





**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands  
**NOI Wetland Fee Transmittal Form**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**B. Fees** (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee

**Step 5/Total Project Fee:** \_\_\_\_\_

**Step 6/Fee Payments:**

Total Project Fee:	<u>N/A Fee exempt</u>
State share of filing Fee:	<u>a. Total Fee from Step 5</u>
City/Town share of filling Fee:	<u>N/A</u>
	<u>b. 1/2 Total Fee <b>less</b> \$12.50</u>
	<u>N/A</u>
	<u>c. 1/2 Total Fee <b>plus</b> \$12.50</u>

**C. Submittal Requirements**

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection  
 Box 4062  
 Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

**To MassDEP Regional Office** (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)



## 2 Executive Summary

Pursuant to the Massachusetts Wetland Protection Act, M.G.L.c. 131 § 40, 310 CMR. 10.00, the Town of Littleton is the applicant for this Notice of Intent (NOI) proposing a linear transportation improvement project that will redevelop Foster Street between Taylor Street and Balsam Lane, replace the surface of Taylor Street for 205 feet, and realign the intersection of Grimes Lane at Foster Street. A new 10-foot wide separated shared-use path will be created parallel to Foster Street while the road surface on Foster St will be narrowed by 4 feet. The project addresses vehicular, pedestrian, and bicycle safety. The project proposes an improved stormwater drainage system to the maximum extent practical for a redevelopment project. Upgrades are proposed to some existing catch basins. The project will also include the replacement of a 10 inch water main underneath Foster Street in an effort to 'dig once' and reduce disturbance to the corridor.

The project is eligible as a limited project under 10.53(3)(f):

“ Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.”

Because the project will not widen the road by the width of one lane the project is eligible as a redevelopment project for stormwater management therefore the Massachusetts Stormwater Management Standards are proposed to be met to the maximum extent practicable.

The project proposes permanent and temporary impacts to the 100-ft Buffer Zone and the Town of Littleton 50-ft No Disturbance Zone. The applicant is requesting a Waiver from the Commission from the provisions of Section 4.2, 50-ft No Disturb Zone, under the relevant provisions of Section 1.4(2) of the Town of Littleton Wetland Protection Regulations.





## 3 Existing Conditions

### 3.1 Existing Site Description

The project is located on Foster Street in Littleton, MA between Taylor Street and Balsam Lane. A locus map of the project area is provided in the attached Figure 1.

The project is located in the Merrimack Watershed. The receiving waters for the project include Beaver Brook, a category 3 impaired waterway for bacteria/pathogens and Mill Pond, a freshwater lake and a category 5 impaired waterway for not supporting aesthetic, primary contact, or secondary contact due to macrophytes.

A sample of site photos along the corridor is attached in Appendix E. The dimensions of the project limits are:

- The project length on Foster Street is 3,936 ft (0.75 mi).
- The project length on Talyor Street is 205 ft extending north and south from the intersection with Foster Street.
- The project length on Grimes Lane is 145 ft extending southeast from the intersection with Foster Street.
- The total project length is therefore 4,286 ft (0.81 mi).
- The project area is traversed via an overhead bridge by Massachusetts State Route 2. No work is proposed on the bridge structure.
- The project area is also traversed at-grade by a 30 ft-wide double-track rail crossing of the MBTA Fitchburg Line. No work is proposed on the tracks.
- The total work area of the project limits sums to 5.37 acres within the limits of grading.

The Town of Littleton owns roadway right-of-way (ROW) layouts that vary between 40-70 feet wide in the project area on Foster Street and Taylor Street. On Grimes Lane however, the Town layout narrows to 20-40 feet in width.

The land surrounding the project area is part of the Boston Metropolitan Statistical Area (MSA) Large Urbanized Area. The surrounding land use is a variety of uses including industrial, commercial, single-family residential, and the I-495/Littleton commuter rail station owned by the MBTA. Several adjacent properties have maintained a rural historical character.

The existing pavement on Taylor Street is generally 44 ft wide consisting of two 12 ft wide lanes and 10 ft paved shoulders on each roadside. Taylor Street is classified as an urban collector road and has a speed limit of 35 mph. There are currently no bicycle or pedestrian facilities along Taylor Street in the project limits.

Existing drainage on Taylor Street is mostly conveyed by runoff infiltration from the edge of road to the adjacent vegetated areas. Taylor Street has two catch basins conveying closed stormwater drainage underneath Taylor Street exiting the project area to the north.





The existing pavement on Foster Street is generally 28 ft wide consisting of two 12 ft wide lanes and 2 ft paved shoulders on each side. Foster Street is classified as an urban collector and has a speed limit of 30 mph. There is currently a single 500 ft length sidewalk spanning from the MBTA station driveway to the Route 2 overpass on the north side of the road. There are no other bicycle or pedestrian facilities along Foster Street in the project limits.

Existing drainage on Foster Street is mostly conveyed by runoff infiltration from the edge of road to the adjacent vegetated areas. Foster Street also has a system of catch basins conveying closed stormwater drainage to open outfalls adjacent to the roadside.

The short section of Grimes Lane in the project area has neither pedestrian accommodations nor catch basins. The width of pavement on Grimes Lane at Foster Street is below current vehicular safety standards for two-way traffic, narrowing to just 10 feet. Grimes Lane is classified as a local road and has a speed limit of 25 mph.

There are two existing culvert crossings beneath Foster Street. The project plans included in Appendix B include a base topographical survey showing an 18 inch corrugated metal pipe Culvert running beneath and transverse to Foster Street at project Station 10+30, adjacent to the parcels of 295 Foster Street and 300 Foster Street. The culvert conveys stormwater drainage from Foster Street and connects an open body of water with an intermittent stream.

There is also a 48 inch Reinforced Concrete Pipe culvert at project station 24+85 conveying an intermittent stream underneath Foster Street located within the State-owned layout of Route 2.

On the frontage of the MBTA station parcel, there is an existing rip-rap swale with catch basins contained in the swale conveying water away from Foster Street and the MBTA parking area.

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## 3.2 Resource Area Delineation

Inland resource areas were delineated in July and August of 2018 by Robin Casioppo, a wetland and soil scientist employed by Fuss & O'Neill, and by Josh Wilson, PWS, also employed by Fuss & O'Neill. The delineations were performed in accordance with methods developed by Massachusetts DEP and with respect to the Wetlands Protection Act. A wetland delineation report has been included in Appendix D.

The delineation found resource areas in the project area including Bank, Land Under Water, Buffer Zone, and Bordering Vegetated Wetland. The attached plans in Appendix B include delineation flags for the resource areas and buffer zone boundaries as part of the topographic survey base mapping underlying the proposed plans.





## 4 Proposed Conditions

### 4.1 Project Description

The project proposes the following work in the project area with an overall goal of improving safety for all modes of travel along the Foster Street corridor.

#### Upgrades to vehicular, pedestrian, and bicycle safety

- A Shared-use path for non-motorized travel use along the north side of Foster Street connecting Balsam Lane to Taylor Street and serving the frontage of the MBTA Commuter Rail Station.
- (4) Rectangular Rapid Flashing Beacons to alert drivers of pedestrian crossings with revised crosswalks for safer visibility and accessibility compliant pedestrian curb ramps.
  - (3) Located on Foster Street
  - (1) Located on Taylor Street
- New 10-foot wide pedestrian and bike sidewalk ramps on Taylor Street at the Foster Street intersection.
- New pavement markings with vehicle warning & regulatory signage for better driver visibility
- Full-depth pavement reconstruction on Foster Street.
- Re-alignment of Grimes Lane at Foster Street to increase safety at the rail crossing and sight distance for all users at the intersection. The improvements will bring the width of Grimes Lane into safety standards for a two-way road.
- Increased LED streetlighting coverage along Foster St.
- Replaced aging guard rail at steep road side embankments.

#### Drainage Improvements

Because curbing will be added to the road shoulder for all of the west side of Foster Street for the shared-use path and parts of the east side to improve pedestrian safety, the closed drainage system will be upgraded to provide improved treatment.

- (9) Existing catch basins on Foster Street replaced with new deep-sump (4ft) catch basins
- (3) New deep-sump catch basins on Foster Street
- (4) New leaching (impervious) catch basins on Foster Street to convey stormwater runoff into ground infiltration
- (7) Existing catch basins remodeled and repaired
- All other existing catch basins in the project limits remaining are to be cleaned at the completion of construction
- The rip-rap drainage swale on the frontage of MBTA property will be moved less than 5 feet to the north and rebuilt as having the same overall area as existing. The location of the swale is proposed to be shifted to fit the shared-use path.





#### Maintenance and Repair to Critical Town Infrastructure

- A new 10 inch water service main under Foster Street through the project limits. This asset upgrade seeks to leverage the opening of the road for pavement reconstruction as preventative maintenance and critical infrastructure upgrade.

#### Pavement Widening

- To implement the shared-use path on Foster Street to MassDOT design standards, overall impervious area widening was necessary. The existing paved cross section of Foster Street is 28 ft wide. The proposed road cross section will narrow the road pavement on Foster Street by 4 ft but will add a 10 ft wide paved shared-use path. This results in a new cross section containing a total of 34 ft in pavement width when the shared-use path is included. This is 6 ft more of total pavement width than the exiting condition on Foster Street.

#### Impervious Area

- The existing condition has a total of 2.930 acres of impervious area within the public layout work limits. The proposed condition has a total of 3.542 acres within the public layout work limits. The project proposes to create an additional 0.612 acres (26,612 SF) of impervious area within the project limits. The net new impervious area is distributed along the 0.75 mile long Foster Street corridor.

#### Layout Alteration and Easements

- The project stays within the existing road layout ROW for a large majority of the project. Where grading of slopes exceeds the layout boundaries or a utility pole must be moved to the edge of the layout boundary, layout alterations and easements are being proposed as part of the project. The temporary and permanent easements are shown on the plans in Appendix B.

#### Tree and Shrub Plantings

- Tree plantings are proposed at two locations. Five native species including red maple trees, *Acer Rubrum*, are proposed to be planted at the frontage of 305 Foster Street. The maple trees will replace a stand of 1 Pine and 2 Hawthorne on private property that must be removed for utility pole relocation. The ornamental shrub 'Mountain Fire Andromeda' is proposed to be planted at the frontage of 284 Foster Street in the public right of way where a slope is being cut back close to the boundary of a private lawn. The purpose of the shrub plantings is for visual screening.

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## 4.2 Alternatives Analysis

The design was initiated in the Fall of 2017 and followed the multi-stage MassDOT project design and development process. The design process evaluated different alternatives for impacts and sought public and stakeholder involvement.







The preferred alternative for the design of Foster Street minimized impacts compared to a second viable alternative by reducing the width of pavement and providing a vegetated buffer between the path and road. Concept 2 below was not selected to continue past 25% design in part because Concept 1 achieved the same mobility and safety goals with a narrower width of pavement by 1ft.

**Figure 1: An Early Concept Alternative for Foster Street that was Not Selected  
Total Pavement Width is 35ft**



**Figure 2: The Preferred Alternative for Foster Street  
Total Pavement Width is 34ft with a Vegetated Buffer Between Path and Edge of Road**



The two concepts above were presented to the Littleton Board of Selectmen and community members at the Town Select Board meeting on January 14, 2019. Community members present at the meeting, including some who live on Foster Street, overwhelmingly favored the shared-use path concept. Those





in favor of the shared-use path believed it would not only benefit adjacent business office parks, but also local residents who would use it for recreational purposes. They preferred the proposed buffer separating vehicular traffic and pedestrians and cyclists. The majority of the Board members present at the meeting supported Concept 2 which included the shared-use path, as they appreciate the increased pedestrian and cyclist safety, as well as the decreased vehicular speeds expected as a result of the proposed road narrowing. With the support of its constituents, the Board passed a motion endorsing Concept 2.

The project design team presented at the Littleton Station Area Visioning Study Community Meeting listening session at Littleton Middle School on April 5, 2019 and the follow-up community visioning session on April 6, 2019. The event was hosted by The Town of Littleton Planning Department.

A required 25% design submission public hearing was hosted by MassDOT. The meeting took place virtually on May 28, 2020. MassDOT recorded the meeting and held an extended mail-in public comment period. The preferred alternative was selected after the conclusion of the design public hearing process.

After the design public hearing comment period, the design continued to be refined as MassDOT performed design reviews at 75% and 100% design stages.

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## 4.3 Erosion and Sedimentation Control

The proposed project will enact erosion and sediment control during construction using the following methods.

- **Sediment Control Barriers**

Staked compost filter tubes or equivalent are proposed for sediment control barriers. The placement of sedimentation control barriers for the Project are shown on the Construction Plans section of the proposed project plans in Appendix B. The construction details section of the proposed plans includes a typical example of a compost filter tube installation. Silt fence is included as incidental to the item when required at sensitive resource areas.

- **SWPPP**

Sedimentation control for the proposed project will be implemented through the National Pollutant Discharge Elimination System (NDPES) required Storm Water Pollution and Protection Plan (SWPPP) which must be prepared by the contractor prior to the commencement of construction. The Plan will include the General Permit conditions and detailed descriptions of erosion and sedimentation controls to be implemented during construction. The SWPPP plan requires weekly inspection and monthly reporting of the condition of erosion controls. The Town will be included on the distribution list of the inspection forms and reports.

- **Silt Sacks**

Silt sacks shall be installed in retained existing catch basins and drop inlets within the project limits and as required by the MassDOT Resident Engineer to prevent sediment from entering existing catch basins during construction. 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 dispose 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.

## 4.4 Sequence of Construction Activities

The Project is proposed to be constructed in a single phase under the control and oversight of MassDOT who will provide on-site construction administrative and inspection services during the entire construction duration.

Although the contractor will have the ability to propose adjusting the sequence of work to optimize scheduling and efficiency, or may perform work simultaneously, a general sequence of construction is as follows:

- Creation of a Storm Water Pollution and Prevention Plan (SWPPP)
- Erosion and sedimentation control installation
- Establishment of contractor access and laydown areas outside of resource areas
- Work zone safety signage establishment including rail crossing location and temporary traffic guidance
- Removal of vegetation within the limit of work as needed for access
- Work on underground utilities including water main installation and storm drainage
- Work on overhead utilities
- Testing of new water main
- Excavation and grading to establish new sub-base of shared-use path and road
- Installation of curbing, sidewalk ramps, guardrail, fencing and new permanent traffic safety signage
- Full-depth paving of shared use path and road
- Establish plantings and loam/seed
- Installation of pavement markings
- Restoration of temporary work areas and removal of temp signage
- Removal of erosion and sedimentation controls





## 5 310 CMR 10.00 WPA Regulations Review

This section describes how the project conforms to the relevant provisions of 310 CMR 10.00, the Wetland Protection Act, enumerates the proposed project impacts to resource areas, and describes how the project meets performance standards under the Act.

### 5.1 Limited Project Status

Under 310 CMR 10.53, projects may be eligible as a limited project:

“Notwithstanding the provisions of 310 CMR 10.54 through 10.58 and 10.60, the Issuing Authority may issue an Order of Conditions and impose such conditions as will contribute to the interests identified in M.G.L. c. 131, § 40 permitting the following limited projects (although no such project may be permitted which will have any adverse effect on specified habitat sites of Rare Species, as identified by procedures established under 310 CMR 10.59). In determining whether to exercise its discretion to approve the limited projects listed in 310 CMR 10.53(3), the Issuing Authority shall consider the following factors: the magnitude of the alteration and the significance of the project site to the interests identified in M.G.L. c. 131, § 40, the availability of reasonable alternatives to the proposed activity, the extent to which adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, § 40.”

The project is eligible as a limited project under 310 CMR 10.53(3)(f) which stipulates that:

“Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.”

The proposed widening of paved surface in the Foster Street Corridor is 6ft wide. This is less than the width of a single traffic lane, which has a typical minimum of 10ft wide. The widening on Foster Street is not providing an additional lane for motorized vehicle travel, but instead a non-motorized shared-use path.

### 5.2 Bank (310 CMR 10.54)

Bank was delineated in the project area as shown on the plans in Appendix B. Bank flags are found in the project area at the following locations:

- On the property of 300 Foster Street. Between project stations 9+00 and 10+75 on the east side of Foster Street. The flag series in the plans is A100-A116. There is an open freshwater body adjacent to a culvert located beneath Foster Street.





- On MassDOT property, between project stations 24+75 and 25+00, there is an intermittent stream flowing from a culvert underneath Foster Street. The flag series in the plans is F600-F602 (R&L) on the west side of Foster Street. On the east side of Foster Street the flag series are H800-803 and I900-901.

No temporary or permanent impacts to Bank are proposed by the project.

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### 5.3 Bordering Vegetative Wetland (310 CMR 10.55)

BVW was delineated in the project area as shown on the plans in Appendix B. BVW flags are found in the project area at the following locations:

- On the east side of Foster Street at the property of 260 Foster Street. Between project stations 30+50 and 33+00. Flag series K200-K220.
- On the east side of Foster Street and adjacent to Grimes at the property of 260 Foster Street. Between project stations 26+50 and 30+25. Flag series L300-L326.
- On the west side of Foster Street at the property of 295 Foster Street. Between project stations 9+00 and 10+50. Flag series B200-B205.
- On the west side of Foster Street at the property of 295 Foster Street. Between project stations 10+40 and 10+45. Flag series C300-C309.
- On the west side of Foster Street at the property of 295 Foster Street. Between project stations 12+00 and 17+00. Flag series D400-D405.
- On the east side of Foster Street at the properties of 300 and 290 Foster Street. Between project stations 13+50 and 14+50. Flag series E500-E503.
- On the east side of Foster Street at the property of the Mass. Dept of Transportation. Between project stations 24+75 and 25+00. Flag series J100-104.

No temporary or permanent impacts to BVW are proposed by the project.

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### 5.4 Land Under Water (310 CMR 10.56)

LUW is found in the project area at the locations described under Bank.

No temporary or permanent impacts to LUW are proposed by the project.

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### 5.5 Land Subject to Flooding (310 CMR 10.57)

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) does not depict areas of potential flooding in the project limits. Bordering Land Subject to Flooding (BLSF) is not mapped as overlapping at the project site. BLSF is defined in 310 CMR 10.57 (2)(a)(1) as “an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetlands.” No temporary or permanent impacts to BLSF





or ILSF are proposed by the project. The FEMA FIRM map panels for the project are provided in Appendix A.

## 5.6 Riverfront Area (310 CMR 10.58)

There is no Riverfront Area within the project limits. No temporary or permanent impacts to Riverfront Area are proposed by the project.

## 5.7 100-ft Buffer Zone (310 CMR 10.02(2)(b))

The project work limit area contains a total of 116,466 SF (2.67 AC) of 100-ft Buffer Zone measured from BVW and Bank. The existing impervious area within the 100-ft Buffer Zone is 50,517 SF (1.16 AC).

Permanent impacts are calculated as the area of new impervious surface from the shared use path or realignment of the road. Temporary impacts for the project are areas to be disturbed by construction activities, but ultimately returned to a vegetated cover with loam & seed. Table 1 summarizes the existing and proposed impacts to the 100-ft Buffer Zone.

**Table 1: Buffer Zone Impacts**

100-FT Buffer from BVW or Bank			
Description	Area (SF/ AC)	Perm./Temp.	Cause/Descrip. Of Impacts
Total Zone Area in Project Limit	116,466/ 2.67	-	-
Existing Impervious	50,517/ 1.16	Perm.	Road surface, Sidewalk
Net Change in Impervious	15,768/ 0.36	Perm.	Road surface, Shared-use path
Proposed Impervious	66,285/ 1.52	Perm.	Road surface, Shared-use path
Temp. Impacts	35,344/ 0.81	Temp.	Earthwork, grading, grubbing. To be restored with loam & seed

The net increase of proposed permanent impact to 100-ft Buffer Zone is 15,768 SF or 0.36 AC within the 5.37 AC and 0.81-mile-long project area.

The general provisions of 310 CMR 10.53 states that:

“The Issuing Authority may consider the characteristics of the Buffer Zone, such as the presence of steep slopes, that may increase the potential for adverse impacts on Resource Areas. Conditions may include limitations on the scope and location of work in the Buffer Zone as necessary to avoid alteration of Resource Areas. The Issuing Authority may require erosion and





sedimentation controls during construction, a clear limit of work, and the preservation of natural vegetation adjacent to the Resource Area and/or other measures commensurate with the scope and location of the work within the Buffer Zone to protect the interests of M.G.L. c. 131, § 40. Where a Buffer Zone has already been developed, the Issuing Authority may consider the extent of existing development in its review of subsequent proposed work and, where prior development is extensive, may consider measures such as the restoration of natural vegetation adjacent to a Resource Area to protect the interest of M.G.L. c. 131, § 40.”

As a linear transportation project in an existing corridor, the project was not able to avoid the Buffer Zone. The design alternatives analysis, described in Section 4.2, did select a preferred alternative that is 1ft narrower in total pavement width than the next alternate design. The impacted Buffer Zone is a previously developed road corridor. The project proposes an erosion and sediment control plan as described in Section 4.3 and shown on the plans. The project also proposes to revegetate the temporary impact areas within the Buffer Zone with loam & seed.





## 6 Stormwater Report

The project is located in the Merrimack Watershed. The receiving waters for the project include Beaver Brook, a category 3 impaired waterway for bacteria/pathogens. Also Mill Pond, a freshwater lake and a category 5 impaired waterway for not supporting aesthetic, primary contact, or secondary contact due to macrophytes.

The project is eligible as a redevelopment and a limited project under the Wetlands Protection Act. The following is a description of how the proposed project meets the stormwater standards to the maximum extent practicable in accordance with the Massachusetts Stormwater Handbook.

The project will result in a net increase of an additional 0.612 acres of impervious area within the project limits distributed along the 0.75 mile long linear Foster Street corridor. Upgrades to the storm water system are proposed to the maximum extent practicable.

### **Standard 1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth**

No new stormwater point source discharges to the resource areas are proposed as part of the redevelopment project. Two existing discharge points will be improved upon with new flared ends and rip rap protection. All other existing discharge points will remain as is. Installation of rip rap protection at refurbished outfalls will provide erosion protection, which is an improvement to the existing condition. The project complies with Standard 1.

### **Standard 2: Peak Rate Attenuation**

Attenuation improvement has been proposed to the maximum extent practical. The project proposes improved attenuation through:

- 4 new leaching catch basins with 3 feet of sump depth
- 9 existing non-deep sump catch basins on Foster Street to be replaced with deep sump catch basins. A deep-sump catch basin has 4 feet of sump depth compare to 2-3ft for a non-deep sump catch basin
- 3 new deep sump catch basin locations are proposed on Foster Street
- 7 existing catch basins will be remodeled and repaired
- All other remaining catch basins will be cleaned of debris and sediment there by restoring original sump capacity

No new detention areas for attenuation are proposed outside of the width of road as this is a linear transportation project corridor where impacts to adjacent property and trees have been intentionally minimized. The project is a redevelopment and meets the Stormwater Standard 2 to the maximum extent practicable.







### **Standard 3: Stormwater Recharge**

Recharge has been proposed to the maximum extent practicable. In the existing condition, recharge is provided by a combination of sheet flow to the road shoulder where infiltration occurs and by discharge where the closed drainage system outfalls. The proposed condition will also provide recharge by a combination infiltration by sheetflow at the edges of the shared-use path and outfall at existing discharge points. Improvements to recharge are provided by:

- Four new leaching catch basins on Foster Street will convey stormwater runoff to ground infiltration
- A riprap swale at the frontage of the MBTA Station will be repaired and rebuilt 5 feet offset from the existing location to accommodate the proposed shared-use path

No new infiltration areas are proposed outside road and shared-use path as this is a linear transportation corridor where impacts to adjacent property and trees have been intentionally minimized. The project is a redevelopment project and meets the Stormwater Standard 3 to the maximum extent practicable.

### **Standard 4: Water Quality**

Water quality will be maintained and improved by the following:

- 4 new leaching catch basins
- 9 existing non-deep sump catch basins on Foster Street to be replaced with deep sump catch basins. A deep-sump catch basin has 4 feet of sump depth compare to 2-3ft for a non-deep sump catch basin
- 3 new deep sump catch basin locations are proposed on Foster Street
- 7 existing catch basins will be remodeled and repaired
- All other remaining catch basins will be cleaned of debris and sediment there by restoring original sump capacity

The proposed post-construction operation and maintenance of the closed drainage structures will maintain the treatment capability of the system. A suggested Long-term Operation and Maintenance Plan, including required maintenance activities and schedule of maintenance requirements is included in Appendix G. This is a redevelopment project and meets Stormwater Standard 4 to the maximum extent practicable. A TSS removal spread sheet for deep sump catch basins can be found in Appendix H. The deep sump catch basins will provide 25% TSS removal. The leaching catch basins will provide 25% TSS removal as they will be offline and not connected to a deep sum catch basin.

### **Standard #5: Land Uses with Higher Potential Pollutant Loads**

Standard 5 does not apply to the project. The project does not contain any area of higher pollutant loads as defined by the Massachusetts Stormwater Handbook.

### **Standard #6: Critical Areas**

Standard 6 does not apply to the project. This project does not contain any critical areas as defined by the Massachusetts Stormwater Handbook.



**Standard #7: Redevelopment**

This project is a redevelopment project. Standards 2, 3, and 4 are met to the maximum extent practicable. Standards 1, 8, 9, and 10 are met fully.

**Standard #8: Construction Period Controls**

It is anticipated that there will be no pollution created during the development of the site. Erosion and sedimentation controls will be implemented and maintained during construction until construction is complete and disturbed areas have been stabilized. This will be done in accordance with local, state, and federal requirements. Details of the erosion and sedimentation control measures are shown on the Site Plans located in Appendix B. The contractor will be responsible to ensure the correct implementation of the erosion and sedimentation controls. MassDOT will provide continuous on-site construction inspection to ensure contractor compliance with erosion and sedimentation controls.

The extent and schedule for the commencement of construction activities, grading, and soil stabilization measures will be recorded and maintained as part of the Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will be completed and provided by the contractor prior to the start of construction in accordance with the EPA NPDES General Permit for Discharge from Construction activities.

**Standard #9: Operation and Maintenance Plan**

A Construction Operation and Maintenance (O&M) Plan has been developed for the redevelopment of the site and is included in Appendix G. The contractor and Town of Littleton shall be responsible for the construction operation and maintenance of the site.

A suggested Long-term Operation and Maintenance Plan, including required maintenance activities and schedule of maintenance requirements is included in Appendix G. The Town of Littleton will be responsible for post construction operation and maintenance of the site.

**Standard #10: Illicit Discharge to Drainage System**

This project does not contain illicit discharges to Stormwater Management Systems as defined in the Massachusetts Stormwater Handbook. A copy of the Illicit Impact Statement can be found in Appendix I.





## 7 Town of Littleton Wetland Protection Regulation Review

The performance standards of the Town of Littleton Wetland Protection Regulations are described in this section.

### 7.1 The 50-ft No-Disturbance Zone

The Town of Littleton observes a 50-ft No-Disturbance Zone where:

“No activities or work is permitted other than passive (foot or non-motorized vehicle) passage and removal of invasive vegetation if done in compliance with these Regulations. Except as noted, no vegetation may be disturbed, and the area should remain unchanged from its pre-project state.”

The project work limit area contains a total of 45,253 SF (1.04 AC) of 50-ft No-Disturbance Zone measured from BVW or Bank. Existing impervious area within the 50-ft No-Disturb Zone totals 14,655 SF (0.34 AC). The construction of the shared-use path and shifting of the existing road alignment in some locations will result in an additional 7,499 SF (0.17 AC) of impervious area within the 50-ft-No-Disturbance Zone.

Permanent impacts are calculated as the area of new impervious surface. Temporary impacts are areas that will be disturbed by construction activities such as earthwork and then returned to a vegetated cover with loam & seed. Table 2 summarizes the impacts to the 50-ft No Disturb Zone.

**Table 2: 50-ft No Disturbance Zone Impacts**

<b>50-FT No Disturb Zone from BVW or Bank</b>			
<b>Description</b>	<b>Area (SF/ AC)</b>	<b>Perm./Temp.</b>	<b>Cause/Descrip. Of Impacts</b>
Total Zone Area in Project Limit	45,253 / 1.04	-	-
Existing Impervious	14,655 / 0.34	Perm.	Road surface, Sidewalk
Net Change in Impervious	7,499 / 0.17	Perm.	Road surface, Shared-use path
Proposed Impervious	22,154 / 0.50	Perm.	Road surface, Shared-use path
Temp. Impacts	14,355 / 0.33	Temp.	Earthwork, grading, grubbing. To be restored with loam & seed





Only projects meeting the eligibility for a waiver under Section 1.4 of the Town Regulations may be exempt. See Section 8.4 for more information on the project's eligibility for a waiver.

---

## 7.2 Performance Standards in the 100-ft Buffer Zone

The Town performance standards for work in the 100-Ft Buffer Zone (Section 4.3 of the Littleton Wetland Bylaw Regulations) state that:

“The activity shall not significantly impair the values and functions of the adjacent Areas Subject to Protection. The quantity and quality of resource values and functions, as well as pre-project conditions, such as ground slope, soil conditions, vegetation, and prior disturbance of the site should be considered explicitly in making this determination. Any offsetting mitigation provided shall also be considered, including the inclusion of pedestrian and bicycle access rights-of-way in the project (which can reduce the pollutant runoff and climate change contribution associated with the project).”

The project proposes pedestrian and bicycle access on Foster Street in a safe, dedicated and separate facility. The project is a potentially important step toward a larger more complete network of bicycle and pedestrian access for the Town of Littleton and the MBTA commuter rail station. The shared-use path will contribute to the reduction in vehicular trips and emissions as a non-motorized link to commuter rail service and as a new recreational trail for local residents

---

## 7.3 Other Resource Areas

- The project limits are not within an area of NHESP Estimated Habitats of Rare Wildlife or NHESP Priority Habitats of Rare Species.
- There are no state certified vernal pools within the project limits.
- The project is not within an Area of Critical Environmental Concern.
- The project does not discharge or drain to a waterbody designated as an Outstanding Resource Water. The nearest ORW is Nagog Pond in Acton located 5.4 miles east of the project area.

Attached Figure 2 shows the most recent NHESP Habitats map of the project area as accessed from MassMapper showing data from the most recent NHESP Atlas.

---

## 7.4 Eligibility for Waiver

Section 1.4(2) of the Town Regulation states that:

“The Commission may also waive the provisions of Sections 4.2, 4.3, and/or 4.5, to permit any of the limited projects listed in 310 CMR 10.53(3)(a) through (t). In determining whether to exercise its discretion to approve a limited project, the Commission shall consider the following factors: the magnitude of the alteration, the significance of the project site to the





Interests Protected by the Bylaw, the availability of reasonable alternatives to the proposed activity, the extent to which adverse impacts are minimized, and the extent to which mitigation measures are provided to contribute to the protection of the Interests Protected by the Bylaw”

The magnitude of the alteration proposed by the project is small when compared to the overall project limits. The overall project limit totals 5.37 acres. The project area permanently impacting the 50-ft No-Disturb Zone is 0.16 acres, comprising a share of 3% of the total project area.

The significance of the project site to the interests protected by the Bylaw may be considered in context of roadside vegetation. The vegetated shoulders of Foster Street within the 50-ft No Disturb Zone have been in close proximity to the road and vehicular traffic with associated roadside mowing and stormwater runoff for many years. The project area does not contain NHESP priority or estimated habitats or vernal pools (see Figure 2 attached).

The availability of reasonable alternatives was evaluated as discussed in the Alternatives Analysis Section 5.2. The preferred alternative did reduce permanent impacts to the 50-ft- No-Disturb Zone by selecting a cross section with 1ft less of total new pavement width compared to an alternate design.

Impacts are proposed to be minimized via the sedimentation and erosion control measures proposed. All temporary impact areas will receive loam & seed to restore ground cover vegetation. A mitigating factor will be the creation of a new facility for non-motorized travel. The shared-use path may contribute to the reduction in vehicular trips and emissions as a link to commuter rail service and as a new recreational trail for local residents.

In summary, the applicant respectfully requests that the Littleton Conservation Commission find these measures adequately protective of the interests identified in the Town Bylaw and issue a waiver to the work described in this NOI and on the attached plans.





## 8 Conclusion

In Summary, the project proposes a new 10 foot wide separated shared-use path on Foster St while the road surface on Foster St will be narrowed by 4 feet. An unsafe intersection at Grimes Lane and Foster Street is proposed to be realigned. The project addresses vehicular, pedestrian, and bicycle safety. The project proposes an improved stormwater drainage system to the maximum extent practical including four new leaching catch basins and upgrades to some existing catch basins as described in Section 4. The project will also include the replacement of a 10 inch water main underneath Foster Street in an effort to 'dig once' and reduce sediment disturbance in the corridor.

Because the project area is an existing roadway and the project will not widen the road by the width of one lane, under 310 CMR, the project is eligible as a redevelopment project for stormwater management and also eligible as a limited project under 10.53(3)(f). The project proposes permanent and temporary impacts to 100-ft Buffer Zone and the Town of Littleton 50-ft No Disturbance Zone. All temporary impact areas will be revegetated with loam and grass seed. No other resource areas are proposed to be impacted. The applicant is requesting a Waiver from the Commission under the relevant provisions of Section 1.4(2) of the Town of Littleton Wetland Protection Regulations.

The applicant respectfully requests that the Littleton Conservation Commission find these measures adequately protective of the interests identified in the WPA and the Town Bylaw as presented in this NOI.



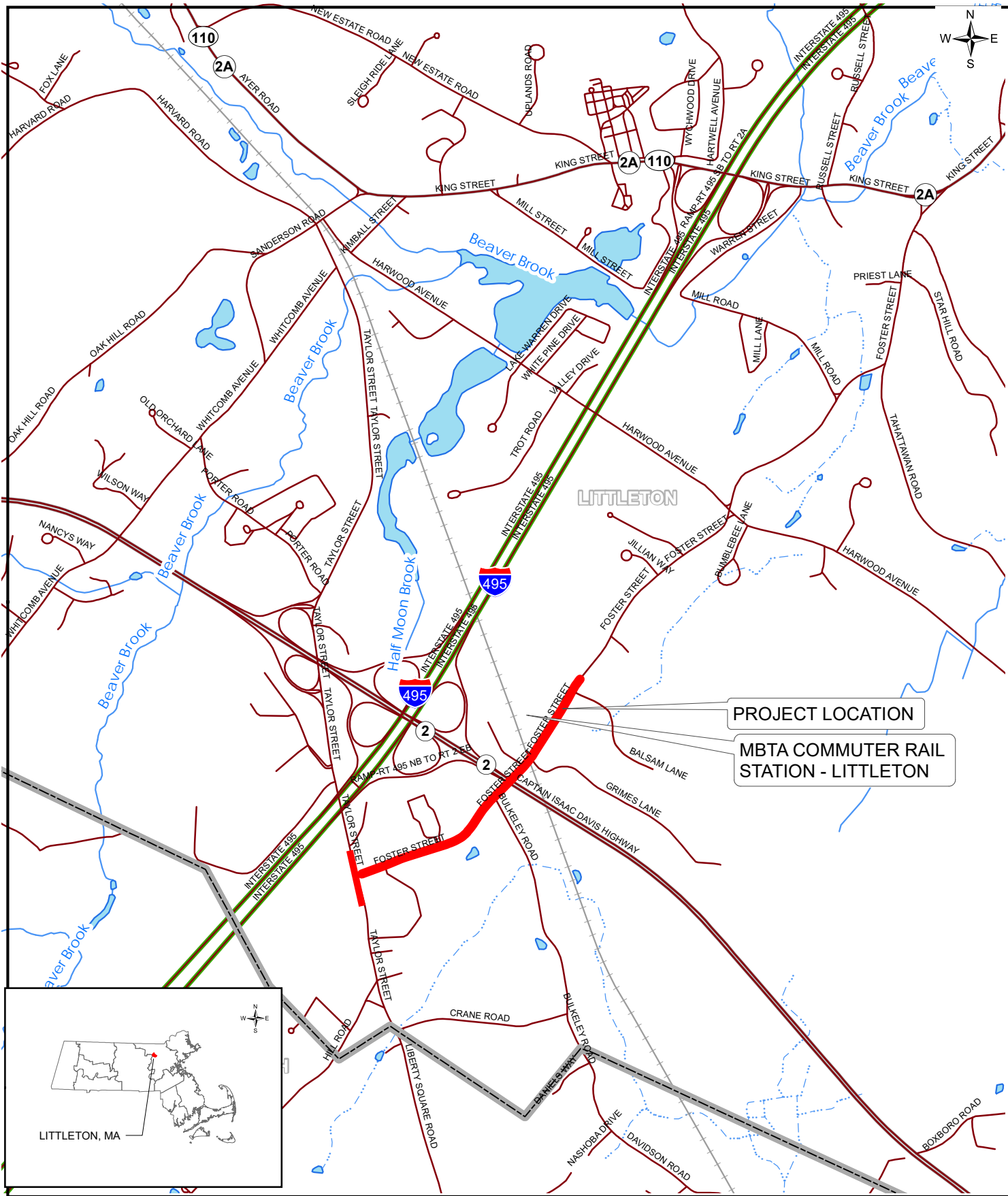


## Figures

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File Path: K:\IP2017\0044\A20\MXD\A20\_Foster\_Figure 1\_Location.mxd Plotted: Monday, February 12, 2018



**PROJECT LOCATION**  
**MBTA COMMUTER RAIL STATION - LITTLETON**

0 1,000 2,000  
 Feet

Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

www.fando.com

**FUSS & O'NEILL**

78 INTERSTATE DRIVE WEST SPRINGFIELD, MA 01089 413.452.0445

RECONSTRUCTION OF FOSTER STREET (PHASE I)  
 SITE LOCATION MAP  
 MASSDOT PROJ. #609054  
 LITTLETON MASSACHUSETTS

PROJ. No. 20170044.A20  
 DATE: FEBRUARY 2018  
**FIG. 1**



Figure2: Natural Resources Map



- NHESP Natural Communities
- NHESP Priority Habitats of Rare Species
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Certified Vernal Pools
- Outstanding Resource Waters
  - ACEC
  - Cape Cod National Seashore
  - Protected Shoreline
  - Public Water Supply Watershed
  - Retired Public Water Supply
  - Scenic/Protected River
  - Wildlife Refuge

Project Extent

Accessed from  
<https://maps.massgis.digital.mass.gov/MassMapper/MassMapper.html>

by A.Keegan, PE on  
 4/18/2023

NHESP Data based on  
 August 2021 NHESP  
 Atlas



## Appendix A

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### FEMA FIRM MAPS



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage systems. Users are encouraged to consult with local officials for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or Floodway Areas have been determined, users are encouraged to consult the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded, whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, the FIRM is not intended for use in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Massachusetts State Plane Mianland Zone (FIPS zone 2007). The horizontal datum was NAD 83. GRS 1980 datum was used for the vertical datum. For information regarding conversion of FIRM data to other datum, please contact the National Geospatial Survey at the following address:

NGS Information Services  
National Geospatial Survey  
SSMC-3, #8202  
1315 East-West Highway  
Silver Spring, Maryland 20910-3282  
(301) 715-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geospatial Survey at (301) 715-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was derived from orthophotography provided by MassGIS at a scale of 1:500 from photography dated April 2008.

The profile baselines depicted on this map represent the hydraulic modeling baselines that the flood elevations in FIS are based on. The profile baselines are located on the centerline or appear outside the SFHA.

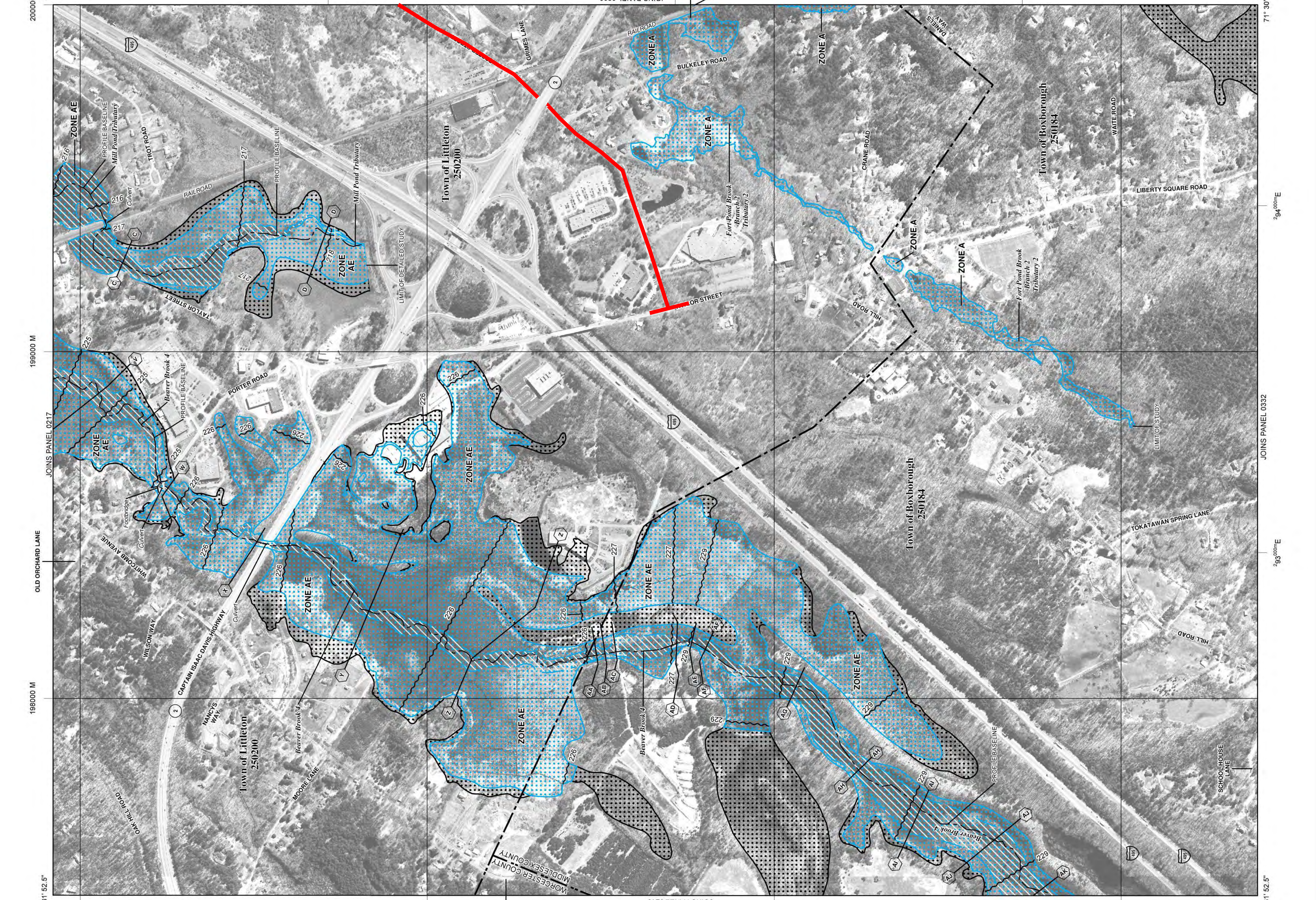
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report may differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred since the date of publication, users are encouraged to contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses, and dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM, visit the Map Store at <http://www.fema.gov/business/nfip>. The Map Store includes previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the NSC website.

If you have questions about this map, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip>.



PROJECT AREA

**LEGEND**

**SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**  
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. Special Flood Hazard Areas include Zone A, AE, AH, AO, AR, AV, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

**ZONE A**  
No Base Flood Elevations determined.

**ZONE AE**  
Base Flood Elevations determined.

**ZONE AH**  
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

**ZONE AO**  
Flood depths of 1 to 3 feet (usually areas of ponding); average velocities also determined.

**ZONE AR**  
Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined to be inadequate to provide protection from the 1% annual chance flood.

**ZONE AV**  
Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

**ZONE VE**  
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**  
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

**ZONE X**  
Areas of 0.2% annual chance flood; areas of 1% annual chance flood with 100-year return period; and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**  
Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**  
Areas determined to be outside the 0.2% annual chance floodplain.

**OTHERWISE PROTECTED AREAS (OPAs)**  
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary  
0.2% Annual Chance Floodplain Boundary  
Floodway boundary  
Zone D boundary  
Zone A boundary  
CBRS and OPA boundary  
Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined to be inadequate to provide protection from the 1% annual chance flood.

Base Flood Elevation line and value: elevation in feet  
Base Flood Elevation value where uniform within zone: elevation in feet  
\*Referenced to the North American Vertical Datum of 1988

Cross section line  
Transect line  
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere  
4980000 M  
1000-meter ticks: Massachusetts State Plane Mianland Zone (FIPS Zone 2007), Lambert Conformal Conic projection  
1000-meter Universal Transverse Mercator grid values, zone 19  
Bench mark (see explanation in Notes to Users section of this FIRM)  
Revised Map  
MAP REPOSITORIES  
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP  
FLOOD INSURANCE RATE MAP  
4/27/2014  
4/27/2014

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.  
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-877-336-2627.

**INFLIP**

**FIRM**  
FLOOD INSURANCE RATE MAP  
MIDDLESEX COUNTY,  
MASSACHUSETTS  
(ALL JURISDICTIONS)

PANEL 0219F

PANEL 219 OF 656  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:  
COMMUNITY NUMBER 250184  
LITTLETON, TOWN OF 250200

PANEL SUFFIX F

NOTICE TO USER: The Map Number shown below the FIRM title is the map number that should be used on insurance applications for the subject community.

MAP NUMBER 2507C0219F  
MAP REVISED JULY 7, 2014

Federal Emergency Management Agency

MAP SCALE 1" = 500'  
0 500 1000 FEET  
0 150 300 METERS

**NOTES TO USERS**

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage systems. For more information on flood hazards, users are encouraged to consult the most up-to-date local flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or Floodway Areas have been determined, users are encouraged to consult the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded, whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, the FIRM is not intended to be used for engineering or construction purposes in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Massachusetts State Plane Mainland Zone (NAD 83). The horizontal datum was NAD 83. GRS 1980 production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, users are encouraged to consult the National Geodetic Survey at the following address: <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services  
National Geodetic Survey  
1315 East-West Highway  
Silver Spring, Maryland 20910-3282  
(301) 715-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 715-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was derived from orthophotography provided by MassGIS at a scale of 1:500 from photography dated April 2008.

The profile baselines depicted on this map represent the hydraulic modeling baselines that the flood elevations in FIS are the result of. The profile baselines are the centerline or appear outside the SFHA.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Profiles and Floodway Data tables may deviate significantly from the previous stream channel distances that differ from what is shown on this map.

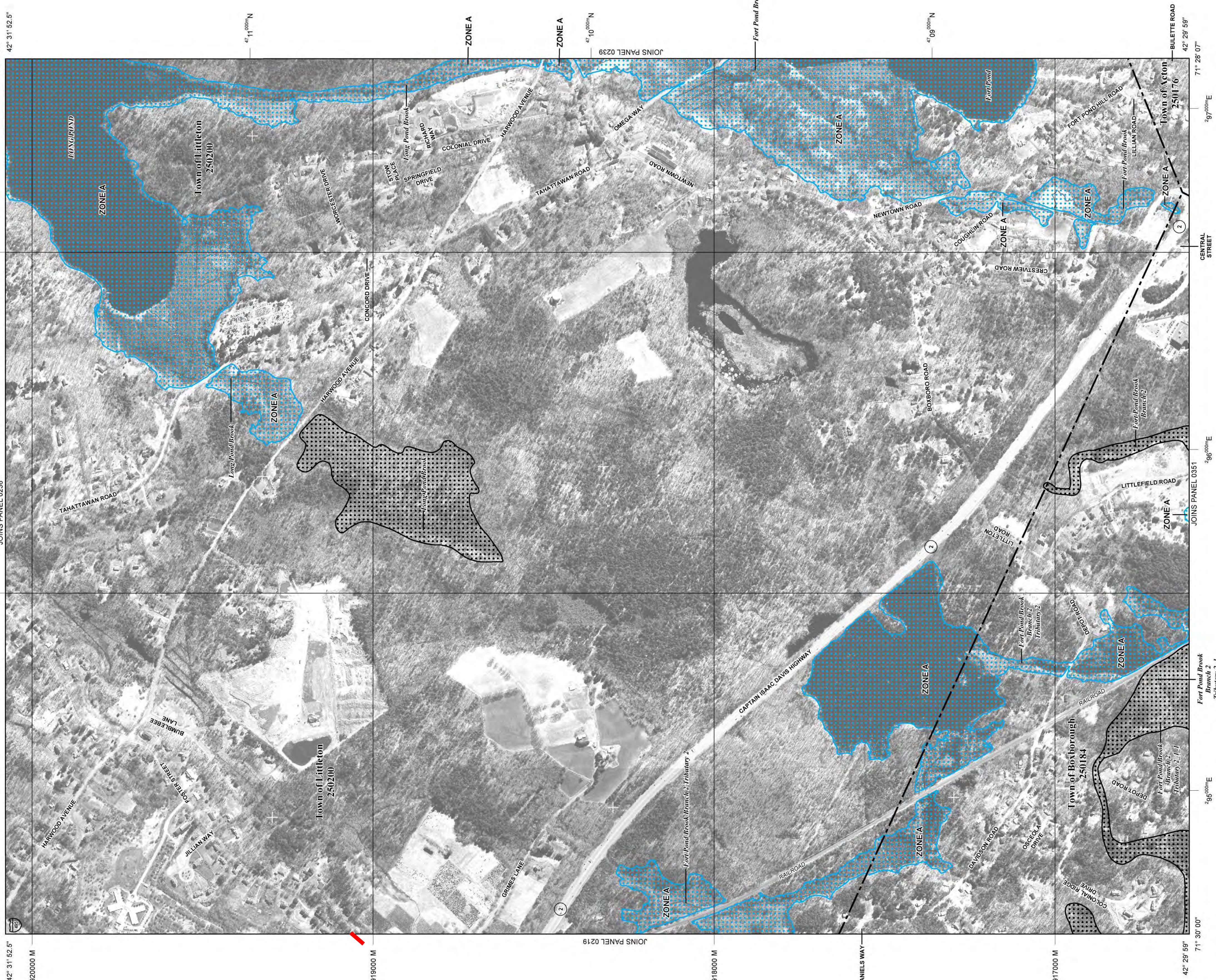
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred since the date of the map, users are encouraged to contact appropriate community officials to verify current corporate limit locations.

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**PROJECT AREA**



**LEGEND**

**SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**  
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. Areas subject to flooding by the 1% annual chance flood are shown on this map. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AV, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

**ZONE A**  
No Base Flood Elevations determined.  
Base Flood Elevations determined.

**ZONE AE**  
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

**ZONE AH**  
Flood depths of 1 to 3 feet (usually areas of ponding); average depths determined. For areas of alluvial fan flooding, velocities also determined.

**ZONE AO**  
Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined to be obsolete. Areas to be protected from the 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

**ZONE AR**  
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

**ZONE AV**  
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

**ZONE VE**  
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**  
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**  
Areas of 0.2% annual chance flood; areas of 1% annual chance flood with water surface elevations that are 1.5 feet or more above the 1% annual chance flood.

**OTHER AREAS**  
Areas determined to be outside the 0.2% annual chance floodplain.

**COASTAL BARRIER PROTECTED AREAS (CBPAs)**  
Areas in which flood hazards are undetermined, but possible.

**OTHERWISE PROTECTED AREAS (OPAs)**  
CBPAs areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain boundary  
0.2% Annual Chance Floodplain boundary  
Floodway boundary  
Zone D boundary  
Zone A boundary  
CBPAs and OPA boundary  
Special Flood Hazard Areas (SFHAs) Base and boundary  
Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.  
Base Flood Elevation line and value; elevation in feet\*  
Base Flood Elevation value where uniform within zone; elevation in feet\*  
Reference to the North American Vertical Datum of 1988  
Cross section line  
Transect line  
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere  
1000-meter ticks; Massachusetts State Plane Mainland Zone (MPS Zone 2001), Lambert Conformal Conic projection  
1000-meter Universal Transverse Mercator grid values; zone 19  
Bench mark (see explanation in Notes to Users section of this FIRM Report)  
MAP REPOSITORIES  
Refer to Map Repositories list on Map Index  
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP  
FLOOD INSURANCE RATE MAP

250 0 MAP SCALE 1" = 500'  
1000 0 100 200 FEET  
250 0 100 200 METERS

**INFIP**

**FIRM**  
FLOOD INSURANCE RATE MAP  
MIDDLESEX COUNTY,  
MASSACHUSETTS  
(ALL JURISDICTIONS)

**PANEL 0238F**

**PANEL 238 OF 656**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:  
COMMUNITY NUMBER 250176  
ACTION TOWN OF BOXBOROUGH, TOWN OF LITTLETON, TOWN OF  
PANEL SUFFIX F  
F  
F

NOTICE TO USER: The Map Number shown below identifies the specific map panel. The Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
2501760238F  
**MAP REVISED**  
JULY 7, 2014

Federal Emergency Management Agency



## Appendix B

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### Project Plans



# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

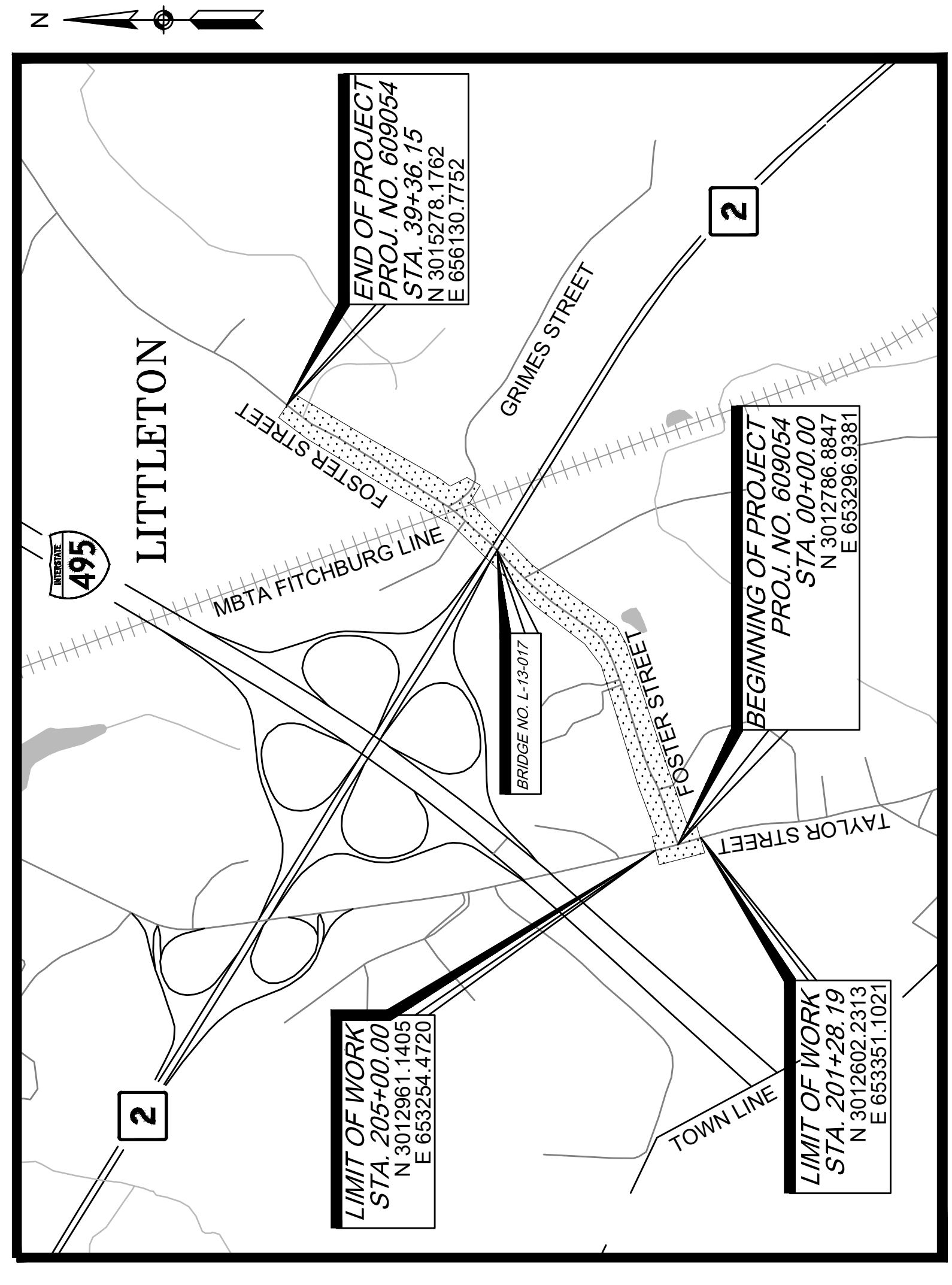
PLAN AND PROFILE OF  
**FOSTER STREET**  
(BRIDGE NO. L-13-017)  
IN THE TOWN OF  
**LITTLETON**  
MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. XXX-XXXX(XXX)X

## PERMITTING PLAN SET 100% SUBMITTAL

PERMITTING PLAN SET PAGE NO.	SHEET NO.	DESCRIPTION
1	1	TITLE SHEET & INDEX
2	2	LEGEND & ABBREVIATIONS
3	3	KEY PLAN & BORING LOCATIONS
4-8	4-8	TYPICAL SECTIONS
9-16	9-16	CONSTRUCTION PLANS
17-24	E1-E8	ENVIRONMENTAL PLANS
25-31	17-23	PROFILE - FOSTER STREET
	25-32	CURB & BASELINE TIE PLANS *
32-39	33-40	GRADING PLANS
40-47	41-48	PAVEMENT MARKING & SIGNING PLANS
	49-50	TRAFFIC SIGN SUMMARY SHEET *
	51-56	TEMPORARY TRAFFIC CONTROL PLANS *
48-55	57-64	DRAINAGE & UTILITY PLANS
56-61	68-70	CONSTRUCTION DETAILS
	71-73	WHEELCHAIR RAMP/DRIVEWAY DETAILS *
62-117	74-129	CROSS-SECTIONS

\*NOT INCLUDED IN PERMITTING PLAN SET



750 0 750 1500  
SCALE IN FEET  
LENGTH OF PROJECT = 3936.15 FEET = 0.745 MILES  
(FOSTER STREET)

### NOT FOR CONSTRUCTION

LITTLETON  
RECONSTRUCTION OF FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	1	129

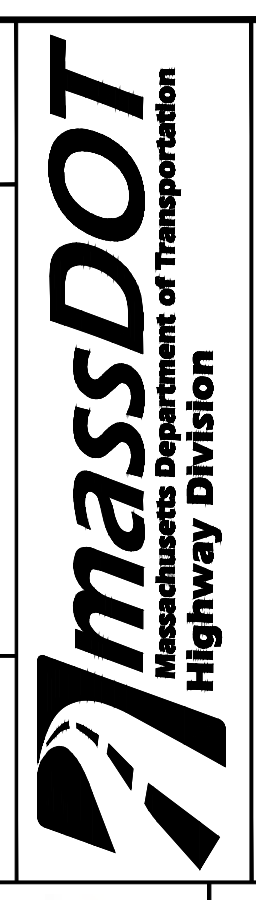
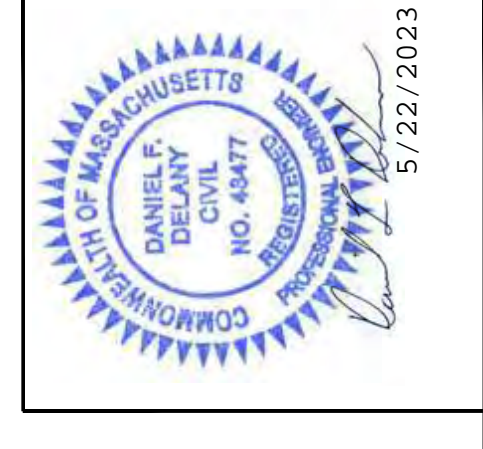
PROJECT FILE NO. 609054  
TITLE SHEET & INDEX

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 1966 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

#### DESIGN DESIGNATION (FOSTER STREET)

DESIGN SPEED	35 MPH
ADT (2017)	2,100
ADT (2037)	2,562
K	12%
D	69% (NB)
T (PEAK HOUR)	0.9%
T (AVERAGE DAY)	5.5%
DHV	252
DDHV	174 (NB)
FUNCTIONAL CLASSIFICATION	URBAN COLLECTOR

NOI SUBMISSION	REV #
08-11-2023	1
10-21-2022	1
11-18-2020	1
06-13-2019	1
03-14-2019	1
DATE	DESCRIPTION



**FUSS & O'NEILL**  
1550 MAIN STREET, SUITE 400  
SPRINGFIELD, MA 01103  
413.452.0445  
www.fandoc.com

APPROVED  
CHIEF ENGINEER  
DATE

LITTLETON RECONSTRUCTION OF FOSTER STREET

Table with 3 columns: STATE (MA), FED. AID PROJ. NO. (XXX-XXX-XXXX), SHEET NO. (2), TOTAL SHEETS (129), PROJECT FILE NO. (60954)

LEGEND & GENERAL NOTES

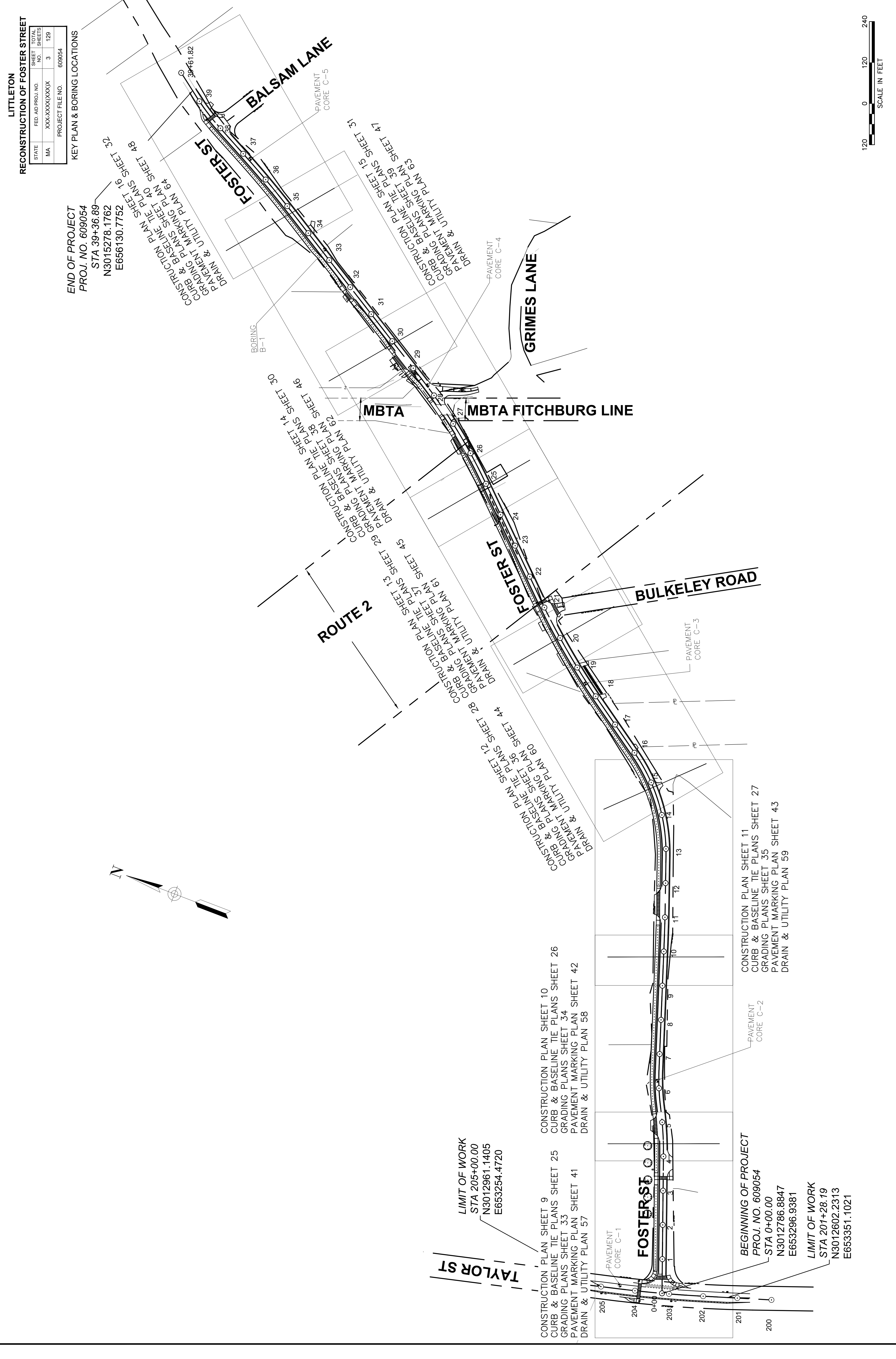
- GENERAL NOTES: 1. INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN BASED UPON AVAILABLE INFORMATION AND MAY BE INCOMPLETE... 2. VERIZON UNDERGROUND TELEPHONE... 3. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY LOCAL AND STATE APPROVALS... 4. THE CONTRACTOR SHALL BE PROMPTLY REPAIRED TO EXISTING OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE... 5. THE ROADWAY IS TO BE GRADED SMOOTHLY AND EVENLY IN ACCORDANCE WITH THE GRADING AND TIE PLANS... 6. THE CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS TO REMOVE ANY PERSONAL ITEMS... 7. ANY PUBLIC OR PRIVATE PROPERTY DISTURBED AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED AS QUICKLY AS POSSIBLE... 8. RIM OR FRAME ELEVATIONS OF ALL UTILITY STRUCTURES SHALL BE ADJUSTED TO MEET FINISHED PAVED SURFACES... 9. STAGING AREAS AND MATERIAL STOCK PILES SHALL BE LIMITED WITHIN THE SITE AND LOCATED SO AS NOT TO INTERFERE WITH PEDESTRIAN OR VEHICULAR TRAFFIC... 10. HOURS OF WORK SHALL BE DEFINED IN THE CONTRACT DOCUMENTS... 11. ACCESS TO PRIVATE PROPERTIES MUST BE MAINTAINED AT ALL TIMES... 12. INSTALL SEDIMENTATION AND EROSION CONTROL MEASURES PRIOR TO START OF CONSTRUCTION...

ABBREVIATIONS (cont.) Table with 2 columns: ABBREVIATION (e.g., PAVEMENT, RADIUS OF CURVATURE), DESCRIPTION (e.g., PAVED WATER WAY, RADIUS OF CURVATURE)

ABBREVIATIONS Table with 2 columns: ABBREVIATION (e.g., AADT, ABAN, ADJ), DESCRIPTION (e.g., ANNUAL AVERAGE DAILY TRAFFIC, ABANDON, ADJUST APPROXIMATE)

TRAFFIC SYMBOLS Table with 4 columns: EXISTING, PROPOSED, DESCRIPTION, and a sub-section for PAVEMENT MARKINGS SYMBOLS (EXISTING, PROPOSED)

GENERAL SYMBOLS Table with 4 columns: EXISTING, PROPOSED, DESCRIPTION, and a sub-section for PAVEMENT MARKINGS SYMBOLS (EXISTING, PROPOSED)



**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	3	129

PROJECT FILE NO. 609054

**KEY PLAN & BORING LOCATIONS**

**END OF PROJECT**  
 PROJ. NO. 609054  
 STA 39+36.89  
 N3015278.1762  
 E656130.7752

**LIMIT OF WORK**  
 STA 205+00.00  
 N3012961.1405  
 E653254.4720

**BEGINNING OF PROJECT**  
 PROJ. NO. 609054  
 STA 0+00.00  
 N3012786.8847  
 E653296.9381

**LIMIT OF WORK**  
 STA 201+28.79  
 N3012602.2313  
 E653351.1021





**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	4	129
PROJECT FILE NO.		609054	

**TYPICAL SECTIONS - FOSTER ST**

**PAVEMENT NOTES:**

**PROPOSED PAVEMENT MILLING AND OVERLAY - FOSTER STREET**  
 1-1/2" PAVEMENT FINE MILLING  
 1-1/2" SUPERPAVE SURFACE COURSE - 9.5  
 MILLING TO BE VARIABLE DEPTH (INCREASING) AT PROJECT LIMITS TO MEET EXISTING GRADE ON TAYLOR ST  
 MILLING TO BE VARIABLE DEPTH (DECREASING) AT SAWCUT TRANSITION ON FOSTER ST EAST OF BALSAM LN

**PROPOSED FULL DEPTH PAVEMENT RECONSTRUCTION**  
 SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
 INTERMEDIATE: 1-3/4" SUPERPAVE INTERMEDIATE COURSE - 12.5 OVER  
 BASE: 4" SUPERPAVE BASE COURSE - 37.5 OVER  
 SUBBASE: 4" DENSE GRADED CRUSHED STONE  
 8" GRAVEL BORROW, TYPE b

**PROPOSED SHARED-USE PATH FULL DEPTH PAVEMENT**  
 SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
 INTERMEDIATE: 2-1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 OVER  
 SUBBASE: 8" GRAVEL BORROW, TYPE b

**PROPOSED HOT MIX ASPHALT SIDEWALK OR DRIVEWAY**  
 SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
 2-1/2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5)  
 FOUNDATION: 8" GRAVEL BORROW, TYPE b.

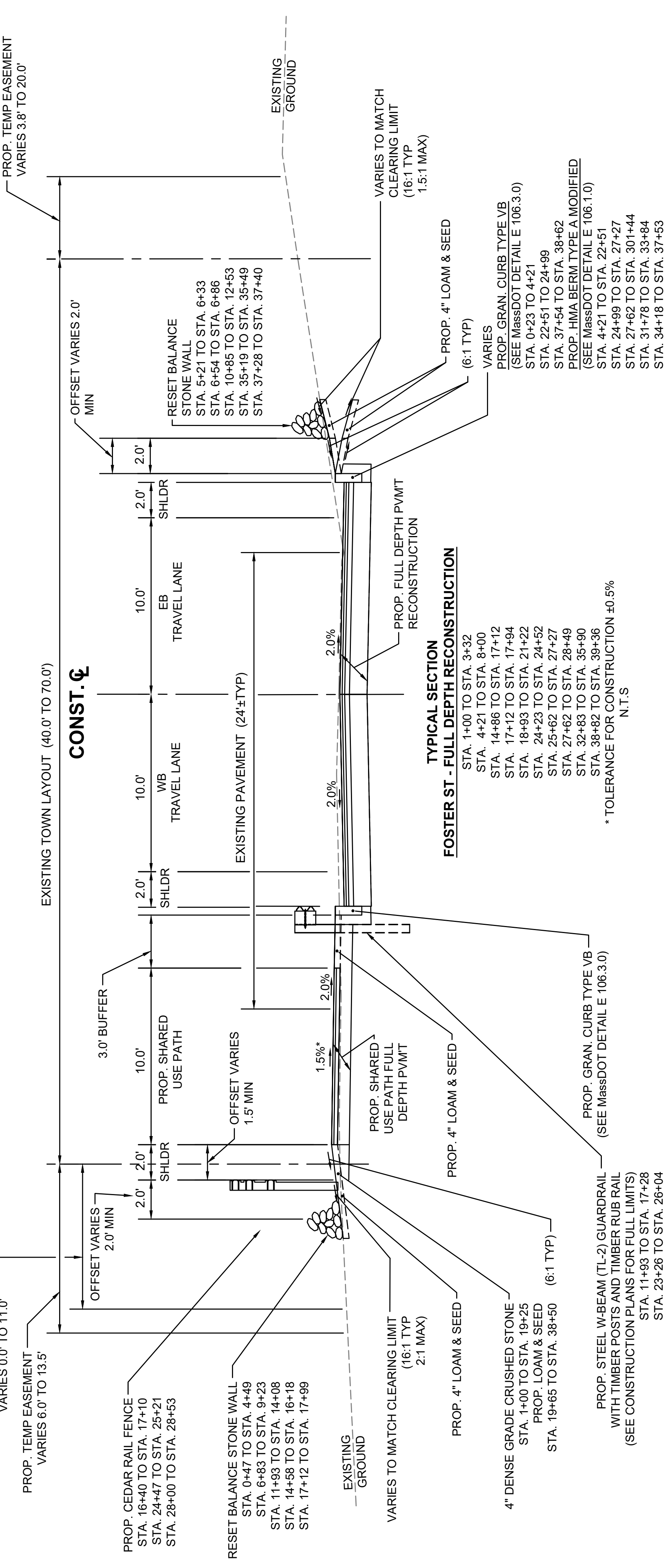
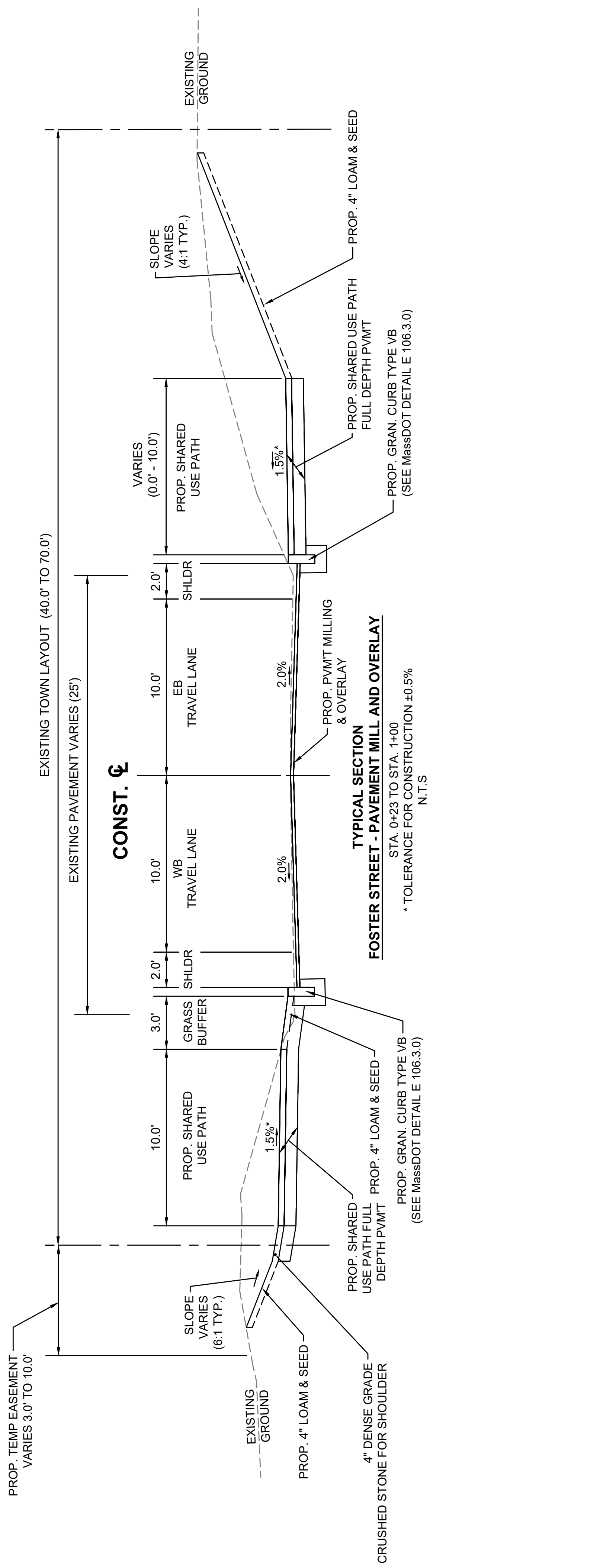
**PROPOSED CEMENT CONCRETE SIDEWALK**  
 SURFACE: 4" CEMENT CONCRETE  
 AIR ENTRAINED 4000psi, 3/4", 610  
 FOUNDATION: 8" GRAVEL BORROW, TYPE b.

**PROPOSED CEMENT CONCRETE PEDESTRIAN CURB RAMP**  
 SURFACE: 6" CEMENT CONCRETE  
 AIR ENTRAINED 4000psi, 3/4", 610  
 FOUNDATION: 8" GRAVEL BORROW, TYPE b.

**NOTES:** ASPHALT EMULSION FOR TACK COAT AND HMA JOINT SEALANT SHALL BE APPLIED PER SECTION 450 QA OF THE SPECIAL PROVISIONS.

HMA FOR PATCHING SHALL BE USED FOR ALL PERMANENT, PARTIAL, AND FULL DEPTH PAVEMENT REPAIRS OF UNSOUND PAVEMENT PER SECTION 450 IN AREAS OUTSIDE OF PROPOSED FULL DEPTH RECLAMATION OR RECONSTRUCTION ROADWAY AREAS.

HMA FOR MISCELLANEOUS WORK SHALL BE USED FOR ALL TEMPORARY CONSTRUCTION, TAPER RAMPS, CURB CUT RAMPS, TEMPORARY TRENCH REPAIR, ETC.



PROP. PERM EASEMENT VARIES 0.0' TO 11.0'  
 PROP. TEMP EASEMENT VARIES 6.0' TO 13.5'

PROP. CEDAR RAIL FENCE STA. 16+40 TO STA. 17+10  
 STA. 24+47 TO STA. 25+21  
 STA. 28+00 TO STA. 28+53

RESET BALANCE STONE WALL STA. 0+47 TO STA. 4+49  
 STA. 6+83 TO STA. 9+23  
 STA. 11+93 TO STA. 14+08  
 STA. 14+58 TO STA. 16+18  
 STA. 17+12 TO STA. 17+99

VARIES TO MATCH CLEARING LIMIT (16:1 TYP 2:1 MAX)

PROP. 4" LOAM & SEED

4" DENSE GRADE CRUSHED STONE STA. 1+00 TO STA. 19+25  
 PROP. LOAM & SEED STA. 19+65 TO STA. 38+50 (6:1 TYP)

PROP. STEEL W-BEAM (TL-2) GUARDRAIL WITH TIMBER POSTS AND TIMBER RUB RAIL (SEE CONSTRUCTION PLANS FOR FULL LIMITS) STA. 11+98 TO STA. 17+28  
 STA. 23+26 TO STA. 26+04

VARIES TO MATCH CLEARING LIMIT (16:1 TYP 1.5:1 MAX)

PROP. 4" LOAM & SEED (6:1 TYP)

VARIES (SEE MassDOT DETAIL E 106.3.0)

PROP. GRAN. CURB TYPE VB STA. 0+23 TO 4+21  
 STA. 22+51 TO 24+99  
 STA. 37+54 TO STA. 38+62 (SEE MassDOT DETAIL E 106.1.0)

STA. 4+21 TO STA. 22+51  
 STA. 24+99 TO STA. 301+44  
 STA. 31+78 TO STA. 33+84  
 STA. 34+18 TO STA. 37+53

VARIES (SEE MassDOT DETAIL E 106.3.0)

PROP. GRAN. CURB TYPE VB STA. 0+23 TO 4+21  
 STA. 22+51 TO 24+99  
 STA. 37+54 TO STA. 38+62 (SEE MassDOT DETAIL E 106.1.0)

STA. 4+21 TO STA. 22+51  
 STA. 24+99 TO STA. 301+44  
 STA. 31+78 TO STA. 33+84  
 STA. 34+18 TO STA. 37+53

\* TOLERANCE FOR CONSTRUCTION ±0.5%  
 N.T.S.

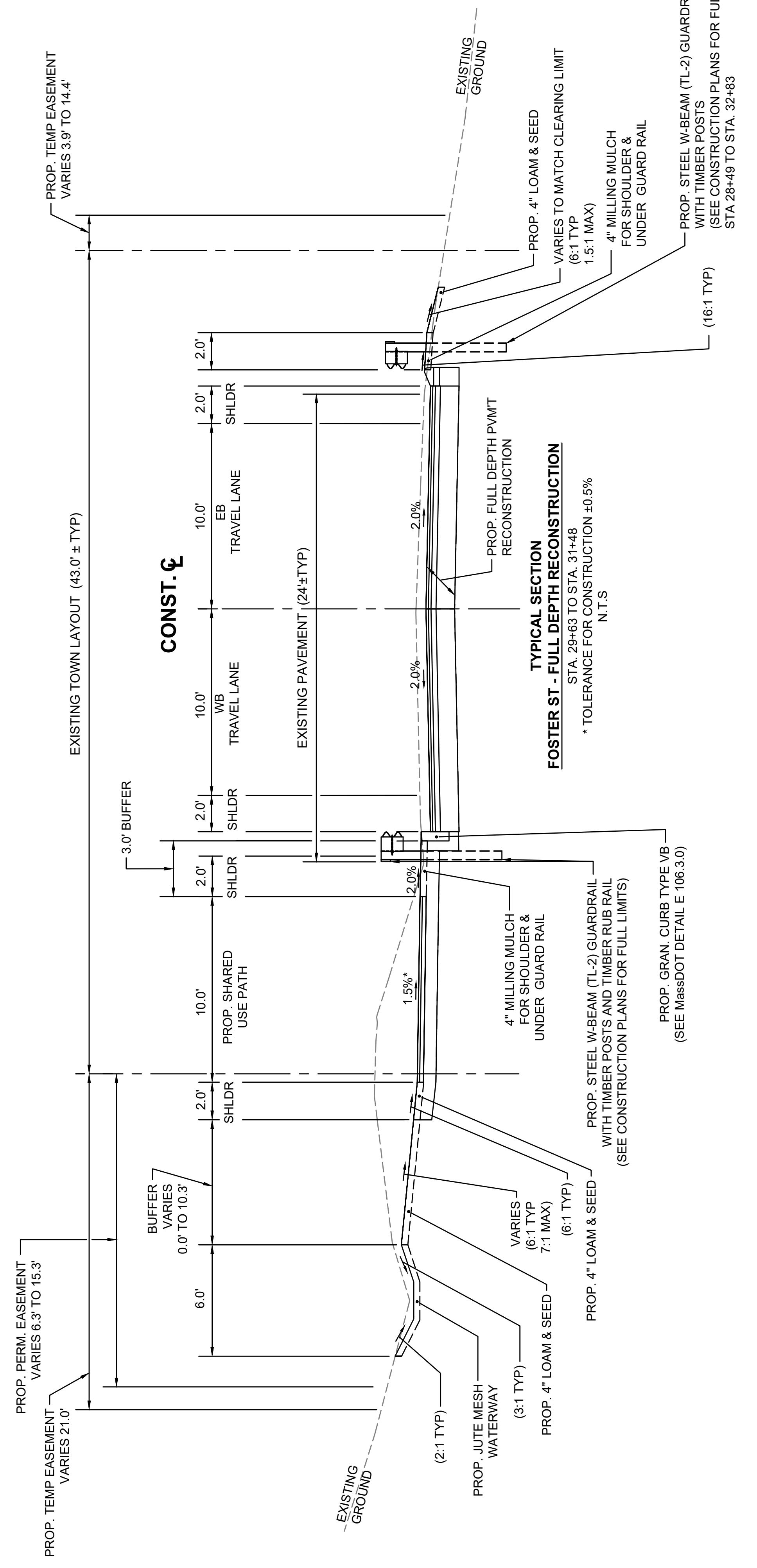
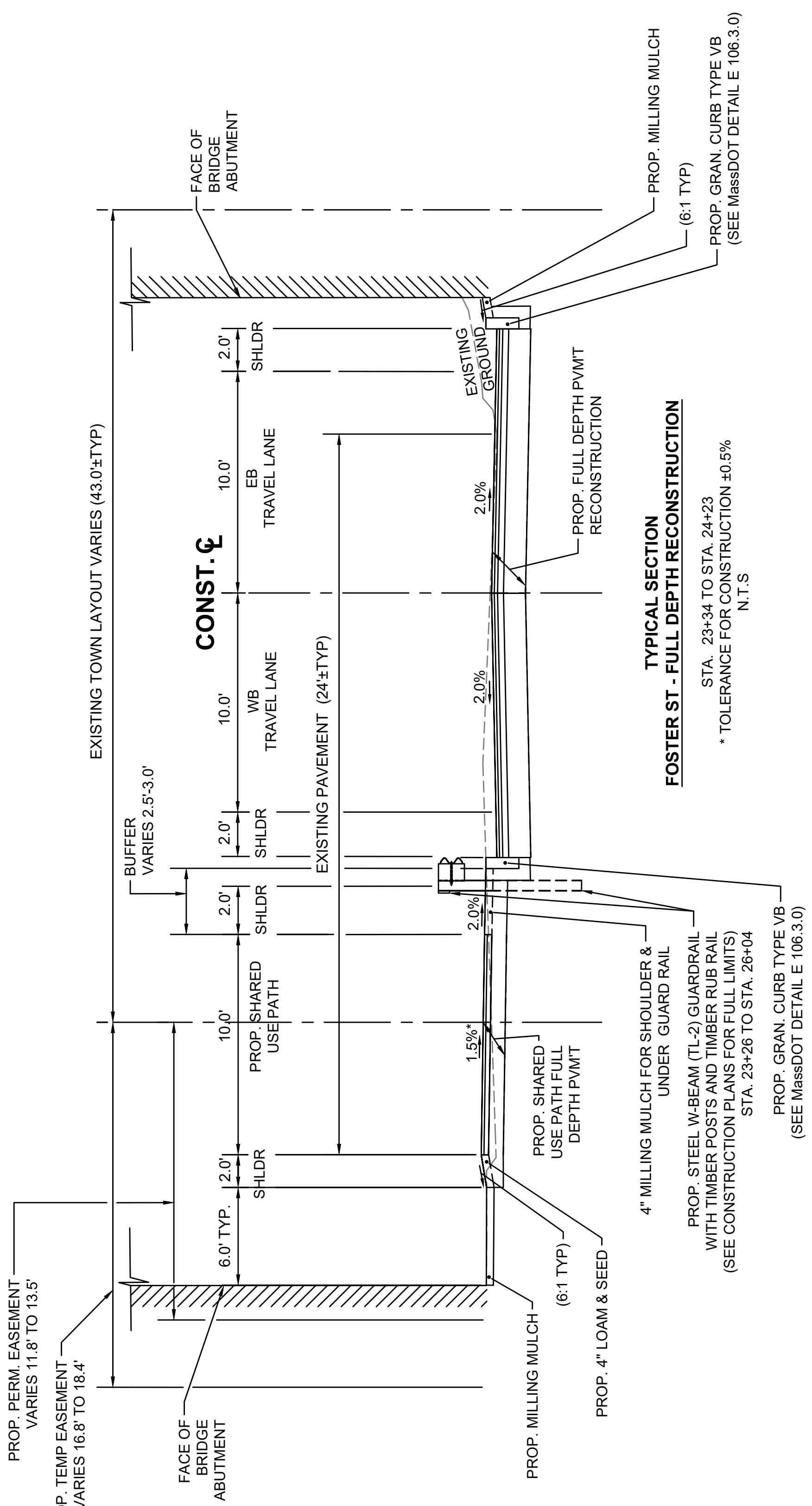




**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

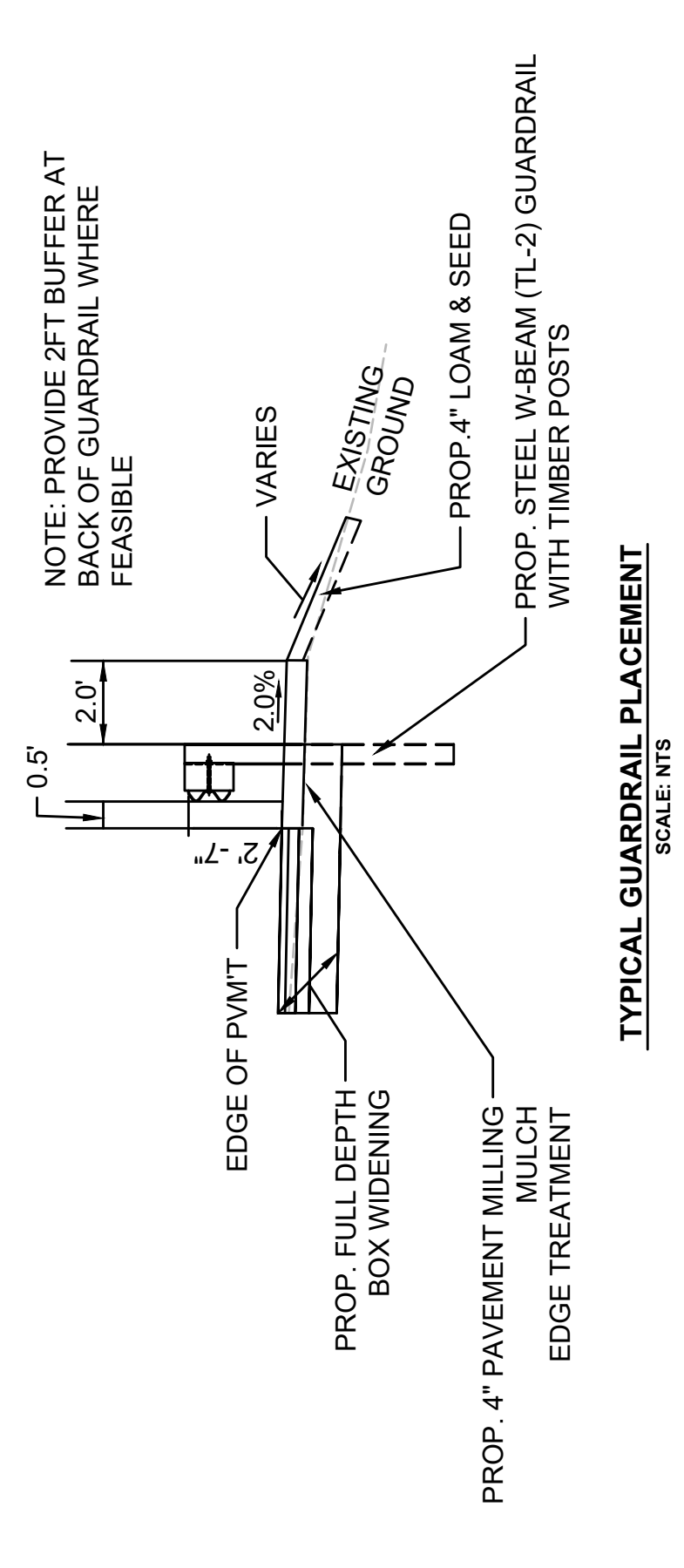
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	7	129
PROJECT FILE NO.			609054

**TYPICAL SECTIONS - FOSTER ST**

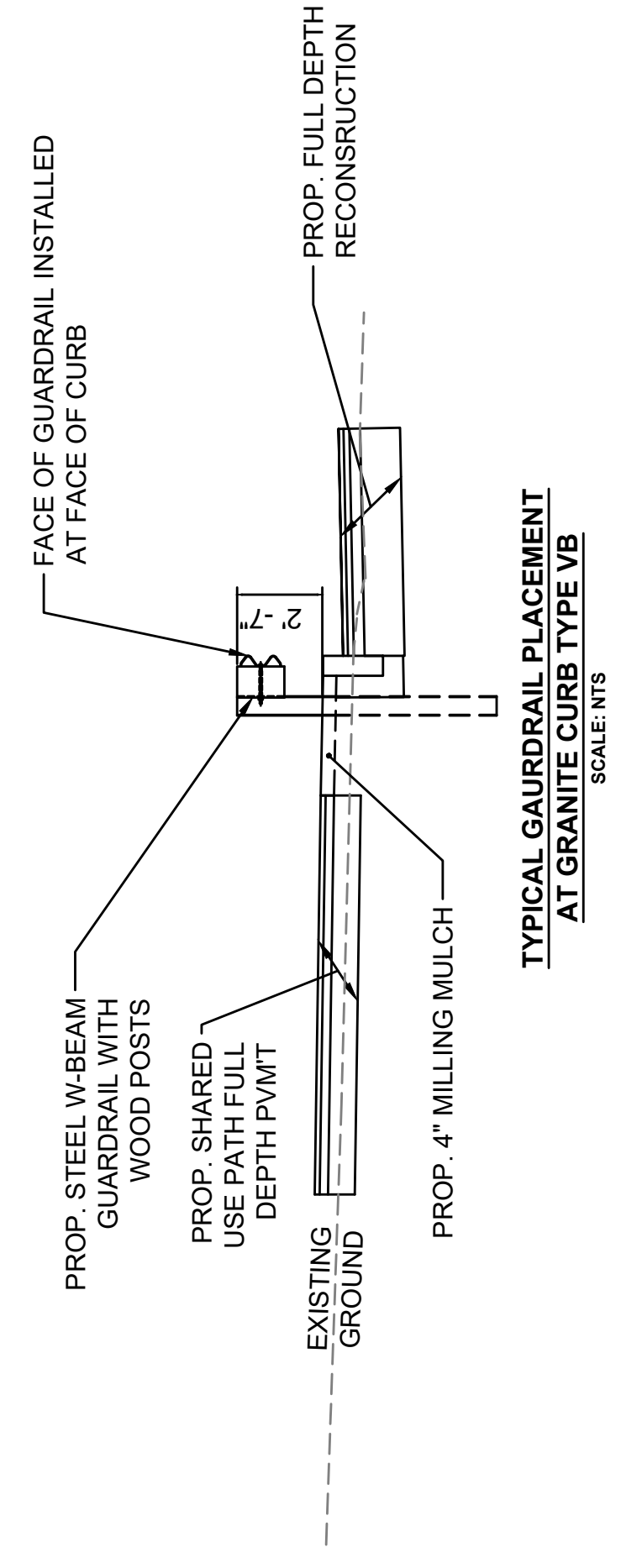


**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**TYPICAL SECTIONS - FOSTER ST**

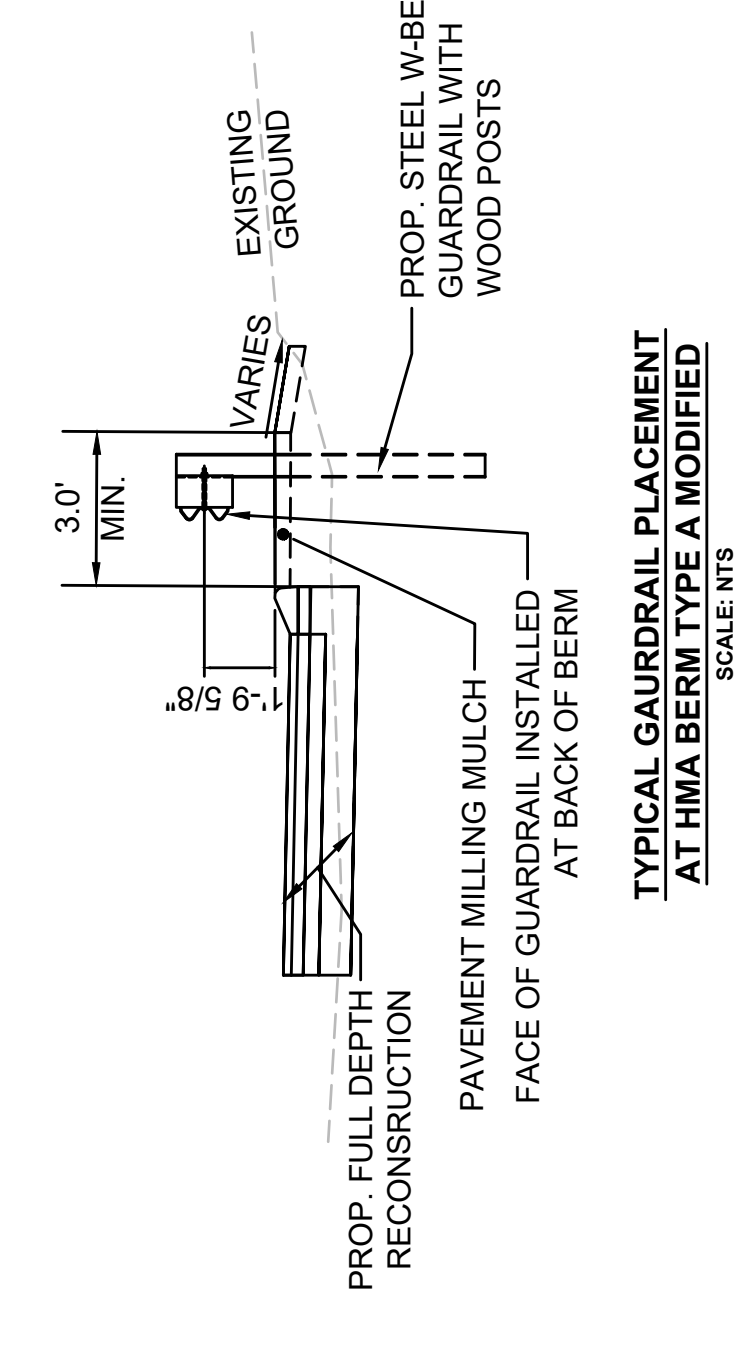
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MA	XXX-XXX(XXX)X	8	129
PROJECT FILE NO.			609054



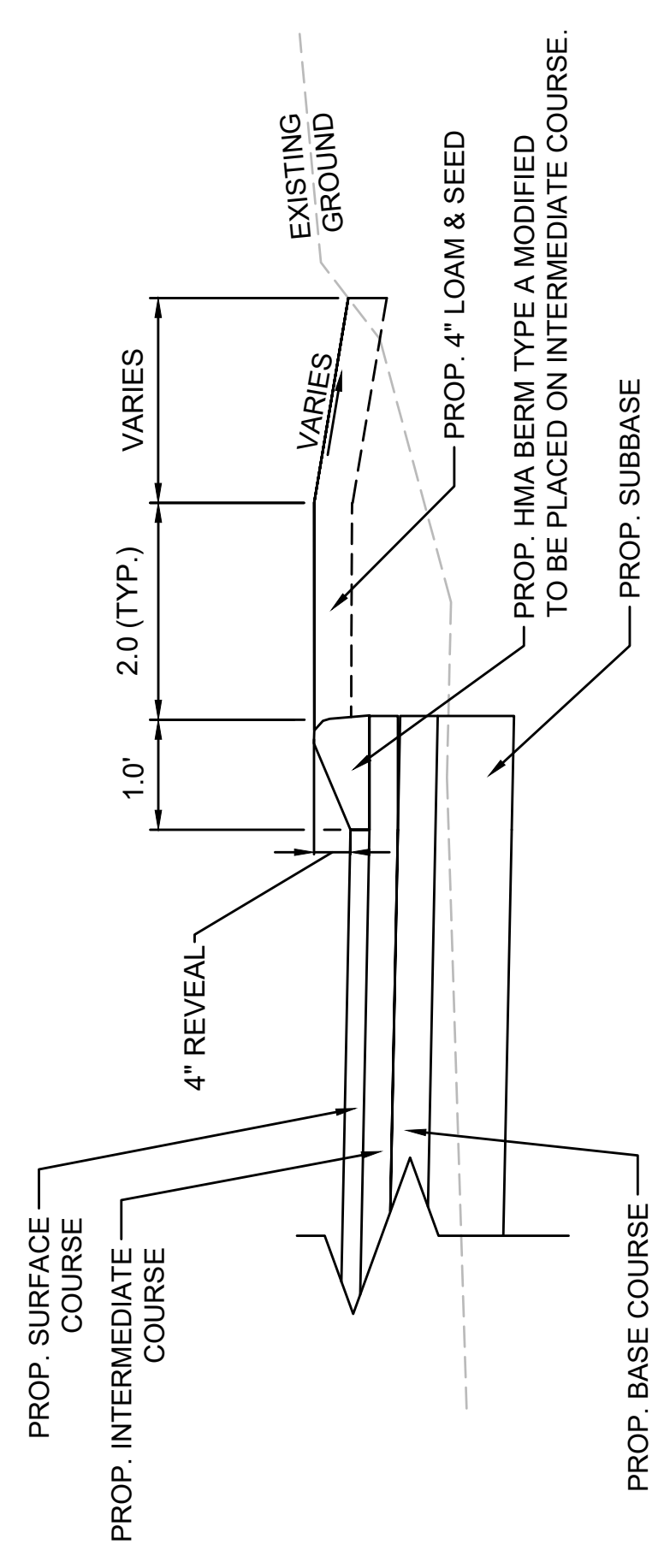
**TYPICAL GUARDRAIL PLACEMENT**  
SCALE: NTS



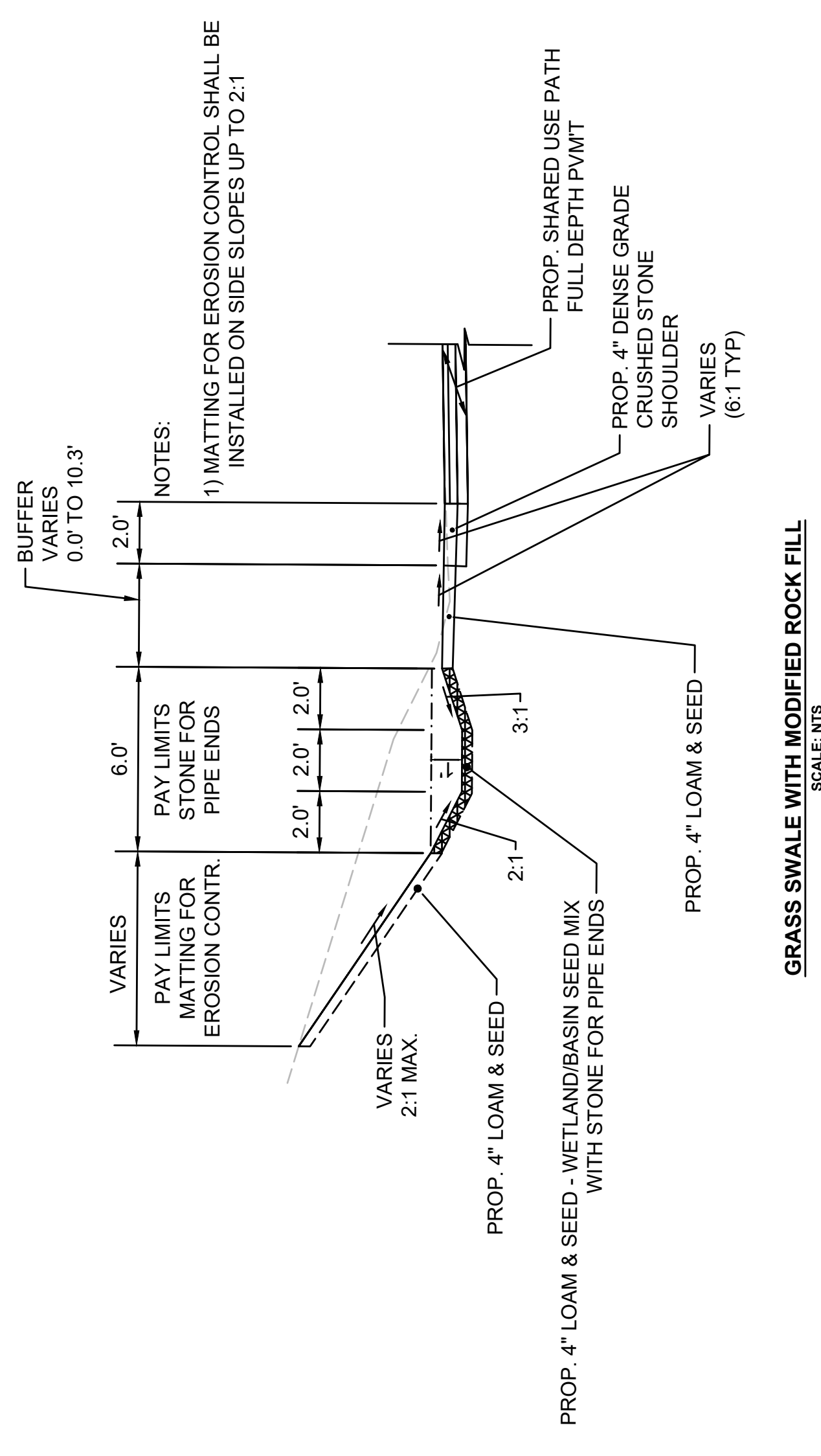
**TYPICAL GAURDRAIL PLACEMENT AT GRANITE CURB TYPE VB**  
SCALE: NTS



**TYPICAL GAURDRAIL PLACEMENT AT HMA BERM TYPE A MODIFIED**  
SCALE: NTS



**PROP. HMA BERM TYPE A MODIFIED PLACEMENT**  
SCALE: NTS



**GRASS SWALE WITH MODIFIED ROCK FILL**  
SCALE: NTS

2017/04/21 1:48 AM Plotted on 19-Apr-2023 1:48 AM

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	9	129

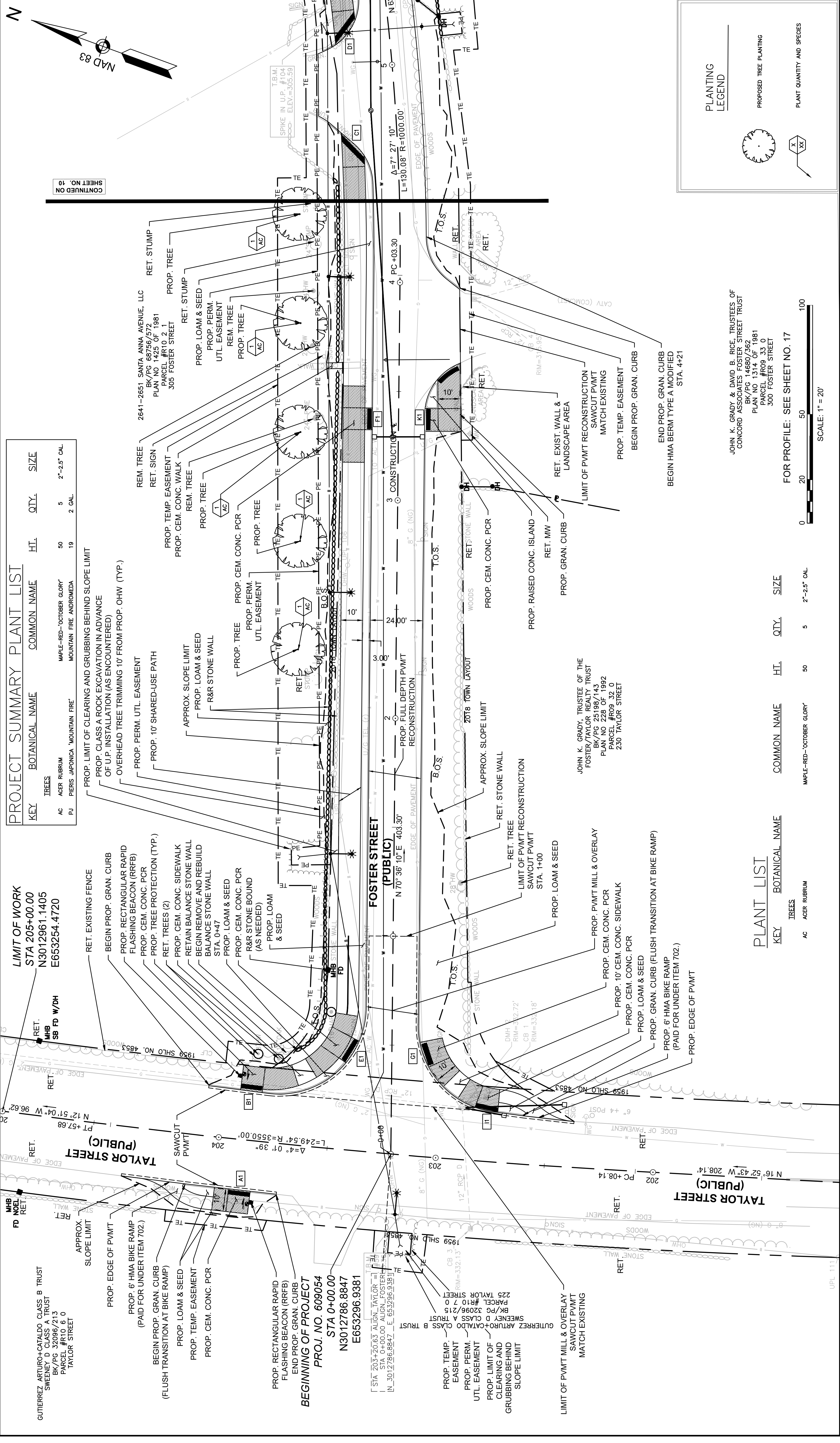
PROJECT FILE NO. 609054

**CONSTRUCTION PLANS**

- NOTES:**
- ALL EXISTING GRANITE CURB WITHIN PROJECT LIMITS SHALL BE REMOVED & DISCARDED UNLESS OTHERWISE NOTED ON THE PLAN
  - FOR GUARDRAIL DETAILS REFER TO STANDARD DETAILS 400.1.2, 400.1.3, 400.1.4, 400.1.5, 400.1.6, AND 400.5.1
  - ALL PROPOSED GRANITE CURB SHALL BE TYPE VB.
  - PRIOR TO CONSTRUCTION ACTIVITIES, A SITE WALK SHALL BE CONDUCTED WITH CONTRACTOR, ENGINEER, AND LANDSCAPE ARCHITECT TO DETERMINE SELECTIVE CLEARING AND THINNING OF TREES.
  - ALL PROPOSED CLEARING AND GRUBBING IS SHOWN WITH THE PROPOSED SLOPE LINE UNLESS OTHERWISE SHOWN

- LEGEND:**
- PROPOSED PEDESTRIAN CURB RAMP DETAIL # [X#]
- PROPOSED DRIVEWAY TYPE # [DR#-#]

- DRAINAGE DETAILS**  
SEE SHEET NOS. 65-67
- WATER SUPPLY ALTERATIONS**  
SEE SHEET 57-64
- TRAFFIC SIGNAL CONDUIT**  
NONE
- HIGHWAY GUARD DETAILS**  
NONE



**PROJECT SUMMARY PLANT LIST**

KEY	BOTANICAL NAME	COMMON NAME	HT.	QTY.	SIZE
TREES					
AC	ACER RUBRUM	MAPLE-RED-OCTOBER GLORY	50	5	2"-2.5" CAL.
PJ	PERIS JAPONICA	MOUNTAIN FIRE ANDROMEDA	19	2	2" CAL.

**PLANTING LEGEND**

PROPOSED TREE PLANTING

PLANT QUANTITY AND SPECIES

FOR PROFILE: SEE SHEET NO. 17

SCALE: 1" = 20'

**PLANT LIST**

KEY	BOTANICAL NAME	COMMON NAME	HT.	QTY.	SIZE
TREES					
AC	ACER RUBRUM	MAPLE-RED-OCTOBER GLORY	50	5	2"-2.5" CAL.

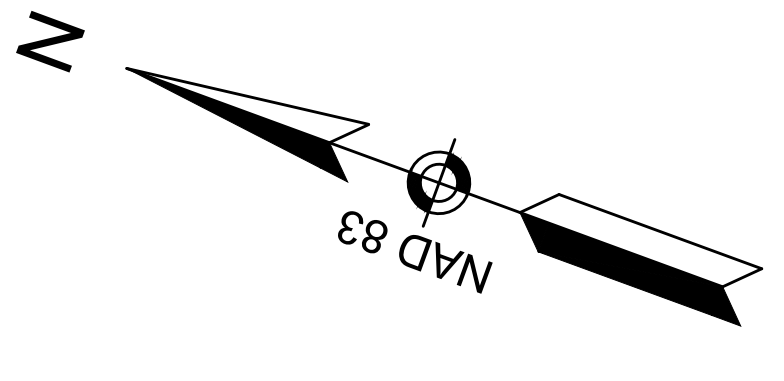
FOR PROFILE: SEE SHEET NO. 17

SCALE: 1" = 20'

2017004421\_HFN01.DWG Plotted on 19-Apr-2023 1:48 AM

**LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
CONSTRUCTION PLANS**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	10	129
PROJECT FILE NO. 609054			



**LEGEND:**

PROPOSED PEDESTRIAN CURB RAMP DETAIL # **X#**

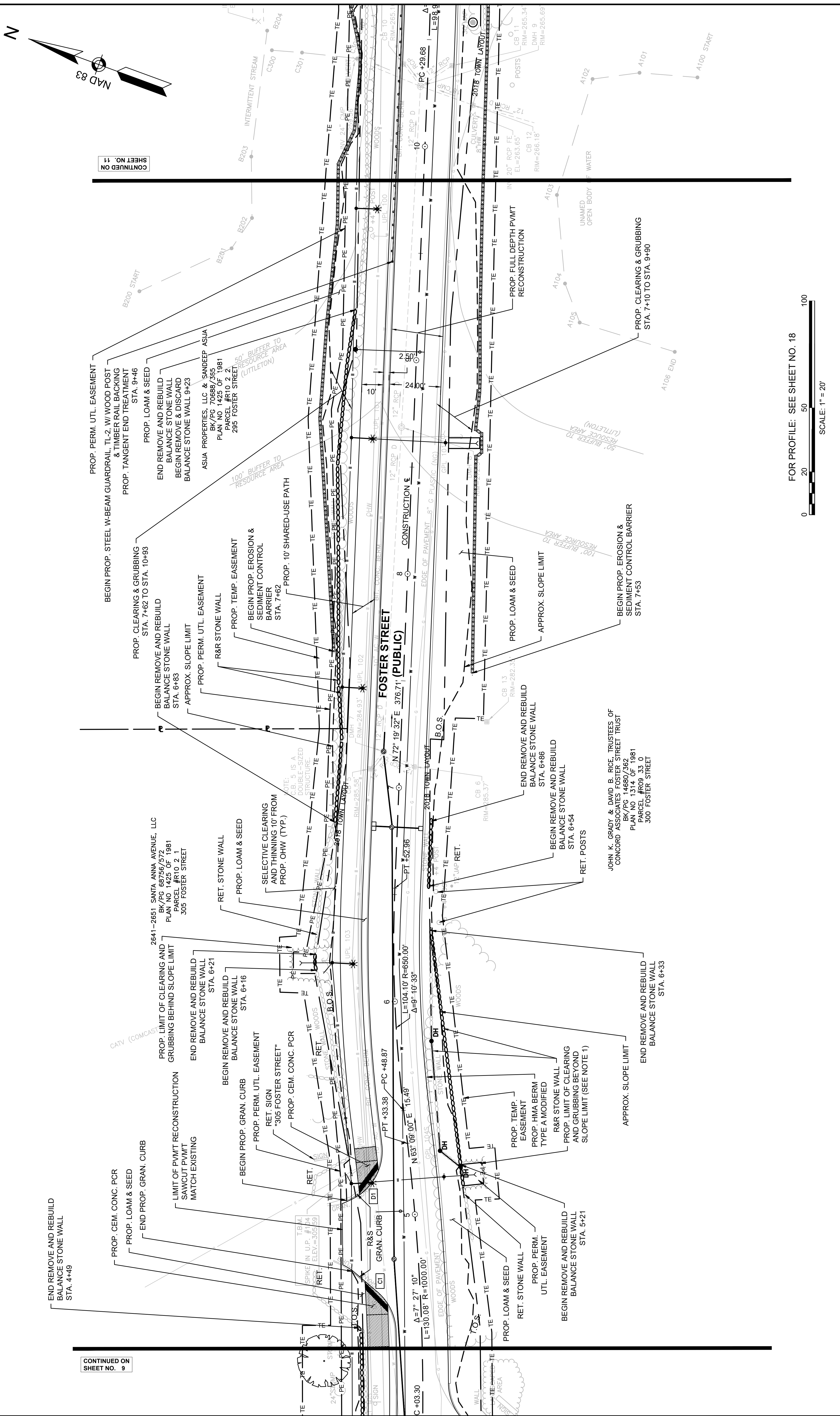
PROPOSED DRIVEWAY TYPE # **DR#**

**TRAFFIC SIGNAL CONDUIT** NONE

**WATER SUPPLY ALTERATIONS** SEE SHEET 57-64

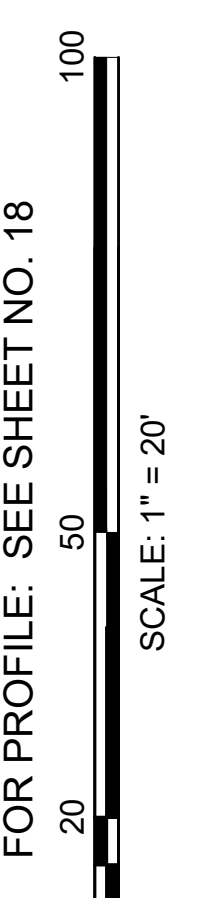
**DRAINAGE DETAILS** SEE SHEET NOS. 65-67

**HIGHWAY GUARD DETAILS** STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 9+46 LT TO TANGENT END STA 10+84 LT



CONTINUED ON SHEET NO. 11

CONTINUED ON SHEET NO. 9



FOR PROFILE: SEE SHEET NO. 18

2017004421\_HFN01.DWG Plotted on 19-Apr-2023 1:48 AM

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	11	129

PROJECT FILE NO. 609054

**CONSTRUCTION PLANS**

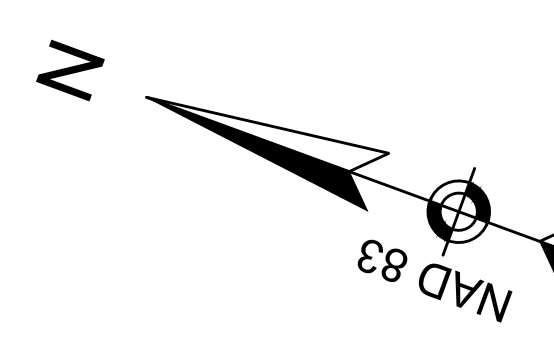
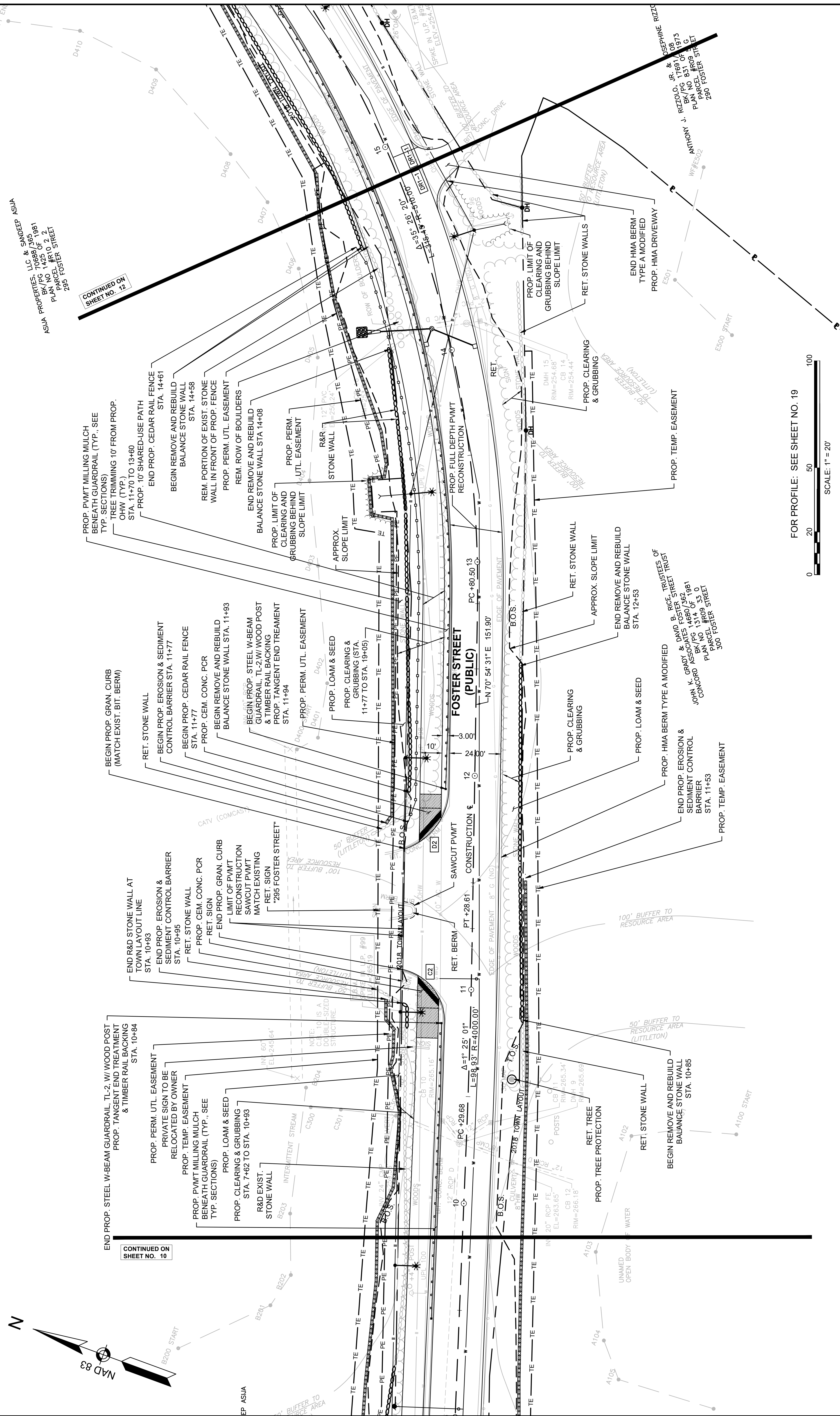
**HIGHWAY GUARD DETAILS**  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 9+46 LT TO TANGENT END STA 10+84 LT  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 11+94 LT TO TANGENT END STA 17+28 LT

**TRAFFIC SIGNAL CONDUIT**  
 NONE

**WATER SUPPLY ALTERATIONS**  
 SEE SHEET 57-64

**DRAINAGE DETAILS**  
 SEE SHEET NOS. 65-67

**LEGEND:**  
 PROPOSED PEDESTRIAN CURB RAMP DETAIL # [X#]  
 PROPOSED DRIVEWAY TYPE # [DR#]



CONTINUED ON SHEET NO. 12

CONTINUED ON SHEET NO. 10







**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	13	129
PROJECT FILE NO. 609054			

**CONSTRUCTION PLANS**

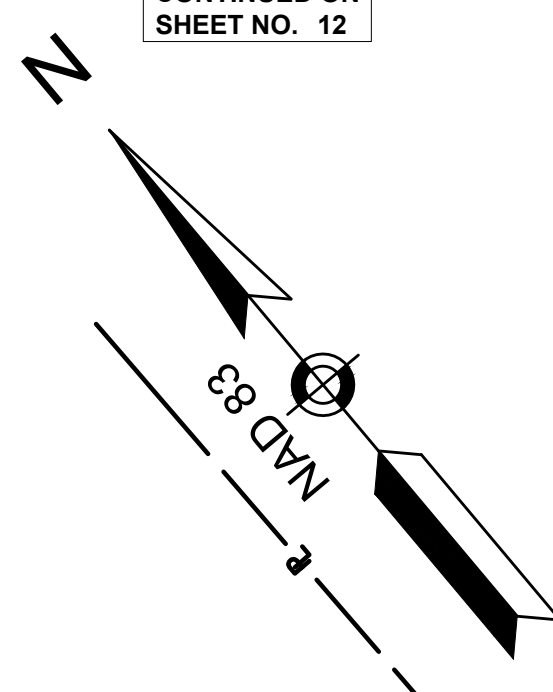
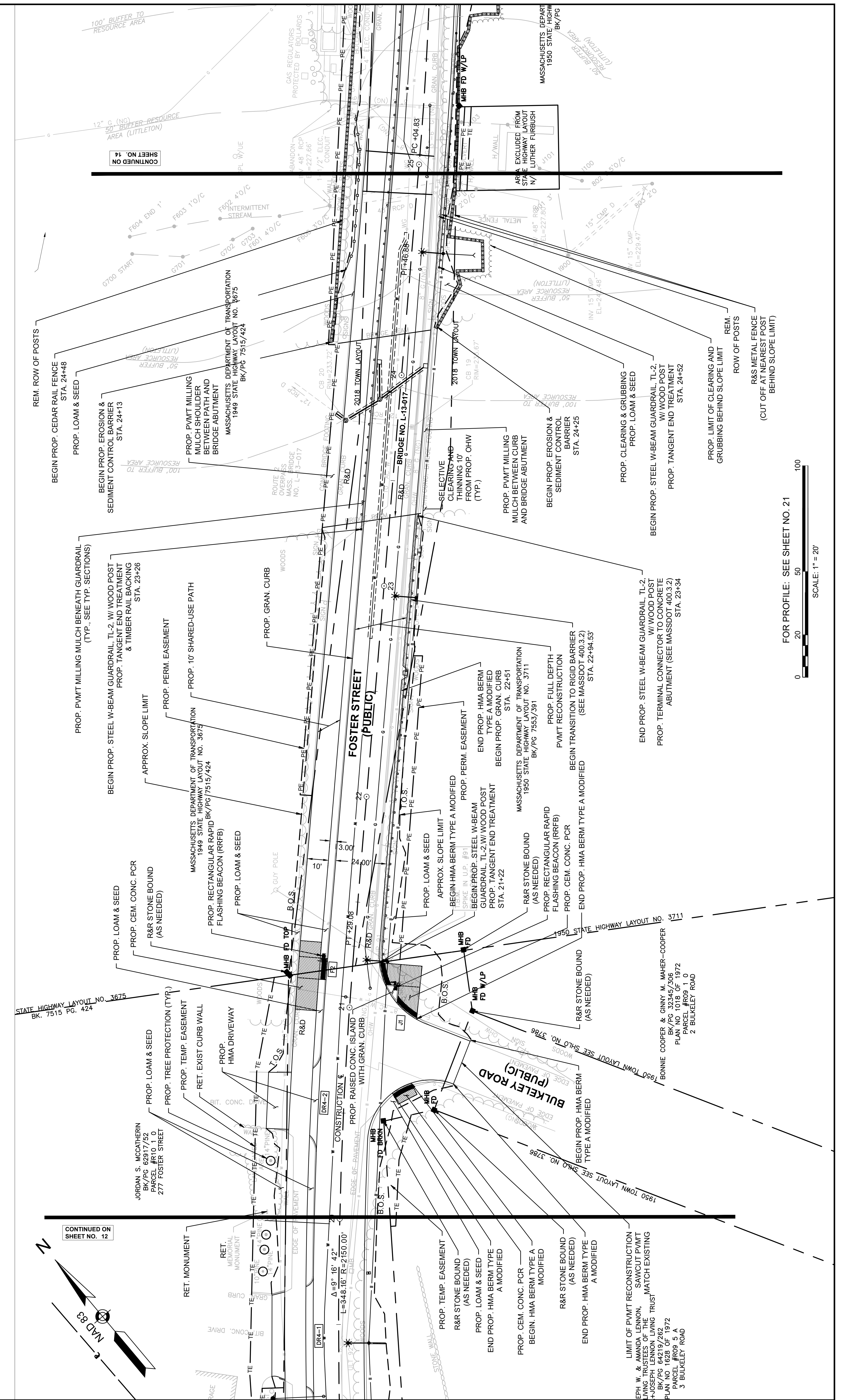
**HIGHWAY GUARDRAIL DETAILS**  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 21+22 RT TO CONCRETE ABUTMENT STA 23+34 RT  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 23+26 LT TO TANGENT END STA 26+04 LT  
 STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 24+52 RT TO TANGENT END STA 25+62 RT

**WATER SUPPLY ALTERATIONS**  
 SEE SHEET 57-64

**DRAINAGE DETAILS**  
 SEE SHEET NOS. 65-67

**TRAFFIC SIGNAL CONDUIT**  
 NONE

**LEGEND:**  
 PROPOSED PEDESTRIAN CURB RAMP DETAIL # [X#]  
 PROPOSED DRIVEWAY TYPE # [DR#]



FOR PROFILE: SEE SHEET NO. 21

CONTINUED ON SHEET NO. 12

CONTINUED ON SHEET NO. 14

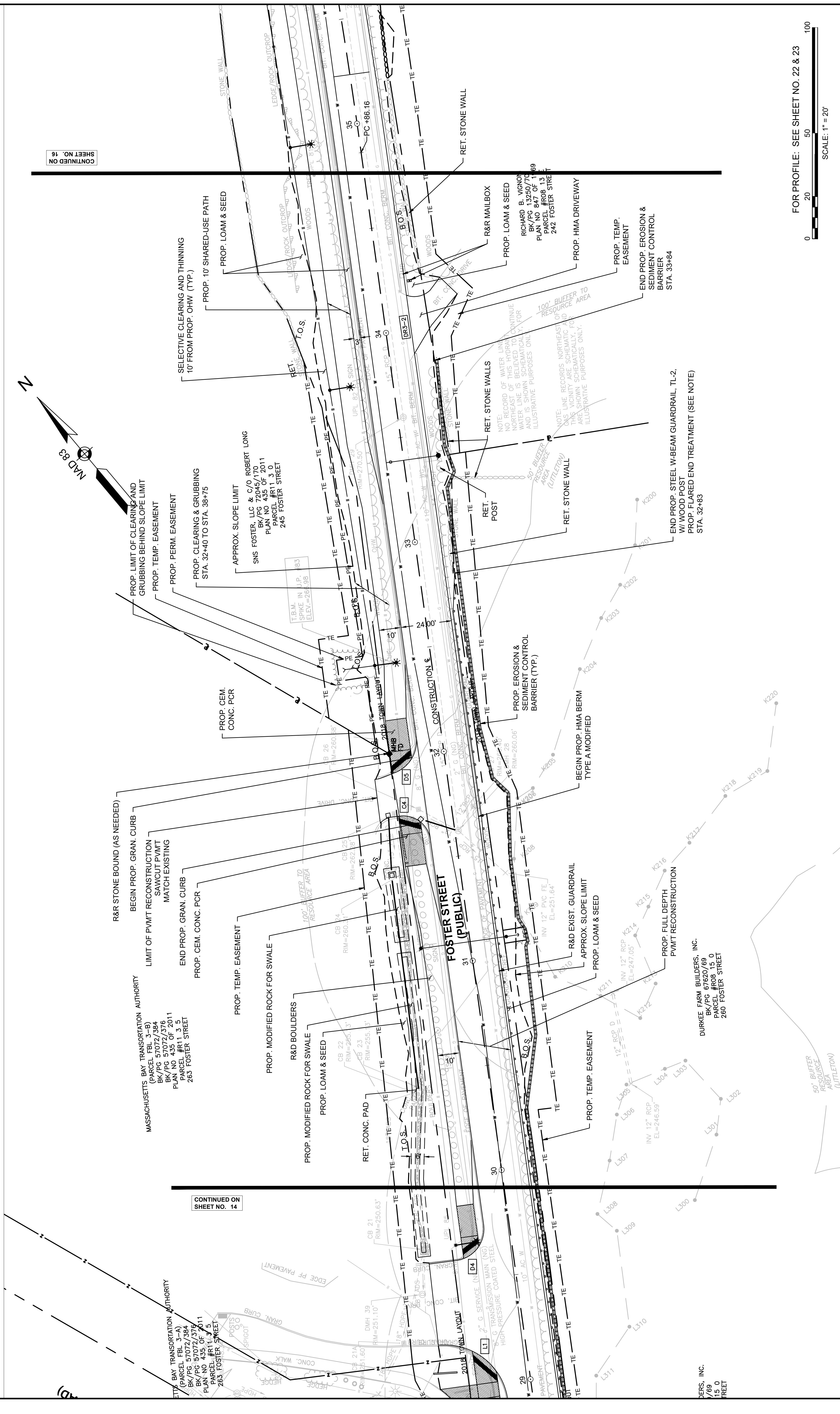


HIGHWAY GUARDRAIL DETAILS  
STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 28+49 RT TO FLARED END STA 32+83 RT

WATER SUPPLY ALTERATIONS  
SEE SHEET 57-64  
TRAFFIC SIGNAL CONDUIT  
NONE

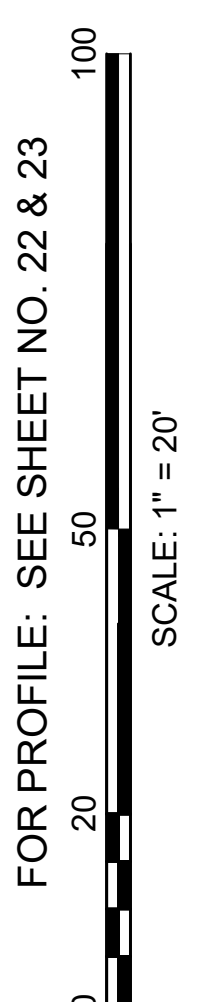
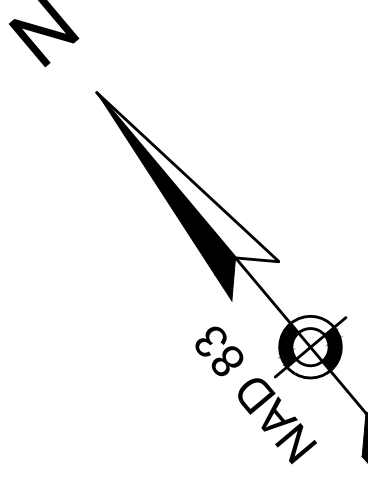
DRAINAGE DETAILS  
SEE SHEET NOS. 65-67  
PROPOSED PEDESTRIAN CURB  
RAMP DETAIL # X#  
PROPOSED DRIVEWAY  
TYPE # DR#

LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
CONSTRUCTION PLANS  
FED. AID PROJ. NO. XXX-XXXX(XXX)X  
STATE MA  
SHEET NO. 15  
TOTAL SHEETS 129  
PROJECT FILE NO. 609054



CONTINUED ON SHEET NO. 16

CONTINUED ON SHEET NO. 14



FOR PROFILE: SEE SHEET NO. 22 & 23

DEERS, INC.  
7/69  
15 0  
FREET

**LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
CONSTRUCTION PLANS**

FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
STATE	NO.	
MA	XXX-XXXX(XXX)X	16
PROJECT FILE NO.		609054

PATRICIA A. NARGIZIAN  
BK/PG 70735/46  
PARCEL #R11  
237 FOSTER STREET

**LEGEND:**

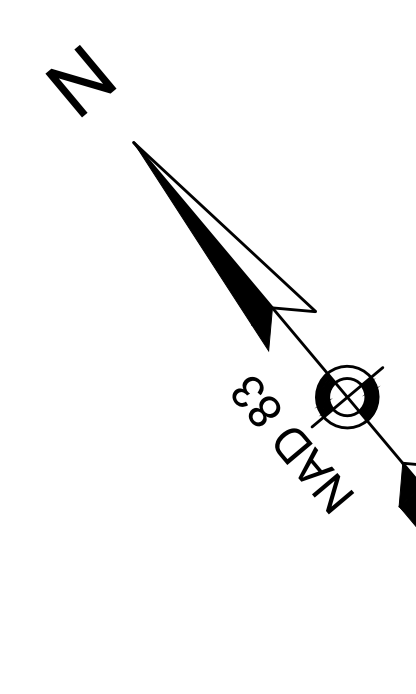
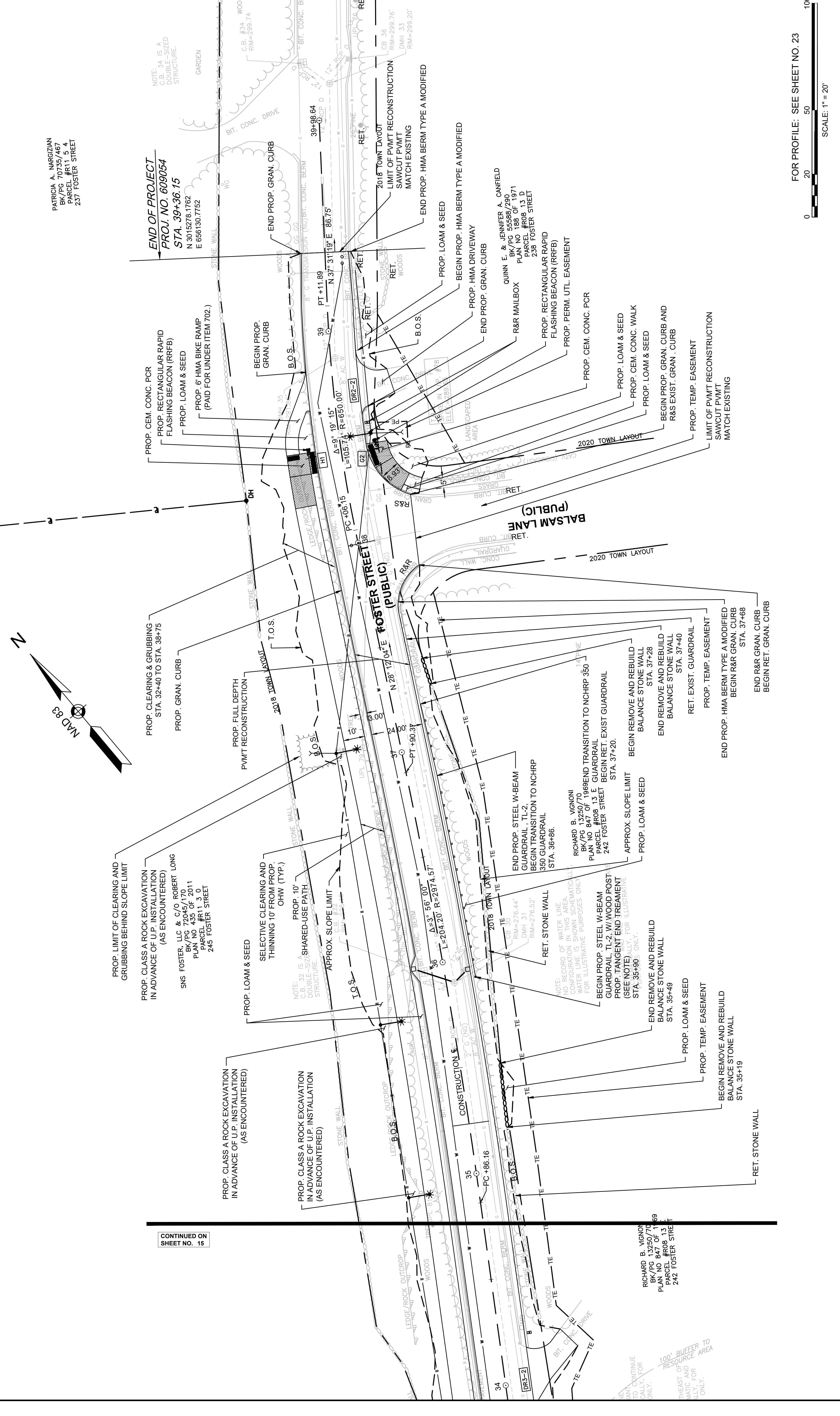
PROPOSED PEDESTRIAN CURB RAMP DETAIL #	X#
PROPOSED DRIVEWAY TYPE #	DR#

**DRAINAGE DETAILS**  
SEE SHEET NOS. 65-67

**WATER SUPPLY ALTERATIONS**  
SEE SHEET 57-64

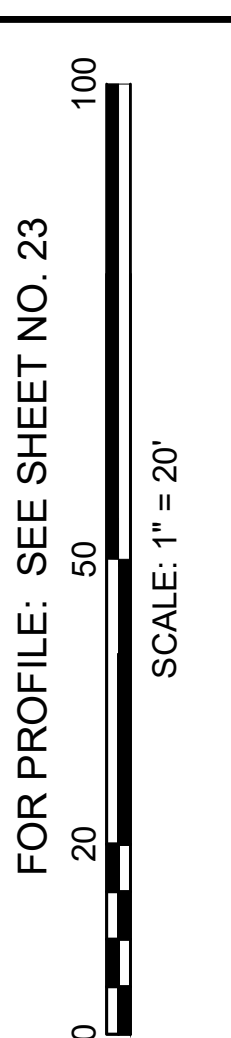
**TRAFFIC SIGNAL CONDUIT**  
NONE

**HIGHWAY GUARD DETAILS**  
STEEL W-BEAM GUARDRAIL (TL-2) W/ WOOD POST & TANGENT END STA. 35+90 RT



CONTINUED ON SHEET NO. 15

RICHARD B. VIGNONI  
BK/PG 13250/70  
PLAN NO. 847 OF 1969  
PARCEL #R08 13 D  
242 FOSTER STREET





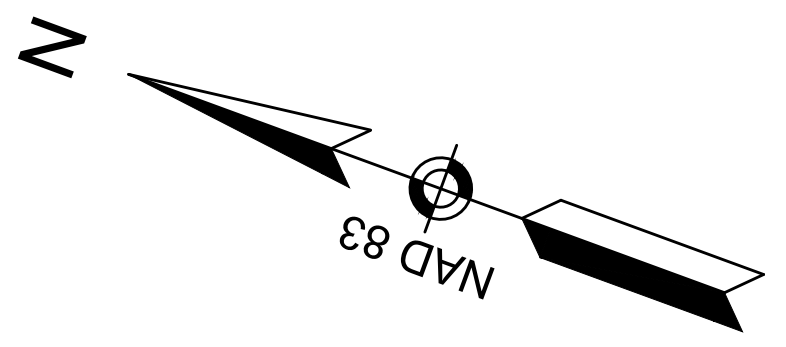
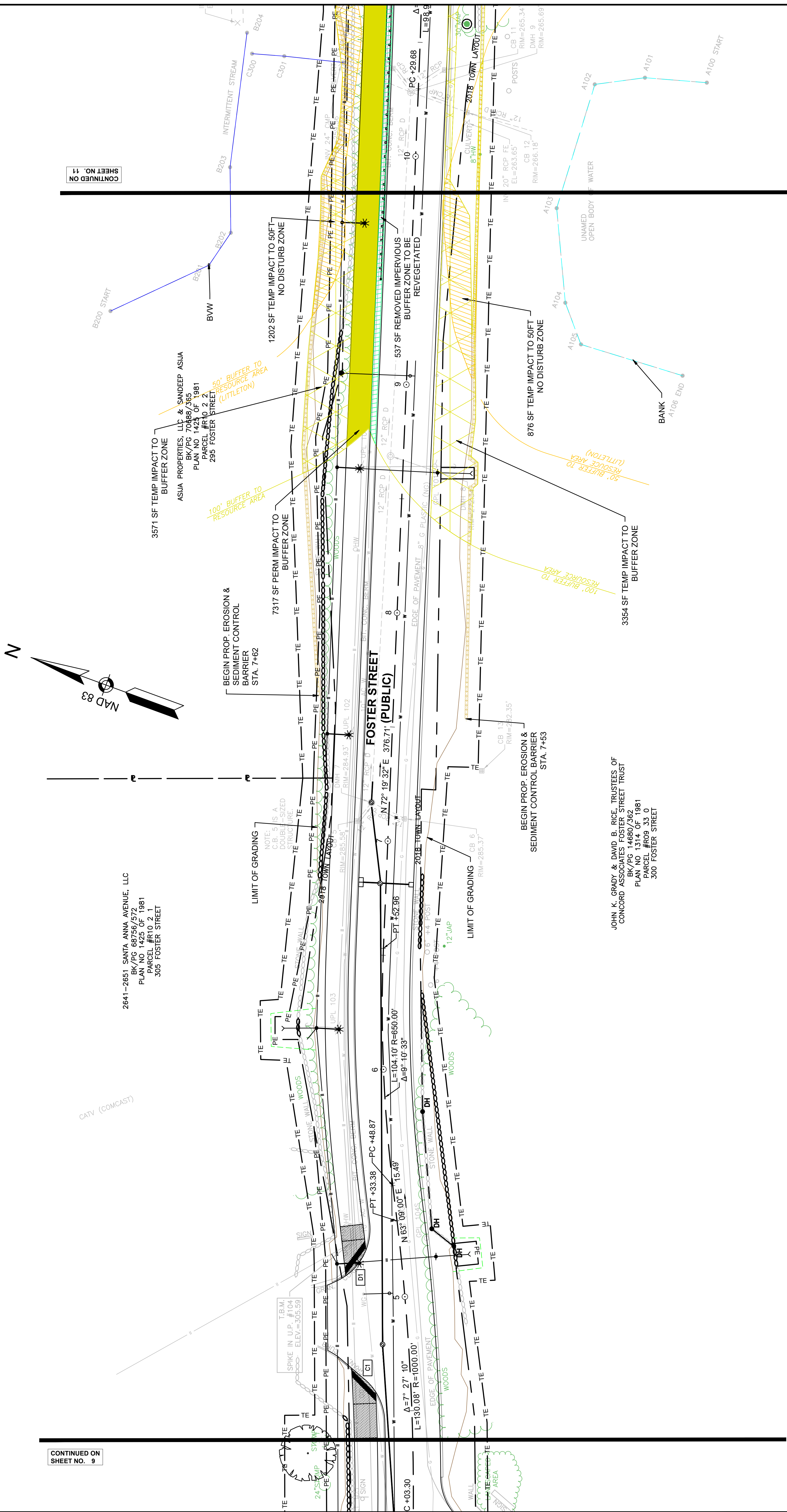
**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	E2	129
PROJECT FILE NO. 609054			

**ENVIRONMENTAL PLANS**

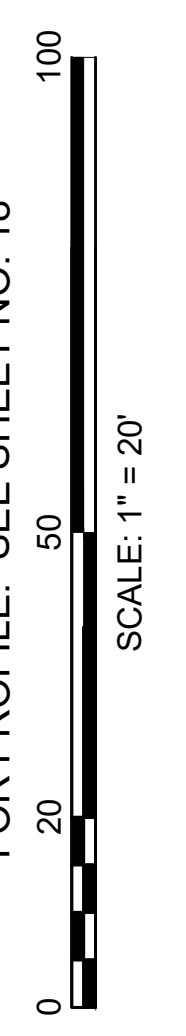
**ENVIRONMENTAL PLANS LEGEND**

	EXISTING TREE LINE		PERM IMPACT TO BUFFER ZONE
	PROPOSED TREE LINE		TEMP IMPACT TO BUFFER ZONE
	BORDERING VEGETATED WETLANDS		PERM IMPACT TO 50-FT NO DISTURB
	BANK/LAND UNDER WATER		TEMP IMPACT TO 50-FT NO DISTURB
	100FT BUFFER from BVW or BANK		IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
	50FT NO DISTURB LIMIT from BVW or BANK		IMPERVIOUS REMOVED FROM BUFFER ZONE
	EROSION CONTROLS		
	LIMIT OF WORK		



CONTINUED ON SHEET NO. 9

CONTINUED ON SHEET NO. 11

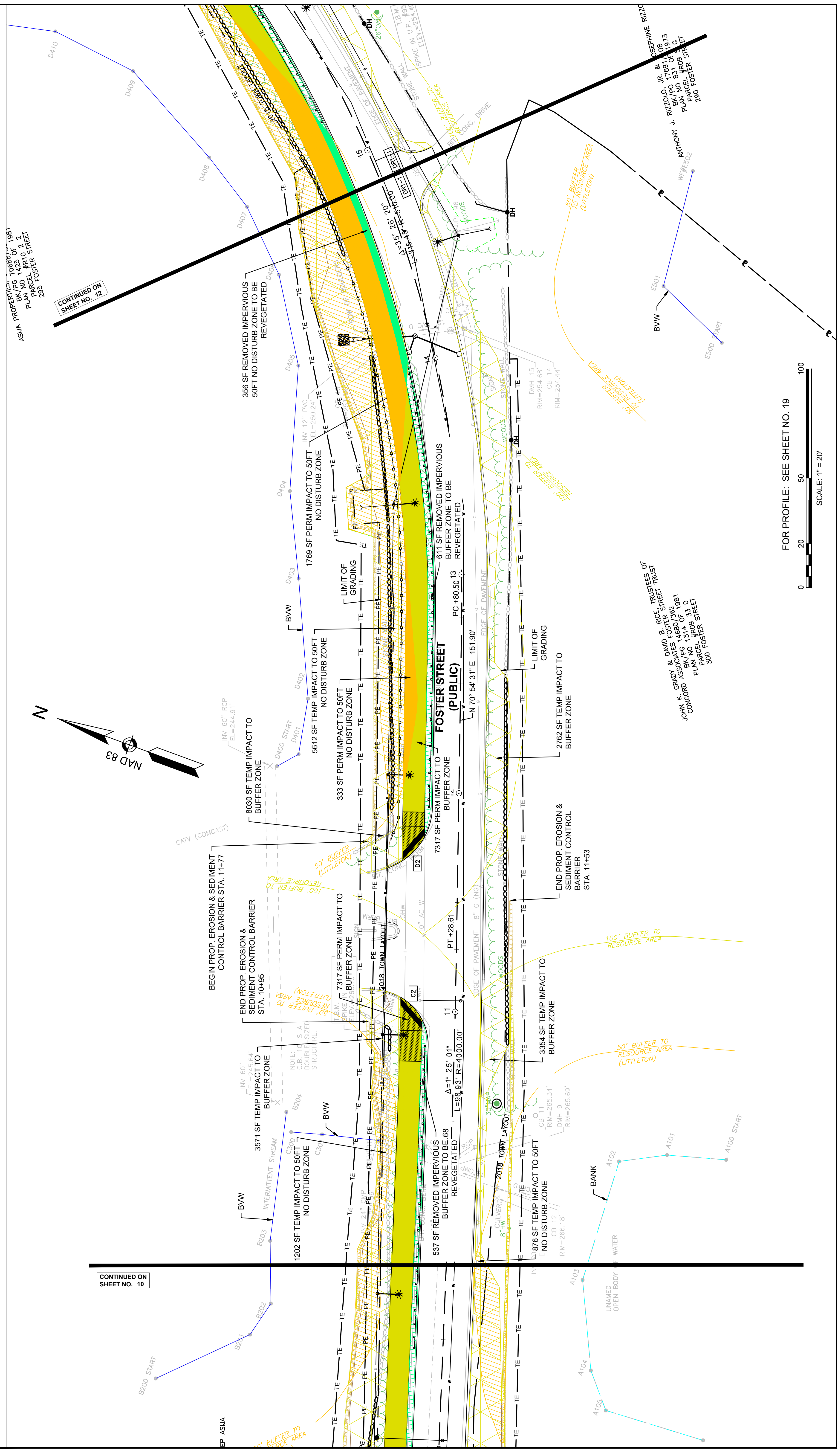


FOR PROFILE: SEE SHEET NO. 18

2017004421\_HFN01\_RDA.SET.DWG Plotted on 19-Apr-2023 2:50 AM

**LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
ENVIRONMENTAL PLANS**

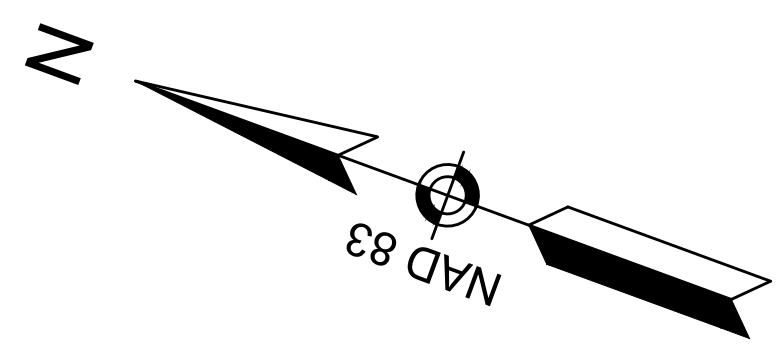
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	E3	129
PROJECT FILE NO. 609054			



**ENVIRONMENTAL PLANS LEGEND**

	EXISTING TREE LINE
	PROPOSED TREE LINE
	BORDERING VEGETATED WETLANDS
	BANK/LAND UNDER WATER
	100FT BUFFER from BVW or BANK
	50FT NO DISTURB LIMIT from BVW or BANK
	EROSION CONTROLS
	LIMIT OF WORK

	PERM IMPACT TO BUFFER ZONE
	TEMP IMPACT TO BUFFER ZONE
	PERM IMPACT TO 50-FT NO DISTURB
	TEMP IMPACT TO 50-FT NO DISTURB
	IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
	IMPERVIOUS REMOVED FROM BUFFER ZONE

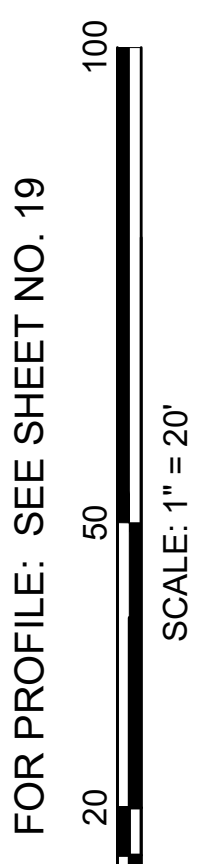


CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 12

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
CONCORD BK/PG 1314 OF 1310  
PLAN NO. 1409.33.0  
PARCEL #R09.33.0  
300 FOSTER STREET

ANTHONY J. RIZZOLO, JR. &  
JOSEPHINE RIZZOLO  
BK/PG 831 OF 831  
PLAN NO. #R09.33.0  
280 FOSTER STREET













**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**ENVIRONMENTAL PLANS**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	E8	129

PROJECT FILE NO. 609054

**ENVIRONMENTAL PLANS**

PATRICIA A. MARGITIAN  
 BK/PG 70737/46  
 PARCEL #R11 15 STREET  
 237 FOSTER STREET

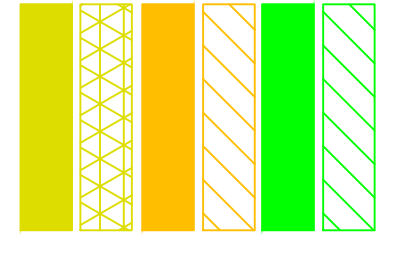
**END OF PROJECT**  
**PROJ. NO. 609054**  
**STA. 39+36.15**  
 N 3015278.1762  
 E 656130.7762

QUINN E. & JENNIFER A. CANFIELD  
 BK/PG 55588/290  
 PLAN NO 188 OF 1971  
 PARCEL #R08 13 D  
 238 FOSTER STREET

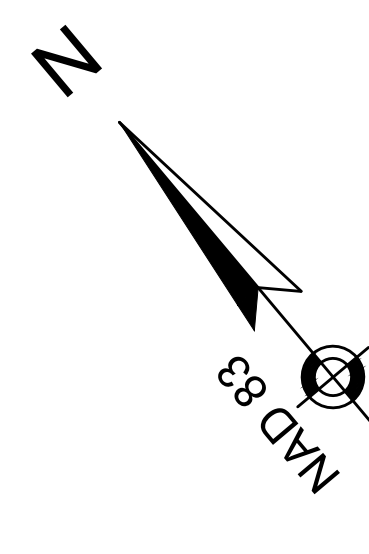
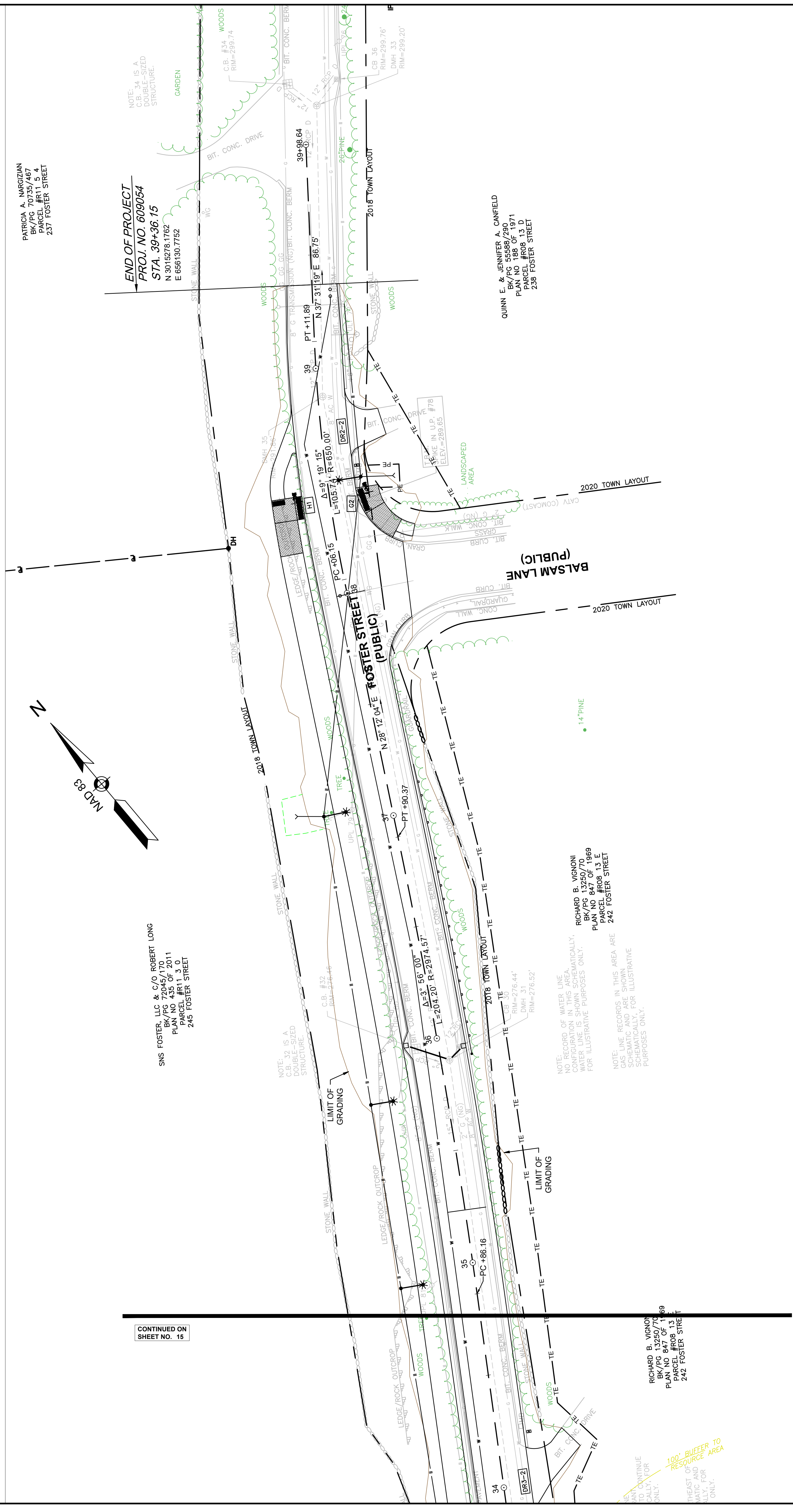
RICHARD B. VIGNONI  
 BK/PG 13250/70  
 PLAN NO 847 OF 1969  
 PARCEL #R08 13 E  
 242 FOSTER STREET

RICHARD B. VIGNONI  
 BK/PG 13250/70  
 PLAN NO 847 OF 1969  
 PARCEL #R08 13 E  
 242 FOSTER STREET

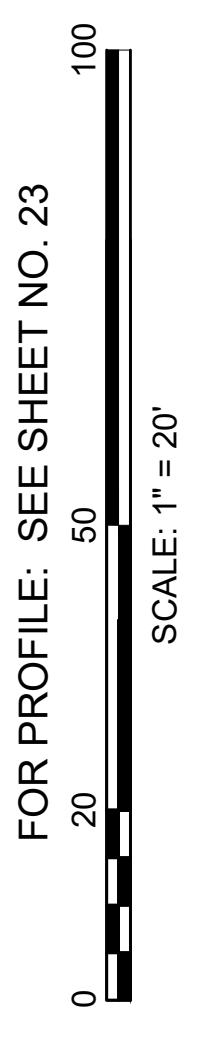
- PERM IMPACT TO BUFFER ZONE
- TEMP IMPACT TO BUFFER ZONE
- PERM IMPACT TO 50-FT NO DISTURB
- TEMP IMPACT TO 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM 50-FT NO DISTURB
- IMPERVIOUS REMOVED FROM BUFFER ZONE



- ENVIRONMENTAL PLANS LEGEND**
- EXISTING TREE LINE
  - PROPOSED TREE LINE
  - BORDERING VEGETATED WETLANDS
  - BANK/LAND UNDER WATER
  - 100FT BUFFER from BVW or BANK
  - 50FT NO DISTURB LIMIT from BVW or BANK
  - EROSION CONTROLS
  - LIMIT OF WORK

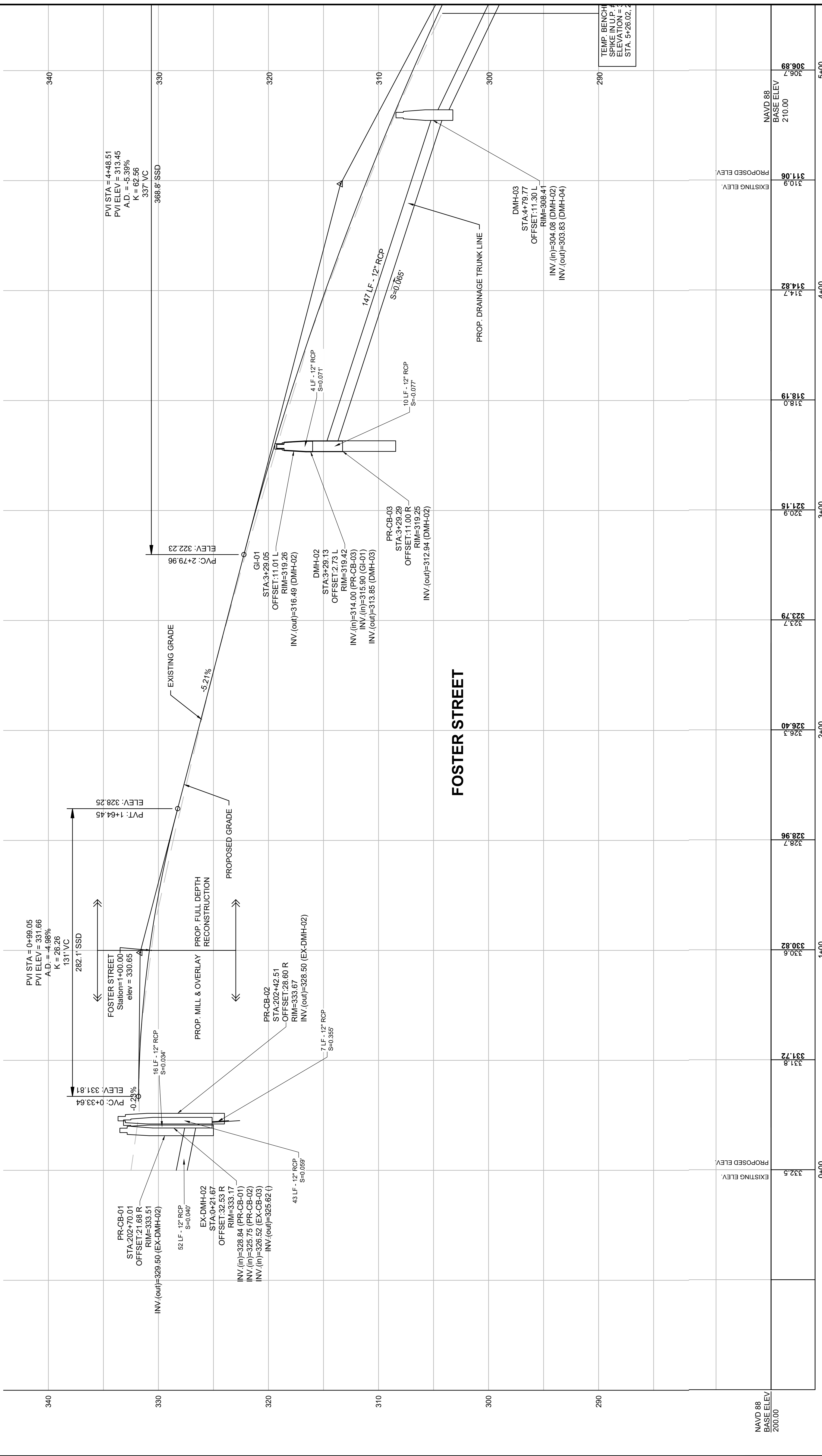


CONTINUED ON SHEET NO. 15

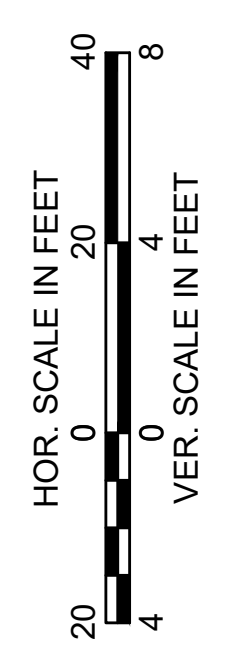


**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PROFILE - FOSTER STREET**

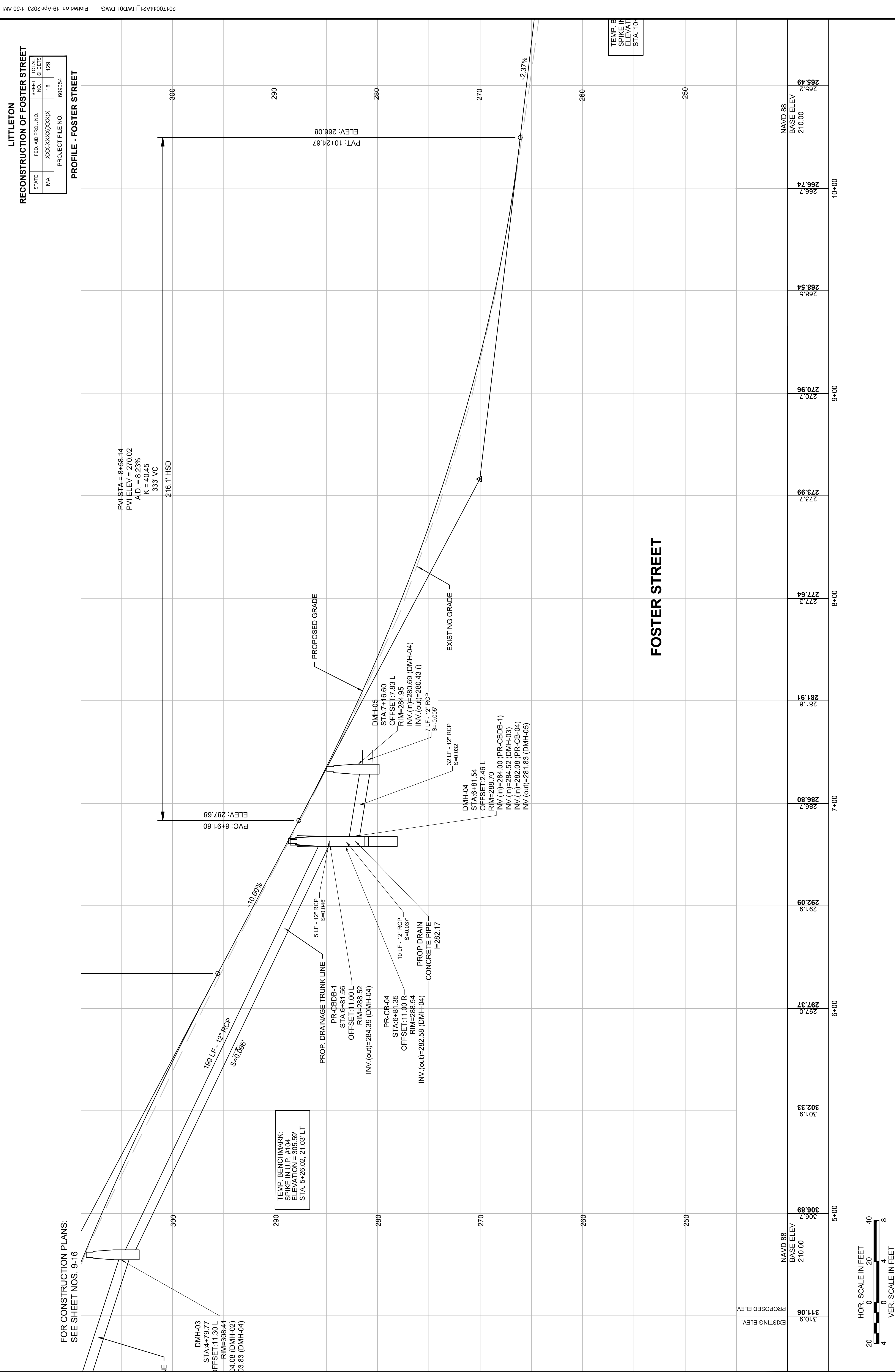
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	17	129
PROJECT FILE NO. 609054			



FOR CONSTRUCTION PLANS:  
 SEE SHEET NOS. 9-16



TEMP. BENCH  
 SPIKE IN USE  
 ELEVATION = 290.00  
 STA. 5+26.02



**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	18	129

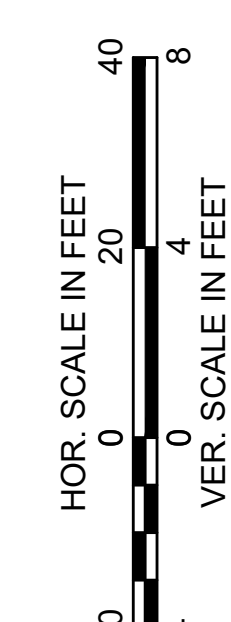
PROJECT FILE NO. 609054

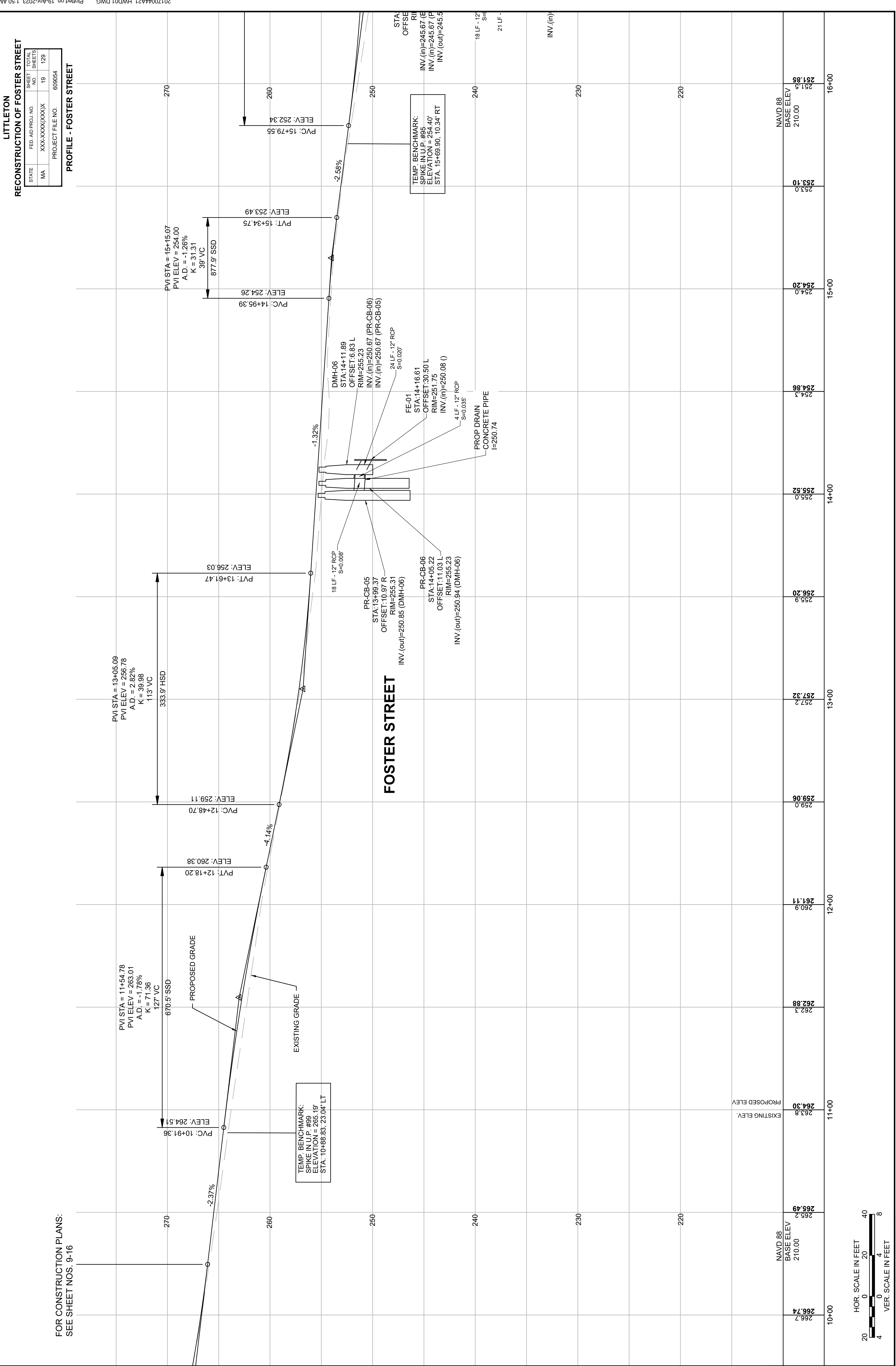
FOR CONSTRUCTION PLANS:  
 SEE SHEET NOS. 9-16

DMH-03  
 STA:4+79.77  
 OFFSET:11.30 L  
 RIM=308.41  
 04.08 (DMH-02)  
 03.83 (DMH-04)

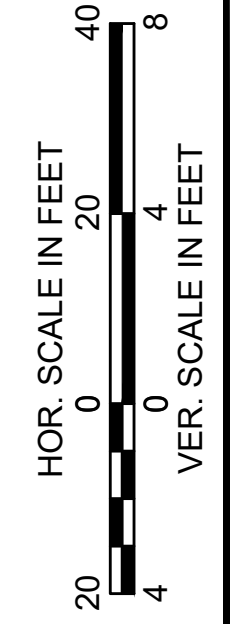
TEMP. BENCHMARK:  
 SPIKE IN U.P. #104  
 ELEVATION = 305.99  
 STA. 5+26.02, 21.03' LT

TEMP. B  
 SPIKE IN  
 ELEVAT  
 STA. 10





FOR CONSTRUCTION PLANS:  
SEE SHEET NOS. 9-16



LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
PROFILE - FOSTER STREET

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	19	129

PROJECT FILE NO. 609054

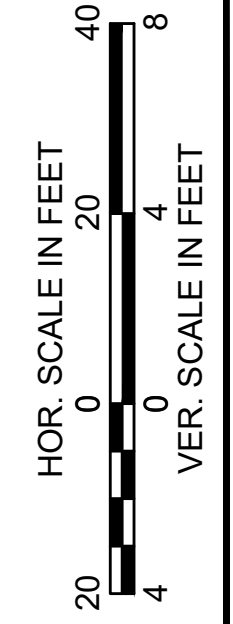
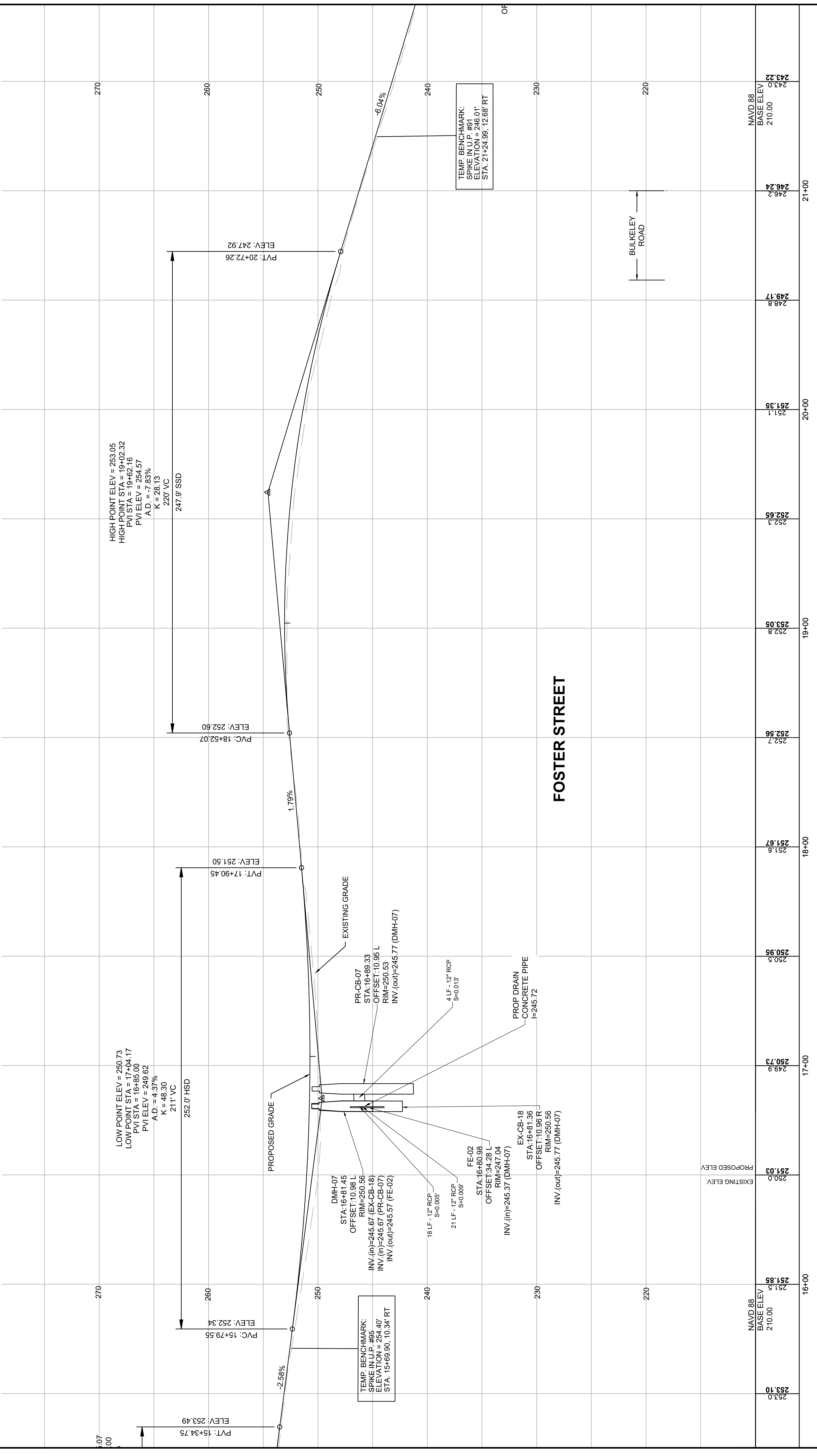
20170044A21\_HWD01.DWG Plotted on 19-Apr-2023 1:50 AM

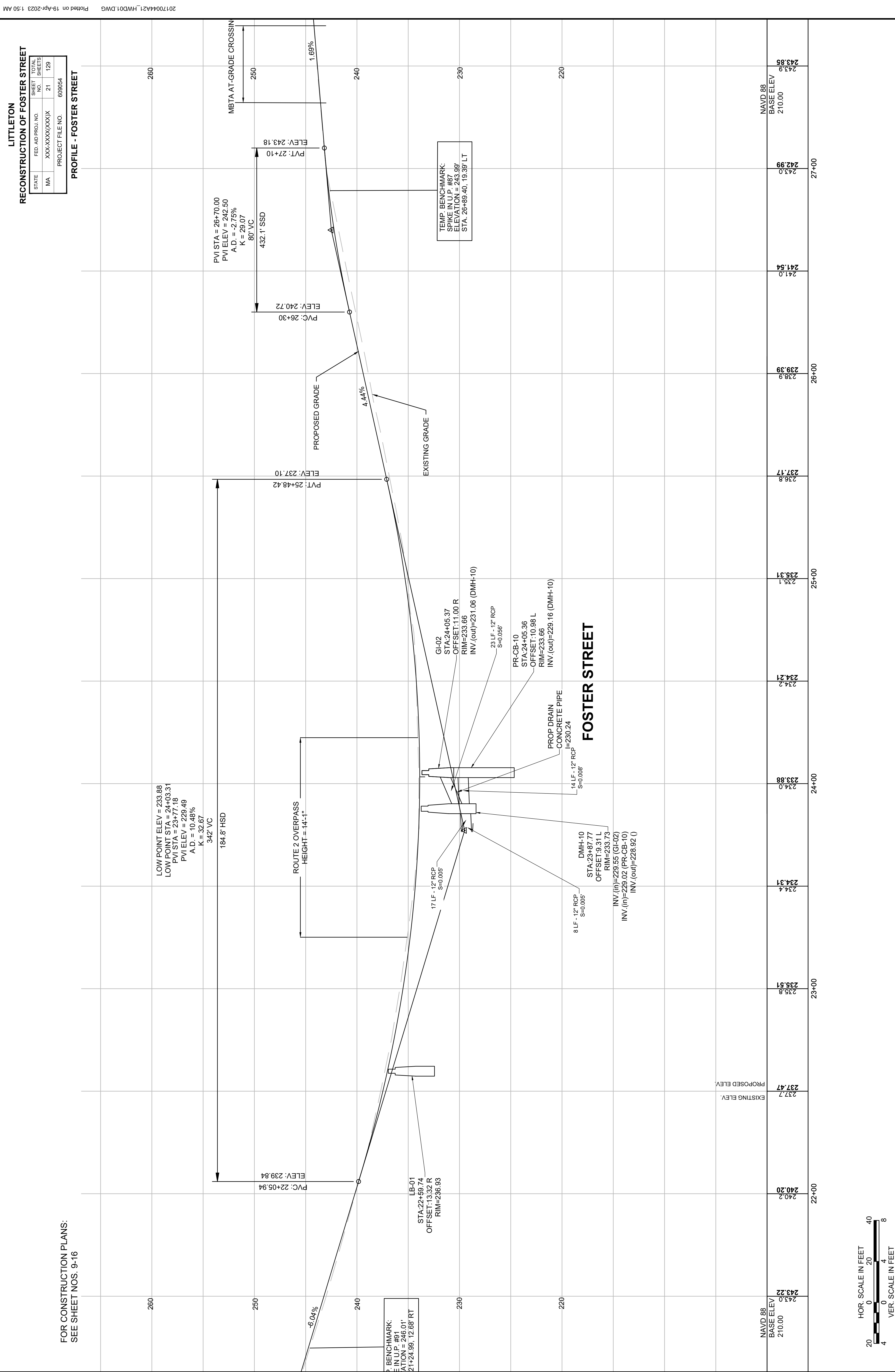


**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PROFILE - FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	20	129
PROJECT FILE NO. 609054			

FOR CONSTRUCTION PLANS:  
 SEE SHEET NOS. 9-16





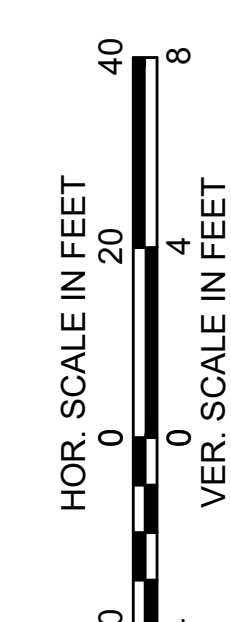
**LITTLETON**

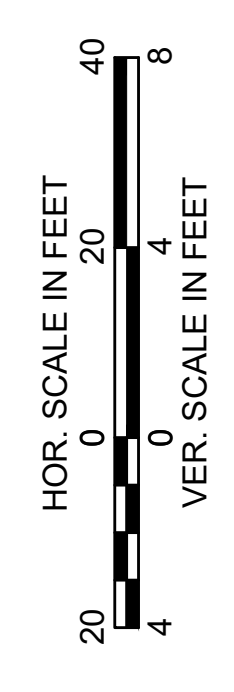
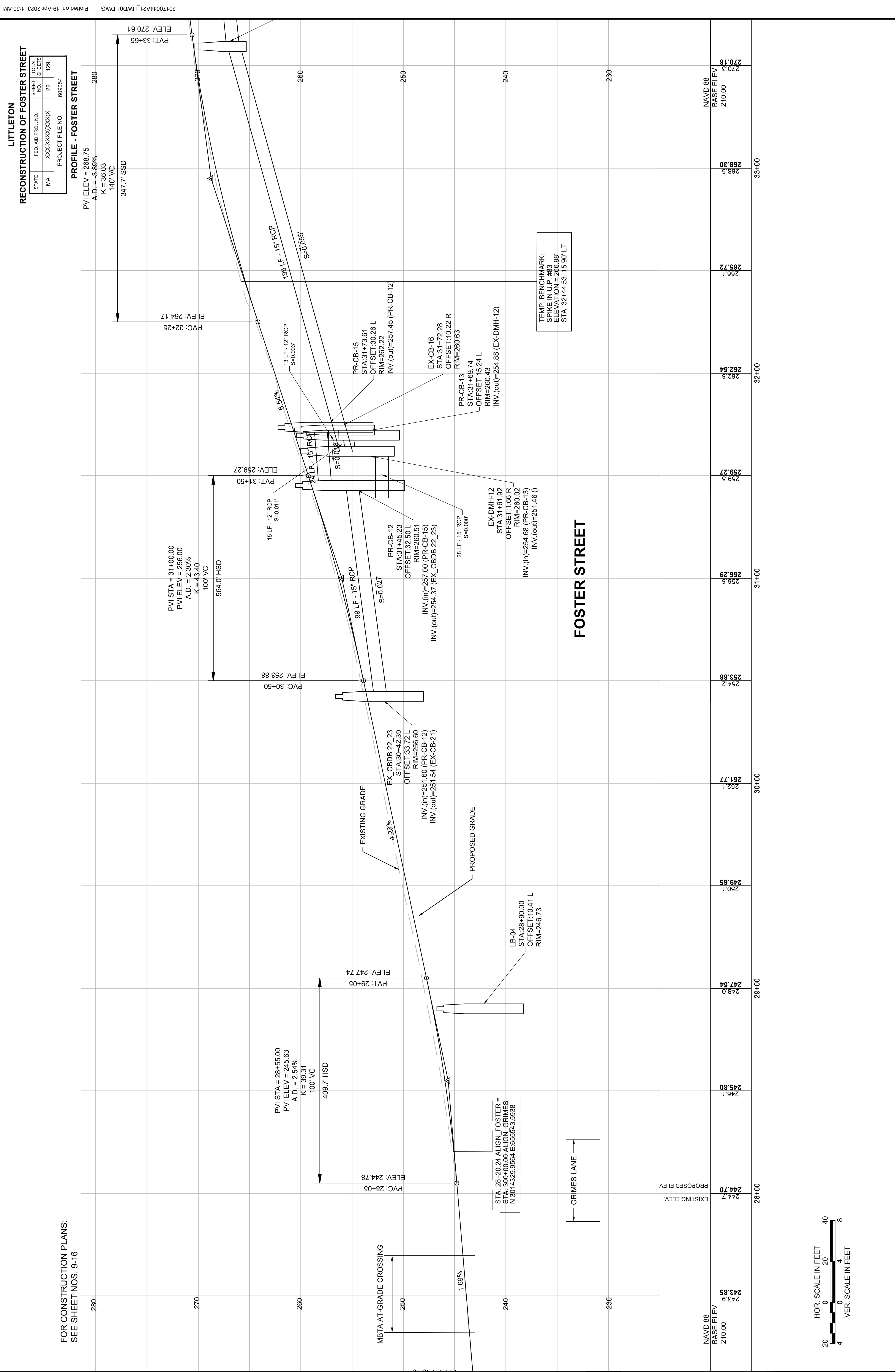
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	21	129

PROJECT FILE NO. 609054

FOR CONSTRUCTION PLANS:  
SEE SHEET NOS. 9-16





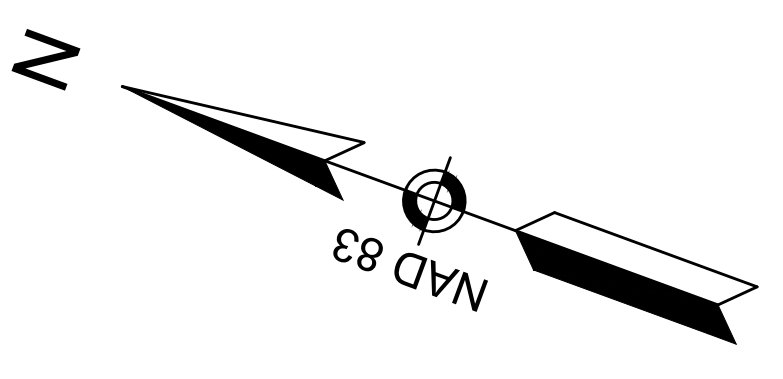
20170044A21\_HWD01.DWG Plotted on 19-Apr-2023 1:50 AM



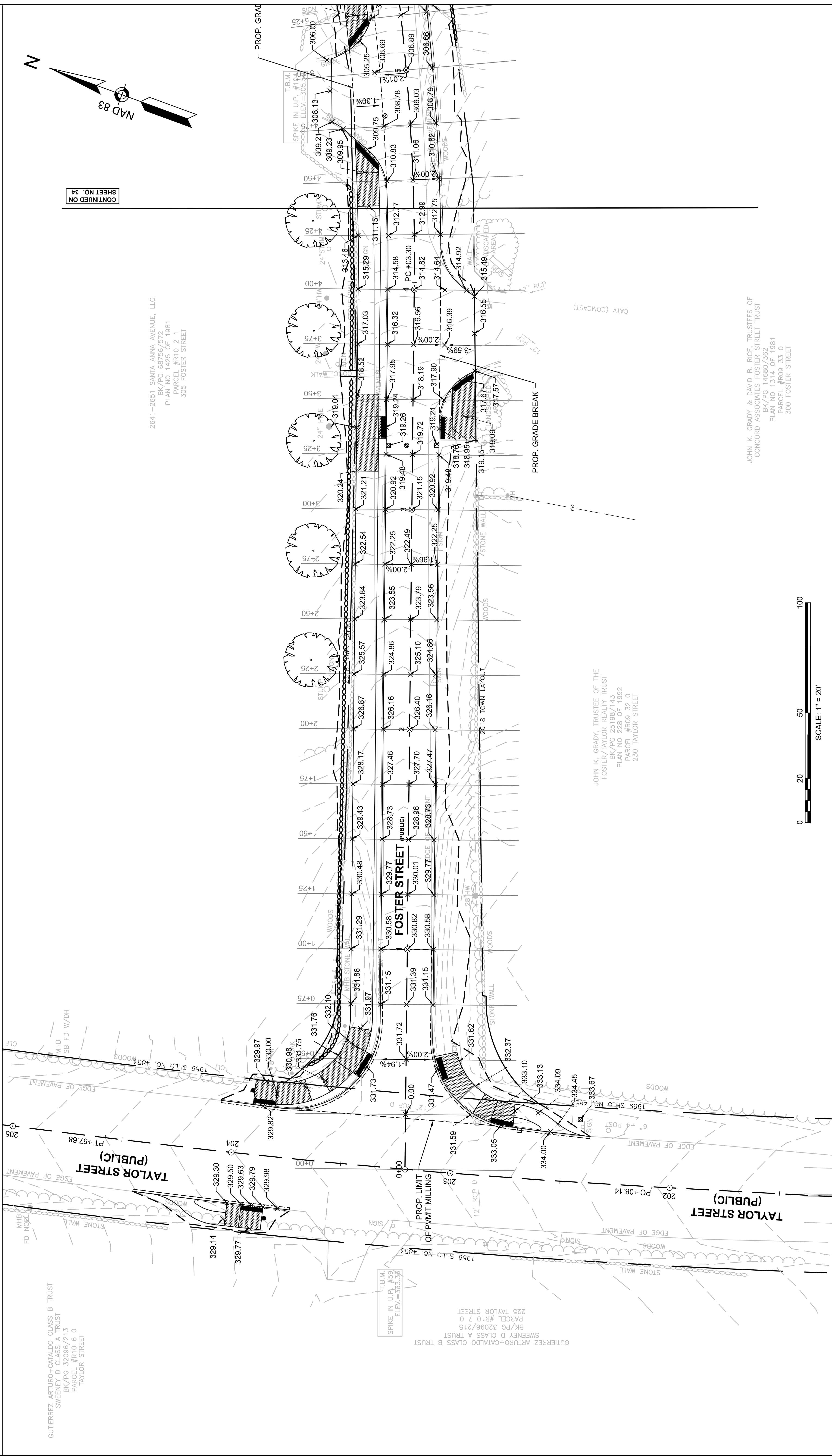
**LITTLETON  
RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(X)X	33	129
PROJECT FILE NO.		609054	

**GRADING PLAN**



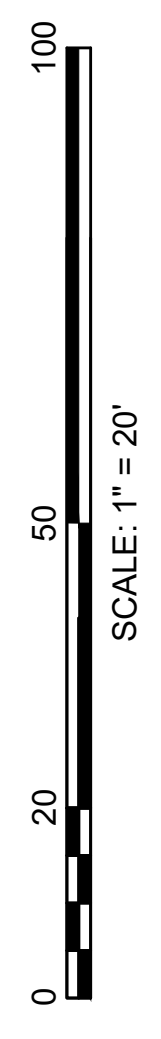
CONTINUED ON  
SHEET NO. 34



2641-2651 SANTA ANNA AVENUE, LLC  
BK/PG 68766/572  
PLAN NO 1425 OF 1981  
PARCEL #R10.2.1  
305 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
CONCORD ASSOCIATES FOSTER STREET TRUST  
BK/PG 14680/362  
PLAN NO 1314 OF 1981  
PARCEL #R09.33.0  
300 FOSTER STREET

JOHN K. GRADY, TRUSTEE OF THE  
FOSTER/TAYLOR REALTY TRUST  
BK/PG 25198/143  
PLAN NO 228 OF 1992  
PARCEL #R09.33.0  
250 TAYLOR STREET



THIS PLAN IS BASED ON FIELD SURVEY CONDUCTED BY:  
SHERMAN & FRYDRYK, LLC  
FIELD DATA WAS COLLECTED BETWEEN 8/14/18 & 9/17/18

HORIZONTAL CONTROL IS BASED ON VALUES PROVIDED BY MEANS OF GLOBAL POSITION SYSTEM METHODS, AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD-1983) MASSACHUSETTS STATE PLANE COORDINATE SYSTEM. VERTICAL CONTROL IS BASED ON SURVEY POINTS WITH ELEVATIONS BASED ON MAIN ZONE CONTROL SURVEY. THE ORIGINAL DATUM IS BASED ON THE CITY OF LITTLETON ENGINEERING DEPARTMENT, GPS CONTROL STATION: CORS\_IS-HAMP, PID-DE0903

VERTICAL CONTROL IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD-1988), OR VERTICAL DATUM IS BASED ON THE 1988 N.G.V.D. SYSTEM USING SURVEY GPS CONTROL POINTS SET BY THE CITY OF LITTLETON ENGINEERING DEPARTMENT, GPS CONTROL STATION: CORS\_ID-HAMP, PID-DE0903

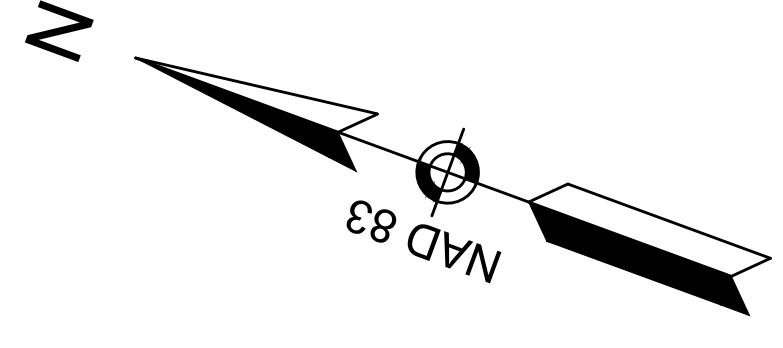
GUTIERREZ ARTURO+CATALDO CLASS B TRUST  
SWEENEY D CLASS A TRUST  
BK/PG 32096/213  
PARCEL #R10.6.0  
TAYLOR STREET

T.B.M.  
SPIKE IN U.P. #59  
ELEV.=303.36

GUTIERREZ ARTURO+CATALDO CLASS B TRUST  
SWEENEY D CLASS A TRUST  
BK/PG 32096/213  
PARCEL #R10.7.0  
225 TAYLOR STREET

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**GRADING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	34	129
PROJECT FILE NO. 609054			



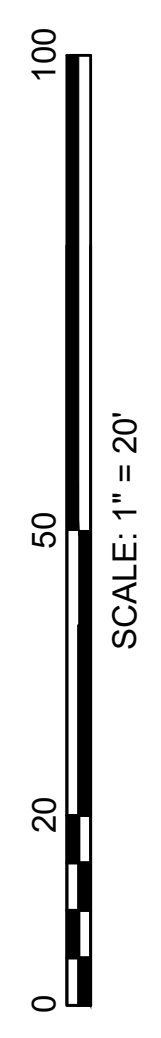
CONTINUED ON SHEET NO. 34

CONTINUED ON SHEET NO. 33

2641-2651 SANTA ANNA AVENUE, LLC  
BK/PG 68756/572  
PLAN NO. 1425 OF 1981  
PARCEL #R10.2.2  
305 FOSTER STREET

ASUA PROPERTIES, LLC & SANDEEP ASUA  
BK/PG 70688/365  
PLAN NO. 1425 OF 1981  
PARCEL #R10.2.2  
295 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
CONCORD ASSOCIATES FOSTER STREET TRUST  
BK/PG 14680/362  
PLAN NO. 1314 OF 1981  
PARCEL #R09.33.0  
300 FOSTER STREET



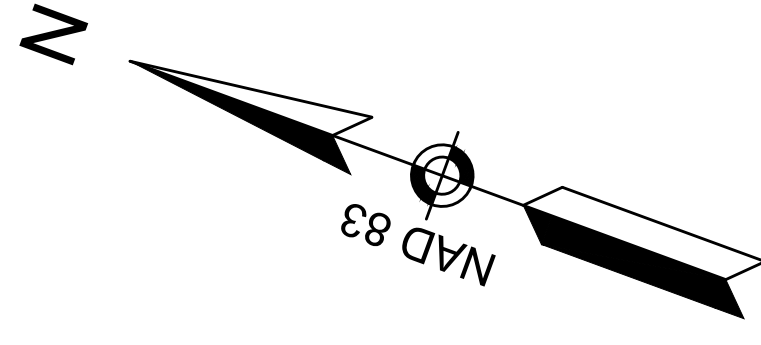






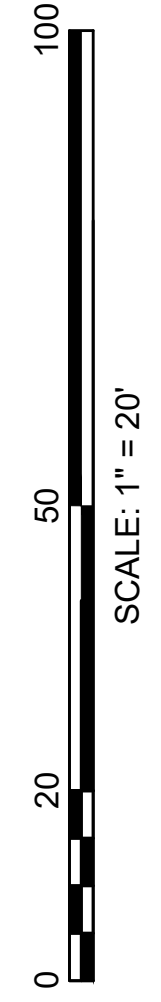
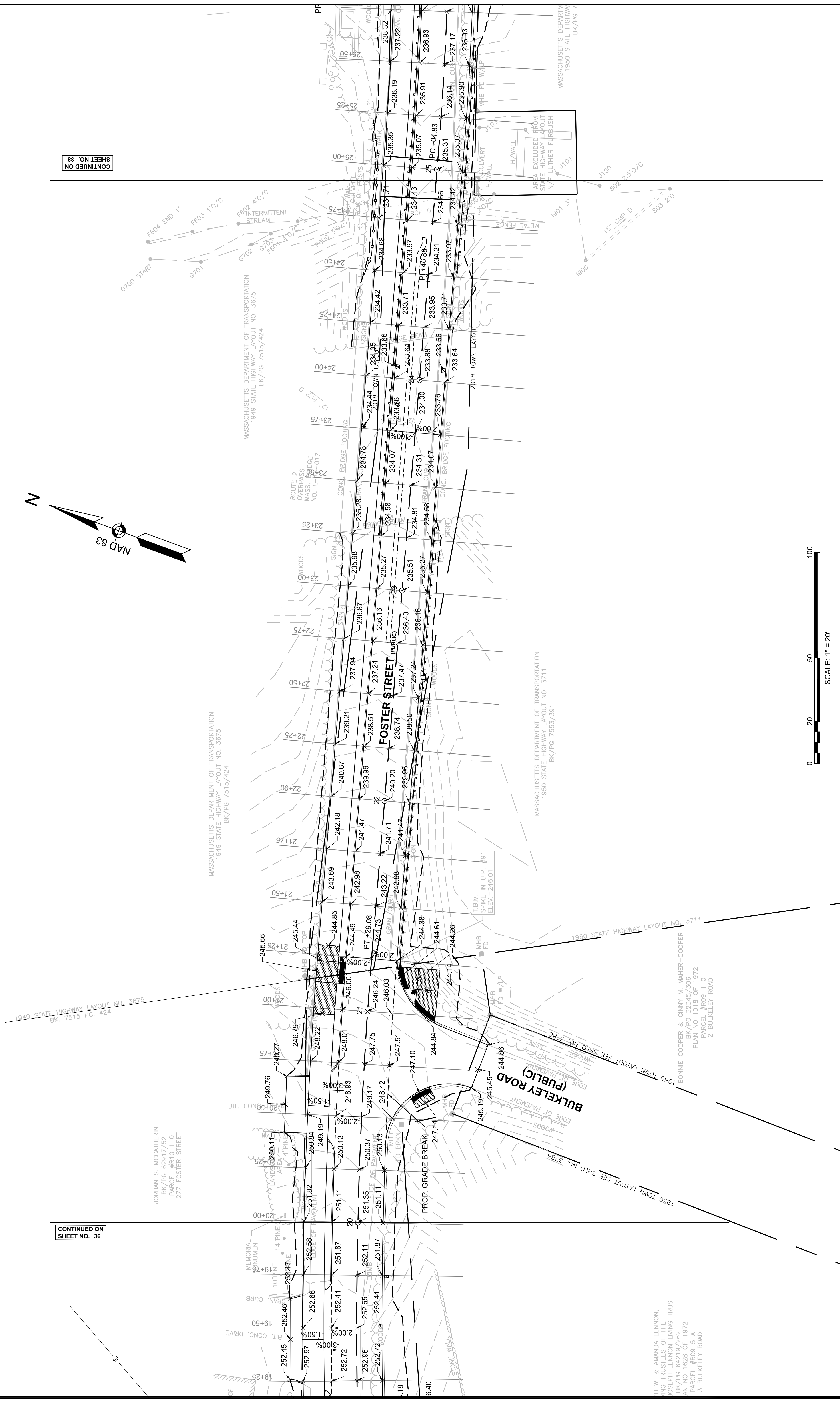
**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
 GRADING PLAN

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	37	129
PROJECT FILE NO.			609054



CONTINUED ON SHEET NO. 38

CONTINUED ON SHEET NO. 36

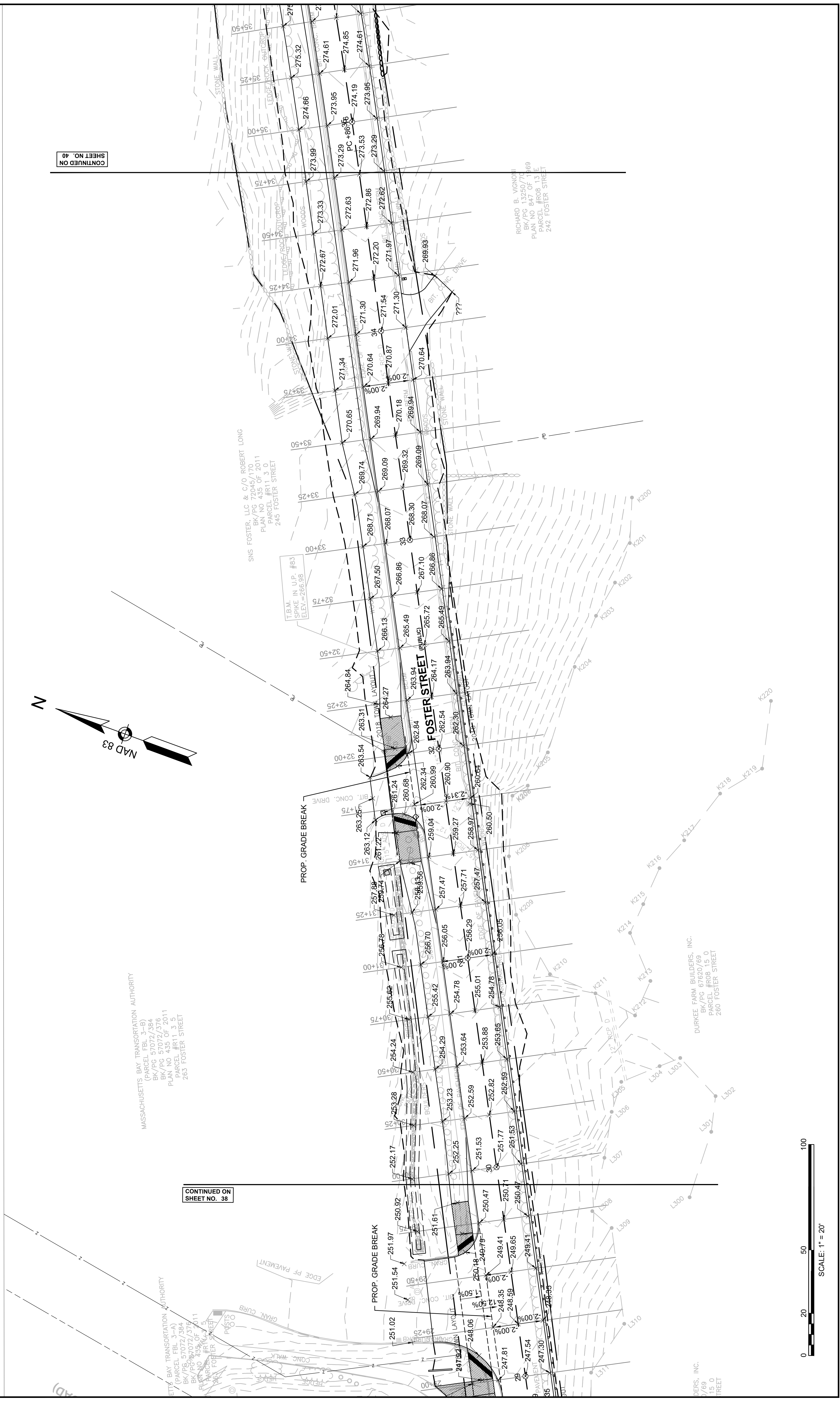
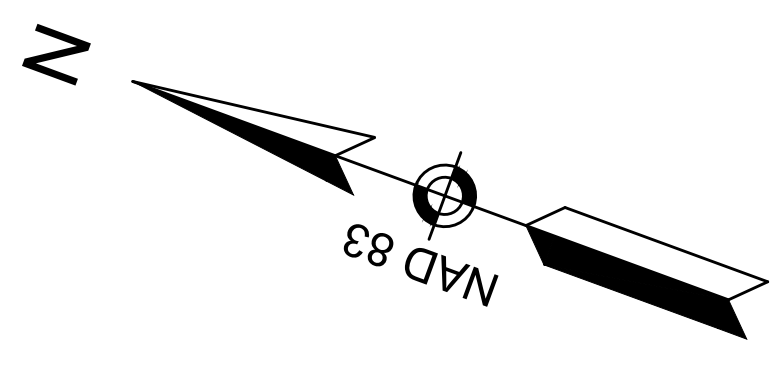




**LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
GRADING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	39	129
PROJECT FILE NO.			609054

CONTINUED ON SHEET NO. 40



CONTINUED ON SHEET NO. 38



**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**GRADING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	40	129
PROJECT FILE NO. 609054			



PATRICIA A. NARGIZIAN  
 BK/PG 70735/467  
 PARCEL #R11.5.4  
 237 FOSTER STREET

END OF PROJECT  
 PROJ. NO. 609054  
 STA. 39+36.15  
 N 3015278.1762  
 E 656130.7742

QUINN E. & JENNIFER A. CANFIELD  
 BK/PG 55580/290  
 PLAN NO 188 B 1.3 D  
 PARCEL #R08.13 D  
 238 FOSTER STREET

RICHARD B. VIGNONI  
 BK/PG 13250/70  
 PLAN NO 847 OF 1989  
 PARCEL #R08.13 E  
 242 FOSTER STREET

SNS FOSTER, LLC & C/O ROBERT LONG  
 BK/PG 72045/170  
 PLAN NO 433 OF 2011  
 PARCEL #R 1.3.0  
 245 FOSTER STREET

RICHARD B. VIGNON  
 BK/PG 13250/70  
 PLAN NO 847 OF 1989  
 PARCEL #R08.13  
 242 FOSTER STREET

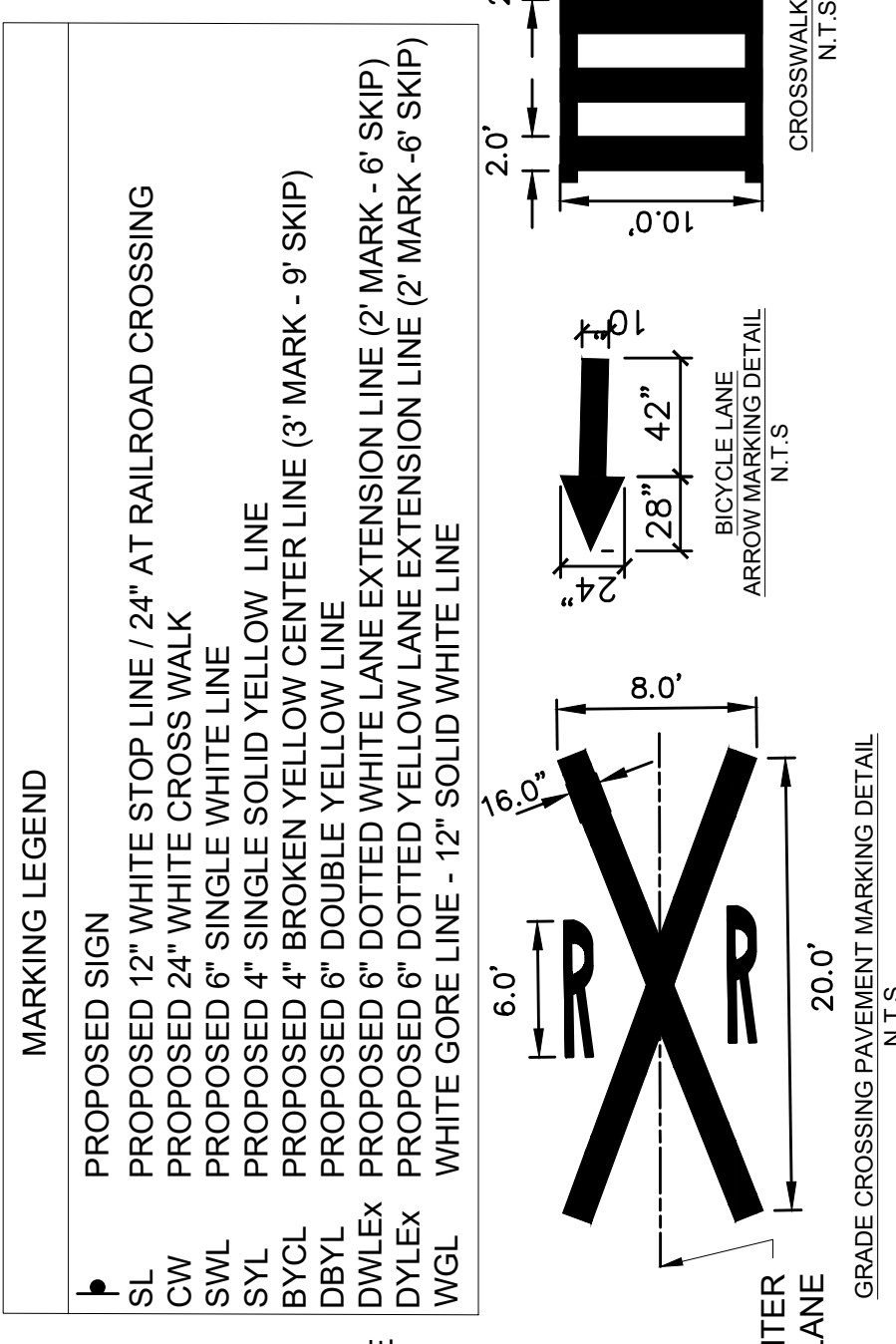
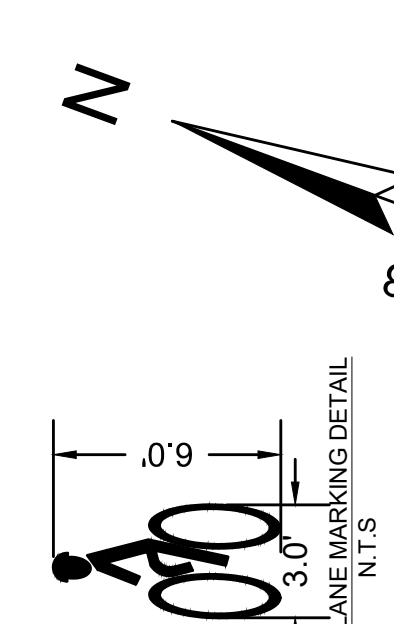
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2017004421\_PVT01.DWG Plotted on 19-Apr-2023 1:54 AM

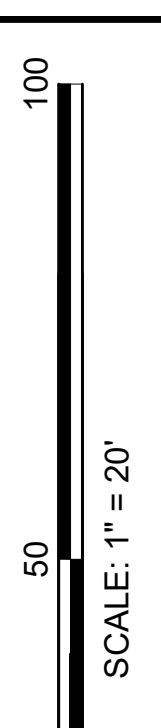
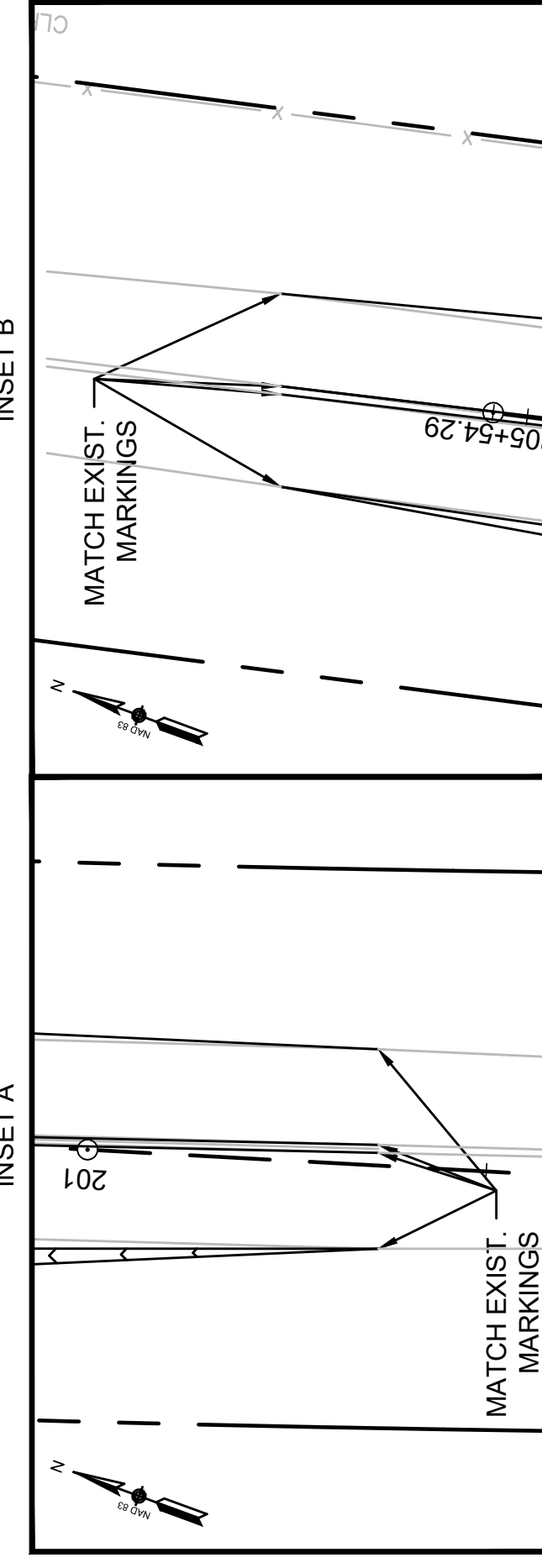
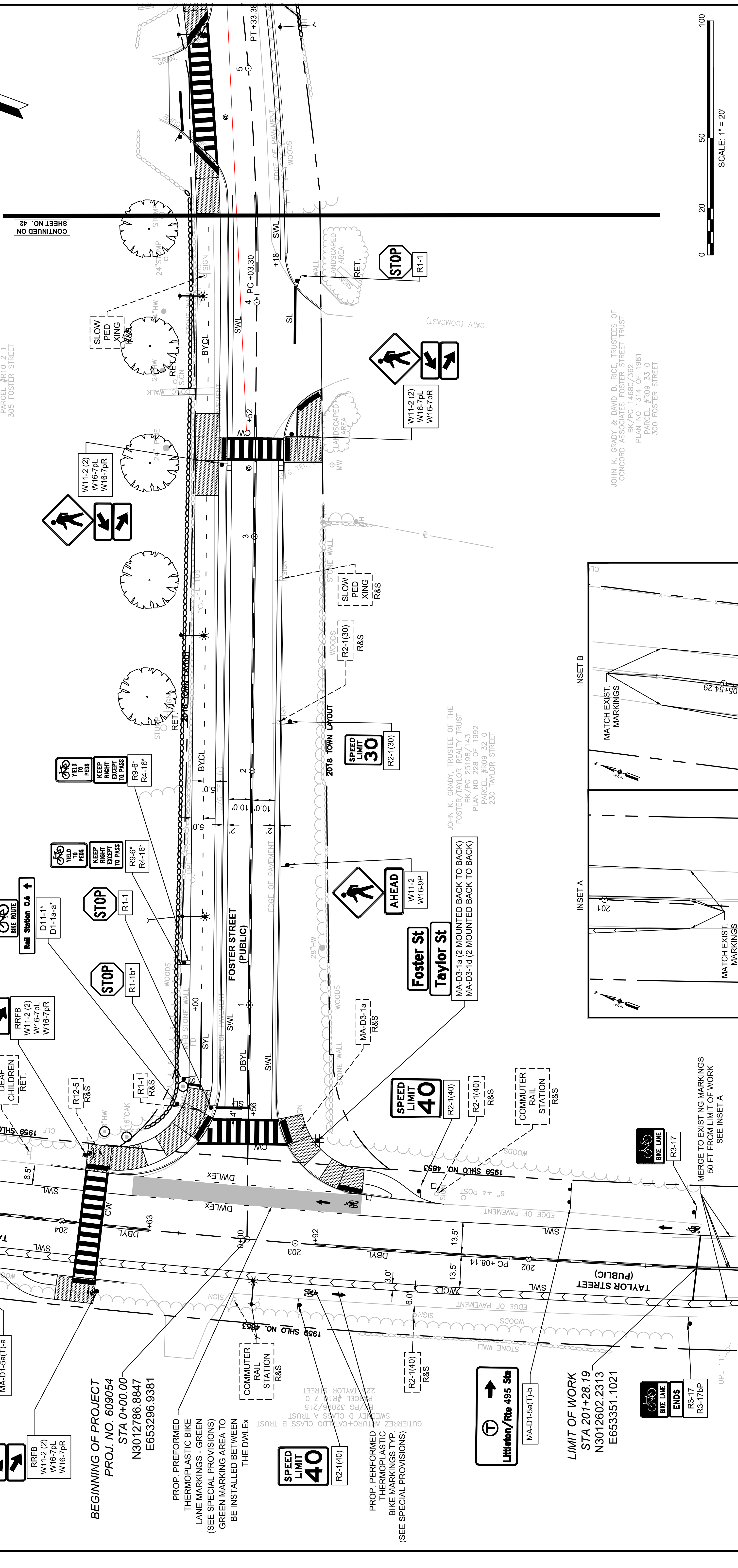
**LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	41	129
PROJECT FILE NO. 609054			



- NOTES:**
- ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED ON PLANS
  - ALL PROPOSED PAVEMENT MARKING LINES ON ROADWAYS SHALL BE WET REFLECTORIZED RECESSED THERMOPLASTIC. ALL MARKINGS SHALL BE 6" WIDE, EXCEPT STOP BARS WHICH SHALL BE 12" WIDE.
  - ALL PROPOSED PAVEMENT MARKING LINES ON SHARED-USE PATH SHALL BE PAINTED. ALL MARKINGS SHALL BE 4" WIDE, EXCEPT STOP BARS WHICH SHALL BE 12" WIDE.
  - ANY SIGN LABELED WITH AN "\*" SHALL BE MOUNTED ON A SIGN SUPPORT FOR SHARED-USE PATH. THE SUPPORTS SHALL BE 4"x4" PRESSURE TREATED WOOD POSTS AND PLACED AS SHOWN ON THE "TYPICAL SIGN PLACEMENT DETAIL" IN THE CONSTRUCTION DETAILS.

2641-2651 SANTA ANNA AVENUE, LLC  
 BK/PG 68756/572  
 PLAN NO 1425 OF 1981  
 PARCEL #R10 2.1  
 305 FOSTER STREET



JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
 CONCORD ASSOCIATES FOSTER STREET TRUST  
 BK/PG 14680/362  
 PLAN NO 1314 OF 1981  
 PARCEL #R09 33.0  
 300 FOSTER STREET

JOHN K. GRADY, TRUSTEE OF THE  
 FOSTER/TAYLOR REALTY TRUST  
 BK/PG 23190/14892  
 PARCEL #R09 32.0  
 230 TAYLOR STREET

PROP. PERFORMED THERMOPLASTIC BIKE LANE MARKINGS - GREEN (SEE SPECIAL PROVISIONS) BE INSTALLED BETWEEN THE DWLX

PROP. PERFORMED THERMOPLASTIC BIKE MARKINGS TYP. (SEE SPECIAL PROVISIONS)

MERGE TO EXISTING MARKINGS 50 FT FROM LIMIT OF WORK SEE INSET B

**BIKE LANE** R3-17

**WEIGHT LIMIT** 811 LB (SEE SPECIAL PROVISIONS)

**BIKE LANE** R12-5

**CAUTION DEAF CHILDREN!** RET.

**STOP** R1-1b

**STOP** R1-1a

**KEEP RIGHT EXCEPT TO PASS** R9-6" R4-16"

**KEEP RIGHT EXCEPT TO PASS** R9-6" R4-16"

**BIKE ROUTE** D11-1" D1-1a-a"

**RAIL STATION 0.6**

**RRFB** W11-2 (2) W16-7PL W16-7PR

**COMMUTER RAIL STATION** R&S

**MA-D1-5a(T)-a**

**MA-D1-5a(T)-b**

**LIMIT OF WORK** STA 205+00.00 N3012961.1405 E653254.4720

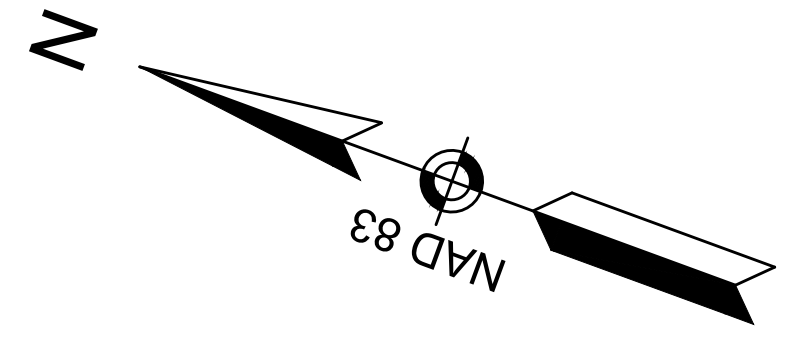
**LIMIT OF WORK** STA 201+28.19 N3012602.2313 E653351.1021

**BIKE LANE ENDS** R3-17 R3-17bP

MERGE TO EXISTING MARKINGS 50 FT FROM LIMIT OF WORK SEE INSET A

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	42	129
PROJECT FILE NO.			609054

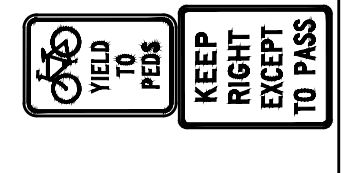


CONTINUED ON SHEET NO. 41

2641-2651 SANTA ANNA AVENUE, LLC  
 BK/PG 69736/572, 1981  
 PLAN NO. 1425 OF 1981  
 PARCEL #R10.2.1  
 305 FOSTER STREET

ASJIA PROPERTIES, LLC & SANDEEP ASJIA  
 BK/PG 70688/365  
 PLAN NO. 1425 OF 1981  
 PARCEL #R10.2.2  
 295 FOSTER STREET

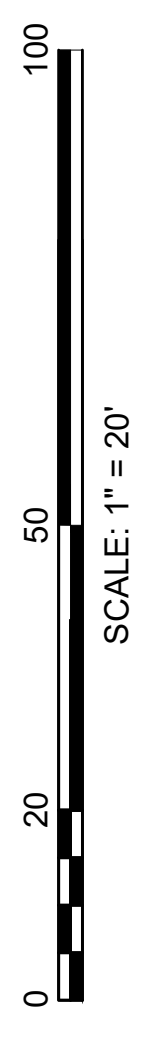
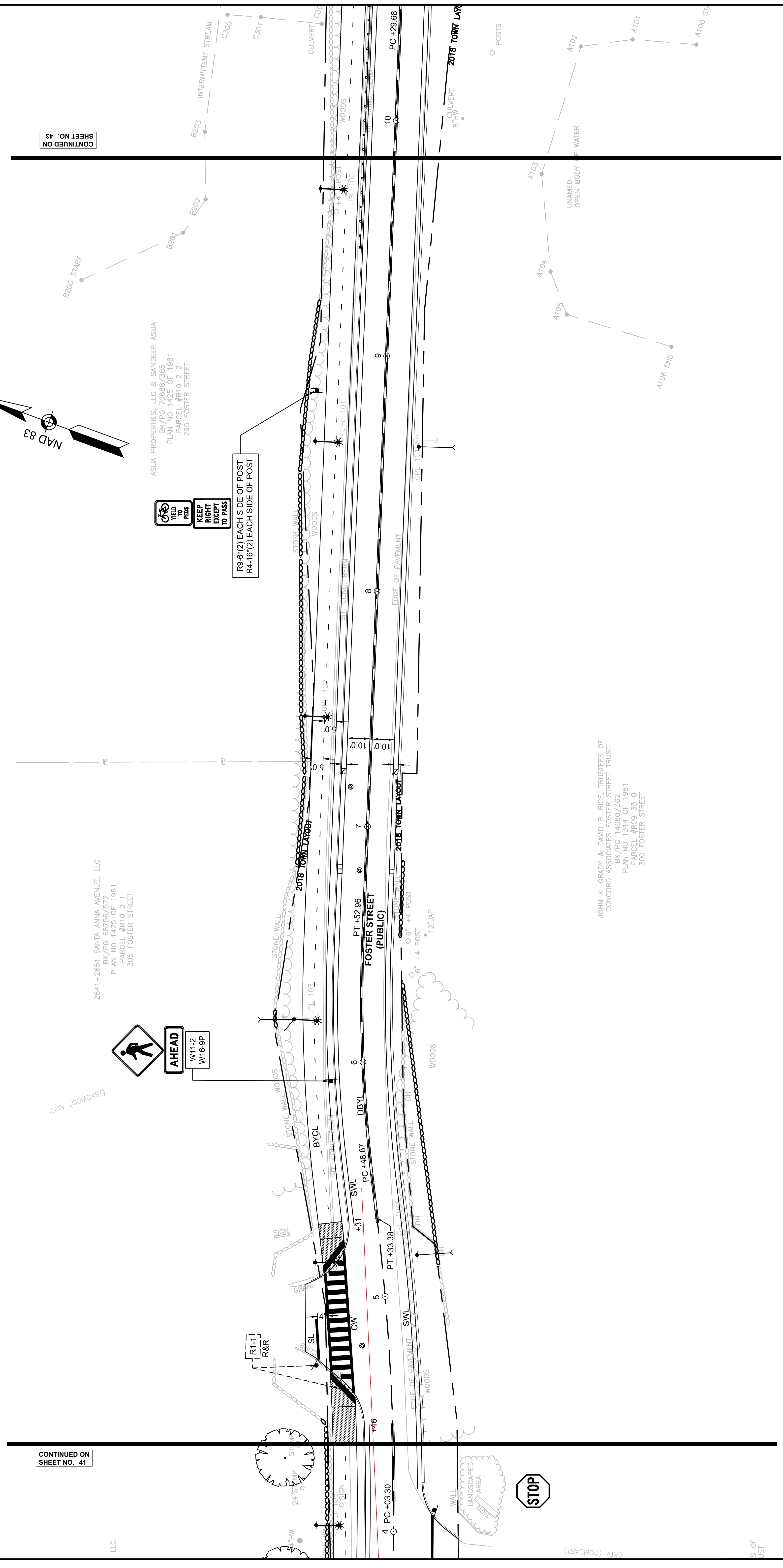
JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
 CONCORD ASSOCIATES FOSTER STREET TRUST  
 BK/PG 14680/362  
 PLAN NO. 1314 OF 1981  
 PARCEL #R09.33.0  
 300 FOSTER STREET



R9-6(2) EACH SIDE OF POST  
 R4-16(2) EACH SIDE OF POST



CATV (COMCAST)



SEE SHEET 41 FOR MARKING & SIGNING NOTES

LLC

CATV (COMCAST)

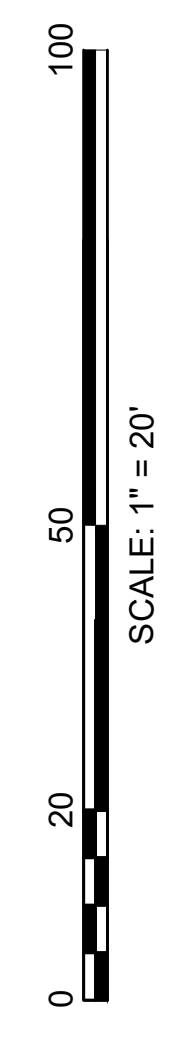
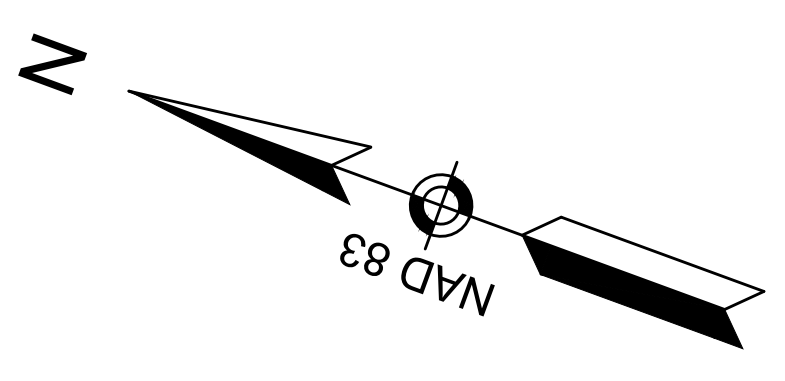
S. OF

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	43	129
PROJECT FILE NO.			609054

ASUA PROPERTY TO 7100' OF 130'-  
 BK/PG 1420.0.2  
 PLAN NO. 1420.0.2  
 PARCEL #101  
 295 FOSTER STREET

CONTINUED ON  
 SHEET NO. 44



SEE SHEET 41 FOR MARKING & SIGNING NOTES

CONTINUED ON  
 SHEET NO. 42

**BIKE ROUTE**  
 D11-1\*  
 D1-1a-b\*

**BIKE ROUTE**  
 D11-1\*  
 D1-1a-c\*

Sheet Station 0+4  
 Type 0.2

RETAIN  
 ENTRANCE  
 SIGN

REAL  
 ESTATE  
 SIGN  
 R&S

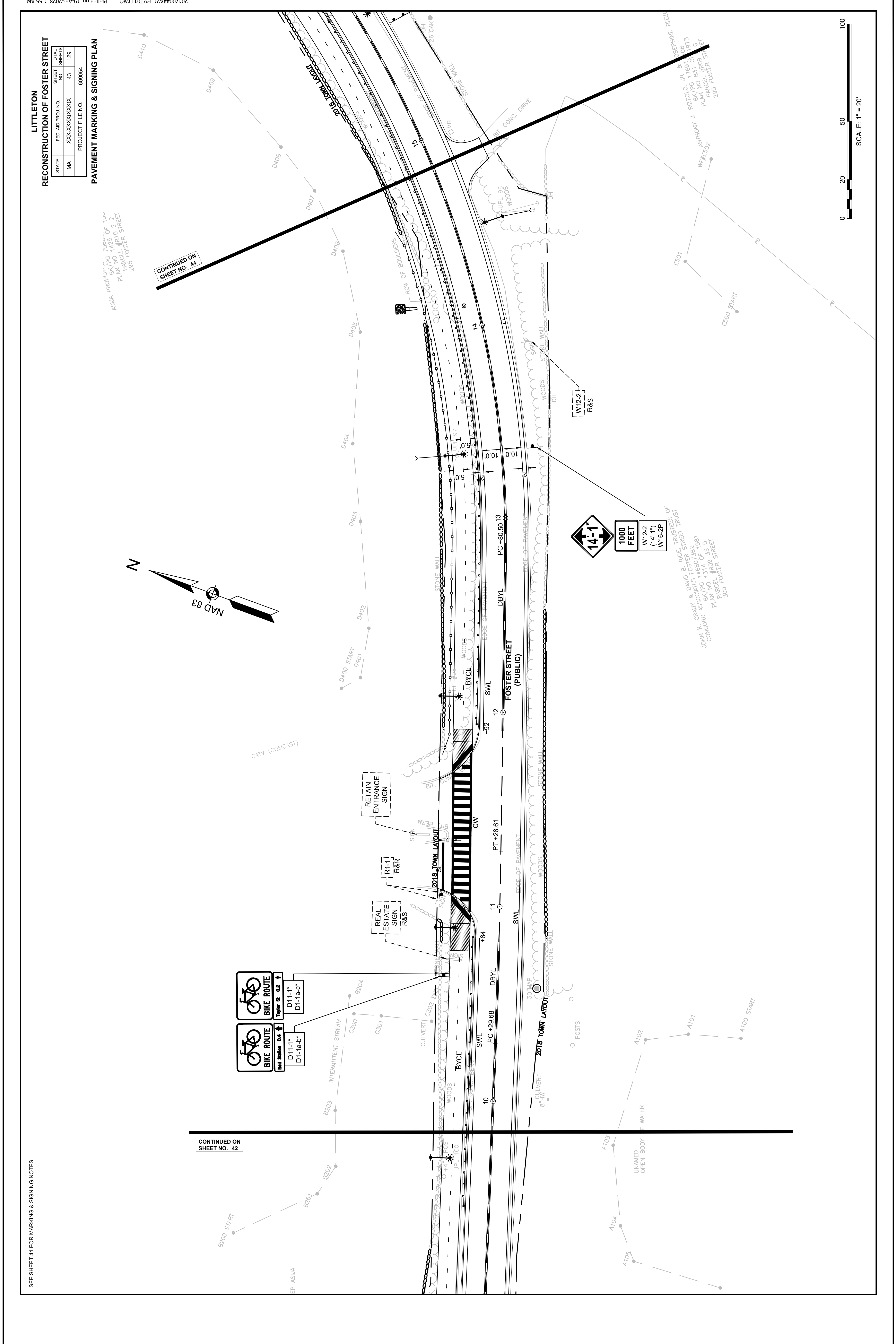
**14-1**

**1000  
 FEET**

W12-2  
 (14'-1")  
 W16-2P

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
 CONCORD BK/PG 1314.0  
 PLAN NO. 1314.0  
 PARCEL #R09.53.0  
 300 FOSTER STREET

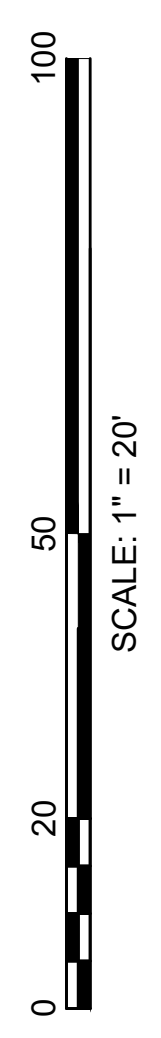
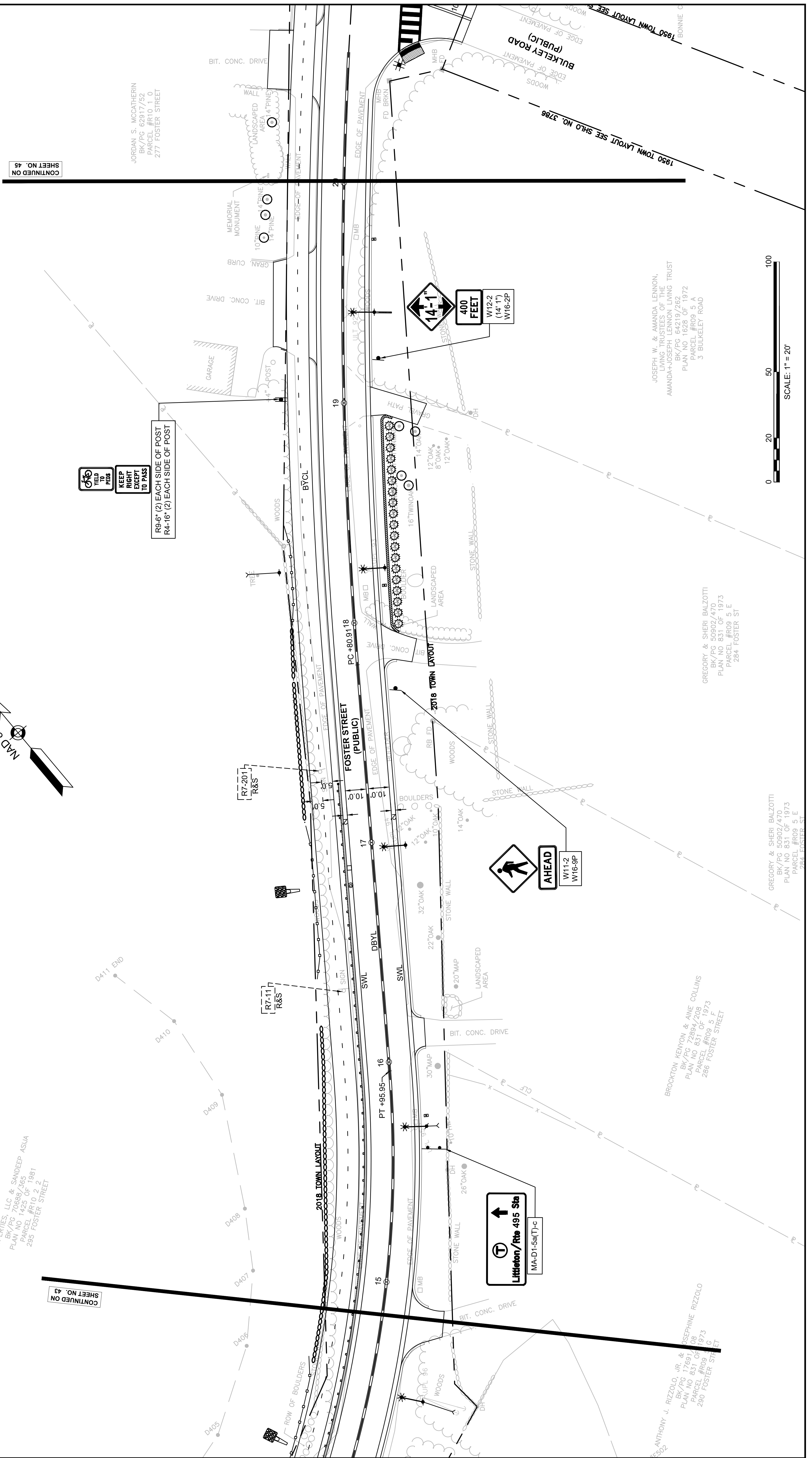
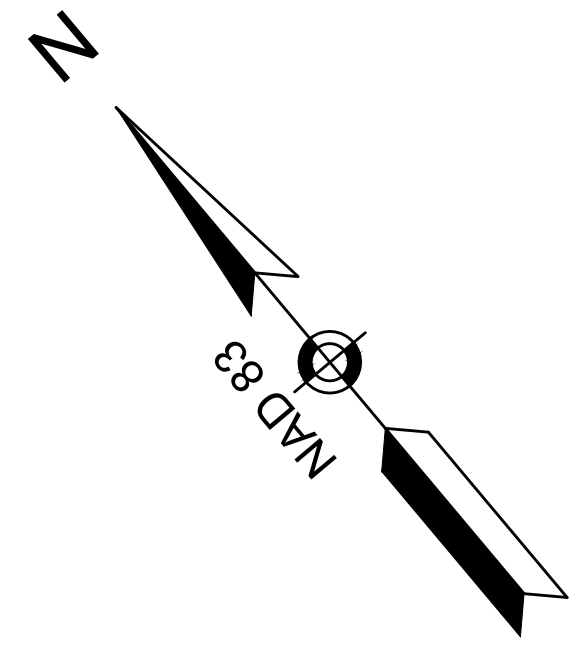
ANTHONY J. RIZZOLO, JR. &  
 CSEPHINE RIZZI  
 BK/PG 1769.0.1  
 PLAN NO. 1769.0.1  
 PARCEL #R01.01.0  
 250 FOSTER STREET



**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	44	129
PROJECT FILE NO.			609054

CONTINUED ON SHEET NO. 43



ASIA PROPERTIES, LLC & SANDEEP ASIA  
 BK/PG 70688/765  
 PLAN NO. 1425 OF 1981  
 PARCEL #R10.2.1981  
 295 FOSTER STREET

JORDAN S. MCCATHERIN  
 BK/PG 62917/52  
 PLAN NO. R10.1.0  
 PARCEL #R10.1.0  
 277 FOSTER STREET

JOSEPH W. & AMANDA LENNON,  
 LIVING TRUSTEES OF THE  
 AMANDA+JOSEPH LENNON LIVING TRUST  
 BK/PG 64219/262  
 PLAN NO. 1628 OF 1972  
 PARCEL #R09.5.A  
 3 BULKLEY ROAD

GREGORY & SHERI BALZOTTI  
 BK/PG 83102/1973  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.E  
 284 FOSTER ST

GREGORY & SHERI BALZOTTI  
 BK/PG 80002/470  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.E  
 284 FOSTER ST

BROCKTON KENYON & ANNE COLLINS  
 BK/PG 72894/208  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.F  
 286 FOSTER STREET

ANTHONY J. RIZZOLO, JR. & JOSEPHINE RIZZOLO  
 BK/PG 17691/08  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.G  
 290 FOSTER STREET

SEE SHEET 41 FOR MARKING & SIGNING NOTES

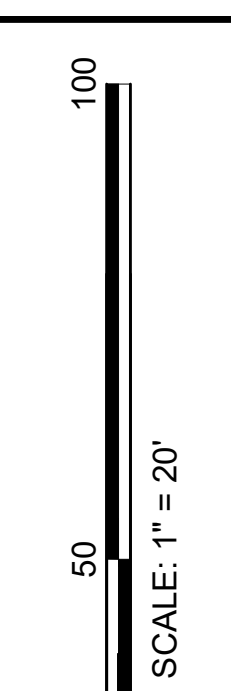
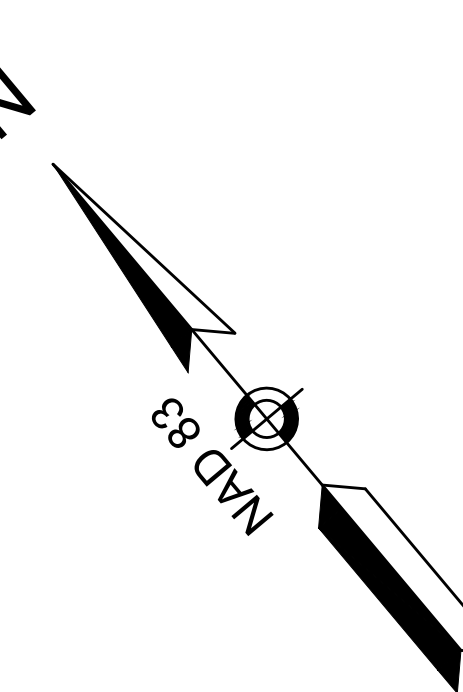
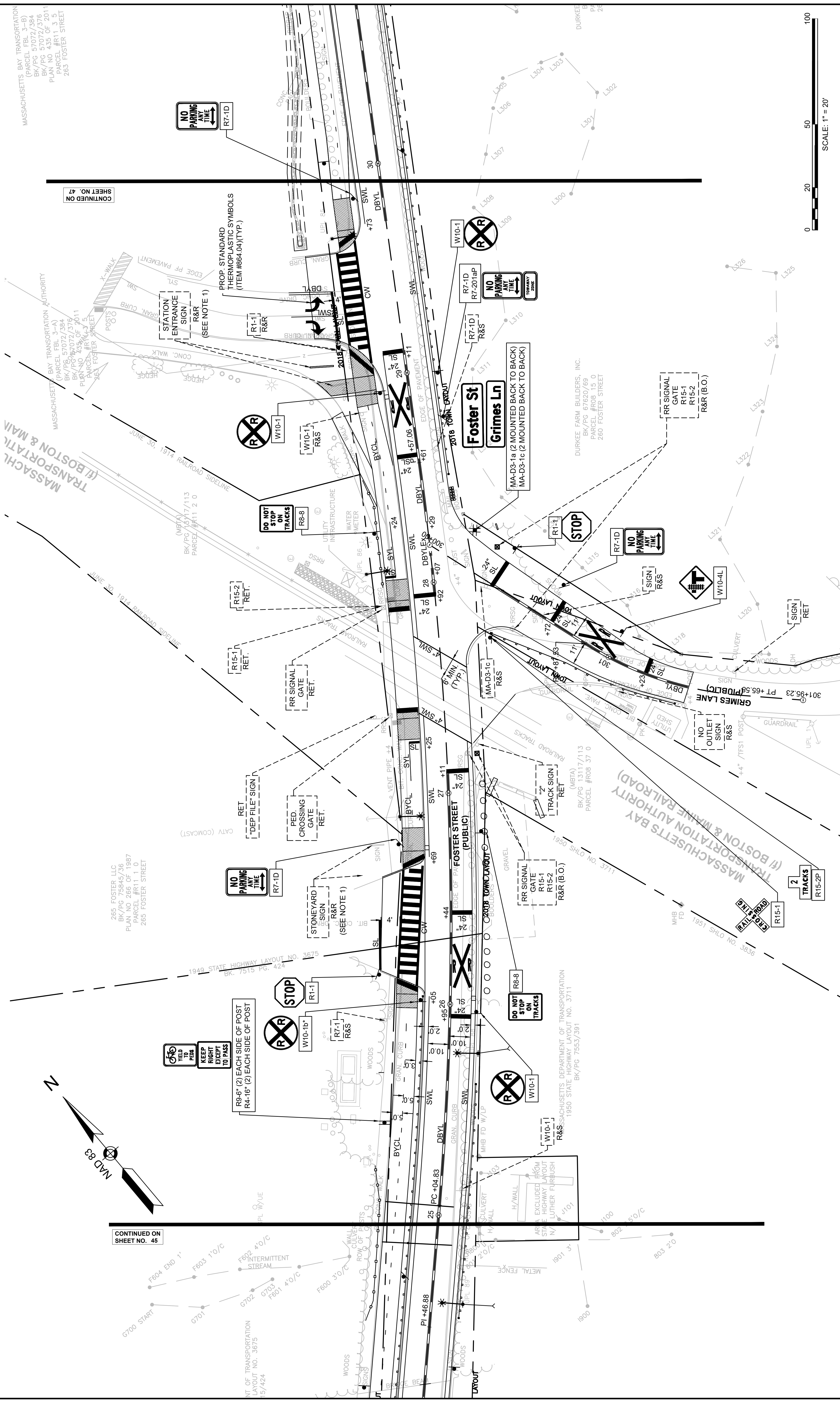




**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	46	129

PROJECT FILE NO. 609054



SEE SHEET 41 FOR MARKING & SIGNING NOTES

NOTES

- REMOVE AND RESET OF THESE SIGNS SHALL BE PAID FOR UNDER ITEM 874.85

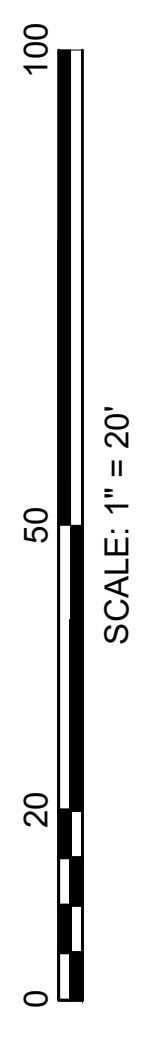
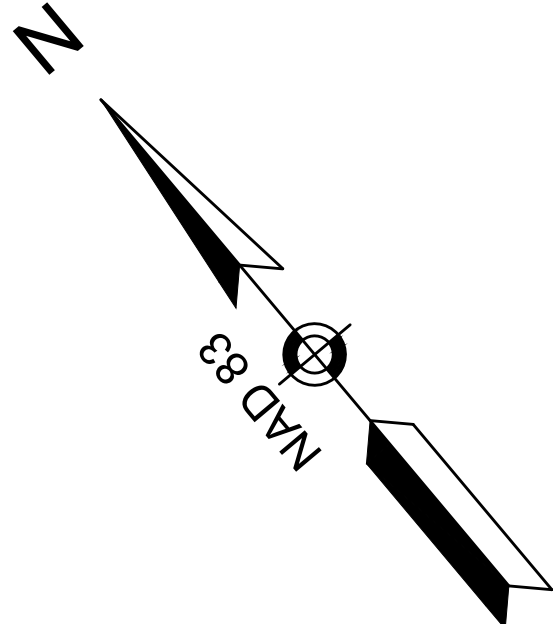
CONTINUED ON SHEET NO. 45

CONTINUED ON SHEET NO. 47

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	47	129
PROJECT FILE NO.			609054

CONTINUED ON SHEET NO. 48

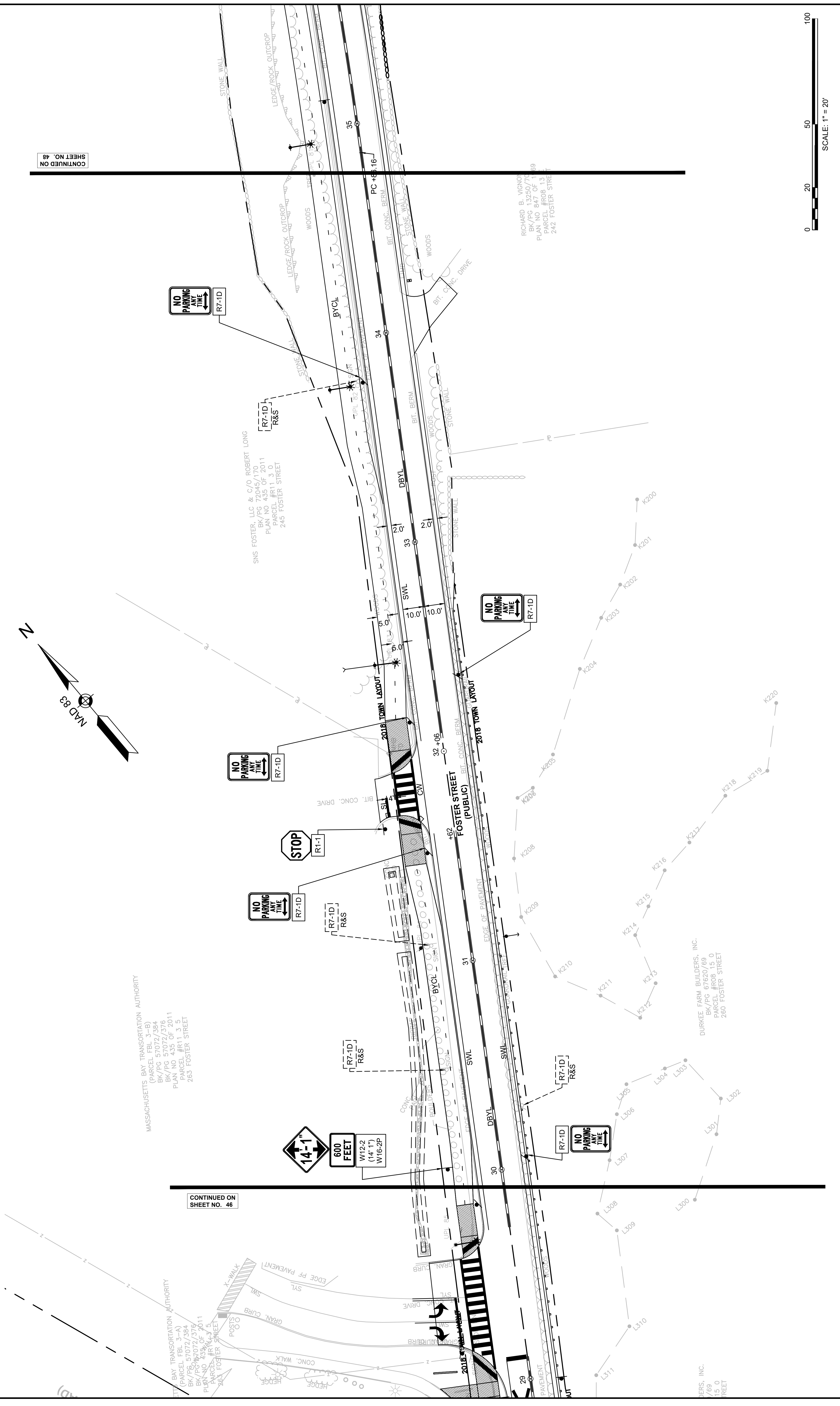


SEE SHEET 41 FOR MARKING & SIGNING NOTES

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
 (PARCEL FEL 3-58)  
 BK/PG 57072/376  
 PLAN NO. 435 OF 2011  
 PARCEL #R15 STREET  
 263 FOSTER STREET

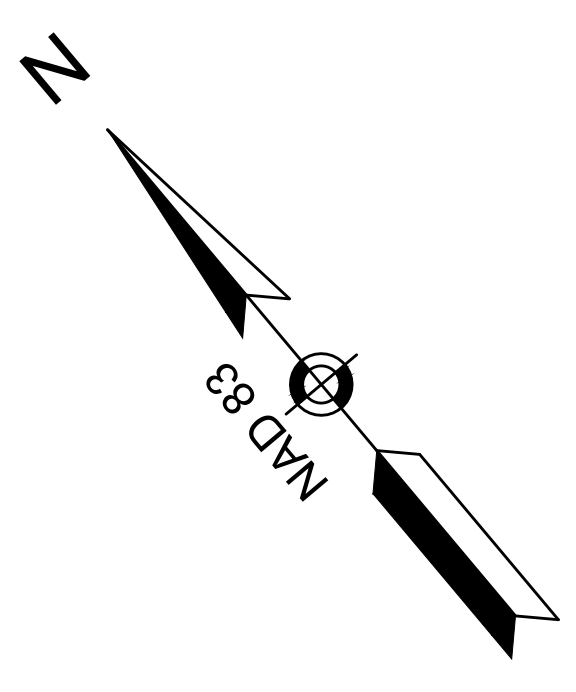
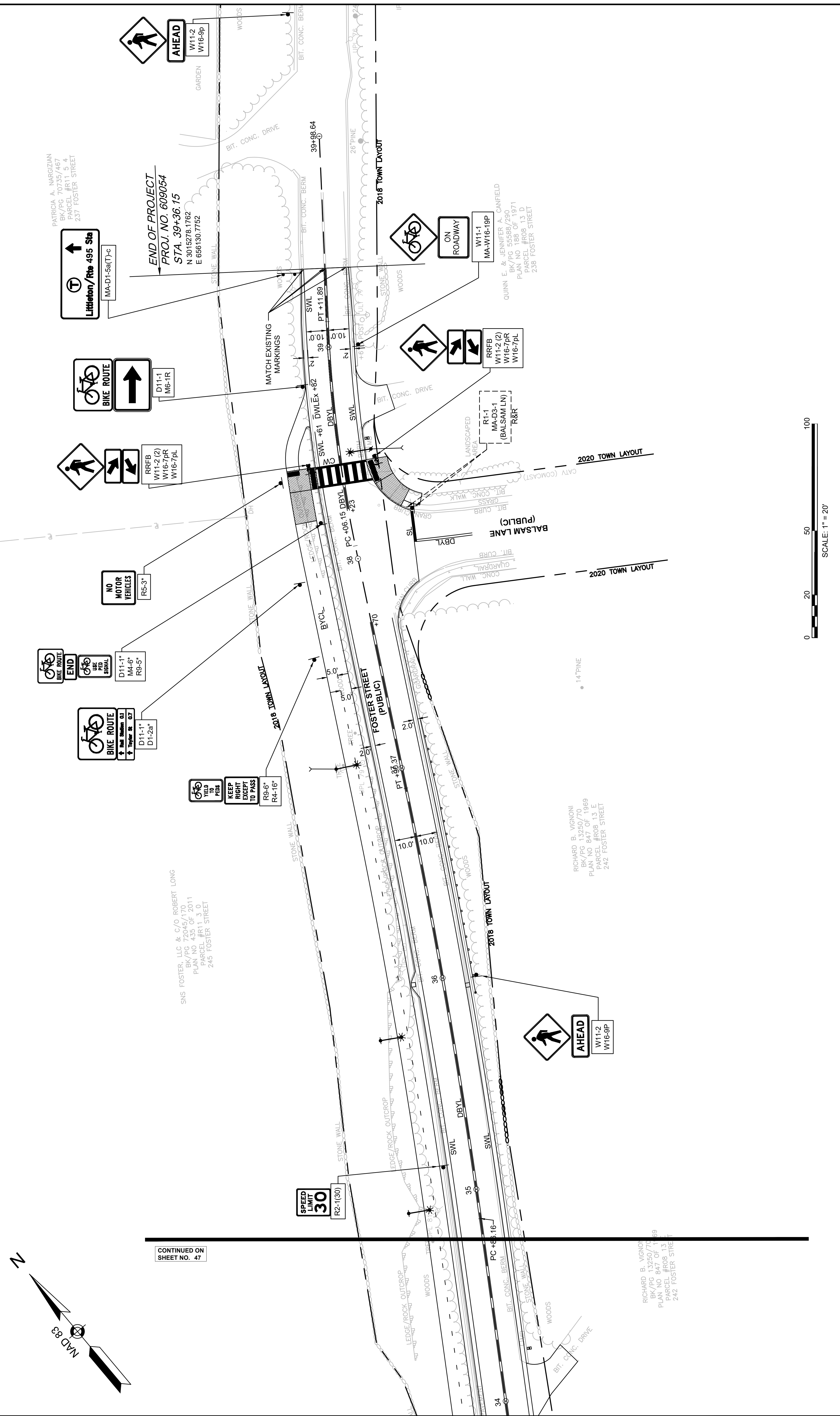
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY  
 (PARCEL FEL 3-A)  
 BK/PG 57072/376  
 PLAN NO. 435 OF 2011  
 PARCEL #R15 STREET  
 263 FOSTER STREET

CONTINUED ON SHEET NO. 46

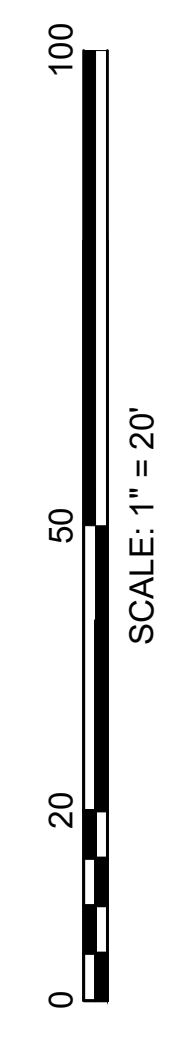


**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**PAVEMENT MARKING & SIGNING PLAN**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	48	129
PROJECT FILE NO. 609054			



CONTINUED ON  
 SHEET NO. 47



SEE SHEET 41 FOR MARKING & SIGNING NOTES

RICHARD B. VIGNONI  
 BK/PG 13250/70  
 PLAN NO 847 OF 1969  
 PARCEL #R08 1.3 E  
 242 FOSTER STREET

SNS FOSTER, LLC & C/O ROBERT LONG  
 BK/PG 72045/170  
 PLAN NO 435 OF 2011  
 PARCEL #R11 3.0  
 245 FOSTER STREET

RICHARD B. VIGNONI  
 BK/PG 13250/70  
 PLAN NO 847 OF 1969  
 PARCEL #R08 1.3 E  
 242 FOSTER STREET

QUINN E. & JENNIFER A. CANFIELD  
 BK/PG 55588/290  
 PLAN NO 188 OF 1971  
 PARCEL #R08 1.3 D  
 238 FOSTER STREET

PATRICIA A. NARGIZIAN  
 BK/PG 70735/467  
 PLAN NO 111 OF 1971  
 PARCEL #R11 3.0  
 237 FOSTER STREET

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**DRAINAGE & UTILITY PLANS REVISED 5/26/2022**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(X)X	57	129
PROJECT FILE NO. 609054			

**ELECTRICAL NOTES:**  
 1. CONTRACTOR SHALL COORDINATE WITH LITTLETON LIGHT AND ELECTRIC DEPT. (LELD) ON THE TIMING OF TRANSFER FOR PRIMARY RISER AT UTILITY POLES #78, 99, 104, AND 105. DISRUPTION TO COMMERCIAL PROPERTIES SHALL BE MINIMIZED BY WEEKEND WORK OR THE USE OF GENERATORS.

**TREE TRIMMING NOTES:**  
 1. LIMITS OF SELECTIVE CLEARING AND THINNING SHALL BE 10FT OFFSET BACK FROM ANY RESET OHW OR AS SHOWN ON CONSTRUCTION PLANS.

**GENERAL NOTES:**  
 1. IF EXISTING PIPES SHOWN TO BE REMOVED ARE WITHIN THE LIMITS OF NEW PIPE TRENCH EXCAVATION, THEN THE REMOVAL COST OF THE OLD PIPES SHALL BE INCLUDED IN THE UNIT COST FOR THE NEW PIPE THAT IS BEING INSTALLED. IF PIPES SHOWN TO BE REMOVED ARE OUTSIDE THE LIMITS OF NEW PIPE TRENCH (AS DETERMINED BY THE ENGINEER), THEN REMOVAL COST SHALL BE PAID UNDER ITEM 141 - CLASS A TRENCH EXCAVATION.

2. ALL PROPOSED (NEW) CATCH BASINS SHALL HAVE 4' SUMPS.  
 3. ALL CATCH BASINS WITHIN THE PAVED ROADWAY SHALL HAVE CASCADE STYLE/BICYCLE SAFE GRATES UNLESS OTHERWISE NOTED ON THE PLANS.  
 4. ALL ELEVATIONS, STATIONS, AND OFFSETS FOR ALL CATCH BASINS AND DRAINAGE MANHOLES COME FROM CENTER OF COVER OR GRATE.  
 5. CONTRACTOR SHALL USE APPROPRIATELY SIZED RCP TO MATCH INTO EXISTING PIPES AS SHOWN.

**BEGINNING OF PROJECT**  
 PROJ. NO. 609054  
 STA 0+00.00  
 N3012786.8847  
 E653296.9381

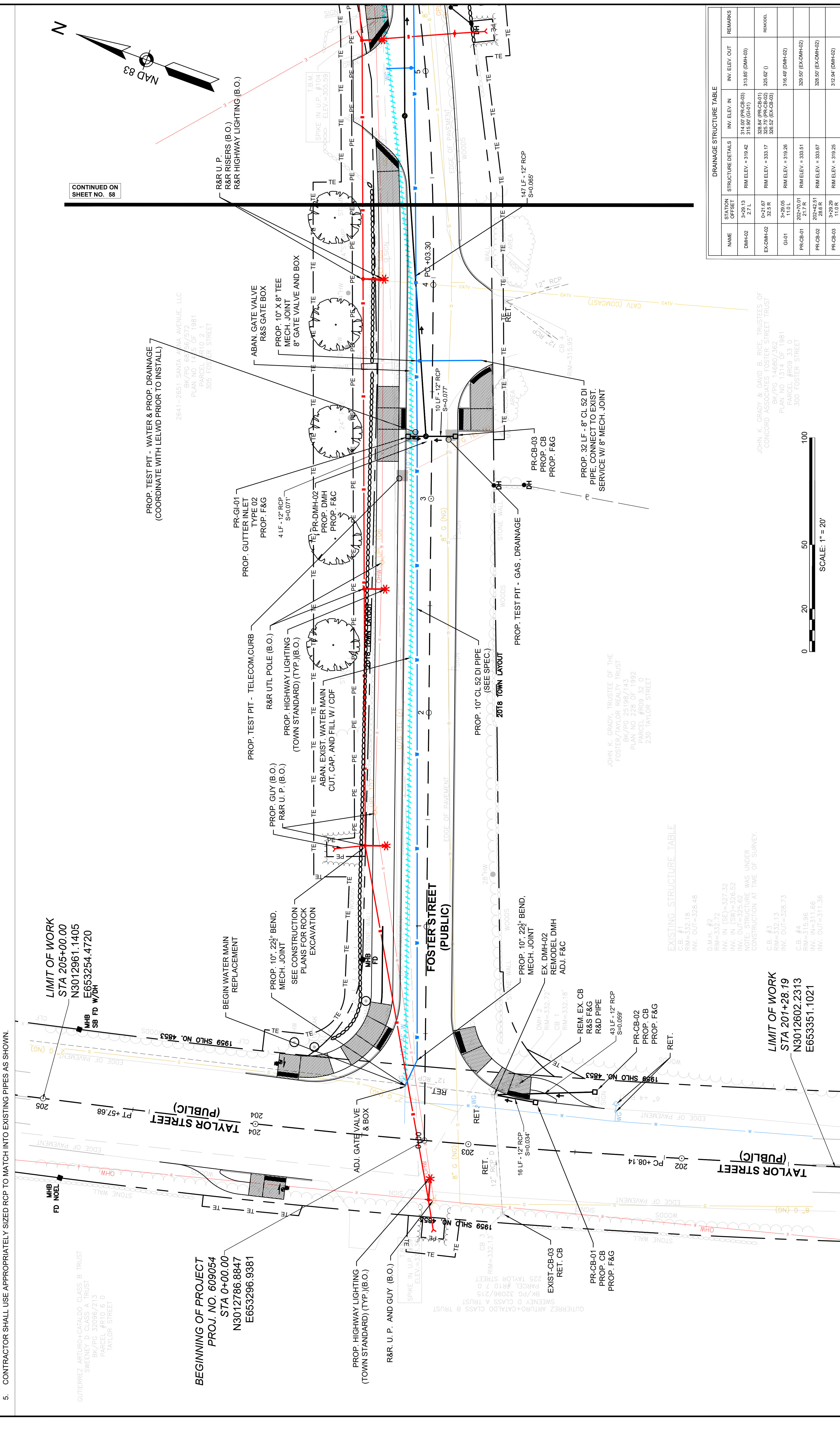
**LIMIT OF WORK**  
 STA 205+00.00  
 N3012961.1405  
 E653254.4720  
 MHB SB FD W/DH

**EXISTING STRUCTURE TABLE**

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DMH-02	3+26.13 2.7 L	RIM ELEV. = 319.42	314.00' (PR-CB-03)	313.85' (DMH-03)	
EK-DMH-02	0+21.67 32.5 R	RIM ELEV. = 333.17	328.84' (PR-CB-01)	325.62' ( )	REMODEL
GI-01	3+29.05 11.0 L	RIM ELEV. = 319.26	316.49' (DMH-02)		
PR-CB-01	202+70.01 21.7 R	RIM ELEV. = 333.51	329.50' (EX-DMH-02)		
PR-CB-02	202+42.51 28.6 R	RIM ELEV. = 333.67	328.50' (EX-DMH-02)		
PR-CB-03	3+29.29 11.0 R	RIM ELEV. = 319.25	312.84' (DMH-02)		

**EXISTING STRUCTURE TABLE**

C.B. #1	RIM=332.18 INV. OUT=328.48
D.M.H. #2	RIM=332.72 INV. IN (SE)=327.32 INV. IN (SW)=326.52 INV. OUT=325.62
C.B. #3	RIM=332.13 INV. OUT=328.73
C.B. #4	RIM=315.96 INV. IN=311.66 INV. OUT=311.36



**CONTINUED ON SHEET NO. 58**

**SCALE: 1" = 20'**

0 20 50 100

JOHN K. GRADY, TRUSTEE OF THE FOSTER/TAYLOR REALTY TRUST  
 BK/PG 251967/143  
 PLAN NO. 1314 OF 1981  
 PARCEL #10 2.1  
 3005 FOSTER STREET

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF CONCORD ASSOCIATES FOSTER STREET TRUST  
 BK/PG 14680/362  
 PLAN NO. 1314 OF 1981  
 PARCEL #109 33.0  
 500 FOSTER STREET

2641-2651 SANTA ANA AVENUE, LLC  
 BK/PG 68 36/572  
 PLAN NO. 14 3 OF 1981  
 PARCEL #10 2.1  
 3005 FOSTER STREET

GUTIERREZ ARTURO+CATALDO CLASS B TRUST  
 SWEENEY D CLASS A TRUST  
 BK/PG 32096/213  
 PARCEL #10 6 0  
 TAYLOR STREET

GUTIERREZ ARTURO+CATALDO CLASS B TRUST  
 BK/PG 42096/215  
 PARCEL #10 4 0  
 225 TAYLOR STREET

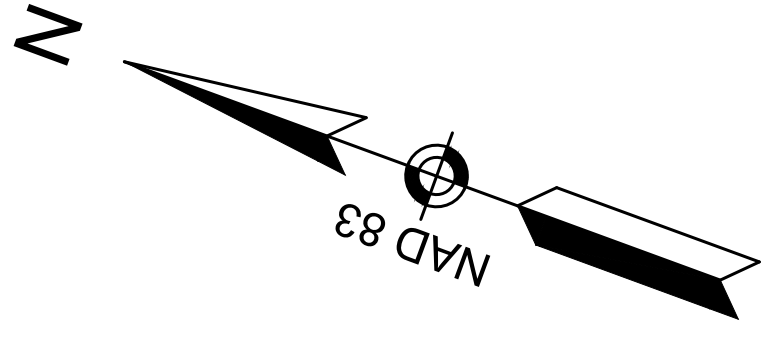
SWEENEY D CLASS A TRUST  
 BK/PG 32096/213  
 PARCEL #10 6 0  
 TAYLOR STREET

2017004421.COLOR.U101.DWG  
 Plotted on 19-Apr-2023 1:56 AM

2017004421.COLOR.U101.DWG Plotted on 19-Apr-2023 1:56 AM

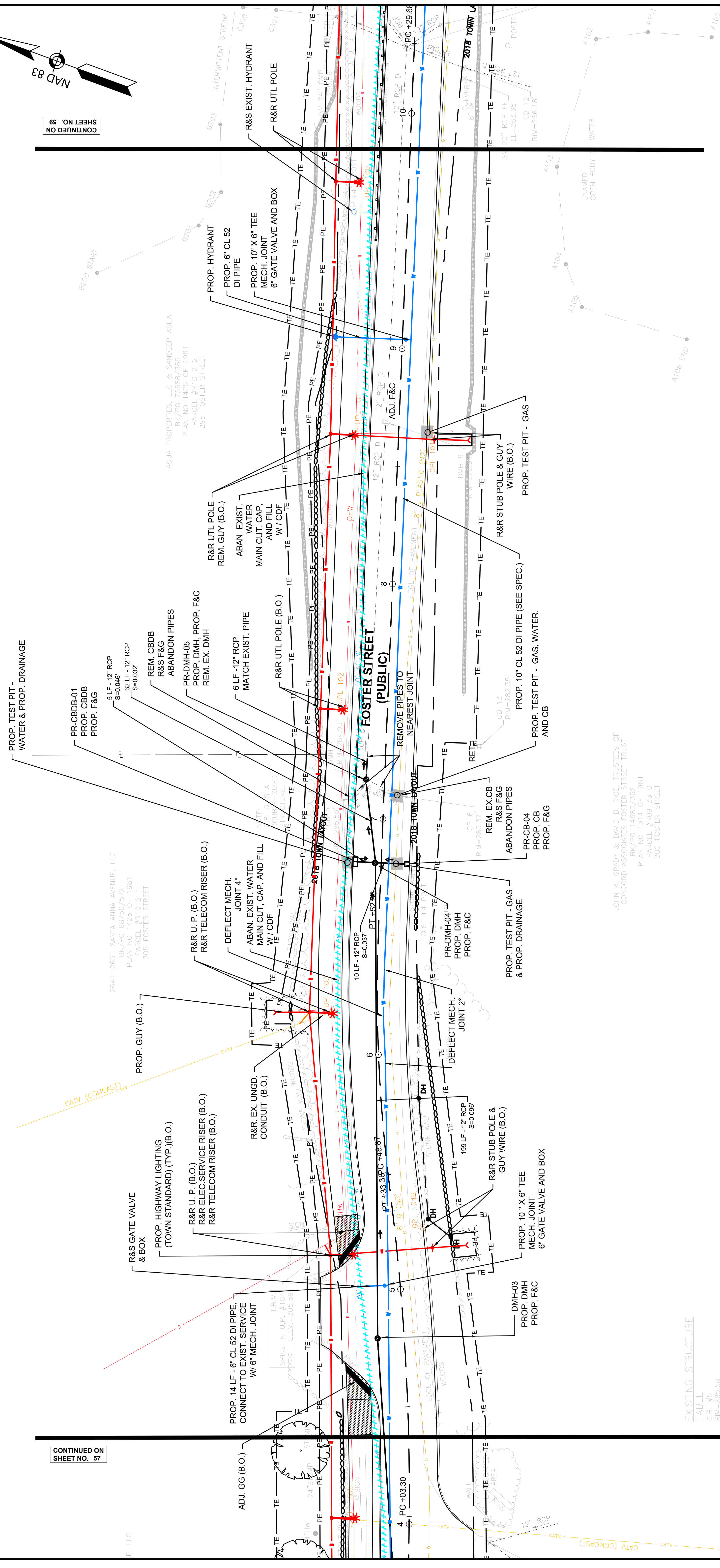
**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**DRAINAGE & UTILITY PLANS REVISED 5/26/2022**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	58	129
PROJECT FILE NO. 609054			

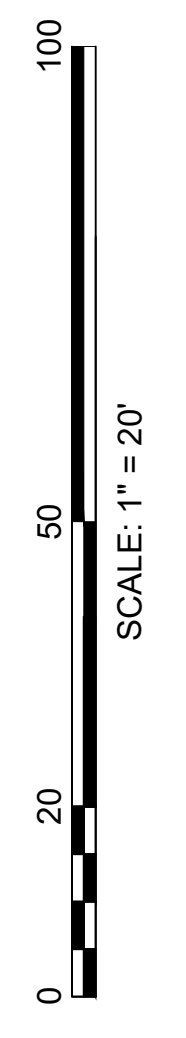


CONTINUED ON SHEET NO. 59

- NOTES:
- SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES
  - \* - CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE



STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARK
DMH-03	4'-7.97' 11.3 L	304.08' (DMH-02)	303.87' (DMH-04)	
DMH-04	6'-81.54' 2.5 L	284.00' (PR-CBDB-1)	281.83' (DMH-05)	
DMH-05	7'-16.80' 7.8 L	280.69' (DMH-04)	280.43' 0	
PR-CB-04	6'-81.35' 11.0 R	282.58' (DMH-04)	282.58' (DMH-04)	
PR-CBDB-1	6'-81.56' 11.0 L	284.39' (DMH-04)	284.39' (DMH-04)	



CONTINUED ON SHEET NO. 57

EXISTING STRUCTURE TABLE

C.B.#	INVERT	OUTLET
#5	285.58	281.58
#6	285.37	280.87
#7	284.93	280.43
#8	272.34	268.74

JOHN K. GRADY & DAVID B. RICE, TRUSTEES OF  
 CONCORD ASSOCIATES- FOSTER STREET TRUST  
 BK/PC 14680/362  
 PLAN NO. 0316 OF 1981  
 300 FOSTER STREET

2641-2651 SANTA ANNA AVENUE, LLC  
 BK/PC 68756/572  
 PLAN NO. 1425 OF 1981  
 PARCEL #10.2.1  
 305 FOSTER STREET

ASUA PROPERTIES, LLC & SANDEEP ASUA  
 BK/PC 70688/365  
 PLAN NO. 1425 OF 1981  
 PARCEL #10.2.1  
 295 FOSTER STREET

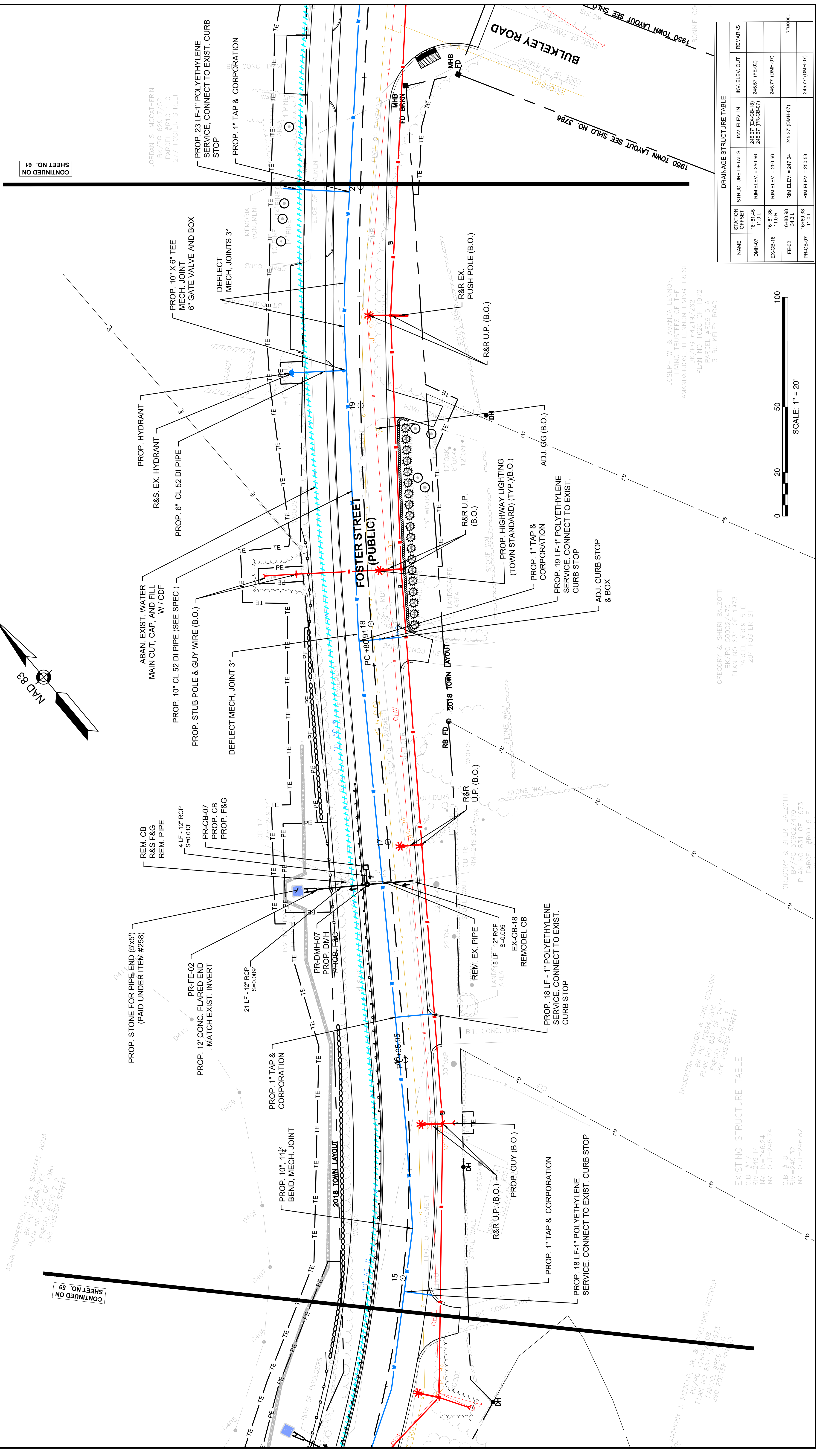
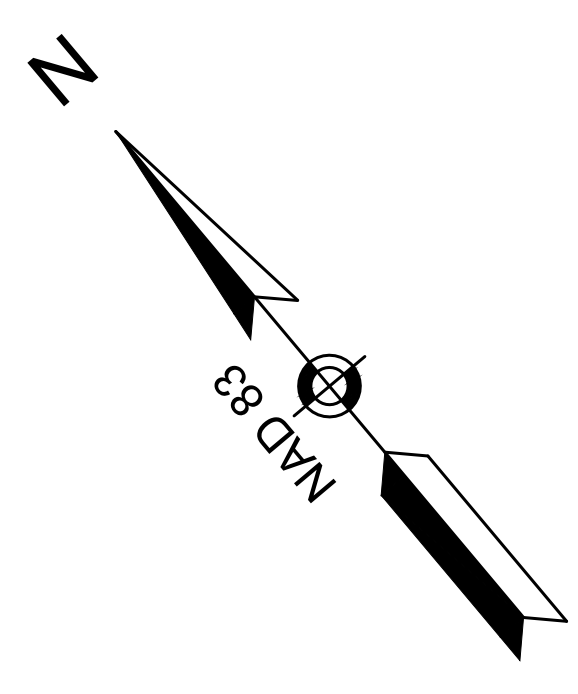


2017004421\_COLOR\_UTL01.DWG Plotted on 19-Apr-2023 1:56 AM

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
 STATE: MA  
 FED. AID PROJ. NO.: XXX-XXX(XXX)X  
 SHEET NO.: 60  
 TOTAL SHEETS: 129  
 PROJECT FILE NO.: 609054

**DRAINAGE & UTILITY PLANS REVISED 5/26/2022**

**NOTES:**  
 1. SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES  
 2. \*- CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE

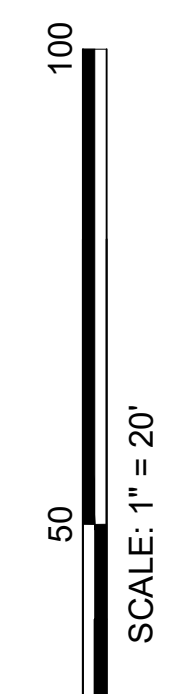


**EXISTING STRUCTURE TABLE**

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DMH-07	16+81.45 11.0 L		245.67 (EX-CB-18) 245.67 (PR-CB-07)	245.57 (FE-02)	
EX-CB-18	16+81.36 11.0 R		245.67	245.77 (DMH-07)	
FE-02	16+80.98 34.3 L		245.37 (DMH-07)		REMODEL
PR-CB-07	16+89.33 11.0 L		245.53	245.77 (DMH-07)	

**DRAINAGE STRUCTURE TABLE**

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DMH-07	16+81.45 11.0 L		245.67 (EX-CB-18) 245.67 (PR-CB-07)	245.57 (FE-02)	
EX-CB-18	16+81.36 11.0 R		245.67	245.77 (DMH-07)	
FE-02	16+80.98 34.3 L		245.37 (DMH-07)		REMODEL
PR-CB-07	16+89.33 11.0 L		245.53	245.77 (DMH-07)	



ASUA PROPERTIES, LLC & SANDREEP ASUA  
 BK/PG 70686/265  
 PARCEL #R10.2.2  
 285 FOSTER STREET

CONTINUED ON SHEET NO. 59

BROCKTON KENTON & ANNE COLLINS  
 BK/PG 72894/208  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.F  
 286 FOSTER STREET

ANTHONY J. RIZZOLO, JR. & STEPHEN RIZZOLO  
 BK/PG 1789  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.G  
 280 FOSTER STREET

JOSEPH W. & AMANDA LENNON,  
 LIVING TRUSTEES OF THE  
 AMANDA-JOSEPH LENNON LIVING TRUST  
 BK/PG 64219/262  
 PLAN NO. 1628 OF 1972  
 3 BULKELEY ROAD

GREGORY & SHERI BALZOTTI  
 BK/PG 50902/470  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.E  
 284 FOSTER ST

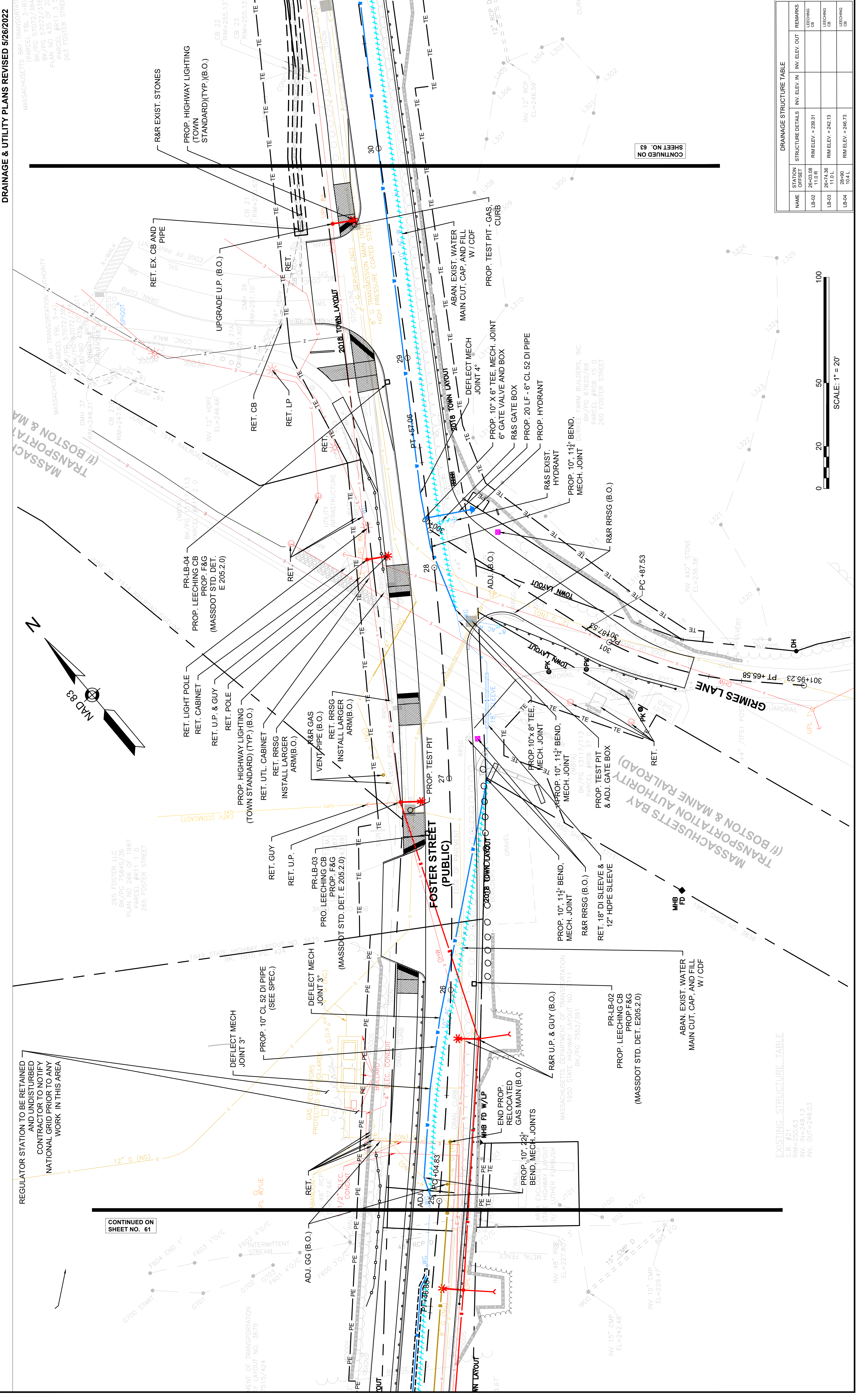
GREGORY & SHERI BALZOTTI  
 BK/PG 50902/470  
 PLAN NO. 831 OF 1973  
 PARCEL #R09.5.E





**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**DRAINAGE & UTILITY PLANS REVISED 5/26/2022**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	62	129
PROJECT FILE NO. 609054			



- NOTES:
- SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES
  - \*- CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE

REGULATOR STATION TO BE RETAINED AND UNDISTURBED. CONTRACTOR TO NOTIFY NATIONAL GRID PRIOR TO ANY WORK IN THIS AREA

CONTINUED ON SHEET NO. 61

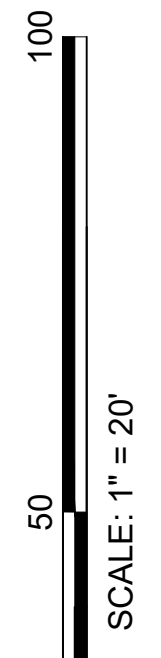
CONTINUED ON SHEET NO. 63

EXISTING STRUCTURE TABLE

CB #	INVERT	OUTLET
#21	250.63	248.13
	248.13	248.03

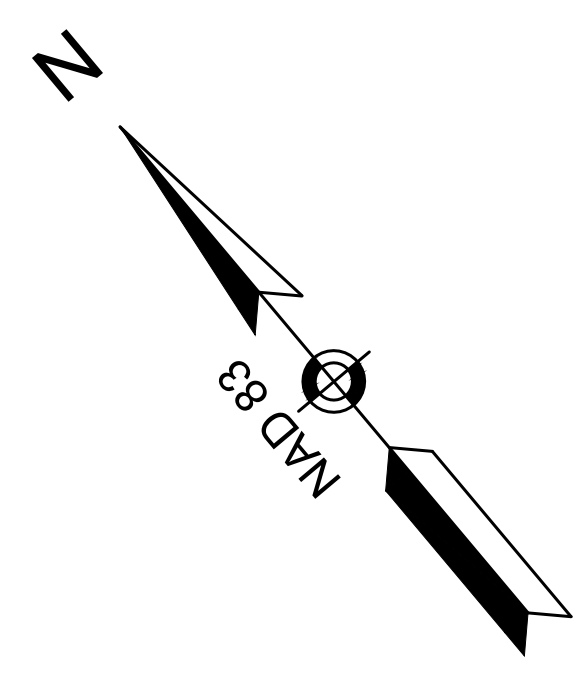
DRAINAGE STRUCTURE TABLE

NAME	STATION	STRUCTURE OFFSET	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
UB-02	26+03.08	11.0 R	RIM ELEV = 238.31		LEACHING CO.
UB-03	26+74.36	11.0 L	RIM ELEV = 242.13		LEACHING CO.
UB-04	28+90.10	10.4 L	RIM ELEV = 246.73		LEACHING CO.



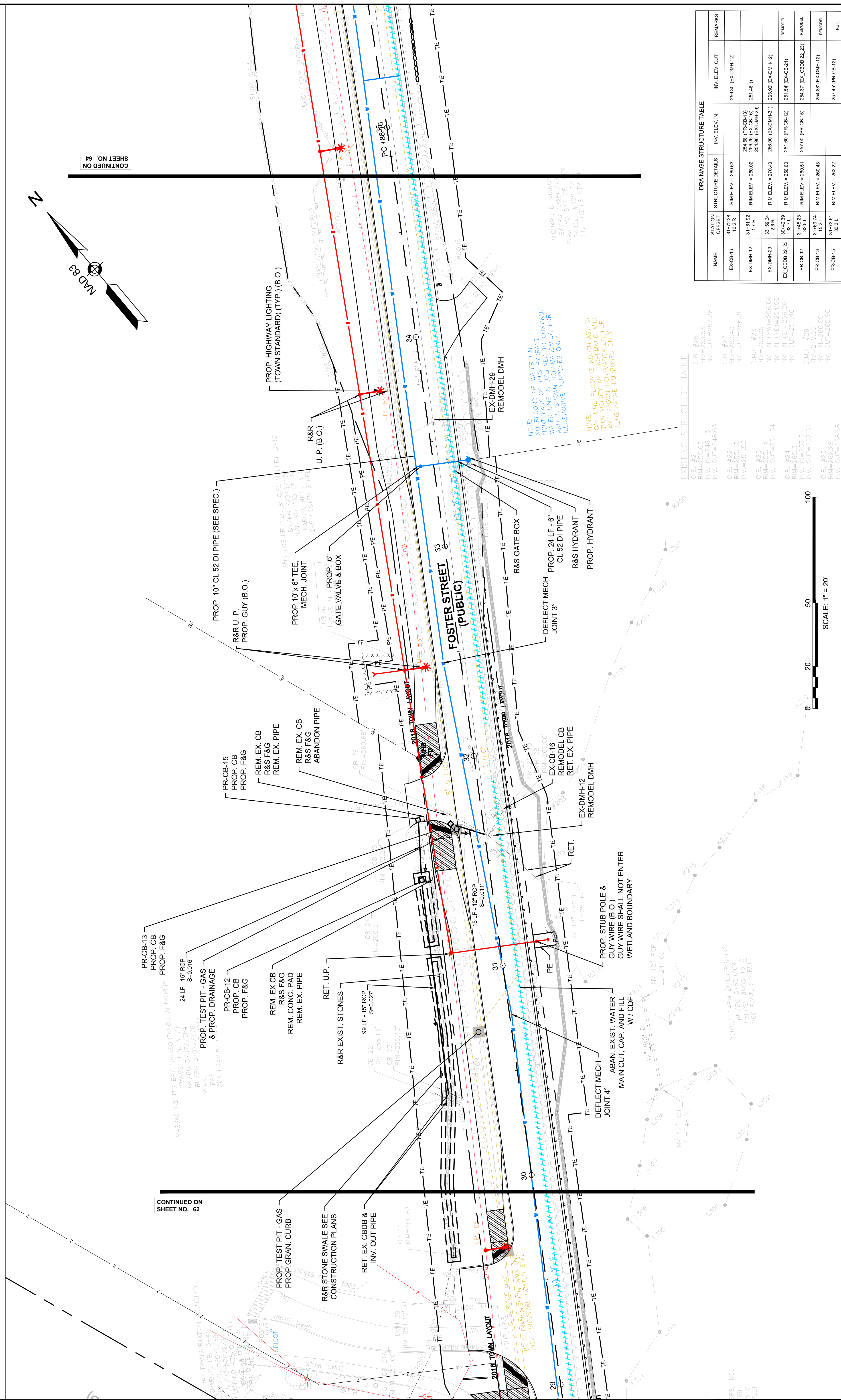
**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**DRAINAGE & UTILITY PLANS REVISED 5/26/2022**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	63	129
PROJECT FILE NO. 60954			



CONTINUED ON SHEET NO. 64

- NOTES:
- SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES
  - \* - CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE

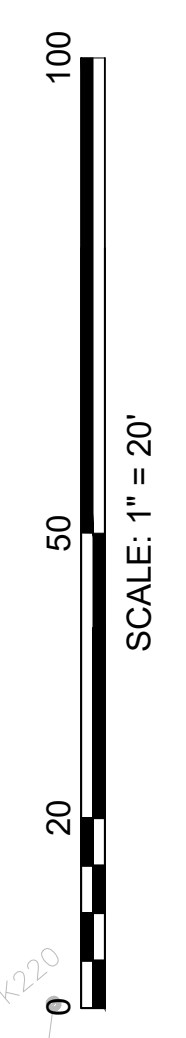


CONTINUED ON SHEET NO. 62

EXISTING STRUCTURE TABLE

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
EX-CB-16	31+72.28 10.2 R	RM ELEV = 260.03	256.30' (EX-DMH-12)		
EX-DMH-12	31+61.92 1.7 R	RM ELEV = 260.02	254.66' (PR-CB-13) 256.26' (EX-CB-16) 254.96' (EX-DMH-29)	251.46'	
EX-DMH-29	33+69.34 2.8 R	RM ELEV = 270.40	266.00' (EX-DMH-31)	265.90' (EX-DMH-12)	REMODEL
EX-CBDB 22, 23	30+42.39 33.7 L	RM ELEV = 266.00	251.60' (PR-CB-12)	251.54' (EX-CB-21)	
PR-CB-12	31+46.23 32.3 L	RM ELEV = 260.51	257.00' (PR-CB-15)	254.37' (EX-CBDB 22, 23)	REMODEL
PR-CB-13	31+69.74 13.2 L	RM ELEV = 260.43	254.88' (EX-DMH-12)		REMODEL
PR-CB-15	31+73.61 33.3 L	RM ELEV = 262.22	257.45' (PR-CB-12)		RET.

C.B. #	RM	INV.	IN	OUT
#26	260.68	257.38		
#21	248.13	248.03		
#22	255.13	251.53		
#23	255.14	251.54		
#24	250.31	257.51		
#25	262.28	265.96		



NOTE:  
 NO RECORD OF WATER LINE  
 NORTHEAST OF THIS HYDRANT.  
 WATER LINE IS BELIEVED TO CONTINUE  
 AND IS SHOWN SCHEMATICALLY, FOR  
 ILLUSTRATIVE PURPOSES ONLY.

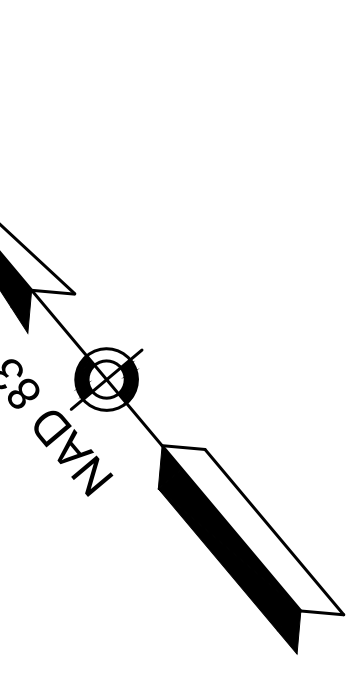
NOTE:  
 LINE RECORDS NORTHEAST OF  
 THIS VICINITY ARE SCHEMATIC AND  
 ARE SHOWN SCHEMATICALLY, FOR  
 ILLUSTRATIVE PURPOSES ONLY.

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**DRAINAGE & UTILITY PLANS REVISED 5/26/2022**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	64	129
PROJECT FILE NO. 609054			

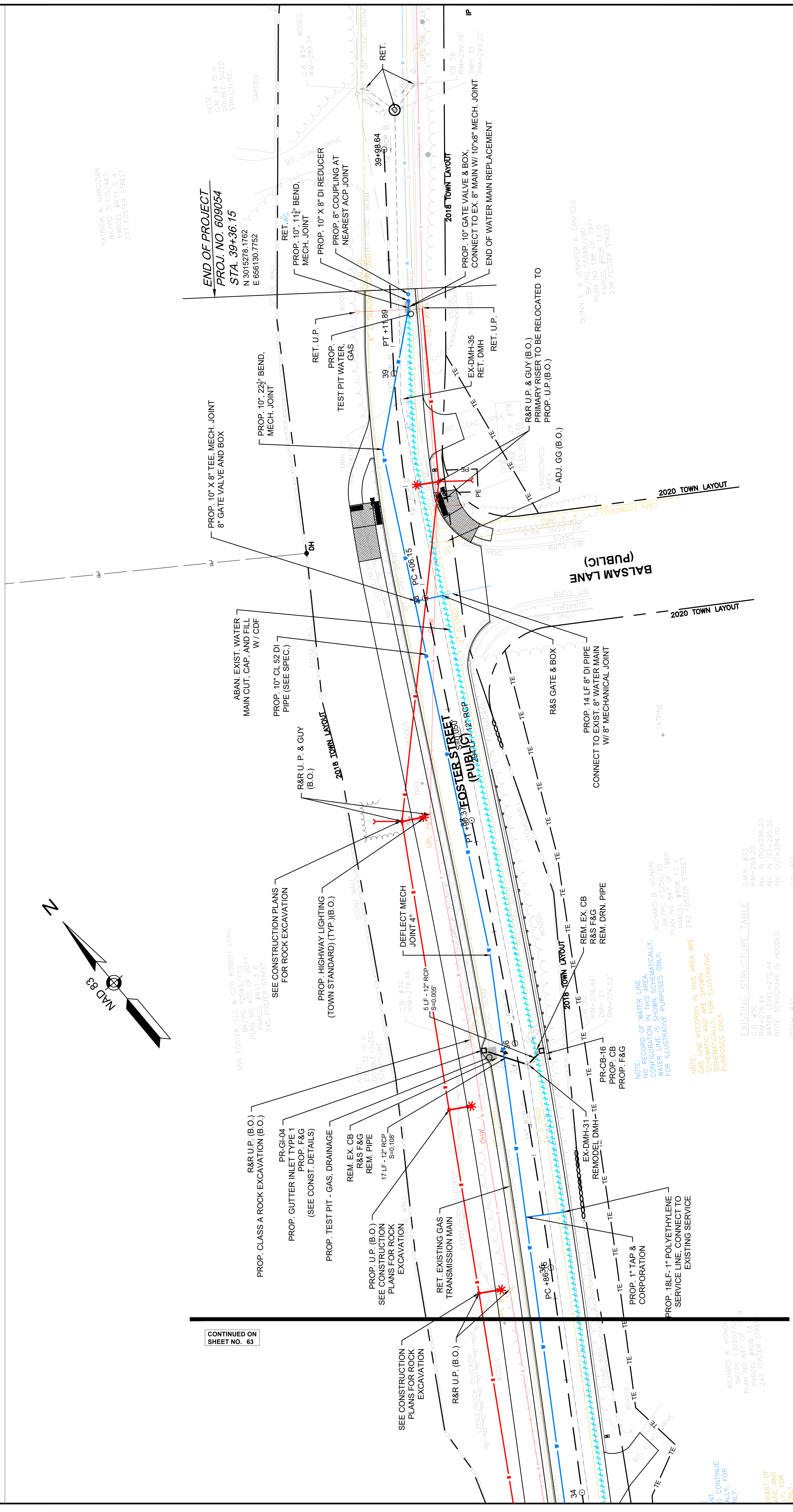
609054

PATRICIA A. MARGIZIAN  
 BK/PG 70735/7467  
 PLAN NO. 188 OF 1971  
 PARCEL #R13 D  
 237 FOSTER STREET



- NOTES:
- SEE SHEET 57 FOR GENERAL UTILITY, ELECTRICAL AND TREE TRIMMING NOTES
  - \* - CONTRACTOR TO MATCH EXISTING PIPE INVERT. INVERT GIVEN IS APPROXIMATE

CONTINUED ON SHEET NO. 63



**DRAINAGE STRUCTURE TABLE**

NAME	STATION OFFSET	STRUCTURE DETAILS	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
EX-DMH-31	35+89.75	RIM ELEV. = 276.55	272.32' (G104)	272.22' (PR-CB-16)	REMODEL
EX-DMH-35	38+87.45	RIM ELEV. = 282.70	288.37' (EX-DMH-33)	287.77' (EX-DMH-31)	RETAIN
G104	35+89.26	RIM ELEV. = 276.60	RIM ELEV. = 276.60	274.50' (EX-DMH-31)	
PR-CB-16	35+94.81	RIM ELEV. = 276.55	272.15' (EX-DMH-31)		

**EXISTING STRUCTURE TABLE**

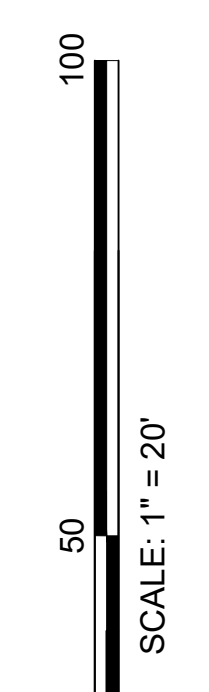
C.B. #30	D.M.H. #33
RIM=276.44	RIM=299.20
INV. IN (N)=295.20	INV. IN (N)=295.20
INV. IN (E)=295.30	INV. IN (E)=295.30
NOTE: STRUCTURE IS HOODED.	NOTE: FILLED WITH DEBRIS.
D.M.H. #31	C.B. #34
RIM=276.52	RIM=299.74
INV. IN (NW)=272.32	INV. IN (NW)=272.32
INV. IN (NE)=270.72	INV. IN (NE)=270.72
INV. IN (E)=272.32	INV. IN (E)=272.32
INV. OUT=270.52	INV. IN=286.37
C.B. #32	C.B. #36
RIM=276.46	RIM=299.76
WATER LEVEL=272.86	WATER LEVEL=295.76
NOTE: STRUCTURE IS HOODED.	NOTE: STRUCTURE IS HOODED.

NOTE: NO RECORD OF WATER LINE CONFIGURATIONS IN THIS AREA. WATER LINES SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

NOTE: LINE RECORDS IN THIS AREA ARE SCHEMATIC AND ARE SHOWN SCHEMATICALLY, FOR ILLUSTRATIVE PURPOSES ONLY.

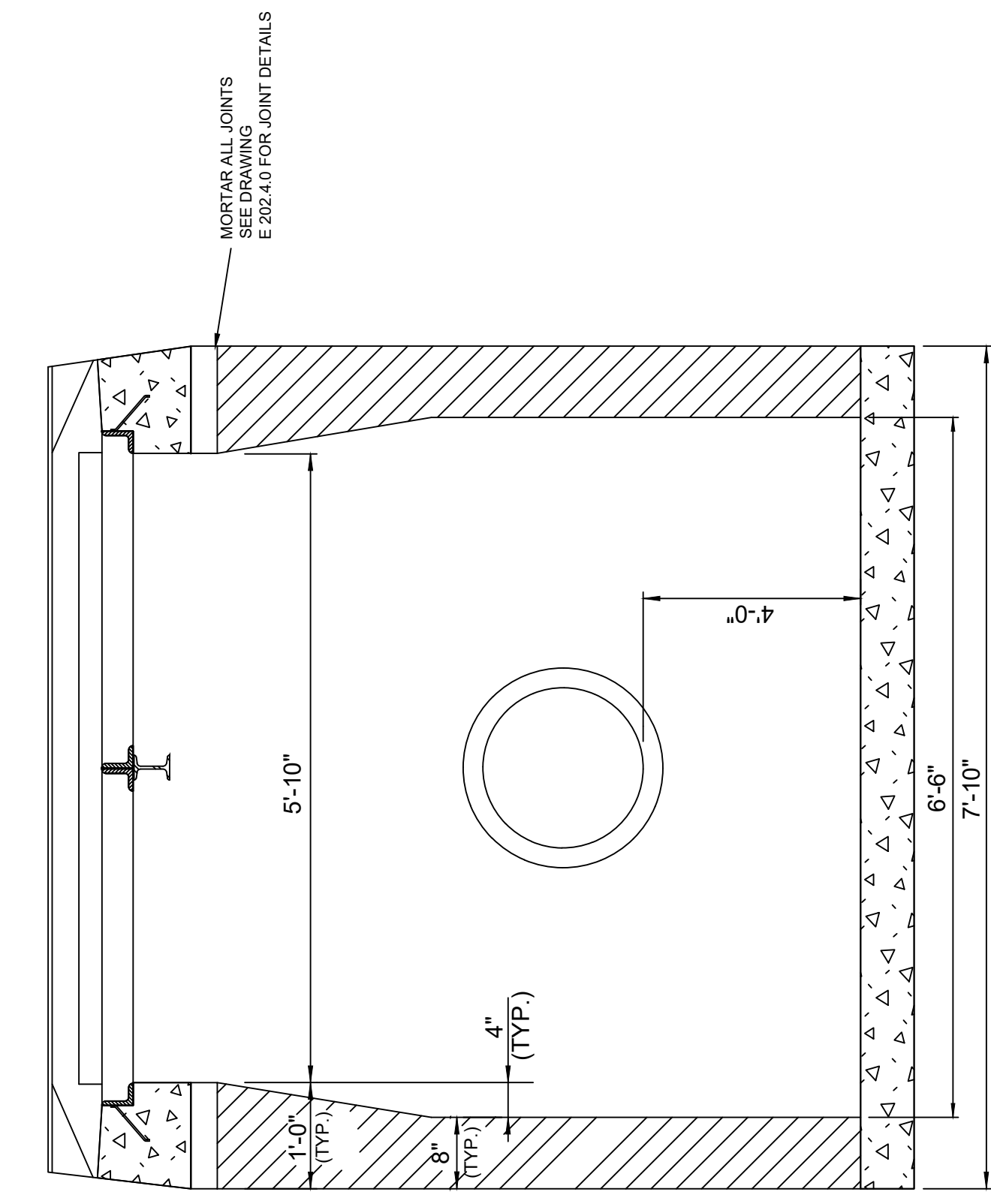
NOTE: STRUCTURE IS HOODED.

NOTE: STRUCTURE IS HOODED.

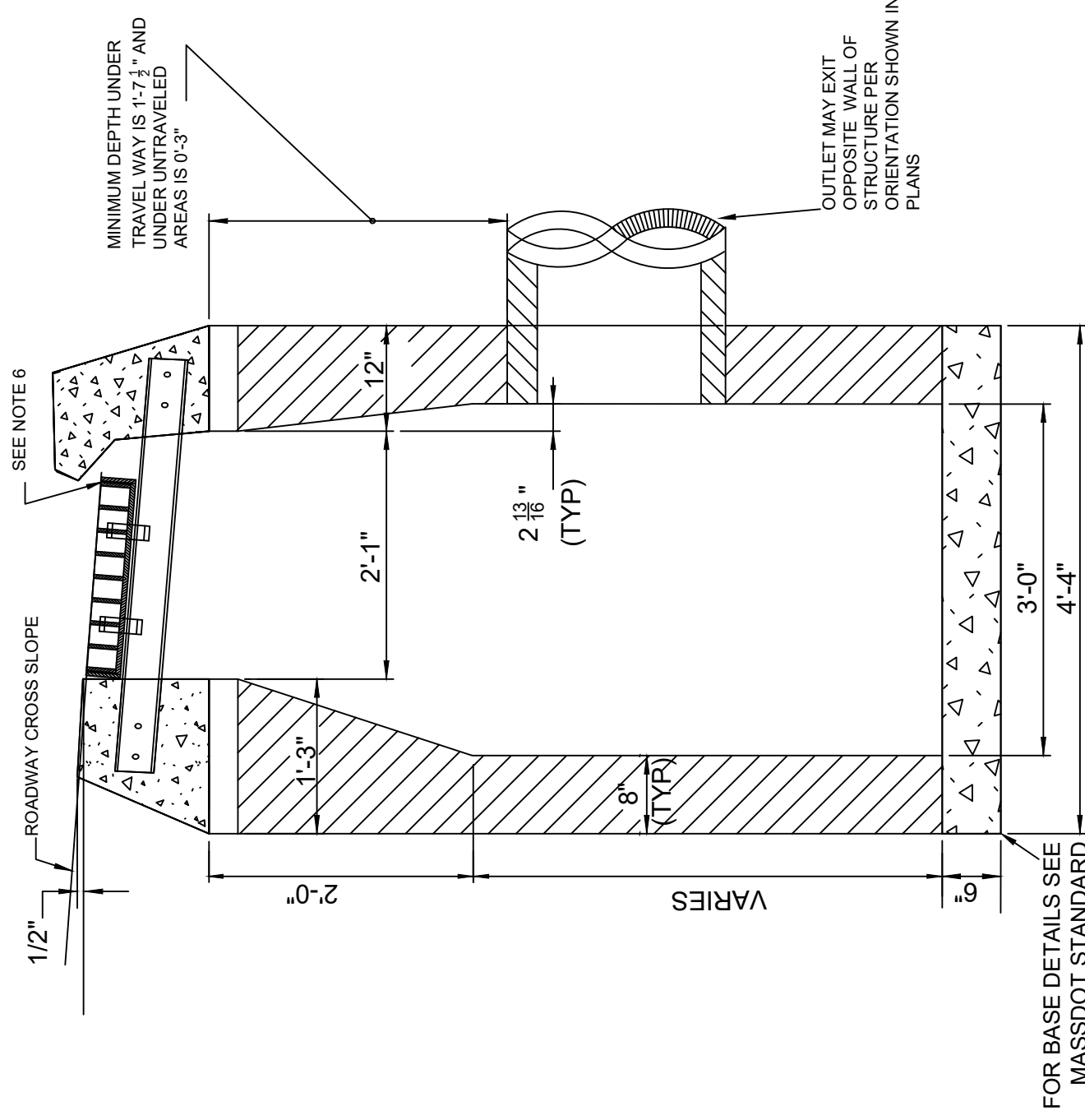


LITTLETON  
RECONSTRUCTION OF FOSTER STREET  
DRAINAGE & UTILITY DETAILS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	65	129
PROJECT FILE NO.			609054

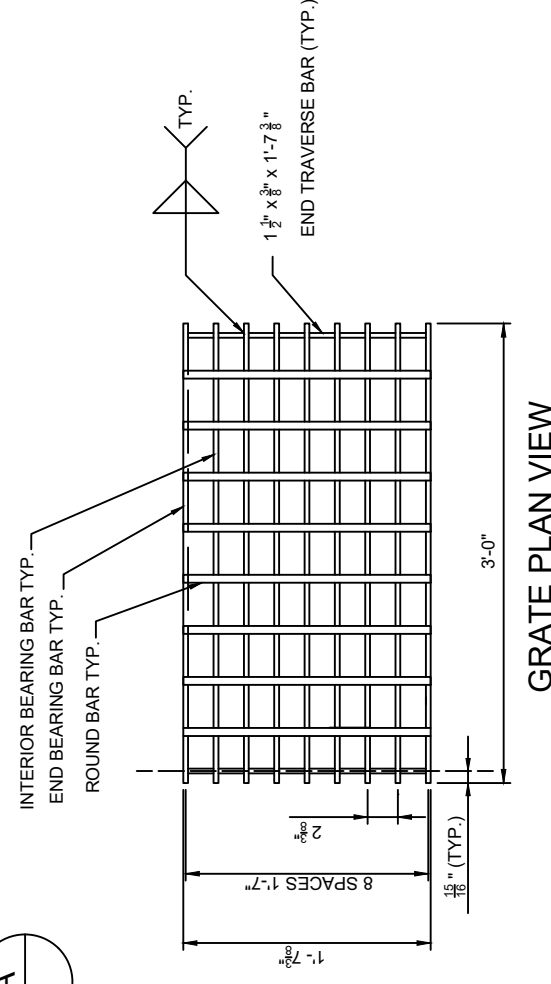


SECTION A

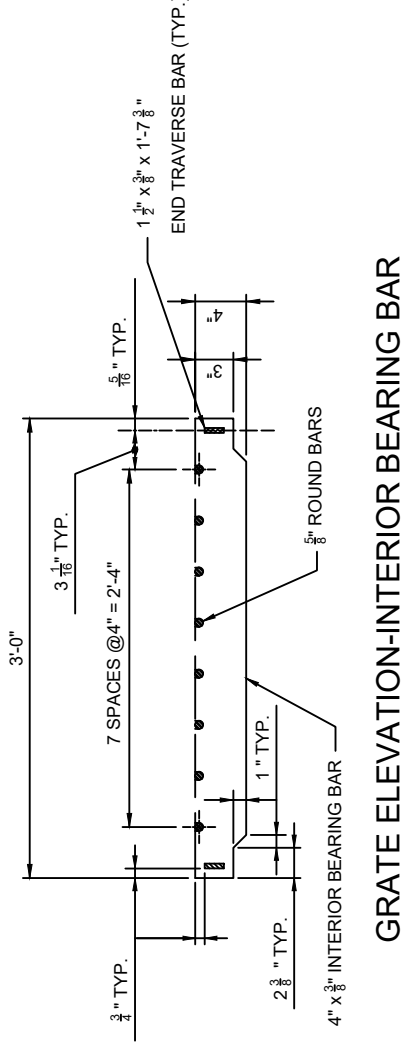


SECTION B

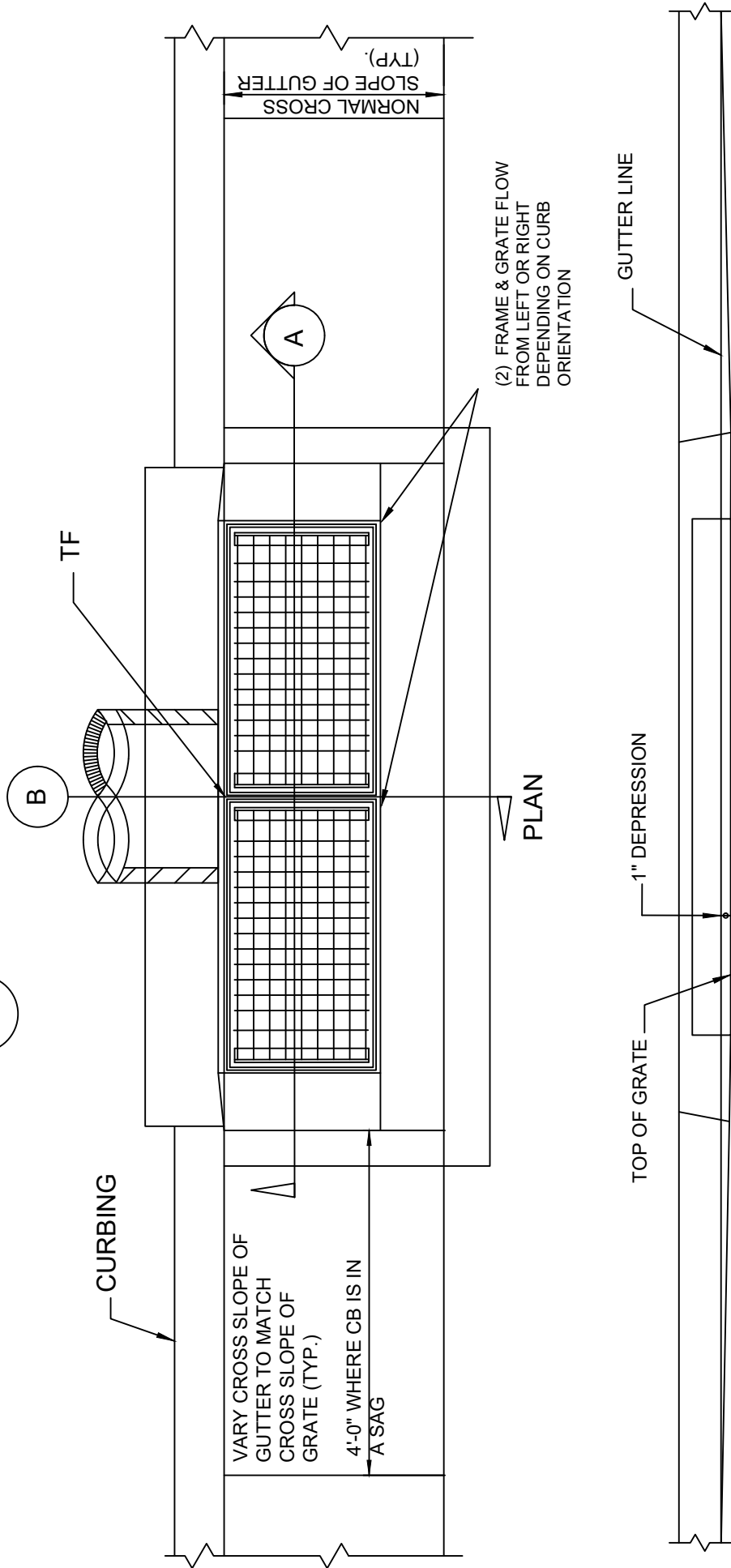
FOR BASE DETAILS SEE MASSDOT STANDARD DRAWING E 202.4.0



GRATE PLAN VIEW



GRATE ELEVATION-INTERIOR BEARING BAR



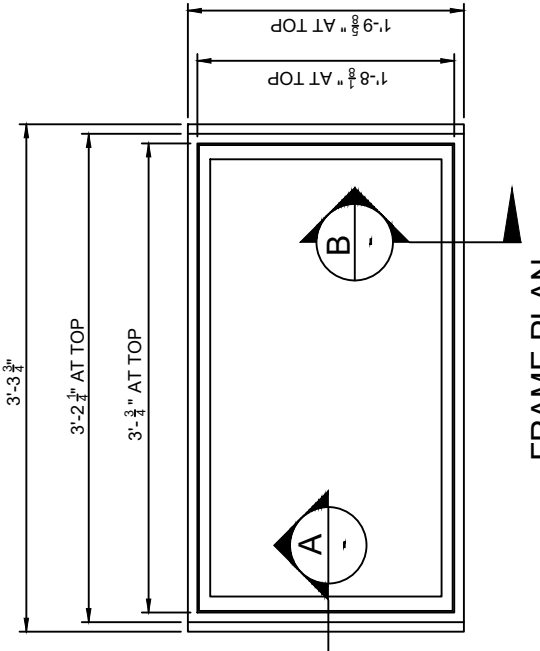
FOR CATCH BASINS IN A LINE OF 6" CONCRETE OR STONE CURBING

DETAILS OF DEPRESSED GUTTER STRIP

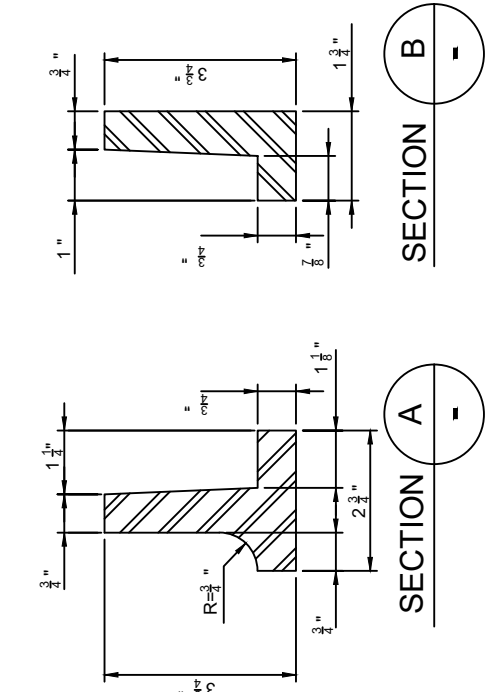
- CATCH BASIN NOTES:
1. INVERTS AND PIPE DIAMETERS PER UTILITY PLANS
  2. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON MASSDOT STANDARD DETAIL 201.3.0
  3. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTERLINE OF PIPE
  4. FOR DESCRIPTION OF MATERIALS AND CONSTRUCTION METHOD, SEE STANDARD MASSDOT SPECIFICATIONS AND CONSTRUCTION METHOD, SECTION 200
  5. ALL CONCRETE TO BE AIR ENTRAINED
  6. TOP OF FRAME ELEVATION SHALL BE MEASURED IN THE CENTER OF THE GRATE AT GUTTER LINE

FRAME AND GRATE NOTES:

1. DIMENSIONAL TOLERANCE SHALL BE  $\pm \frac{1}{16}$ "
2. ALL STEEL BARS SHALL BE WELDED AT ALL INTERSECTIONS
3. ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF AWS STRUCTURAL WELDING CODE, D1.1
4. STEEL AND CAST IRON MATERIALS SHALL CONFORM TO STANDARD SPECIFICATIONS SECTION 200



FRAME PLAN



SECTION A

SECTION B

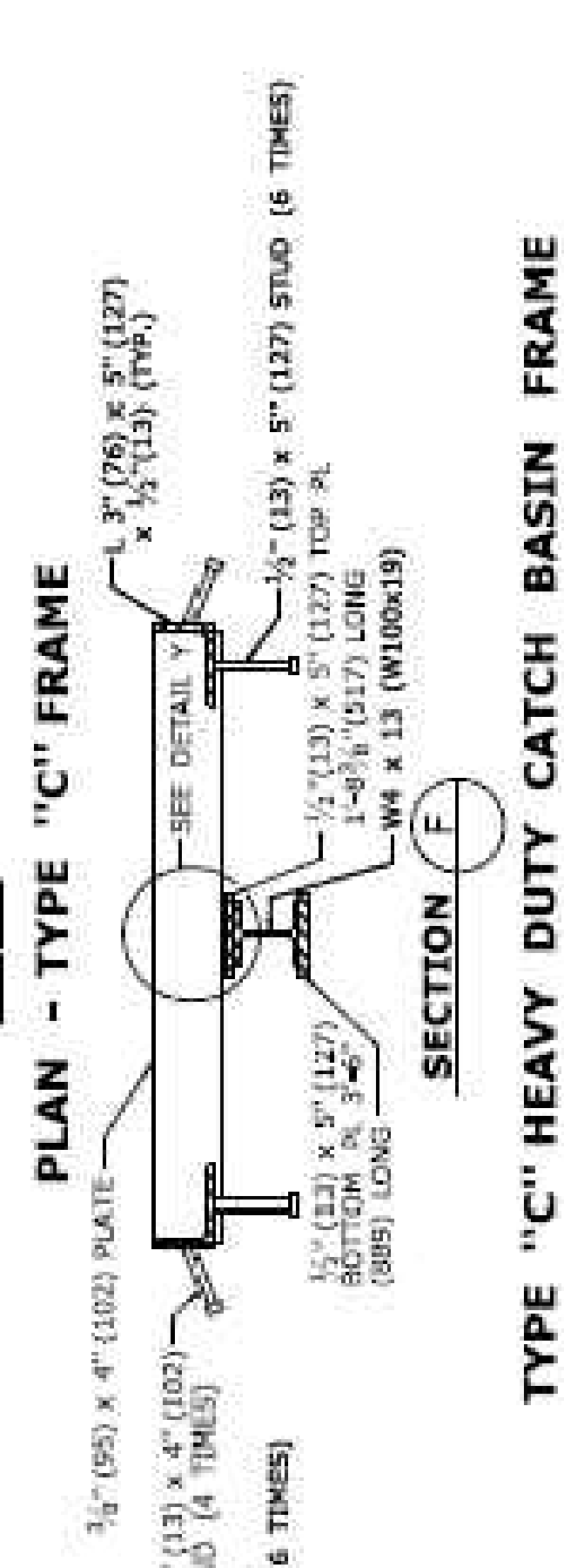
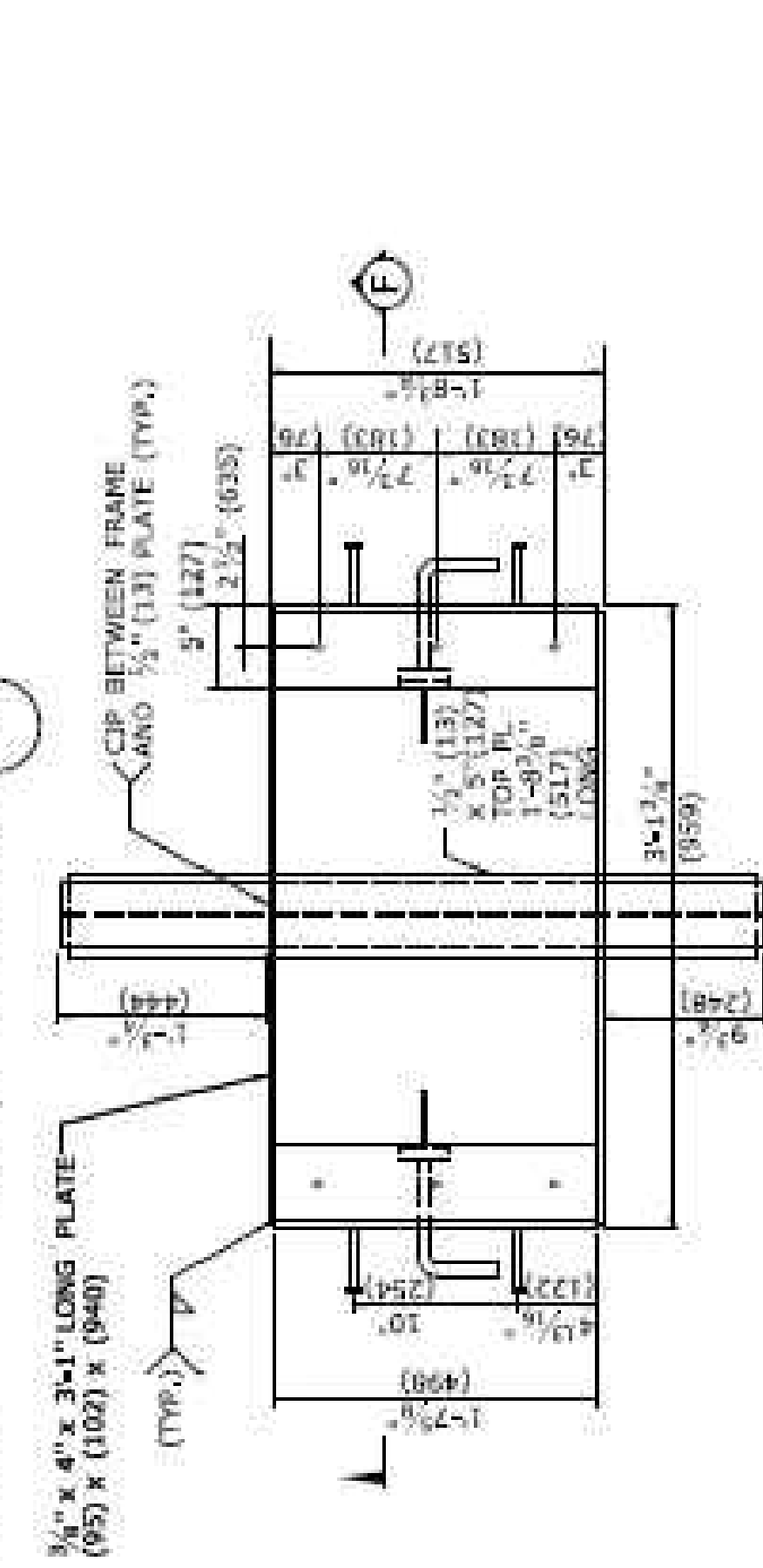
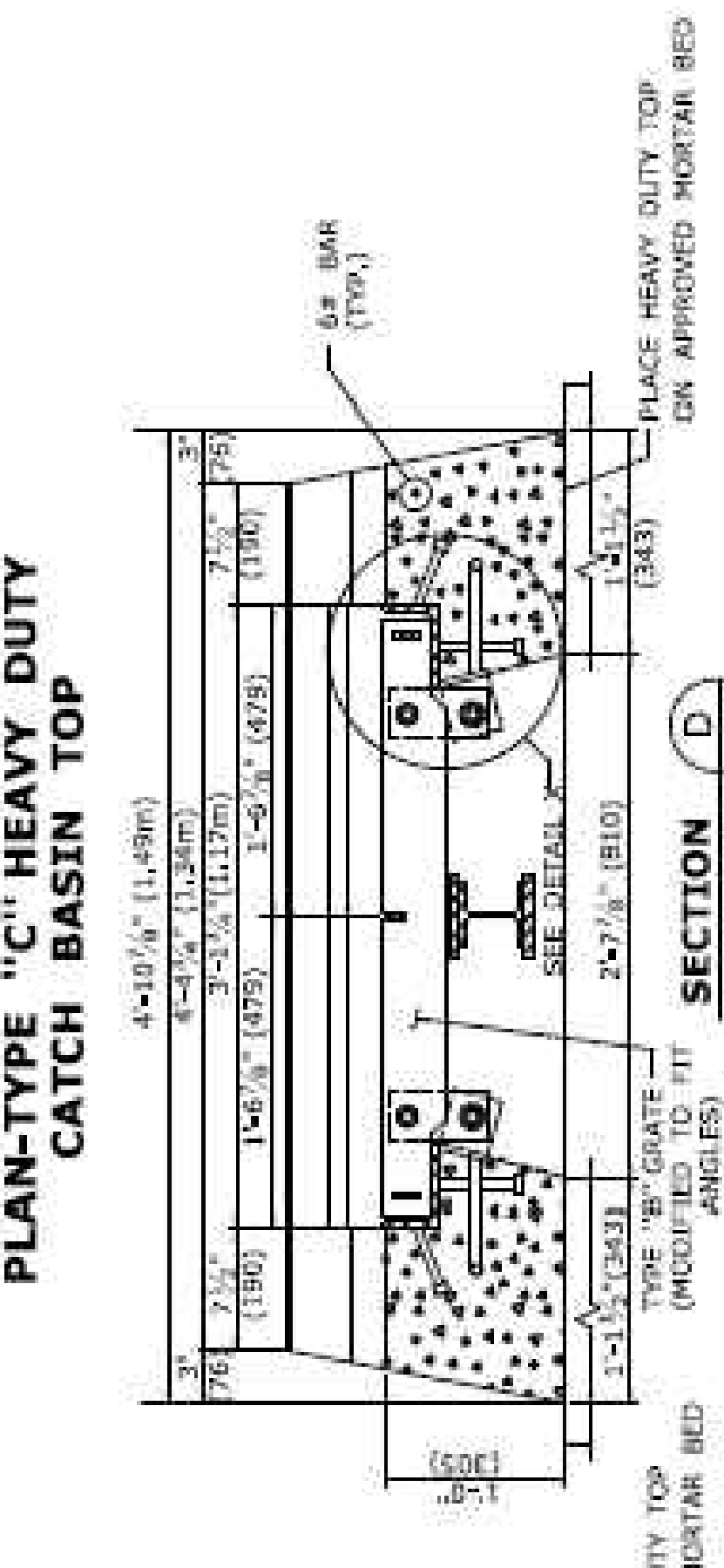
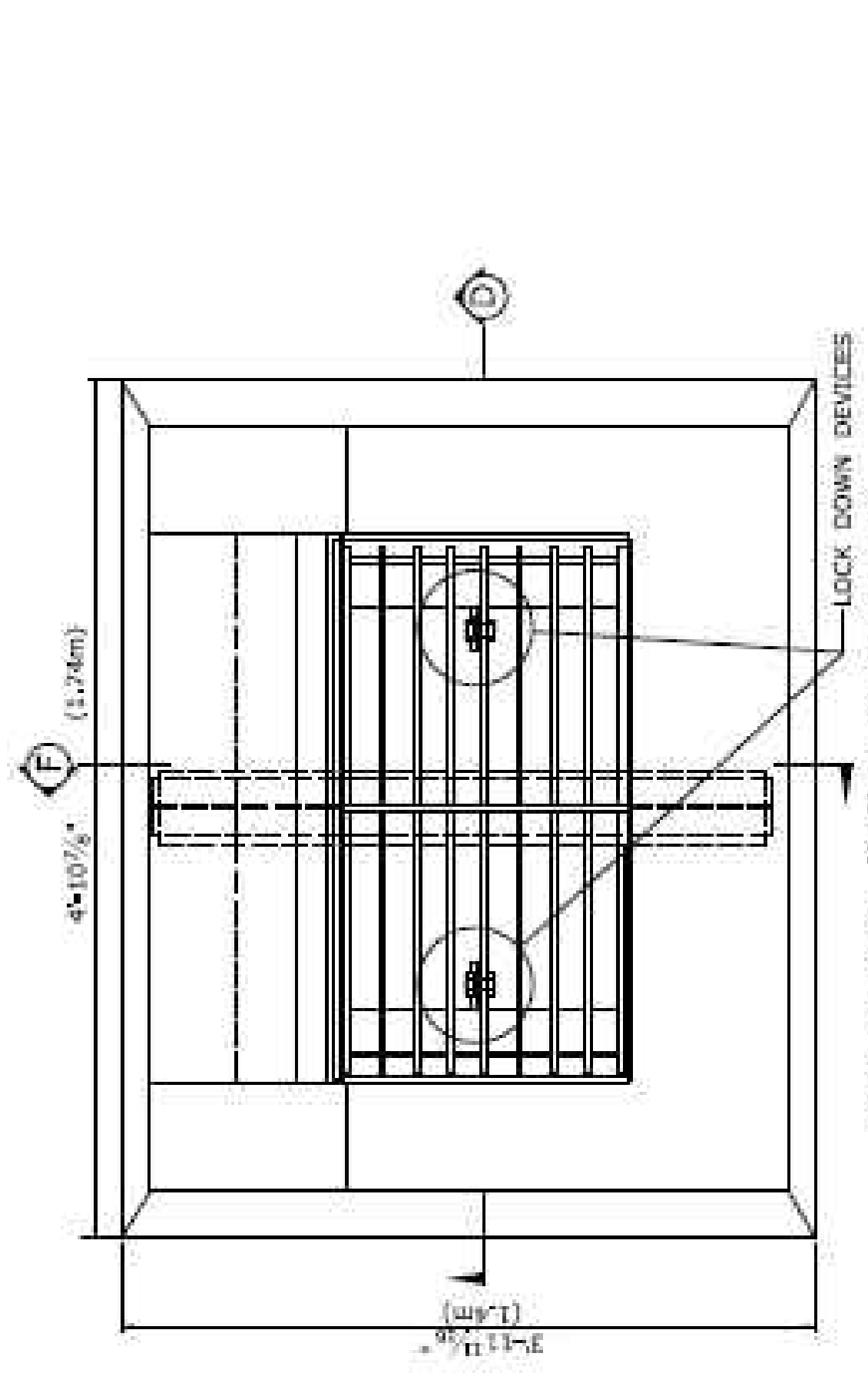
CAST IRON FRAME

1 DOUBLE CATCH BASIN WITH CURB INLET

SCALE: N.T.S.

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**DRAINAGE & UTILITY DETAILS**

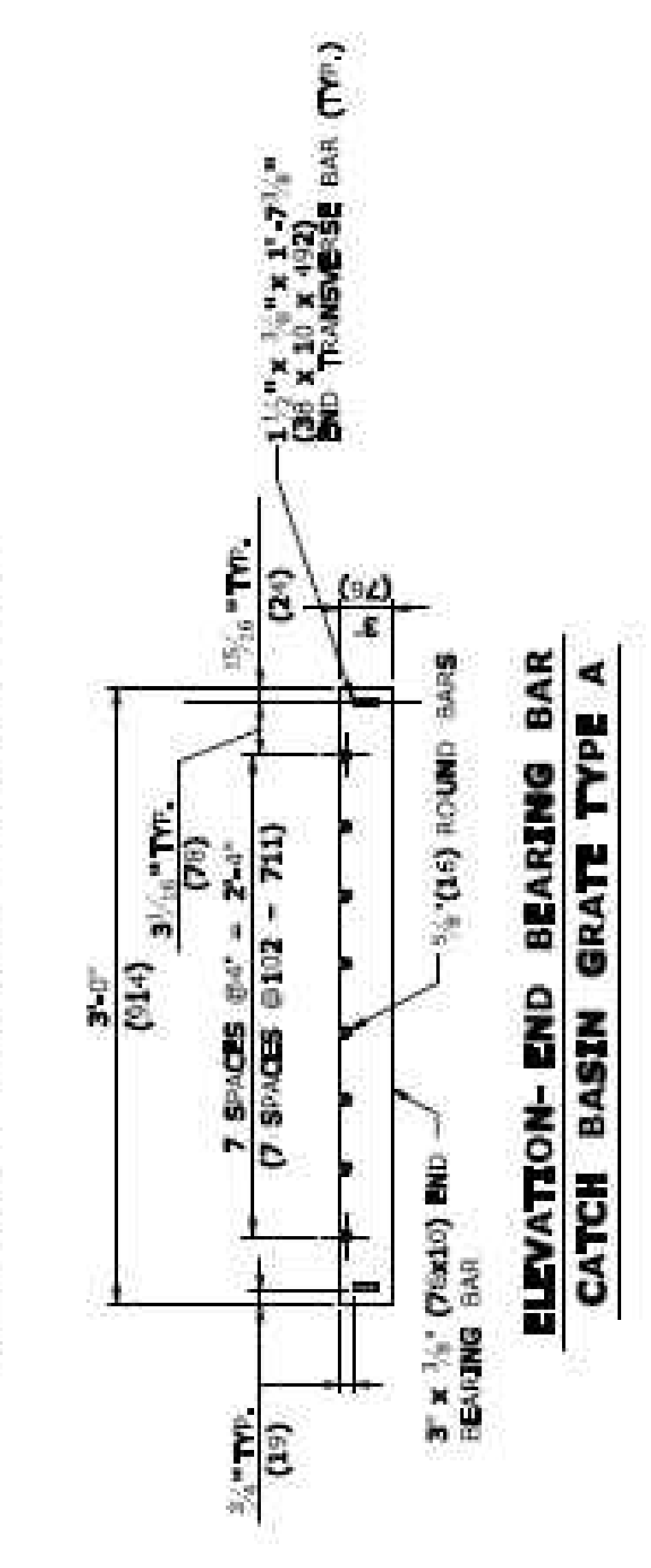
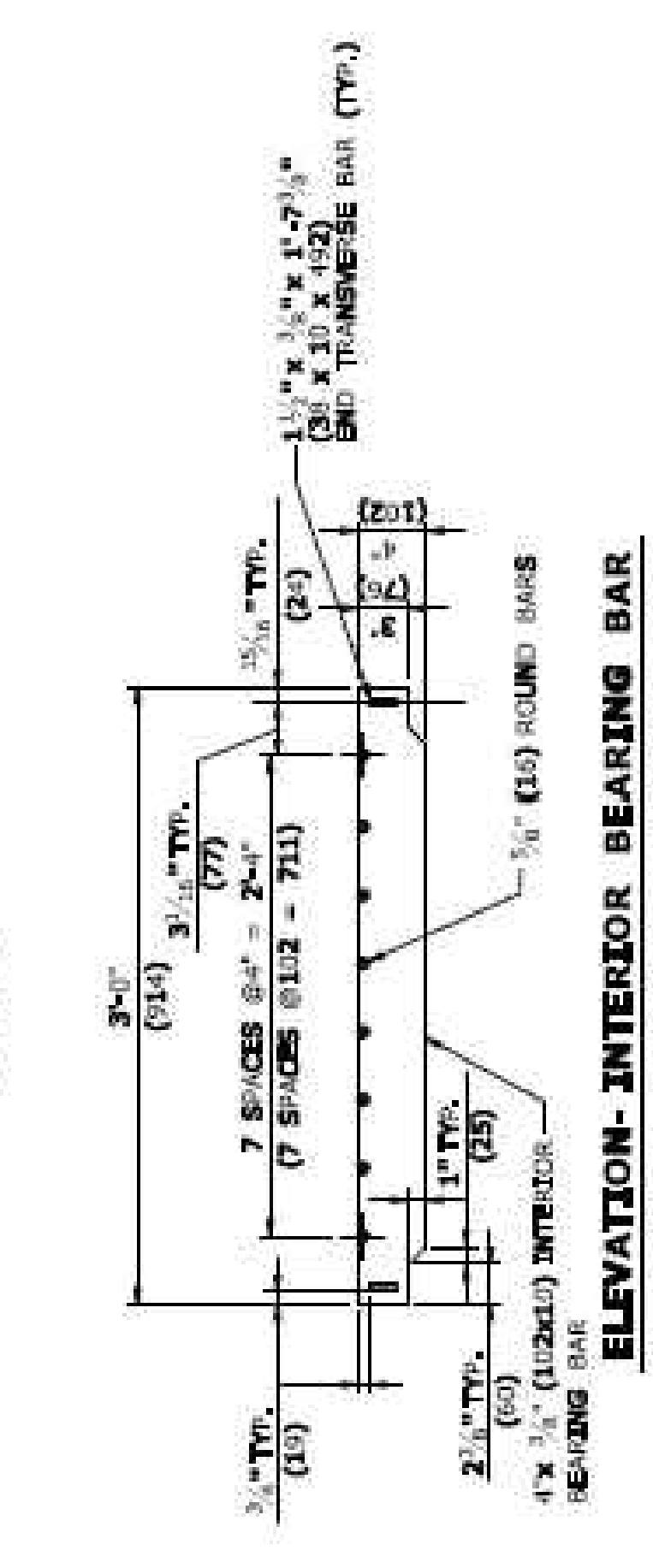
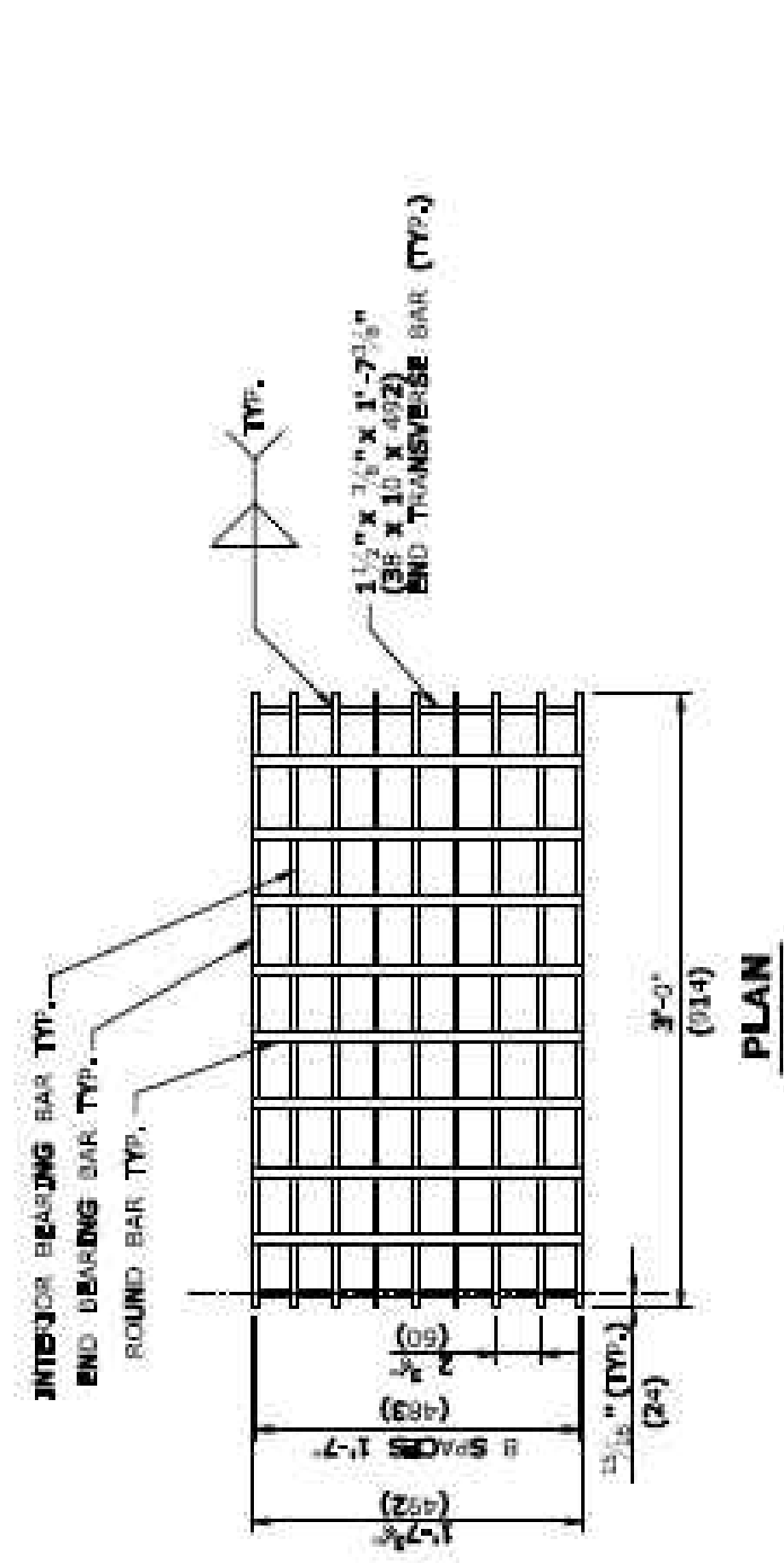
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	66	129
PROJECT FILE NO. 609054			



**TYPE "C" HEAVY DUTY CATCH BASIN FRAME**

**DOUBLE CATCH BASIN FRAME**

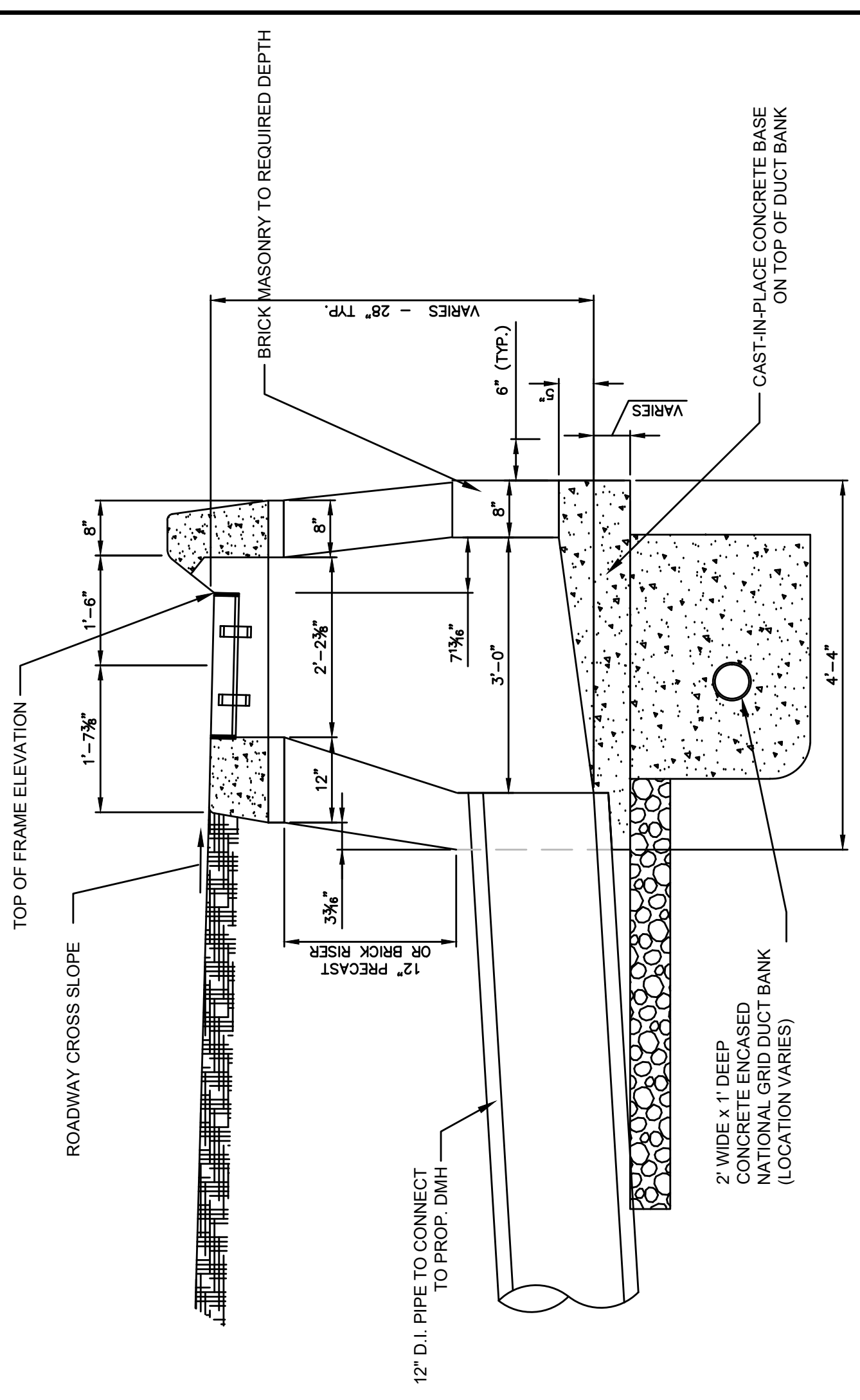
2 SCALE: N.T.S.



**DOUBLE CATCH BASIN GRATE**

SCALE: N.T.S.

3

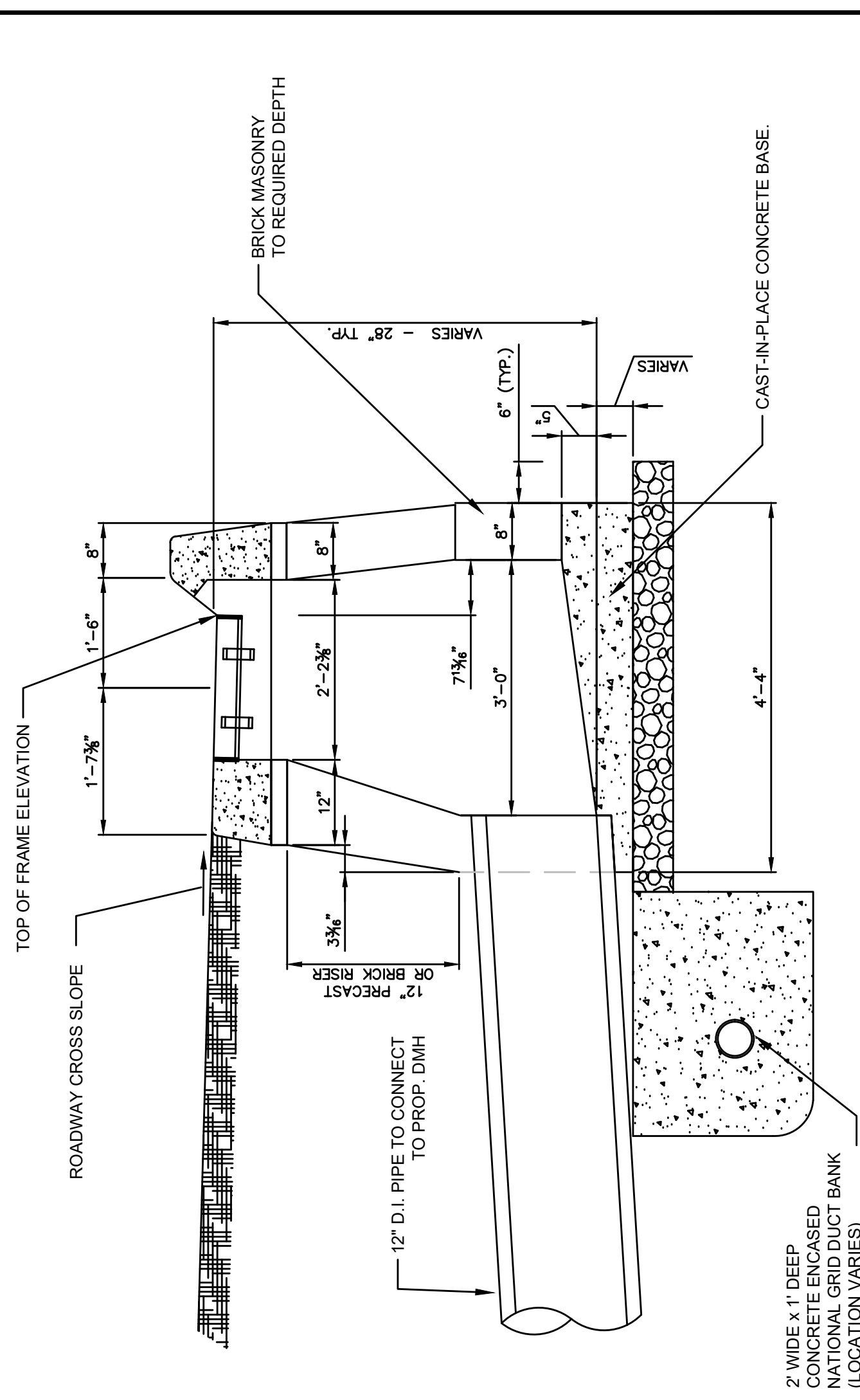


- GUTTER INLET - SPECIAL TYPE 1 GENERAL NOTES**
- IF CONCRETE MASONRY UNITS ARE REQUIRED, THE BASIN SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE OVER ALL DIMENSIONS SHOWN HERE. CORBELLING WILL BE ALLOWED AT A MAXIMUM OF 1" PER BLOCK; TURN TOP COURSE 90° TO FRONT AND SIDE WALLS ONLY. RED BRICK IS NOT TO BE USED.
  - END OF PIPE SHALL EXTEND TO AND BE CUT FLUSH WITH INSIDE FACE OF GUTTER INLET WALL.
  - MINIMUM CONCRETE COMPRESSIVE STRENGTH OF F<sub>c</sub> = 4000 PSI SHALL BE OBTAINED PRIOR TO SHIPPING.
  - ALL KNOCKOUTS IN PRECAST UNITS SHALL BE MADE FLUSH WITH EXTERIOR / INTERIOR OF UNITS USING CONCRETE, BRICKS AND MORTAR.
  - LATEST MASSDOT STANDARD SPECIFICATIONS AND SUPPLEMENTALS SHALL GOVERN.

**GUTTER INLET - SPECIAL TYPE 1**

SCALE: N.T.S.

4



**GUTTER INLET - SPECIAL TYPE 2**

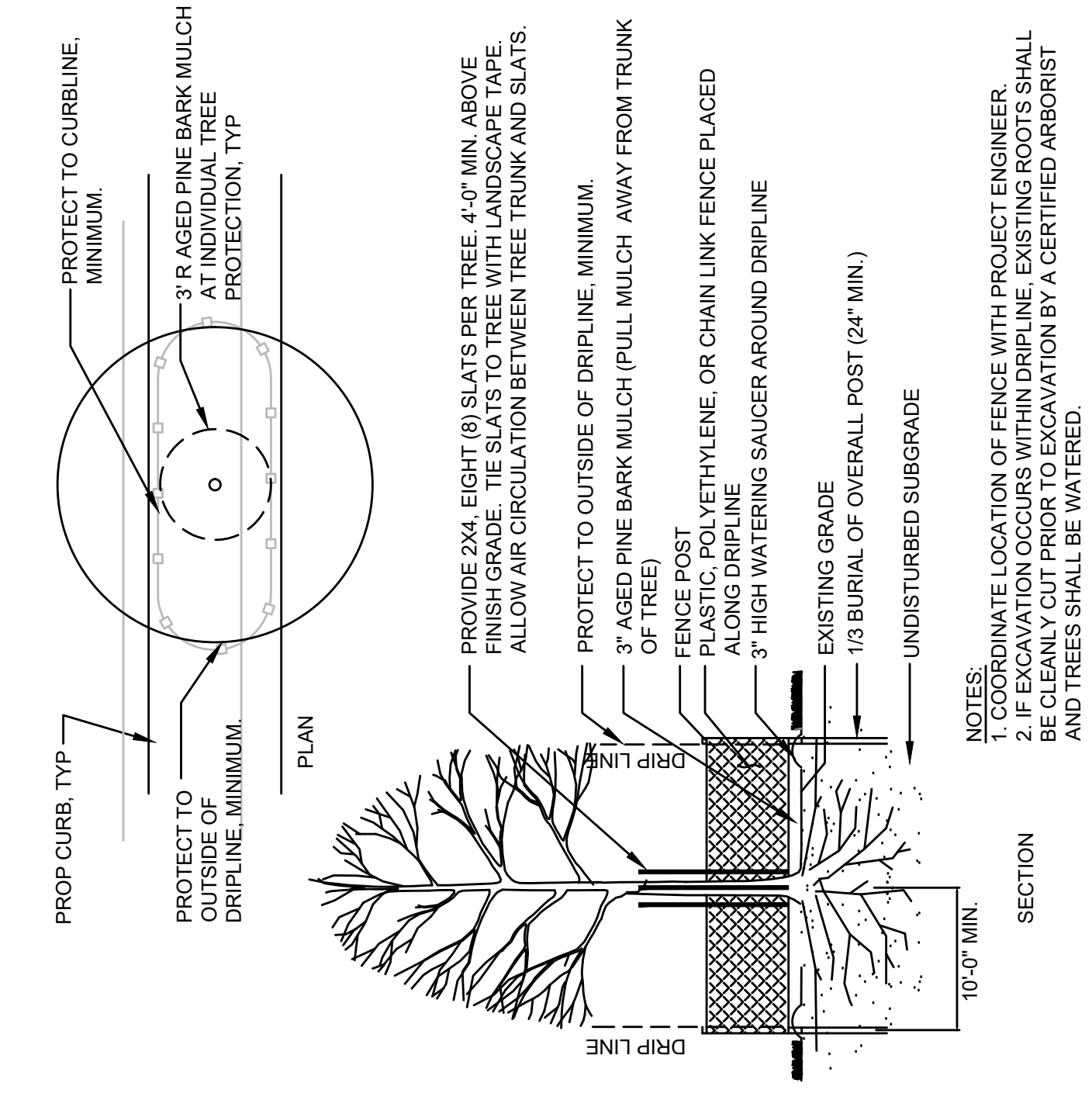
SCALE: N.T.S.

5

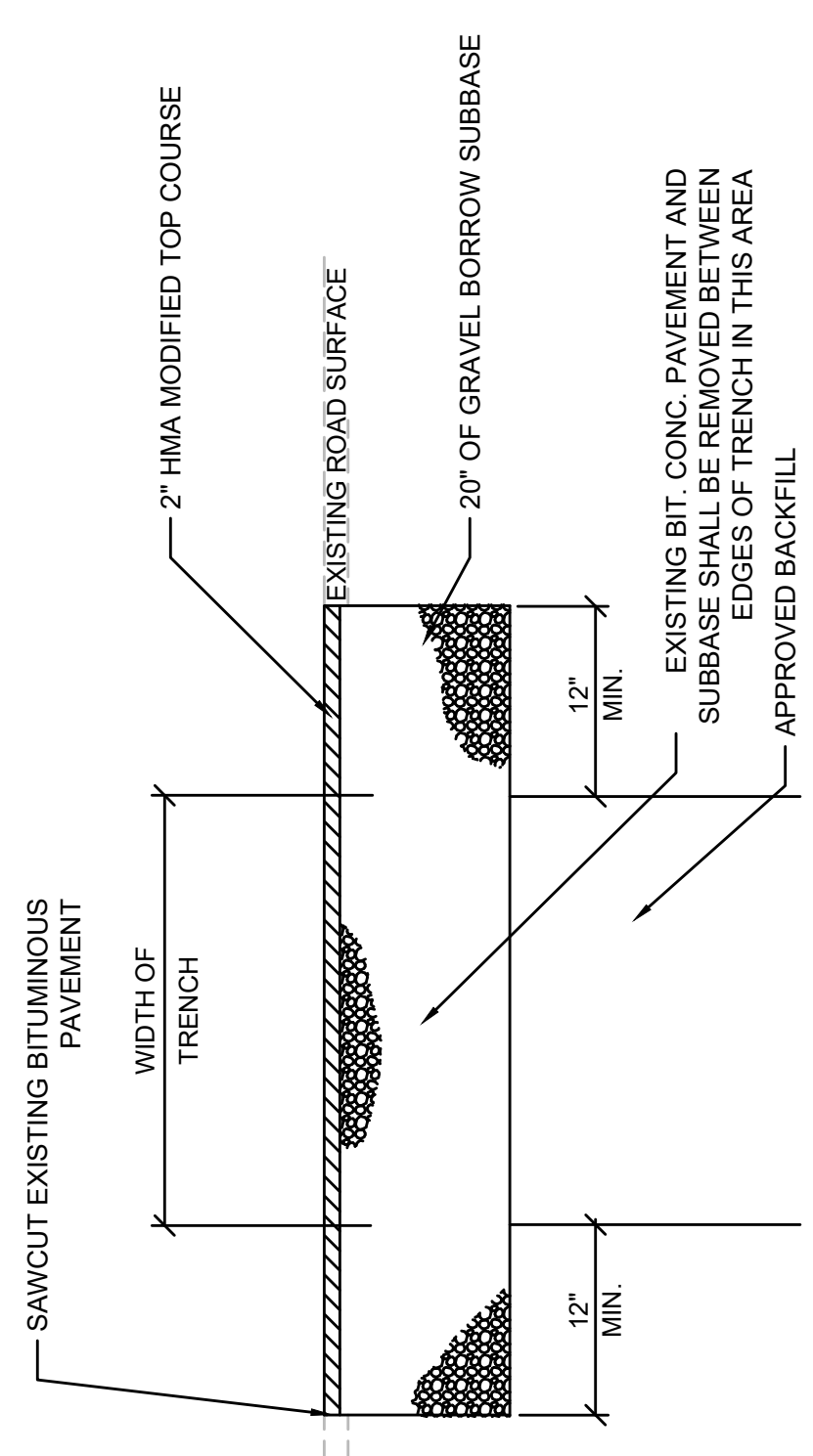
**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	67	129
PROJECT FILE NO. 609054			

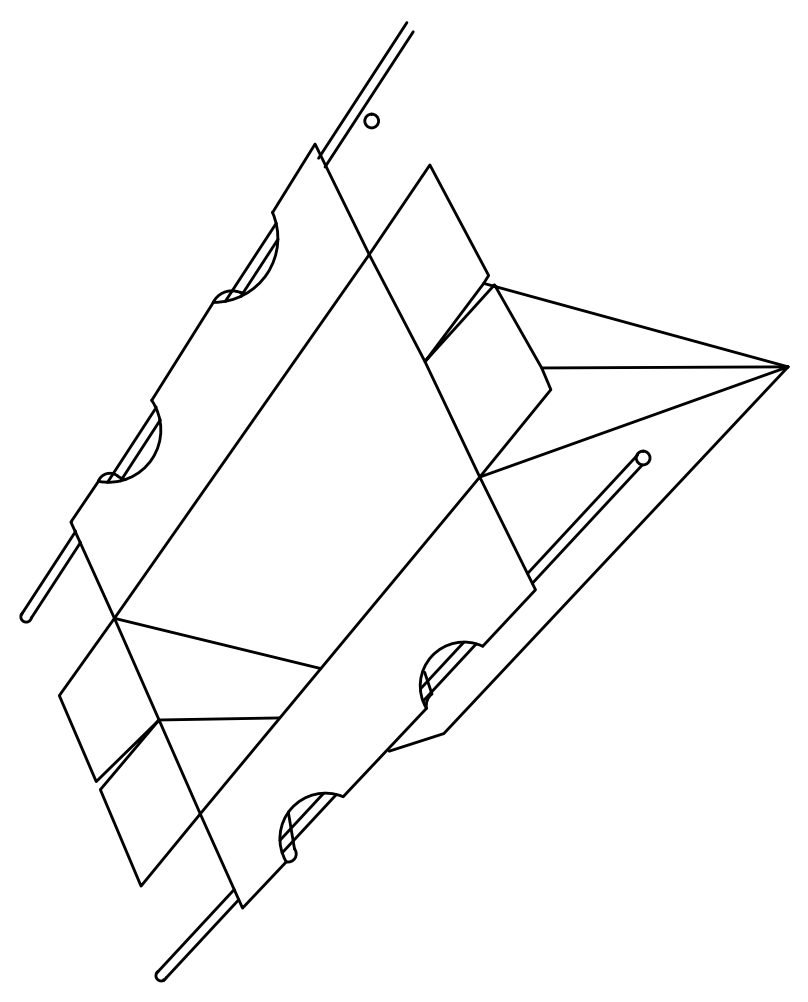
**CONSTRUCTION DETAILS**



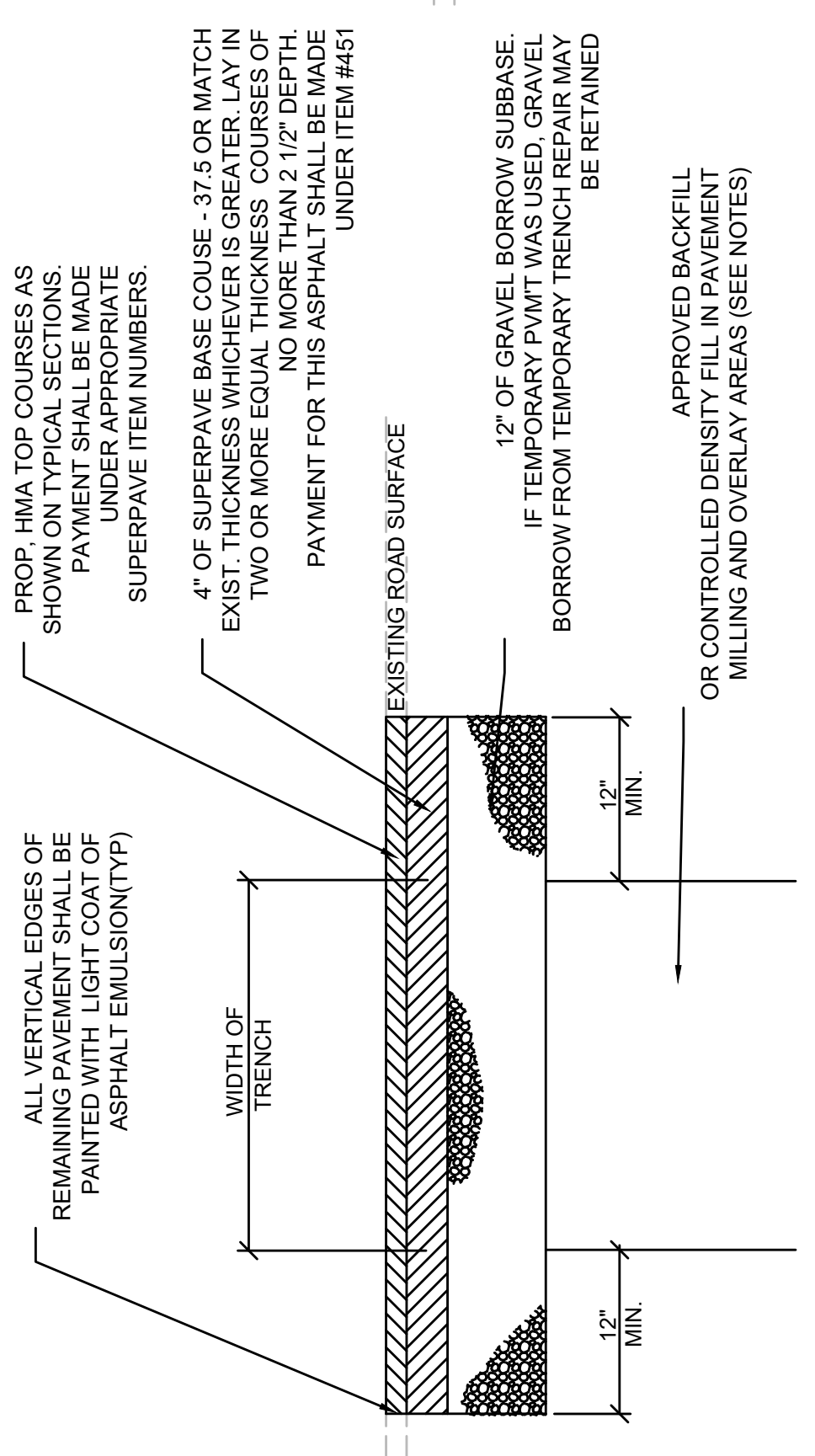
**8 INDIVIDUAL TREE PROTECTION**  
SCALE: N.T.S.



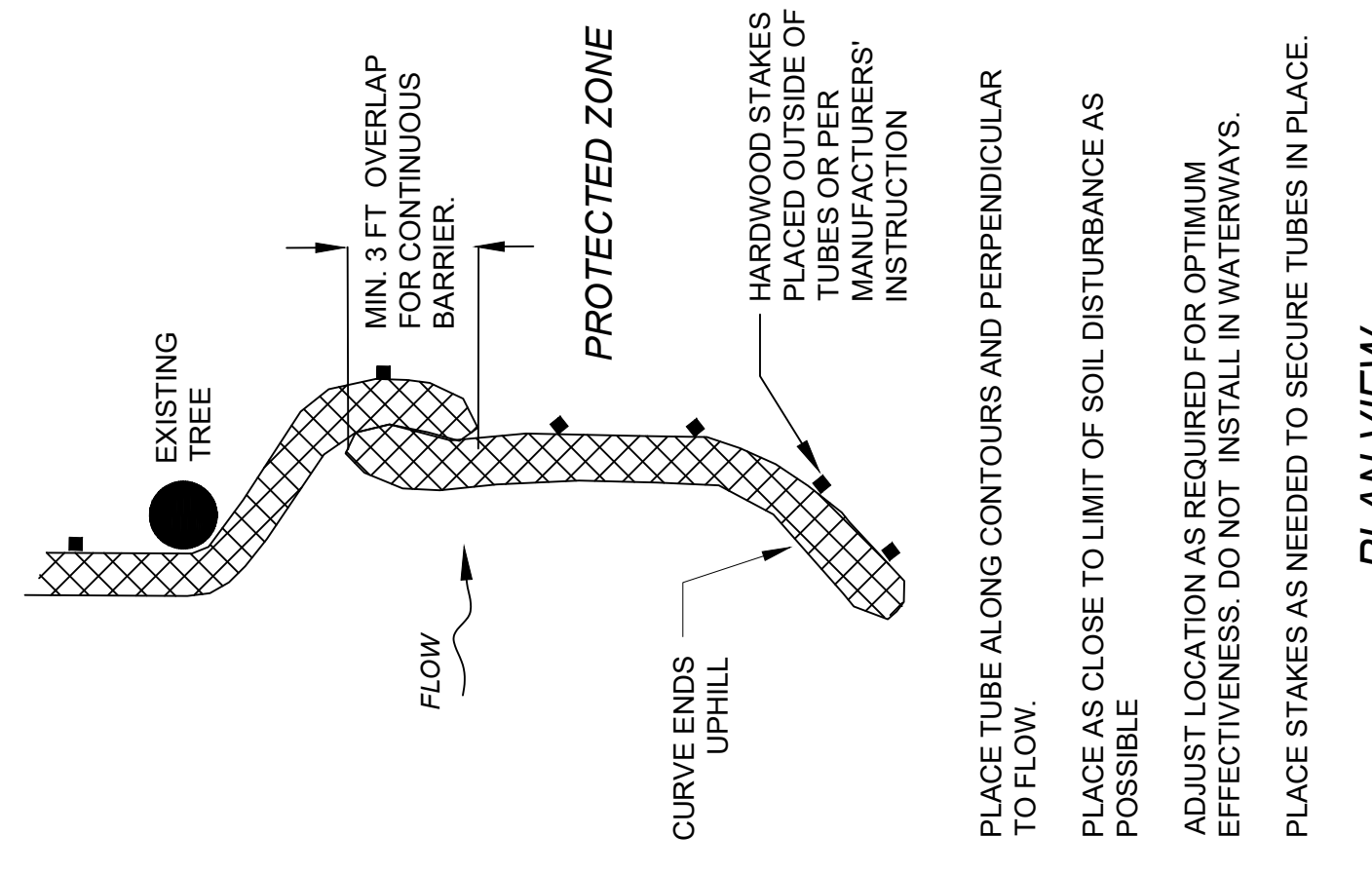
**11 TEMPORARY PAVEMENT TRENCH REPAIR**  
SCALE: N.T.S.



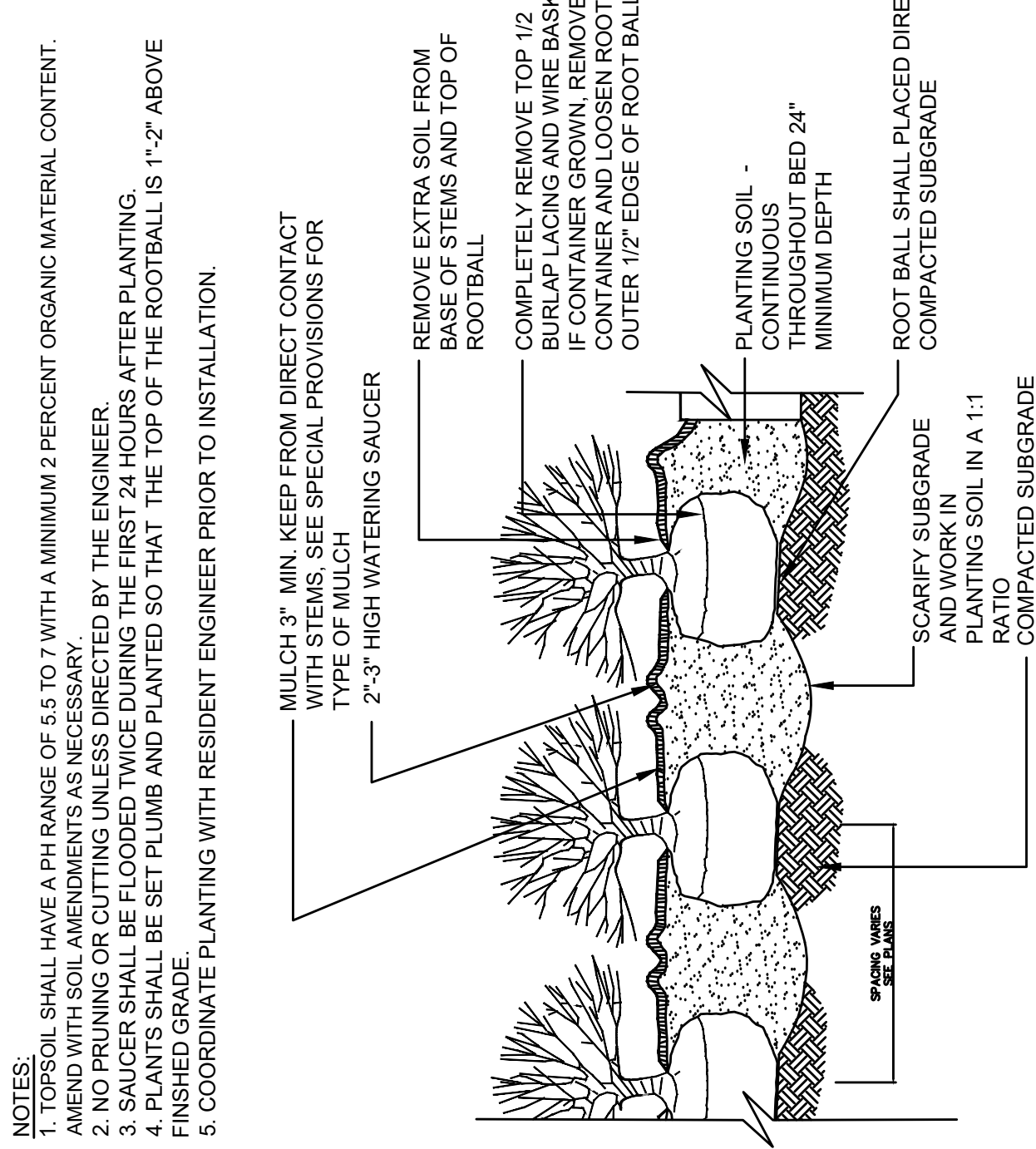
**7 CATCH BASIN SILT SACK**  
SCALE: N.T.S.



**10 PERMANENT PAVEMENT TRENCH REPAIR IN ROADWAYS**  
SCALE: N.T.S.



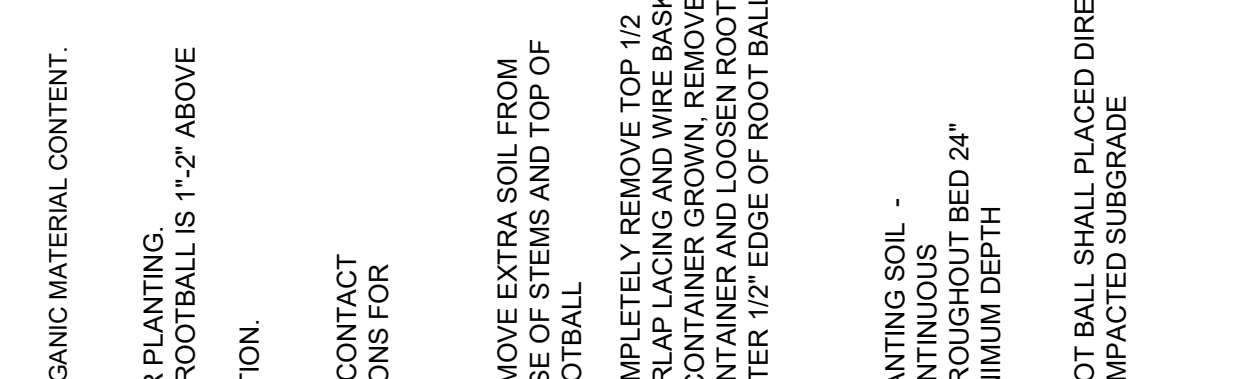
**9 SEDIMENT BARRIER - COMPOST FILTER TUBES**  
NOT TO SCALE



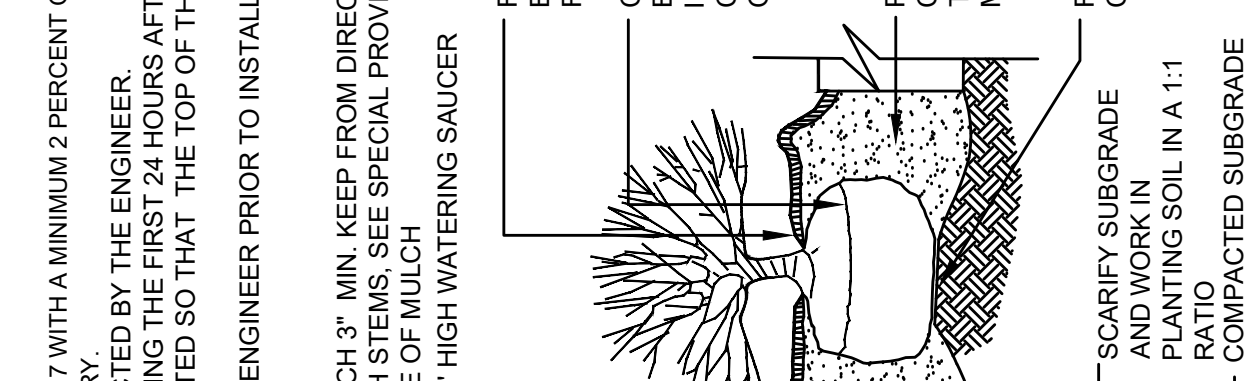
**9 SHRUB AND PERENNIAL PLANTING**  
SCALE: N.T.S.



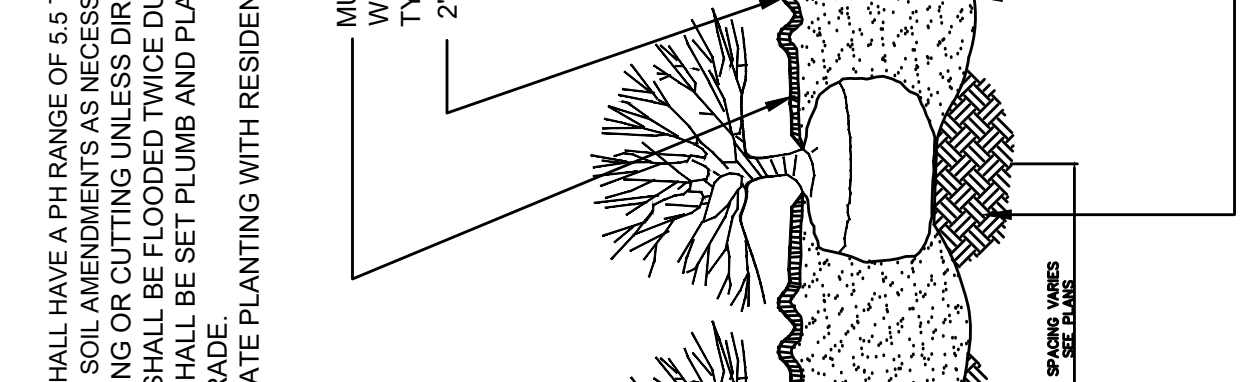
**9 COMPOST FILTER TUBE**  
NOT TO SCALE



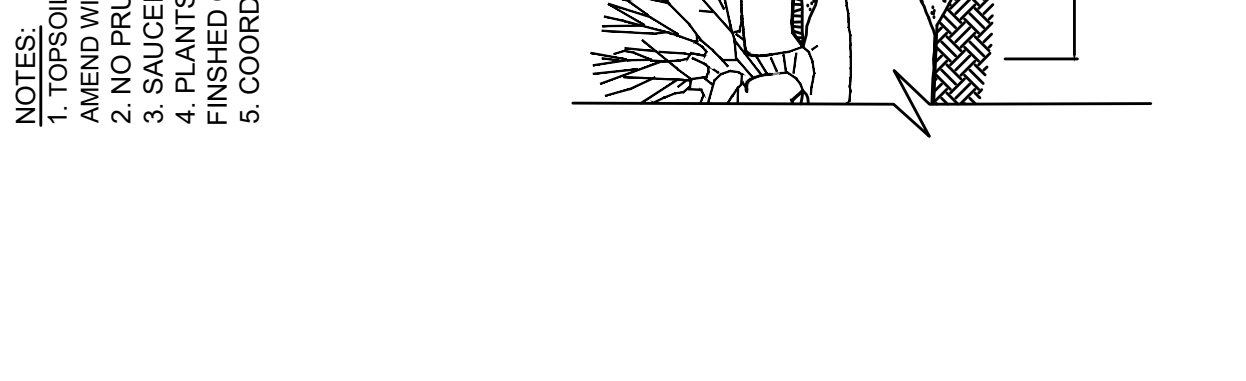
**9 SEDIMENT BARRIER - COMPOST FILTER TUBES**  
NOT TO SCALE



**9 SEDIMENT BARRIER - COMPOST FILTER TUBES**  
NOT TO SCALE



**9 SEDIMENT BARRIER - COMPOST FILTER TUBES**  
NOT TO SCALE

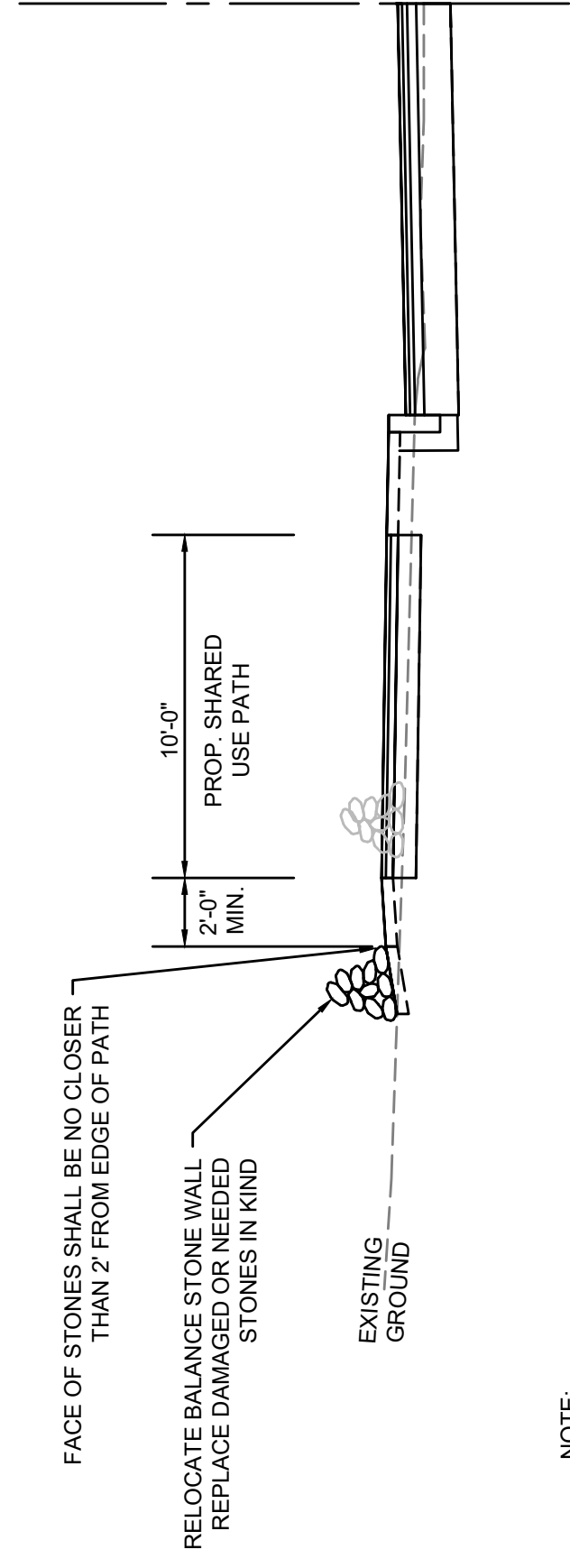


**9 SEDIMENT BARRIER - COMPOST FILTER TUBES**  
NOT TO SCALE

**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	68	129
PROJECT FILE NO. 609054			

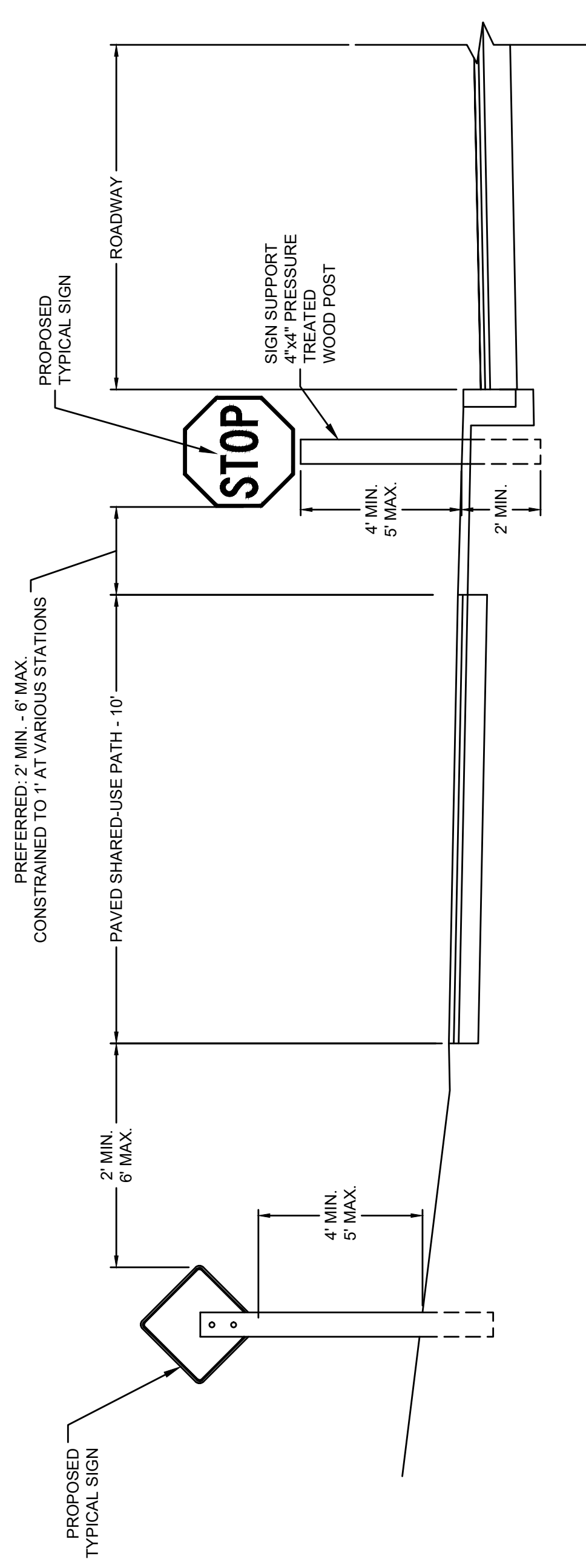
**CONSTRUCTION DETAILS**



NOTE:  
STONE WALL WIDTH AND HEIGHT ARE VARIABLE IN WALL  
REPLACEMENT AREAS. REPLACE IN KIND AT LOCATIONS  
SHOWN ON THE CONSTRUCTION PLANS.

**BALANCE STONE WALL  
REMOVED AND REBUILT, DRY**

12 SCALE: N.T.S.



**13 SHARED-USE PATH TYPICAL SIGN PLACEMENT**

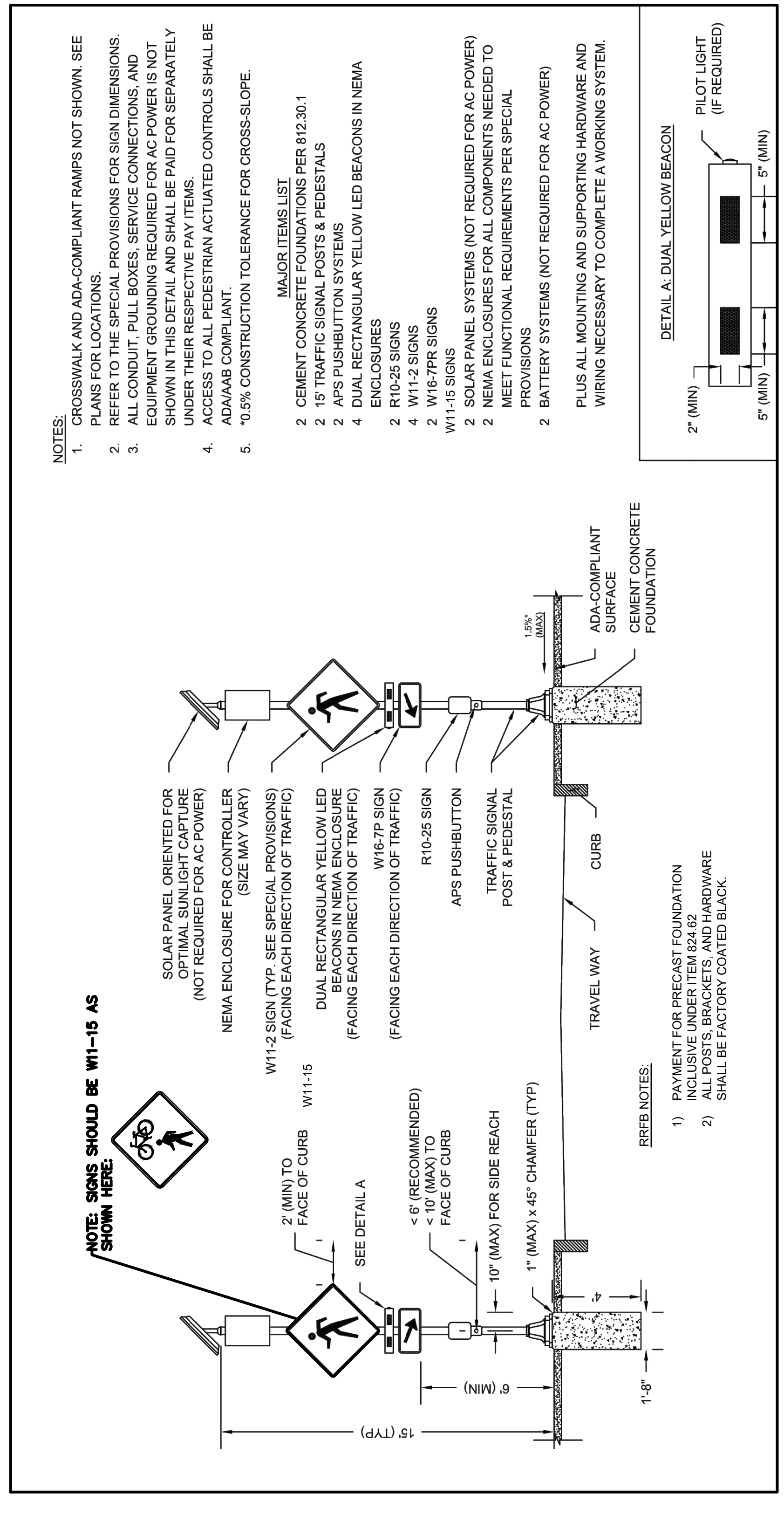
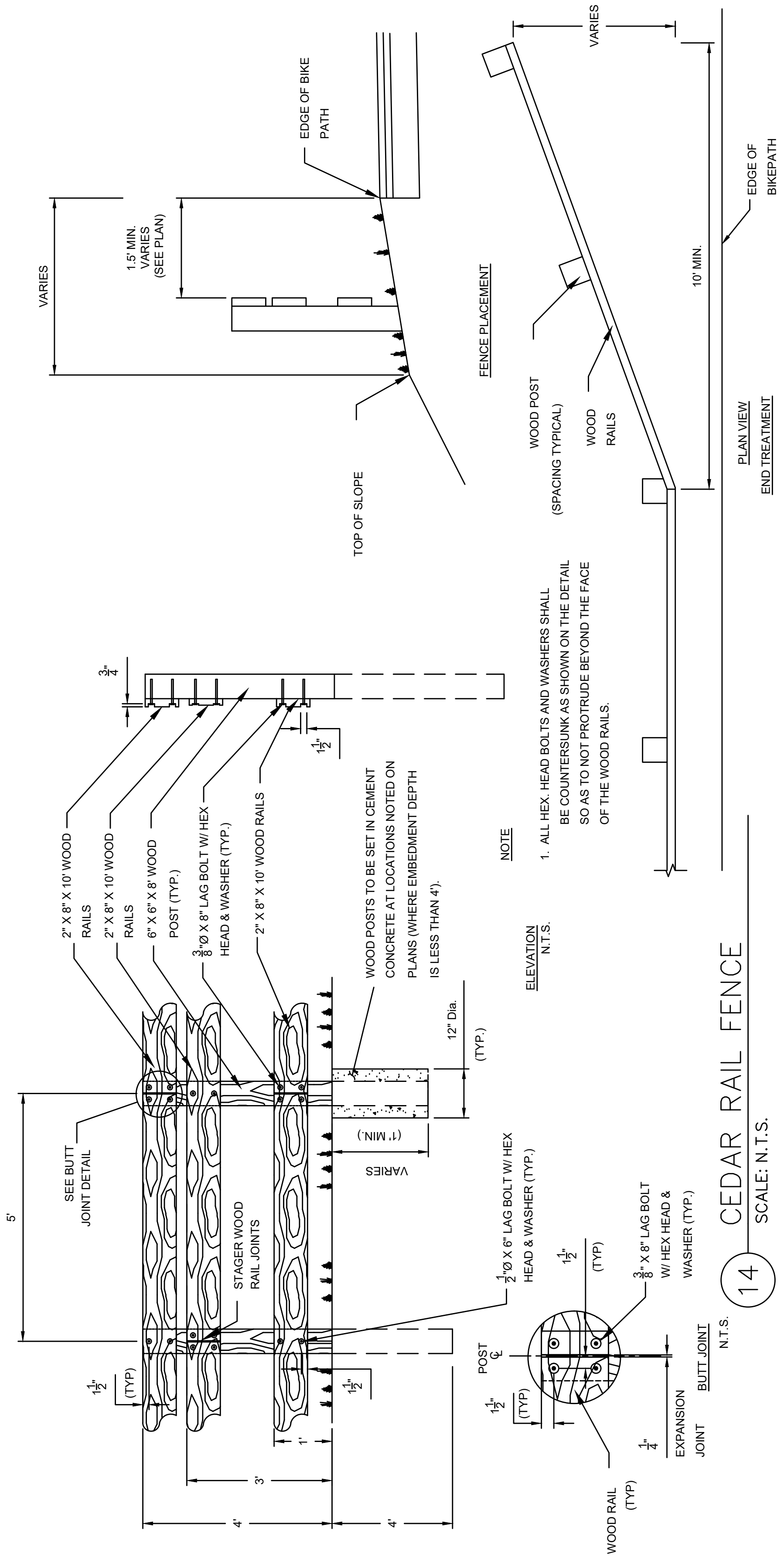
SCALE: N.T.S.

NOTES:  
1. ALL HARDWARE SHALL BE GALVANIZED.  
2. WOOD POSTS SHALL BE PAID FOR UNDER ITEM 847.11.



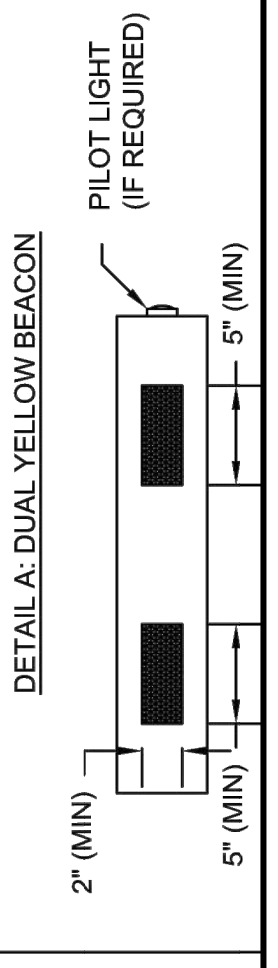
**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**  
**CONSTRUCTION DETAILS**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	69	129
PROJECT FILE NO.		609054	



- NOTES:**
- CROSSWALK AND ADA-COMPLIANT RAMPS NOT SHOWN. SEE PLANS FOR LOCATIONS.
  - REFER TO THE SPECIAL PROVISIONS FOR SIGN DIMENSIONS, ALL CONDUIT, PULL BOXES, SERVICE CONNECTIONS, AND EQUIPMENT GROUNDING REQUIRED FOR AC POWER IS NOT SHOWN IN THIS DETAIL AND SHALL BE PAID FOR SEPARATELY UNDER THEIR RESPECTIVE PAY ITEMS.
  - ACCESS TO ALL PEDESTRIAN ACTUATED CONTROLS SHALL BE ADA/AAAB COMPLIANT.
  - 0.5% CONSTRUCTION TOLERANCE FOR CROSS-SLOPE.
- MAJOR ITEMS LIST**
- 2 CEMENT CONCRETE FOUNDATIONS PER 812.30.1
  - 2 W11-15 TRAFFIC SIGNAL POSTS & PEDESTALS
  - 2 APS PUSHBUTTON SYSTEMS
  - 4 DUAL RECTANGULAR YELLOW LED BEACONS IN NEMA ENCLOSURES
  - 2 R10-25 SIGNS
  - 4 W11-2 SIGNS
  - 2 W16-7P SIGNS
  - 2 SOLAR PANEL SYSTEMS (NOT REQUIRED FOR AC POWER)
  - 2 NEMA ENCLOSURES FOR ALL COMPONENTS NEEDED TO MEET FUNCTIONAL REQUIREMENTS PER SPECIAL PROVISIONS
  - 2 BATTERY SYSTEMS (NOT REQUIRED FOR AC POWER)
- PLUS ALL MOUNTING AND SUPPORTING HARDWARE AND WIRING NECESSARY TO COMPLETE A WORKING SYSTEM.

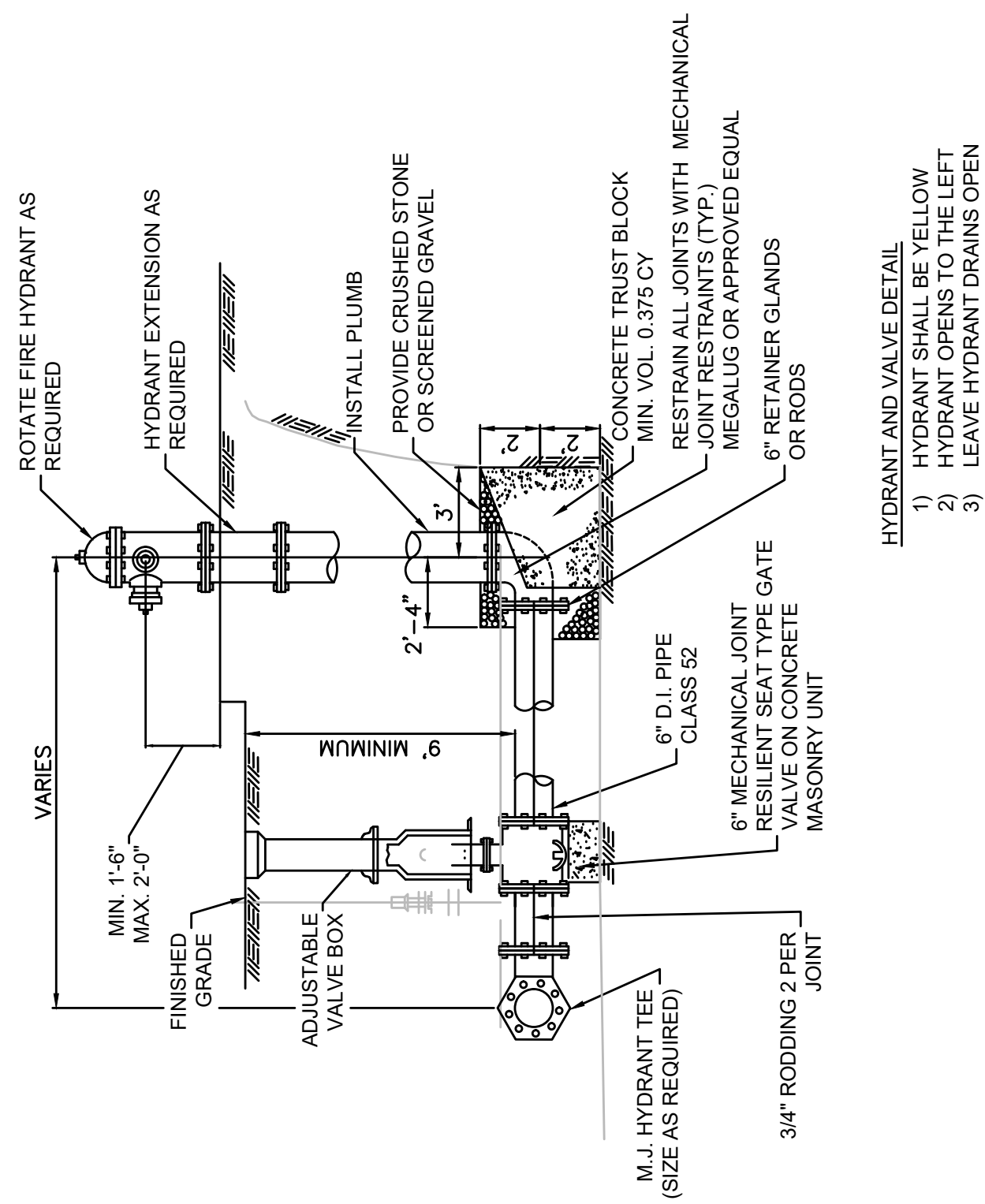
OPERATIONAL TIME BETWEEN ACTIVATION	MINIMUM ALLOWABLE INTERVAL BETWEEN ACTIVATION
STATION/ROADWAY LOCATION #	
1 383-37 TAYLOR ST	18s
2 381-45 FOSTER ST	12s
3 381-45 FOSTER ST	12s



**LITTLETON**  
**RECONSTRUCTION OF FOSTER STREET**

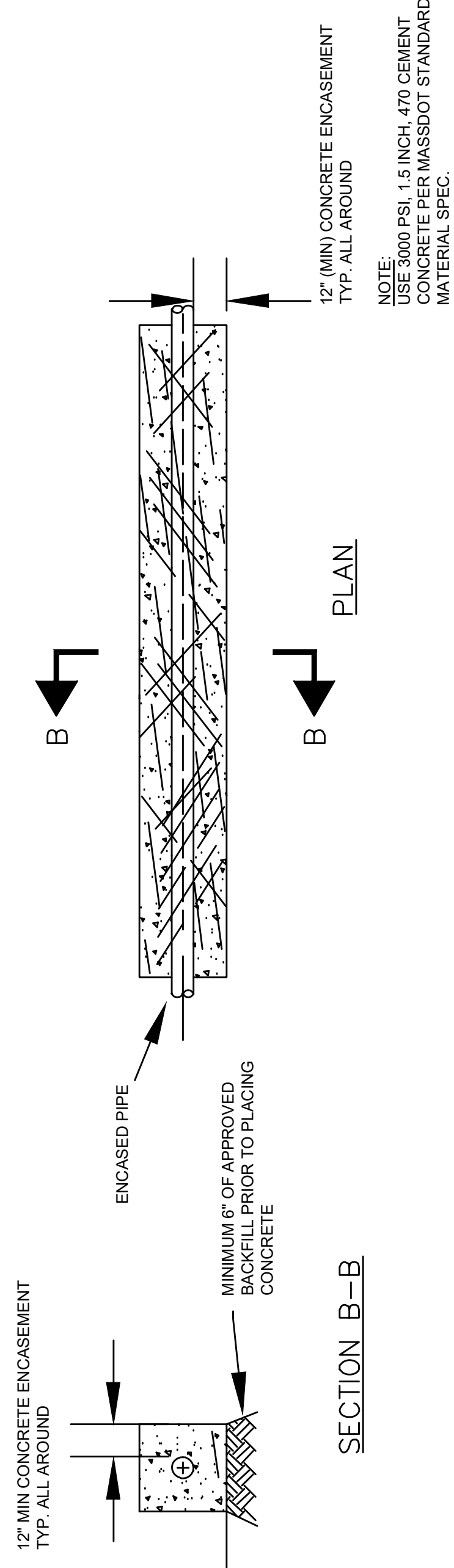
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXX(XXX)X	70	129
PROJECT FILE NO.			609054

**CONSTRUCTION DETAILS**



- HYDRANT AND VALVE DETAIL
- 1) HYDRANT SHALL BE YELLOW
  - 2) HYDRANT OPENS TO THE LEFT
  - 3) LEAVE HYDRANT DRAINS OPEN

**16** HYDRANT AND VALVE DETAIL  
SCALE: N.T.S.



- NOTE:  
1) USE 3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE PER MASSDOT STANDARD MATERIAL SPEC.

**17** CEM. CONCRETE PIPE ENCASEMENT  
SCALE: N.T.S.



## Appendix C

### Notice To Abutters

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## NOTIFICATION TO ABUTTERS

### Modified for Covid-19 Emergency Response

#### Notice of Intent or abbreviated Notice of Resource Area Delineation

*Under MA Wetlands Protection Act and Littleton Wetlands Protection ByLaw (Chapter 171), this form must be completed and mailed, certified mail return receipt requested, to all abutters at their mailing addresses shown on the most recent Town Assessor's records as well as the owner (if not applicant).*

In accordance with the MA Wetlands Protection Act and Littleton Wetlands Protection ByLaw Chapter 171-2D, you are hereby notified of a public hearing on the matter described below:

- A. The applicant has filed a Notice of Intent with the Littleton Conservation Commission for work in an area subject to protection under the Massachusetts Wetlands Protection Act and Littleton Wetlands Protection ByLaw.
- B. The name of the applicant is \_\_\_\_\_
- C. The address of the land where the activity is proposed is \_\_\_\_\_
- D. The work proposed is \_\_\_\_\_  
Road reconstruction, shared-use path construction, water main replacement, catch basin replacement on Foster Street from Taylor Street to Balsam Lane, Intersection of Taylor Street and Foster Street, and Intersection of Grimes Lane and Foster Street
- E. Due to the Commonwealth and Town of Littleton's Covid-19 Emergency Response, it is anticipated that paper copies of the Notice of Intent will not be available for inspection. Copies of the Notice of Intent may be examined at the Conservation Commission webpage at <https://www.littletonma.org/conservation>, under "Conservation Calendar" at least 48 hours before the meeting. If you click on the day of the meeting in the Calendar, you will be lead to a link showing posted project information. If you have questions you can contact the Littleton Conservation Commission (contact information at the end of this notice).
- F. Due to the Commonwealth and Town of Littleton's Covid-19 Emergency Response, it is anticipated that paper copies of the Notice of Intent will not be available for distribution. Copies of the Notice of Intent may be obtained electronically from (check one) the \_\_\_ applicant or \_\_\_ the applicant's representative by calling \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ during the following times:  
\_\_\_\_\_  
Fuss & O'Neill, Inc.
- G. The public hearing will be held on \_\_\_\_\_. Information regarding the date and time of the public hearing may be obtained from the Littleton Conservation Commission (see contact info at the end of this notice).

- H. Notice of the public hearing, including date, will be published at least five business days in advance in a paper of local circulation. The agenda, noting times will be posted at Town Hall and at <https://www.littletonma.org/conservation> under “Conservation Calendar” at least 48 hours in advance of the meeting. It is currently anticipated that this meeting will be held entirely remotely, pursuant to Governor Baker’s March 12, 2020 Order Suspending Certain Provisions of the Open Meeting Law and Governor Baker’s March 15, 2020 Order imposing strict limitations on the number of people that may gather in one place. If the meeting is held remotely, instructions for remote viewing of, and participation in, the meeting will be included in the agenda and may also be obtained from the Littleton Conservation Commission.

You may contact the Littleton Conservation Commission Coordinator (Amy Green; [agreen@littletonma.org](mailto:agreen@littletonma.org); 978-540-2428), or the Massachusetts Department of Environmental Protection/ Central Region (508-792-7650) at 8 New Bond Street, Worcester, MA 01606) for information about this application



TOWN OF LITTLETON  
BOARD OF ASSESSORS

P.O. BOX 1305  
LITTLETON, MA 01460  
(978) 540-2410  
FAX: (978) 952-2321

Date: June 21, 2023

Re: Certified List of Abutters Conservation Commission

Applicant: Aaron Keegan  
Name of Firm: Fuss & O'Neill, Inc.  
Mailing Address 1550 Main Street Suite 400

**Subject Parcel Location:** Roadway; Foster Street 238-305 & Taylor Street 221-241  
**Subject Parcel No.:** Roadway  
**Subject Owner Name:** Town of Littleton

M.G.L. Chapter 131: Section 40 ..... "Any person filing a notice of intention with a conservation commission shall at the same time give written notification thereof, by delivery in hand or certified mail, return receipt requested, to all abutters within one hundred feet of the property line of the land where the activity is proposed, but not limited to, owners of land directly opposite said proposed activity on any public or private street or way, and in another municipality or across a body of water. When a notice of intent proposes activities on land under water bodies and waterways or on a tract of land greater than 50 acres, written notification shall be given to all abutters within 100 feet of the proposed project site. For the purposes of this action, "project site" shall mean lands where the following activities are proposed to take place: dredging, excavating, filling, grading, the erection, reconstruction or expansion of a building or structure, the driving of pilings, the construction or improvement of roads or other ways and the installation of drainage, sewerage and water systems, and "land under water bodies and waterways" shall mean the bottom of, or land under, the surface of the ocean or an estuary, creek, river stream, pond or lake. When a notice of intent proposes activity on a linear shaped project site longer than 1,000 feet in length, notification shall be given to all abutters within 1,000 feet of the proposed project site. If the linear project site takes place wholly within an easement through another person's land, notice shall also be given to the landowner. Said notification shall be at the applicant's expense, and shall state where copies of the notice of intention may be examined and obtained and where information regarding the date, time and place of the public hearing may be obtained. Proof of such notification, with a copy of the notice mailed or delivered, shall be filed with the conservation commission." .....

**I hereby certify the attached list of abutter (s) as stated in the M.G.L. Chapter 131, Section 40.**

Number of Abutter (s) 161

**Certified by:**

  
April Iannacone, Assistant Assessor

RTE 2 COMMONWEALTH OF MASSACHUSETTS MASS DOT 10 PARK PLAZA-REAL ESTATE DEPT BOSTON, MA 02116	R06 2 0 LUC: 911	234 FOSTER ST 2021 JACOBS-ANDERSON FAMILY TR TRUSTEE JACOBS DEBORAH 234 FOSTER ST LITTLETON, MA 01460	R08 13 C LUC: 101	14 FRASER ST RIZZA MEGAN A RIZZA CHRISTOPHER D 14 FRASER ST LITTLETON, MA 01460	R08 15 14 LUC: 101
212 FOSTER ST JOURIS WILLIAM E INV TRUST JOURIS MARION E INV TRUST 212 FOSTER ST LITTLETON, MA 01460	R08 11 0 LUC: 101	238 FOSTER ST CANFIELD QUINN E CANFIELD JENNIFER A 238 FOSTER ST LITTLETON, MA 01460	R08 13 D LUC: 101	16 FRASER ST RICHARD MATTHEW J RICHARD CATHERINE E 16 FRASER ST LITTLETON, MA 01460	R08 15 15 LUC: 101
216 FOSTER ST RAUSA PAUL A/K/A RAUSA PAUL W RAUSA REBECCA A/K/A REBECCA R 216 FOSTER ST LITTLETON, MA 01460	R08 12 0 LUC: 101	242 FOSTER ST VIGNONI RICHARD B 242 FOSTER ST LITTLETON, MA 01460	R08 13 E LUC: 101	1 FRASER ST XIA WENYU SHEN LINMING 1 FRASER ST LITTLETON, MA 01460	R08 15 16 LUC: 101
FIR LN TOWN OF LITTLETON PO BOX 1305 LITTLETON, MA 01460	R08 13 0 LUC: 930	230 FOSTER ST BAUCOM ALLAN 230 FOSTER ST LITTLETON, MA 01460	R08 14 0 LUC: 101	3 FRASER ST KOSINSKI-COLLINS MELISSA S COLLINS JOHN A IV 3 FRASER ST LITTLETON, MA 01460	R08 15 17 LUC: 101
5 FIR LN LAFERTY CRAIG WILLIAM JR LAFERTY KRISTIN MELENEY 5 FIR LN LITTLETON, MA 01460	R08 13 2 LUC: 101	260 FOSTER ST DURKEE FARM BUILDERS INC 487 GROTON RD WESTFORD, MA 01886	R08 15 0 LUC: 101	5 FRASER ST STEVENS CLIFFORD S STEVENS TIFFANY D 5 FRASER ST LITTLETON, MA 01460	R08 15 18 LUC: 101
3 FIR LN BELIN EVGENI KUKLINA POLINA 3 FIR LN LITTLETON, MA 01460	R08 13 3 LUC: 101	31 GRIMES LN BRANDON & KARA GUSTAFSON 2021 GUSTAFSON BRANDON FORD 31 GRIMES LN LITTLETON, MA 01460	R08 15 1 LUC: 101	7 FRASER ST SHARMA MANOJ K SHARMA PUJA 7 FRASER ST LITTLETON, MA 01460	R08 15 19 LUC: 101
1 FIR LN TODD & JENNIFER SHULMAN REV TR SHULMAN TODD L, TRUSTEE 1 FIR LN LITTLETON, MA 01460	R08 13 4 LUC: 101	6 FRASER ST KARNATI V V REDDY 2017 REV TR KARNATI KAVITHA 2017 REV TR 6 FRASER ST LITTLETON, MA 01460	R08 15 10 LUC: 101	BALSAM LN LITTLETON TOWN OF 37 SHATTUCK ST LITTLETON, MA 01460	R08 15 2 LUC: 930
1 DOUGLAS RD GE JIJUN SUN YUQING 1 DOUGLAS RD LITTLETON, MA 01460	R08 13 5 LUC: 101	8 FRASER ST ROTHLEUTNER KRISTOFFER BRICE ROTHLEUTNER LAURIE ANN 8 FRASER ST LITTLETON, MA 01460	R08 15 11 LUC: 101	8 SPRUCE ST CROAL SEAN C CROAL KATHLEEN A 8 SPRUCE ST LITTLETON, MA 01460	R08 15 20 LUC: 101
220 FOSTER ST CYNTHIA G DUBE REV TRUST DUBE GREGORY P & CYNTHIA G TRS 220 FOSTER ST LITTLETON, MA 01460	R08 13 A LUC: 101	10 FRASER ST ZHANG YULIAN 10 FRASER ST LITTLETON, MA 01460	R08 15 12 LUC: 101	6 SPRUCE ST AHUJA NEERAJ S AHUJA KIRAN N 6 SPRUCE ST LITTLETON, MA 01460	R08 15 21 LUC: 101
224 FOSTER ST BLANCHARD JOHN BLANCHARD TERESA 224 FOSTER STREET LITTLETON, MA 01460	R08 13 B LUC: 101	12 FRASER ST ZHENG MINXING CHAN LAI SIM 12 FRASER ST LITTLETON, MA 01460	R08 15 13 LUC: 101	4 SPRUCE ST PEDDI SRINIVASA PEDDI PRASUNA 4 SPRUCE ST LITTLETON, MA 01460	R08 15 22 LUC: 101

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2 SPRUCE ST ALLA PAVAN KUMAR JAVVADI SAI SWETHA 2 SPRUCE ST LITTLETON, MA 01460	R08 15 23 LUC: 101	15 GRIMES LN GALLO JOSEPH MICHAEL GALLO ALEXANDRA A 15 GRIMES LN LITTLETON, MA 01460	R08 15 39 LUC: 101	FRASER ST DURKEE FARM BUILDERS INC 487 GROTON RD WESTFORD, MA 01886	R08 15 A LUC: 132
3 SPRUCE ST DEVIREDDY NARAYAN DEVIREDDY APARNA S 3 SPRUCE ST LITTLETON, MA 01460	R08 15 24 LUC: 101	FRASER ST LITTLETON TOWN OF 37 SHATTUCK ST LITTLETON, MA 01460	R08 15 4 LUC: 930	264 FOSTER ST BOSTON & MAINE RAILROAD C/O GUILFORD TRANSPORTATION IRON HORSE PARK TAX DEPT 67 HIGH ST NO BILLERICA, MA 01862 196 FOSTER ST	R08 37 0 LUC: 901 R08 B 0 LUC: 101
5 SPRUCE ST SANMARCO CARLOS A CANDIOTTI ANDRADE DE VASCONCELOS D A 5 SPRUCE ST LITTLETON, MA 01460	R08 15 25 LUC: 101	11 GRIMES LN POPE CAREY NAT POPE JING LIU 11 GRIMES LN LITTLETON, MA 01460	R08 15 40 LUC: 101	TIERNAN JANELLE S 196 FOSTER ST LITTLETON, MA 01460	R08 B 0 LUC: 101
7 SPRUCE ST LU JIANHONG NI QUANHONG 7 SPRUCE ST LITTLETON, MA 01460	R08 15 26 LUC: 101	7 GRIMES LN KELA AMITKUMAR B KACHOLIYA MOUSHMI 7 GRIMES LN LITTLETON, MA 01460	R08 15 41 LUC: 101	198 FOSTER ST GRANT ANDREW F GRANT LORI G 198 FOSTER STREET LITTLETON, MA 01460	R08 B 1 LUC: 101
9 SPRUCE ST KRUPNIK ERIC F BEAUDOIN JENNIFER A 9 SPRUCE ST LITTLETON, MA 01460	R08 15 27 LUC: 101	3 GRIMES LN ROSHAN RAKESH PANKAJ SWARNICA 3 GRIMES LN LITTLETON, MA 01460	R08 15 42 LUC: 101	202 FOSTER ST VIRTUE-STRACKE FAMILY TRUST TRUSTEE STRACKE JOHN 202 FOSTER ST LITTLETON, MA 01460	R08 9 0 LUC: 101
11 SPRUCE ST MORRISON JODY MORRISON KAREN 11 SPRUCE ST LITTLETON, MA 01460	R08 15 28 LUC: 101	GRIMES LN LITTLETON TOWN OF 37 SHATTUCK ST LITTLETON, MA 01460	R08 15 5 LUC: 930	204 FOSTER ST LITTLETON TOWN OF PO BOX 1305 LITTLETON, MA 01460	R08 9 2 LUC: 930
BALSAM LN LITTLETON TOWN OF 37 SHATTUCK ST LITTLETON, MA 01460	R08 15 3 LUC: 930	GRIMES LN LITTLETON TOWN OF 37 SHATTUCK ST LITTLETON, MA 01460	R08 15 6 LUC: 930	206 FOSTER ST LITTLETON TOWN OF PO BOX 1305 LITTLETON, MA 01460	R08 9 3 LUC: 930
27 GRIMES LN LODER FAMILY TRUST TRUSTEE LODER CORY R 27 GRIMES LN LITTLETON, MA 01460	R08 15 36 LUC: 101	7 BALSAM LN MITCHELL ANDREW JAMES LEEDO DESIREE MARIE 7 BALSAM LN LITTLETON, MA 01460	R08 15 7 LUC: 101	208 FOSTER ST SULLIVAN CONOR SULLIVAN SAMANTHA 208 FOSTER ST LITTLETON, MA 01460	R08 9 A LUC: 101
23 GRIMES LN ARMSTRONG WILLIAM ARMSTRONG ASHLEY 23 GRIMES LN LITTLETON, MA 01460	R08 15 37 LUC: 101	9 BALSAM LN ANDERSEN MARK A ANDERSEN JULIE 9 BALSAM LN LITTLETON, MA 01460	R08 15 8 LUC: 101	2 BULKELEY RD COOPER BONNIE MAHER-COOPER GINNY M 2 BULKELEY RD LITTLETON, MA 01460	R09 1 0 LUC: 101
19 GRIMES LN ARUMUGASAMY JEEVANANDAM JEEVANANDAM VAIJAYANTHIMALA 19 GRIMES LN LITTLETON, MA 01460	R08 15 38 LUC: 101	2 FRASER ST FORSBERG JAMES M FORSBERG MEGAN 2 FRASER ST LITTLETON, MA 01460	R08 15 9 LUC: 101	6 BULKELEY RD HORNE ALEXANDER C MCLEOD SAMANTHA 6 BULKELEY RD LITTLETON, MA 01460	R09 1 A LUC: 101



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10 BULKELEY RD R09 2 0  
LUC: 105  
WHEELER JOHN L + KAREN L CO-TR  
OF THE J + K REALTY TRUST  
63 JUNIPER CREEK BLVD  
PINEHURST, NC 28374

12 BULKELEY RD R09 2 1  
LUC: 101  
CLARK KEVIN J  
CLARK LAN  
12 BULKELEY RD  
LITTLETON, MA 01460

15 CRANE RD R09 24 0  
LUC: 101  
PALERMO JR PAUL A  
PALERMO CARRIE J  
15 CRANE RD  
LITTLETON, MA 01460

13 CRANE RD R09 25 2  
LUC: 106  
MEUNIER JONATHAN P  
MEUNIER KATELYN R  
34 BAY DR  
SUDBURY, MA 01776

8 CRANE RD R09 28 0  
LUC: 101  
ARMSTRONG JOANNIE L  
STORMWIND BRIAN L  
8 CRANE ROAD  
LITTLETON, MA 01460

253 TAYLOR ST R09 29 0  
LUC: 101  
PARTHASARATHY VIJAYAN  
NAGENDRA BHAVANA  
253 TAYLOR ST  
LITTLETON, MA 01460

4 LIBERTY SQ R09 29 A  
LUC: 101  
CANNISTRARO CHANG FAM TR  
CANNISTRARO DD & CHANG JC-TRS  
4 LIBERTY SQUARE  
LITTLETON, MA 01460

1247 HILL RD R09 29 C  
LUC: 101  
MCHUTCHEON JOHN P+ELIZABETH TR  
JOHN/ELIZABETH MCHUTCHEON LVG  
1247 HILL RD  
LITTLETON, MA 01460-2000

BULKELEY RD R09 3 0  
LUC: 950  
LITTLETON CONSERVATION TRUST  
P O BOX 594  
LITTLETON, MA 01460

LIBERTY SQ R09 30 0  
LUC: 930  
LITTLETON TOWN OF  
PARK DEPARTMENT  
PO BOX 1305  
LITTLETON, MA 01460

238 TAYLOR ST R09 31 0  
LUC: 101  
MACLEOD DOUGLAS S  
MACLEOD LOLA F  
238 TAYLOR ST  
LITTLETON, MA 01460

236 TAYLOR ST R09 31 1  
LUC: 101  
CURRAN JAMES P  
RIGALI YOLANDA M  
236 TAYLOR ST  
LITTLETON, MA 01460

240 TAYLOR ST R09 31 2  
LUC: 101  
SCULLY KATHLEEN K  
240 TAYLOR ST  
LITTLETON, MA 01460

242 TAYLOR ST R09 31 3  
LUC: 101  
DRINKWATER LAURA J  
242 TAYLOR ST  
LITTLETON, MA 01460

244 TAYLOR ST R09 31 4  
LUC: 101  
MOHLENHOFF BENJAMIN A  
MOHLENHOFF BROOKE E  
244 TAYLOR ST  
LITTLETON, MA 01460

230 TAYLOR ST R09 32 0  
LUC: 441  
GRADY JOHN K TRUSTEE OF  
FOSTER/TAYLOR REALTY TRUST  
CONCORD ASSC- 323 WEST MAIN ST  
AYER, MA 01432

232 TAYLOR ST R09 32 A  
LUC: 403  
GRADY J, D RICE TRUSTEES OF  
CONCORD ASSOC FOSTER ST TRUST  
323 WEST MAIN STREET  
AYER, MA 01432

300 FOSTER ST R09 33 0  
LUC: 404  
GRADY JOHN K, RICE DAVID B  
OF CONCORD ASSCS FOSTER ST TR  
323 WEST MAIN STREET  
AYER, MA 01432

234 TAYLOR ST R09 34 0  
LUC: 400  
PREMIER HEALTHCARE GROUP, LLC  
234 TAYLOR ST  
LITTLETON, MA 01460

OFF BULKELEY RD R09 4 0  
LUC: 901  
BOSTON & MAINE RAILROAD  
C/O GUILFORD TRANSPORTATION  
IRON HORSE PARK  
TAX DEPT 67 HIGH ST  
NO BILLERICA, MA 01862

BULKELEY RD R09 5 0  
LUC: 601  
WEBSTER LYLE D  
WEBSTER GRETCHEN O  
33 BULKELEY RD  
LITTLETON, MA 01460

17 BULKELEY RD R09 5 2  
LUC: 101  
GRAY DANA C  
GRAY KARIN M  
17 BULKELEY ROAD  
LITTLETON, MA 01460

33 BULKELEY RD R09 5 3  
LUC: 101  
WEBSTER LYLE D  
WEBSTER GRETCHEN O  
33 BULKELEY RD  
LITTLETON, MA 01460

19 BULKELEY RD R09 5 4  
LUC: 101  
PRATAPA RADHA K  
PUTCHA VEENA S  
19 BULKELEY RD  
LITTLETON, MA 01460

23 BULKELEY RD R09 5 5  
LUC: 101  
PAVLOVIC DRAGANA  
KARLSSON JONAS  
23 BULKELEY ROAD  
LITTLETON, MA 01460

21 BULKELEY RD R09 5 6  
LUC: 101  
THE FENTON FAMILY TRUST  
TRUSTEE FENTON JAMES T  
21 BULKELEY RD  
LITTLETON, MA 01460

25 BULKELEY RD R09 5 7  
LUC: 016  
WEBSTER LYLE D  
WEBSTER GRETCHEN O  
33 BULKELEY RD  
LITTLETON, MA 01460

3 BULKELEY RD R09 5 A  
LUC: 101  
LENNON JOSEPH W+AMANDA TRS OF  
AMANDA+JOSEPH LENNON LIVING TR  
3 BULKELEY RD  
LITTLETON, MA 01460

7 BULKELEY RD R09 5 B  
LUC: 101  
WARD KEITH A  
7 BULKELEY RD  
LITTLETON, MA 01460

11 BULKELEY RD R09 5 C  
LUC: 101  
WALSH JR VANCE J V  
11 BULKELEY RD  
LITTLETON, MA 01460

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15 BULKELEY RD R09 5 D LUC: 101 CROWLEY JENNIFER L TRUSTEE OF 15 BULKELEY ROAD REALTY TRUST 15 BULKELEY ROAD LITTLETON, MA 01460	10 CRANE RD R09 6 P LUC: 101 BERTOLINO VINCENT & MELISSA H 10 CRANE RD LITTLETON, MA 01460	1250 HILL RD R10 19 0 LUC: 101 SONI DEEPAK DHILLON SHUBHLAKHAN KAUR 1250 HILL RD LITTLETON, MA 01460
284 FOSTER ST R09 5 E LUC: 101 BALZOTTI GREGORY BALZOTTI SHERI 284 FOSTER STREET LITTLETON, MA 01460	14 BULKELEY RD R09 7 2 LUC: 101 MURPHY JOHN E 14 BULKELEY RD LITTLETON, MA 01460	305 FOSTER ST R10 2 1 LUC: 404 2641-2651 SANTA ANNA AVE LLC 80 ERDMAN WAY SUITE 301 LEOMINSTER, MA 01453
286 FOSTER ST R09 5 F LUC: 101 KENYON BROCKTON COLLINS AINE 286 FOSTER ST LITTLETON, MA 01460	20 BULKELEY RD R09 7 4 LUC: 101 KUMAR SUMIT KUMAR ANGELINE G 20 BULKELEY RD LITTLETON, MA 01460	295 FOSTER ST R10 2 2 LUC: 404 ASIJA PROPERTIES LLC C/O SANDEEP ASIJA 440 CENTRAL STREET ACTON, MA 01720
290 FOSTER ST R09 5 G LUC: 101 RIZZOLO ANTHONY J RIZZOLO JOSEPHINE 290 FOSTER ST LITTLETON, MA 01460	277 FOSTER ST R10 1 0 LUC: 104 MCCATHERIN JORDAN S 277-279 FOSTER ST LITTLETON, MA 01460	1252 HILL RD R10 20 0 LUC: 101 KLOCK JAMES CAMPBELL-KLOCK PRISCILLA 1252 HILL RD LITTLETON, MA 01460
14 CRANE RD R09 6 0 LUC: 101 SLUYSKI KRISTEN L 14 CRANE RD LITTLETON, MA 01460	215 TAYLOR ST R10 10 0 LUC: 104 CHB LITTLETON LLC 20 GARDEN ST DANVERS, MA 01923	1254 HILL RD R10 21 0 LUC: 101 MARRESE CHRISTOPHER R MARRESE NANCY A 1254 HILL RD LITTLETON, MA 01460
16 CRANE RD R09 6 A LUC: 101 HILSINGER NANCY L TRUSTEE OF NANCY L HILSINGER INVSTMT TR 16 CRANE RD LITTLETON, MA 01460	205 TAYLOR ST R10 11 0 LUC: 316 CMH LITTLETON LLC 20 GARDEN ST DANVERS, MA 01923	1256 HILL RD R10 22 0 LUC: 101 MORRISON BRUCE A MORRISON NANCY L 1256 HILL RD LITTLETON, MA 01460
20 CRANE RD R09 6 B LUC: 101 STALL ROBERT A 20 CRANE RD LITTLETON, MA 01460	153 TAYLOR ST R10 14 0 LUC: 930 LITTLETON WATER DEPARTMENT 39 AYER RD LITTLETON, MA 01460	247 TAYLOR ST R10 23 0 LUC: 101 SHIMMEL GARY A + KATHLEEN M TRUSTEES OF ATS REALTY TRUST 456 NEWTOWN RD LITTLETON, MA 01460-2206
24 CRANE RD R09 6 C LUC: 101 MCCURDY III ALEXANDER S MCCURDY BRENDA M 24 CRANE ROAD LITTLETON, MA 01460	151 TAYLOR ST R10 14 1 LUC: 401 LML LITTLETON LLC 401 EDGEWATER PLACE, SUITE 265 WAKEFIELD, MA 01880	3 WESTVIEW RD R10 3 0 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803
28 CRANE RD R09 6 D LUC: 101 DIMASE JOHN F W DIMASE LOIS B 28 CRANE ROAD LITTLETON, MA 01460	MONARCH DR R10 16 B LUC: 440 VMD INDUSTRIAL V LLC 733 TURNPIKE ST, ROUTE 114 NORTH ANDOVER, MA 01845	1 WESTVIEW RD R10 3 1 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803
12 CRANE RD R09 6 N LUC: 101 GARBERO PETRA V 12 CRANE RD LITTLETON, MA 01460	200 TAYLOR ST R10 18 0 LUC: 410 FLETCHER JOHN L /JAMES L TR FLETCHER TRUST NO 1 192 DEPOT RD PO BOX 401 EAST TEMPLETON, MA 01438-0401	2 WESTVIEW RD R10 3 2 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803

11 WESTVIEW RD R10 3 3 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803 MONARCH DR	193 FOSTER ST R11 11 1 LUC: 109 CARROLL KEITH S CARROLL LISA M 193 FOSTER ST LITTLETON, MA 01460 FOSTER ST R11 2 0 LUC: 901 BOSTON & MAINE RAILROAD C/O GUILFORD TRANSPORTATION IRON HORSE PARK TAX DEPT 67 HIGH ST NO BILLERICA, MA 01862 18 TROT RD	134 TAYLOR ST R11 27 0 LUC: 410 TAYLOR STREET HOLDINGS LLC 53 MIDLAND DR WALTHAM, MA 02451 245 FOSTER ST R11 3 0 LUC: 441 SNS FOSTER LLC C/O ROBERT LONG 30 HARWOOD AV LITTLETON, MA 01460 215 FOSTER ST R11 3 1 LUC: 101 AQUINO KENNETH C BETEAU WANDA JANE 215 FOSTER ST LITTLETON, MA 01460 217 FOSTER ST R11 3 2 LUC: 101 HORN KRISTIN H LAUFFENBURGER CHRISTOPHER J 217 FOSTER ST LITTLETON, MA 01460 219 FOSTER ST R11 3 3 LUC: 101 TJIONAS GEORGE A BOUMITRI MICHELLE M 219 FOSTER ST LITTLETON, MA 01460 221 FOSTER ST R11 3 4 LUC: 101 GRACE JULIE DAHLBERG GRACE FRANK P 221 FOSTER ST LITTLETON, MA 01460 263 FOSTER ST R11 3 5 LUC: 972 MASS BAY TRANS AUTHORITY TEN PARK PLAZA BOSTON, MA 02116 150 TAYLOR ST R11 30 0 LUC: 950 NEW ENGLAND FORESTRY FNDTN INC PO BOX 1346 LITTLETON, MA 01460 N/W OF 495 R11 31 0 LUC: 950 LITTLETON CONSERVATION TRUST P O BOX 594 LITTLETON, MA 01460 237 FOSTER ST R11 5 4 LUC: 101 NARGIZIAN PATRICIA A P.O. BOX 1003 LITTLETON, MA 01460-1003
241 TAYLOR ST R10 5 0 LUC: 014 MORRISON BRUCE AL 241 TAYLOR ST LITTLETON, MA 01460 TAYLOR ST R10 6 0 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803 225 TAYLOR ST	8 TROT RD R11 23 2 LUC: 101 HELMAN TIMOTHY 6 TROT ROAD LITTLETON, MA 01460 8 TROT RD R11 23 3 LUC: 101 GRANT JONATHAN H GRANT KATE M 8 TROT ROAD LITTLETON, MA 01460 10 TROT RD R11 23 4 LUC: 101 ABETZ WENDY 10 TROT ROAD LITTLETON, MA 01460 12 TROT RD R11 23 5 LUC: 101 KINGSLEY SCOTT M + CASSONDRA L CO-TR SCOTT+CASSONDRA KINGSLEY 12 TROT ROAD LITTLETON, MA 01460 14 TROT RD R11 23 6 LUC: 101 HIGGINS FAMILY 2021 REVOCABLE HIGGINS KENNETH E, TRUSTEE 14 TROT ROAD LITTLETON, MA 01460 16 TROT RD R11 23 7 LUC: 101 16 TROT ROAD NOMINEE REALTY TR ANDERSON ERIC, TRUSTEE 16 TROT RD LITTLETON, MA 01460 OFF TAYLOR ST R11 26 0 LUC: 950 LITTLETON CONSERVATION TRUST PO BOX 594 LITTLETON, MA 01460	241 TAYLOR ST R10 5 0 LUC: 014 MORRISON BRUCE AL 241 TAYLOR ST LITTLETON, MA 01460 TAYLOR ST R10 6 0 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803 225 TAYLOR ST R10 7 0 LUC: 440 GUTIERREZ ARTURO+CATALDO CLASS B TRS, SWEENEY D CLASS A TR C/O THE GUTIERREZ COMPANY 200 WHEELER ROAD BURLINGTON, MA 01803 219 TAYLOR ST
255 FOSTER ST R11 1 0 LUC: 401 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 REAR FOSTER ST R11 1 2 LUC: 441 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 REAR FOSTER ST R11 1 3 LUC: 441 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 191 FOSTER ST R11 11 0 LUC: 304 NASHOBA VALLEY SNF REAL ESTATE INVESTORS LLC 3570 KEITH ST NW CLEVELAND, TN 37312	255 FOSTER ST R11 1 0 LUC: 401 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 REAR FOSTER ST R11 1 2 LUC: 441 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 REAR FOSTER ST R11 1 3 LUC: 441 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 191 FOSTER ST R11 11 0 LUC: 304 NASHOBA VALLEY SNF REAL ESTATE INVESTORS LLC 3570 KEITH ST NW CLEVELAND, TN 37312	255 FOSTER ST R11 1 0 LUC: 401 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 REAR FOSTER ST R11 1 2 LUC: 441 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 REAR FOSTER ST R11 1 3 LUC: 441 VAF I 265 FOSTER LLC 14241 DALLAS PKWY, SUITE 650 DALLAS, TX 75254 191 FOSTER ST R11 11 0 LUC: 304 NASHOBA VALLEY SNF REAL ESTATE INVESTORS LLC 3570 KEITH ST NW CLEVELAND, TN 37312

233 FOSTER ST R11 6 0  
 LUC: 101  
 CAREW MICHAEL J  
 WEINER MICHELLE B  
 233 FOSTER ST  
 LITTLETON, MA 01460

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225 FOSTER ST R11 7 0  
 LUC: 101  
 KIERNAN KAREN A  
 KIERNAN TODD D  
 225 FOSTER ST  
 LITTLETON, MA 01460

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211 FOSTER ST R11 8 0  
 LUC: 101  
 RICHARDSON TODD P  
 RICHARDSON MEREDITH K  
 211 FOSTER ST  
 LITTLETON, MA 01460

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201 FOSTER ST R11 9 0  
 LUC: 101  
 CONLON MARK D  
 SCHOPF-CONLON LISA R  
 201 FOSTER ST  
 LITTLETON, MA 01460

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203 FOSTER ST R11 9 1  
 LUC: 101  
 MCDONALD MICHAEL ADAM  
 MACISAAC KELLY ANN  
 203 FOSTER STREET  
 LITTLETON, MA 01460

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3 JILLIAN WAY R11 9 2  
 LUC: 101  
 SCHOFIELD FRANK B  
 SCHOFIELD MAURA C  
 3 JILLIAN WAY  
 LITTLETON, MA 01460

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5 JILLIAN WAY R11 9 3  
 LUC: 101  
 VASUDEVAN MADHUSUDHANAN  
 MADHUSUDHAN SRIVIDYA  
 5 JILLIAN WAY  
 LITTLETON, MA 01460

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4 JILLIAN WAY R11 9 4  
 LUC: 101  
 ASLAM SAMI  
 AZAM SEEMA  
 4 JILLIAN WAY  
 LITTLETON, MA 01460

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2 JILLIAN WAY R11 9 5  
 LUC: 101  
 YOUNG FAMILY REALTY TRUST  
 TRUSTEE YOUNG BRIAN S  
 2 JILLIAN WAY  
 LITTLETON, MA 01460

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1 JILLIAN WAY R11 9 B  
 LUC: 101  
 FRIEDMAN MICHAEL P  
 LEE SOYOUNG  
 1 JILLIAN WY  
 LITTLETON, MA 01460

1 HARWOOD AV U41 23 0  
 LUC: 901  
 BOSTON & MAINE RAILROAD  
 C/O GUILFORD TRANSPORTATION  
 IRON HORSE PARK  
 67 HIGH ST  
 NO BILLERICA, MA 01862



## Appendix D

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### Wetland Delineation Report





### Massachusetts Inland Resource Area Delineation Report

Report Date: September 11, 2018

Prepared For: Mr. Chris Stoddard, P.E., Director of Public Works, Highway Department  
P.O. Box 1305  
39 Ayer Road (Rte. 2A)  
Littleton, MA 01460

Site Address/Location: Foster Street, Littleton, MA  
42.518314°N, 71.503733°W

Inspection Date(s): July 19, 2018

Regulated Inland Wetland Resource Areas:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Bank                                  | <input checked="" type="checkbox"/> Bordering Vegetated Wetland (BVW) |
| <input checked="" type="checkbox"/> Land Under Water Bodies and Waterways | <input type="checkbox"/> Land Subject to Flooding (BLSF/ILSF)         |
| <input type="checkbox"/> Riverfront Area                                  | <input type="checkbox"/> Isolated Vegetated Wetland                   |
| <input checked="" type="checkbox"/> Buffer Zone                           | <input type="checkbox"/> Estimated Habitats of Rare Wildlife          |
| <input type="checkbox"/> Vernal Pool (Certified and/or Potential)         | <input type="checkbox"/> Priority Habitats of Rare Species            |

Delineated Resource Area Field Numbering Sequence [as depicted on the attached Resource Map]:

Bank/LUWW: A100-116, F600-602 (R&L)  
BVW: B200-205, C300-309, D400-405, E500-503

Inland resource areas were delineated in accordance with applicable local, state and federal statutes, as detailed within the Resource Area Description attachment. This delineation does not constitute an official wetland boundary until such time as it is accepted and approved by local, state or federal regulatory agencies.

146 Hartford Road  
Manchester, CT  
06040  
t 860.646.2469  
800.286.2469  
f 860.533.5143  
www.fando.com

The wetlands delineation was conducted by:

\_\_\_\_\_  
Robin Casioppo  
Wetland Scientist/Soil Scientist

Connecticut  
Massachusetts  
Rhode Island  
South Carolina



Massachusetts Inland Resource Area Delineation Report  
Resource Area Description

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ATTACHMENTS

- Resource Area Description
- DEP Bordering Vegetated Wetland (310 CMR 10.55)  
Delineation Field Forms
- NRCS Soil Map and Soil Report
- Resource Area Sketch Map
- MassGIS: OLIVER generated FEMA Map



## Massachusetts Inland Resource Area Delineation Report Resource Area Description

### Introduction

Fuss & O'Neill Inc. performed a wetland resource area field inspection and delineation at Foster Street ("Site") located off Taylor Street in Littleton, Massachusetts. The field inspection and delineation occurred on July 19, 2018. The purpose of the delineation was to locate the jurisdictional limits of areas regulated under the Wetlands Protection Act (M.G.L. c. 131 sec. 40) and associated Wetlands Protection Act Regulations (310 CMR 10).

Bank and Vegetated Bordering Wetlands (BVW) inland wetland resource areas were identified and delineated during the field investigation. Consecutively numbered flags were placed in the field to demarcate these resource area boundaries. Regulated Buffer Zone on the Property is measured horizontally from the boundaries of BVWs and intermittent watercourse Banks.

Maps retrieved from MassGIS were used to determine if specific regulated inland wetland resources have been mapped and/or documented on the Property. MassGIS maps do not depict Massachusetts Natural Heritage and Endangered Species Program (NHESP) Priority Habitats of Rare Species, Certified Vernal Pools, Potential Vernal Pools or Bordering Land Subject to Flooding (see additional details regarding FEMA Flood Zones below) on the Site. A detailed description of each regulated resource area present on the Site is provided below.

### Resource Areas

#### Bank: Regulatory Framework and Delineation Methodology

Bank is defined under 310 CMR 10.54(2)(c) as "the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland." Fuss & O'Neill Inc. performed a delineation of Bank within the area of interest using consecutively numbered flags placed in the field to demarcate the Bank of an intermittent stream, as well as the Bank of a small unnamed pond and its associated downstream channel.

#### Bank: Resource Description

Bank was located in the field by the first observable break in topography between water bodies and the adjacent BVW or upland. Water bodies on the property include the small unnamed pond and the associated downstream intermittent stream. The delineated Bank along the intermittent watercourses coincided with the Mean Annual High-Water Line (MAHWL)/bankfull, as defined under 310 CMR 10.58 (2)(a)(2). No evidence of riverine characteristics was noted along the pond bank during the inspection (i.e., no discernible direction of flow, no evidence of scour, etc.).

#### Land under Water Bodies and Waterways (LUWW)





## Massachusetts Inland Resource Area Delineation Report Resource Area Description

LUWW is defined under 310 CMR 10.56 (2)(a) as “the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock.” The boundary of LUWW is defined as the mean annual low water level (310 CMR 10.56 (2)(c)). LUWW was not specifically field delineated. For the intents and purposes of this resource area delineation, the delineated Banks of the pond and intermittent watercourse are analogous to the limits of LUWW.

### Bordering Vegetated Wetlands (BVW): Regulatory Framework and Delineation Methodology

As stated in 310 CMR (2)(a), “Bordering Vegetated Wetlands are freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The ground and surface water regime and the vegetation community which occur in each type of freshwater wetland are specified in M.G.L. c 131 sec. 40.”

Fuss & O'Neill Inc. inspected the Site for bordering vegetated wetlands in accordance with methodology provided in the Massachusetts DEP handbook, Delineating Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act, (March 1995), the 1987 Corps of Engineers Wetlands Delineation Manual, and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Northcentral and Northeast Region (Version 2.0. January 2012). Data regarding vegetation, soils, and hydrology was gathered to complete the required MassDEP BVW delineation field forms. Wetlands are categorized in accordance with Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et.al. 1979).

Hydric soil determinations were made in accordance with Field Indicators for Identifying Hydric Soils in New England (NEIWPC, 2018). The Wetland Indicator Status for plant species was ascertained using the USACE Northcentral and Northeast 2014 Regional Wetland Plant List (Lichvar et al., 2014).

### BVW: Resource Area Description

#### Vegetation

Six (6) BVWs were identified on the Site. Four of the six BVWs on the Site are classified as palustrine forested wetlands. Common vegetation identified within forested BVWs includes [common name/scientific name (indicator status)]: Red Maple/*Acer rubrum* (FAC), highbush blueberry/*Vaccinium corymbosum* (FACW), bittersweet/*Celastrus orbiculatus* (UPL), poison ivy/*Toxicodendron radicans* (FAC), silky dogwood/*Swida amomum* (FACW), gray dogwood/*Swida racemosa* (FAC), glossy false buckthorn/*Frangula alnus* (FAC), arrowwood/*Viburnum dentatum* (FACW), elderberry/*Sambucus nigra* (FACW),



## Massachusetts Inland Resource Area Delineation Report Resource Area Description

spicebush/*Lindera benzoin* (FACW), sweet pepperbush/*Clethra alnifolia* (FAC), multiflora rose/*Rosa multiflora* (FACU), cinnamon fern/*Osmundastrum cinnamomeum* (FACW), sensitive fern/*Onoclea sensibilis* (FACW), Jack-in-the-pulpit/*Arisaema triphyllum* (FAC), skunk-cabbage/*Symplocarpus foetidus* (OBL), false hellebore/*Veratrum viride* (FACW), and jewelweed/*Impatiens capensis* (FACW).

The remaining two BVWs are classified as palustrine emergent wet meadows. Common vegetation identified within emergent wet meadow BVWs includes [common name/scientific name (indicator status)]: arrowwood, silky dogwood, poison ivy, sensitive fern, cinnamon fern, jewelweed, royal fern/*Osmunda regalis* (OBL), soft rush/*Juncus effusus* (OBL), tall meadow rue/*Thalictrum pubescens* (FACW), and blue flag iris/*Iris versicolor* (OBL).

### Hydrology

The BVWs identified on the southern portion of the site are hydrologically connected to the on-site pond and another small pond adjacent to the Site. The intermittent stream associated with the on-site pond flows north from the pond and is conveyed through a culvert beneath Foster Street. The stream leads to a wetland system north of Foster Street. Two BVWs on the central portion of the site are hydrologically connected to an intermittent stream that runs parallel to Route 2. The remaining two BVWs are hydrologically connected to one another via a culvert and are supported by an intermittent stream that enters the site from the east. Evidence of surface water and soil saturation include: direct observation of surface water, water stained leaves and tree trunks, sediment deposition, free water in test holes, saturated soils, and hydric soils.

### Soils

The Natural Resource Conservation Service (NRCS) mapped soil types on the Property include: Canton, Paxton, Urban Land, Udorthents, Swansea muck, Charlton, and Hollis series. Detailed information regarding each of these soil series is included within the [NRCS Soil Map and Soil Report](#) attachment. Results of the detailed field analyses of soils on the Property were generally consistent with the published NRCS soil mapping.

### Buffer Zone

Buffer Zone is defined in 310 CMR 10.04 as "that area of land extending 100 feet horizontally outward from the boundary of any area specified in 310 CMR 10.02(1)(a)." Buffer Zone within the area of interest is associated with BVW and Bank. The buffer zone on the Property contains upland forested areas, residential and commercial properties, and various municipal roads. Common vegetation within the Buffer Zone includes: beech/*Fagus grandifolia* (FACU), red maple, red oak/*Quercus rubra* (FACU), eastern white pine/*Pinus strobus* (FACU), gray birch/*Betula populifolia* (FAC), Virginia creeper/*Parthenocissus quinquefolia* (FACU), poison ivy, grape/*Vitis labrusca* (FACU), bittersweet, multiflora rose, sassafras/*Sassafras albidum* (FACU),



## Massachusetts Inland Resource Area Delineation Report Resource Area Description

staghorn sumac/*Rhus hirta* (UPL), brambles/*Rubus* spp., greenbriar/*Smilax rotundifolia* (FAC), tatarian honeysuckle/*Lonicera tatarica* (FACU), whorled bedstraw/*Galium mollugo* (UPL), sensitive fern, and Canada mayflower/*Maianthemum canadense* (FACU).

### FEMA Flood Zones

The MassGIS National Flood Hazard Layer provided by the Federal Emergency Management Agency (FEMA) does not depict areas of potential flooding on the Property. Bordering Land Subject to Flooding (BLSF) is not mapped for the Site: BLSF is defined in 310 CMR 10.57 (2)(a)(1) as "an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetlands."



DEP Bordering Vegetated Wetland (310 CMR 10.55)  
Delineation Field Forms

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# MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Littleton Prepared by: Robin Casioppo, Fuss & O'Neill, Inc. Project location: Littleton, MA DEP File #: \_\_\_\_\_

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

## Section I.

Vegetation	Observation Plot Number: B1W1	Transect Number: 1	Date of Delineation: 7/19/18
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*

### Woody Vines

### Virginia Creeper/

Parthenocissus quinquefolia

2 100

yes

FACU

### Shrubs

Gray dogwood/Swida racemosa\*

80 100

yes

FAC

### Herbs

Sensitive fern/Onoclea sensibilis\*

10 100

yes

FACW

\* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

### Vegetation conclusion:

Number of dominant wetland indicator plants: 2

Number of dominant non-wetland indicator plants: 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent



## MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Littleton Prepared by: Robin Casioppo, Fuss & O'Neill, Inc. Project location: Littleton, MA DEP File #: \_\_\_\_\_

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

### Section I.

Vegetation	Observation Plot Number: E1W1		Transect Number: 1	Date of Delineation: 7/19/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
<b>Shrubs</b>				
Gray dogwood/ <i>Swida racemosa</i> *	90	100	yes	FAC
<b>Herbs</b>				
Jewelweed/ <i>Impatiens capensis</i> *	15	100	yes	FACW
<b>Woody vines</b>				
Virginia creeper/ <i>Parthenocissus quinquefolia</i>	5	100	yes	FACU

\* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

### Vegetation conclusion:

Number of dominant wetland indicator plants: 2                      Number of dominant non-wetland indicator plants: 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

## MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Littleton Prepared by: Robin Casioppo, Fuss & O'Neill, Inc. Project location: Littleton, MA DEP File #: \_\_\_\_\_

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

### Section I.

Vegetation	Observation Plot Number: G1W1		Transect Number: 1	Date of Delineation: 7/19/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*

Trees

Red maple/Acer rubrum*	15	79	yes	FAC
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Eastern cottonwood/

Populus deltoides\*

Ash species/Fraxinus sp.

Herbs

Skunk cabbage/

Symplocarpus foetidus\*

Royal fern/Osmunda regalis

Cinnamon fern/

Osmundastrum cinnamomeum

Purple loosestrife/Lythrum salicaria\*

Smooth goldenrod/Solidago gigantea\*

Fowl bluegrass/Poa palustris\*

	2	10.5	no	FACW
	2	10.5	no	UNK
	25	48	yes	OBL
	5	10	no	OBL
	5	10	no	FACW
	2	3	no	OBL
	5	10	no	FACW
	10	19	no	FACW

\* Use an asterisk to mark wetland indicator plants; plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

### Vegetation conclusion:

Number of dominant wetland indicator plants: 2

Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent



## MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Littleton Prepared by: Robin Casioppo, Fuss & O'Neill, Inc. Project location: Littleton, MA DEP File #: \_\_\_\_\_

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

### Section I.

Vegetation	Observation Plot Number: J1W1		Transect Number: 1	Date of Delineation: 7/19/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*

Trees

Red maple/Acer rubrum*	50	83	yes	FAC
American elm/Ulmus americana*	10	17	no	FACW

Shrubs

Gray dogwood/Swida amomum*	5	50	yes	FAC
Winterberry holly/Ilex verticillata*	5	50	yes	FACW

Woody vines

Poison ivy/Toxicodendron radicans*	50	100	yes	FAC
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Herbs

Skunk cabbage/ Symplocarpus foetidus*	7	47	yes	OBL
Royal fern/Osmunda regalis*	3	20	yes	OBL
Sensitive fern/Onoclea sensibilis*	3	20	yes	OBL
Cinnamon fern/ Osmundastrum cinnamomeum*	2	13	no	FACW

\* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

### Vegetation conclusion:

Number of dominant wetland indicator plants: 7

Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

## MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Littleton Prepared by: Robin Casioppo, Fuss & O'Neill, Inc. Project location: Littleton, MA DEP File #: \_\_\_\_\_

Check all that apply:

- Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- Method other than dominance test used (attach additional information)

### Section I.

Vegetation	Observation Plot Number: L1W1		Transect Number: 1	Date of Delineation: 7/19/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
<b>Herbs</b>				
Purple loosestrife/				
Lythrum salicaria*	25	28	yes	OBL
Bur-reed species/Sparganeum sp.*	20	22	yes	OBL
Wrinkle-leaf goldenrod/				
Solidago rugosa*	20	22	yes	FAC
Wool grass/Scirpus cyperinus*	5	6	no	OBL
Reed canary grass/				
Phalaris arundinacea*	10	11	no	FACW
Joe-pye-weed species/				
Eutrochium sp.	10	11	no	UNK

\* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

### Vegetation conclusion:

Number of dominant wetland indicator plants: 3

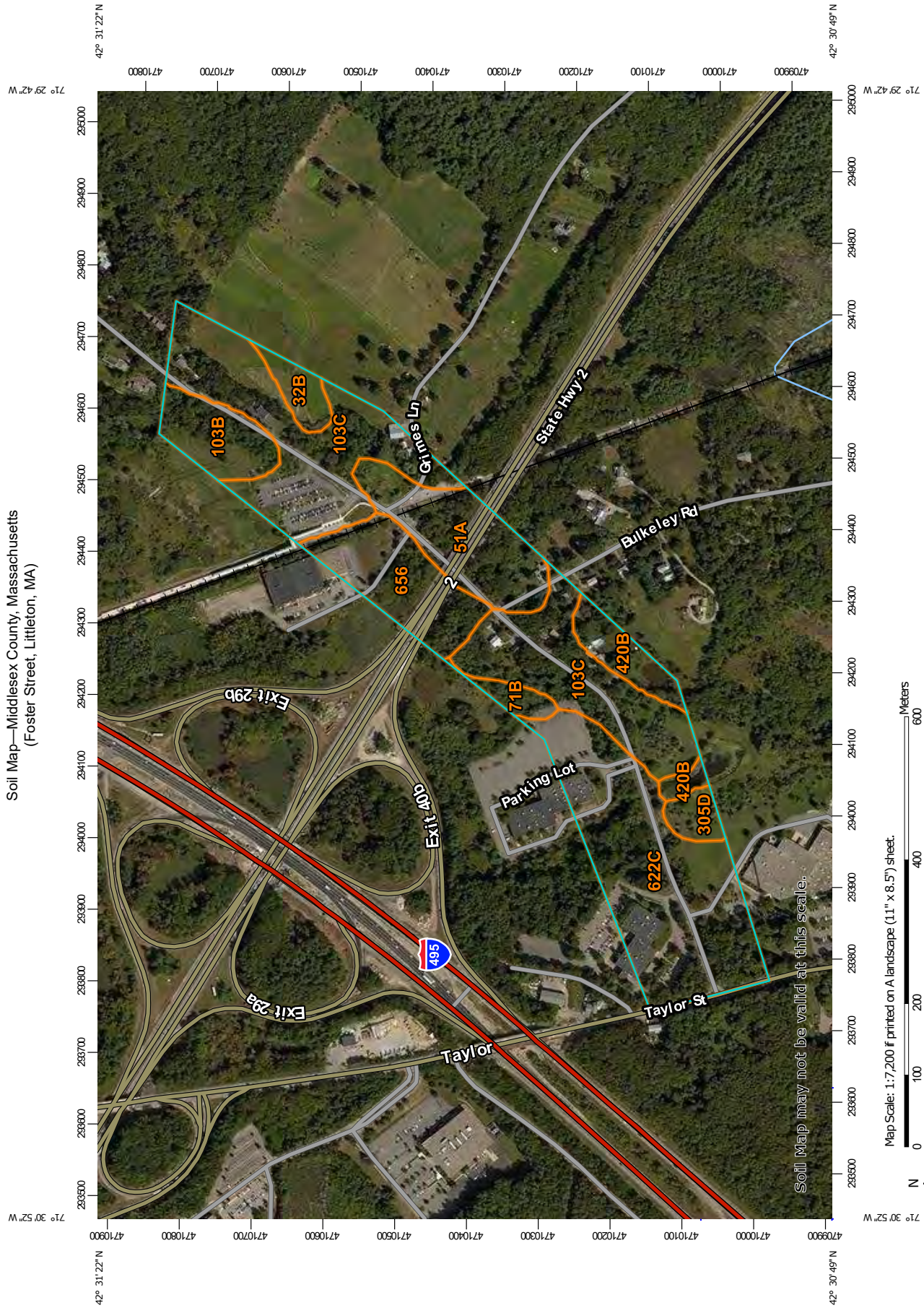
Number of dominant non-wetland indicator plants: 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent



## NRCS Soil Map and Soil Report



## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

**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:  
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: Middlesex County, Massachusetts  
Survey Area Data: Version 17, Oct 6, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

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.

## MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Soil Map Unit Polygons		Stony Spot
	Soil Map Unit Lines		Very Stony Spot
	Soil Map Unit Points		Wet Spot
	Blowout		Other
	Borrow Pit		Special Line Features
	Clay Spot		Streams and Canals
	Closed Depression		Rails
	Gravel Pit		Interstate Highways
	Gravelly Spot		US Routes
	Landfill		Major Roads
	Lava Flow		Local Roads
	Marsh or swamp		Aerial Photography
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
32B	Wareham loamy fine sand, 0 to 5 percent slopes	1.4	2.5%
51A	Swansea muck, 0 to 1 percent slopes	6.6	11.4%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	0.9	1.6%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	3.5	6.0%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	20.4	35.2%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	1.2	2.0%
420B	Canton fine sandy loam, 3 to 8 percent slopes	2.7	4.7%
622C	Paxton-Urban land complex, 3 to 15 percent slopes	15.4	26.6%
656	Udorthents-Urban land complex	5.8	10.1%
<b>Totals for Area of Interest</b>		<b>58.1</b>	<b>100.0%</b>

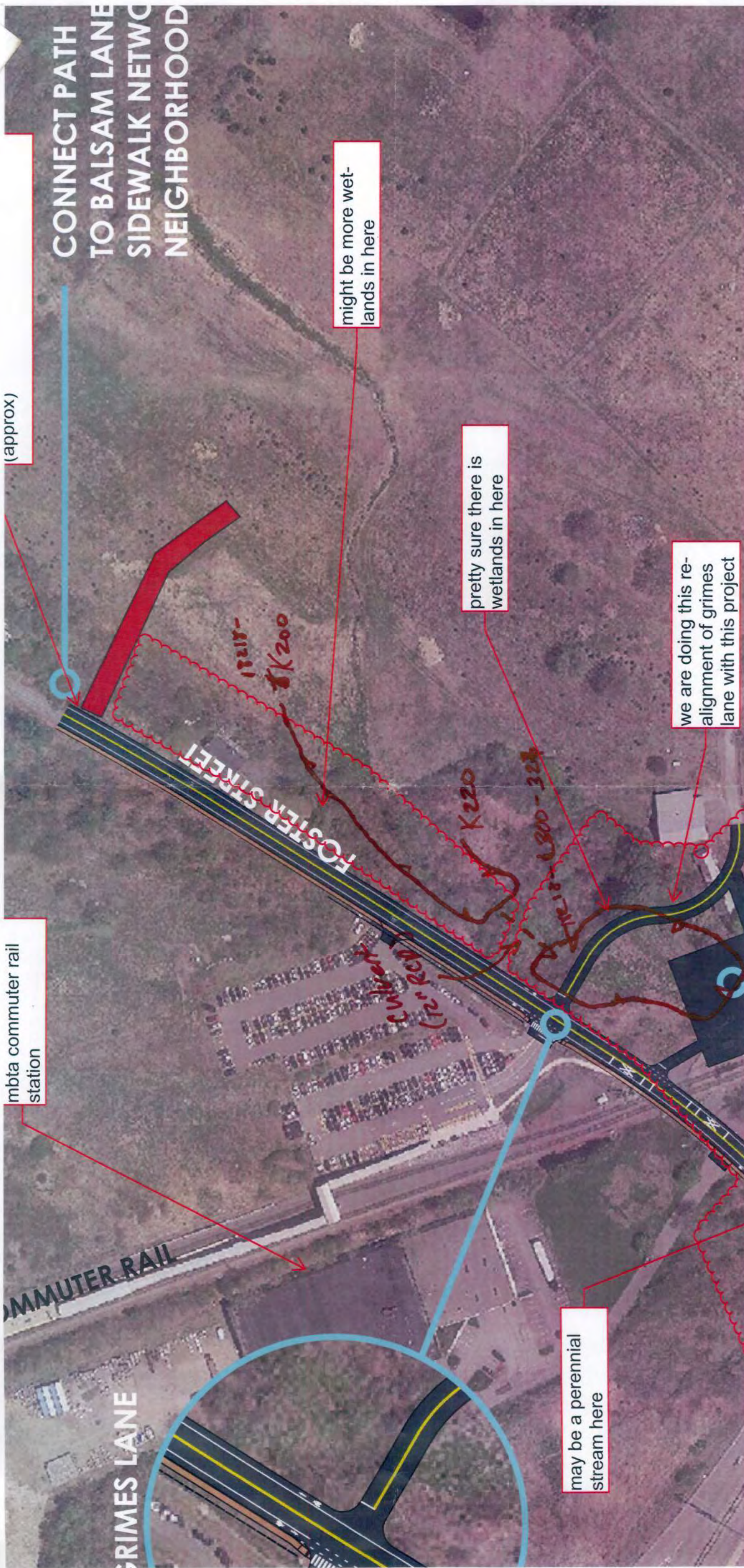


## Wetland Sketch Map

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mbta commuter rail station

(approx)

CONNECT PATH TO BALSAM LANE SIDEWALK NETWORK NEIGHBORHOOD

might be more wetlands in here

pretty sure there is wetlands in here

we are doing this re-alignment of grimes lane with this project

may be a perennial stream here

Josh Wilson, PWS  
Wetland sketch  
8/7/18

Littleton, MA

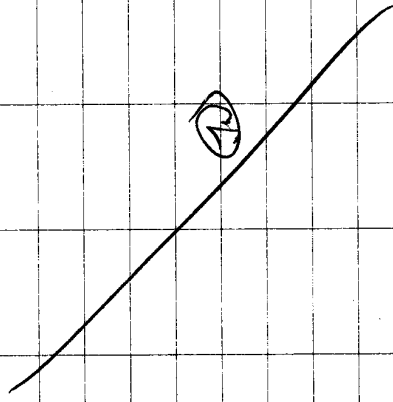
Flags 18218-K200-K220, L300-L326

8/7/18

20170014 AZ1  
 Foster St. Reconstruction  
 Littleton, MFA  
 Resource delineation

0700 Lv home  
 0915 Arr @ site  
 1300 Lv. site  
 1510 Arr @ home

12218-  
 K200-K220 (21)  
 L300-L327 (23)

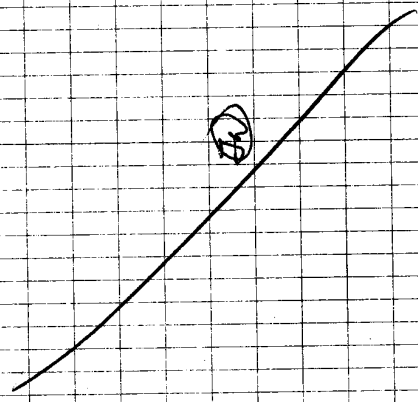


~~0-4~~ L325 wa+  
 0-6 10YR 3/1 fs/  
 6-12 10YR 5/2 fs/  
 75YR 5/6 20m-c

Lophium sel. 25  
 Sparganium 20  
 S. rugosa 20  
 Cyp (small grass) 5  
 RC grass 10  
 Sp. JPN 10

VP  
 0-8 10YR 3/2 fs/  
 8-18 10YR 4/4  
 25Y 5/4 5/  
 18-24 10YR 6/6 3/

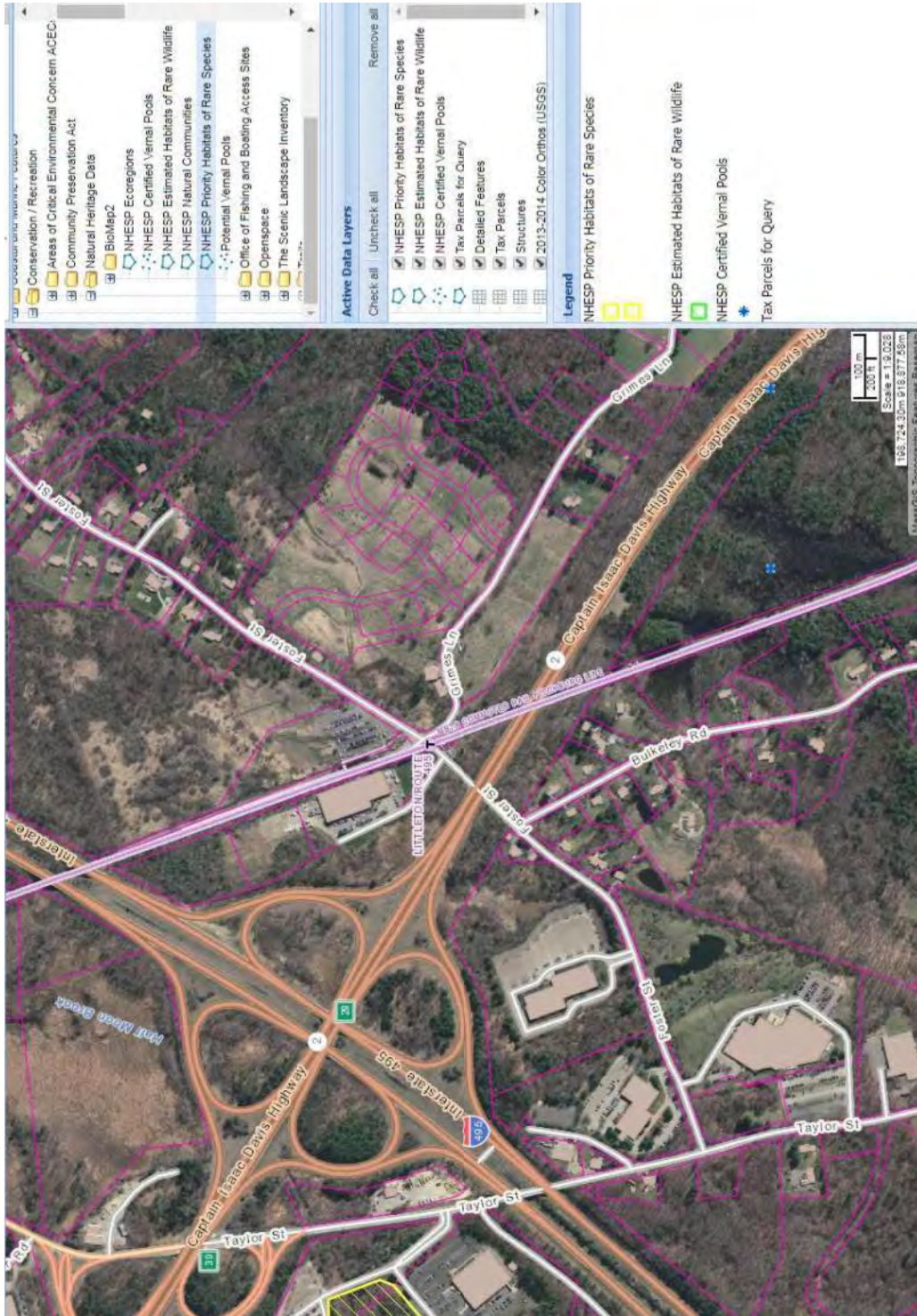
P. strabus 70  
 A. ach. 10  
 Lanicera m. 10  
 C. commun 10  
 PT 30  
 gins. 20  
 C. orbic 10





## MassGIS Maps

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OLIVER MassGIS  
Foster Street, Littleton, MA  
20170044.A21



## Appendix E

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### Site Photos

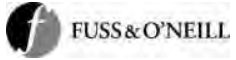




**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054



TOP: Looking east on Taylor St toward the intersection with Foster St from STA 0+00.  
BOTTOM LEFT: Looking west on Foster St at the intersection with Taylor St from STA 1+00.  
BOTTOM RIGHT: Looking east on Foster St from STA 1+00.

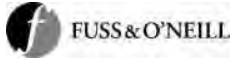


**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**

MassDOT Proj. #609054



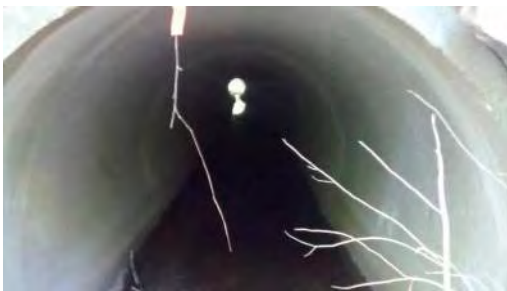
TOP LEFT: Looking west on Foster St from STA 4+00.  
TOP RIGHT: Looking east on Foster St from STA 4+00. The entrance to the office park at 305 Foster St is visible.  
BOTTOM: Looking south from Foster St at the entrance to the office park at 300 Foster St STA 4+00. Employees walking along Foster St during lunch break are visible.



**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054

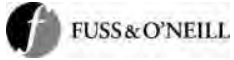
**CULVERT CROSSING UNDERNEATH FOSTER ST AT CENTERLINE STA 10+30**

TOP LEFT: Looking south at the culvert outlet on the north side of Foster St at STA 10+40 LT 40.  
TOP RIGHT: Looking at the Culvert outlet headwall at the north side of Foster St STA 10+40 LT 40.  
BOTTOM LEFT: Looking south into the culvert outlet at STA 10+40 LT 40. The culvert inlet is located at STA 10+16 RT 20 near an open body of water on the south side of Foster St. The length of culvert is 60ft.



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**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054



TOP LEFT: Looking west from STA 10+80 on Foster St.  
TOP RIGHT: Looking south from STA 10+20 toward a body of open water on the south side of Foster St. The body of water is unnamed on all available maps.  
BOTTOM LEFT: Looking east from STA 10+20 on Foster St. The driveway to the office park at 295 Foster St is visible.  
BOTTOM RIGHT: Looking south from STA 10+00 toward the body of water on the south side of Foster St.

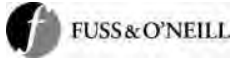
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**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054



LEFT: Looking west on Foster St at STA 14+25.  
RIGHT: Looking east on Foster St at STA 14+25.



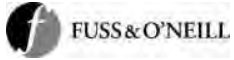
**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**

MassDOT Proj. #609054



**LEGEND:**  
TOP LEFT: Looking west on Foster St from STA 17+00.  
TOP RIGHT: Looking east on Foster St from STA 14+00 showing catch basins.  
BOTTOM LEFT: Looking west on Foster St from STA 21+00 at the historic South School.  
BOTTOM RIGHT: Looking east on Foster St at STA 19+10 at the historic South School.





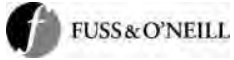
**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054

**ROUTE 2 OVERPASS BRIDGE OVER FOSTER ST AT STA 24+55**



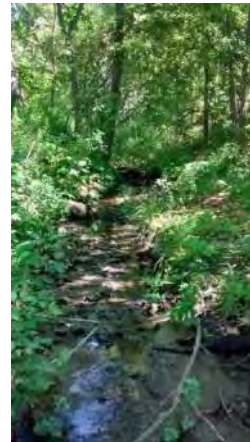
TOP LEFT: Looking east on Foster St at STA 23+00 at Route 2 overpass.  
TOP RIGHT: Looking west on Foster St at STA 23+00.  
BOTTOM LEFT: Looking east on Foster St at STA 24+50 at rail crossing approach.  
BOTTOM RIGHT: Looking west on Foster St and Route 2 overpass at STA 26+50.

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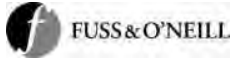
**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054

**CULVERT CROSSING AT FOSTER ST STA 24+80**



**LEGEND:**  
TOP LEFT- Looking north on Foster St at bollards demarcating the culvert location at STA 24+80.  
TOP RIGHT- Looking south on Foster St at bollards demarcating the culvert location at STA 24+80.  
BOTTOM LEFT- Culvert inlet at the south side of Foster St at STA 24+80 RT 21.  
BOTTOM MIDDLE- Culvert outlet and crushed stone lined spillway on the north side of Foster St at STA 24+80 LT 41. The culvert is 63ft in length.  
BOTTOM RIGHT- Looking north downstream of the culvert outlet on the north side of Foster St at STA 24+80 LT 41.

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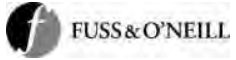
**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054

**RAIL CROSSING AT FOSTER ST AND GRIMES LN STA 27+40**



**LEGEND:**

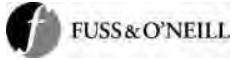
- TOP- Looking northeast at STA 27+40 the commuter rail lot and station are visible.
- LEFT MIDDLE- Looking west at STA 27+60 the rail crossing and Route 2 overpass are visible.
- RIGHT MIDDLE- Looking east at STA 27+00 the rail crossing is visible.
- BOTTOM- Looking south at STA 27+40 the Grimes Lane intersection is visible.



**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054



LEFT- Looking west from STA 29+00 the overflow commuter parking on the north side of Foster St is visible.  
RIGHT- Looking east from STA 29+00 the overflow commuter parking on the north side of Foster St is visible.



**RECONSTRUCTION OF FOSTER ST**  
**Existing Site Condition Photos**  
MassDOT Proj. #609054



**LEGEND:**  
TOP LEFT- Looking west on Foster St from STA 39+00 at the intersection with Balsam Ln.  
TOP RIGHT- Looking east on Foster St from STA 39+00 viewing the eastern project limit.  
BOTTOM- Looking south at the Balsam Ln retaining wall at from STA 37+75.

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## Appendix F

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### Littleton Waiver Request Form





## Littleton Conservation Commission

37 Shattuck Street / Room 303

Phone: 978 540-2428

Fax: 978 952-2321

### Littleton Wetland Protection Regulations

#### Waiver Request Requirement Information (Section 1.4)

Date: 5/19/2023 Applicant/Owner: Town of Littleton DPW

Map/Lot: 1425 Project Address: Roadway; 238-305 Foster St & 221-241 Taylor St

**In order request a waiver, the following provides a guidance for required information (attach additional text, plans, photos or graphics if needed):**

**Project purpose and need:** The Project will reconstruct Foster Street between Taylor Street and Balsam Lane. A new 10 ft separated shared-use path will be furnished throughout the project while the road surface on Foster St will be narrowed slightly. The project addresses vehicular, pedestrian, and bicycle safety. The project proposes an improved storm water drainage system to the maximum extent practical. The project will also include the replacement of a 10" water main underneath Foster Street in an effort to 'dig once' and reduce disturbance to the corridor.

**What specific action(s) is the Waiver being asked for?** \_\_\_\_\_

A Waiver from the provisions in Section 4.2, 50-ft No Disturb Zone, of the Town Bylaw Regulation for a limited project qualifying under 310 CMR 10.53 (3)(f), "Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems."

**How is the action(s) in the public interest, necessary to avoid a taking, necessary to prevent a safety hazard or water dependent?** \_\_\_\_\_

The project will include construction a new shared-use path for non-motorized travel connecting to a commuter rail station on Foster St. The drinking water main underneath Foster St will be replaced during reconstruction of the road.

**How is the action(s) consistent with the intent and purpose of the Bylaw?** \_\_\_\_\_

The shared-use path for bicycles and pedestrians is a mitigating factor because it will expand the Town's non-motorized travel network to a public transit station. This will contribute to lowering vehicle exhaust emissions, a much needed step toward reducing climate change.

**Existing and proposed site conditions (ie, impervious, lawn & disturbed areas) (square feet; show on plan):** \_\_\_\_\_

Project area is 5.4 acres along a linear road corridor. Total length of road is 0.81 miles. Existing impervious is 2.93 acres in the project area from road surface, driveways, and some sidewalks.

**Existing and proposed distances of land uses from wetland resource areas (show on plan):** \_\_\_\_\_

Foster St will be shifted up to 4ft in some locations to the south side. A new 10ft wide shared-use path will be constructed on the west side of the road. The total paved cross section of the road and path will change from 28ft wide in the existing condition to 34ft wide in the proposed condition. The environmental impact plans show proposed permanent and temporary impacts to 50-ft No Disturb Zone and 100-ft Buffer Zone. There are no other proposed direct impacts to any other wetland resource area.

**Analysis of less environmentally damaging practicable alternative:** \_\_\_\_\_

An alternative that reconstructs Foster St as the same design as existing condition would avoid Buffer Zone and 50-FT No Disturb impacts. However, there would be no accommodation of safe and separated walking or biking in the corridor thus continuing an unsafe condition that encourages driving over non-motorized travel for short local trips.

**Proposed short term and long term protection of wetland resource areas:** \_\_\_\_\_

As shown in plans, erosion controls including sediment barriers and catch basin silt sacks will be installed during the full length of the project construction for short term protection of wetland resources. Long-term protection will be provided by an upgraded storm drainage system including new deep-sump catch basins, leaching catch basins, and cleaned/repared existing catch basins.

**Is the site in a Zone I, II or III (groundwater) or Zone A, B or C (surface water) water supply area:** \_\_\_\_\_

The project limits are not within any of the above water supply areas.

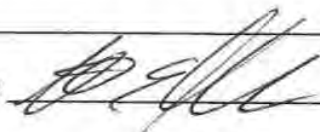
**Are there critical, unique or sensitive resource areas in the area (ie, NHESP mapped habitat, vernal pools, unusual wetland types, cold water fisheries, outstanding resource waters, Core Habitat, Conservation land, etc); show on plan:** \_\_\_\_\_

There are no critical resource areas in the project limits nor nearby adjacent.

**Other factors for consideration:** \_\_\_\_\_

The final preferred alternative for the project chose a road design that had 1ft less width of pavement compared to a competing alternative which called for bike lanes and sidewalks on both sides of the road instead of the shared-use path in the preferred alternative.

**Signature:** \_\_\_\_\_

  
Stephen Jahhle, DPW Director

**Project:** \_\_\_\_\_

Reconstruction of Foster St. between Taylor St. and Balsam Lane including Foster St. intersections with Taylor St. and Grimes Ln.



## Appendix G

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### Operation and Maintenance Plans





## MEMORANDUM

TO: Town of Littleton, MA

FROM: Fuss & O'Neill, Inc.

DATE: April 18, 2023

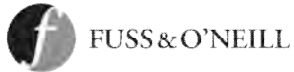
RE: Construction Operation and Maintenance Plan  
Foster Street Reconstruction  
Littleton, MA

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Responsible Party: Town of Littleton  
Department of Public Works  
39 Ayer Rd  
Littleton, MA 01460

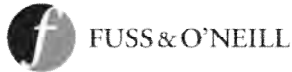
Property Owner shall be responsible for the operation and maintenance of the site during reconstruction Foster Street. Reconstruction of Foster Street includes full depth pavement replacement, replacement of existing stormwater drainage system, installation of a stormwater treatment structure, addition of a multi-use path and replacement of sidewalks. A suggested operation and maintenance activities and proposed schedule for during construction is as follows:

1. No earthwork activities shall commence until silt fence has been installed. Silt fence shall be installed as shown on the drawings.
2. Areas left exposed to erosion for more than seven days shall be rough graded and temporarily stabilized. Areas disturbed but inactive for more than thirty days shall be temporarily seeded.
3. Erosion and sedimentation controls shall be maintained initial successful establishment of ground cover.
4. No staging of materials or lay down areas shall be located within the resource areas.
5. Paved areas shall be kept free of sediment, and shall be cleaned periodically as required by construction activities.
6. Catch basins shall be periodically inspected for the accumulation of sediment. Catch basins within the project and downstream of work shall have catch basin protection installed and shall be cleaned at the end of the project.
7. Temporary soil stockpiles shall be located within areas consisting of formerly paved or developed surfaces, and will be moved as necessary to accommodate ongoing work.



8. Sediment stockpiles shall have a side slope of no greater than 2:1. Stockpiles shall be rough graded or maintain a roughened surface to prevent erosion. Stockpiles that are not to be used within 7 days shall be seeded after formation of stockpile as to prevent erosion. Straw bale barrier and silt fence shall be installed around stockpile area approximately 10 feet from toe of slope.
9. The contractor is responsible to inspect and repair erosion and sedimentation control measures as required to prevent damage or sedimentation.
10. Upon completion of construction and establishment of permanent ground cover, remove and dispose of temporary erosion control measures. Clean sediment and debris from temporary measures and from permanent storm drain and sanitary sewer systems.

Inspections shall be completed a minimum of every seven (7) calendar days and within 24 hours of the end of a storm event of 0.25 inches or greater. Attached is an example Inspection and Maintenance Report Form.



**INSPECTION AND MAINTENANCE REPORT FORM**

**Reconstruction of Foster Street, Littleton, MA**

*To be completed every 7 calendar days and within 24 hours of the end of a storm event of 0.25 inches or greater*

Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

Inspector's Title and Qualifications: \_\_\_\_\_  
 \_\_\_\_\_

**Summary of Previous 7-day Rainfall:**

Date	Friday Date	Saturday Date	Sunday Date	Monday Date	Tuesday Date	Wednesday Date	Thursday Date
Total Daily Rainfall (in.)							

**Stabilization Measures:**

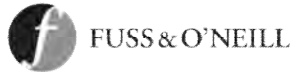
Area	Disturbed (Yes/No)	Stabilized (Yes/No)	Stabilized With	Condition

**Detention Basin #1**

Depth of Infiltration Basin	Condition of Side Slopes	Evidence of Overtopping of Embankments	Condition of Outfall

**Construction Site & Adjacent Areas:**

General condition: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**INSPECTION AND MAINTENANCE REPORT FORM**

**Reconstruction of Foster Street, Littleton, MA**

Is sediment being tracked on to road? \_\_\_\_\_

\_\_\_\_\_

Maintenance required? \_\_\_\_\_

\_\_\_\_\_

**Changes Required to the Pollution Prevention Plan:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Reasons for Changes:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Certification:**

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_





## MEMORANDUM

TO: Town of Littleton

FROM: Fuss & O'Neill, Inc.

DATE: April 18, 2023

RE: Long Term Operation and Maintenance Plan  
Foster Street, Taylor Street, and Grimes Lane Reconstruction

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This Long Term Operation and Maintenance Plan (O&M) is developed for the reconstruction of Foster Street. This O&M has been prepared in accordance the Massachusetts Stormwater Handbook and the Town of Littleton Regulations.

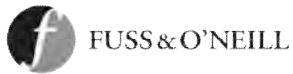
Responsible Party: Town of Littleton  
Department of Public Works  
39 Ayer Rd  
Littleton, MA 01460

It will be the responsibility of the Town of Littleton to comply with this Long Term Operation and Maintenance Plan. Responsibility includes financing, maintenance and emergency repairs. Should the property or any portion of the property be transferred to another owner, that new owner will be notified of the presence of this Long Term Operation and Maintenance Plan and be held responsible for the implementation of this plan and financing as it pertains to their property.

### Operation and Maintenance Plan

The post construction operation and maintenance plan outlined hereafter provides recommendations for periodic inspection and maintenance activities for the stormwater management system. This Long-Term Operation and Maintenance Plan will ensure that the stormwater management system functions as designed throughout the life of the system.

- The stormwater collection systems will be inspected a minimum of four (4) times per year to maintain proper operation. Sediment and debris shall be removed from structures and pipes. Sedimentation will be removed from each deep sump catch basin a minimum of four (4) times a year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe. Deep sump catch basins shall be cleaned at the end of the foliage and snow removal seasons.
- Paved surfaces will be swept twice annually, April and October, to remove sand and debris following winter months.
- Stormwater structures and pipes will be inspected twice annually, April and November, for accumulation of sediment and debris. Clean as required.



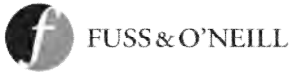
### Location and Access of Stormwater Management System

All components of the stormwater management system are located within Wisdom Way, River Street, and Mill Street. The attached Site Plans provide the location and access for the stormwater management system.

### Records of Maintenance and Repair Activities

The responsible parties shall keep records of installation, maintenance and repairs of the stormwater management facilities. These records shall be retained for the most recent five years be provided to the Conservation Commission annually and upon request. An example Operation and Maintenance Log Form is attached.

Attachments: O&M Log Form



FUSS & O'NEILL

## Post-Construction Operation and Maintenance Log Form

### Foster Street, Taylor Street, and Grimes Lane Littleton, Massachusetts

Project/Location: \_\_\_\_\_

“As Built” Plans Available? \_\_\_\_\_

Date/Time: \_\_\_\_\_

Days Since Previous Rainfall and Rainfall Amount: \_\_\_\_\_

Inspector: \_\_\_\_\_

Maintenance Item	Satisfactory	Unsatisfactory	Comments
<b>1. Street Sweeping - Paved Parking Areas</b>			
<ul style="list-style-type: none"> <li>• evidence of work performed</li> </ul>			
<b>Action to be Taken:</b>			
<b>Date to be Completed by:</b>			
<b>2. Deep Sump Catch Basins</b>			
<ul style="list-style-type: none"> <li>• Sump clean of all sedimentation</li> </ul>			
<b>Action to be Taken:</b>			
<b>Date to be Completed by:</b>			

Source: Adapted from Watershed Management Institute, Inc. 1997. *Operation, Maintenance, and Management of Stormwater Management Systems*. In cooperation with U.S. Environmental Protection Agency, Office of Water. Washington, D.C.



## Appendix H

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### TSS Removal Calculations for Deep Sump Catch Basins





**Project:** Foster Street  
**Site Location:** Foster Street  
 Littleton, MA  
**Project Number:** 20170044.A21  
**Outfall Location:** Resource Areas

**Prepared By:** ATB  
**Date:** 08/11/2023

BMP	TSS Removal Efficiency	Starting TSS Load	TSS Removed	TSS Remaining
deep sump hooded catch basins	25%	1.00	0.25	0.75

<b>Total TSS Removal Efficiency=</b>	<b>25%</b>
--------------------------------------	------------



**Project:** Foster Street  
**Site Location:** Foster Street  
 Littleton, MA  
**Project Number:** 20170044.A21  
**Outfall Location:** No Outfall

**Prepared By:** ATB  
**Date:** 09/14/2023

BMP	TSS Removal Efficiency	Starting TSS Load	TSS Removed	TSS Remaining
Leaching Catch Basin Off line	25%	1.00	0.25	0.75

<b>Total TSS Removal Efficiency=</b>	<b>25%</b>
--------------------------------------	------------



## Appendix I

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### Illicit Impact Statement





Illicit Discharge Statement  
Foster Street, Taylor Street, and Grimes Lane  
Roadway Reconstruction

No illicit discharges are proposed to enter the redeveloped stormwater system located within Foster Street, Taylor Street, and Grimes Lane. Inspection procedures outline in the Long-Term Operation and Maintenance Plan will be strictly followed to ensure contaminations do not enter the stormwater system. Illicit discharge detection and elimination procedures will be implemented routinely by visual inspections to prevent illicit discharges into the stormwater system. Town of Littleton DPW personnel are informed of the illicit discharge detection and elimination procedures and that no illicit discharges are allowed to enter the stormwater system.



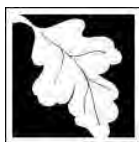


## Appendix J

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### Stormwater Checklist





**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## A. Introduction

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

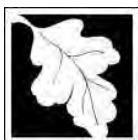
In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

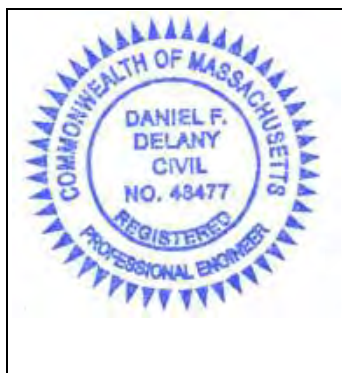
*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

### Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



9/18/23

Signature and Date

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

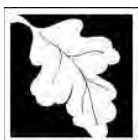
## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
  - Credit 1
  - Credit 2
  - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): \_\_\_\_\_

### Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## Checklist (continued)

### Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
  - Static
  - Simple Dynamic
  - Dynamic Field<sup>1</sup>
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - Site is comprised solely of C and D soils and/or bedrock at the land surface
  - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - Solid Waste Landfill pursuant to 310 CMR 19.000
  - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

<sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## Checklist (continued)

### Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
  - Provisions for storing materials and waste products inside or under cover;
  - Vehicle washing controls;
  - Requirements for routine inspections and maintenance of stormwater BMPs;
  - Spill prevention and response plans;
  - Provisions for maintenance of lawns, gardens, and other landscaped areas;
  - Requirements for storage and use of fertilizers, herbicides, and pesticides;
  - Pet waste management provisions;
  - Provisions for operation and management of septic systems;
  - Provisions for solid waste management;
  - Snow disposal and plowing plans relative to Wetland Resource Areas;
  - Winter Road Salt and/or Sand Use and Storage restrictions;
  - Street sweeping schedules;
  - Provisions for prevention of illicit discharges to the stormwater management system;
  - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
  - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
  - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
  - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
    - is within the Zone II or Interim Wellhead Protection Area
    - is near or to other critical areas
    - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
    - involves runoff from land uses with higher potential pollutant loads.
  - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
  - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## Checklist (continued)

### Standard 4: Water Quality (continued)

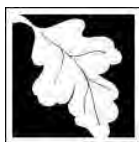
- The BMP is sized (and calculations provided) based on:
  - The ½" or 1" Water Quality Volume or
  - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

### Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



**Massachusetts Department of Environmental Protection**  
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# Checklist for Stormwater Report

## Checklist (continued)

### Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
  - Limited Project
    - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
    - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
    - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
  - Bike Path and/or Foot Path
  - Redevelopment Project
    - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
  - Construction Period Operation and Maintenance Plan;
  - Names of Persons or Entity Responsible for Plan Compliance;
  - Construction Period Pollution Prevention Measures;
  - Erosion and Sedimentation Control Plan Drawings;
  - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
  - Vegetation Planning;
  - Site Development Plan;
  - Construction Sequencing Plan;
  - Sequencing of Erosion and Sedimentation Controls;
  - Operation and Maintenance of Erosion and Sedimentation Controls;
  - Inspection Schedule;
  - Maintenance Schedule;
  - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.





Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands Program

# Checklist for Stormwater Report

## Checklist (continued)

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - Name of the stormwater management system owners;
  - Party responsible for operation and maintenance;
  - Schedule for implementation of routine and non-routine maintenance tasks;
  - Plan showing the location of all stormwater BMPs maintenance access areas;
  - Description and delineation of public safety features;
  - Estimated operation and maintenance budget; and
  - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

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DOCUMENT A00861

**MASSACHUSETTS DEPARTMENT OF  
ENVIRONMENTAL PROTECTION**

**& TOWN OF LITTLETON  
CONSERVATION COMMISSION**

**ORDER OF CONDITIONS –  
MassDEP File No. #204-0991**

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## Littleton Conservation Commission

P.O. Box 1305

37 Shattuck Street

Littleton, MA 01460

Phone: 978 540-2428

FAX: 978 952 2321

E-Mail: [agreen@littletonma.org](mailto:agreen@littletonma.org)

December 12, 2023

Stephen Jahnle  
Littleton DPW  
39 Ayer Road  
Littleton, MA 01460

Re: Order of Conditions for 204-0991 at Foster Street Reconstruction

Dear Mr. Jahnle:

On December 5, 2023 the Littleton Conservation Commission voted to issue the attached Order of Conditions for the above referenced project. While you will be responsible for ALL the Conditions, please note especially the following:

**The following must be done prior to the start of work:**

1. General Conditions (GC) #8: There is a 10-day appeal period from the issuance of the Order of Conditions. If you start work during this time, you are working at your own risk
2. GC #9 and Special Condition Pre-Construction Condition (SC-PC) #1: This Order of Conditions must be registered in the Registry of Deeds, Middlesex South, prior to commencement of any work. As per SC-PC#1, recording information including date, book and page must be submitted to the Littleton Conservation Commission no later than 4 weeks from the date of this Order of Conditions.
3. GC#10: A sign with the MADEP File Number must be displayed prior to work commencing.
4. GC#14 and SC-PC#4: any changes to approved plans shall require the applicant to inquire of the Conservation Commission if the changes are significant enough to require the filing of a new Notice of Intent.
5. SC-C#1 and #10: Contact the Conservation Commission office to review the project before work, other than installation of erosion controls, commences.

You have three years to complete the approved work from the effective date of December 12, 2023, although you may apply for an extension before the Order of Conditions expires. Once work is completed and the site is stabilized, you shall submit a Request for Certificate of Compliance. Please note the Commission must be notified of a transfer of the property any time prior to the issuance of the Certificate of Compliance.

Best of luck moving forward. If you need to change your site plan, please call to discuss.

Sincerely,

Amy Green  
Conservation Agent  
Littleton Conservation Commission

Cc: MADEP

## Littleton Conservation Commission

### MA Wetlands Protection Act and ByLaw Special Order of Conditions

DEP File #204-0991

Owner/Applicant: Littleton Highway Department

Project Title/Address: Foster Street Reconstruction

**Findings:** This Order of Conditions is for pavement reclamation and full depth reconstruction along Foster Street, construction of a 10 foot wide shared-use path, realignment of the Grimes Land and Foster Street intersection and related work. Resource Areas on the property include Bank, Land Under Water, Bordering Vegetated Wetland, Bordering Land Subject to Flooding, as well as the 100-foot buffer zone. The proposed project will have no direct temporary or permanent wetland resource area impacts.

#### **Findings Under the Littleton Wetlands Protection Bylaw Regulations:**

Work will occur within the 50-foot No Disturb Area of the Littleton Wetlands Protection Bylaw regulations. The Commission found, pursuant to Section 1.4 of its Wetlands Protection Regulations, that a waiver of the minimum 50-foot No Disturbance Area (NDA) was in the public interest, consistent with the intent and purpose of the Wetlands Protection Bylaw, and the least environmentally damaging practicable alternative (LEDPA). In granting this waiver, the Commission considered that the project design was altered slightly to provide additional avoidance of work in the NDA, tree replacement plantings are proposed and minor improvement to stormwater drainage/management is proposed.

Under section 6.1(4) of the Bylaw, all activities that result in a net increase of impervious area within the Buffer Zone and Areas Subject to Protection of more than 1,000 sf or 5%, whichever is less, must demonstrate compliance with the Massachusetts Stormwater Standards. The proposed project has demonstrated this compliance in the Notice of Intent and the stormwater analyses provided in the December 1, 2023 Response to Comments.

### **PRE-CONSTRUCTION CONDITIONS**

PC-1. Pursuant to General Condition #9, the Order of Conditions must be registered in the Registry of Deeds, Middlesex South prior to commencement of work. The Littleton Conservation Commission (LCC) hereby orders that it be recorded in the registry and notice filed with the LCC no later than four (4) weeks from the date of this Order of Conditions. Failure to comply with this condition may be deemed cause to revoke this Order of Conditions.

PC-2. This Order of Conditions shall apply to any successor in interest or successor in control of the property. In the event that this property should change in ownership before or during construction or before a Certificate of Compliance is issued, any successor in interest or successor in control of this property shall meet with the LCC before construction shall begin or continue.

PC-3. In conjunction with the sale of the property or any subdivision of the property governed by this Order of Conditions before a Certificate of Compliance is issued the Applicant shall submit to the LCC a signed statement by the buyer that he/she is aware of an outstanding Order or Conditions on the development and has received a copy of this Order of Conditions.

PC-4. Any change or changes made or intended to be made, in the plans shall require the Applicant to file a new Notice of Intent, or to inquire of the LCC in writing whether the change or changes are substantial enough to require a new filing.

PC-5. Members and agents of the LCC shall have the right to enter and inspect the premises at any time and without notice to evaluate compliance with the Order of Conditions, and the LCC may require the submittal of any data necessary for the LCC to evaluate compliance.

PC-6. This document shall be included in all construction contracts and sub-contracts dealing with the work proposed and shall supersede any conflicting contract requirements.

PC-7. This document and approved plans shall be kept available on site at all times in a watertight enclosure.

PC-8. The Applicant/Owner is responsible for ensuring that all persons performing the permitted activities are fully aware of the terms and conditions of this Order.

PC-9. Prior to construction the general contractor shall designate a construction staging area, located outside all resource areas and buffer zones, unless otherwise permitted and on the approved plans. All construction trailers, portable sanitary facilities, material storage and overnight parking of equipment shall be in the staging area. The perimeter of the staging area shall be protected as necessary with silt fence and the ground surface shall be protected with washed stone or another suitable non-erosive material.

PC-10. An area for cleanup and or maintenance of construction equipment shall be designated prior to construction. Any runoff resulting from the washing of trucks or construction equipment (include cement trucks) shall neither be directed to, nor dumped in, any on-site drainage system or in any area subject to protection under the Massachusetts Wetlands Protection Act. Any such washing shall occur in a designated area, protected by washed stone, outside of all resource areas and buffer zones. All construction vehicles exiting the property shall be cleaned of soil prior to traveling on public streets within the Town of Littleton.

PC-11. Prior to commencing any work the Applicant shall provide LCC with a list of all chemicals, pesticides, herbicides, fertilizers, fuels and other potentially hazardous materials anticipated to be used or stored on the premises. This list shall be updated prior to new subcontractors being allowed to store or use potentially hazardous materials on site. The method and location of storage shall be clearly described and shown on a site plan. The Applicant must immediately notify the LCC, Littleton Fire Department, and Mass DEP, when any spill of fuel, oil or hazardous waste occurs.

PC-12. The Applicant must submit, before any construction begins, the Stormwater Pollution Prevention Plan (SWPPP).

PC-13. The Applicant/owner shall designate a SWPPP Monitor for this project. The Monitor's qualifications and contact information shall be submitted to the LCC for approval prior to the start of construction. The Monitor shall be available on a 7 day a week, 24-hour basis to address any emergency situations related to the construction and wetland resources at this location. The Monitor shall also perform inspections on a weekly basis and after all storm events with 0.5-inches or more of rainfall in a 24-hour period. The Monitor shall keep a log of the site conditions during construction, the condition of erosion control devices, and daily weather conditions. The applicant shall provide electronic copies of all site evaluation/inspection reports generated by the environmental monitor to LCC at the frequency of once per week, and shall further provide copies of such reports immediately after all significant storms.



## CONSTRUCTION CONDITIONS

C-1. The Commission will be notified one week prior to construction to allow for a pre-construction meeting. The following people shall, at a minimum, be present: Conservation Agent, the Applicant or their representative, the Contractor, and the individual responsible for erosion control monitoring. The purpose of the pre-construction meeting shall be to review the Order of Conditions, inspect erosion controls, discuss erosion control monitoring and collect the names and numbers of individuals responsible for the daily activities and erosion control at the site.

C-2. During construction, the owner shall identify a person who shall be available either in person or by phone (office, cell or home); this number is to be given to the LCC (or agent) who has the authority to direct the contractor to take measures of erosion and sedimentation control, to receive comments from the LCC or its agent, and cease work.

C-3. The LCC and/or its agent(s) have the authority to inform the owners or their representatives of violations of the erosion and sediment control measures of this Order. Upon such notification the owners shall take immediate action to correct the violation.

C-4. Used petroleum products from the maintenance of construction equipment and any construction debris shall be collected and disposed of off-site in a proper and prompt manner. The construction site shall be maintained in a clean condition.

C-5. No portable toilets, fuel, oil, trash, dumpsters or other possible pollutants/contaminants shall be stored in any resource area or buffer zone, unless specified on the plans for the Order of Conditions. Dumpsters shall be covered.

C-6. No overnight parking or storage of construction vehicles is allowed in resource areas or buffer zones unless specified on the plans for the Order of Conditions. No fueling of construction vehicles is allowed in resource areas or buffer zones.

C-7. During construction, dust control (if required) shall be limited to water; no salts or other wetting agents shall be used.

C-8. Any leakage or spillage of oil, hydraulic fluid, gasoline, or other pollutants must be cleaned up immediately and disposed of off the site. All fueling of equipment shall be performed outside of wetland resource areas and buffer zones. The LCC, Littleton Fire Department, Littleton Water Department and MA Department of Environmental Protection shall be notified immediately in the event of any spillage.

C-9. Appropriate erosion and sediment control measures shall be taken. These measures include but are not limited to:

a) Once begun, the grading and construction shall move uninterrupted to completion to avoid erosion and siltation of the wetlands. If it becomes necessary to delay completion of the project, temporary measures to stabilize sensitive areas are required.

b) As soon as possible during construction all disturbed areas shall be brought to final grade and stabilized with permanent vegetative cover.

c) Storm drainage systems and detention basins shall be constructed during the initial phase of the project so that they may be functional during construction.

d) The Applicant shall have on hand at the start of any soil disturbance removal or stockpiling a sufficient number of straw bales, wattles, silt fence and stakes for the control of emergency erosion prob-

lems. These emergency siltation and sediment control devices shall not be used for the normal control of erosion.

e) If at any time sediment accumulates more than halfway up any portion of the erosion/sedimentation controls, it shall be immediately removed. The erosion/sedimentation controls may not be removed until all sedimentation is removed and area stabilized.

f) Appropriate sedimentation and erosion controls shall be placed around any existing outlet which is to be removed before such removal may commence.

g) Erosion controls shall be installed before any work may begin.

C-10. After the erosion control measures are installed the Applicant or their contractor shall contact the LCC so that the LCC or its agent can inspect and approve the measures before any other activity takes place on the site within a resource area or the Buffer Zone.

C-11. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order of Conditions. Construction equipment is prohibited beyond installed siltation barrier.

C-12. Erosion control methods shall consist of straw bales, 12-inch wattles and/or silt fencing, alone or in combination, as authorized by the LCC. After the erosion control measures are installed the Applicant or their contractor shall contact the LCC so that the LCC or its agent can inspect and approve the measures before any other activity takes place on the site within a resource area or the Buffer Zone.

C-13. The Applicant will be required to ensure proper operations of all sediment and erosion control measures throughout the duration of the project and to provide to the LCC all inspection documentations associated with the SWPPP at the frequency of once per week, and shall further provide copies of such reports immediately after all significant storms. Significant storms shall include rainfall of 1-inch or greater in a 24-hour period or sustained rainfalls in the course of 72-hours. In the event that deficiencies are identified in the SWPPP reporting or the erosion controls, LCC reserves the right to require an Environmental Monitor. Work may not proceed until the Environmental Monitor has been approved by LCC and hired.

C-14. No material stockpiling shall occur in a buffer zone or resource area unless in an area approved in the Notice of Intent plans.

C-15. Unless otherwise already approved on the plans for this Order, any dewatering activities on the project in which water will be directly or indirectly released to a buffer zone, wetland resource area or storm drains shall make use of a stilling pond or similar device to remove sediment before the water is released. Dewatering may commence only after LCC or its agent has been consulted and has approved the location and action in writing.

C-16. If disturbed soils are not to be actively used as part of the construction activities for more than 30 days, they shall be temporarily stabilized unless approved by the LCC. Temporary stabilization methods may include, but are not limited to, seeding, hydroseeding, straw mats, jute netting, sod, mulch, or other LCC approved methods. Continued maintenance of these areas shall be the responsibility of the Applicant. This stabilization must include provision for winter conditions. All disturbed areas within the 100-foot Buffer Zone shall be graded, loamed and seeded prior to November 1st of each year, if possible. No such disturbed areas or stockpiled materials shall be left unprotected or without erosion controls during the winter.

C-17. At the end of each work day the Applicant shall mechanically or manually sweep sediments from adjacent streets and/or sidewalk, unless tracking and sediment is not evident on the streets.

C-18. If unforeseen problems occur during construction which may affect the statutory interests of the Wetlands Protection Act regulations or the Littleton Wetlands Protection Bylaw and regulations, the LCC shall immediately be notified and an immediate meeting held between the LCC, the Applicant and/or the representatives, and other concerned parties to determine the correct measures employed to resolve the issue. The Applicant shall then act to correct the problems using the measures agreed upon. Subsequent to resolution, the Applicant shall document the actions in writing to the LCC.

C-19. Any damage caused as a direct result of this project to any wetland resource areas, except as permitted by this Order of Conditions, shall be the responsibility of the Applicant to repair, restore and/or replace. Sedimentation or erosion into resource areas shall be considered an alteration of that resource area. If such damage occurs, the LCC shall be notified immediately and a plan for abatement and mitigation of the problem shall be submitted for approval and implementation.

C-20. A final list of the proposed replacement trees shall be provided for review to the LCC or its agent prior to purchase.

C-21. Once the site has been stabilized, the Applicant/Owner shall contact the LCC about the removal and proper disposal of all erosion controls. The LCC or its agent may conduct an inspection prior to removal. Removal of said erosion controls shall be accomplished utilizing the least invasive means possible. If silt-sock type material was used, the erosion tube can be sliced and the internal material scattered, but any netting and the siltation fence and stakes must be removed and disposed of properly; The Commission will not issue a Certificate of Compliance until erosion controls are removed and those areas stabilized.

C-22. Two (2) sets of 'as-built' plans for the project, drawn by a registered engineer or architect if the Notice of Intent plans were similarly prepared by a registered professional engineer, shall be submitted to the LCC at the same time as a written request for a Certificate of Compliance (WPA Form 8A) and shall specify in detail how the completed plan differs from that shown on the plans referred to in the Order of Conditions.

## **MITIGATION CONDITIONS**

M-1. The replacement trees shall be monitored for a period of up to two years. Based on MassDOT's Standard Specification 771, the contractor will be responsible for monitoring during the Maintenance Period (60 days) and Establishment Period (1 year). Following that, and once project is turned back over to the town, Littleton Highway will be responsible for the yearly monitoring. Consideration of watering beyond the 60 day Maintenance Period should be considered for success of the plantings.

M-2. **Seasonal monitoring reports** of the replacement trees shall be prepared for a period of two years after installation. This monitoring program will consist of fall inspections and shall include documentation that details the success or failure of the trees. Monitoring reports shall be submitted to the Commission by October 30<sup>th</sup> of each year.

M-3. The targeted success will be 75 percent survivorship; if less than 75 percent of the trees survive, the applicant shall replace the failed plantings.





**Massachusetts Department of Environmental Protection**  
**Bureau of Resource Protection - Wetlands**

**WPA Form 5 – Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40  
 Littleton Wetlands Protection Bylaw

Provided by MassDEP:  
 204-0991 Foster St Recon  
 MassDEP File #

eDEP Transaction #  
 Littleton  
 City/Town

**A. General Information (cont.)**

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

NA

a. County

b. Certificate Number (if registered land)

NA

NA

c. Book

d. Page

7. Dates: 9-28-2023 12-05-2023 12-12-2023  
 a. Date Notice of Intent Filed b. Date Public Hearing Closed c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Foster St Reconstruction Permitting Plan Set

a. Plan Title

Fuss and O'neill

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

Response to ConCom Comments 2023-12-01

9-11-2023

f. Additional Plan or Document Title

g. Date

**B. Findings**

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

- a.  Public Water Supply
- b.  Land Containing Shellfish
- c.  Prevention of Pollution
- d.  Private Water Supply
- e.  Fisheries
- f.  Protection of Wildlife Habitat
- g.  Groundwater Supply
- h.  Storm Damage Prevention
- i.  Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

**Approved** subject to:

- a.  the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



**Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands**

**WPA Form 5 – Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40  
Littleton Wetlands Protection Bylaw

Provided by MassDEP:  
204-0991 Foster St Recon  
MassDEP File #

eDEP Transaction #  
Littleton  
City/Town

**B. Findings (cont.)**

**Denied because:**

- b.  the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c.  the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**
- 3.  Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) 5  
a. linear feet

**Inland Resource Area Impacts:** Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input type="checkbox"/> Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	a. square feet e. c/y dredged	b. square feet f. c/y dredged	c. square feet	d. square feet
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input type="checkbox"/> Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet



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**B. Findings (cont.)**

**Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)**

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	_____	_____	_____	_____
	a. square feet	b. square feet		
	_____	_____	_____	_____
	c. c/y dredged	d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
14. <input type="checkbox"/> Coastal Dunes	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
15. <input type="checkbox"/> Coastal Banks	_____	_____		
	a. linear feet	b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	_____	_____		
	a. square feet	b. square feet		
17. <input type="checkbox"/> Salt Marshes	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	_____	_____		
	a. c/y dredged	b. c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	_____		
	a. square feet	b. square feet		
22. <input type="checkbox"/> Riverfront Area	_____	_____		
	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	_____	_____	_____	_____
	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	_____	_____	_____	_____
	g. square feet	h. square feet	i. square feet	j. square feet



**Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands**

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**B. Findings (cont.)**

\* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23.  Restoration/Enhancement \*:

a. square feet of BVW

b. square feet of salt marsh

24.  Stream Crossing(s):

a. number of new stream crossings

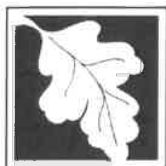
b. number of replacement stream crossings

**C. General Conditions Under Massachusetts Wetlands Protection Act**

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
  - a. The work is a maintenance dredging project as provided for in the Act; or
  - b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
  - c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on \_\_\_\_\_ unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.





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**C. General Conditions Under Massachusetts Wetlands Protection Act**

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
  
9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry’s Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
  
10. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,
 

“Massachusetts Department of Environmental Protection” [or, “MassDEP”]  
 “File Number            204-0991            ”
  
11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
  
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
  
13. The work shall conform to the plans and special conditions referenced in this order.
  
14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
  
15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
  
16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.



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**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- 17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
  
- 18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.
  
- 19. The work associated with this Order (the "Project")
  - (1)  is subject to the Massachusetts Stormwater Standards
  - (2)  is NOT subject to the Massachusetts Stormwater Standards

**If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

- a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.
  
- b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
  - i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
  - ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
  - iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;



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**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

*iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

*v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

*c)* The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement (“O&M Statement”) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan (“O&M Plan”) and certifying the following:

*i.)* the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

*ii.)* the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

*d)* Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

*e)* Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

*f)* The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



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**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- g) The responsible party shall:
  - 1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
  - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
  - 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
- k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
- l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

**SEE ATTACHED**

- 20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.



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**D. Findings Under Municipal Wetlands Bylaw or Ordinance**

- 1. Is a municipal wetlands bylaw or ordinance applicable?  Yes     No
- 2. The Littleton hereby finds (check one that applies):  
Conservation Commission

- a.  that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw	2. Citation
---------------------------------	-------------

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- b.  that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

<u>Littleton Wetlands Protection Bylaw</u>	<u>Ch 171</u>
1. Municipal Ordinance or Bylaw	2. Citation

- 3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):  
**SEE ATTACHED**

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**Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands**

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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40  
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**E. Signatures**

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

12-12-2023  
1. Date of Issuance

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

4  
2. Number of Signers

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

The individuals whose electronic signatures are affixed below have authorized the Conservation Coordinator to sign on their behalf pursuant to the vote on 12-05-2023 approving this Order of Conditions and the signature authorization recorded with the Middlesex South Registry of Deeds in Book 74580, Page 442. They also intend for their electronic signatures to serve as their signatures for any entity (such as MassDEP) that accepts electronic signatures.

Signatures:

DocuSigned by:  
Andrew Sammarco  
DocuSigned by:  
EBAF7E145FBC4C8...  
ed fulter  
88205427DABA4D2...

DocuSigned by:  
Kyle Maxfield  
DocuSigned by:  
9D0E20A09224B7...  
Michael J Livingston  
9D5A875036DC4ED...

Amy Green  
Amy Green, for the Conservation Commission  
pursuant to the above-referenced authorization

by hand delivery on

by certified mail, return receipt requested, on

Date

Date

12-12-2023



**Massachusetts Department of Environmental Protection**  
**Bureau of Resource Protection - Wetlands**

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**F. Appeals**

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department’s Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.



**Massachusetts Department of Environmental Protection**  
**Bureau of Resource Protection - Wetlands**

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**G. Recording Information**

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission

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

To:

Conservation Commission

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

Project Location

MassDEP File Number

Has been recorded at the Registry of Deeds of:

County

Book

Page

for: Property Owner

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

Book

Page

In accordance with the Order of Conditions issued on:

Date

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

Instrument Number

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

Document Number

Signature of Applicant





**Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands**

DEP File Number:

**Request for Departmental Action Fee  
Transmittal Form**

Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**A. Request Information**

1. Location of Project

a. Street Address	b. City/Town, Zip
c. Check number	d. Fee amount

2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town	State	Zip Code
Phone Number	Fax Number (if applicable)	

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town	State	Zip Code
Phone Number	Fax Number (if applicable)	

4. DEP File Number:

\_\_\_\_\_

**Important:**  
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



**B. Instructions**

1. When the Departmental action request is for (check one):

- Superseding Order of Conditions – Fee: \$120.00 (single family house projects) or \$245 (all other projects)
- Superseding Determination of Applicability – Fee: \$120
- Superseding Order of Resource Area Delineation – Fee: \$120



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**Request for Departmental Action Fee  
Transmittal Form**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

\_\_\_\_\_  
Provided by DEP

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**B. Instructions (cont.)**

Send this form and check or money order, payable to the *Commonwealth of Massachusetts*, to:

Department of Environmental Protection  
Box 4062  
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.
3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see <https://www.mass.gov/service-details/massdep-regional-offices-by-community>).
4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

DOCUMENT A00872

**USFWS - FHWA, FRA & FTA  
INDIANA BAT & NORTHERN LONG-EARED BAT**

**PROGRAMMATIC BIOLOGICAL OPINION –  
NLAA CONCURRENCE VERIFICATION LETTER**

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## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New England Ecological Services Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5094  
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:

January 20, 2023

Project code: 2023-0033815

Project Name: 609054 - LITTLETON- RECONSTRUCTION OF FOSTER STREET

Subject: Concurrence verification letter for the '609054 - LITTLETON- RECONSTRUCTION OF FOSTER STREET' 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 January 20, 2023 to verify that the **609054 - LITTLETON- RECONSTRUCTION OF FOSTER STREET** (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.

NOTE: The Service reclassified the NLEB as an endangered species on November 30, 2022. This ruling becomes effective on January 30, 2023. This NLAA determination does not require reinitiation. For projects requiring consultation after the effective date of January 30, 2023, please use the 2022 FHWA, FRA, FTA PBO.

**For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:** If your initial bridge/culvert or structure assessment documented signs of bat use or occupancy, or an assessment failed to detect Indiana bats and/or NLEBs, yet are later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of any potential take. In these instances, potential incidental take of Indiana bats and/or NLEBs is covered under the Incidental Take Statement in the 2018 FHWA, FRA, FTA PBO (provided that the take is reported to the Service).

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or Northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required. 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***

609054 - LITTLETON- RECONSTRUCTION OF FOSTER STREET

### ***Description***

609054 - LITTLETON- RECONSTRUCTION OF FOSTER STREET

Project includes milling with box widening and resurfacing of approximately 3,850 L.F. of Foster Street to obtain a 32 foot roadway cross section. This includes 5 foot bicycle lanes in each direction. The primary improvement on foster street will be the installation of a new 5' concrete sidewalk on the north side of Foster Street, beginning at the intersection of Taylor Street extending easterly to the MBTA station and connecting to the existing Balsam Lane neighborhood sidewalk network. Associated work includes: improvements to the closed drainage system- (addition of short segments of trunk line), installation of granite and asphalt berm, advanced warning signs and pavement marking upgrades to the MBTA at grade crossing, pavement milling, retaining walls at select locations, and guardrail installations. Pedestrian flashing beacons are proposed at the project limit at Balsam Lane and at a mid block crosswalk at Medtronic (private driveway). Pedestrian level Lighting along foster street in front of the MBTA station is included to enhance the user experience and provide additional level of safety and security. Lighting shall be reviewed during preliminary design. 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**

- 609054\_MassDOT\_Littleton\_NLEB Memo-Final.pdf <https://ipac.ecosphere.fws.gov/project/MSL46C6XWBE3LNC4F5ZWCO5WY/projectDocuments/121156787>

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 triangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

No

15. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

Yes

16. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

*C) During both the active and inactive seasons*

17. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

Yes

18. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

No

19. Are *all* trees that are being removed clearly demarcated?

Yes

20. Will the removal of habitat or the removal/trimming of trees involve the use of **temporary** lighting?

Yes

21. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?  
*Yes*
22. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?  
*No*
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)?  
*No*
25. 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*
26. 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*
27. 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*
28. Will the project install *any* new or replace any existing **permanent** lighting in addition to the lighting already indicated for habitat removal (including the removal or trimming of trees) or bridge/structure removal, replacement or maintenance activities?  
*Yes*
29. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **permanent** lighting (other than the lighting already indicated for habitat removal (including the removal or trimming of trees) or bridge/structure removal, replacement or maintenance activities) will be installed or replaced?  
*Yes*
30. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?  
*Yes*

31. Will the activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season<sup>[1]</sup>?

[1] Coordinate with the local Service Field Office for appropriate dates.

Yes

32. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season<sup>[1]</sup>?

[1] Coordinate with the local Service Field Office for appropriate dates.

Yes

33. 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

34. Will the project raise the road profile **above the tree canopy**?

No

35. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

**Automatically answered**

*Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.*

36. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) and/or increase noise levels above existing traffic/background levels consistent with a No Effect determination in this key?

**Automatically answered**

*Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the inactive season*

37. 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.*

**38. 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.

2

## Avoidance And Minimization Measures (AMMs)

This determination key result includes the committment 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 December 01, 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: Penelope Pappas

Address: 10 Park Plaza

City: Boston

State: MA

Zip: 02116

Email penelope.e.pappas@dot.state.ma.us

Phone: 8574452880

## **Lead Agency Contact Information**

Lead Agency: Federal Highway Administration

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DOCUMENT A00875

**POLICY DIRECTIVE P-22-001**

**AND**

**POLICY DIRECTIVE P-22-002**

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Number:           P-22-001            
Date:           9/23/22          

# **POLICY DIRECTIVE**

Jonathan Gulliver (signature on original)  
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HIGHWAY ADMINISTRATOR

## **Off-Site Stockpiling of Soil from MassDOT Construction Projects**

### **Purpose**

The purpose of this Policy Directive is to formally establish a policy and procedures for managing and stockpiling soil generated and transported from MassDOT construction projects. This Policy Directive does not supersede any Federal, State, or Local regulations.

### **Date of Effect**

This Policy Directive is effective immediately for all projects, including active construction projects.

For active construction projects and for other projects advertised prior to October 15, 2022, changes to the contract documents needed to implement the requirements of this Policy Directive will be considered on a case-by-case basis and shall be approved by the District Highway Director, as necessary.

For projects advertised on or after October 15, 2022, MassDOT will include the requirements and implementation procedures of this Policy Directive in the construction contract documents.

### **Policy Requirements**

This policy is intended to prevent the off-site relocation of excavated soil generated from MassDOT projects to areas near residential receptors and to control potential fugitive dusts and/or contaminants. To that end, excavated soil may not be moved from the project site without knowledge of the content of the material. Knowledge may include visual field observations for presence of staining, odor, and/or debris, screening with a photoionization detector (PID), laboratory analysis, and/or site history. Pavement millings and other non-soil materials are not subject to the requirements of this Policy Directive.

Moving soil from a MassDOT project site to a temporary off-site storage location must be approved in writing by the District Highway Director.

The Contractor must select a storage location that is at least 500 feet away from residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially

zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.

Temporary off-site storage of excavated soil from a MassDOT project is only permissible at a location approved and permitted by MassDOT. The temporary storage location should be located within the same municipality where the soil was excavated, where possible. Stockpiled soil must be securely covered, and appropriate measures must be taken to minimize fugitive dust and erosion.

Signs indicating the source of the soil, the date the soil was generated, and contact information must be erected and maintained until the stockpiled soils are transported to a disposal facility or reused on the project site.

### **Implementation Procedures**

To ensure that off-site storage of excavated soils is managed properly on MassDOT projects, this policy requires the following:

#### **1. Off-Site Stockpile Storage Locations**

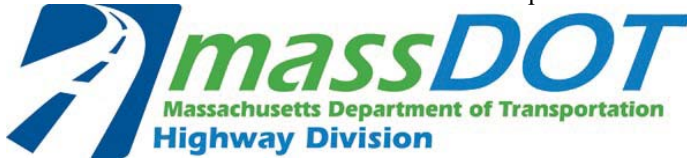
- a. The Contractor shall provide proposed off-site storage locations to the Engineer for approval at least 30 days prior to transporting soil off site. Off-site storage locations should be in the same municipality as the work site.
- b. The Contractor shall keep excavated soil on site until adequately characterized to the satisfaction of the Engineer.
- c. The Contractor shall provide notification of the approved off-site storage location to the local Board of Health and the Town Manager's/Mayor's Office at least 7-days prior to transporting soil off site.
- d. The Contractor shall provide the Engineer with at least 3-days' notice prior to transporting soil off site.
- e. For off-site storage locations on MassDOT property, the Contractor is required to obtain an Access Permit through the District Permits Office prior to storage of soil or other materials. MassDOT will issue these permits at no cost to the Contractor. Information to be submitted by the Contractor as part of the permit application shall include:
  - i. A description of material to be stored off-site, including available analytical data;
  - ii. A figure of the location with distances to residences and residential receptors; and
  - iii. Anticipated duration of temporary storage.
- f. Stockpile locations should not be within 500 feet of residential receptors (e.g., residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities).
  - i. If the stockpile location must be within 500 feet of residential receptors, then soil must be less than RCS-1 (per 310 CMR 40.1600) and free of potentially hazardous or regulated items.

- g. For off-site storage locations on non-MassDOT property, the Contractor must notify the property owner(s) at least 7 days prior to transporting material.
- h. Exceptions to these rules will be reviewed by MassDOT and may be approved by the District Highway Director on a case-by-case basis.

## **2. Off-Site Stockpile Management**

- a. The Contractor shall keep soil stockpiles on impermeable surfaces (e.g., asphalt or concrete) or on 10-mil polyethylene sheeting.
- b. The Contractor shall cover soil stockpiles with 10-mil polyethylene sheeting and surround with a berm made of hay bales, straw wattles, or similar.
  - i. Piles that are actively being worked on must be covered and re-secured at the end of the work shift.
- c. The Contractor shall label stockpiles with signs, including:
  - i. Location of origin (including any Release Tracking Numbers)
  - ii. Stockpile ID number (including MassDOT District office-assigned tracking ID, if different)
  - iii. Date of initial accumulation
  - iv. Applicable telephone numbers for the Contractor and MassDOT.
- d. The Contractor shall mitigate fugitive dust at storage locations under the direction of an appropriately trained/certified environmental professional.
- e. The Contractor shall remedy noncompliance with this policy within 48 hours.
- f. The Contractor shall remedy noncompliance with this policy on the SAME DAY for potentially hazardous material, as determined by the Engineer.
- g. The Contractor shall handle excavated soil according to federal, state, and local regulations.
- h. The Contractor shall use appropriate shipping documents for all movements of excavated soil on public roadways (e.g., Bill of Lading, Material Shipping Record, Manifest, Asbestos Waste Shipment Record, etc.).

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Number:           P-22-002            
Date:           9/23/22          

# **POLICY DIRECTIVE**

Jonathan Gulliver (signature on original)  
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HIGHWAY ADMINISTRATOR

## **Use of MassDOT Property for Staging and other Construction-Related Operations**

### **Purpose**

This Policy Directive is intended to address the use of MassDOT property by MassDOT Contractors for construction staging and other construction-related operations that are not specifically defined in the construction contract. Such use of MassDOT property will only be allowed if permitted by the District Office in accordance with 700 CMR 13.00, Approval of Access to MassDOT Highways and Other Property. This includes the use of MassDOT property for staging, laydown, and storage of equipment and materials, including soil excavated from a project site.

This Policy Directive requires the Contractor/applicant to obtain a Non-Vehicular Access Permit from MassDOT to use MassDOT property for these purposes.

This Policy Directive is effective immediately and applies to all MassDOT construction projects.

### **General Permit Considerations and Conditions**

In addition to other normal MassDOT Access Permit procedures, MassDOT shall consider the following during the application, review, implementation and monitoring processes of Access Permits required by this Policy Directive:

- Storage and placement of the Contractor’s equipment and materials should not be allowed within the clear zone of the roadway.
- Stockpiled soils should not be located within 500 feet of residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.
- The Contractor/applicant shall identify the access/egress locations of the proposed storage areas. MassDOT will only approve locations determined to be safe for roadway users, construction workers and the general public.
- The Contractor may be required to submit a Traffic Management Plan and/or Lighting Plan for MassDOT review and approval as part of the permit application, depending on the proposed use of the area.

- The Contractor shall submit the permit application through MassDOT's online State Highway Access Permit System (SHAPS).
- MassDOT will waive the permit application fee for any application received from a MassDOT Contractor for any permit required by this Policy Directive and will waive any subsequent amendment and extension fees that may otherwise be required.
- MassDOT will review the permit application in accordance with applicable standard procedures and will apply standard permit terms and conditions, as necessary.
- The Resident Engineer will verify that the permit is approved before allowing the Contractor to use the affected area for the requested purpose.
- Areas permitted are for use by the approved applicant only and are not to be shared with or used by other vendors. Subcontractors specifically engaged with the applicant working on the specific MassDOT project will be allowed to use the area in accordance with the terms of the permit.
- Permits are issued on an annual basis and will require the Contractor to file for an extension each year to continue use.

### **Exemptions from Permit Requirements**

Equipment and materials being used for active construction operations and located within the work zone of the construction contract are exempt from this permit requirement, provided they do not interfere with the safety or operation of the roadway or the work zone. Examples of these types of exempt uses are:

- Equipment and materials parked or stored within a protected (barriered) work zone.
- Materials placed in the work zone prior to same-day installation or use.
- Soils excavated temporarily and scheduled to be replaced, such as for trenching operations or for installation of drainage structures.



DOCUMENT B00420

**PROPOSAL**

**LITTLETON**

For: **Reconstruction of Foster Street**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the Town of **LITTLETON** in Middlesex County, in the Commonwealth of Massachusetts, and is shown by the locus map (Document 00331) in the Proposal Pamphlet, the work locations extend as follows:

**Foster Street**

**Begin – Sta. 00+00.00 +/-**

**End – Sta. 39+36.15 +/-**

**Taylor Street**

**Begin – Sta. 201 + 28.19 +/-**

**End – Sta. 205 + 00.00 +/-**

The contract prices shall include the furnishing of all materials (except as otherwise herein specified), the performing of all the labor requisite or proper, the providing of all necessary machinery, tools, apparatus and other means of construction, the doing of all the abovementioned work in the manner set forth, described and shown in the specifications and on the drawings for the work, and in the form of contract, and the completion thereof within **730 CALENDAR DAYS** upon receipt of a Notice to Proceed, except that if the completion date falls between December 1 and March 15 then the same number of days beyond December 1st will be extended after March 15<sup>th</sup>.

**The Work of this project is described by the following Items and quantities.**

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Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
100.	1	SCHEDULE OF OPERATIONS - FIXED PRICE \$42000.00  AT Forty Two Thousand Dollars LUMP SUM	\$42,000.00	\$42,000.00
101.	0.8	CLEARING AND GRUBBING  AT _____ PER ACRE		
102.	0.8	SELECTIVE CLEARING AND THINNING  AT _____ PER ACRE		
102.001	8	TREE TRIMMING CREW  AT _____ PER HOUR		
102.33	16	INVASIVE PLANT MANAGEMENT STRATEGY  AT _____ PER HOUR		
102.511	27	TREE PROTECTION - ARMORING AND PRUNING  AT _____ EACH		
102.513	500	TREE PROTECTION - AIR EXCAVATION AND ROOT PRUNING  AT _____ PER FOOT		
102.533	500	TREE CARE - WATERING  AT _____ PER GALLON		
102.55	12	ARBORIST  AT _____ PER HOUR		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
103.	3	TREE REMOVED - DIAMETER UNDER 24 INCHES  AT _____ EACH		
104.	4	TREE REMOVED - DIAMETER 24 INCHES AND OVER  AT _____ EACH		
105.	1	STUMP REMOVED  AT _____ EACH		
120.	7,000	EARTH EXCAVATION  AT _____ PER CUBIC YARD		
121.	170	CLASS A ROCK EXCAVATION  AT _____ PER CUBIC YARD		
129.2	11,150	OLD PAVEMENT EXCAVATION  AT _____ PER SQUARE YARD		
141.	170	CLASS A TRENCH EXCAVATION  AT _____ PER CUBIC YARD		
141.101	150	TEST PIT FOR EXPLORATION-VACUUM TRUCK  AT _____ PER CUBIC YARD		
141.2	10	TEST PIT FOR GROUNDWATER  AT _____ PER CUBIC YARD		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
142.	1,570	CLASS B TRENCH EXCAVATION  AT _____ PER CUBIC YARD		
144.	120	CLASS B ROCK EXCAVATION  AT _____ PER CUBIC YARD		
146.	8	DRAINAGE STRUCTURE REMOVED  AT _____ EACH		
151.	4,940	GRAVEL BORROW  AT _____ PER CUBIC YARD		
152.	10	PROCESSED GRAVEL  AT _____ PER CUBIC YARD		
153.01	90	CONTROLLED DENSITY FILL FOR WATER MAIN  AT _____ PER CUBIC YARD		
156.	755	CRUSHED STONE  AT _____ PER TON		
170.	16,150	FINE GRADING AND COMPACTING - SUBGRADE AREA  AT _____ PER SQUARE YARD		
180.01	1	ENVIRONMENTAL HEALTH AND SAFETY PROGRAM  AT _____ LUMP SUM		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
180.02	40	PERSONAL PROTECTION LEVEL C UPGRADE  AT _____ PER HOUR		
180.03	40	LICENSED SITE PROFESSIONAL SERVICES  AT _____ PER HOUR		
181.11	40	DISPOSAL OF UNREGULATED SOIL  AT _____ PER TON		
181.12	10	DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY  AT _____ PER TON		
181.13	10	DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY  AT _____ PER TON		
181.14	10	DISPOSAL OF HAZARDOUS WASTE  AT _____ PER TON		
182.1	1	INSPECTION AND TESTING FOR ASBESTOS  AT _____ LUMP SUM		
182.2	30	REMOVAL OF ASBESTOS  AT _____ PER FOOT		
201.	31	CATCH BASIN  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
201.3	1	SPECIAL CATCH BASIN  AT _____ EACH		
202.	11	MANHOLE  AT _____ EACH		
202.2	1	MANHOLE (9 TO 14 FOOT DEPTH)  AT _____ EACH		
204.	2	GUTTER INLET  AT _____ EACH		
205.01	5	LEACHING BASIN  AT _____ EACH		
220.	11	DRAINAGE STRUCTURE ADJUSTED  AT _____ EACH		
220.3	1	DRAINAGE STRUCTURE CHANGE IN TYPE  AT _____ EACH		
220.5	20	DRAINAGE STRUCTURE REMODELED  AT _____ EACH		
221.	15	FRAME AND COVER  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
222.1	21	FRAME AND GRATE - MASSDOT CASCADE TYPE  AT _____ EACH		
223.1	11	FRAME AND GRATE (OR COVER) REMOVED AND STACKED  AT _____ EACH		
227.3	30	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT  AT _____ PER CUBIC YARD		
227.31	1,190	REMOVAL OF DRAINAGE PIPE SEDIMENT  AT _____ PER FOOT		
227.4	5	MASONRY PLUG  AT _____ PER SQUARE FOOT		
241.12	1,520	12 INCH REINFORCED CONCRETE PIPE CLASS III  AT _____ PER FOOT		
241.15	150	15 INCH REINFORCED CONCRETE PIPE CLASS III  AT _____ PER FOOT		
242.12	2	12 INCH REINFORCED CONCRETE PIPE FLARED END  AT _____ EACH		
258.	90	STONE FOR PIPE ENDS  AT _____ PER SQUARE YARD		



Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
303.061	170	6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)  AT _____ PER FOOT		
303.081	55	8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)  AT _____ PER FOOT		
303.101	3,830	10 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)  AT _____ PER FOOT		
309.01	2,210	DUCTILE IRON FITTINGS FOR WATER PIPE  AT _____ PER POUND		
336.101	120	1 INCH POLYETHYLENE WATER SERVICE LINE  AT _____ PER FOOT		
336.102	35	2 INCH POLYETHYLENE WATER SERVICE LINE  AT _____ PER FOOT		
350.061	8	6 INCH GATE AND GATE BOX  AT _____ EACH		
350.081	3	8 INCH GATE AND GATE BOX  AT _____ EACH		
350.101	10	10 INCH GATE AND GATE BOX  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
358.	4	GATE BOX ADJUSTED  AT _____ EACH		
358.1	6	GATE BOX REMOVED AND STACKED  AT _____ EACH		
363.101	9	1 INCH CORPORATION COCK  AT _____ EACH		
363.102	1	2 INCH CORPORATION COCK  AT _____ EACH		
371.08	2	8 INCH COUPLING  AT _____ EACH		
371.10	1	10 INCH COUPLING  AT _____ EACH		
376.01	6	HYDRANT - TOWN STANDARD  AT _____ EACH		
376.3	5	HYDRANT - REMOVED AND STACKED  AT _____ EACH		
384.	6	CURB STOP  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
402.	1,270	DENSE GRADED CRUSHED STONE FOR SUB-BASE  AT _____ PER CUBIC YARD		
402.12	150	DENSE GRADED CRUSHED STONE FOR SHOULDERS  AT _____ PER CUBIC YARD		
415.2	290	PAVEMENT FINE MILLING  AT _____ PER SQUARE YARD		
440.	90,430	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL  AT _____ PER POUND		
443.	61	WATER FOR ROADWAY DUST CONTROL  AT _____ PER 1000 GALLONS		
450.22	1,280	SUPERPAVE SURFACE COURSE – 9.5 (SSC – 9.5)  AT _____ PER TON		
450.31	1,120	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC -12.5)  AT _____ PER TON		
450.32	2,760	SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0)  AT _____ PER TON		
451.	2	HMA FOR PATCHING  AT _____ PER TON		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
452.	1,550	ASPHALT EMULSION FOR TACK COAT  AT _____ PER GALLON		
453.	840	HMA JOINT ADHESIVE  AT _____ PER FOOT		
470.2	70	HOT MIX ASPHALT BERM, TYPE A - MODIFIED  AT _____ PER FOOT		
472.	335	TEMPORARY ASPHALT PATCHING  AT _____ PER TON		
506.	4,050	GRANITE CURB TYPE VB - STRAIGHT  AT _____ PER FOOT		
506.1	540	GRANITE CURB TYPE VB - CURVED  AT _____ PER FOOT		
509.	160	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT  AT _____ PER FOOT		
509.1	300	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - CURVED  AT _____ PER FOOT		
514.	2	GRANITE CURB INLET - STRAIGHT  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
580.	30	CURB REMOVED AND RESET  AT _____ PER FOOT		
590.	70	CURB REMOVED AND STACKED  AT _____ PER FOOT		
594.	1,270	CURB REMOVED AND DISCARDED  AT _____ PER FOOT		
620.12	1,930	GUARDRAIL, TL-2 (SINGLE FACED)  AT _____ PER FOOT		
620.32	30	GUARDRAIL - CURVED, TL-2 (SINGLE FACED)  AT _____ PER FOOT		
627.82	15	GUARDRAIL TANGENT END TREATMENT, TL-2  AT _____ EACH		
627.92	3	GUARDRAIL FLARED END TREATMENT, TL-2  AT _____ EACH		
628.21	1	TRANSITION TO NCHRP 350 GUARDRAIL  AT _____ EACH		
628.22	1	TRANSITION TO RIGID BARRIER (SINGLE FACED)  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
630.	80	HIGHWAY GUARD REMOVED AND RESET  AT _____ PER FOOT		
630.2	80	HIGHWAY GUARD REMOVED AND DISCARDED  AT _____ PER FOOT		
655.03	540	TIMBER FENCE - THREE RAIL  AT _____ US DOLLARS		
669.	40	FENCE REMOVED AND STACKED  AT _____ PER FOOT		
675.2	26	LANDSCAPE BOULDER BARRIER REMOVED AND DISCARDED  AT _____ EACH		
675.201	16	LANDSCAPE BOULDER BARRIER REMOVED AND RESET  AT _____ EACH		
685.	50	STONE MASONRY WALL IN CEMENT MORTAR  AT _____ PER CUBIC YARD		
691.01	1,410	BALANCE STONE WALL REMOVED AND REBUILT  AT _____ PER FOOT		
691.1	180	BALANCE STONE WALL REMOVED AND DISCARDED  AT _____ PER FOOT		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
697.1	38	SILT SACK  AT _____ EACH		
698.3	865	GEOTEXTILE FABRIC FOR SEPARATION  AT _____ PER SQUARE YARD		
701.	70	CEMENT CONCRETE SIDEWALK  AT _____ PER SQUARE YARD		
701.2	690	CEMENT CONCRETE PEDESTRIAN CURB RAMP  AT _____ PER SQUARE YARD		
702.	80	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY  AT _____ PER TON		
710.4	2	BOUND - PLAIN GRANITE  AT _____ EACH		
711.	8	BOUND REMOVED AND RESET  AT _____ EACH		
715.	9	RURAL MAIL BOX REMOVED AND RESET  AT _____ EACH		
740.	24	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A)  AT _____ PER MONTH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
748.	1	MOBILIZATION  AT _____ LUMP SUM		
751.	650	LOAM FOR ROADSIDES  AT _____ PER CUBIC YARD		
751.1	150	LOAM FOR LAWNS  AT _____ PER CUBIC YARD		
755.86	1	SEASONAL TREE MONITORING REPORT  AT _____ LUMP SUM		
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN  AT _____ LUMP SUM		
757.	1	VIBRATION MONITORING  AT _____ LUMP SUM		
765.	4,400	SEEDING  AT _____ PER SQUARE YARD		
765.21	1	ANNUAL COVER CROP FOR NATIVE SEEDING  AT _____ PER POUND		
765.490	2	NEW ENGLAND ROADSIDE WET MEADOW SEED MIX  AT _____ PER POUND		



Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
765.635	128	NATIVE SEEDING AND ESTABLISHMENT  AT _____ PER SQUARE YARD		
767.121	2,914	SEDIMENT CONTROL BARRIER  AT _____ PER FOOT		
767.78	128	COMPOSTED MULCH OVER MODIFIED ROCK  AT _____ PER SQUARE YARD		
769.	2,060	PAVEMENT MILLING MULCH UNDER GUARD RAIL  AT _____ PER FOOT		
776.525	19	MAPLE - RED KARPICK 2-2.5 INCH CALIPER  AT _____ EACH		
777.138	12	OAK - PIN 2-2.5 INCH CALIPER  AT _____ EACH		
777.241	5	OAK - SCARLET 2-2.5 INCH CALIPER  AT _____ EACH		
777.671	8	BLACK GUM - 2-2.5 INCH CALIPER  AT _____ EACH		
778.399	6	CHOKE CHERRY - 1.5-2 INCH CALIPER  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
781.284	7	HAWTHORN - COCKSPUR 1.5-2 INCH CALIPER  AT _____ EACH		
782.537	10	REDBUD - EASTERN 6-8 FEET CLUMP - 1.5 INCH CALIPER  AT _____ EACH		
783.031	28	SERVICEBERRY - ROBIN HILL 1.5-2 INCH (SINGLE STEM)  AT _____ EACH		
787.045	19	RHODODENDRON - WHITE CATAWBA 3 GAL.  AT _____ EACH		
806.4	118	4 INCH ELECTRICAL CONDUIT TYPE RM - GALVANIZED STEEL  AT _____ PER FOOT		
824.221	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR) LOC.1  AT _____ LUMP SUM		
824.222	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR) LOC.2  AT _____ LUMP SUM		
824.223	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR) LOC.3  AT _____ LUMP SUM		
827.22	4	36 INCH WARNING CLUSTER (H1-2) - ALUMINUM PANEL (TYPE A)  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
832.	455	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A)  AT _____ PER SQUARE FOOT		
833.7	18	DELINEATION FOR GUARD RAIL TERMINI  AT _____ EACH		
847.11	15	TIMBER SIGN POST  AT _____ EACH		
847.12	66	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL (BLACK)  AT _____ EACH		
850.41	140	ROADWAY FLAGGER  AT _____ PER HOUR		
851.1	435	TRAFFIC CONES FOR TRAFFIC MANAGEMENT  AT _____ PER DAY		
852.	760	SAFETY SIGNING FOR TRAFFIC MANAGEMENT  AT _____ PER SQUARE FOOT		
852.11	300	TEMPORARY PEDESTRIAN BARRICADE  AT _____ PER FOOT		
852.12	2	TEMPORARY PEDESTRIAN CURB RAMP  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
853.1	2	PORTABLE BREAKAWAY BARRICADE TYPE III  AT _____ EACH		
853.21	20	TEMPORARY BARRIER REMOVED AND RESET  AT _____ PER FOOT		
854.016	15,690	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED)  AT _____ PER FOOT		
854.036	1,050	TEMPORARY PAVING MARKINGS - 6 INCH (TAPE)  AT _____ PER FOOT		
854.1	680	PAVEMENT MARKING REMOVAL  AT _____ PER SQUARE FOOT		
856.	20	ARROW BOARD  AT _____ PER DAY		
856.12	120	PORTABLE CHANGEABLE MESSAGE SIGN  AT _____ PER DAY		
859.	119,842	REFLECTORIZED DRUM  AT _____ PER DAY		
860.112	15	12 INCH REFLECTORIZED WHITE LINE (PAINTED)  AT _____ PER FOOT		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
861.044	820	4 INCH REFLECTORIZED YELLOW LINE (PAINTED)  AT _____ PER FOOT		
864.04	230	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC)  AT _____ PER SQUARE FOOT		
865.	2,270	CROSS WALKS REFL. WHITE (THERMOPLASTIC)  AT _____ PER SQUARE FOOT		
865.01	790	HIGH FRICTION SURFACE TREATMENT - GREEN (BIKE LANES)  AT _____ PER SQUARE FOOT		
865.16	4	PREFORMED THERMOPLASTIC BIKE LANE MARKINGS - WHITE  AT _____ EACH		
868.106	7,675	6 INCH WET REFLECTORIZED RECESSED WHITE LINE (THERMOPLASTIC)  AT _____ PER FOOT		
868.112	320	12 INCH WET REFLECTORIZED RECESSED WHITE LINE (THERMOPLASTIC)  AT _____ PER FOOT		
869.106	8,010	6 INCH WET REFLECTORIZED RECESSED YELLOW LINE (THERMOPLASTIC)  AT _____ PER FOOT		
874.	8	STREET NAME SIGN  AT _____ EACH		

Project # 609054		Contract # 125644		
Location : LITTLETON				
Description : Reconstruction of Foster Street				
ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
874.2	6	TRAFFIC SIGN REMOVED AND RESET  AT _____ EACH		
874.4	35	TRAFFIC SIGN REMOVED AND STACKED  AT _____ EACH		
874.85	1	PRIVATE SIGN REMOVED AND RESET  AT _____ LUMP SUM		
903.	20	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE  AT _____ PER CUBIC YARD		
986.	135	MODIFIED ROCKFILL  AT _____ PER TON		
<b>Total Qty:</b>		336,544.6		



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DOCUMENT B00854

**DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION  
LETTER OF INTENT**

(To be completed by the DBE – Page 1 of 2)

TO: \_\_\_\_\_ (Prime Bidder)

FROM: \_\_\_\_\_ (DBE Firm)

RE: PROJECT NO.: 609054 FEDERAL AID PROJECT NO.: STP/CMQ/TAP-0033(037)X

PROJECT LOCATION: LITTLETON

DATE OF BID OPENING: \_\_\_\_\_

I, \_\_\_\_\_, **authorized signatory of the above-referenced DBE firm hereby declare:**  
*Print Name*

1. My company is currently certified as a Disadvantaged Business Enterprise (DBE) by the Massachusetts Supplier Diversity Office (“SDO”), formerly known as the State Office of Minority and Women Business Assistance (SOMWBA), as a: (check all applicable, see Section 1 of the Special Provisions For Participation By Disadvantaged Business Enterprises, MassDOT Document 00719 additional guidance is available at Title 49, Code of Federal Regulations, Part 26.55 (49 CFR Part 26.55)):

- CONTRACTOR       REGULAR DEALER       BROKER
- MANUFACTURER       TRUCKING OPERATIONS       PROFESSIONAL SERVICES

2. My firm has the ability to manage, supervise and perform the activity described on page 2 of this Letter of Intent. If you are awarded the contract, my company intends to enter into a contract with your firm to perform the items of work or other activity described on the following sheet for the prices indicated.

3. There have been no changes affecting the ownership, control or independence of my company since my last certification review on \_\_\_\_\_, 20\_\_\_\_. If any such change is planned or occurs prior to my company's completion of this proposed work, I will give prior written notification to your firm and to the Massachusetts Department of Transportation (“MassDOT”) Office of Civil Rights and SDO.

4. I have read the MassDOT proposal for the Project which may be entitled “Project Contract Documents and Special Provisions” or the draft “Contract” which includes MassDOT Document 00719, and acknowledge that my company will comply with that document and the requirements of 49 CFR Part 26.

5. For the purpose of obtaining subcontractor approval from MassDOT, my firm will provide to you:

**A. The following construction work:**

- (i) a resume, stating the qualifications and experience, of the superintendent or foreperson who will supervise on site-work;
- (ii) a list of equipment owned or leased by my firm for use on this project; and
- (iii) a list of all projects (public or private) upon which my firm is currently performing, is committed to perform, or intends to make a commitment to perform. I shall also include, for each project: the name and telephone number of a contact person for the contracting authority, person, or organization; the dollar value of the work; a description of the work; and my firm's work schedule for the project.

**B. The following services, materials or supplies:**

- (i) a written agreement and invoices for the materials or supplies, and any other documents evidencing the terms of providing such items;
- (ii) information concerning brokers fees and commissions for providing services or materials; and
- (iii) a statement concerning whether my firm intends or will be required to use a joint check arrangement; and any other documents that may be required by MassDOT.

\_\_\_\_\_  
*DBE Company Authorized Signature*

Date \_\_\_\_\_

**DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION  
LETTER OF INTENT**

(To be completed by the DBE – Page 2 of 2)

DATE OF BID OPENING: \_\_\_\_\_

PROJECT NUMBER: 609054

FEDERAL AID PROJECT NUMBER: STP/CMQ/TAP-0033(037)X

PROJECT LOCATION: LITTLETON

PRIME BIDDER: \_\_\_\_\_

DBE COMPANY NAME: \_\_\_\_\_

<u>Item number</u> if applicable	<u>NAICS</u> <u>Code</u>	<u>Description of Activity</u> with notations such as Services, or Brokerage, Installation Only, Material Only, or Complete	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
TOTAL AMOUNT:					

*Please give full explanations, attach additional sheets if necessary.*

I HEREBY VERIFY THAT \_\_\_\_\_ WILL SOLELY  
(DBE company name)  
PERFORM THE WORK, OR PROVIDE THE SERVICES OR MATERIALS, AS DESCRIBED ABOVE.

DBE AUTHORIZED SIGNATURE: \_\_\_\_\_

NAME AND TITLE (PRINT): \_\_\_\_\_

TELEPHONE NUMBER: \_\_\_\_\_ FAX NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

DOCUMENT B00855

**DBE JOINT CHECK ARRANGEMENT APPROVAL FORM**

*(to be submitted by Prime Contractor)*

Contract No: 125644 Project No. 609054 Federal Aid No.: STP/CMO/TAP-0033(037)X

Location: LITTLETON Bid Opening Date: \_\_\_\_\_

Project Description: Reconstruction of Foster Street

We have received the attached request for the use of a joint check arrangement from \_\_\_\_\_, a DBE on the above- referenced Contract and \_\_\_\_\_, a Material Supplier/Vendor for the subject Contract. The DBE has complied with the requirements of 49 CFR Part 26.55(c)(1). In particular, the DBE has:

- a written agreement with the material supplier/vendor;
- applied for credit with the subject material supplier and has supplied the vendor's response;
- shown that it will place all orders to the subject material supplier/vendor;
- made and retains all decision-making responsibilities concerning the materials; and
- provided a Joint Check Agreement that is acceptable to MassDOT;

As the Contractor for the Project, we agree to issue joint checks (made payable to the Material Supplier/Vendor and the DBE) for payment of sums due pursuant to invoices from the Supplier/Vendor and DBE.

**Contractor:**

Company Name	Signature Duly Authorized
	Printed Name
Date	Title

**SubContractor:**

Company Name	Signature – Duly Authorized
	Printed Name
Date	Title

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DOCUMENT B00856

**JOINT VENTURE AFFIDAVIT**

*(All Firms)*

- All Information Requested By This Schedule Must Be Answered. Additional Sheets May Be Attached.
- If, there is any change in the information submitted, the Joint Venture parties must inform MassDOT Pre-Qualifications Office (and, if one of the companies is a DBE, the Director of Contract Compliance, Office of Civil Rights) *prior* to such change, in writing, either directly or through the Prime Contractor if the Joint Venture is a subcontractor.
- If the Joint Venture Entity will be the bidder on a prime Contract, it must bid and submit all required documents (insurance, worker’s compensation, bonds, etc.) in the name of the Joint Venture Entity.

**I. Name of Joint Venture:** \_\_\_\_\_

Type of Entity if applicable (Corp., LLC): \_\_\_\_\_ Filing State \_\_\_\_\_

Address of joint venture: \_\_\_\_\_

Phone No(s) for JV Entity: \_\_\_\_\_ E-mail: \_\_\_\_\_

Contact Person(s) \_\_\_\_\_

Tax ID/EIN of Joint Venture: \_\_\_\_\_ Vendor Code: \_\_\_\_\_

**II. Identify each firm or party to the Joint Venture:**

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Phone : \_\_\_\_\_ E-mail: \_\_\_\_\_

Contact person(s) \_\_\_\_\_

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Contact Person(s) \_\_\_\_\_

**III. Describe the role(s) of the each party to the Joint Venture:**

\_\_\_\_\_  
\_\_\_\_\_

- IV. Attach a copy of the Joint Venture Agreement.** The proposed Joint Venture Agreement should include specific details including, but not limited to: (1) the contributions of capital and equipment; (2) work items to be performed by each company’s forces, (3) work items to be performed under the supervision of any DBE Venturer; (4) the commitment of management, supervisory and operative personnel employed by the DBE to be dedicated to the performance of the Project; and (5) warranty, guaranty, and indemnification clauses.

**V. Attach any applicable Corporate or LLC Votes, Authorizations, etc.**

**VI. Ownership of the Joint Venture:**

A. What is the percentage(s) of each company’s ownership in the Joint Venture?

ownership percentage(s): \_\_\_\_\_

ownership percentage(s): \_\_\_\_\_

B. Specify percentages for each of the following (provide narrative descriptions and other detail as applicable):

1. Sharing of profit and loss: \_\_\_\_\_

2. Capital contributions:

(a) Dollar amounts of initial contribution: \_\_\_\_\_

(b) Dollar amounts of anticipated on-going contributions: \_\_\_\_\_

(c) Contributions of equipment (specify types, quality and quantities of equipment to be provided by each firm): \_\_\_\_\_

4. Other applicable ownership interests, including ownership options or other agreements, which restrict or limit ownership and/or control:

\_\_\_\_\_  
\_\_\_\_\_

5. Provide copies of all other written agreements between firms concerning bidding and operation of this Project or projects or contracts.

6. Identify all current contracts and contracts completed during the past two (2) years by either of the Joint Venture partners to this Joint Venture:

\_\_\_\_\_  
\_\_\_\_\_

**VII. Control of and Participation in the Joint Venture.** Identify by name and firm those individuals who are, or will be, responsible for and have the authority to engage in the following management functions and policy decisions. (Indicate any limitations to their authority such as dollar limits and co-signatory requirements.):

A. Joint Venture check signing:

\_\_\_\_\_  
\_\_\_\_\_

B. Authority to enter Contracts on behalf of the Joint Venture:

\_\_\_\_\_  
\_\_\_\_\_

C. Signing, co-signing and/or collateralizing loans:

\_\_\_\_\_  
\_\_\_\_\_

D. Acquisition of lines of credit:

\_\_\_\_\_

\_\_\_\_\_

E. Acquisition and indemnification of payment and performance bonds:

\_\_\_\_\_

\_\_\_\_\_

F. Negotiating and signing labor agreements:

\_\_\_\_\_

\_\_\_\_\_

G. Management of contract performance. *(Identify by name and firm only):*

1. Supervision of field operations: \_\_\_\_\_
2. Major purchases: \_\_\_\_\_
3. Estimating: \_\_\_\_\_
4. Engineering: \_\_\_\_\_

**VIII. Financial Controls of Joint Venture:**

A. Which firm and/or individual will be responsible for keeping the books of account?

\_\_\_\_\_

\_\_\_\_\_

B. Identify the "Managing Partner," if any, and describe the means and measure of their compensation:

\_\_\_\_\_

\_\_\_\_\_

C. What authority does each firm have to commit or obligate the other to insurance and bonding companies, financing institutions, suppliers, subcontractors, and/or other parties participating in the performance of this Contract or the work of this Project?

\_\_\_\_\_

**IX. Personnel of Joint Venture:** State the approximate number of personnel (by trade) needed to perform the Joint Venture's work under this Contract. Indicate whether they will be employees of the majority firm, DBE firm, or the Joint Venture.

	Firm 1 (number)	Firm 2 (number)	Joint Venture (number)
Trade			
Professional			
Administrative/Clerical			
Unskilled Labor			

Will any personnel proposed for this Project be employees of the Joint Venture?: \_\_\_\_\_

If so, who: \_\_\_\_\_

A. Are any proposed Joint Venture employees currently employed by either firm?

Employed by Firm 1: \_\_\_\_\_ Employed by firm 2 \_\_\_\_\_

B. Identify by name and firm the individual who will be responsible for Joint Venture hiring: \_\_\_\_\_

\_\_\_\_\_

**X. Additional Information.** Please state any material facts and additional information pertinent to the control and structure of this Joint Venture.

\_\_\_\_\_  
\_\_\_\_\_

**XI. AFFIDAVIT OF JOINT VENTURE PARTIES.** The undersigned affirm that the foregoing statements and attached documents are correct and include all material information necessary to identify and explain the terms and operations of our Joint Venture and the intended participation of each firm in the undertaking. Further, the undersigned covenant and agree to provide to MassDOT current, complete and accurate information regarding actual Joint Venture work, payments, and any proposed changes to any provisions of the Joint Venture, or the nature, character of each party to the Joint Venture. We understand that any material misrepresentation will be grounds for terminating any Contract awarded and for initiating action under Federal or State laws concerning false statements.

\_\_\_\_\_  
Firm 1

\_\_\_\_\_  
Firm 2

\_\_\_\_\_  
Signature  
Duly Authorized

\_\_\_\_\_  
Signature  
Duly Authorized

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

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