jmr

COMMONWEALTH OF MASSACHUSETTS

CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	608753-128103
P.V. =	$8,978,000.00
PLANS	YES

FOR

Federal Aid Project No. STP-0035(059)
Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)

in the City of

TAUNTON

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

This Proposal to be opened and read: **TUESDAY, OCTOBER 16, 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 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, OCTOBER 16, 2024, at 2:00 P.M. **
TAUNTON
Federal Aid Project No. STP-0035(059)
Corridor Improvements and Related Work on Broadway (Route 138),
from Purchase Street to Jackson Street (Phase 2)

****Date Subject to Change**

PROJECT VALUE = $8,978,000.00

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.

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

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

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

NOTICE TO CONTRACTORS (Continued)

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

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

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

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

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

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

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

NOTICE TO CONTRACTORS (Continued)

PRICE ADJUSTMENTS

This Contract contains price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel, and gasoline. For reference the base prices are as follows: liquid asphalt $575.00 per ton, Portland cement $425.53 per ton, diesel fuel $2.713 per gallon, and gasoline $2.666 per gallon, and Steel Base Price Index 415.9. MassDOT posts the **Price Adjustments** on their Highway Division's website at
https://www.mass.gov/massdot-contract-price-adjustments

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

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

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

BY: Monica G. Tibbits-Nutt, Secretary and CEO, MassDOT
Jonathan L. Gulliver, Administrator, MassDOT Highway Division
SATURDAY, SEPTEMBER 14, 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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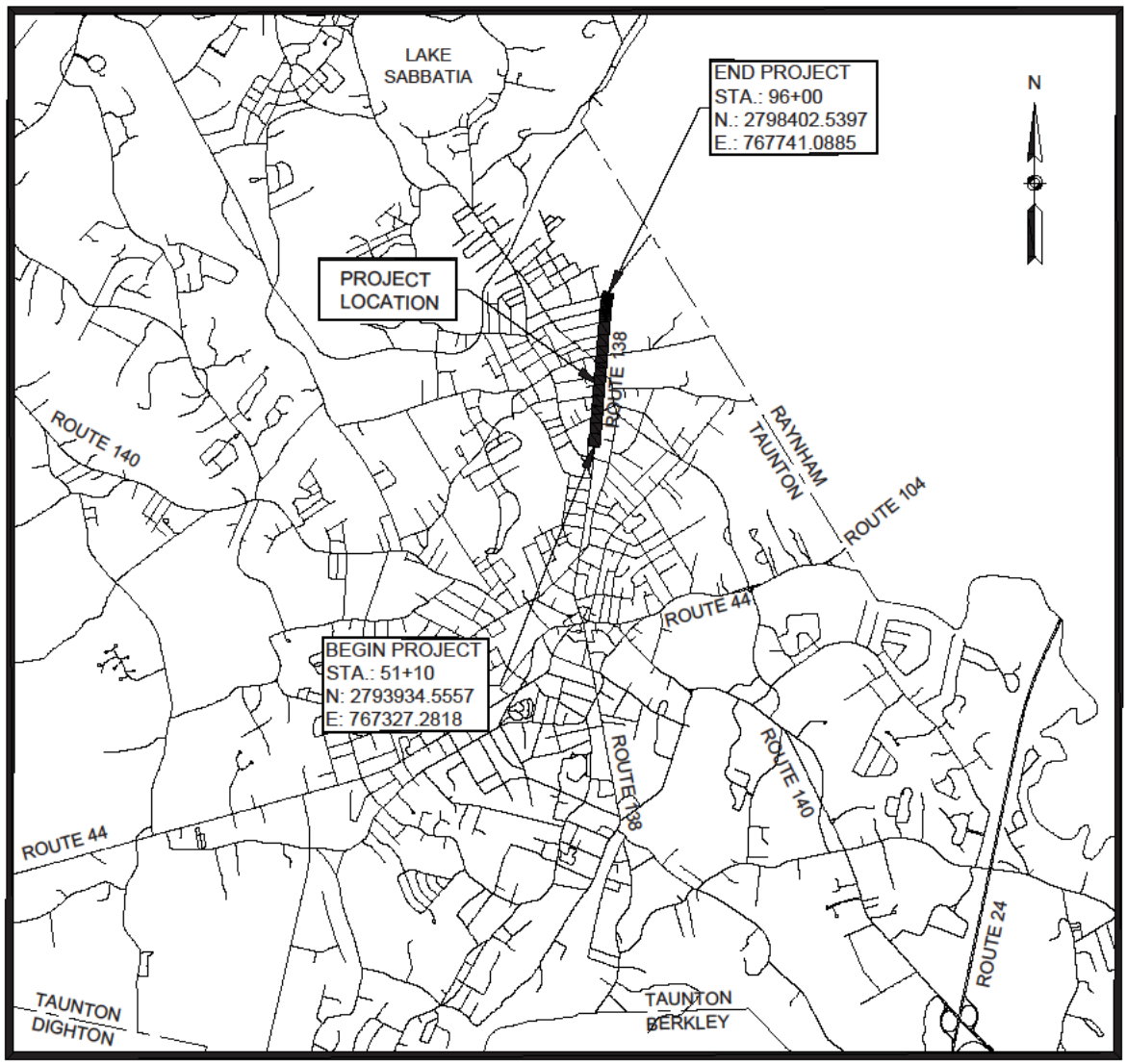
DOCUMENT 00331

LOCUS MAP

TAUNTON
Federal Aid Project No. STP-0035(059)
Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)



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

(Give explanation of items 1 through 9 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)

_____ _____

District Construction Engineer's Signature/Date Resident Engineer's Signature/Date

_____

Contractor's Signature Acknowledging Report/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): _____

_____

_____

CONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number:_____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.
A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR
(*Write Yes or No in space provided*)

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

I recommend a deduction for project completed late:_____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 9:_____

WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

Revised: 04/28/17

*** END OF DOCUMENT ***

DOCUMENT 00440

Final Report ☐

Interim Report ☐

SUBCONTRACTOR PROJECT EVALUATION FORM

For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010

Date: _____

City/Town: _____ Subcontractor: _____

Project: _____ Address: _____

F.A. No.: _____ Contract Number: _____

Prime Contractor _____ Current Contract Completion Date: _____

Date Work Started: _____ Date Work Completed*: _____

Subcontractor's Superintendent: _____

Type of Work Performed by Subcontractor: _____

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

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

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

_____ _____

District Construction Engineer's Signature/Date Resident Engineer's Signature/Date

_____ _____

Contractor Signature Acknowledging Report/Date Subcontractor Signature Acknowledging Report/Date

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

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

_____

_____

Contractor's Comments: _____

_____

SUBCONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number:_____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.
A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR
(*Write Yes or No in space provided*)

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

I recommend a deduction for project completed late:_____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 8: _____

_____

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WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

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Revised: 04/28/17

*** END OF DOCUMENT ***

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

NOTICE OF AVAILABILITY

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

SPECIAL PROVISIONS FOR RIGHT-TO-KNOW ACT REQUIREMENTS

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

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

1. Deliver to the Department, prior to the start of any work under this contract, copies of MSDS for all MSL substances to be used, stored, processed or manufactured at the worksite by the Contractor.

2. Train employees of the Department, who may be exposed to MSL substances as a result of the Contractor's work under this contract, with regard to those specific substances in accordance with requirements of the Right-To-Know Act.

3. Observe all safety precautions recommended on the MSDS for any MSL substance to be used, stored, processed, or manufactured at the worksite by the Contractor.

4. Inform the Department in writing regarding specific protective equipment recommended in the MSDS for MSL substances to which employees of the Department may be exposed as a result of the Contractor's work under this contract.

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

ALTERNATIVE DISPUTE RESOLUTION
Forum, Choice of Law and Mediations:

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

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DOCUMENT 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 (≥ 4,000 psi).....M4.02.00
Preformed Expansion Joint Filler.....M9.14.0[1]

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

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

A. Combined Aggregate System.

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

1. Tarantula Curve.

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

Table 701.30-1: Tarantula Curve Particle Size Distribution

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

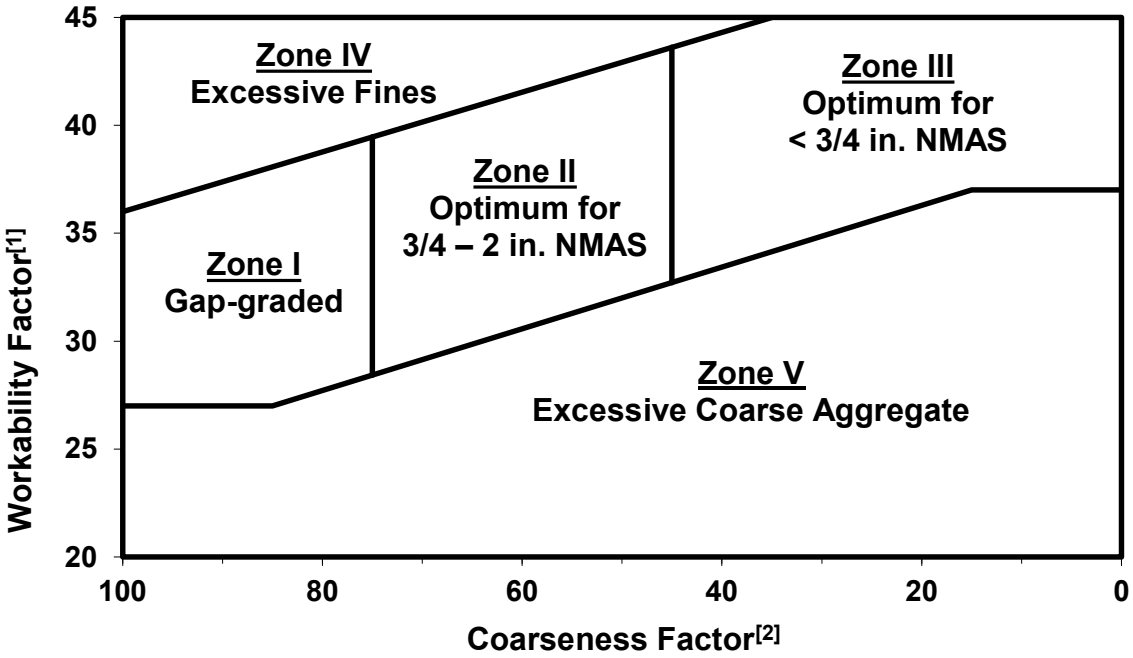
2. Shilstone Workability-Coarseness Chart.

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

Table 701.30-2: Shilstone Workability-Coarseness

Zone	Property	Cause
Zone I	Gap-graded; High potential for segregation during placement and consolidation; Cracking, blistering, spalling, and scaling	Deficiency in intermediate particles; Non-cohesive
Zone II	Optimum mixture for nominal maximum aggregate size from 2 in. – ¾ in.	Optimized workability factor and coarseness factor
Zone III	Optimum mixture for nominal maximum aggregate size < ¾ in.	Optimized workability factor and coarseness factor
Zone IV	Sticky; High potential for segregation during consolidation and finishing; Variable strength, high shrinkage, cracking, curling, spalling, and scaling	Excessive fines
Zone V	Rocky; Lacking plasticity	Excessive amount of coarse and intermediate aggregate

Figure 701.30-1: Shilstone Workability-Coarseness Chart



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

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

3. Fineness Modulus.

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

4. Coarse Aggregate Content.

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

B. Paste System.

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

1. Water-Cementitious Ratio.

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

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

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

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

2. Air Content.

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

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

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

3. Cement and Supplementary Cementitious Materials Content.

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

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

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

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

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

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

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

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

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

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

4. Chemical Admixtures.

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

Table 701.30-7: Chemical Admixtures

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

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

5. Paste Content.

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

Table 701.30-8: Paste Content

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

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

$V_{CEMENT} = W_{CEMENT} / SG_{CEMENT} * D_{WATER}$

$V_{SCM} = W_{SCM} / SG_{SCM} * D_{WATER}$

$V_{ADMIXTURE} = V_{ADMIXTURE}$ in oz. / 957.5 oz. per cf

$V_{WATER} = V_{WATER}$ in gal. / 7.48 gal. per cf

$V_{COARSE} = W_{COARSE} / SG_{COARSE} * D_{WATER}$

$V_{FINE} = W_{FINE} / SG_{FINE} * D_{WATER}$

$V_{CONCRETE} = V_{CEMENT} + V_{SCM} + V_{ADMIXTURE} + V_{WATER} + V_{COARSE} + V_{FINE} + V_{AIR}$

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

$V_{PASTE} = V_{CEMENT} + V_{SCM} + V_{ADMIXTURE} + V_{WATER}$

$PC_{CONCRETE} = V_{PASTE} / V_{CONCRETE}$

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

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

$VC_{COARSE} = SG_{COARSE} * D_{WATER} - BD_{COARSE} / D_{COARSE}$

$VC_{FINE} = SG_{FINE} * D_{WATER} - BD_{FINE} / D_{FINE}$

$VC_{AGGREGATE} = [(V_{COARSE} / (V_{COARSE} + V_{FINE})) * VC_{COARSE} + (V_{FINE} / (V_{COARSE} + V_{FINE})) * VC_{FINE}]$

$AVC_{CONCRETE} = [VC_{AGGREGATE} * ((V_{COARSE} + V_{FINE}) / V_{CONCRETE})]$

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

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

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

C. Initial Curing Materials.

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

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

1. Liquid-Applied Evaporation Reducers.

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

D. Intermediate Curing Materials.

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

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

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

E. Final Curing Materials.

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

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

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

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

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

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

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

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

1. Saturated Covers.

Saturated covers used for final curing methods shall meet AASHTO M 182, Class 3. Saturated covers shall be in good condition, free from holes, tears, or other defects that would render it unsuitable for curing cement concrete and cementitious materials. Saturated covers shall be dried to prevent mildew when storing. Prior to application, saturated covers shall be thoroughly rinsed in water and free of harmful substances that are deleterious or cause discoloration to cement concrete and cementitious materials. Saturated covers shall have sufficient thickness and proper positioning onto the surface to maximize moisture retention. Saturated covers shall contain a sufficient amount of moisture to prevent moisture loss from the surface of cement concrete and cementitious materials. Saturated covers shall have the ability to retain sufficient moisture from continuous watering so that a film of water remains on the surface of cement concrete and cementitious materials throughout the entire duration of the final curing method cycle. Saturated covers shall not absorb water from cement concrete and cementitious materials. Polyethylene film may be applied over the saturated cover to limit the amount of continuous watering required for sufficient moisture retainage. Saturated covers shall accommodate uniform and slow drying of cement concrete and cementitious materials surfaces immediately prior to removal.

2. Sheet Materials.

Sheet materials, including polyethylene film, white burlap-polyethylene sheeting, and reinforced paper, used for final curing methods shall meet ASTM C171 and the requirements specified herein. Sheet materials shall inhibit moisture loss and reduce temperature rise in concrete exposed to radiation from the sun during the final curing method cycle. Adjoining covers shall overlap not less than 12 inches. All edges of the sheet materials shall be secured to maintain a moist environment.

a. Polyethylene Film.

Polyethylene film shall be clear, white, or black in color and consist of a single sheet manufactured from polyethylene resins, be free of visible defects, including tears, wrinkles, and discontinuity. The film shall prohibit mottling and uneven spots from appearing on the surface of concrete, due to variations in temperature, moisture content, or both. Application of additional curing water under the film or application of a polyethylene film bonded to absorbent fabric to the concrete surface may be required to prevent mottling and to retain and evenly distribute the moisture. Polyethylene film shall accommodate concrete surfaces with constant contact without damage. The film shall be sufficient in length to extend beyond the edges of the concrete surface. Edges of adjacent polyethylene film shall overlap a minimum of 6 inches and be tightly sealed with the use of sand, wood planks, pressure-sensitive tape, mastic, or glue to maintain close contact with the concrete surface, retain moisture, and prevent the formation of air pockets throughout the entire duration of the final curing method cycle.

i. White Polyethylene Film.

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

ii. Clear and Black Polyethylene Films.

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

b. White Burlap-Polyethylene Sheeting.

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

c. Reinforced Impervious Paper.

Reinforced impervious paper shall be white in color, consist of two sheets of kraft paper cemented together with a bituminous adhesive, and reinforced with embedded cords or strands of fiber running in both directions. Reinforced impervious paper shall be free of holes, tears, and pin holes from deterioration of the paper through repeated use. Reinforced impervious paper shall be treated to prevent tearing when wetted and dried. Reuse of reinforced impervious paper shall be permitted so long as it is able to retain moisture on the surface of concrete. The paper shall be discarded and prohibited from use when moisture is no longer retained in the material.

3. Liquid Membrane-Forming Compounds.

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

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

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

Careful considerations shall be made by the Contractor to determine if the evaporation rate is exceeding the rate of bleeding, thus causing the surface to appear dry even though bleeding is still occurring. To diagnose and prevent this condition, the Contractor may place a transparent plastic sheet over a test area of the uncured and unfinished concrete surface and shall determine if any bleed water accumulates under the plastic. Under such conditions, the application of liquid membrane-forming compounds to the concrete surface shall be delayed to prevent bleed water from being sealed below the concrete surface, map cracking of the membrane films, reduction in moisture-retention capability, and the need for reapplication of the compound.

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

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

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

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

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

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

a. Liquid Membrane-Forming Compounds for Curing.

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

Table 701.30-1: Types of Compounds for Curing

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

Table 701.30-2: Composition Class of Compounds for Curing

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

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

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

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

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

Type	Description
Type I	Clear or translucent
Type II	White pigmented

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

Type	Description
Class A	Non-yellowing

F. Protective Sealing Compounds.

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

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

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

G. Cold Weather Concreting Materials.

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

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

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

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

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

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

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

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

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

1. Insulating Materials.

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

2. Heaters.

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

a. Direct Fired Heaters.

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

b. Indirect Fired Heaters.

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

c. Hydronic Heaters.

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

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

3. Enclosures.

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

H. Hot Weather Concreting Materials.

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

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

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

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

where E = evaporation rate of water-covered surface ($lb/ft^2/hr$), T_c = concrete temperature of the evaporating surface (°F), r = relative humidity of air surrounding the evaporating surface (%), T_a = temperature of the air surrounding the evaporative surface (°F), and V = average wind speed 20 inches above the evaporating surface. The air surrounding the evaporating surface shall be defined as the air approximately 4 to 6 feet above the evaporating surface on the windward side and shielded from the sun's rays.

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

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

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

CONSTRUCTION METHODS

701.40: Pre-Placement

A. Excavation.

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

B. Subgrade and Subbase.

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

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

C. Forms.

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

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

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

All forms shall be oiled before placing concrete.

701.41: Placement

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

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

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

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

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

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

701.42: Initial Curing

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

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

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

701.43: Finishing

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

701.44: Intermediate Curing

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

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

701.45: Final Curing

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

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

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

Table 701.45-1: Termination of Curing Cycle

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

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

701.46: Protective Sealing

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

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

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

701.47: Cold Weather Concreting

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

701.48: Hot Weather Concreting

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

CONTRACTOR QUALITY CONTROL

701.60: General

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

701.61: Contractor Quality Control Plan

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

701.62: Production Personnel

A. Foreman.

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

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

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

Table 701.62-1: Minimum Foreman Activities

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

B. Operators.

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

Table 701.62-2: Minimum Operator Activities

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

[1] Recommended number of operators.

Table 701.62-2: Minimum Operator Activities (Continued)

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

[1] Recommended number of operators.

701.63: Quality Control Inspection

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

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

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

DEPARTMENT ACCEPTANCE

701.70: General

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

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

701.71: Acceptance of Contractor Quality Control Plan

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

701.72: Acceptance Inspection

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

701.73: Acceptance Sampling and Testing

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

Table 701.73-1: Minimum Acceptance Sampling and Testing Requirements

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

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

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

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

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

COMPENSATION

701.80: Method of Measurement

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

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

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

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

701.81: Basis of Payment

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

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

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

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

701.82: Payment Items

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

GUIDE TO THE INTERIM SUBSECTION 701 CEMENT CONCRETE SIDEWALK SPECIFICATION

MATERIALS ACTIVITIES

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

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

CONTRACTOR ACTIVITIES

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

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

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

	The Contractor shall apply cold weather concreting materials and procedures meeting 701.47 and the Department approved Contractor cold weather concreting plan.	Required when applicable
701.48	**Hot Weather Concreting (When Applicable)**	
	The Contractor should have a minimum of four (4) Operators.	Recommendation
	The Contractor shall submit a Hot Weather Concreting Plan meeting 701.48.	Required when applicable
	The Contractor shall apply hot weather concreting materials and procedures meeting 701.47 and the Department approved Contractor hot weather concreting plan.	Required when applicable
701.61	**Contractor Quality Control Plan**	
	The Contractor shall prepare and submit a Quality Control Plan (QC Plan) to the Department for review.	Requirement
701.62	**Production Personnel**	
701.62.A	Foreman	
	The Contractor shall have a minimum of One (1) Foreman.	Requirement
	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	Requirement
	The Contractor's Foreman shall review and compare batch ticket quantities and sources to approved mix design.	Requirement
	The Contractor's Foreman shall monitor conformance to AASHTO M 157 Standard Specification for Ready-Mixed Concrete.	Requirement
	The Contractor's Foreman shall monitor conformance to Department specifications.	Requirement
	The Contractor's Foreman shall monitor Production Personnel activities.	Requirement
	The Contractor's Foreman shall verify that proper equipment is on hand prior to start of construction.	Requirement
	The Contractor's Foreman shall monitors equipment, environmental conditions, materials, and workmanship.	Requirement
	The Contractor's Foreman shall prohibit the use of prohibited equipment and practices.	Requirement
	The Contractor's Foreman shall acknowledge sampling, testing, and inspection results.	Requirement

701.62.B	**Operators**	
	Concrete sidewalk shall be constructed by sufficiently staffed, trained, experienced, and qualified equipment operators and craftsmen, who are presently involved in sidewalk construction, throughout the entire duration of the construction operation, per the requirements specified in Sections 701.40 to 701.48.	Requirement
701.63	**Quality Control Inspection**	
	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	Requirement

DOCUMENT 00715

SUPPLEMENTAL SPECIFICATIONS

JUNE 30, 2024

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

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

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

DIVISION I

GENERAL REQUIREMENTS AND COVENANTS

SECTION 4: SCOPE OF WORK

Subsection 4.06: Increased or Decreased Contract Quantities
Replace the second paragraph with the following.

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

DIVISION II

CONSTRUCTION DETAILS

DIVISION II: Construction Details
Replace M4.02.15 Cement Mortar with M4.04.0 Grout, Mortar, and Concrete Products where encountered, including in Subsections 230.40, 485.40, 501.40, 685.40, 940.40A and 983.40.

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

SUBSECTION 150: EMBANKMENT

Subsection 150.62: Embankment Construction with Materials Other Than Rock
Replace the fourth paragraph with the following.

The embankment materials shall be compacted to not less than 95% of the maximum dry density of the embankment material as determined by AASHTO T 99, Method C. If required, a correction for oversized particles shall be in accordance with Annex A of AASHTO T 99. If the material retained on the ¾-in. sieve is 30% or more of the total sample, this test shall not apply and the material shall be compacted to the target density. The target density shall be established by determining the number of passes of a roller required to produce a constant and uniform density, after conducting a series of tests using either AASHTO T 310, *In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)*, AASHTO T 191, *Density of Soil In-Place by the Sand-Cone Method*, or *ASTM D 8167 Standard Test Method for In-Place Bulk Density of Soil and Soil-Aggregate by a Low-Activity Nuclear Method (Shallow Depth)*. The Contractor shall, without additional compensation, employ whatever measures may be necessary to adjust the natural water content of the suitable embankment material to permit the placement and compaction as hereinbefore specified.

SUBSECTION 160: CONTROLLED LOW-STRENGTH MATERIAL

Subsection 160: Controlled Low-Strength Material
Add this new subsection.

DESCRIPTION

160.20: General

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

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

MATERIALS

160.40: General

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

CLSM – Manual Excavatable (≤100 psi)

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

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

CONSTRUCTION METHODS

160.60: General

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

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

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

COMPENSATION

160.80: Method of Measurement

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

160.81: Basis of Payment

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

160.82: Payment Items

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

SECTION 200: DRAINAGE

SUBSECTION 201: BASINS, MANHOLES AND INLETS

Subsection 201.40: General
Replace "Cement Mortar ..... M4.02.15" with "Mortar ..... M4.04.0".

SECTION 400: SUB-BASE, BASE COURSES, SHOULDERS, PAVEMENTS AND BERMS

SUBSECTION 401: GRAVEL SUB-BASE

Subsection 401.60: Gravel Sub-base
Replace the last sentence of the first paragraph with the following.

The specific density of the Gravel Sub-base shall be maintained by determining the number of passes of a roller required to produce a constant and uniform density, after conducting a series of tests using a nuclear device or the sand/volume method in accordance with AASHTO T310, AASHTO T 191, or ASTM D 8167.

SUBSECTION 402: DENSE GRADED CRUSHED STONE FOR SUB-BASE

Subsection 402.61: Spreading and Compacting
Replace the last sentence of the first paragraph with the following.

The specified density of the Dense Graded Crushed Stone shall be maintained by determining the number of passes of a roller are required to produce a constant and uniform density, after conducting a series of tests using a nuclear device or the sand/volume method in accordance with AASHTO T310, AASHTO T 191, or ASTM D 8167.

SUBSECTION 403: RECLAIMED PAVEMENT FOR BASE COURSE AND/OR SUB-BASE

Subsection 403.64: Compaction and Dust Control
Replace the second paragraph with the following.

The reclaimed base course shall be tested for compaction and smoothness and accuracy of grade in accordance with the applicable provisions of 401.60: Gravel Sub-base. The required density shall be measured by using a nuclear device or the sand/volume method in accordance with AASHTO T310, AASHTO T 191, or ASTM D 8167. If any portions are found to be unacceptable by the Engineer, such portions shall be reprocessed, regraded, and recompacted until the required smoothness and accuracy are obtained.

SUBSECTION 404: RECLAIMED PAVEMENT BORROW MATERIAL

Subsection 404.60: General
Replace the second sentence with the following.

The specified density of the Reclaimed Pavement Borrow Material shall be maintained by determining the number of passes of a roller that are required to produce a constant and uniform density, after conducting a series of tests using a nuclear device or the sand/volume method in accordance with AASHTO T310, AASHTO T 191, or ASTM D 8167

SUBSECTION 450: HOT MIX ASPHALT PAVEMENT

Subsection 450.40: General
Add the following paragraph to the end of this subsection.

Prior to placing hot mix asphalt the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, HMA tonnage, the type of mix, the mix provider and plant location.

SUBSECTION 460: HOT MIX ASPHALT PAVEMENT FOR LOCAL ROADS

Subsection 460.40: General
Add the following paragraph to the end of this subsection.

Prior to placing hot mix asphalt the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, HMA tonnage, the type of mix, the mix provider and plant location.

SUBSECTION 466: STRESS ABSORBING MEMBRANE & STRESS ABSORBING MEMBRANE INTERLAYER

Subsection 466.40: General
Replace this subsection with the following.

Prior to placing stress absorbing membrane the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, tonnage, the type of mix, the mix provider and plant location. Stress absorbing membrane and stress absorbing membrane interlayer shall be constructed as specified herein.

SUBSECTION 470: HOT MIX ASPHALT PAVEMENT BERM

Subsection 470.40: General
Replace this subsection with the following.

Prior to placing hot mix asphalt the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, HMA tonnage, the type of mix, the mix provider and plant location. The Contractor shall obtain HMA berm material of the type specified.

SUBSECTION 472: TEMPORARY ASPHALT PATCHING

Subsection 472.40: General
Add the following paragraph to the beginning of this subsection.

Prior to placing hot mix asphalt the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, HMA tonnage, the type of mix, the mix provider and plant location.

SUBSECTION 486: ULTRATHIN BONDED OVERLAY

Subsection 486.40: General
Add the following paragraph to the end of this subsection.

Prior to placing ultrathin bonded overlay the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, tonnage, the type of mix, the mix provider and plant location.

SECTION 600: HIGHWAY GUARD, FENCES AND WALLS

SUBSECTION 690: WALLS REMOVED AND RESET

Subsection 403.64: General
Replace the last sentence with the following.

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

SECTION 700: INCIDENTAL WORK

SUBSECTION 702: HOT MIX ASPHALT SIDEWALKS AND DRIVEWAYS

Subsection 702.40: General
Add the following paragraph to the end of this subsection.

Prior to placing hot mix asphalt the contractor shall provide notice to the Engineer at least 48 hours in advance of the work. The notice shall include the anticipated schedule, HMA tonnage, the type of mix, the mix provider and plant location.

SECTION 800: TRAFFIC CONTROL DEVICES

SUBSECTION 825: RECTANGULAR RAPID FLASHING BEACONS

Subsection 825: Rectangular Rapid Flashing Beacons
Add this new subsection.

DESCRIPTION

825.20: General

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

MATERIALS

825.40: General

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

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

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

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

The Contractor shall supply cement concrete foundations per the Plans.

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

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

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

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

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

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

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

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

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

825.41: Shop Drawings

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

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

825.42: Material Warranties

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

CONSTRUCTION METHODS

825.60: General

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

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

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

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

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

Solar panels shall be oriented to maximize sunlight gain.

SYSTEM OPERATION

825.70: APS Pushbuttons

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

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

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

825.71: Light Bar

The Light Bar shall remain dark until actuated.

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

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

A. The yellow beacon on the left-hand side shall be illuminated for approximately 50 milliseconds.
B. Both yellow beacons shall be dark for approximately 50 milliseconds.
C. The yellow beacon on the right-hand side shall be illuminated for approximately 50 milliseconds.
D. Both yellow beacons shall be dark for approximately 50 milliseconds.
E. The yellow beacon on the left-hand side shall be illuminated for approximately 50 milliseconds.
F. Both yellow beacons shall be dark for approximately 50 milliseconds.
G. The yellow beacon on the right-hand side shall be illuminated for approximately 50 milliseconds.
H. Both yellow beacons shall be dark for approximately 50 milliseconds.
I. Both yellow beacons shall be illuminated for approximately 50 milliseconds.
J. Both yellow beacons shall be dark for approximately 50 milliseconds.
K. Both yellow beacons shall be illuminated for approximately 50 milliseconds.
L. Both yellow beacons shall be dark for approximately 250 milliseconds.

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

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

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

COMPENSATION

825.80: Method of Measurement

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

825.81: Basis of Payment

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

825.82: Payment Item

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

SECTION 900: STRUCTURES

Subsection 922: Elastomeric Bearing Pads
Add this new subsection.

SUBSECTION 922: ELASTOMERIC BEARING PADS

DESCRIPTION

922.20: General

This specification consists of the construction requirements for elastomeric bearing pads. Elastomeric bearing pads shall consist of plain or laminated bearings consisting of layers of elastomers restrained at their interfaces by bonded steel laminates.

MATERIALS

922.40: General

Elastomeric bearing pads shall meet the following requirements:

Elastomeric Bearing Pads M9.14.5

Anchor bolts.....M8.01.5

CONSTRUCTION METHODS

922.50: Submittals

The Contractor shall submit the following to the Engineer for approval:

1. Prior to fabrication:
    a. Written notification 30 days prior to the start of bearing production. The notification shall include the contract number, quantity, type, and size of bearing being produced, manufacturer's name, and the name of the independent testing lab.
    b. Shop drawings for approval in accordance with Subsection 5.02, 14 days prior to the start of bearing production.
2. At the time of bearing pad delivery:
    a. A certificate of compliance (COC) certifying that the elastomeric bearing pads meet the requirements of the contract specifications. The COC shall be accompanied by:
        - A mill certificate for steel laminates used in bearings, where applicable.
        - Fabricator QC test reports.
    b. Independent test results as required under Subsection 922.62.

922.51: Fabricators

Fabricators shall be in accordance with Subsection M9.14.5D.

922.52: Fabrication

Fabrication shall be in accordance with Subsection M9.14.5E.

In addition to the number of bearing pads required for the contract the Contractor shall order additional bearing pads as defined in Subsection M9.14.5G, in order to allow the Engineer to randomly select a bearing pad for testing in accordance with 922.72.

922.53: Packaging, Handling, & Storage

The bearing pads shall be packaged, handled, and stored in accordance with Subsection M9.14.5F.

All bearing devices and components shall be stored on the project in an area that provides protection from environmental and physical damage. When installed, bearings shall be clean and free of all foreign substances.

922.54 Installation

Bearing pads shall be installed only on concrete bridge seat bearing areas that have been prepared in accordance with Subsection 901.65A(3).

Bearing pads shall be installed by qualified personnel to the positions, elevations, and slopes shown on the plans and to the dimensions and offsets prescribed by the manufacturer. The bearing pads shall be adjusted, as necessary, to take into account the ambient temperature at installation and future movements of the bridge due to temperature changes, release of falsework, and shortening due to post-tensioning.

Elastomeric bearings shall be placed directly on the concrete surface provided that it is flat within the bearing area to within a tolerance of 0.005 times the smallest nominal dimension of the bearing as measured by a

straight edge from peak to valley. Bearings shall be placed on surfaces that do not deviate from the specified bridge seat slope in any direction by more than 0.01 rad.

Any bearing areas that exceed these tolerances shall be brought into compliance by grouting or use of shims as directed by the Engineer before the weight of the structure acts on the bearing.

Bearings that have an internal tapered load plates shall be marked with an arrow that points up-station in order to properly align the slope of the internal tapered load plate with the centerline of the bridge.

Sole plates that sit on the bearing shall not be welded to the beam flange in the field unless at least 1.5 in. of the steel exists between the weld and the elastomer. In no case shall the elastomer or the bond be subjected to temperatures higher than 400°F.

No beams shall be erected until the bearings have been accepted by the Engineer.

CONTRACTOR QUALITY CONTROL

922.60: General

The Contractor shall provide a Quality Control System (QC System) to ensure that all materials and workmanship meet the required specifications.

922.61: Quality Control Inspection

The Contractor shall perform QC inspection of all work items addressed under this specification. Inspection activities during placement may be performed by qualified production personnel. The Contractor's QC personnel shall have overall responsibility for the QC inspection. The Contractor shall not rely on the results of the Engineer's Acceptance inspection for QC purposes. The Engineer shall be provided with the opportunity to monitor and witness all QC inspections.

QC inspection activities must address the following three primary components:

a. Materials
b. Environmental Conditions
c. Workmanship

The minimum frequency of QC inspection activity shall be in accordance with the requirements below.

Table 922.61-1 - Minimum QC Inspection of Elastomeric Bearing Pads

Inspection Component	Inspection Attribute	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	Bearing Pad	Each Delivery	Bearing Pad	Check COC
	Geometry and Surface	Each Bearing Pad	Bearing Pad Surface	Visual Check & Check Measurement
Environmental Conditions	Temperature of Air	1 per Day	At Project Site	Check Measurement
Workmanship	Bridge Seat	Each Bearing Location	Bearing Pad Location	Visual Check
	Elevation	Each Bearing Pad	Bearing Pad Location	Check Measurement
	Orientation	Each Bearing Pad	Bearing Pad Location	Check Measurement

922.62: Quality Control Sampling and Testing Requirements

The Contractor shall have each Lot of bearing pads sampled and tested in accordance with Subsection M9.14.5G. This shall include both QC and compliant independent laboratory test results.

DEPARTMENT ACCEPTANCE

922.70: General

The Department shall sample and test bearing pads as part of its Acceptance activities. Independent testing shall also be used to supplement its testing.

922.71: Acceptance Inspection

The Engineer will perform Acceptance inspection to ensure that materials and completed work are in conformance with the contract requirements. Acceptance inspection is intended to visually assess the quality of each Lot produced and placed and will address only the inspection components of materials and workmanship in support of the Department's final Acceptance determination. All Acceptance inspection activities by the Department will be performed independent of the Contractor's QC inspection.

Table 922.71-1 – Department Acceptance Inspection of Elastomeric Bearing Pads

Inspection Component	Inspection Attribute	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	Bearing Pad	1 Per Bearing Pad	Bearing Pad Surface	Check COC
	Geometry and Surface	1 Per Bearing Pad	Bearing Pad Surface	Visual Check & Check Measurement
Workmanship	Elevation	1 per Bearing Pad	Bearing Pad Location	Check Measurement
	Orientation	1 per Bearing Pad	Bearing Pad Location	Check Measurement

922.72: Acceptance Sampling and Testing Requirements

For Acceptance samples taken by the Engineer at the project, the sampling rate shall be in accordance with Subsection M9.14.5G. Bearing pads shall be tested by the Department in accordance with Table M9.14.5-1.

922.73: Lot Acceptance Determination Based on Inspection Results

The Engineer's Acceptance inspection results will be used in the final Acceptance determination for all Lots. Prior to final Acceptance of each Lot produced and placed, the Engineer will evaluate all Acceptance inspection information for the Lot. The materials and product workmanship for the completed work will be evaluated for conformance with the plans and the requirements specified in Subsections 922.60, 922.61, and 922.62.

When the Acceptance information identifies deficiencies in either material quality or product workmanship, the location will be isolated and further evaluated by the Engineer through additional Acceptance inspection. Depending upon the findings of the additional Acceptance inspection activity, the Engineer will determine the disposition of the nonconforming work in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

922.74: Lot Acceptance Determination Based on Testing Data

Prior to final Acceptance of each Lot, the Engineer will evaluate all available QC, independent, and Acceptance testing data for the Lot to determine conformance with the minimum requirements in Subsection M9.14.5G and Table M9.14.5-1.

If a test result does not meet the minimum requirement, the Contractor and Engineer will further assess the quality to determine whether the material can remain in place.

If the Engineer's assessment determines that the material quality is not sufficient to permit the bearing pad to remain in place, the pad shall be removed and replaced. When a nonconforming bearing pad is corrected or replaced, the Engineer will perform Acceptance testing of the replacement bearing pad and evaluate the test results for conformance with the minimum requirements.

922.75: Final Lot Acceptance Determination

For each Lot produced and placed, the Engineer will evaluate all Acceptance inspection and testing data for the Lot. The final review and visual inspection shall be conducted jointly by the Contractor and Engineer. Any items that do not meet the requirements of the specifications and plans shall be addressed at this time, at no additional cost to the Department.

After each Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Acceptance data for the Lot. The Engineer will accept the Lot if the evaluation of all inspection and testing data for the Lot is in conformance with this specification and the contract documents.

When the above requirements have been met, the Engineer will accept all completed bearing pads.

COMPENSATION

922.80: Method of Measurement

Laminated Elastomeric Bearing Pads will be measured by each pad installed. Plain Elastomeric Bearing Pads will be measured by the square foot installed. The measured quantities do not include the additional bearings required for conformance and destructive testing.

922.81: Basis of Payment

Payment under this item shall be at the contract unit price. This price will include all materials, equipment, tools and labor, additional bearing pads for testing and all required testing necessary to complete the work.

922.82: Payment Items

921.	Laminated Elastomeric Bearing Pad with Anchor Bolts	Each
922.	Laminated Elastomeric Bearing Pad without Anchor Bolts	Each
923.	Laminated Sliding Elastomeric Bearing Pad with Anchor Bolts	Each
933.	Plain Elastomeric Bearing Pad	Square Foot

SECTION 970: DAMP-PROOFING

Subsection 970.30: General
Add the following material to this subsection.

Mortar..... M4.04.0

Subsection 970.40: General
Replace the second sentence in the second paragraph with the following.

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

SUBSECTION 983: REVETMENT

Subsection 983.64 Special Slope Paving Under Bridges
Replace the last sentence under B. Quarry Stone or Precast Concrete Blocks. with the following.

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

Subsection 983.65 Channel Paving and Grouted Channel Paving
Replace the last sentence with the following.

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

DIVISION III

MATERIALS SPECIFICATIONS

SECTION M4: CEMENT AND CEMENT CONCRETE MATERIALS

Subsection M4.02.00 Cement Concrete

Add the following to the end of this subsection.

Alkali Silica Reactivity - Resistant Portland Cement Concrete

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

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

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

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

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

(1) Use a second order polynomial of $\%Exp = A^o + A^1 SQRT(t) + A^2t$. See publication SD92-04-F.
(2) Based on the total aggregate sample.

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

Material	Specification	Cementitious Material Percentage (1)
Low alkali cement (2)	AASHTO M 85	100%
Fly ash - Class F	AASHTO M 295	15% minimum to 30% (4) maximum
Silica Fume (5)	AASHTO M 307	6% ± 1% (6)
Slag Grade 100 and 120	AASHTO M 302	25% minimum to 50% maximum

(1) Measure this minimum content of cementitious material as percent by weight of cement plus pozzolan.
(2) This single criterion is not effective in all cases in remediating ASR. Low alkali cement (0.60% maximum (3)) must be used in combination with other pozzolanic materials in Table B.
(3) Na_2O equivalent = $\%Na_2O + 0.658\ (\%K_2O)$
(4) Fly ash, Type F, shall replace 15% by weight of the design cement content, and any additional fly ash will be considered as fine aggregate.
(5) Silica fume shall only be used in silica fume cement concrete.
(6) The total amount of Type F fly ash and silica fume shall constitute 20% by weight of the design cement content, and any additional fly ash shall be considered as fine aggregate.

Subsection M4.02.15 Cement Mortar
Delete this subsection.

Subsection M4.04.0: Grout, Mortar and Concrete Products
Replace this subection with the following.

M4.04.0: Grout, Mortar, and Concrete Products

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

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

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

A. Technical Data Sheet.

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

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

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

B. Mix Design Formulation.

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

C. Product Verification Testing.

Verification test results shall be within the limits specified herein.

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

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

M4.04.2: Rapid Hardening Cementitious Mortar and Concrete Products

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

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

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

Table M4.04.2-2: Verification Testing Requirements

Property	Method	Quality Characteristic		Limits					
				R1		R2		R3	
				Min.	Max.	Min.	Max.	Min.	Max.
Setting	T 197	Initial Set (min.)		Technical Data Sheet					
		Final Set (min.)		Technical Data Sheet					
Strength	T 97[1]	Flexural Strength (psi)	24 Hours	–	–	–	–	650	–
			7 Days	–	–	–	–	–	–
Durability	T 358	Surface Chloride Ion Penetration Resistance (kΩ-cm)	28 Days	21	–	21	–	21	–
	T 161 (A)	Relative Durability Factor		90	–	90	–	90	–
		Mass Loss (%)		–	6.0	–	6.0	–	6.0
[1] Not applicable to vertical and overhead repair applications.									

M4.04.3: Mortar Products for Unit Masonry

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

M4.04.4: Grout Products for Unit Masonry

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

M4.04.5: Non-Shrink Grout Products

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

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUIT

Subsection M5.01.0: Joint Material for Pipe
Replace M4.02.15 Cement Mortar with M4.04.0 Grout, Mortar, and Concrete Products in paragraph B.

SECTION M8: METALS AND RELATED MATERIALS

Subsection M8.18.1: Traffic Signal Supports
Delete the heading Posts and the two paragraphs under it. Delete the heading Bases and the three paragraphs under it.

SECTION M9: MISELLANEOUS MATERIALS

Subsection M9.14.5: Elastomeric Bridge Bearing Pads
Replace this subsection with the following:

M9.14.5: Elastomeric Bearing Pads

A. General Requirements

Elastomeric bearing pads shall be plain or laminated. They shall meet the applicable requirements of AASHTO M 251, the MassDOT Bridge Manual, and the AASHTO LRFD Bridge Design and Construction Specifications. The type of bearing will be specified on the plans.

Laminated elastomeric bearing pads consist of layers of elastomers restrained at their interfaces by bonded metal laminates.

B. Material Requirements

Plain elastomeric bearing pads shall consist of elastomer.

Laminated elastomeric bearing pad shall consist of:

- Elastomer
- Internal Steel Laminates
- Tapered Internal Load Plates (if used)

The components of the elastomeric bearing pad shall conform to AASHTO M 251 and the following:

- The elastomer compound shall be 100% virgin neoprene and classified as being of low-temperature grade 3.
- The steel laminates shall meet the requirements of ASTM A 1011 Grade 36 or higher

C. Material Qualification

Elastomeric bearing pads shall be approved on a project basis. The Contractor shall furnish to the Research and Materials Section certified independent test reports demonstrating conformance. All testing shall be performed by the same independent lab in accordance with Subsection M9.14.5G.

D. Fabricators

Bearing shall be fabricated by a fabricator listed on the MassDOT Qualified Construction Materials List (QCML).

E. Fabrication

Fabrication shall not begin until the shop drawings have been approved and the Department has an inspector at the fabricator's facility.

The shop drawings shall specify bearing dimensions as shown on the plans and, where applicable, shall include:

- Elastomer thickness and edge cover,
- Number and thickness of steel reinforcing laminates,
- Dimensions of load plates (if any),
- Design shear modulus of the elastomer shall be as shown on the Plans.

Plain elastomeric bearing pads shall be fabricated and tested in accordance with the "Method A" design outlined in the AASHTO LRFD Bridge Design Specifications.

Laminated elastomeric bearing pads shall be fabricated and tested in accordance with the "Method B" design outlined in the AASHTO LRFD Bridge Design Specifications.

The manufacturer shall designate the bearings in each Lot, as described in Subsection M9.14.5G, and certify that each bearing in the Lot was manufactured in a reasonably continuous manner from the same batch of elastomer and cured under the same conditions. In addition, the manufacturer shall certify that each bearing in the Lot satisfies the requirements of this specification, AASHTO M 251, the AASHTO LRFD Bridge Construction Specifications, and the contract plans and documents.

The tolerances on the overall dimensions for the bearings shall be according to Table 2 of AASHTO M 251, except that the tolerance on the overall vertical dimension shall be limited to 0, +1/8" regardless of the design thickness.

All steel included in the final bearing product must conform to Buy America Requirements.

F. Packaging, Handling, & Storage

The bearing pads shall be packaged, handled, and stored as specified below:

Prior to shipment from the point of manufacture, bearings shall be packaged in such a manner to ensure that during shipment and storage the bearings will be protected against damage from handling, weather, or any normal hazard. Each completed bearing shall have its components clearly identified, be securely bolted, strapped, or otherwise fastened to prevent any relative movement, and be marked on it top as to location and orientation in each structure in the project in conformity with the contract documents.

Each elastomeric bearing shall be marked in indelible ink or flexible paint. The marking shall consist of the order number, lot number, bearing identification number, and elastomer type and grade per AASHTO M 251. For bearing pads fabricated with a tapered internal load plate, a 1/32" deep direction arrow shall be inscribed into the bearing which will allow the bearing to be aligned with the up-station direction. All marks shall be permanent and be visible after the bearing is installed.

G. Testing Requirements

Quality Control System

Fabricators shall perform Quality Control (QC) testing in accordance with their quality system. QC test reports shall accompany the bearing pads when delivered to the project.

Acceptance System

MassDOT will evaluate the fabricator's quality system and QC test reports. It will also perform its own testing and verify the independent laboratory's test reports, if applicable.

Lot Sizes

Sampling of bearing pads for testing shall be random and performed on a Lot basis. A Lot of bearings shall be a group of 100 or fewer bearings that are:

- For a single contract,
- Cured under the same conditions,
- The same size and configuration,
- Manufactured in a reasonably continuous manner from the same batch of elastomer.

Testing of Plain Bearings

Testing Laboratory

Plain elastomeric bearing pads shall be tested by both an independent laboratory and MassDOT:

- Independent testing shall be performed by a nationally recognized third-party laboratory approved by the Research & Materials Section.
- Acceptance testing shall be performed by the Research and Materials.

Sampling Frequency

Each Lot of plain bearings shall be randomly sampled for testing. The Contractor shall ensure that the fabricator produces the additional bearings required for testing.

Samples for independent testing shall be selected by the fabricator. The sampling rate for the independent

testing shall be as follows:

- Lot sizes less than 10 bearings – One full-size bearing per Lot.
- Lot sizes greater than or equal to 10 bearings – Two full-size bearings per lot.

Samples for Acceptance testing shall be selected by the Engineer. The sampling rate for Acceptance testing shall be one bearing pad per lot.

Testing Requirements

The laboratory shall test the bearings in accordance with Sections 8 and 9 of AASHTO M 251 as specified below:

1. Dimensions per Section 8.4.
2. Elastomer per Section 8.6.
    - The hardness, tensile strength, and ultimate elongation shall be in accordance with Table 1 of AASHTO M 251.
3. Test procedures per Section 8.9.
    - Heat resistance per Section 8.9.3.

Testing of Laminated Bearings

Testing Laboratory

Laminated elastomeric bearing pads shall be tested by both an independent laboratory and MassDOT:

- Independent testing shall be performed by a nationally recognized third-party laboratory approved by the Research & Materials Section.
- Acceptance testing shall be performed by the Research and Materials.

Sampling Frequency

Each Lot of laminated bearings shall be randomly sampled for testing. The Contractor shall ensure that the fabricator produces the additional bearings required for testing.

Samples for independent testing shall be selected by the fabricator. The sampling rate for the independent testing shall be as follows:

- Lot sizes less than 10 bearings – One full-size bearing per Lot.
- Lots sizes greater than or equal to 10 bearings:
    - One full-size bearing per every twenty per lot, or a minimum of two bearings.
    - The number of laminated bearings to sample shall be determined by taking the Lot size divided by 20. If the integer part of this calculation is 0 or 1, then two bearings shall be sampled. For example, if the lot size is 58 laminated bearings, two bearings shall be sampled; if the lot size is 65, three bearings shall be sampled; and if the lot size is 22, two bearings shall be sampled.

Samples for Acceptance testing shall be selected by the Engineer. The sampling rate for Acceptance testing shall be one bearing pad per lot.

Testing Requirements

Testing of the bearings shall be in accordance with Sections 8 and 9 of AASHTO M 251 as specified below:

1. Dimensions per Section 8.4.
2. Elastomer per Section 8.6.
    - The hardness, tensile strength, and ultimate elongation shall be in accordance with Table 1 of AASHTO M 251.
3. Compressive strain at the maximum design dead plus live service compressive load per Section 8.8.1.1.

- The compressive deflection, as determined per Section 9.1., between the two loadings for each bearing tested shall not exceed 10%.

4. Bond via Compressive Load per Section 8.8.2.2.
5. Shear Modulus of the elastomer per Section 8.8.3.
   - Shear modulus shall meet the requirements on the plans.
6. Test procedures per Section 8.9.
   a. Additional Low Temperature Shear Modulus testing per Section 8.9.1.
   b. Heat resistance per Section 8.9.3.
   c. Compression set per Section 8.9.4.
   d. Creep per Section 8.9.5.
      - The percent creep shall be less than 35%.
   e. Long Term Compression per Section 8.9.6.

Table M9.14.5-1: Department Acceptance Testing of Elastomeric Bearing Pads

Quality Characteristic	**Test Method**	**Requirement**
Hardness	ASTM D2240	From Independent Test Results ± 5 Pts
Tensile Strength	ASTM D412	≥ 2250 psi
Ultimate Elongation	ASTM D412	Minimum Elongation Based on Durometer according to AASHTO M 251 Table 1
Shear Modulus (see Note 1)	ASTM D4014	Specified Value ± 15%
After Heat Aging for 70 Hours at 100°C (Maximum Change from Unaged Testing)		
Hardness	ASTM D573	Hardness + 15 Pts
Tensile Strength	ASTM D573	Tensile Strength - 15%
Ultimate Elongation	ASTM D573	Ultimate Elongation - 40%
Note 1: Test is only required for laminated elastomeric bearing pads.		

SECTION M10: TRAFFIC CONTROL DEVICES

Subsection M10.05.0: Traffic Signal Structures (General)
Add this new subsection.

M10.05.0: Traffic Signal Structures (General)

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

Subsection M10.05.1: Signal Posts and Bases
Add this new subsection.

M10.05.1: Signal Posts and Bases

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

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

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

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

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

Signal Post Bases shall be square or octagonal.

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

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

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

Subsection M10.11.0: RRFB Assemblies
Add this new subsection.

M10.11.0: RRFB Assemblies

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

Light Bar

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

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

Controller and Activation Unit

The enclosure for the Controller and Activation Unit shall be NEMA rated for outdoor use and protection against rain and sleet.

The Controller and Activation Unit shall be powered by a DC battery/solar array system or a 120 VAC service connection.

The Controller and Activation Unit shall be actuated by a pedestrian pushbutton, a passive pedestrian detection device, or both.

Communications between multiple units within the same system shall be via a 900MHz or 2.4 GHz frequency hopping spread spectrum with a minimum range of 200 ft. Multiple channels shall be available to prevent cross-communication between multiple systems located close to each other.

The Controller shall be programmable via an on-board user interface or a no-fee wireless (Wi-Fi, Bluetooth®, etc.) connection and application.

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END OF SUPPLEMENTAL SPECIFICATIONS

DOCUMENT 00719

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

SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES

(IMPLEMENTING TITLE 49 OF THE CODE OF FEDERAL REGULATIONS, PART 26)

Section: Page 00719-

POLICY

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:

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

1. DEFINITIONS

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

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

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

"Contract" shall mean the Contract for work between the Contractor and MassDOT.

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

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

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

(a) that is at least fifty-one (51%) percent owned by one or more individuals who are both socially and economically disadvantaged, or, in the case of any corporation, in which at least fifty-one (51%) percent of the stock is owned by one or more such individuals; and

(b) where the management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

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

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

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

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

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

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

(a) To be a regular dealer, the firm must be an established, regular business that engages, as its principal business, and under its own name, in the purchase and sale of the products in question.

(b) A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided above if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by long term lease agreement and not on an ad hoc or contract by contract basis.

(c) Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this definition.

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

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

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

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

(a) Individuals found by SDO to be socially and economically disadvantaged individuals on a case by case basis.

(b) Individuals in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:

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

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

2. DBE PARTICIPATION

a. Goal

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

☐ Design-Bid-Build Projects: DBE Participation Goal ____**%**
(*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 the 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 a use joint check, MassDOT will require prior notice and will closely monitor the arrangement for compliance with FHWA regulations and guidance. MassDOT may allow a joint check arrangement and give credit to a Contractor for use of the DBE where one or more of the following conditions exist:

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

Other factors MassDOT may consider:

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

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

d. Joint Check Procedure(s)

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

7. AWARD DOCUMENTATION AND PROCEDURES

a. The two lowest bidders/the two bidders with the lowest price per quality score point, shall submit, by the close of business on the third (3rd) business day after the bid opening, a completed Schedule of Participation by DBEs (Document B00853) which shall list:

(1) The full company name, address and telephone number of each DBE with whom the bidder intends to make a commitment.

(2) The contract item(s), by number(s) and quantity(ies), if applicable, or specific description of other business activity to be performed by each DBE as set forth in the Letters of Intent. The Bidder shall list only firms which have the capacity to perform, manage and supervise the work proposed in accordance with the requirements of 49 CFR Part 26 and Section **6.b** of these Special Provisions.

(3) The total dollar amount to be paid to each DBE. (Bidders are cautioned that at least one half of the participation goal must be met with construction activity work.)

(4) The total dollar amount to be paid to each DBE that is eligible for credit toward the DBE participation goal under the counting rules set out in Section **6.b**.

(5) The total creditable DBE participation as a percentage of the total bid price.

b. All firms listed on the Schedule must be currently certified.

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

d. Evidence of good faith efforts will be evaluated by MassDOT in the selection of the lowest responsible bidder.

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

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

f. If MassDOT finds that the percentage of DBE participation submitted by the bidder on its Schedule does not meet the Contract participation goal, or that Schedule and Letters of Intent were not timely filed, and that the bidder has not demonstrated good faith efforts to comply with these requirements, it shall propose that the bidder be declared ineligible for award. In that case, the bidder may request administrative reconsideration. Such requests must be sent in writing within three (3) calendar days of receiving notice of proposed ineligibility to: The Office of the General Counsel, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA, 02116.

g. If, after administrative reconsideration, MassDOT finds that the bidder has not shown that sufficient good faith efforts were made to comply with the requirements of these Special Provisions, it shall reject the bidder's proposal and may retain the proposal guaranty.

h. Actions which constitute evidence of good faith efforts to meet a DBE participation goal include, but are not limited to, the following examples, which are set forth in 49 CFR Part 26, Appendix A:

(1) Soliciting through all reasonable and available means (e.g., attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the Contract. The bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE participation goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Prime Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE Subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE Subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone number of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

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

(5) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. Contractors should be careful of adding additional requirements of performance that would in effect limit participation by DBEs or any small business. The Contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. nonunion employee status) are not legitimate causes for the rejection or non-solicitation of bids in the Contractor's efforts to meet the Contract participation goal.

(6) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.

(7) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case by case basis to provide assistance in the recruitment and placement of DBEs.

8. COMPLIANCE

a. All activity performed by a DBE for credit toward the Contract participation goal must be performed, managed and supervised by the DBE in accordance with all commercially useful function requirements of 49 CFR Part 26. The Prime Contractor shall not enter into, or condone, any other arrangement.

b. The Prime Contractor shall not perform with its own organization, or assign to any other business, an activity designated for the DBE(s) named on the Schedule(s) submitted by the Prime Contractor under Section 7 or under paragraph **8.f** of this section, without the approval of MassDOT in accordance with the requirements of paragraphs **8.f** and **8.j** of this section.

c. MassDOT may suspend payment for any activity that was not performed by the DBE to whom the activity was committed on the approved Schedule of Participation, or that was not performed in accordance with the requirements of Section 6.

d. MassDOT retains the right to approve or disapprove of any or all Subcontractors. Requests by the Prime Contractor for approval of participation by a DBE Subcontractor for credit toward the Contract participation goal must include, in addition to any other requirements for Subcontractor approval, the following:

(1) A copy of the proposed subcontract. The subcontract must be for at least the dollar amount, and for the work described, in the Bidder's Schedule of Participation.

(2) A resume stating the qualifications and experience of the DBE Superintendent and/or foreperson who will supervise the on-site work. A new resume will be required for any change in supervisory personnel during the progress of the work.

(3) A Schedule of Operations indicating when the DBE is expected to perform the work.

(4) A list of (1) equipment owned by the DBE to be used on the Project, and (2) equipment to be leased by the DBE for use on the Project.

(5) A list of: (1) all projects (public and private) which the DBE is currently performing; (2) all projects (public and private) to which the DBE is committed; and (3) all projects (public and private) to which the DBE intends to make a commitment. For each Contract, list the contracting organization, the name and telephone number of a contact person for the contracting organization, the dollar value of the work, a description of the work, and the DBE's work schedule for each project.

e. If, pursuant to the Subcontractor approval process, MassDOT finds that a DBE Subcontractor does not have sufficient experience or resources to perform, manage and supervise work of the kind proposed in accordance with the requirements of 49 CFR Part 26, approval of the DBE Subcontractor may be denied. In the event of such denial, the Prime Contractor shall proceed in accordance with the requirements paragraphs **8.f** and **8.j** of this section.

f. If, for reasons beyond its control, the Prime Contractor cannot comply with its DBE participation commitment in accordance with the Schedule of Participation submitted under Section 7, the Prime Contractor shall submit to MassDOT the reasons for its inability to comply with its obligations and shall submit, and request approval for, a revised Schedule of Participation. If approved by MassDOT, the revised Schedule shall govern the Prime Contractor's performance in meeting its obligations under these Special Provisions.

g. A Prime Contractor's compliance with the participation goal in Section 2 shall be determined by reference to the established percentage of the total contract price, provided, however, that no decrease in the dollar amount of a bidder's commitment to any DBE shall be allowed without the approval of MassDOT.

h. If the contract amount is increased, the Prime Contractor may be required to submit a revised Schedule of Participation in accordance with paragraphs **8.f** and **8.j** of this section.

i. In the event of the decertification of a DBE scheduled to participate on the Contract for credit toward the participation goal, but not under subcontract, the Contractor shall proceed in accordance with paragraphs **8.f** and **8.j** of this section.

j. The Prime Contractor shall notify MassDOT immediately of any facts that come to its attention indicating that it may or will be unable to comply with any aspect of its DBE obligation under this Contract.

k. Any notice required by these Special Provisions shall be given in writing to: (1) the Resident Engineer; (2) the District designated Compliance Officer; and (3) the DBE Liaison Officer, MassDOT Office of Civil Rights, 10 Park Plaza, – 3rd Floor - West, Boston, MA, 02116 and cc'd to the Deputy Chief of External Programs.

l. The Prime Contractor and its Subcontractors shall comply with MassDOT's Electronic Reporting System Requirements (MassDOT Document 00821) and submit all information required by MassDOT related to the DBE Special Provisions through the Equitable Business Opportunity Solution ("EBO"). MassDOT reserves the right to request reports in the format it deems necessary anytime during the performance of the Contract.

m. Termination of DBE by Prime Contractor

(1) A Prime Contractor shall not terminate a DBE Subcontractor or an approved substitute DBE firm without the prior written consent of MassDOT. This includes, but is not limited to, instances in which a Prime Contractor seeks to perform work originally designated for a DBE Subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

(2) MassDOT may provide such written consent only if MassDOT agrees, for reasons stated in its concurrence document, that the Prime Contractor has good cause to terminate the DBE firm.

(3) For purposes of this paragraph, good cause includes the following circumstances:

(i) The DBE Subcontractor fails or refuses to execute a written contract;

(ii) The DBE Subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Good cause, however, does not exist if the failure or refusal of the DBE Subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Prime Contractor;

(iii) The DBE Subcontractor fails or refuses to meet the Prime Contractor's reasonable, nondiscriminatory bond requirements.

(iv) The DBE Subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(v) The DBE Subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable State law;

(vi) (vii) MassDOT has determined that the listed DBE Subcontractor is not a responsible contractor;

(vii) The listed DBE Subcontractor voluntarily withdraws from the Project and provides written notice of its withdrawal;

(viii) The listed DBE is ineligible to receive DBE credit for the type of work required;

(ix) A DBE owner dies or becomes disabled with the result that the listed DBE Contractor is unable to complete its work on the Contract;

(x) Other documented good cause that MassDOT determines compels the termination of the DBE Subcontractor. Good cause, however, does not exist if the Prime Contractor seeks to terminate a DBE it relied upon to obtain the Contract so that the Prime Contractor can self-perform the DBE work or substitute another DBE or non-DBE Contractor after Contract Award.

(4) Before transmitting to MassDOT a request to terminate and/or substitute a DBE Subcontractor, the Prime Contractor must give notice in writing to the DBE Subcontractor, with a copy to MassDOT, of its intent to request to terminate and/or substitute, and the reason for the request.

(5) The Prime Contractor must give the DBE five (5) business days to respond to the Prime Contractor's notice. The DBE must advise MassDOT and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why MassDOT should not approve the Prime Contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), MassDOT may provide a response period shorter than five (5) business days.

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

n. Prompt Payment.

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

9. SANCTIONS

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

a. Retain, in connection with final acceptance and final payment processing, an amount determined by multiplying the total contract amount by the percentage in Section 2, less the amount paid to approved DBE(s) for work performed under the Contract in accordance with the provisions of Section 8.

b. Suspend, terminate or cancel this Contract, in whole or in part, and call upon the Prime Contractor's surety to perform all terms and conditions in the Contract.

c. In accordance with 720 CMR 5.05(1)(f), modify or revoke the Prime Contractor's Prequalification status or recommend that the Prime Contractor not receive award of a pending Contract. The Prime Contractor may appeal the determination of the Prequalification Committee in accordance with the provisions of 720 CMR 5.06.

d. Initiate debarment proceedings pursuant to M.G.L. c. 29 §29F and, as applicable, 2 CFR Parts 180, 215 and 1,200.

e. Refer the matter to the Massachusetts Attorney General for review and prosecution, if appropriate, of any false claim or pursuant to M.G.L. c. 12, §§ 5A to 5O (the Massachusetts False Claim Act).

f. Refer the matter to the U.S. DOT's Office of the Inspector General or other agencies for prosecution under Title 18, U.S.C. § 1001, 49 CFR Parts 29 and 31, and other applicable laws and regulations.

10. FURTHER INFORMATION; ENFORCEMENT, COOPERATION AND CONFIDENTIALITY.

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

(1) If you are a firm that does not meet the eligibility criteria of 49 CFR, Parts 26.61 to 26.73 ("subpart D"), that attempts to participate in a DOT- assisted program as a DBE on the basis of false, fraudulent, or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, MassDOT or FHWA may initiate suspension or debarment proceedings against you under 49 CFR Part 29.

(2) If you are a firm that, in order to meet DBE Contract participation goals or other DBE Program requirements, uses or attempts to use, on the basis of false, fraudulent or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, another firm that does not meet the eligibility criteria of subpart D, FHWA may initiate suspension or debarment proceedings against you under 49 CFR Part 29.

(3) In a suspension or debarment proceeding brought either under subparagraph a.(1) or b.(2) of this section, the concerned operating administration may consider the fact that a purported DBE has been certified by a recipient. Such certification does not preclude FHWA from determining that the purported DBE, or another firm that has used or attempted to use it to meet DBE participation goals, should be suspended or debarred.

(4) FHWA may take enforcement action under 49 CFR Part 31, Program Fraud and Civil Remedies, against any participant in the DBE Program whose conduct is subject to such action under 49 CFR Part 31.

(5) FHWA may refer to the Department of Justice, for prosecution under 18 U.S.C. 1001 or other applicable provisions of law, any person who makes a false or fraudulent statement in connection with participation of a DBE in any DOT-assisted program or otherwise violates applicable Federal statutes.

b. Pursuant to 49 CFR Part 26.109, the rules governing information, confidentiality, cooperation, and intimidation or retaliation are as follows:

(1) Availability of records.

(i) In responding to requests for information concerning any aspect of the DBE Program, FHWA complies with provisions of the Federal Freedom of Information and Privacy Acts (5 U.S.C. 552 and 552a). FHWA may make available to the public any information concerning the DBE Program release of which is not prohibited by Federal law.

(ii) MassDOT shall safeguard from disclosure to unauthorized persons information that may reasonably be considered as confidential business information, consistent with Federal and Massachusetts General Law (M.G.L. c. 66, § 10, M.G.L. c. 4, §7 (26), 950 CMR 32.00).

(2) Confidentiality of information on complainants. Notwithstanding the provisions of subparagraph b.(1) of this section, the identity of complainants shall be kept confidential, at their election. If such confidentiality will hinder the investigation, proceeding or hearing, or result in a denial of appropriate administrative due process to other parties, the complainant must be advised for the purpose of waiving the privilege. Complainants are advised that, in some circumstances, failure to waive the privilege may result in the closure of the investigation or dismissal of the proceeding or hearing.

(3) Cooperation. All participants in FHWA's DBE Program (including, but not limited to, recipients, DBE firms and applicants for DBE certification, complainants and appellants, and Contractors using DBE firms to meet Contract participation goals) are required to cooperate fully and promptly with U.S. DOT and recipient compliance reviews, certification reviews, investigations, and other requests for information. Failure to do so shall be a ground for appropriate action against the party involved (e.g., with respect to recipients, a finding of noncompliance; with respect to DBE firms, denial of certification or removal of eligibility and/or suspension and debarment; with respect to a complainant or appellant, dismissal of the complaint or appeal; with respect to a Contractor which uses DBE firms to meet participation goals, findings of non-responsibility for future Contracts and/or suspension and debarment).

(4) Intimidation and retaliation. No recipient, Contractor, or any other participant in the program, may intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by this part or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under this part. If any recipient or contractor violates this prohibition, that entity is in noncompliance with this 49 CFR Part 26.

11. LIST OF ADDITIONAL DOCUMENTS.

a. The following documents shall be completed and signed by the bidder and designated DBEs in accordance with Section 7 - Award Documentation and Procedures. These documents must be returned by the bidder to MassDOT's Bid Document Distribution Center:

- □ Schedule of DBE Participation (Document B00853)
- □ Letter of Intent (Document B00854)
- □ DBE Joint Check Arrangement Approval Form (Document B00855), if Contractor and DBE plan, or if DBE is required to use a Joint Check

b. The following document shall be signed and returned by Contractor and Subcontractors/DBEs to the MassDOT District Office overseeing the Project, as applicable:

- □ Contractor/Subcontractor Certification Form (Document No. 00859) (a checklist of other documents to be included with every subcontract (DBEs and non-DBEs alike)).

c. The following document shall be provided to MassDOT's Office of Civil Rights and Prequalification Office at least fourteen (14) business days before the bid opening date, if applicable:

- □ Affidavit of DBE/Non-DBE Joint Venture (Document B00856)

d. The following document shall be provided to MassDOT's District Office of Civil Rights within 30 calendar days after the work of the DBE is completed, or no later than 30 calendar days after the work of the DBE is on a completed and processed CQE. This document shall be completed and submitted by the Prime Contractor:

- □ Certificate of Completion by a Minority/Women or Disadvantaged Business Enterprise (M/W/DBE) (Form No. CSD-100)

*** END OF DOCUMENT ***

DOCUMENT 00760

FHWA-1273 – Revised October 23, 2023

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

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

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

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

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

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

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

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

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

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

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

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

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

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

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

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

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

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

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

10. Assurances Required:

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

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

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

1. Minimum wages (29 CFR 5.5)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2. Withholding (29 CFR 5.5)

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

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

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

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement 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 reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

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

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

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

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

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

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

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

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

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

VII. SAFETY: ACCIDENT PREVENTION

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

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

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

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

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

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

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

* * * * *

3. **Instructions for Certification - Lower Tier Participants:**

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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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

August 21, 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	$0.64
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note (8) below.)	$0.88
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	$0.88
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	$0.91
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	$0.98
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	$0.90
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	$0.98
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	$0.90
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	$1.02
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	$0.91
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	$1.02
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	$0.91
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	$1.06
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	$1.13
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	$1.74
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	$1.02
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	$0.91
18	ASTM A276 Type 316 Stainless Steel	$5.18
19	ASTM A240 Type 316 Stainless Steel	$5.18
20	ASTM A148 Grade 80/50 Steel Castings (See Note (8) below.)	$1.79
21	ASTM A53 Grade B Structural Steel Pipe	$1.13
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	$1.13
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	$0.89
24	ASTM 252, Grade 2 Permanent Steel Casing	$0.89
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	$0.96
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	$1.71
27	ASTM A572 / A572M, Grade 50 Sheetpiling	$1.71
28	ASTM A36/36M, Grade 50	$0.98
29	ASTM A570, Grade 50	$0.96
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	$0.98
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	$1.13
32	AREA 140 LB Rail and Track Accessories	$0.59

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 l51 B).

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

III. Minority and Women Workforce Participation

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

IV. Liaison Committee

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

V. Reports and Records

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

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

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

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

VI. Access to Work Site

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

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

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

VIII. Sanctions

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

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

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

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

IX. Severability

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

X. Contractor's Certification

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

XI. Subcontractor Requirements

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

Rev'd 03/07/14

*** END OF DOCUMENT ***

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DOCUMENT 00821

ELECTRONIC REPORTING REQUIREMENTS
CIVIL RIGHTS PROGRAMS AND CERTIFIED PAYROLL

Implemented on March 2, 2009 Revised June 04, 2019

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

Contractor and Sub-Contractor EBO User Certification

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

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

Vetting of Firms and Designated Firm Individuals

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

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

Interim Reporting Requirements

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

*** END OF DOCUMENT ***

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DOCUMENT 00859

CONTRACTOR/SUBCONTRACTOR CERTIFICATION FORM ‡

The contractor shall submit this completed document 00859 to MassDOT for each subcontract.

_____ **(Contractor)** **Date:** _____

_____ **(Subcontractor)** ☐ District Approved Subcontractor

Contract No: 128103 **Project No.** 608753 **Federal Aid No.:** STP-0035(059)

Location: Taunton

Project Description: Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)

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: _____
_____
_____
Telephone Number:_____
Federal I.D. Number:_____
Estimated Start Date:_____
Estimated Completion Date:_____
Estimated Dollar Amount:_____

_____
(Print Name and Title)

_____
(Authorized Signature)

_____
(Date)

Rev'd 09/02/22

*** END OF DOCUMENT ***

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 that two week before the anniversary of the Notice to Proceed date of the contract to allow for adequate processing by the Department of Labor Standards (DLS). The effective date for the new rates will be the anniversary date of the contract (i.e. the notice to proceed date), regardless of the date of issuance on the schedule from DLS.

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

*** END OF DOCUMENT ***

DOCUMENT 00861

STATE PREVAILING WAGE RATES

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Proposal No. 608753-128103

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

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: MassDOT Highway

Contract Number: 128103 **City/Town:** TAUNTON

Description of Work: TAUNTON: Federal Aid Project No. STP-0035(059) Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)

Job Location: Purchase Street to Jackson Street

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 updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F "rental of equipment" contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- 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 within90 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.

Issue Date: 09/16/2024 **Wage Request Number:** 20240916-026

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	06/01/2024	$39.28	$9.65	$18.40	$0.00	$67.33
	12/01/2024	$40.61	$9.65	$18.40	$0.00	$68.66
	06/01/2025	$42.00	$9.65	$18.40	$0.00	$70.05
	12/01/2025	$43.38	$9.65	$18.40	$0.00	$71.43
	06/01/2026	$44.82	$9.65	$18.40	$0.00	$72.87
	12/01/2026	$46.26	$9.65	$18.40	$0.00	$74.31
	06/01/2027	$47.71	$9.65	$18.40	$0.00	$75.76
	12/01/2027	$49.16	$9.65	$18.40	$0.00	$77.21
	06/01/2028	$50.66	$9.65	$18.40	$0.00	$78.71
	12/01/2028	$52.16	$9.65	$18.40	$0.00	$80.21
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$39.28	$9.65	$17.80	$0.00	$66.73
	12/01/2024	$40.61	$9.65	$17.80	$0.00	$68.06
	06/01/2025	$42.00	$9.65	$17.80	$0.00	$69.45
	12/01/2025	$43.38	$9.65	$17.80	$0.00	$70.83
	06/01/2026	$44.82	$9.65	$17.80	$0.00	$72.27
	12/01/2026	$46.26	$9.65	$17.80	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	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 *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$56.03	$15.30	$16.40	$0.00	$87.73
	12/01/2024	$57.48	$15.30	$16.40	$0.00	$89.18
	06/01/2025	$58.78	$15.30	$16.40	$0.00	$90.48
	12/01/2025	$60.23	$15.30	$16.40	$0.00	$91.93
	06/01/2026	$61.53	$15.30	$16.40	$0.00	$93.23
	12/01/2026	$62.98	$15.30	$16.40	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$56.03	$15.30	$16.40	$0.00	$87.73
	12/01/2024	$57.48	$15.30	$16.40	$0.00	$89.18
	06/01/2025	$58.78	$15.30	$16.40	$0.00	$90.48
	12/01/2025	$60.23	$15.30	$16.40	$0.00	$91.93
	06/01/2026	$61.53	$15.30	$16.40	$0.00	$93.23
	12/01/2026	$62.98	$15.30	$16.40	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	06/01/2024	$39.28	$9.65	$18.40	$0.00	$67.33
	12/01/2024	$40.61	$9.65	$18.40	$0.00	$68.66
	06/01/2025	$42.00	$9.65	$18.40	$0.00	$70.05
	12/01/2025	$43.38	$9.65	$18.40	$0.00	$71.43
	06/01/2026	$44.82	$9.65	$18.40	$0.00	$72.87
	12/01/2026	$46.26	$9.65	$18.40	$0.00	$74.31
	06/01/2027	$47.71	$9.65	$18.40	$0.00	$75.76
	12/01/2027	$49.16	$9.65	$18.40	$0.00	$77.21
	06/01/2028	$50.66	$9.65	$18.40	$0.00	$78.71
	12/01/2028	$52.16	$9.65	$18.40	$0.00	$80.21
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$39.28	$9.65	$17.80	$0.00	$66.73
	12/01/2024	$40.61	$9.65	$17.80	$0.00	$68.06
	06/01/2025	$42.00	$9.65	$17.80	$0.00	$69.45
	12/01/2025	$43.38	$9.65	$17.80	$0.00	$70.83
	06/01/2026	$44.82	$9.65	$17.80	$0.00	$72.27
	12/01/2026	$46.26	$9.65	$17.80	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	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) *BRICKLAYERS LOCAL 3 (FOXBORO)*	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

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

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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.83	$11.49	$22.90	$0.00	$66.22
2	60	$38.20	$11.49	$22.90	$0.00	$72.59
3	70	$44.56	$11.49	$22.90	$0.00	$78.95
4	80	$50.93	$11.49	$22.90	$0.00	$85.32
5	90	$57.29	$11.49	$22.90	$0.00	$91.68

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2024	$46.63	$9.65	$18.22	$0.00	$74.50
	12/01/2024	$48.10	$9.65	$18.22	$0.00	$75.97
	06/01/2025	$49.60	$9.65	$18.22	$0.00	$77.47
	12/01/2025	$51.10	$9.65	$18.22	$0.00	$78.97
	06/01/2026	$52.65	$9.65	$18.22	$0.00	$80.52
	12/01/2026	$54.15	$9.65	$18.22	$0.00	$82.02
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2024	$45.48	$9.65	$18.22	$0.00	$73.35
	12/01/2024	$46.95	$9.65	$18.22	$0.00	$74.82
	06/01/2025	$48.45	$9.65	$18.22	$0.00	$76.32
	12/01/2025	$49.95	$9.65	$18.22	$0.00	$77.82
	06/01/2026	$51.50	$9.65	$18.22	$0.00	$79.37
	12/01/2026	$53.00	$9.65	$18.22	$0.00	$80.87
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2024	$45.81	$9.65	$18.22	$0.00	$73.68
	12/01/2024	$47.28	$9.65	$18.22	$0.00	$75.15
	06/01/2025	$48.78	$9.65	$18.22	$0.00	$76.65
	12/01/2025	$50.28	$9.65	$18.22	$0.00	$78.15
	06/01/2026	$51.83	$9.65	$18.22	$0.00	$79.70
	12/01/2026	$53.33	$9.65	$18.22	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER - Zone 2 Eastern MA*

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

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.33	$9.83	$1.73	$0.00	$33.89
2	45	$22.33	$9.83	$1.73	$0.00	$33.89
3	55	$27.29	$9.83	$3.40	$0.00	$40.52
4	55	$27.29	$9.83	$3.40	$0.00	$40.52
5	70	$34.73	$9.83	$16.51	$0.00	$61.07
6	70	$34.73	$9.83	$16.51	$0.00	$61.07
7	80	$39.70	$9.83	$18.24	$0.00	$67.77
8	80	$39.70	$9.83	$18.24	$0.00	$67.77

Notes:

Apprentice to Journeyworker Ratio:1:5

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

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 10/01/2023

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

Effective Date - 10/01/2024

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

Notes:

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

Apprentice to Journeyworker Ratio:1:5

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

Apprentice - *CEMENT MASONRY/PLASTERING - Foxboro*

Effective Date - 01/01/2024

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

Notes:

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$57.15	$15.30	$16.40	$0.00	$88.85
	12/01/2024	$58.63	$15.30	$16.40	$0.00	$90.33
	06/01/2025	$59.96	$15.30	$16.40	$0.00	$91.66
	12/01/2025	$61.43	$15.30	$16.40	$0.00	$93.13
	06/01/2026	$62.76	$15.30	$16.40	$0.00	$94.46
	12/01/2026	$64.24	$15.30	$16.40	$0.00	$95.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$36.17	$15.30	$16.40	$0.00	$67.87
	12/01/2024	$37.12	$15.30	$16.40	$0.00	$68.82
	06/01/2025	$37.97	$15.30	$16.40	$0.00	$69.67
	12/01/2025	$38.92	$15.30	$16.40	$0.00	$70.62
	06/01/2026	$39.78	$15.30	$16.40	$0.00	$71.48
	12/01/2026	$40.73	$15.30	$16.40	$0.00	$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2024	$57.26	$9.95	$23.95	$0.00	$91.16
	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.23	$9.95	$0.00	$0.00	$39.18
2	55	$32.15	$9.95	$6.66	$0.00	$48.76
3	60	$35.08	$9.95	$7.26	$0.00	$52.29
4	65	$38.00	$9.95	$7.87	$0.00	$55.82
5	70	$40.92	$9.95	$20.32	$0.00	$71.19
6	75	$43.85	$9.95	$20.93	$0.00	$74.73
7	80	$46.77	$9.95	$21.53	$0.00	$78.25
8	90	$52.61	$9.95	$22.74	$0.00	$85.30

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	06/10/2024	$45.53	$9.65	$18.40	$0.00	$73.58
	12/02/2024	$47.00	$9.65	$18.40	$0.00	$75.05
	06/02/2025	$48.50	$9.65	$18.40	$0.00	$76.55
	12/01/2025	$50.00	$9.65	$18.40	$0.00	$78.05
	06/01/2026	$51.55	$9.65	$18.40	$0.00	$79.60
	12/07/2026	$53.05	$9.65	$18.40	$0.00	$81.10
	06/07/2027	$54.65	$9.65	$18.40	$0.00	$82.70
	12/06/2027	$56.25	$9.65	$18.40	$0.00	$84.30
	06/05/2028	$57.93	$9.65	$18.40	$0.00	$85.98
	12/04/2028	$59.60	$9.65	$18.40	$0.00	$87.65

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	06/10/2024	$46.53	$9.65	$18.40	$0.00	$74.58
	12/02/2024	$48.00	$9.65	$18.40	$0.00	$76.05
	06/02/2025	$49.50	$9.65	$18.40	$0.00	$77.55
	12/01/2025	$51.00	$9.65	$18.40	$0.00	$79.05
	06/01/2026	$52.55	$9.65	$18.40	$0.00	$80.60
	12/07/2026	$54.05	$9.65	$18.40	$0.00	$82.10
	06/07/2027	$55.65	$9.65	$18.40	$0.00	$83.70
	12/06/2027	$57.25	$9.65	$18.40	$0.00	$85.30
	06/05/2028	$58.93	$9.65	$18.40	$0.00	$86.98
	12/04/2028	$60.60	$9.65	$18.40	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 2*	06/10/2024	$46.28	$9.65	$18.40	$0.00	$74.33
	12/02/2024	$47.75	$9.65	$18.40	$0.00	$75.80
	06/02/2025	$49.25	$9.65	$18.40	$0.00	$77.30
	12/01/2025	$50.75	$9.65	$18.40	$0.00	$78.80
	06/01/2026	$52.30	$9.65	$18.40	$0.00	$80.35
	12/07/2026	$53.80	$9.65	$18.40	$0.00	$81.85
	06/07/2027	$55.40	$9.65	$18.40	$0.00	$83.45
	12/06/2027	$57.00	$9.65	$18.40	$0.00	$85.05
	06/05/2028	$58.68	$9.65	$18.40	$0.00	$86.73
	12/04/2028	$60.35	$9.65	$18.40	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	06/10/2024	$46.53	$9.65	$18.40	$0.00	$74.58
	12/02/2024	$48.00	$9.65	$18.40	$0.00	$76.05
	06/02/2025	$49.50	$9.65	$18.40	$0.00	$77.55
	12/01/2025	$51.00	$9.65	$18.40	$0.00	$79.05
	06/01/2026	$52.55	$9.65	$18.40	$0.00	$80.60
	12/07/2026	$54.05	$9.65	$18.40	$0.00	$82.10
	06/07/2027	$55.65	$9.65	$18.40	$0.00	$83.70
	12/06/2027	$57.25	$9.65	$18.40	$0.00	$85.30
	06/05/2028	$58.93	$9.65	$18.40	$0.00	$86.98
	12/04/2028	$60.60	$9.65	$18.40	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	06/10/2024	$46.28	$9.65	$18.40	$0.00	$74.33
	12/02/2024	$47.75	$9.65	$18.40	$0.00	$75.80
	06/02/2025	$49.25	$9.65	$18.40	$0.00	$77.30
	12/01/2025	$50.75	$9.65	$18.40	$0.00	$78.80
	06/01/2026	$52.30	$9.65	$18.40	$0.00	$80.35
	12/07/2026	$53.80	$9.65	$18.40	$0.00	$81.85
	06/07/2027	$55.40	$9.65	$18.40	$0.00	$83.45
	12/06/2027	$57.00	$9.65	$18.40	$0.00	$85.05
	06/05/2028	$58.68	$9.65	$18.40	$0.00	$86.73
	12/04/2028	$60.35	$9.65	$18.40	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	06/10/2024	$45.53	$9.65	$18.40	$0.00	$73.58
	12/02/2024	$47.00	$9.65	$18.40	$0.00	$75.05
	06/02/2025	$48.50	$9.65	$18.40	$0.00	$76.55
	12/01/2025	$50.00	$9.65	$18.40	$0.00	$78.05
	06/01/2026	$51.55	$9.65	$18.40	$0.00	$79.60
	12/07/2026	$53.05	$9.65	$18.40	$0.00	$81.10
	06/07/2027	$54.65	$9.65	$18.40	$0.00	$82.70
	12/06/2027	$56.25	$9.65	$18.40	$0.00	$84.30
	06/05/2028	$57.93	$9.65	$18.40	$0.00	$85.98
	12/04/2028	$59.60	$9.65	$18.40	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$68.70	$9.40	$23.12	$0.00	$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$73.60	$9.40	$23.12	$0.00	$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2023	$47.87	$11.75	$16.86	$0.00	$76.48

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2023

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

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2022

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

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2024	$50.79	$15.00	$16.40	$0.00	$82.19
	11/01/2024	$52.08	$15.00	$16.40	$0.00	$83.48
	05/01/2025	$53.52	$15.00	$16.40	$0.00	$84.92
	11/01/2025	$54.81	$15.00	$16.40	$0.00	$86.21
	05/01/2026	$56.25	$15.00	$16.40	$0.00	$87.65
	11/01/2026	$57.54	$15.00	$16.40	$0.00	$88.94
	05/01/2027	$58.97	$15.00	$16.40	$0.00	$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2024	$52.37	$15.00	$16.40	$0.00	$83.77
	11/01/2024	$53.67	$15.00	$16.40	$0.00	$85.07
	05/01/2025	$55.12	$15.00	$16.40	$0.00	$86.52
	11/01/2025	$56.42	$15.00	$16.40	$0.00	$87.82
	05/01/2026	$57.87	$15.00	$16.40	$0.00	$89.27
	11/01/2026	$59.17	$15.00	$16.40	$0.00	$90.57
	05/01/2027	$60.62	$15.00	$16.40	$0.00	$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2024	$24.91	$15.00	$16.40	$0.00	$56.31
	11/01/2024	$25.67	$15.00	$16.40	$0.00	$57.07
	05/01/2025	$26.52	$15.00	$16.40	$0.00	$57.92
	11/01/2025	$27.28	$15.00	$16.40	$0.00	$58.68
	05/01/2026	$28.13	$15.00	$16.40	$0.00	$59.53
	11/01/2026	$28.89	$15.00	$16.40	$0.00	$60.29
	05/01/2027	$29.74	$15.00	$16.40	$0.00	$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$45.23	$15.30	$16.40	$0.00	$76.93
	12/01/2024	$46.41	$15.30	$16.40	$0.00	$78.11
	06/01/2025	$47.47	$15.30	$16.40	$0.00	$79.17
	12/01/2025	$48.64	$15.30	$16.40	$0.00	$80.34
	06/01/2026	$49.70	$15.30	$16.40	$0.00	$81.40
	12/01/2026	$50.88	$15.30	$16.40	$0.00	$82.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$27.01	$9.65	$17.80	$0.00	$54.46
	12/01/2024	$27.01	$9.65	$17.80	$0.00	$54.46
	06/01/2025	$28.09	$9.65	$17.80	$0.00	$55.54
	12/01/2025	$28.09	$9.65	$17.80	$0.00	$55.54
	06/01/2026	$29.21	$9.65	$17.80	$0.00	$56.66
	12/01/2026	$29.21	$9.65	$17.80	$0.00	$56.66
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE II*	03/01/2024	$49.47	$8.83	$20.27	$0.00	$78.57

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone II*

Effective Date - 03/01/2024

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

Notes: Steps are 750 hrs.
% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $32.63/ 3&4 $39.28/ 5&6 $59.86/ 7&8 $66.52

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$56.03	$15.30	$16.40	$0.00	$87.73
	12/01/2024	$57.48	$15.30	$16.40	$0.00	$89.18
	06/01/2025	$58.78	$15.30	$16.40	$0.00	$90.48
	12/01/2025	$60.23	$15.30	$16.40	$0.00	$91.93
	06/01/2026	$61.53	$15.30	$16.40	$0.00	$93.23
	12/01/2026	$62.98	$15.30	$16.40	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$36.17	$15.30	$16.40	$0.00	$67.87
	12/01/2024	$37.12	$15.30	$16.40	$0.00	$68.82
	06/01/2025	$37.97	$15.30	$16.40	$0.00	$69.67
	12/01/2025	$38.92	$15.30	$16.40	$0.00	$70.62
	06/01/2026	$39.78	$15.30	$16.40	$0.00	$71.48
	12/01/2026	$40.73	$15.30	$16.40	$0.00	$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.59	$10.80	$1.80	$0.00	$32.19
2	56	$22.04	$10.80	$1.80	$0.00	$34.64
3	63	$24.49	$10.80	$2.45	$0.00	$37.74
4	69	$26.94	$10.80	$2.45	$0.00	$40.19
5	75	$29.39	$10.80	$3.15	$0.00	$43.34
6	81	$31.83	$10.80	$3.15	$0.00	$45.78
7	88	$34.28	$10.80	$10.45	$0.00	$55.53
8	94	$36.73	$10.80	$10.45	$0.00	$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$56.03	$15.30	$16.40	$0.00	$87.73
	12/01/2024	$57.48	$15.30	$16.40	$0.00	$89.18
	06/01/2025	$58.78	$15.30	$16.40	$0.00	$90.48
	12/01/2025	$60.23	$15.30	$16.40	$0.00	$91.93
	06/01/2026	$61.53	$15.30	$16.40	$0.00	$93.23
	12/01/2026	$62.98	$15.30	$16.40	$0.00	$94.68

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$30.82	$15.30	$0.00	$0.00	$46.12
2	60	$33.62	$15.30	$16.40	$0.00	$65.32
3	65	$36.42	$15.30	$16.40	$0.00	$68.12
4	70	$39.22	$15.30	$16.40	$0.00	$70.92
5	75	$42.02	$15.30	$16.40	$0.00	$73.72
6	80	$44.82	$15.30	$16.40	$0.00	$76.52
7	85	$47.63	$15.30	$16.40	$0.00	$79.33
8	90	$50.43	$15.30	$16.40	$0.00	$82.13

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$31.61	$0.00	$0.00	$0.00	$31.61
2	60	$34.49	$15.30	$16.40	$0.00	$66.19
3	65	$37.36	$15.30	$16.40	$0.00	$69.06
4	70	$40.24	$15.30	$16.40	$0.00	$71.94
5	75	$43.11	$15.30	$16.40	$0.00	$74.81
6	80	$45.98	$15.30	$16.40	$0.00	$77.68
7	85	$48.86	$15.30	$16.40	$0.00	$80.56
8	90	$51.73	$15.30	$16.40	$0.00	$83.43

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	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 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	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) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 2*	06/01/2024	$39.28	$9.65	$18.40	$0.00	$67.33
	12/01/2024	$40.61	$9.65	$18.40	$0.00	$68.66
	06/01/2025	$42.00	$9.65	$18.40	$0.00	$70.05
	12/01/2025	$43.38	$9.65	$18.40	$0.00	$71.43
	06/01/2026	$44.82	$9.65	$18.40	$0.00	$72.87
	12/01/2026	$46.26	$9.65	$18.40	$0.00	$74.31
	06/01/2027	$47.71	$9.65	$18.40	$0.00	$75.76
	12/01/2027	$49.16	$9.65	$18.40	$0.00	$77.21
	06/01/2028	$50.66	$9.65	$18.40	$0.00	$78.71
	12/01/2028	$52.16	$9.65	$18.40	$0.00	$80.21
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$39.28	$9.65	$17.80	$0.00	$66.73
	12/01/2024	$40.61	$9.65	$17.80	$0.00	$68.06
	06/01/2025	$42.00	$9.65	$17.80	$0.00	$69.45
	12/01/2025	$43.38	$9.65	$17.80	$0.00	$70.83
	06/01/2026	$44.82	$9.65	$17.80	$0.00	$72.27
	12/01/2026	$46.26	$9.65	$17.80	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	09/01/2024	$51.23	$14.75	$19.61	$0.00	$85.59
	09/01/2025	$54.31	$14.75	$19.61	$0.00	$88.67
	09/01/2026	$57.38	$14.75	$19.61	$0.00	$91.74

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Southern MA*

Effective Date - 09/01/2024

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

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.16	$14.75	$14.32	$0.00	$56.23
2	60	$32.59	$14.75	$15.37	$0.00	$62.71
3	70	$38.02	$14.75	$16.43	$0.00	$69.20
4	80	$43.45	$14.75	$17.49	$0.00	$75.69

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

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

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	06/01/2024	$38.53	$9.65	$18.40	$0.00	$66.58
	12/01/2024	$39.86	$9.65	$18.40	$0.00	$67.91
	06/01/2025	$41.25	$9.65	$18.40	$0.00	$69.30
	12/01/2025	$42.63	$9.65	$18.40	$0.00	$70.68
	06/01/2026	$44.07	$9.65	$18.40	$0.00	$72.12
	12/01/2026	$45.51	$9.65	$18.40	$0.00	$73.56
	06/01/2027	$46.96	$9.65	$18.40	$0.00	$75.01
	12/01/2027	$48.41	$9.65	$18.40	$0.00	$76.46
	06/01/2028	$49.91	$9.65	$18.40	$0.00	$77.96
	12/01/2028	$51.41	$9.65	$18.40	$0.00	$79.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 2*

Effective Date - 06/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.12	$9.65	$18.40	$0.00	$51.17
2	70	$26.97	$9.65	$18.40	$0.00	$55.02
3	80	$30.82	$9.65	$18.40	$0.00	$58.87
4	90	$34.68	$9.65	$18.40	$0.00	$62.73

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.92	$9.65	$18.40	$0.00	$51.97
2	70	$27.90	$9.65	$18.40	$0.00	$55.95
3	80	$31.89	$9.65	$18.40	$0.00	$59.94
4	90	$35.87	$9.65	$18.40	$0.00	$63.92

Notes:

Apprentice to Journeyworker Ratio:1:5

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

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

Effective Date - 06/01/2024

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

Effective Date - 12/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	06/01/2024	$38.53	$9.65	$18.40	$0.00	$66.58
	12/01/2024	$39.86	$9.65	$18.40	$0.00	$67.91
	06/01/2025	$41.25	$9.65	$18.40	$0.00	$69.30
	12/01/2025	$42.63	$9.65	$18.40	$0.00	$70.68
	06/01/2026	$44.07	$9.65	$18.40	$0.00	$72.12
	12/01/2026	$45.51	$9.65	$18.40	$0.00	$73.56
	06/01/2027	$46.96	$9.65	$18.40	$0.00	$75.01
	12/01/2027	$48.41	$9.65	$18.40	$0.00	$76.46
	06/01/2028	$49.91	$9.65	$18.40	$0.00	$77.96
	12/01/2028	$51.41	$9.65	$18.40	$0.00	$79.46
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	06/01/2024	$38.53	$9.65	$18.40	$0.00	$66.58
	12/01/2024	$39.86	$9.65	$18.40	$0.00	$67.91
	06/01/2025	$41.25	$9.65	$18.40	$0.00	$69.30
	12/01/2025	$42.63	$9.65	$18.40	$0.00	$70.68
	06/01/2026	$44.07	$9.65	$18.40	$0.00	$72.12
	12/01/2026	$45.51	$9.65	$18.40	$0.00	$73.56
	06/01/2027	$46.96	$9.65	$18.40	$0.00	$75.01
	12/01/2027	$48.41	$9.65	$18.40	$0.00	$76.46
	06/01/2028	$49.91	$9.65	$18.40	$0.00	$77.96
	12/01/2028	$51.41	$9.65	$18.40	$0.00	$79.46
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	06/03/2024	$38.62	$9.65	$17.76	$0.00	$66.03
	12/02/2024	$39.95	$9.65	$17.76	$0.00	$67.36
	06/02/2025	$41.34	$9.65	$17.76	$0.00	$68.75
	12/01/2025	$42.72	$9.65	$17.76	$0.00	$70.13
	06/01/2026	$44.16	$9.65	$17.76	$0.00	$71.57
	12/07/2026	$45.60	$9.65	$17.76	$0.00	$73.01
	06/07/2027	$47.05	$9.65	$17.76	$0.00	$74.46
	12/06/2027	$48.50	$9.65	$17.76	$0.00	$75.91
	06/05/2028	$50.00	$9.65	$17.76	$0.00	$77.41
	12/04/2028	$51.50	$9.65	$17.76	$0.00	$78.91
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	06/01/2024	$38.53	$9.65	$18.40	$0.00	$66.58
	12/01/2024	$39.86	$9.65	$18.40	$0.00	$67.91
	06/01/2025	$41.25	$9.65	$18.40	$0.00	$69.30
	12/01/2025	$42.63	$9.65	$18.40	$0.00	$70.68
	06/01/2026	$44.07	$9.65	$18.40	$0.00	$72.12
	12/01/2026	$45.51	$9.65	$18.40	$0.00	$73.56
	06/01/2027	$46.96	$9.65	$18.40	$0.00	$75.01
	12/01/2027	$48.41	$9.65	$18.40	$0.00	$76.46
	06/01/2028	$49.91	$9.65	$18.40	$0.00	$77.96
	12/01/2028	$51.41	$9.65	$18.40	$0.00	$79.46
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	06/01/2024	$38.53	$9.65	$18.40	$0.00	$66.58
	12/01/2024	$39.86	$9.65	$18.40	$0.00	$67.91
	06/01/2025	$41.25	$9.65	$18.40	$0.00	$69.30
	12/01/2025	$42.63	$9.65	$18.40	$0.00	$70.68
	06/01/2026	$44.07	$9.65	$18.40	$0.00	$72.12
	12/01/2026	$45.51	$9.65	$18.40	$0.00	$73.56
	06/01/2027	$46.96	$9.65	$18.40	$0.00	$75.01
	12/01/2027	$48.41	$9.65	$18.40	$0.00	$76.46
	06/01/2028	$49.91	$9.65	$18.40	$0.00	$77.96
	12/01/2028	$51.41	$9.65	$18.40	$0.00	$79.46
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 *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2024	$49.32	$11.49	$21.62	$0.00	$82.43
	02/01/2025	$50.36	$11.49	$21.62	$0.00	$83.47
	08/01/2025	$52.08	$11.49	$21.62	$0.00	$85.19
	02/01/2026	$53.16	$11.49	$21.62	$0.00	$86.27
	08/01/2026	$54.92	$11.49	$21.62	$0.00	$88.03
	02/01/2027	$56.04	$11.49	$21.62	$0.00	$89.15

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

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.66	$11.49	$21.62	$0.00	$57.77
2	60	$29.59	$11.49	$21.62	$0.00	$62.70
3	70	$34.52	$11.49	$21.62	$0.00	$67.63
4	80	$39.46	$11.49	$21.62	$0.00	$72.57
5	90	$44.39	$11.49	$21.62	$0.00	$77.50

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.18	$11.49	$21.62	$0.00	$58.29
2	60	$30.22	$11.49	$21.62	$0.00	$63.33
3	70	$35.25	$11.49	$21.62	$0.00	$68.36
4	80	$40.29	$11.49	$21.62	$0.00	$73.40
5	90	$45.32	$11.49	$21.62	$0.00	$78.43

Notes:

Apprentice to Journeyworker Ratio:1:3

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.91	$11.49	$23.56	$0.00	$67.96
2	60	$39.49	$11.49	$23.56	$0.00	$74.54
3	70	$46.07	$11.49	$23.56	$0.00	$81.12
4	80	$52.66	$11.49	$23.56	$0.00	$87.71
5	90	$59.24	$11.49	$23.56	$0.00	$94.29

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

MORTAR MIXER *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$24.71	$15.30	$16.40	$0.00	$56.41
	12/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	06/01/2025	$25.97	$15.30	$16.40	$0.00	$57.67
	12/01/2025	$26.63	$15.30	$16.40	$0.00	$58.33
	06/01/2026	$27.22	$15.30	$16.40	$0.00	$58.92
	12/01/2026	$27.89	$15.30	$16.40	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$30.28	$15.30	$16.40	$0.00	$61.98
	12/01/2024	$31.08	$15.30	$16.40	$0.00	$62.78
	06/01/2025	$31.80	$15.30	$16.40	$0.00	$63.50
	12/01/2025	$32.60	$15.30	$16.40	$0.00	$64.30
	06/01/2026	$33.32	$15.30	$16.40	$0.00	$65.02
	12/01/2026	$34.12	$15.30	$16.40	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	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 - 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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.23	$9.95	$0.00	$0.00	$39.18
2	55	$32.15	$9.95	$6.66	$0.00	$48.76
3	60	$35.08	$9.95	$7.26	$0.00	$52.29
4	65	$38.00	$9.95	$7.87	$0.00	$55.82
5	70	$40.92	$9.95	$20.32	$0.00	$71.19
6	75	$43.85	$9.95	$20.93	$0.00	$74.73
7	80	$46.77	$9.95	$21.53	$0.00	$78.25
8	90	$52.61	$9.95	$22.74	$0.00	$85.30

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	07/01/2024	$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 - 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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.68	$9.95	$0.00	$0.00	$34.63
2	55	$27.15	$9.95	$6.66	$0.00	$43.76
3	60	$29.62	$9.95	$7.26	$0.00	$46.83
4	65	$32.08	$9.95	$7.87	$0.00	$49.90
5	70	$34.55	$9.95	$20.32	$0.00	$64.82
6	75	$37.02	$9.95	$20.93	$0.00	$67.90
7	80	$39.49	$9.95	$21.53	$0.00	$70.97
8	90	$44.42	$9.95	$22.74	$0.00	$77.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *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 - 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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.71	$9.95	$0.00	$0.00	$33.66
2	55	$26.08	$9.95	$6.66	$0.00	$42.69
3	60	$28.45	$9.95	$7.26	$0.00	$45.66
4	65	$30.82	$9.95	$7.87	$0.00	$48.64
5	70	$33.19	$9.95	$20.32	$0.00	$63.46
6	75	$35.57	$9.95	$20.93	$0.00	$66.45
7	80	$37.94	$9.95	$21.53	$0.00	$69.42
8	90	$42.68	$9.95	$22.74	$0.00	$75.37

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.98	$9.95	$0.00	$0.00	$33.93
2	55	$26.38	$9.95	$6.66	$0.00	$42.99
3	60	$28.78	$9.95	$7.26	$0.00	$45.99
4	65	$31.17	$9.95	$7.87	$0.00	$48.99
5	70	$33.57	$9.95	$20.32	$0.00	$63.84
6	75	$35.97	$9.95	$20.93	$0.00	$66.85
7	80	$38.37	$9.95	$21.53	$0.00	$69.85
8	90	$43.16	$9.95	$22.74	$0.00	$75.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *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 - 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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.01	$9.95	$0.00	$0.00	$32.96
2	55	$25.31	$9.95	$6.66	$0.00	$41.92
3	60	$27.61	$9.95	$7.26	$0.00	$44.82
4	65	$29.91	$9.95	$7.87	$0.00	$47.73
5	70	$32.21	$9.95	$20.32	$0.00	$62.48
6	75	$34.52	$9.95	$20.93	$0.00	$65.40
7	80	$36.82	$9.95	$21.53	$0.00	$68.30
8	90	$41.42	$9.95	$22.74	$0.00	$74.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.53	$9.65	$17.80	$0.00	$65.98
	12/01/2024	$39.86	$9.65	$17.80	$0.00	$67.31
	06/01/2025	$41.25	$9.65	$17.80	$0.00	$68.70
	12/01/2025	$42.63	$9.65	$17.80	$0.00	$70.08
	06/01/2026	$44.07	$9.65	$17.80	$0.00	$71.52
	12/01/2026	$45.51	$9.65	$17.80	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2024	$39.78	$15.07	$18.67	$0.00	$73.52
	12/01/2024	$39.78	$15.07	$20.17	$0.00	$75.02
	01/01/2025	$39.78	$15.57	$20.17	$0.00	$75.52
	06/01/2025	$40.78	$15.57	$20.17	$0.00	$76.52
	12/01/2025	$40.78	$15.57	$21.78	$0.00	$78.13
	01/01/2026	$40.78	$16.17	$21.78	$0.00	$78.73
	06/01/2026	$41.78	$16.17	$21.78	$0.00	$79.73
	12/01/2026	$41.78	$16.17	$23.52	$0.00	$81.47
	01/01/2027	$41.78	$16.77	$23.52	$0.00	$82.07

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

PIPELAYER *LABORERS - ZONE 2*	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/26/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.90	$10.15	$2.50	$0.00	$34.55
2	50	$27.37	$10.15	$2.50	$0.00	$40.02
3	60	$32.84	$10.15	$8.80	$0.00	$51.79
4	70	$38.32	$10.15	$14.08	$0.00	$62.55
5	80	$43.79	$10.15	$17.60	$0.00	$71.54

Effective Date - 08/25/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$23.00	$10.15	$2.50	$0.00	$35.65
2	50	$28.75	$10.15	$2.50	$0.00	$41.40
3	60	$34.49	$10.15	$8.80	$0.00	$53.44
4	70	$40.24	$10.15	$14.08	$0.00	$64.47
5	80	$45.99	$10.15	$17.60	$0.00	$73.74

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

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	06/01/2024	$39.28	$9.65	$18.40	$0.00	$67.33
	12/01/2024	$40.61	$9.65	$18.40	$0.00	$68.66
	06/01/2025	$42.00	$9.65	$18.40	$0.00	$70.05
	12/01/2025	$43.38	$9.65	$18.40	$0.00	$71.43
	06/01/2026	$44.82	$9.65	$18.40	$0.00	$72.87
	12/01/2026	$46.26	$9.65	$18.40	$0.00	$74.31
	06/01/2027	$47.71	$9.65	$18.40	$0.00	$75.76
	12/01/2027	$49.16	$9.65	$18.40	$0.00	$77.21
	06/01/2028	$50.66	$9.65	$18.40	$0.00	$78.71
	12/01/2028	$52.16	$9.65	$18.40	$0.00	$80.21
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER	06/01/2024	$39.53	$9.65	$18.40	$0.00	$67.58
LABORERS - ZONE 2	12/01/2024	$40.86	$9.65	$18.40	$0.00	$68.91
	06/01/2025	$42.25	$9.65	$18.40	$0.00	$70.30
	12/01/2025	$43.63	$9.65	$18.40	$0.00	$71.68
	06/01/2026	$45.07	$9.65	$18.40	$0.00	$73.12
	12/01/2026	$46.51	$9.65	$18.40	$0.00	$74.56
	06/01/2027	$47.96	$9.65	$18.40	$0.00	$76.01
	12/01/2027	$49.41	$9.65	$18.40	$0.00	$77.46
	06/01/2028	$50.91	$9.65	$18.40	$0.00	$78.96
	12/01/2028	$52.41	$9.65	$18.40	$0.00	$80.46
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY)	06/01/2024	$39.53	$9.40	$17.55	$0.00	$66.48
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	$40.86	$9.40	$17.55	$0.00	$67.81
	06/01/2025	$42.25	$9.40	$17.55	$0.00	$69.20
	12/01/2025	$43.63	$9.40	$17.55	$0.00	$70.58
	06/01/2026	$45.07	$9.40	$17.55	$0.00	$72.02
	12/01/2026	$46.51	$9.40	$17.55	$0.00	$73.46
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE	06/01/2024	$56.03	$15.30	$16.40	$0.00	$87.73
OPERATING ENGINEERS LOCAL 4	12/01/2024	$57.48	$15.30	$16.40	$0.00	$89.18
	06/01/2025	$58.78	$15.30	$16.40	$0.00	$90.48
	12/01/2025	$60.23	$15.30	$16.40	$0.00	$91.93
	06/01/2026	$61.53	$15.30	$16.40	$0.00	$93.23
	12/01/2026	$62.98	$15.30	$16.40	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE)	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
OPERATING ENGINEERS LOCAL 4	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER)	06/01/2024	$36.17	$15.30	$16.40	$0.00	$67.87
OPERATING ENGINEERS LOCAL 4	12/01/2024	$37.12	$15.30	$16.40	$0.00	$68.82
	06/01/2025	$37.97	$15.30	$16.40	$0.00	$69.67
	12/01/2025	$38.92	$15.30	$16.40	$0.00	$70.62
	06/01/2026	$39.78	$15.30	$16.40	$0.00	$71.48
	12/01/2026	$40.73	$15.30	$16.40	$0.00	$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER	01/01/2024	$27.00	$10.76	$5.45	$0.00	$43.21
TEAMSTERS 170 - Dauphinais (Bellingham)	12/01/2024	$27.60	$11.26	$6.15	$0.00	$45.01
	01/01/2025	$27.60	$11.26	$6.15	$0.00	$45.01

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
RECLAIMERS	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
OPERATING ENGINEERS LOCAL 4	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR	06/01/2024	$38.78	$9.65	$18.40	$0.00	$66.83
LABORERS - ZONE 2	12/01/2024	$40.11	$9.65	$18.40	$0.00	$68.16
	06/01/2025	$41.50	$9.65	$18.40	$0.00	$69.55
	12/01/2025	$42.88	$9.65	$18.40	$0.00	$70.93
	06/01/2026	$44.32	$9.65	$18.40	$0.00	$72.37
	12/01/2026	$45.76	$9.65	$18.40	$0.00	$73.81
	06/01/2027	$47.21	$9.65	$18.40	$0.00	$75.26
	12/01/2027	$48.66	$9.65	$18.40	$0.00	$76.71
	06/01/2028	$50.16	$9.65	$18.40	$0.00	$78.21
	12/01/2028	$51.66	$9.65	$18.40	$0.00	$79.71
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
OPERATING ENGINEERS LOCAL 4	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	08/01/2024	$51.03	$13.03	$21.70	$0.00	$85.76
ROOFERS LOCAL 33	02/01/2025	$52.28	$13.03	$21.70	$0.00	$87.01
	08/01/2025	$53.78	$13.03	$21.70	$0.00	$88.51
	02/01/2026	$55.03	$13.03	$21.70	$0.00	$89.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ROOFER - Local 33*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.52	$13.03	$6.52	$0.00	$45.07
2	60	$30.62	$13.03	$21.70	$0.00	$65.35
3	65	$33.17	$13.03	$21.70	$0.00	$67.90
4	75	$38.27	$13.03	$21.70	$0.00	$73.00
5	85	$43.38	$13.03	$21.70	$0.00	$78.11

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.14	$13.03	$6.52	$0.00	$45.69
2	60	$31.37	$13.03	$21.70	$0.00	$66.10
3	65	$33.98	$13.03	$21.70	$0.00	$68.71
4	75	$39.21	$13.03	$21.70	$0.00	$73.94
5	85	$44.44	$13.03	$21.70	$0.00	$79.17

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 *ROOFERS LOCAL 33*	08/01/2024	$51.28	$13.03	$21.70	$0.00	$86.01
	02/01/2025	$52.53	$13.03	$21.70	$0.00	$87.26
	08/01/2025	$54.03	$13.03	$21.70	$0.00	$88.76
	02/01/2026	$55.28	$13.03	$21.70	$0.00	$90.01
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	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 - 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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$25.50	$14.59	$6.13	$0.00	$46.22
2	42	$25.50	$14.59	$6.13	$0.00	$46.22
3	47	$28.54	$14.59	$12.11	$1.66	$56.90
4	47	$28.54	$14.59	$12.11	$1.66	$56.90
5	52	$31.57	$14.59	$13.09	$1.78	$61.03
6	52	$31.57	$14.59	$13.34	$1.79	$61.29
7	60	$36.43	$14.59	$14.75	$1.97	$67.74
8	65	$39.47	$14.59	$15.73	$2.09	$71.88
9	75	$45.54	$14.59	$17.69	$2.33	$80.15
10	85	$51.61	$14.59	$19.15	$2.56	$87.91

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *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 *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1*	03/01/2024	$69.04	$11.51	$23.30	$0.00	$103.85
	10/01/2024	$70.84	$11.51	$23.30	$0.00	$105.65
	03/01/2025	$72.64	$11.51	$23.30	$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	$24.16	$11.51	$12.90	$0.00	$48.57
2	40	$27.62	$11.51	$13.70	$0.00	$52.83
3	45	$31.07	$11.51	$14.50	$0.00	$57.08
4	50	$34.52	$11.51	$15.30	$0.00	$61.33
5	55	$37.97	$11.51	$16.10	$0.00	$65.58
6	60	$41.42	$11.51	$16.90	$0.00	$69.83
7	65	$44.88	$11.51	$17.70	$0.00	$74.09
8	70	$48.33	$11.51	$18.50	$0.00	$78.34
9	75	$51.78	$11.51	$19.30	$0.00	$82.59
10	80	$55.23	$11.51	$20.10	$0.00	$86.84

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$24.79	$11.51	$12.90	$0.00	$49.20
2	40	$28.34	$11.51	$13.70	$0.00	$53.55
3	45	$31.88	$11.51	$14.50	$0.00	$57.89
4	50	$35.42	$11.51	$15.30	$0.00	$62.23
5	55	$38.96	$11.51	$16.10	$0.00	$66.57
6	60	$42.50	$11.51	$16.90	$0.00	$70.91
7	65	$46.05	$11.51	$17.70	$0.00	$75.26
8	70	$49.59	$11.51	$18.50	$0.00	$79.60
9	75	$53.13	$11.51	$19.30	$0.00	$83.94
10	80	$56.67	$11.51	$20.10	$0.00	$88.28

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 *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$40.69	$11.75	$14.53	$0.00	$66.97

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2024

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

Notes: See Electrician Apprentice Wages

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

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *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 - 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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.37	$11.49	$23.59	$0.00	$67.45
2	60	$38.84	$11.49	$23.59	$0.00	$73.92
3	70	$45.32	$11.49	$23.59	$0.00	$80.40
4	80	$51.79	$11.49	$23.59	$0.00	$86.87
5	90	$58.27	$11.49	$23.59	$0.00	$93.35

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2024	$49.81	$9.65	$18.22	$0.00	$77.68
	12/01/2024	$51.28	$9.65	$18.22	$0.00	$79.15
	06/01/2025	$52.78	$9.65	$18.22	$0.00	$80.65
	12/01/2025	$54.28	$9.65	$18.22	$0.00	$82.15
	06/01/2026	$55.83	$9.65	$18.22	$0.00	$83.70
	12/01/2026	$57.33	$9.65	$18.22	$0.00	$85.20
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2024	$45.60	$9.65	$18.22	$0.00	$73.47
	12/01/2024	$47.07	$9.65	$18.22	$0.00	$74.94
	06/01/2025	$48.57	$9.65	$18.22	$0.00	$76.44
	12/01/2025	$50.07	$9.65	$18.22	$0.00	$77.94
	06/01/2026	$51.62	$9.65	$18.22	$0.00	$79.49
	12/01/2026	$53.12	$9.65	$18.22	$0.00	$80.99
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2024	$45.48	$9.65	$18.22	$0.00	$73.35
	12/01/2024	$46.95	$9.65	$18.22	$0.00	$74.82
	06/01/2025	$48.45	$9.65	$18.22	$0.00	$76.32
	12/01/2025	$49.95	$9.65	$18.22	$0.00	$77.82
	06/01/2026	$51.50	$9.65	$18.22	$0.00	$79.37
	12/01/2026	$53.00	$9.65	$18.22	$0.00	$80.87
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	06/01/2024	$55.41	$15.30	$16.40	$0.00	$87.11
	12/01/2024	$56.85	$15.30	$16.40	$0.00	$88.55
	06/01/2025	$58.13	$15.30	$16.40	$0.00	$89.83
	12/01/2025	$59.57	$15.30	$16.40	$0.00	$91.27
	06/01/2026	$60.85	$15.30	$16.40	$0.00	$92.55
	12/01/2026	$62.29	$15.30	$16.40	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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 *LABORERS (COMPRESSED AIR)*	06/01/2024	$57.71	$9.65	$19.00	$0.00	$86.36
	12/01/2024	$59.18	$9.65	$19.00	$0.00	$87.83
	06/01/2025	$60.68	$9.65	$19.00	$0.00	$89.33
	12/01/2025	$62.18	$9.65	$19.00	$0.00	$90.83
	06/01/2026	$63.73	$9.65	$19.00	$0.00	$92.38
	12/01/2026	$65.23	$9.65	$19.00	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2024	$59.71	$9.65	$19.00	$0.00	$88.36
	12/01/2024	$61.18	$9.65	$19.00	$0.00	$89.83
	06/01/2025	$62.68	$9.65	$19.00	$0.00	$91.33
	12/01/2025	$64.18	$9.65	$19.00	$0.00	$92.83
	06/01/2026	$65.73	$9.65	$19.00	$0.00	$94.38
	12/01/2026	$67.23	$9.65	$19.00	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2024	$49.78	$9.65	$19.00	$0.00	$78.43
	12/01/2024	$51.25	$9.65	$19.00	$0.00	$79.90
	06/01/2025	$52.75	$9.65	$19.00	$0.00	$81.40
	12/01/2025	$54.25	$9.65	$19.00	$0.00	$82.90
	06/01/2026	$55.80	$9.65	$19.00	$0.00	$84.45
	12/01/2026	$57.30	$9.65	$19.00	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2024	$51.78	$9.65	$19.00	$0.00	$80.43
	12/01/2024	$53.25	$9.65	$19.00	$0.00	$81.90
	06/01/2025	$54.75	$9.65	$19.00	$0.00	$83.40
	12/01/2025	$56.25	$9.65	$19.00	$0.00	$84.90
	06/01/2026	$57.80	$9.65	$19.00	$0.00	$86.45
	12/01/2026	$59.30	$9.65	$19.00	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
VAC-HAUL	06/01/2024	$40.24	$15.07	$18.67	$0.00	$73.98
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2024	$40.24	$15.07	$20.17	$0.00	$75.48
	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53
WAGON DRILL OPERATOR	06/01/2024	$39.28	$9.65	$18.40	$0.00	$67.33
LABORERS - ZONE 2	12/01/2024	$40.61	$9.65	$18.40	$0.00	$68.66
	06/01/2025	$42.00	$9.65	$18.40	$0.00	$70.05
	12/01/2025	$43.38	$9.65	$18.40	$0.00	$71.43
	06/01/2026	$44.82	$9.65	$18.40	$0.00	$72.87
	12/01/2026	$46.26	$9.65	$18.40	$0.00	$74.31
	06/01/2027	$47.71	$9.65	$18.40	$0.00	$75.76
	12/01/2027	$49.16	$9.65	$18.40	$0.00	$77.21
	06/01/2028	$50.66	$9.65	$18.40	$0.00	$78.71
	12/01/2028	$52.16	$9.65	$18.40	$0.00	$80.21
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	06/01/2024	$38.78	$9.65	$17.80	$0.00	$66.23
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR	06/01/2024	$56.03	$15.30	$16.40	$0.00	$87.73
OPERATING ENGINEERS LOCAL 4	12/01/2024	$57.48	$15.30	$16.40	$0.00	$89.18
	06/01/2025	$58.78	$15.30	$16.40	$0.00	$90.48
	12/01/2025	$60.23	$15.30	$16.40	$0.00	$91.93
	06/01/2026	$61.53	$15.30	$16.40	$0.00	$93.23
	12/01/2026	$62.98	$15.30	$16.40	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
PLUMBERS & PIPEFITTERS LOCAL 51	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Additional Apprentice Information:

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

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

All steps are six months (1000 hours.)
Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.
*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

DOCUMENT 00870

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

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:

   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

   d. "Minority" includes:

      (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $ 10,000 the provisions of the specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

   f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

   g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

   h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11 The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as many be required by the Government and keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

APPENDIX A

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

Area covered: Goal for Women apply nationwide

Goals and 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

STATE:	Goals (percent)
MASSACHUSETTS	
004 Boston MA: SMSA Counties: 1123 Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	4.0
MA Essex, MA Middlesex, MA Norfolk, MA Plymouth, MA Suffolk, NH Rockingham.	
5403 Fall River- New Bedford MA, Bristol	1.6
9243 Worcester-Fitchburg-Leominster, MA	1.6
6323 Springfield-Chicopee-Holyoke MA-CT MA Hampden, MA Hampshire	4.8
Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket	3.6
Non-SMSA Counties: MA Franklin	5.9

APPENDIX C

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

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontractors, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Massachusetts Department of Transportation (MassDOT) or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to MassDOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, MassDOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a 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 contact, 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 **X**

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 that clerk-typist or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc. where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Federal Highway Administration division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Reimbursement

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

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

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

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

Payment

Trainees will be paid:

1. Percentage (%) of the journeyworker's rate as provided in the existing programs approved by the Department of Labor or Transportation as of September 15, 1970.

2. For journeyworker programs submitted by the Contractor and approved by Massachusetts Department Of Transportation and the Federal Highway Administration at least 60 percent of the appropriate minimum journeyworker's rate specified in the contract for the first half of the training period, 75 percent for the third quarter if the training period, and 90 percent for the last quarter of the training period.

3. For skilled laborer programs, the minimum starting wage rate of unskilled laborer. At the conclusion of training, he or she will be paid the minimum wage rate of the Classification for programs submitted by the Contractor and approved by the Massachusetts Department Of Transportation and the Federal Highway Administration.

4. For the purposes of meeting the legal requirements of State Prevailing Wage Law, please be advised that no person may be paid the Apprentice wage rate as listed on a MA Prevailing Wage Rates schedule, unless that person and program is registered with the Department of Labor Standards/Division of Apprentice Standards (DLS/DAS). Any person or program not registered with DLS/DAS, regardless of whether or not they are registered with any other federal, state, local, or private entity must be paid the journeyworker’s rate for the trade.

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

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

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

*** END OF DOCUMENT ***

DOCUMENT 00880

Revised January 12, 2022

DEPARTMENT OF LABOR

Employment Standards Administration

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONTRACTS

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General Decision Number: MA20240017 09/13/2024

Superseded General Decision Number: MA20230017

State: Massachusetts

Construction Type: Highway

County: Bristol County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

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

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the

Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

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

Modification Number	Publication Date
0	01/05/2024
1	01/19/2024
2	03/22/2024
3	05/31/2024
4	06/21/2024
5	09/13/2024

ELEC0103-003 03/01/2024

	Rates	Fringes
ELECTRICIAN (Includes Traffic Signalization)	$ 61.86	36.14

ENGI0004-021 06/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 56.03	32.75
GROUP 2	$ 55.41	32.75

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:
A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS
Group 1: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid Loader; Broom/Sweeper; Crane; Gradall; Loader; Paver (Asphalt, Aggregate, and Concrete); Post Driver (Guardrail/Fences)
Group 2: Bulldozer; Grader/Blade; Milling Machine; Roller

IRON0007-029 03/16/2024

	Rates	Fringes

IRONWORKER, ORNAMENTAL.....$ 54.68 36.48

LABO0133-001 06/01/2022

	Rates	Fringes
LABORER (Concrete Surfacer).....	$ 36.31	26.64

LABO0385-001 06/01/2018

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

LABO0721-001 06/01/2018

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

LABO0876-002 06/01/2018

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

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* PAIN0035-023 07/01/2024

	Rates	Fringes
PAINTER (Steel).....	$ 56.76	36.00

SUMA2014-007 01/11/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	$ 56.70	21.08
IRONWORKER, REINFORCING.....	$ 42.13	18.15
IRONWORKER, STRUCTURAL.....	$ 45.19	17.30
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	$ 34.72	16.01
LABORER: Concrete Saw (Hand		

Held/Walk Behind)	$ 44.43	14.18
LABORER: Jack Hammer	$ 35.32	18.48
OPERATOR: Forklift	$ 64.67	0.00
OPERATOR: Mechanic	$ 48.74	11.79
OPERATOR: Piledriver	$ 42.56	17.34
PAINTER: Spray (Linestriping)	$ 47.30	6.42
TRAFFIC CONTROL: Flagger	$ 23.00	20.44
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper	$ 53.35	12.78
TRUCK DRIVER: Concrete Truck	$ 33.69	15.79
TRUCK DRIVER: Dump Truck	$ 39.03	12.89
TRUCK DRIVER: Flatbed Truck	$ 48.53	0.00

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

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

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

Union Rate Identifiers

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

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

Survey Rate Identifiers

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

these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

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

Union Average Rate Identifiers

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

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

State Adopted Rate Identifiers

Classifications listed under the ""SA"" identifier indicate that the prevailing wage rate set by a state (or local) government was adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 01/03/2024 reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

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

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter

* a conformance (additional classification and rate) ruling

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION

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DOCUMENT A00801

SPECIAL PROVISIONS

TAUNTON
Federal Aid Project No. STP-0035(059)
Corridor Improvements and Related Work on Broadway (Route 138),
from Purchase Street to Jackson Street (Phase 2)

Labor participation goals for this Project shall be 15.3% for minorities and 6.9% for women for each job category. The goals are applicable to both Contractor's and Subcontractor's on-site construction workforce. Refer to Document 00820 for details.

SCOPE OF WORK

The work under this Contract includes improvements to Broadway (Route 138) from approximately from Purchase Street to Jackson Street.

The improvements will include:

- Full depth roadway reconstruction
- Pavement resurfacing
- Drainage improvements
- Reconstruction of sidewalks with ADA compliant ramps
- Provisions for bicycle accommodations
- Geometric modifications and upgraded traffic signal systems.

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

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.

CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 3:00 P.M. on the Tuesday of the previous week before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address massdotspecifications@dot.state.ma.us The MassDOT project file number and municipality is to be placed in the subject line.

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 Year's 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.

HOLIDAY WORK RESTRICTIONS (Continued)

Evacuation Day (Suffolk County State Holiday)
No work restrictions due to traffic concerns.

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

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

Memorial Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

Bunker Hill Day (Suffolk County State Holiday)
No work restrictions due to traffic concerns.

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

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

Labor Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the Friday before, until the normal start of business on the following day.

Columbus Day (Federal Holiday)
No work on major arterials from 5:00 AM on the Friday before, until the normal start of business on the following day

Veterans' Day (Federal Holiday)
No work restrictions due to traffic concerns.

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.

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 behalf of FHWA, the lead federal agency for Section 7 consultation, MassDOT submitted a FHWA, FRA, FTA 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 May Affect, Not Likely to Adversely Affect (NLAA) determination (see **Document USFWS NLAA**). Therefore, the project has completed Section 7 consultation through the ESA. The following Avoidance and Minimization Measures (AMMs) must be strictly adhered to in order to protect NLEB and to be in compliance with the ESA. Contact MassDOT Environmental Services - Wildlife Unit Supervisor for questions about project limits, restrictions, or conservation measures.

General AMM

- 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.

Lighting AMMs

- Direct temporary lighting away from suitable habitat during the active season: **April 1 to October 31.**

Tree Removal AMMs

- If additional cutting is proposed by the Contractor that is outside the scope of this contract, additional review is required by the MassDOT Highway Division's Environmental Services Section, and additional review and restrictions may be required by the USFWS.
- Ensure tree removal is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits).
- No tree cutting shall be conducted during the active season: **April 1 to October 31.**
- No tree cutting shall be conducted during the active season: **April 1 to October 31**, or if cutting outside of this timeframe is required, tree removal is limited to 10 or fewer trees per project at any time of year within 100 feet of existing road/rail surface and outside of documented roosting/foraging habitat or travel corridors; and a visual emergence survey must be conducted by *MassDOT Highway Division's Environmental Services Section or appointed representative* with no bats observed.

NORTHERN LONG-EARED BAT PROTECTION (Continued)

- In order to protect female northern long-eared bats and their young during the maternity roosting season, **no tree cutting shall be conducted during the active season**: **April 1 to October 31**.
- Do not remove **documented** or NLEB roosts that are still suitable for roosting, or trees within 0.25 miles of roosts, or **documented** foraging habitat any time of year.
- The Contractor shall ensure all personnel working in on the project site are aware of all environmental commitments related to NLEB, including the **TOY** restriction. If this restriction needs to be waived at any location(s) the Resident Engineer shall send a locus map of the proposed work to MassDOT Highway Division's Environmental Services Section for review and a determination if the restriction can be waived.

ENVIRONMENTAL PERMITTING

Environmental permits have not been obtained, as neither temporary nor permanent work is proposed to occur in water or wetland resource areas.

If the Contractor's operations, such as, erection, demolition, storage, or other procedures require work to occur in or otherwise impact water, wetland resource areas, buffer zones, etc., then the Contractor is advised that no associated work can occur until all required environmental permits have been obtained.

The Contractor shall notify the District 5 Highway Director and Engineer in writing at least 60 days prior to desired commencement of the proposed activity.

All environmental submittals, including any contact with Local, State, or Federal environmental agencies, must be coordinated through the District 5 Environmental Engineer.

The Contractor is expected to fully cooperate with requests for information and provide same in a timely manner. The Contractor is further advised that the Department will not entertain a delay claim due to the time required to obtain the environmental permits.

As a supplement to Section 7.00 of the Standard Specifications, the Contractor is reminded that no debris of any type shall be allowed to enter water or wetland resource areas, either temporarily or permanently.

CONTAMINATED SOIL

Soil to be removed from the project area shall not be assumed to be uncontaminated and must be evaluated prior to off-site management for potential contamination with hazardous materials. No soil may be disposed of off-site without proper assessment by the contractor and approval from the Resident Engineer (RE), District Environmental Engineer (DEE), or the project designee.

SOIL STOCKPILING DIRECTIVE P-22-001

Any stockpiling of soil must be performed in compliance with Policy Directive P-22-001, Off-Site Stockpiling of Soil from MassDOT Construction Projects. This directive limits the allowable locations for off-site stockpiling of soil generated during MassDOT projects and includes various requirements that must be satisfied by the contractor prior to off-site stockpiling.

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.

WORK SCHEDULE AND RESTRICTIONS

(Supplementing Subsection 7.09) AND (Supplementing Subsection 8.02 Schedule of Operations)

All work under this contract shall be conducted between the hours of 7:00 AM and 3:30 PM unless otherwise authorized by the Engineer.

One lane of travel in each direction shall be maintained at the end of the work shift.

No work that in the opinion of the Engineer may cause traffic delays for any cause or reason shall be permitted during peak travel hours unless authorized by the Engineer.

The Prime Contractor and all Subcontractors shall be restricted to the same work hours. The Contractor shall request other work hours or additional work hours in writing and submit the request to the Engineer for approval at least ten days prior to the requested start date.

Setup and removal of all equipment and materials for work under this contract, including the work and materials required to set up and dismantle the work zones, shall only be done during the prescribed work hours outlined in this section. Roadways shall be free of the Contractor's personnel and equipment during the restricted hours.

NOTICE TO OWNERS OF UTILITIES
(Supplementing Subsection 7.13)

The Contractor shall investigate to determine the existence of other utilities that may be affected by the Contractor's operations.

The Contractor shall give written notice to the Engineer and all public service corporations or officials, owning or having charge of public or privately owned utilities, of their intention to commence operations affecting such utilities one week in advance of the commencement of such operations.

A list of public and private utilities can be found on the MassDOT website at:
https://hwy.massdot.state.ma.us/webapps/utilities/select.asp.

Select District 5 on top of the webpage, select Taunton, and then locate the utility.
The utility contact list is for guidance only and is not guaranteed to be complete or up to date.

Prior to working on service connections, the Contractor shall contact the serving utility to ensure that proper construction procedures are followed.

Following are the names of owners and representatives of the principal utilities affected, but completeness of this list is not guaranteed by the Department:

Taunton Municipal Lighting Plant
PO Box 870
Taunton, MA 02780
ATTN: Joe Fernandes
508-824-5844

Eversource Gas
995 Belmont Street
Brockton, MA 02301
ATTN: Richard Salverezza
508-895-4818
Richard.salvarezza@eversource.com

Enbridge
8 Wilson Way
Westwood, MA 02090
ATTN: Kathy M. Aruda
508-938-7728
Kathleen.aruda@enbridge.com

NOTICE TO OWNERS OF UTILITIES (Continued)

Verizon
385 Myles Standish Blvd.
Taunton, MA 02780
ATTN: Karen Mealey
774-409-3160
Karen.m.mealey@verizon.com

Taunton DPW (Water/Sewer)
90 Ingell St
Taunton, MA 02780
ATTN: Mike Arruda
508-823-3582
marruda@taunton-ma.gov

Comcast
PO Box 6505 – 5 Omni Way
Chelmsford, MA 01824
ATTN: Wendy Brown
978-848-5163
Wendy.brown@comcast.com

AT&T / Teleport Communications America
c/o Siena Engineering
50 Mall Road, Suite 203
Burlington, MA 01803
ATTN: Erica Hudson
Erica.hudson@sienaengineeringgroup.com

Crown Castle
80 Central Street
Boxborough, MA 01719
ATTN: Mark Bonanno
508-616-7818
Mark.bonanno@crowncastle.com

Taunton City Engineer
90 Ingell Street
Taunton, MA 02780
ATTN: Mike Patnaude
508-821-1027
mpatneaude@taunton-ma.gov

EVERSOURCE EMERGENCY TELEPHONE NUMBERS

GAS:
Outage/ Emergency: 800-592-2000
New Service: 866-678-2744
Customer Support: 800-592-2000

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.

HAZARDOUS MATERIALS

Based on preliminary review of the MassDEP database for prior hazardous material release sites, contaminated soil may be encountered at the following locations:

- 149-231 Broadway
- 188 Broadway
- 212 Broadway
- 225 Broadway
- 286 Broadway
- 289 Broadway

EQUIVALENT SINGLE AXLE LOADS (ESALS)

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is 3.4 Million 18-kip (80-kn) ESALs.

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.

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

A. In order to be considered for MassDOT review each VECP shall:

1. Be clearly labeled pursuant to this Subsection;

2. Yield a net savings at least two hundred and fifty thousand (250,000.00) Dollars and/or a net saving of contract completion duration of at least three (3) months;

3. The proposed changes to contract items must:

    a. maintain the specified items' required functions (service life, reliability);

    b. meet applicable safety regulations and codes;

    c. material substitutions must be in accordance with DOT prequalified/preapproved products and must be tested in accordance with standard material specs/testing methods (and considering all relevant environmental, load, and other relevant factors);

    d. show economy of operation, ease of maintenance, ease of construction, and necessary standardized features and appearance; and

4. Shall not require an extension of Contract Time or Contract Milestones, with the exception of cases when there are anticipated significant cost saving.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

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

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

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

1. ***VECP Description***: A description of the difference between the existing and the proposed Contract requirements, and the comparative advantages and disadvantages of each;

2. ***VECP Change Listing***: A listing of the Contract requirements that will need to be changed, modified, or reviewed as well as the proposed Contract document changes in the Instructions to Bidders, Contract, Standard Specifications, General Requirements and Special Provisions required by the VECP.

3. ***Construction Schedule Update*****:** Any changes in the Contract Time(s) or Contract Milestone(s), that will result from acceptance of the VECP, shall be accompanied by a contemporaneous schedule analysis *(i.e, the Contractor's baseline schedule submission, all past/required monthly schedule updates, a detailed assessment of all past delays, and a resource loaded Crticial Path Method schedule as specified in Section 8.0 / Subsection 8.02 of this Contract)* of the projected Work that remains including the proposed VECP related schedule changes *(inclusive of the timeline to review accept the VECP and the timeline for implementing the design changes)* in the remaining work. This shall be submitted in the form of a Proposal Schedule until the VECP has been formally accepted. Note: All of this information is to be updated, recertified, and formally accepted by MassDOT before final acceptance of this this VECP is issued.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

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

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

5. ***Cost and Savings Estimates***: A detailed estimate of the anticipated net savings, calculated as follows:

   a. ***Original Scope:*** Isolate the cost of performing the original contract construction activities, in accordance with the original Contract Documents, as originally bid by the Contractor, that are anticipated to be superseded by the VECP. *This cost is to include any original contract scope that is anticipated to be altered or eliminated by the VECP such as, shop drawing preparation, inspection work, testing, maintenance of traffic, or any other original contract costs, that have yet to have been performed at the time of this VECP submission.*

   b. ***New VECP Scope:*** Calculate the cost of performing the comparable construction activities associated with the VECP.

   c. ***Contractor's Engineer & Inspection***: Calculate the cost of engineering, inspection, and design work by the Contractor's Engineer/Designer. This should be a realistic estimate of the costs of any required engineering, design and review work by the Contractor's Engineer.

   d. ***MassDOT's Costs:*** MassDOT's estimate of costs to perform engineering/design reviews, cost estimate reviews, schedule reviews, and any other administrative costs to review and recommend implementation of the proposed VECP. *(including all anticipated increased costs to MassDOT on other Contracts and all anticipated follow-on increased costs to MassDOT, if any)* as provided by MassDOT. MassDOT's estimated costs must be included the VECP calculation and will be provided by MassDOT in support of the VECP evaluation process.

   e. ***Other Costs:*** Estimated costs associated with any revisions to other project related costs, such as Environmental Permits or Right of Way acquisitions, including other agency or municipality costs, as provided by MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

Net Savings:

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

6. *The Contractor shall also provide:*

   a. A proposed Change Order, which explains and justifies any required Equitable Adjustment in the Contract Price.

   b. The Contractor's actual costs expended for developing the VECP as of the date of the VECP submission;

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

   a. Design changes shall be prepared and stamped by the Contractor's professional designer and/or engineer. In addition, in the development of the VECP; the Contractor is responsible for anticipating and managing all aspects associated with any VECP design work that must be performed by a licensed Engineer.

   b. The Contractor's engineer must analyze and stamp all components of any aspect of the project that has been redesigned, changed, or altered as a result of this VECP.

   c. The Contractor's engineer shall provide all calculations and supporting design/engineering documentation that was utilized to develop the changes and stamped drawings. These will be used by MassDOT's Designer-of-Record to review the VECP changes. The Contractor is limited to selecting only those engineer's that have been pre-qualified by MassDOT's A&E Board.

   d. MassDOT's Designer-of-Record will review and respond to all completed design submissions related to this VECP within thirty (30) calendar days, unless determined to be a non-critical path item.

   e. MassDOT will be responsible for estimating and managing MassDOT's Designer-of-Record during the VECP review and implementation. Should any significant conflicts arise, between the Contractor's Engineer and MassDOT's Designer-of-Record, the DOT and the Contractor will work expeditiously to resolve the conflict. Should this type of conflict continue for greater than five (5) days, the Contractor is to bear all financial and time related impacts of such delay and must seek to resolve the design conflict, in an acceptable manner to MassDOT. The resolution of this conflict will be funded at the Contractor's expense – exclusive of the net saving that was agreed to at the execution of the contract modification for this VECP.

   f. The Contractor's Engineer may also be required to inspect the construction work. The Contractor is to include such anticipated inspection costs in the initial VECP.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

g. MassDOT's Designer of Record will remain the Designer-of-Record for the entire Project. Any costs incurred in the use of MassDOT's Designer-of-Record by MassDOT or Contractor associated with the review of a VECP are to be included in the calculated net savings.

C. Approval of the VECP shall not occur until a Contract Modification, incorporating the VECP, is issued by MassDOT and properly executed by the Contractor. MassDOT may accept or reject part or all of any VECP at any time prior to an executed Contract Modification for the applicable VECP. The decision of MassDOT, concerning acceptance or rejection of any VECP, shall be final and shall not be subject to dispute resolution.

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

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

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

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

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

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

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

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

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

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

SUBSECTION 8.02 SCHEDULE OF OPERATIONS

Replace this subsection with the following:

An integrated cost and schedule controls program shall be implemented by the Contractor to track and document the progress of the Work from Notice to Proceed (NTP) through the Contractor Field Completion (CFC) Milestone. The Contractor's schedules will be used by the Engineer to monitor project progress, plan the level-of-effort required by the Department's work force and consultants and as a critical decision-making tool. Accordingly, the Contractor shall ensure that it complies fully with the requirements specified herein and that its schedules are both accurate and updated as required by the specification throughout the life of the project. Detailed requirements are provided in Division II, Section 722 Construction Scheduling.

SUBSECTION 8.14 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

SUBSECTION 8.14 (Continued)

C.1 - BASELINE SCHEDULE – UTILITY BASIS

The Contractor shall provide a Baseline Schedule submission in accordance with the requirements of Subsection 8.02 and inclusive of all of the information provided in the PUC Form that has been issued in the Contract documents. This is to include the utility durations, sequencing of work, allowable concurrent work, and all applicable considerations that have been depicted on the PUC Form.

C.2 – EARLY UTILITY REQUEST – (aka SUBNET SCHEDULE) PRIOR TO THE BASELINE

All early utility work is defined as any anticipated/required utility relocations that need to occur prior to the Baseline Schedule acceptance. In all cases of proposed early utility relocation, the Contractor shall present all known information at the pre-construction conference in the form of a 'sub-net' schedule showing when each early utility activity needs to be issued a notice-to-proceed. The Contractor shall provide advance notification of this intent to request early utility work in writing at or prior to the Pre-Construction meeting. Prior to officially requesting approval for early utility work, the Contractor shall also coordinate with MassDOT and all utility companies (private, state or municipal) which may be impacted by the Contract. If this request is acceptable to the Utilities and to MassDOT, the Engineer will issue a notice-to-proceed to the affected Utilities, based on these accepted dates.

C.3 – PROPOSAL SCHEDULE - CHANGES TO THE PUC FORM

If the Contractor intends to submit a schedule (in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02) that contains durations or sequencing that vary from those provided in the Project Utility Coordination (PUC) Form, the Contactor 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.

SUBSECTION 8.14 (Continued)

In order to demonstrate that a critical path delay has been caused by a third-party Utility, the Contractor must demonstrate, through the requirements of the monthly Progress Schedule submissions and the supporting contract records associated with Subsection 8.02, 8.10 and 8.14, that the delays were beyond the control of the Contractor.

All documentation provided in this section is subject to the review and verification of the Engineer and, if required, the Utility Owner. In accordance with MassDOT Specifications, Division I, Subsection 8.10, a Time Extension will be granted for a delay caused by a Utility, only if the actual duration of the utility work is in excess of that shown on the Project Utility Coordination Form, and only if;

1) proper Notification of Delay was provided to MassDOT in accordance with the time requirements that are specified in this Section
2) the utility delay is a critical path impact to the Baseline Schedule (or most recently approved Progress Schedule)

E. LOCATION OF UTILITIES

The locations of existing utilities are shown on the Contract drawings as an approximation only. The Contractor shall perform a pre-construction utility survey, including any required test pits, to determine the location of all known utilities no later than thirty (30) calendar days before commencing physical site work in the affected area.

F. POST UTILITY SURVEY – NOTIFICATION

Following completion of a utility survey of existing locations, the Contractor will be responsible to notify the Engineer of any known conflicts associated with the actual location of utilities prior to the start of the work. The Engineer and the Contractor will coordinate with any utility whose assets are to be affected by the Work of this Contract. A partial list of utility contact information is provided in the Project Utility Coordination Form.

G. MEETINGS AND COOPERATION WITH UTILITY OWNERS

The Contractor shall notify the Engineer in advance of any meeting they initiate with a Utility Owner's representative to allow MassDOT to participate in the meeting if needed.

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.

SUBSECTION 8.14 (Continued)

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.

BIDDERS LIST

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

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

BUILD AMERICA BUY AMERICA PREFERENCE

On Federally-aid projects the Buy America (23.CFR § 635.410) and Build America, Buy America Act (Pub. L. No. 117-58, §§ 70901-52). requires the following,

(1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, must occur in the United States. Foreign steel and iron can be used if the cost of the materials does not exceed 0.1% of the total Contract cost or $2,500, whichever is greater. The action of applying a coating to a covered material (i.e., steel and iron) is deemed a manufacturing process subject to Buy America. Coating includes epoxy coating, galvanizing, painting and any other coating that protects or enhances the value of a material subject to requirements of Build America, Buy America. Steel used for temporary support of excavation, including H piles, soldier piles, and sheeting when the steel is required to be left in place is subject to requirements of Build America, Buy America. Temporary steel, shall remain in place when it falls within the influence zone of the soil supporting any structure or railroad tracks.

(2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and

BUILD AMERICA BUY AMERICA PREFERENCE (Continued)

(3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. "Construction materials" includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of:

- non-ferrous metals,
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables),
- glass (including optic glass),
- lumber; or
- drywall.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

NOTE: The requirements for manufactured products indicated in paragraph (2) above are not in effect for this contract.

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.

SECTION 722 (Continued)

Type A – for all Site-Specific Contracts with a Project Value over $20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Resource-Loading
- Resources Graphic Reporting
- Cash Flow Projections from the CPM
- Cash Flow Charts
- Cost-loaded CPM
- Contractor-furnished CPM software, computer and training

Type B – for all Site-Specific Contracts with a Project Value between $10 Million and $20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded CPM
- Resource-Loading
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

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.)

SECTION 722 (Continued)

MATERIALS, EQUIPMENT, PERSONNEL

722.40 General

A. Software Requirements (Types A, B and C)

The Contractor shall use Primavera P6 computer scheduling software.

In addition to the requirements of Section 740 – Engineer's Field Office and Equipment, the Contractor shall provide to the Department one (1) copy of the scheduling software, one (1) software license and one (1) computer capable of running the scheduling software for the duration of the Contract. This computer and software shall be installed in the Engineer's Field Office within twenty-eight (28) Calendar Days after Notice to Proceed. The computer and software shall be maintained and serviced as recommended by the computer manufacturer and/or as required by the Engineer during the duration of the Contract at no additional cost to the Department. The Contractor shall provide professional training in the basic use of the software for up to eight (8) Department employees. The trainer shall be approved by the Engineer. This training shall be provided within twenty-eight (28) Calendar Days after Notice to Proceed.

B. Scheduler Requirements

For all schedule types, if the Contractor plans to use outside scheduling services, the scheduler shall be approved as a subcontractor by the Engineer.

For Type A, B and C Schedules the name of the Contractor's Project Scheduler together with his/her qualifications shall be submitted to the Department for approval by the Engineer within seven (7) Calendar Days after NTP. The Project Scheduler shall have a minimum of five [5] years of project CPM scheduling experience, three [3] years of which shall be on projects of similar scope and value as the project for which the Project Scheduler is being proposed. References shall be provided from past projects that can attest to the capabilities of the Project Scheduler.

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;

SECTION 722 (Continued)

7. the anticipated Critical Path of the project and a summary of the activities on that Critical Path;
8. a summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges;
9. a summary of the anticipated quarterly cash flow over the life of the project.

This will be an interactive session and the Contractor shall answer all questions that the Department and its consultants may have. The Contractor shall provide a minimum of five (5) copies of a written summary of the information presented and discussed during the session to the Engineer. The Contractor's Baseline Schedule and accompanying Schedule Narrative shall incorporate the information discussed at this Schedule Planning Session.

B. Schedule Reviews by the Department (All Types)

1. Baseline Schedule Reviews
   The Engineer will respond to the Baseline Schedule Submission within thirty (30) Calendar Days of receipt providing comments, questions and/or disposition that either accepts the schedule or requires revision and resubmittal. Baseline Schedules shall be resubmitted within fifteen (15) Calendar Days after receipt of the Engineer's comments.

2. Contract Progress Schedule / Monthly Update Reviews
   The Engineer will respond to each submittal within twenty one (21) Calendar Days. Schedules shall be resubmitted by the Contractor within five (5) Calendar Days after receipt of the Engineer's comments.

   Failure to submit schedules as and when required could result in the withholding of full or partial pay estimate payments by the Engineer.

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.

SECTION 722 (Continued)

B. ACTIVITIES

The schedules shall clearly define the progression of the Work from NTP to Contractor Field Completion (CFC) by using separate activities for each of the following items:

1. NTP
2. Each component of the Work defined by specific activities
3. Detailed activities to satisfy permit requirements
4. Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before purchasing
5. The preparation and submission of shop drawings, procedures and other required submittals, with a planned duration that is to be demonstrated to the Engineer as reasonable
6. The review and return of shop drawings, procedures and other required submittals, approved or with comments, the duration of which shall be thirty (30) Calendar Days, unless otherwise specified or as approved by the Engineer
7. Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third party work affecting the Contract
8. The Critical Path, clearly defined and organized
9. Float shall be clearly identified
10. Access Restraints – restrictions on access to areas of the Work that are defined by the Department in the bid package, in Subsection 8.06 – Limitations of Operations or elsewhere in the Contract
11. Milestones listed in Subsection 8.03 - Prosecution of Work or elsewhere in the Contract Documents
12. Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
13. Full Beneficial Use (FBU) Contract Milestone per the requirements of Subsection 8.03 - Prosecution of Work
14. Contractor's request for validation of FBU (ready to open to traffic)
15. The Department's confirmation of completed work to allow for FBU
16. Substantial Completion Contract Milestone per the requirements of Subsections 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
17. Contractor's request for validation of Substantial Completion
18. Punchlist Completion Period of at least thirty (30) Calendar Days per the requirements of Subsections 5.11 - Final Acceptance, 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
19. Contractor confirmation that all punchlist work and documentation has been completed
20. Physical Completion of the Work Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
21. Documentation Completion per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
22. Contractor Field Completion Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work

SECTION 722 (Continued)

23. Utility work to be performed in accordance with the Project Utility Coordination (PUC) Form as provided in Section 8.14 - Utilities Coordination, Documentation and Monitoring Responsibilities
24. Traffic work zone set-up and removal, night work and phasing
25. Early Utility Relocation (by others) that has been identified in the Contract
26. Right-of-Way (ROW) takings that have been identified in the Contract
27. Material Certifications
28. Work Breakdown Structure in accordance with the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at: https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit
29. For Type A and B Contracts only: All items to be paid, including all Unit Price and Lump Sum pay items, shall be identified by activity. This shall include all non-construction activities such as engineering work; purchase of permanent materials and equipment, purchase of structural steel stock, equipment procurement, equipment delivery to the site or storage location and the representative amount of overhead/indirect costs that was included in the Contractor's Bid Prices.

C. EARLY AND LATE DATES

Early Dates shall be based on proceeding with the Work or a designated part of the Work exactly on the date when the corresponding Contract Time commences. Late Dates shall be based on completing the Work or a designated part of the Work exactly on the corresponding Contract Time, even if the Contractor anticipates early completion.

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.

SECTION 722 (Continued)

E. MATERIALS ON HAND (for Types A and B only)

The Contractor shall identify in the Baseline Schedule all items of permanent materials (Materials On Hand) for which the Contractor intends to request payment prior to the incorporation of such items into the Work.

F. ACTIVITY DESCRIPTIONS

The Contractor shall use activity descriptions in all schedules that clearly describe the work to be performed using a combination of words, structure numbers, station numbers, bid item numbers, work breakdown structure (WBS) and/or elevations in a concise and compact label as specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit

G. ACTIVITY IDENTIFICATION NUMBERS

The Contractor shall use the activity identification numbering system specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

H. ACTIVITY CODES

The Contractor shall use the activity codes specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

I. CALENDARS

Different calendars may be created and assigned to all activities or to individual activities. Calendars define the available hours of work in each Calendar Day, holidays and general or project-specific non-Work Days such as Fish Migration Periods, time of year (TOY) restrictions and/or area roadway restrictions.

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.

SECTION 722 (Continued)

- Working over Waterways Restricted Periods: Refer to the Project Special Provisions for specific restrictions.
- Night-time paving and striping operations, traffic and temperature restrictions: Refer to the Project Special Provisions for specific restrictions.
- Utility Restrictions shall be as specified within the Contract.

J. FLOAT

For the calculation of float in the CPM schedule, the setting for *Retained Logic* is required for all schedule submissions, starting with the Baseline Schedule Submission. Should the Contractor have a reason to propose that an alternative calculation setting such as *Progress Override* be used, the Contractor shall obtain the Engineer's approval prior to modifying to this setting.

K. COST AND RESOURCE LOADING (Types A and B only)

For all Type A and B Schedules, the Contractor shall provide a cost and resource-loaded schedule with an accurate allocation of the costs and resources necessary to complete the Work. The costs and resources shall be assigned to all schedule activities in order to enable the Contractor to efficiently execute the Contract requirements and the Engineer to validate the original plan, monitor progress, provide cash flow projections and analyze delays.

1. Each schedule activity shall have an assigned cost that accurately represents the value of the Work. Each schedule activity shall have its resources assigned to it by craft and the anticipated hours to accomplish the work. Each schedule activity's equipment resources shall be assigned to it by equipment type and hours operated. Front-loading or other unbalancing of the cost distribution will not be permitted.
2. The sum of the cost of all schedule activities shall be equal to the Contractor's Bid Price.
3. Indicating the labor hours per individual, per day, by craft and equipment hours/day will be acceptable.
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.

SECTION 722 (Continued)

L. NOT TO BE USED IN THE CONTRACTOR'S CPM SCHEDULE

1. Milestones or constraint dates not specified in the Contract
2. Scheduled work not required for the accomplishment of a Contract Milestone
3. Use of activity durations, logic ties and/or sequences deemed unreasonable by the Engineer
4. Delayed starts of follow-on trades
5. Float suppression techniques

722.62 Submittal Requirements

All schedules shall be prepared and submitted in accordance with the requirements listed below.

Each monthly Contract Progress Schedule submittal shall be uniquely identified.

Except as stated elsewhere in this subsection, schedule submittals shall include each of the documents listed below, prepared in two formats, for distribution as follows:

a. four (4) compact discs (CD); one (1) each for the Office of Project Controls and Performance Oversight (O-PC&PO), the Boston Construction Section Office, the District Construction Office and the Resident Engineer's Office. Additional copies shall be required if the work is performed in more than one district.
b. two (2) hard copies plotted in color on 24" X 36" paper; one (1) copy each for the District Construction Office and the Resident Engineer's Office. No copies for the O-PC&PO and the Boston Construction Section Office. Additional copies shall be required if the work is performed in more than one district.

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;

SECTION 722 (Continued)

5. provide a description of all critical issues that are not within the control of the Contractor or the Department (third party) and any impact they had or may have on the Critical Path;
6. provide a description of any possible considerations to improve the probability of completing the project early or on-time;
7. compare Early and Late Dates for activities on the Critical Path and describe reasons for changes in the top three (3) most critical paths ;
8. describe the Contractor's plan, approach, methodologies and resources to be employed for completing the various operations and elements of the Work for the top three (3) most critical paths. For update schedules, describe and propose changes to those plans and verify that a Proposal Schedule is not required;
9. describe, in general, the need for shifts that are not 5 days/week, 8 hours/day, the holidays that are inserted into each calendar and a tabulation of each calendar that has been used in the schedule;
10. describe any out-of-sequence logic and provide an explanation of why each out-of-sequence activity does not require a correction, if one has not been provided, and an adequate demonstration that these changes represent the basis of how these activities will be built, including considerations for resources, dependencies and previously-approved production rates;
11. identify any possible duration increases resulting from actual or anticipated unit price item quantity overruns as compared to the baseline duration, with a corresponding suggestion to mitigate any possible delays to the Critical Path. If the delay is anticipated to impact the Critical Path, refer to Subsections 4.06 - Increased or Decreased Contract Quantities and 8.10 - Determination and Extension of Contract Time for Completion and submit a letter to the Engineer notifying of a potential delay;
12. include a schedule log consisting of the name of the schedule, the data date and the date submitted.

B. Bar Charts (Types A, B, C and D)

One (1) time-scaled bar chart containing all activities shall be prepared and submitted using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements Activities shall be linked by logic ties and shown on their Early Dates. Critical Paths shall be highlighted and Total Float shall be shown for all activities.

A second time-scaled bar chart shall also be prepared containing only the Critical Path or, if the Critical Path is not the longest path, the Longest Path using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Total Float shall be shown for all activities.

Bar Charts shall be printed in color and submitted on 11” X 17” paper or, if approved by the Engineer, as a .pdf file.

SECTION 722 (Continued)

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 Subsection722.20 - General:

D. Activity Cost Report and Monthly Cash Flow Projections (Type A only)

With each Contractor Quantity Estimate (CQE), the Contractor shall submit an Activity Cost Report and Cash Flow Projection that includes all activities grouped by Contract Bid Item.

The Activity Cost Report shall be generated from the Schedule of Record and shall be the basis of the Monthly Cash Flow Projection. Within each contract Bid Item, activities shall be sequenced by ascending activity identification number and shall show:

1. activity ID and description,
2. forecast start and finish dates for each activity and,
3. when submitted as a revised schedule, actual start and finish dates for each completed activity.

For Unit Price pay items, in addition to the above, estimates to complete and any variance to the estimated Contract quantity shall be shown.

E. Resource Graphs (Type A only)

Monthly and cumulative resource graphs for the remaining Contract period using the Early Dates and Late Dates in the Contract Progress Schedule shall be included as part of each schedule submittal.

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.

SECTION 722 (Continued)

The Projected Spending Report (PSR) shall be depicted in a tabular format and printed in color on 11 x 17-sized paper or larger as approved by the Engineer. For additional instructions and a template for preparing the Projected Spending Report (PSR), refer to the Contractor's Construction Schedule Toolkit located on the MassDOT-Highway Division website at: https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit or consult with the District Construction Scheduler.

722.63. Progress Schedule Requirements

A. Baseline Schedule

The Baseline Schedule shall be due thirty (30) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule shall only reflect the Work awarded to the Contractor and shall not include any additional work involving Extra Work Orders or any other type of alleged delay. The Baseline Schedule shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements. Once the Baseline Schedule has been accepted by the Engineer, with or without comments, it shall represent the as-planned schedule for the Work and become the Contract Progress Schedule of Record until such time as the schedule is updated or revised under Subsections 722.63.C - Contract Progress Schedules / Monthly Updates, 722.64.C - Recovery Schedules and 722.64.D - Proposal Schedules.

The Cost and Resource-Loading information (Types A and B only) shall be provided by the Contractor within forty-five (45) Calendar Days after NTP.

The Engineer's review comments on the Baseline Schedule and the Contractor's responses to them will be maintained for the duration of the Contract and will be used by the Engineer to monitor the Contractor's work progress by comparing it to the Contract Progress Schedule / Monthly Update.

B. Interim Progress-Only Schedule Submissions

The first monthly update of the Contract Progress Schedule/Monthly Update is due within seventy (70) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule review period ends at sixty (60) Calendar Days after NTP, see Subsection 722.60.B - Schedule Reviews by the Department. If the Baseline Schedule has not been accepted within sixty (60) Calendar Days after NTP, an Interim Progress-Only Schedule shall be due within seventy (70) Calendar Days after NTP. The purpose of the Interim Progress-Only Schedule is to document the actual progress of all activities, including non-construction activities, from NTP until the Baseline Schedule is accepted.

SECTION 722 (Continued)

C. Contract Progress Schedules / Monthly Updates (Types A, B, C and D)

The first Contract Progress Schedule shall be submitted by the Contractor no later than seventy (70) Calendar Days after NTP. The data date for this first Progress Schedule shall be sixty (60) Calendar Days after NTP. Subsequent Progress Schedules shall be submitted monthly.

Each Contract Progress Schedule shall reflect progress up to the data date. Updated progress shall be limited to as-built sequencing and as-built dates for completed and in-progress activities. As-built data shall include actual start dates, remaining Work Days and actual finish dates for each activity, but shall not change any activity descriptions, the Original Durations, or the Original Resources (as planned at the time of bid), without the acceptance of the Engineer. If any activities have been completed out-of-sequence, the Contractor shall propose new logic ties for affected in-progress and future activities that accurately reflect the previously-approved sequencing. Alternatively, the Contractor may submit to the Engineer for approval an explanation of why an out-of-sequence activity does not require a correction and an adequate demonstration that the changes accurately represent how the activities will be built, including considerations for resources, dependencies and previously approved production rates. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

No revisions to logic ties; sequence, description or duration of future activities; or planned resource costs shall be made without prior approval by the Engineer.

Any proposed logic changes for in-progress or future activities shall be submitted to the Engineer for approval before being incorporated into a Contract Progress Schedule. The logic changes must be submitted using a Proposal Schedule or a schedule fragnet submission. Once approved by the Engineer, the Contractor may incorporate the logic in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

For any proposed changes to the original sequence, description or duration of future activities, the Contractor shall submit to the Engineer for approval an explanation of how the proposed description or duration change reflects how the activity will be progressed, including considerations for resources and previously approved production rates. Any description or duration change that does not accurately reflect how the activity will be progressed will not be approved by the Engineer. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule if any Contract Progress Schedule/Monthly Update indicates a failure to meet the Contract Dates.

D. Short-Term Construction Schedule

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a bar chart format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule, and may be at a greater level of detail.

SECTION 722 (Continued)

The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work for the two (2) week period prior and all planned work for the following three (3) week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities. Short-Term Construction Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements.

Failure to submit Short-Term Construction Schedules every two (2) weeks may result in withholding of full or partial payments by the Engineer.

722.64 Impacted Schedule Requirements

A. Notice of Delay

The Contractor shall notify the Engineer in writing, with copies to the District and State Construction Engineers, within three (3) Calendar Days of the start of any delays to the Critical Path that are caused by actions or inactions that were not within the control of the Contractor. Delay notifications that are not provided in a letter to the Engineer, such as a delay notification in the schedule narrative, will not be recognized as contractual notice in the determination of any Time Extension related to the impacts to the work associated with this specific alleged delay. Should such delay continue for more than one (1) week, the Contractor shall note it in the Schedule Narrative until the delay is no longer impacting the Critical Path for the completion of the Contract Milestones. The Engineer will evaluate the alleged delay and its impact and will respond to the Contractor within ten (10) Calendar Days after receipt of a notice of delay.

B. Time Entitlement Analysis

A Time Entitlement Analysis (TEA) shall consist of a descriptive narrative, prepared in accordance with Subsection 722.62.A - Narratives, and an as-built CPM schedule, which may be in the form of a schedule fragnet (that has been developed from the project's Contract Progress Schedule of Record, and illustrates the impact of a delay to the Critical Path, Contract Milestones and/or Contract Completion Date as required in Subsection 8.10 - Determination and Extension of Contract Time for Completion. TEAs shall also be used to determine the schedule impact of proposed Extra Work Orders (EWO) as also required in Subsection 8.10.

TEAs shall be prepared and submitted in accordance with the requirements of Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements and shall be based on the Contract Progress Schedule of Record applicable at the start of the delay or impact from an EWO. A TEA fragnet must start with a specific new activity describing the work contained in either a Notice of Delay previously submitted to the Department per Subsection 722.64.A - Notice of Delay or an EWO.

SECTION 722 (Continued)

TEAs shall be submitted:

1. as part of any Extra Work Order that may impact Contract Time,
2. with a request for a Time Extension,
3. within fourteen (14) Calendar Days after a request for a TEA by the Engineer for any other reason.

A TEA shall be submitted to the Engineer before any Time Extension is granted to the Contractor. Time Extensions will not be granted unless the TEA accurately reflects an evaluation of all past delays and the actual events that occurred that impacted the Critical Path. The TEA must also demonstrate a plan for the efficient completion of all of the remaining work through an optimized CPM Schedule. The analysis shall include all delays, including Contractor-caused delays, and shall be subdivided into timeframes and causes of delays.

TEAs shall incorporate any proposed activities, logic ties, resource considerations, and activity costs required to most efficiently demonstrate the schedule impacts in addition to detailing all impacts to existing activities, logic ties, the Critical Path, Contract Milestones and the Contract Completion Date. In addition, TEAs shall accurately reflect any changes made to activities, logic ties, restraints and activity costs, necessitated by an Extra Work Order or other schedule impact, for the completion of the remaining work. The Contractor shall provide TEAs that demonstrate that all delays have been mitigated to the fullest extent possible without requiring an Equitable Adjustment to the original bid basis.

All TEAs shall clearly indicate any overtime hours, additional shifts and the resource that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts. The Engineer shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions if it is determined to be in the best interest of the Department to do so.

When accepted, the changes included in a TEA shall be incorporated into the next Contract Progress Schedule per the requirements of Subsection 722.63.C - Contract Progress Schedules / Monthly Updates.

During the review of any TEA, all Contract Progress Schedules shall continue to be submitted as required.

The Engineer may request that the Contractor prepare a Proposal Schedule or a Recovery Schedule to further mitigate any delays that are shown in the accepted TEA/Contract Progress Schedule.

C. Recovery Schedules

The Contractor shall promptly report to the Engineer all schedule delays during the prosecution of the Work. Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule within fourteen (14) Calendar Days of a Contract Progress Schedule submission that shows failure to meet the Contract Dates. This requirement is critical to the Department’s ability to make informed decisions regarding Contract Time and costs.

SECTION 722 (Continued)

During the prosecution of the Work, should the Contractor's progress on a critical operation clearly not meet anticipated production, without cause by fault of the Department, or should a critical activity or series of activities not be staffed in accordance with the Contractor's approved Baseline Schedule resource planning, the Contractor shall be obligated to recover such delay. Recovery Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements within fourteen (14) Calendar Days of any of the cases listed above.

Recovery Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in to the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts and shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions, without additional compensation for any Contractor delays, if it is determined to be in the best interest of the Department to do so.

During the review of any Recovery Schedule, all Contract Progress Schedules shall continue to be required every month.

The Engineer may request that the Contractor prepare a Recovery Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

Changes represented in accepted Recovery Schedules shall be incorporated into the next Contract Progress Schedule.

D. Proposal Schedules

A Proposal Schedule is an alternative schedule used to evaluate proposed changes to the Contract scope or significant alternatives to previously approved approaches to complete the Work, which may include changes to activity durations, logic and sequence. For Types A and B Schedules, the Proposal Schedule shall be cost and resource-loaded.

A Proposal Schedule may be requested by the Department at any time or may be offered by the Contractor. The Engineer may request that the Contractor prepare a Proposal Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

The Contractor shall submit the Proposal Schedule within thirty (30) Calendar Days of a request from the Department.

The Proposal Schedule shall not be considered a Schedule of Record until the logic, durations, narrative and basis of the Proposal Schedule have been accepted by the Engineer. If the Proposal Schedule took the form of a fragnet, it must be incorporated into the Contract Progress Schedule of Record showing the current progress of all other activities and the impacts/results of the changes made by the Proposal Schedule before the Proposal Schedule is accepted by the Department.

Proposal Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts.

Changes represented in accepted Proposal Schedules shall be incorporated into the next Contract Progress Schedule. During the review of any Proposal Schedule, all Contract Progress Schedules shall continue to be required every month.

SECTION 722 (Continued)

E. Disputes (Types A, B, C and D)

All schedules shall be submitted, reviewed, dispositioned and accepted in the timely manner specified herein so as to provide the greatest possible benefit to the execution of this Contract.

Any dispute concerning the acceptance of a schedule or any other question of fact arising under this subsection shall be determined by the Engineer. Pending resolution of any dispute, the last schedule accepted by the Engineer will remain the Contract Schedule of Record.

COMPENSATION

722.80 Method of Measurement and Basis of Payment (Types A, B, C and D)

The Special Provisions will specify the fixed-price amount to be paid to the Contractor for the Project Schedule requirements contained herein. Each bidder shall include this lump-sum, fixed-price bid item amount in his/her bid. Failure to do so may be grounds for the rejection of the bid.

All required schedule-related work, including, but not limited to computers, computer software, the planning and coordination with utilities, training, schedule preparation and schedule submittals will be paid for under the fixed price amount.

This fixed price amount is for payment purposes only and is separate from what the Department considers to be the Contractor's General Condition costs. If the Contractor deems it necessary to include additional costs to provide all of the requirements of this section, these additional costs shall be included in the Contractor's overall bid price.

Twenty percent (20%) of this pay item will be paid upon the Engineer's acceptance of the Contractor's Baseline Schedule, prepared and submitted in accordance with Subsection 722.63.A.

The remaining eighty percent (80%) of this pay item will be paid in equal monthly installments distributed across the Contract Duration from Notice to Proceed (NTP) to Contractor Field Completion (CFC), less the 2 months required for the submittal and review of the Baseline Schedule in accordance with the following formula:

$$\text{Monthly Payment} = \frac{\text{Remaining Fixed Price amount (80\% of Item 100.)}}{\text{Contract Duration in whole months} - 2 \text{ months}}$$

The timely and accurate submission of the Baseline Schedule is critical to the Contract and the Department's ability to make informed decisions. Only payments under Item 740 - Engineer's Field Office and Item 748 – Mobilization will be made until the Baseline Schedule is accepted by the Engineer.

SECTION 722 (Continued)

No payment for any other pay item will be processed beyond seventy-five (75) Calendar Days from Notice to Proceed (NTP) until the Baseline Schedule is accepted by the Engineer. Until the Engineer's acceptance of the Baseline Schedule, the combined total of all payments made to the Contractor will be limited to an amount no greater than the total price for Item 748 - Mobilization or 3% of the contract price, whichever is less.

All Contract Progress Schedule Updates submitted later than ten (10) Calendar Days after the CQE (Contract Quantity Estimate) completion date, or greater than forty (40) Calendar Days from the Data Date of the previous submission, will be deemed to be no longer useful and will not qualify for payment. Late submittal of missed Contract Progress Monthly Updates will not result in recovery of the previously forfeited portion of the Schedule of Operations Fixed Price Payment Item.

Failure to submit schedules as and when required may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

Failure to submit schedules that are acceptable to the Engineer may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

The Schedule of Operations pay item will be adjusted to pay for only the actual quantity of schedules that have been submitted in accordance with this section.

The Contractor's failure or refusal to comply with the requirements of this Section shall be reasonable evidence that the Contractor is not prosecuting the Work with due diligence and may result in the withholding of full or partial payments by the Engineer.

Should there be a Time Extension granted to the Contractor, the Engineer may provide an Equitable Adjustment for additional Contract Progress Schedule Updates at intervals directed by the Engineer. Item 100. will be the basis for this Equitable Adjustment.

722.82 Payment Items

100.	SCHEDULE OF OPERATIONS - FIXED PRICE $_____	LUMP SUM

ITEM 102.2 TREE TRIMMING LUMP SUM

The work under this Item shall conform to the relevant provisinos of Subsections 8.08 and 101 of the Standard Specifications and the following:

The work consists of removing all living, dead, dying, broken and certain other limbs and branches in areas adjacent to proposed overhead wire relocations, highway lighting, traffic signals, traffic signage, other areas as described on the plans, and as required by the Engineer from trees located within the limits of the Project and the satisfactory disposal of all such removed debris.

Tree trimming shall be done as directed by the Engineer. Any tree trimming for overhead wire relocations shall meet the current requirements of each Utility. Prior to commencing work the Contractor shall verify each location with the Utility Companies.

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.

All tree trimming work within 10 feet of energized power lines and equipment shall be in conformance with the most current version of the United States Department of Labor (DOL) OSHA Standard 1910.269(r) along with subsections (1) through (8).

All work under this Item will be performed or supervised by the Massachusetts Certified Arborist. Contractor shall be required to provide a crew, consisting of a bucket truck with operator and grounds man for pruning and removal. The minimum crew shall consist of the following: a supervisor and three tree-trimmers/laborers. The crew shall be equipped with all necessary equipment needed to complete the work including, but not limited to, pickup trucks, chippers, gas powered chain saws, hand saws, loppers, shears, pruners, branch trimmers, ladders, tree- climbing equipment, etc. Fuel for equipment shall also be considered incidental to this Item. The crew shall be OSHA certified as line-clearance tree trimmers in order to work within 10 feet of energized power lines and equipment.

Submittals
Prior to start of work, the Contractor shall submit to the Engineer the name, certification number and resume of the Massachusetts Certified Arborist referenced herein. Cost for Certified Arborist for all activities pertaining to this Item shall be incidental to this Item.

Incidental to this Item, the Contractor shall provide to the Engineer one (1) copy of 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, Part 1: Pruning. These references shall be kept by the Engineer at his/her office for the length of the Contract.

Prior to start of work, the Contractor shall coordinate with the MassDOT Landscape Design Section, the Electric Utility Company, and the Utility Company with pole set in the field to confirm number, location, and extent of selective tree trimming.

ITEM 102.2 (Continued)

Line-clearance Tree Trimming: Shall be defined as the pruning, trimming, repairing, maintaining, removing, or clearing of trees or the cutting of brush that is near (within 10 feet of) energized power lines.
TREE: Shall be defined as having a diameter of 4 inches or over, measured at a point 3 feet above the average ground.

LIMBS AND BRANCHES: Shall be defined as wood having a diameter of ½ inch or over and wood that has a diameter of less than ½ inch shall be considered a TWIG.

A DYING LIMB OR BRANCH: May have live growth at some point but shall be removed if found to be in an unhealthy condition.

While it is not the intent that every dead, dying and/or broken twig be removed from trees requiring trimming, the tree worker will be required to remove all such twigs accessible in the areas of the tree in which he/she is working.

If required by the Engineer, specific trees or parts thereof which are so located that damage may result from dropping shall be reduced by rope or cable lowering.

Tree shaping may be required on trees, where up-branching done under this contract has distorted the natural symmetry of the tree. Tree shaping shall consist of the removal of limbs and branches from other locations of the tree where removal is desirable to restore natural symmetry.

All sucker growth on all tree trunks within the limits of the contract shall be removed from the ground level to the beginning of the main branch system.

Any and all trees, branches, or brush conflicting with utility poles, equipment, overhead wires, and service connections, shall be removed and/or cut back using best practices to satisfy the requirements of all Utilities with an attachment to the pole line.

Any and all branches extending directly below a street luminaire as to limit the light reaching the street or path/sidewalk surfaces shall be removed and all branches shall be cut back to afford a minimum of 5-foot clearance on all sides of the luminaire. The path/sidewalk surface shall be considered as the area from the edge of the roadway surface to the edge of the path/sidewalk surface farthest from the roadway.

By cutting NEARLY, but not quite, flush with the trunk, limb or branch, the "collar" is left at the top of the wound (in the crotch of the union). This will permit the callus growth to cover the wound in a shorter period of time.

Basis of Payment
This work will be measured and paid for at the Lump Sum Bid Price and is considered full compensation for all labor, certifications, materials, equipment, apparatus, tools and incidentals necessary for the satisfactory completion of the work.

ITEM 102.511 TREE PROTECTION – ARMORING & PRUNING EACH

The work under this item shall conform to the relevant provisions of Subsection 771 of the Standard Specifications and the following:

Tree protection – armoring and pruning shall be used for instances where construction activity (the use of heavy equipment), comes within proximity to potentially damage tree trunk(s) or limbs.

The work shall include the furnishing and installing of temporary tree trunk protection, minor limb pruning, or removal of lower tree limbs to prevent injury to the tree from construction equipment and activities; as shown on the Drawings; and/or 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. Material used for trunk armoring or mounting shall be such that installation and removal shall not damage the trunk.

Acceptable trunk armoring materials shall include two by four (2x4) wood cladding, mounted with wire or metal strapping, or when duration of construction activities is less than three months, slotted corrugated plastic pipe, mounted with duct tape. Eight (8) once untreated burlap shall be used to wrap the tree trunk prior to installation of cladding.

Alternative armoring methods or materials may be acceptable if approved by the Engineer.

The height of tree trunk cladding shall be measured from the base of the tree (including root flare) to the bottom of the first branch, or to a height of eight (8) feet, or as may be required by the Engineer.

Methods of Work
Prior to construction activities, the Engineer, Contractor, and the Arborist (if item is included in the contract), shall review trees noted on the Drawings to be protected. Final decision and selection of trees to be 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 maintained such that it is effective for as long as required or replaced when materials are found to be damaged or ineffective, as determined by the Engineer. Replacement, if required, shall be incidental to the work. Armoring shall be removed immediately upon completion of work activities adjacent to the protected tree(s).

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

ITEM 102.511 (Continued)

Damages or Loss
If 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, secure the services of an Arborist, described in Item 102.55. The Arborist shall be approved by MassDOT.

If, based on the recommendation 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; soil injection fertilization; and/or watering; the damage shall be repaired as soon as possible, within the appropriate season for such work and according to industry standards.

If, based on the recommendation of the Arborist, the Engineer determines that damages are irreparable, or that the damages are such that the tree is sufficiently compromised to pose a future safety hazard, the tree shall be removed. Tree removal shall include cleanup of all wood, 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. Such tree removal(s), grinding, debris removal, and topsoil filling, shall be at the Contractor's expense.

Tree removal from improper or inadequate tree protection shall result in the Engineer assessing the Contractor monetary damages consistent with industry standards for assessed value and/or replacement.

Method of Measurement and Basis of Payment
Item 102.511 will be measured and paid at the contract unit price per EACH tree to be armored and pruned. This will include 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 or as required by the Engineer.

Payment for work under this item will be scheduled as follows:

- 40% of the value shall be paid upon installation of trunk armoring and completion of pruning work, if required.

- 60% of the value shall be paid at the end of construction operations that would potentially 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.

No separate payment will be made for costs of remedial actions, Arborist services, tree removal, but all costs in connection therewith shall be included in the Contract unit price bid.

Tree damages assessed, due to lack of or improper tree and plant protective measures being taken, shall be deducted from the contract price of the work.

ITEM 102.521 TREE AND PLANT PROTECTION FENCE FOOT

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

Work under this item shall consist of furnishing, installing, and maintaining tree and plant protection fence(s) in a vertical and taut position; removing and resetting fencing as may be required; and final removal of protection fence(s) at the completion of construction activities, or as otherwise required by the Engineer.

The purpose of the fencing is to signify a construction work-free zone and physical barrier, thereby preventing damage to tree roots, tree trunks, soil, and all other vegetation within this delineated Tree and Plant Protection Zone (TPPZ), as shown on the Drawings, as required by the Engineer, and as described herein.

Protection shall be for the duration of the construction activities unless otherwise required by the Engineer.

Tree and plant protection fence(s) shall provide a minimum forty-eight (48) inch tall barrier, that remains vertical and taut. The Fence shall be orange plastic safety fence (recommended where high visibility is necessary), or wooden snow fencing, or other approved material. Posts and anchoring materials shall be incidental to the work.

Per requirements of the Engineer, additional posts, deeper post depths, and/or additional attachments shall be used if the fabric or fence sags, leans or otherwise is not providing visible or physical protection to the TPPZ.

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

Establishment of the TPPZ
Fencing shall be used to delineate and establish the TPPZ, adjacent to construction areas, staging areas, stockpile areas, as shown on the Drawings, and/or as required by the Engineer.

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

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

ITEM 102.521 (Continued)

The Contractor shall not engage in any construction activity within the TPPZ without the approval of the Engineer. Activities may including operating, moving, or storing equipment, supplies, or materials; and locating temporary facilities, including trailers or portable toilets, Accessing or traversing the TPPZ shall not be permitted.

Method of Work
TPPZ fencing shall be installed prior to any construction work or staging activities. Fence(s) shall be repositioned where and as necessary for optimum tree and plant protection. Repositioning shall be incidental to this item. TPPZ fencing shall not be moved without prior approval by the Engineer.

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

After construction activities are completed, or when required by the Engineer, fencing, stakes, and other anchoring materials, if any, shall be removed and disposed off-site by the Contractor.

Required Work Within the TPPZ
In the event that grading, trenching, utility work, or storage is unavoidable within the TPPZ, the Engineer shall be notified. Measures may be required for tree protection and preservations, including air spading; the use of six (6) inch depth of wood chips or approved matting for root protection; pruning of branches; and/or trunk protection. These protection measures shall be paid under applicable contract items.

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

Tree and Plant Injury or Loss
If the TPPZ is encroached by construction activity without approval, at the discretion of the Engineer, the Contractor may be required to provide a more durable barrier (e.g., Jersey Barriers, chain link fence (if not already in use) to secure the area. Costs of furnishing and installing additional or more durable barrier(s) shall be borne by the Contractor.

In such cases of encroachment, soils shall be considered compacted and tree root injury will be assumed. Action shall be taken as specified below.

In the event that trees designated for protection under this item are injured, including root injury from unapproved trespassing onto the root zone, the Contractor shall, at his own expense, secure the services of an Arborist, described under Item 102.55. The Arborist shall be approved by MassDOT.

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

ITEM 102.521 (Continued)

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

If, based on the recommendations of the Arborist, the Engineer determines that injuries are irreparable, or that the injuries are such that the tree is sufficiently compromised to pose a future safety hazard, the tree shall be removed. Tree removal shall include cleanup of all wood, 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. Such tree removal(s), grinding, debris removal, and filling, shall be at the Contractor's expense.

Tree removal from improper or inadequate protection of the TPPZ shall result in the Engineer assessing the Contractor monetary damages consistent with industry standards for assessed value and/or replacement.

Shrubs removals from improper or inadequate protection of the TPPZ shall be replaced with plants of similar species and equal size or the largest size plants reasonably available. The Engineer shall approve the size, quality, and quantity of the replacement plant(s). Each replacement shall include a minimum of one year of watering and establishment care, specified under Section 771.

Method of Measurement and Basis of Payment
Tree and Plant Protection Fence will be measured by the FOOT, complete in place, by the length along the top of the fence.

Tree and plant protection fence will be paid for under the contract unit price per FOOT, complete in place and shall include all materials, labor, and equipment required to furnish, install, anchor, maintain, and remove the fence upon completion, as described herein. Posts, temporary footings, anchoring and removal upon completion, shall be incidental to this item.

No separate payment will be made for costs of remedial actions, including addition of more durable barriers, Arborist services, tree or plant removal, shrub replacement and establishment, but all costs in connection therewith shall be included in the Contract unit price bid.

Tree damages assessed, due to lack of or improper tree and plant protective measures being taken, shall be deducted from the contract price of the work.

Payment for work under this item will be scheduled as follows:

Forty (40) percent of the value payment will be made upon installation of TPPZ fencing.

Sixty (60) percent of the value payment will be made when TPPZ fencing materials have been maintained to function as specified for the intended duration and removed and disposed off-site at the completion of protection measure requirement.

ITEM 102.55 ARBORIST HOUR

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

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

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

Submittals

- Contractor shall submit to the Engineer for approval by MassDOT Landscape Design the qualifications and experience of the Arborist. Submittal shall include copy of current certification and a resume summarizing specific construction experience (including relevant MassDOT projects) for a minimum of five projects.

- Arborist's Report documenting recommendations shall be submitted to the Engineer and an electronic copy forwarded to MassDOT Landscape Design Section. Report shall include the following:

Scope of Work

The Arborist shall be responsible for the following tasks:

Review Initial Evaluation and Report

- recommend and prioritize trees that require removal as appropriate to contract scope, project limits, and project intent;
- review and modify, if necessary, tree protection measures shown on the drawings
- review and mark limits of protective fencing for trees and groups of trees to be retained;
- review and recommend protection measures for high priority trees;
- submit a marked-up Construction Plan that briefly notes recommendations and decisions made in the field;

ITEM 102.55 (Continued)

- submit a corresponding report including photo documentation;

Oversight

- direct or execute pruning of branches and/or roots, air spading, and/or other tree care operations
- Monitoring and Inspections
- periodically inspect fencing and ensure root zones are properly protected and clear of equipment and materials as required by the Engineer
- reevaluate tree protection measures for various phases of a project
- submit inspection notes with relevant and dated photos to the Engineer.

Special Care

- oversee tree pruning for health and aesthetics
- recommend fertilization and amendments
- recommend and oversee pest control

Methods

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

Trees to be removed shall be painted or otherwise marked.

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

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

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.

ITEM 127.1 REINFORCED CONCRETE EXCAVATION CUBIC YARD

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

The Contractor's attention is directed to the existence of a reinforced concrete roadway slab below the existing Route 138 roadway.

The Contractor shall remove all reinforced concrete encountered during full depth roadway construction, drainage and utility installations and other excavation necessary to complete all required contract work.

Excavated reinforced concrete shall not be stored onsite, but shall be trucked offsite immediately after excavation. The excavated reinforced concrete shall become the property of the contractor and shall be disposed of offsite in accordance with all applicable city, state and federal regulations.

Method of Measurement
Item 127.1 will be measured by the cubic yard in the truck prior to disposal.

Basis of Payment
Item 127.1 will be paid for at the Contract unit price per cubic yard. This price shall include all labor, materials, sawcut, excavate, break up, transport and dispose of the reinforced cement concrete materials, equipment, and incidental costs required to complete the work.

ITEM 129.5 TRACK EXCAVATION FOOT

The work under this Item shall be done in conformance with the relevant provisions of Subsection 120 of the Standard Specifications and the following:

The work under this Item includes excavation and removal of the existing steel tracks, conduit and switches, and wood ties. Work under this item shall also include the disposal of the tracks, conduit and switches in accordance with all regulatory requirements.

Method of Measurement
Item 129.5 will be measured by the foot of track excavated, removed and properly disposed of offsite.

Basis of Payment
Item 129.5 will be paid for at the Contract unit price per foot. This price shall include all labor, tools, equipment, excavating, removing, and discarding steel rails, conduit, and switches required, proper off-site disposal, and incidentals required to complete the work.

Disposal of wood ties will be paid for under Item 184.1.

ITEM 153. CONTROLLED DENSITY FILL - EXCAVATABLE CUBIC YARD

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

Controlled Density Fill (CDF) material used in this project shall be Type 2E Flowable/Excavatable in accordance with Standard Specification Section M4.08 Controlled Density Fill.

CDF material shall only be used in trenches within areas noted as "Proposed Milling and Pavement Overlay" on the plans, locations where the full depth pavement structure has been completed or where trenches are constructed through existing cement concrete roadway base, and as required by the Engineer.

A CDF producer and mix design may be found on the Qualified Construction Materials List (QCML).

Method of Measurement
Item 153. will be measured for payment by the Cubic Yard of CDF-excavatable, complete in place.

Basis of Payment
Item 153. will be paid for at the contract unit price per Cubic Yard. This price shall include all labor, materials, equipment, and incidentals required to complete the work.

ITEM 180.01 ENVIRONMENTAL HEALTH AND SAFETY PROGRAM LUMP SUM

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

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

ITEM 180.01 (Continued)

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

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

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

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

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

Method of Measurement and Basis of Payment

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

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

ITEM 180.02 PERSONAL PROTECTION LEVEL C UPGRADE 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.

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.

ITEM 180.03 (Continued)

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.

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 their own expense.

ITEM 180.03 (Continued)

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).

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

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

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

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

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

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

ITEM 181.11 DISPOSAL OF UNREGULATED SOIL TON
ITEM 181.12 DISPOSAL OF REGULATED SOIL IN-STATE FACILITY TON
ITEM 181.13 DISPOSAL OF REGULATED SOIL OUT-OF-STATE FACILITY TON
ITEM 181.14 DISPOSAL OF HAZARDOUS WASTE TON

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.

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

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

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

MONITORING/SAMPLING/TESTING REQUIREMENTS

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

ITEMS 181.11 through **181.14** (Continued)

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

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

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

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

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.

ITEMS 181.11 through **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 baseplan to record this information.

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

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.

ITEMS 181.11 through **181.14** (Continued)

Disposal and Recycling Facilities:
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.

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.

ITEMS 181.11 through **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 all of these items shall be incidental to the work with no additional compensation.

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

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

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

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

ITEM 184.1 DISPOSAL OF TREATED WOOD PRODUCTS TON

Work under this item shall include the transportation and disposal of all treated existing wood product as directed by the Engineer.

The timber components of the existing structure are suspected to be treated with creosote, pentachlorophenol and/or CCA. This item shall include all costs for sampling, laboratory testing, loading, transportation and disposal of the treated wood. The Contractor is required to submit disposal manifests to the Engineer prior to the completion of the project. All aspects of this Item are to be completed in accordance with state and federal regulations.

Compensation
Measurement and payment will be by the weight, in Tons, of treated timber transported and accepted at a licensed facility. The work shall be considered full compensation for all labor, tools, equipment, materials, testing, loading, transportation, approvals, and permits necessary for the completion of the work.

ITEM 201. CATCH BASIN EACH

The work to be done under this item shall conform to the relevant provisionsof Subsection 201 of the Standard Specifications, Materials Section M4.02.14, and the following:

All catch basins shall be constructed as shown in MassDOT Standard Drawing E 201.4.0 with 4 foot sump; deep sump.

A bedding of 6 inch minimum crushed stone shall be placed under catch basins.

Flat top sections shall be substituted for conical sections in areas of low cover. Flat top structures shall have a minimum 28 day compressive strength of 4000 psi, reinforced for AASHTO H-20 loading with ASTM A 615 Grade 60 steel. No additional payment will be made for flat top structures.

Method of Measurement
Item 201. will be measured for payment per Subsection 201.80.

Basis of Payment
Item 201. will be measured for payment per Subsection 201.81.

The crushed stone will be paid for under Item 156.

ITEM 201.6 CATCH BASIN – BRADLEY HEAD EACH

The work under this item shall conform to the relevant provisions of Subsection 201 of the Standard Specifications, Materials Section M4.02.14, and the following:

All proposed Bradley Head catch basins shall have 4-foot deep sumps and shall be in accordance with the detail in the Contract Drawings. .

The Bradley Head frame and cover shall be in accordance with the City of Taunton Construction Standards with the word DRAIN cast in 3 inch letters, on the top.

All Bradley Head catch basins shall be placed on a bedding of 6 inches crushed stone to stabilize foundations in accordance with Subsection 150.68.

Method of Measurement
Item 201.6 will be measured for payment by the Each, including the basin and top, complete in place.

Basis of Payment
Item 201.6 will be paid for at the Contract unit price per Each. This price shall include all labor, materials, equipment, precast concrete base, riser sections, precast concrete flat top section with the frame and cover cast eccentrically, sawcutting pavement for installation of drainage structures and incidentals required to complete the work.

Crushed stone for bedding shall be paid for under Item 156.

ITEM 203.1 SPECIAL MANHOLE - 5 FOOT DIAMETER EACH

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

The manhole shall be constructed with a 5-foot interior diameter. A bedding minimum of 6 inch crushed stone shall be placed under manholes where necessary to obtain a suitable foundation.

Method of Measurement
Item 203.1 will be measured in place by the unit each, regardless of depth.

Basis of Payment
Item 203.1 will be measured for payment per Each. This price shall include all labor, materials, equipment, tools, sawcut, excavation, and incidental required to complete the work.

The crushed stone will be paid for under Item 156.

ITEM 204.11 GUTTER INLET - SPECIAL EACH

The work to be done under this Item shall conform to the relevant provisions of Subsection 201 of the Standard Specifications, Materials Section M4.02.14, and the following:

The work shall include the furnishing and installing gutter inlets meeting the dimensions and at the locations shown on the plans.

Method of Measurement
Item 204.11 will be measured for payment by the Each gutter inlet installed, complete in place.

Basis of Payment
Item 204.11 will be paid for at the contract unit price per Each. This price shall include full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 220.6 SANITARY STRUCTURE REBUILT FOOT

The work to be done under these Items shall conform to Subsection 220 of the Standard Specifications and the following:

Existing sanitary structures that, in the judgement of the Engineer, show deterioration shall be rebuilt. The casting and deteriorated masonry shall be removed in a neat manner until a clean sound base is obtained upon which concrete blocks and clay bricks may be set to rebuild the structure.

Method of Measurement
Item 220.6 will be measured for payment by the Foot.

Basis of Payment
Item 220.6 will be paid for at the contract unit price per Foot. This price shall include all labor, materials, equipment, and incidentals required to complete the work.

Reuse of castings will not be measured for payment.

ITEM 221. FRAME AND COVER EACH

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

Drainage manhole covers and frames shall be as shown on the 2017 MassDOT Construction Standards No. E 202.6.0 and E 202.8.0 and shall have the letters "DRAIN" inscribed on the cover.

Method of Measurement
Item 221. will be measured for payment by the Each frame and cover installed, complete in place.

Basis of Payment
Item 221. will be paid for at the Contract unit price per Each. This price shall include all labor, materials, equipment and incidentals required to complete the work.

ITEM 303.06 6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) FOOT

ITEM 303.12 12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) FOOT

The work under these items shall conform to the relevant provisions of Subsection 301 of the Standard Specifications, the City of Taunton Water Department requirements as supplemented by the American Waterworks Association Standard Specifications, and the following:

The work shall include the furnishing and installing ductile iron water pipe in areas where utility obstructions warrant and as required by the Engineer.

The work shall also include submittal of shop drawings, pressure tests and disinfection.

The Contractor shall inform the Taunton Water department of any required shutdowns 5 business days before work. Shutdowns shall be completed outside normal business hours.

Jacket insulation shall be installed on relocations or new pipe where the minimum depth is not in accordance with the Taunton Water Department requirements.

Method of Measurement
Items 303.06 and 303.12 will be measured for payment by the Foot of water main installed, complete in place.

Basis of Payment
Items 303.06 and 303.12 will be paid for at the respective Contract unit price per Foot, which price shall include all labor, materials, jacket insulation, equipment, and incidentals required to complete the work.

ITEM 376.1 HYDRANT – EXCLUDING COST OF HYDRANT EACH

The work under this item shall conform to the relevant provisions of Section 300 of the Standard Specifications and the following:

All work shall be done in accordance with the City of Taunton Water Department requirements, supplemented by American Waterworks Association Standard Specifications.

All new hydrants and gate valves shall be provided by the City of Taunton Water Department in place of removed and stacked locations or as shown on the plans.

The Contractor shall pick up new hydrants and valves from 90 Ingell Street in Taunton from the Taunton Water Department.

The Contractor shall schedule the work with the Taunton Water Department and a technician from the Water Department shall be on site when work is performed on the water distribution system.

The Contractor shall inform the Taunton Water department of any required shutdowns 5 business days before work. Shutdowns shall be completed outside normal business hours.

Method of Measurement
Item 376.1 will be measured for payment by the Each hydrant installed, complete in place.

Basis of Payment
Item 376.1 will be paid for at the contract unit price per Each. This price shall include all labor, materials, equipment, excavation, sawcutting, shoring, bracing, bedding, gravel borrow backfill, pressure testing, chlorination, flushing, sampling, municipal coordination, analysis, and incidentals required to complete the work.

ITEM 376.3 HYDRANT – REMOVED AND STACKED EACH

The work under this item shall conform to the relevant provisions of Subsection 301 of the Standard Specifications, City of Taunton Water Department, and the following:

The Contractor shall remove and stack the existing hydrants shown on the plans. The hydrants shall be stacked on boards and delivered to the Taunton Water Department at 90 Ingell Street, Taunton.

The work shall include the careful removal of the existing hydrant, mechanical joint restraints, bends and couplings.

All pipe shutdowns shall be approved by the City of Taunton prior to performing any work. The work shall be coordinated in a manner to minimize the number and duration of shutdowns.

ITEM 376.3 (Continued)

Method of Measurement
Item 376.3 will be measured for payment by the Each hydrant removed and stacked.

Basis of Payment
Item 376.3 will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidentals required to complete the work.

ITEM 590. CURB REMOVED AND STACKED FOOT

Work under this Item shall conform with the requirements of Subsection 580 of the Standard Specifications and the following:

This work includes removing the existing curb and stacking it in accordance with these specifications and in locations designated on the plans or by the Engineer.

The Contractor shall excavate a trench to a width and depth so that the existing curb can be removed without damage.

The Contractor shall transport the removed and stacked curb and restack at 90 Ingell Street, Taunton MA.

Method of Measurement
Item 590. will be measured for payment by the Foot of curb removed and stacked.

Basis of Payment
Item 590. will be measured for payment by the Foot. This price shall include all labor, materials, transportation, municipal coordination, equipment, and incidentals required to complete the work.

ITEM 669.1 FENCE REMOVED AND STACKED FOOT

The work under this item shall conform to the relevant provisions of Subsection 665 of the Standard Specifications and the following:

The work shall include removing the existing fence at the locations noted below and stacking the existing fence on the property:

29 Jefferson	61+27 to 62+56	LT
164 Broadway	53+21 to 53+71	LT
166 Broadway	53+71 to 54+29	LT
208 Broadway	68+23 to 69+11	LT

ITEM 669.1 (Continued)

208 Broadway	68+25 to 69+11	LT
224 Broadway	74+44 to 74+49	LT
239 Broadway	83+09 to 83+20	RT
247 Broadway	83+20 to 83+54	RT
275 Broadway	90+57 to 91+39	RT

The Contractor shall coordinate with the property owner as to the exact location for stacking the fencing.

Method of Measurement
Item 669.1 will be measured for payment by the Foot of fence removed and stacked, complete in place.

Basis of Payment
Item 669.1 will be paid for at the Contract unit price per Foot. This price shall include all labor, materials, equipment and incidentals required to complete the work.

ITEM 671.1 FENCE GATE AND GATE POSTS REMOVED AND STACKED EACH

The work under this item shall conform to the relevant provisions of Subsection 665 of the Standard Specifications and the following.

The work includes removing and stacking fence gates and gate posts at the following locations:

164 Broadway	53+21 to 53+71	LT
166 Broadway	53+71 to 54+29	LT
275 Broadway	91+08 to 91+12	RT

Fence gate and gate posts shall be stacked on the property. The exact location to be stacked shall be coordinated with the property owner.

Method of Measurement
Item 671.1 will be measured for payment by the Each fence gate or gate post removed and stacked.

Basis of Payment
Item 671.1 will be paid for at the Contract unit price per Each. This price shall include all labor, materials, equipment, removal, stacking, and incidentals required to complete the work.

ITEM 691.1 BOULDER REMOVED AND STACKED EACH

The work under this item includes removing existing landscape boulders at the locations noted below and stacking the existing boulders on the property:

283 Broadway 93+08 RT

The Contractor shall coordinate the exact location with the property owner.

Method of Measurement
Item 691.1 will be measured for payment by the Each boulder removed and stacked.

Basis of Payment
Item 691.1 will be paid for at the Contract unit price per Each. This price shall include all labor, materials, equipment, removing, stacking, and incidentals required to complete the work.

ITEM 697.1 SILT SACK EACH

Work under this item shall conform to the relevant provisions of Subsections 227 and 670 of the Standard Specifications and the following:

The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

Silt sacks shall be installed in retained existing and proposed catch basins and drop inlets within the project limits and as required by the Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions, and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and disposed of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

ITEM 697.1 (Continued)

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 bid.

ITEM 711.1 PROPERTY BOUND REMOVED AND RESET EACH

The work under this item shall conform to the relevant provisions of Subsection 710 of the Standard Specifications and the following:

Bounds removed and reset under this item shall be private property bounds that must be reset to the new right of way lines.

The plans note remove and reset for bounds that are visible, but the work under this item also includes resetting existing bounds that are recessed below ground and consequently were not surveyed or depicted on the plans.

Private property bounds shall be reset by a Massachusetts Registered Professional Land Surveyor along the property line at the intersection with the new right of way.

Prior to the work the Contractor shall confirm with the Engineer, in coordination with the property owner, that the bound shall be reset to either the same height above ground or below ground, as applicable, as the existing bound prior to disturbance.

Method of Measurement
Item 711.1 will be measured by the Each bound removed and reset, complete in place.

Basis of Payment
Item 711.1 will be paid for at the contract unit price per Each. This price shall include all labor, materials and incidentals required to complete the work.

ITEM 740. ENGINEER'S FIELD OFFICE AND EQUIPMENT (TYPE A) MONTH

The work under this Item shall conform to the relevant provisions of Subsection 740 of the Standard Specifications and the following:

Two computer systems and printer system meeting minimum requirements set forth below including installation, maintenance, power, paper, disks, and other supplies shall be provided at the Resident Engineer's Office:

All equipment shall be UL approved and Energy Star compliant.

The Computer System shall meet the following minimum criteria or better:

Processor:	Intel, 3.5 GHz
System Memory (RAM):	12 GB
Hard Drive:	500 GB
Optical Drive:	DVD-RW/DVD+RW/CD-RW/CD+RW
Graphics Card:	8 GB
Network Adapter:	10/100 Mbit/s
USB Ports:	6 USB 3.0 ports
Keyboard:	Generic
Mouse:	Optical mouse with scroll, MS-Mouse compliant
Video/Audio	the computer system shall be capable of allow video calling and recording:
Video camera	shall be High Definition 1080p widescreen capable video calling and recording with built in microphone. The microphone system shall capture natural audio while filtering out background noise.
Audio	shall be stereo multimedia speaker system delivering premium sound.
OS:	Latest Windows Professional with all security updates
Web Browser:	Latest Internet Explorer with all security updates
Applications:	Latest MS Office Professional with all security updates Latest Adobe Acrobat Professional with all security updates Latest Autodesk AutoCAD LT Antivirus software with all current security updates maintained through the life of the contract.
Monitors:	Two 27" LED with Full HD resolution. Max. resolution 1920 x 1080
Flash drives:	2 (two) - 128GB USB 3.0
Internet access:	High Speed (min. 24 mbps) internet access with wireless router.

ITEM 740. (Continued)

The Multifunction Printer System shall meet the following minimum criteria or better:

Color laser printer, fax, scanner, email and copier all in one with the following minimum capabilities:

- Estimated volume 8,000 pages per month
- LCD touch panel display
- 50 page reversing automatic document feeder (RADF)
- 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 (not including the bypass tray)
- Automatic duplexing
- Finisher with staple functions
- Standard Ethernet. Print Controller
- Scan documents to PDF, PC and USB
- ability to print with authenticated access protection

The Contractor shall supply a maintenance contract for next day service, and all supplies (toner, staples, paper) necessary to meet estimated monthly usage.

The Engineer's Field Office and the equipment included herein including the computer system, and printer shall remain the property of the Contractor at the completion of the project. Disks, flash drives, and card readers with cards shall become the property of the Department.

Compensation for this work will be made at the contract unit price per month which price includes full compensation for all services and equipment, and incidentals necessary to provide equipment, maintenance, insurance as specified and as directed by the Engineer.

ITEM 756. NPDES STORM WATER POLLUTION PREVENTION PLAN LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the EPA for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. The Contractor shall be fully responsible for compliance with the most recently issued CGP and any subsequent revisions. Should a fine or penalty be assessed against it, or MassDOT, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

ITEM 756. (Continued)

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.

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.

ITEM 756. (Continued)

In addition to the CGP requirements for inspections, MassDOT requires inspection of all erosion controls and site conditions on a weekly basis. Inspections are also required at portions of sites that discharge to sediment or nutrient impaired or high quality waters per the CGP when each incidence of rainfall exceeding 0.25 inches in twenty-four hours or after snowmelt discharge from a storm event that produces 3.25 inches or more of snow within twenty-four hours occurs. 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 conditions 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 submission of a Notice of termination (NOT) when final stabilization has been achieved.

ITEM 767.121 SEDIMENT CONTROL BARRIER FOOT

The work under this item shall conform to the relevant provisions of Subsections 670, 751 and 767 of the Standard Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment control barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes with biodegradable natural fabric (i.e., cotton, jute, burlap) are intended to be the primary sedimentation control barrier. Photo-biodegradable fabric shall not be used.

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- 9-inch compost filter tubes
- Straw bales which shall be trenched

No straw wattles may be used. Additional compost filter tubes (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

When required by permits, additional sediment barrier shall be stored on-site for emergency use and replacement for the duration of the contract.

Where shown on the plans or when required by permits, sedimentation fence shall be used in addition to compost filter tubes and straw bales and shall be compensated under that item.

Sediment control barriers shall be installed in the approximate location as shown on the plans and as required so that no excavated or disturbed soil can enter mitigation areas or adjacent wetlands or waterways. If necessary to accommodate field conditions and to maximize effectiveness, barrier locations may be shifted with approval from the Engineer. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

Materials and Construction

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer’s instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

ITEM 767.121 (Continued)

Compost Filter Tube
Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

Straw Bales
Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

ITEM 767.121 (Continued)

Sedimentation Fence
Materials and Installation shall be per 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 Section 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

Dismantling and 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 damage by construction activities shall be repaired or replaced as directed by the Engineer at the Contractors expense.

ITEM 802.406 4 INCH TELEPHONE CONDUIT – TYPE NM (6 BANK) FOOT

The work under these Items shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

The Contractor shall excavate the trench to the width and depth shown on the plans.

All construction of duct banks including trench, excavation, and backfill shall conform to Verizon details and specifications. All work shall be performed by a Verizon approved Contractor. A representative from Verizon shall be present for all Telephone conduit installed.

For all conduits encased in concrete, use plastic spacers to maintain conduit spacing. Spacers shall meet Verizon specifications for design and spacing.

All trench excavation activities shall comply with all appropriate OSHA standards.

Duct bank shall have 6-inch orange warning tape installed above the concrete encasement as shown on the plans.

ITEM 802.406 (Continued)

Conduits shall be blown clean using compressed air. Run mandrel thru each conduit to confirm viable pathway.

Woven polyester mule tape with minimum strength of 2500 lb. tensile strength to be installed within each conduit.

PVC conduits shall be Schedule 40.

Concrete encasement shall be 2,500 psi, 3/8 inch, 520 cement concrete.

Method of Measurement
Item 802.466 will be measured for payment by the Foot of 4 inch telephone conduit, Type NM (6 bank), complete in place.

Basis of Payment
Item 802.466 will be paid for at the contract unit price per Foot. This price shall include all labor, equipment, materials, excavation, backfill, conduit, warning tape, spacers, concrete encasement, and incidentals required to complete the work.

ITEM 813.79 INTERCONNECT CABLE SYSTEM LUMP SUM

Work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

The work under this item shall consist of providing all labor, materials, tools, installation equipment and field-test instruments required for the complete installations and testing of a fully functioning traffic signal interconnect system. The work shall also include furnishing and installing fiber optic cable, fiber optic patch panels, fiber splice trays, adapter panels, fiber optic pigtails, duplex fiber optic patch cables, and managed Ethernet switches.

The Contractor shall furnish and install 12-strand, single mode fiber optic interconnect cable between the intersections of Broadway and Washington Street and Broadway and East Britannia Street.

The interconnect communications cable shall run through the designated conduit, pull boxes and controller cabinets between the two locations. Each conductor shall be terminated on properly labeled terminals.

All interconnect communications cable shall be installed in accordance with the plans, these Special Provisions, industry standards and safety practices for telephone communications cable installation. All communications cable shall be installed in the presence of the Engineer.

The Contractor shall furnish and install twelve (12) position fiber optic patch/splice panel and appurtenances in addition to one managed Fiber/Ethernet switch at each of the traffic control cabinets shown on the plans or as required by the Engineer.

ITEM 813.79 (Continued)

The single mode fiber optic cable furnished and installed under this item. The communication system shall include a twelve pair, twisted 19AWG, shielded communications cable, IMSA SPEC 39-2. Each conductor shall be terminated on a Type R66 "quick connect" terminal block. Cables shall be attached to the R66 blocks so that removal of bridge clips will isolate the field side of the cable from the controller side wiring. Each communication pair initially used for system control shall include lightning and surge protection. The protection device shall include capabilities for peak surge current protection of 10K amperes with a response time of less than 5 nanoseconds. Units shall be a plug mountable suppressor or approved equivalent.

The cables shall be terminated only on terminal strips located inside controller cabinets. The Contractor shall provide as-built wiring lists for each terminal point as part of the required documentation. The jacket color and associated function of each communication wire shall be clearly indicated. The Contractor shall be responsible for the complete installation and proper wiring of the interconnect communication cable, including any necessary electrical connections to the proposed controllers, and accessories such as surge protectors, terminal blocks, etc. No cable splices shall be allowed between controller cabinets.

All communication cable installed under this Contract shall be identified with permanently attached plastic labels at each controller cabinet. The labels shall either be embossed or printed with permanent non-fading ink, indicating the name of the intersection that is at the other end of the cable and bearing the legend "TRAFFIC SIGNAL FIBER OPTIC CABLE." The tags shall also be labeled with the location of the cable's termination point. The Engineer shall approve the label format and attachment mechanism before label installation.

Managed Fiber/Ethernet Switch

The Contractor shall furnish and install a Fiber/Ethernet switch in the traffic signal control cabinet for future connection to City-owned fiber optic cable. The module shall support the Ethernet data IEEE 802.3 protocol using Auto-negotiating and Auto-MDI/MDI-X features. The module shall feature eight 10/100TX RJ-45 ports and three 100/1000FX SFP ports. The module shall require no in-field electrical or optical adjustments or in-line attenuators to ease installation. The module shall provide power, link speed, and fiber port status indicating LED’s for monitoring proper system operation. The module shall have redundant power supply connections to minimize single point failure. The module shall provide a serial connection for local management of the device as well as a web-based configuration and management interface hosted on the device. The module shall have a lifetime warranty to reduce system life cycle cost in an event of a module failure. The switch shall be installed in the cabinet as shown on the plans and or as directed by the Engineer.

The Fiber/Ethernet switch shall be of rugged design and suitable for reliable operation when mounted in the configuration as specified.

The Fiber/Ethernet switch shall include all software required for monitoring and updating the Fiber/Ethernet switch.

ITEM 813.79 (Continued)

The Fiber/Ethernet switch shall support the following IEEE Networking Standards:

1. IEEE 802.3 10Base-T Ethernet
2. IEEE 802.3u 100Base-TX Fast Ethernet
3. IEEE 802.3ab 1000Base-TX
4. IEEE 802.3z Gigabit Ethernet Fiber
5. IEEE 802.3x Flow Control and Back-pressure
6. IEEE 802.1p class of service
7. IEEE 802.1Q VLAN and GVRP
8. IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP)
9. IEEE802.3ad LACP
10. IEEE802.1X Port based Network Access Control

The switch shall provide the following switch performance:

1. Switch Technology: Store and Forward Technology with 32Gbps Switch Fabric.
2. System Throughput: 14,880pps for 10M Ethernet; 148,800pps for 100M Fast Ethernet; 1,488,100 for Gigabit Ethernet
3. Transfer Packet Size: 64 bytes to 1522 bytes (with VLAN Tag)
4. MAC Address: 8K MAC
5. Packet Buffer: 1Mbits
6. Relay Alarm: Dry Relay output with 1A@24V ability

The Contractor shall supply, install, and test all Ethernet cables required to make all connections in the cabinet.

The Fiber/Ethernet switch shall be an Ethernet layer 2 device.

The Fiber/Ethernet switch shall have a switching method of store and forward.

The Fiber/Ethernet switch shall support the following protocols:

- RTP/ID
- TCP/IP with full multicast support
- DNS
- DHCP

The Fiber/Ethernet switch shall support the following network management protocols:

- SNMP V2c
- RMON for Ethernet agent
- Telnet/TFTP

ITEM 813.79 (Continued)

The Fiber/Ethernet switch shall have an operating temperature range of -40 degrees to +74 degrees C.

The Fiber/Ethernet switch shall have a power usage of+12VDC to +24 VDC at 1 amp.

This shall be provided by a plug-in type AC adapter supplied with the unit.

The Fiber/Ethernet switch shall include all accessories required for complete operation of the unit, including Ethernet cables, fiber optic patch cables, power adapters, and mounting hardware, as a minimum.

The Contractor shall supply all necessary cables and power supply to ensure a working installation.

Basis of Payment
Item 813.79 will be paid for at the contract unit price, Lump Sum. This price shall include all labor, materials, equipment, furnishing and installing cable, fiber optic patch/splice panels, fiber pigtails, patch cords, managed Ethernet switches, restoring facilities destroyed or damaged during construction, and incidentals required to complete the work.

The conduit used for the Interconnect Cable System will be paid for under Item 804.3.

Electric pull boxes used for the Interconnect Cable System will be paid for under Item 811.31.

ITEM 816.01 TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 LUMP SUM
ITEM 816.02 TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2 LUMP SUM

The work under these items shall conform to the provisions of Section 800 of the Standard Specifications and the following:

The work consists of furnishing and installing traffic control signal equipment complete and ready for operation, as shown on the plans. The intersection locations are designated as follows:

Location 1 – Broadway (Route 138) at Washington Street
Location 2 – Broadway (Route 138) at East Britannia Street

Included in the work is the modifying, furnishing, and installing of traffic control signal equipment, including controllers, cabinets and concrete foundations, vehicle and pedestrian housings, non-louvered backplates, accessible pedestrian pushbutton assemblies, red, amber, and green LED signals, ornamental posts and bases with concrete foundations, ornamental mast arm assemblies with anchor bolts and concrete foundations, video detection equipment, emergency vehicle preemption, software, all cable and wiring, ground rods, equipment grounding and bonding, saw cuts, pull boxes, 1 1/4 inch RGS conduit, electrical connections, service connections, removing and stacking existing signal equipment, and providing all incidental materials necessary to provide a complete, fully operational traffic control signal system as specified herein and as shown on the plans.

ITEM 816.01 and **ITEM 816.02** (Continued)

Taunton Municipal Light Plant (TMLP) will furnish connection and power at the location shown on the Contract Drawings. A service disconnect shall be provided in the pullbox as shown on the Contract Drawings. TMLP will connect and disconnect power as required. No work shall be done in manholes or on power poles without a representative of TMLP or Verizon being present. The Contractor will be responsible for coordinating the TMLP and Verizon work.

It shall also be the Contractor's responsibility to pay all charges to TMLP and Verizon for performing this work. No direct reimbursement will be made under this payment to the Contractor for payments made to TMLP or Verizon, it being understood that full compensation for any payment made by the Contractor to the utility company will be included in the contract unit prices bid.

A list of required major traffic signal system items is included on the plans. All equipment installed shall be listed on MassDOT's "Qualified Traffic Control Equipment List".

The Contractor shall deliver to the Owner a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

The Contractor shall request written approval from the Owner or its Designated Agent before the placement of any concrete for foundations of mast arms, signal posts and cabinets.

Concrete foundations shall be constructed of 4000 PSI, 3/4 inch, 610 cement concrete. Anchor bolts shall be set accurately and tops shall be formed neatly.

The top of the concrete base for the control cabinet shall be 18 inches above grade. The top of all other foundations not in sidewalk or paved areas shall be a minimum of 2 inches above grade. The top of mast arm foundations in sidewalk areas shall be located flush with finish grade.

Flashing Operation
Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Sections 4D.28 through 4D.31 of the MUTCD.

Local Traffic Signal Controllers and Cabinets
The controller, malfunction management unit, detector amplifiers, bus interface units, and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the National Electrical Manufacturers Association (NEMA) Standard No. TS 2.

Traffic Controller Assemblies
The controllers and cabinet assemblies shall be supplied in an 8-phase, TS 2 Type 1 configuration.

Controller cabinet foundations shall not obstruct a sidewalk or crosswalk so that passage by physically-challenged persons is impaired. Anchor bolts shall be internal to the cabinet.

ITEM 816.01 and **ITEM 816.02** (Continued)

TS 2 Type 1 Controllers and Cabinet Assemblies

Controllers shall conform to Section 3, Controller Units of NEMA No. TS 2, Traffic Controller Assemblies. Controllers shall utilize an input/output interface conforming to Section 3.3.1 of the NEMA TS 2 Standard for all input/output functions with the backpanel terminals and facilities, the malfunction management unit, detector rack assemblies, and auxiliary devices.

The TS 2 Type 1 cabinet shall meet the requirements of Configuration 3 as defined in Table 5.3.1-1, "Type 2 Configurations" of the NEMA TS 2 Standard. The cabinet shall be fabricated of sheet aluminum to Size 6 dimensions as specified in Table 7.3-1 of the NEMA TS 2 Standards. The cabinet shall have a brushed aluminum finish.

The cabinet shall also be wired with a normally closed switch connected to a user defined input to the controller for remote monitoring of the control cabinets' door open status.

The following requirements are applicable to each signalized location and are designed for effective use of a laptop computer in conjunction with traffic signal controllers. These requirements are also designed to permit all engineers, electricians and technicians (including those who are disabled but ambulatory) to work in the cabinet in a safe, effective and comfortable manner. To this extent, the following meets applicable ADA requirements.

1. Adjust the control cabinet height by use of a cabinet extender, adjust the placement of cabinet shelves, adjust the height of the cabinet foundation or provide any combination of these three items so that the top of the LCD or other visual display window of both the local controller and the master controller is no more than 48" above finished grade in front of the cabinet. The top of the cabinet door opening shall be at least 5'8" above finished grade. Any technical provision, plan detail, standard specification or standard drawing to the contrary shall not apply to the extent that it may conflict with this viewing height requirement.
2. Furnish and install one slide-out/slide-in shelf or swing-out/swing-in shelf appropriate for the size and load of a laptop computer. This moveable shelf shall support the bottom of the laptop computer at a height between 3'-4" and 3'-8" above finished grade in front of the cabinet.
3. Furnish and install a paved pad in front of the control cabinet. This pad shall be of cement concrete, built in accordance with the sidewalk specification applicable to this project, approximately level, approximately 1" above the surrounding unpaved surface, or at even grade with the adjacent surface if paved. This pad shall abut the front of the cabinet, project at least 1' to each side of the cabinet and at least 3' in front. No pad is required if the front of the cabinet immediately abuts an existing or proposed paved sidewalk or other paved surface.
4. Both the firmware and software version in each timer unit shall be the same throughout the project, and shall be the latest version available on the market. In addition, the contractor shall promptly furnish to the owner and install all upgraded versions of both firmware and software through the last day of the inspection period, guarantee period or warranty period, whichever date is later.

ITEM 816.01 and **ITEM 816.02** (Continued)

5. The contractor shall furnish one cable with each new timer unit to connect a controller timing mechanism to a laptop computer. This cable shall have a termination at one end to match the controller. It shall have a termination on the other end to match the type of serial port found on laptop computers, usually DB9. This cable shall be wired to provide serial RS232C communication between the controller and the computer.
6. Payment for the work described above shall be deemed to be incidental to and included in the prices bid for various items of traffic signal work, and no additional payment shall be made for the work described above.

Controllers

The local traffic controllers shall be capable of being operated in the full-actuated mode, in the free mode, and as semi-actuated in the coordinated mode. The controllers shall be keyboard entry, menu-driven unit mounted in eight-phase cabinets. The controller units shall meet all applicable requirements of the (N.E.M.A.) Standard Publication No. TS-2, Type 2, the Department's 1995 Standard Specifications and include the following as minimum requirements for the "Keyboard Entry Controller Unit."

a. The Keyboard Entry Controller Unit must be type-tested and approved by the Department.
b. The controller shall have hard-wire interconnect capability and internal time base coordination logic. The coordination control shall have the capabilities to operate as described under Section 815.41 of the Standard Specifications.
c. The controller shall have a data transfer/printer port for data transfer to another controller, printer, or laptop PC computer. A port shall be provided for uploading or downloading controller operating parameters from a laptop PC computer.
d. The controller shall have a security code function.
e. The controller unit shall have internal fire preemption control capabilities.
f. The phase or phases selected for "call to non actuated" (C.N.A.) modes shall be determined as needed by keyboard entries.
g. The local controller shall be fully compatible with the closed loop system master. Closed loop communications shall be provided between the local traffic controller and the system master via an internal FSK modem.

The Contractor's attention is directed to Table 2, Required Signal Light Switching Assemblies, Section 815.41 of the Standard Specifications. The Contractor shall furnish the appropriate type and number of load switches and place unutilized load switches in the control cabinet for future use. Load relays shall be easily replaced using a screwdriver. Component relays requiring soldering are not acceptable.

In addition to the convenience outlet as described under Subsection 815.41, a lamp with an on/off switch shall be installed in the controller cabinet.

ITEM 816.01 and **ITEM 816.02** (Continued)

Bus Interface Units
The Bus Interface Unit (BIU) shall comply with Section 8 of the NEMA TS 2 Standard. The BIU shall be fully interchangeable with any other manufacturer's unit and interchangeable in a NEMA TS 2 Type 1 cabinet assembly.

The BIU shall perform the interface function between Port 1 at the controller unit, the malfunction management unit, loop detector rack assembly, and the backpanel terminal and facilities.

As a minimum, two LED indicators shall be provided on the BIU front panel. One indicator shall serve a dual use; as a power on indication and as a diagnostic indicator for proper operation of the device. The second indicator shall serve as a transmit indicator illuminating each time data is transmitted.

Note: The contractor shall supply one additional spare BIU in each controller cabinet.

TS2 Cabinet Power Supply
A separate power supply shall be supplied and installed in each of the TS 2 cabinets. The unit shall be AC line powered and provide regulated DC power, unregulated AC power, a line frequency reference for the bus interface units, load switches, and other auxiliary cabinet equipment, as required. As a minimum, the power supply shall meet all requirements of Section 5.3.5 of the NEMA TS 2 Standard.

The power supply shall be either shelf mounted or wall mounted utilizing key hole slots for ease of replacement or installed as part of the rack assembly.

The unit shall contain four LED indicators on the front panel to indicate the four outputs; + 12 VDC +/- 1 VDC @ 2.0 amps, + 24 VDC +/- 2 VDC @ 2.0 amps, 12 VAC @ 250 milliamps, and 60 Hz line frequency reference. A test point terminal shall also be located on the unit’s front panel for + 24VDC and logic ground testing.

Malfunction Management Unit
The malfunction management unit (MMU) shall comply with Section 4 of the NEMA TS 2 standard. The MMU shall be capable of operating as either a Type 16 with 16 channels (8 vehicle, 4 pedestrian, 4 overlap) or a Type 12 with 12 channels (8 vehicle, 4 overlap). The MMU's supplied shall be configured to operate as Type 16 units.

The MMU's in either the Type 16 or Type 12 configuration shall be capable of operating in a NEMA TS 2 Type 1 cabinet or a NEMA TS 1 cabinet without loss of functionality.

ITEM 816.01 and **ITEM 816.02** (Continued)

Load Switches
Load switches shall comply with Subsection 6.2 of the NEMA TS 2 Standard. All load switches shall utilize optically isolated encapsulated modular solid-state relays. Discrete components on circuit boards are not acceptable.

Load switch indicator lights shall be LED-type and wired on the input side of the device.

Note: The controller cabinet assembly shall be initially supplied with a full complement of load switches to accommodate each available position of the backpanel.

Flasher
Flashers shall comply with Subsection 6.3 of the NEMA TS 2 Standard and be equipped with two output indicator lights which will show flashing power out to the cabinet assembly.

Flash Transfer Relays
Flash transfer relays shall comply with Subsection 6.4 of the NEMA TS 2 Standard.

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

Note: The controller cabinet assembly shall be initially supplied with a full complement of flash transfer relays to accommodate each available position of the backpanel.

Testing of Grounding System
The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer in accordance with the Standard Specifications. A ground rod shall be installed in each controller cabinet.

Software
All computer system, controller, conflict monitor, and amplifier software shall be supplied with the latest available revision. Any software upgrades released by the manufacturer shall be supplied at no charge to the City for a period of five years after acceptance of the work.

Data Base Programming
Each programmable local hardware component (controller, malfunction management unit, and detector amplifier) shall be initially programmed by the Contractor based on information contained on the plans. Three (3) sets of hard copy programming per device shall be supplied and stored in each controller cabinet.

ITEM 816.01 and **ITEM 816.02** (Continued)

Labels
All time settings, switches, harnesses, relays, terminals, and fuses shall be clearly and permanently labeled.

Surge Suppression for Traffic Signal Equipment
Wherever electronic traffic signal equipment is located (cabinets, cameras, etc.), each input & output should be surge protected except traffic signal outputs. Signal outputs from load switches do not need surge suppression since the load switches act as surge suppressors.

The surge protector must be electrically connected to the nearest grounded metal structure or nearest ground rod.

Surge protection for power service shall conform to the current NEMA TS-2 standard except surge capacity shall be 80 kA. The product complies when a lab report from an independent test laboratory stating the product passes the current NEMA TS-2(5.4.2.4) specification (with the additional surge capacity of 80 kA) is submitted with the shop drawings.

Surge protection for all video, loop, pedestrian button, and pre-emption connections should have peak surge current protection of at least 10K amperes with a response time of less than 5 nanoseconds. The product complies when a lab report from an independent test laboratory stating the product passes this specification is submitted with the shop drawings.

Units should be unconditionally warrantied for at least 10 years.

Video Detection System
The Contractor shall provide a Video Detection System to detect vehicles at each location. The system shall also provide full motion video output showing zones highlighted during detection for fine-tuning. All hardware and software within the traffic signal cabinet shall be NEMA TS-2 compliant. The system shall be compatible with TMLP's existing City-wide video detection software system.

A 9 inch video monitor shall be provided for video detection diagnostic purposes. The major components of the Video Detection System are further described as follows:

A. Prior to installation of the Video Detection System a detailed site survey shall be conducted by a factory trained and certified representative. The site survey shall ensure that the design of the camera, camera location, camera optics, and video/data interconnect is appropriate for the application.

B. The supplier of the Video Detection System shall supervise the installation and testing of the Video Detection System and computer software. A factory certified representative from the supplier shall be on site during installation.

ITEM 816.01 and **ITEM 816.02** (Continued)

C. The Video Detection System shall provide one National Television Standards Committee (NTSC) color composite video output.

D. The Video Detection System shall provide a minimum of 20 detection zones. The system shall provide flexible, user configurable detection zone placement at any orientation within the field of view of the Video Detection System Camera. It shall be possible to overlap detection zones. It shall be possible to configure the Video Detection System to provide detection signals to the traffic signal controller which are comprised of Boolean combinations of detection zones.

E. The Video Detection System shall provide failsafe operation whereby it places continuous vehicle calls to the traffic signal controller on all detection zones in the event it senses unacceptable video from the Video Detection System Camera.

F. The Video Detection System shall include a configuring device and/or a Windows based computer software that provides for configuring the Video Detection System, viewing real time video, and updating the flash memory of the Video Detection System with updated application software.

G. The Video Detection System shall provide count and presence detection performance with at least 96% accuracy under normal (day and night) conditions.

H. The Video Detection System shall utilize FLASH memory to store the resident application software.

I. The Video Detection System shall be comprised of a Video Detection System Camera, Video Detection System Cable, and Video Detection System Hardware.

J. Video Detection System Cameras

1) The Video Detection System Camera shall operate without degradation over a temperature range of -34 to 60 degrees Celsius at a relative humidity of 10% to 90% condensing.

2) The Video Detection System Cameras shall be housed in a water resistant, dust proof NEMA-4 housing. The housing shall include a rear connector for connection of the Video Detection System Cable. The housing shall be field rotatable to allow for proper alignment between the camera and the traveled road surface.

3) The Video Detection System Cameras shall have a heater to prevent the formation of ice and condensation in cold weather and allow the camera to operate correctly while exposed to precipitation and direct sunlight.

4) The Video Detection System Cameras shall have a sunshield to protect the lens from direct sunlight and direct precipitation exposure.

5) The Video Detection System Cameras shall provide useable video and resolvable features in the video image when those features have luminance levels as low as 0.1 lux at night, and as high as 10,000 lux during the day. The Video Detection System Camera shall contain an automatic gain control (AGC) to provide a satisfactory image over the full range of light levels.

ITEM 816.01 and **ITEM 816.02** (Continued)

K. Video Detection System Cable

1) The Video Detection System Cable shall interconnect the Video Detection System Camera with the Video Detection System Hardware in the traffic signal control cabinet.

2) The Video Detection System Cable shall meet the design requirements of the Video Detection System Camera manufacturer, and shall be designed and manufactured specifically for the Video Detection System Camera supplied.

3) The Video Detection System Cable shall be capable of withstanding the rigors of outdoor environments, including all combinations of precipitation, heat and cold from -34 to 74 degrees Celsius, and direct exposure to sunlight without exhibiting any signs of deterioration over time.

4) The Video Detection System Cable shall be installed with a suitable drip loop to prevent the entrance of water into the housing.

L. Video Detection System Hardware

1) The Video Detection System Hardware shall operate without degradation over a temperature range of -34 to 74 degrees Celsius at a relative humidity of 10% to 90% condensing.

2) The Video Detection System Hardware shall include interface device(s) which shall be installed in the traffic control cabinet.

3) The interface device(s) shall be used to terminate the traffic controller cabinet end of the Video Detection System Cable.

a) The interface device(s) shall contain transient suppression devices for all signals transported on the Video Detection System Cable, including but not limited to video, data, and power.

- The surge protector shall be electrically connected to the cabinet ground rod.
- Surge protectors should have peak surge current protection of at least 10K amperes with a response time of less than 5 nanoseconds. The protector complies when a lab report from an independent test laboratory stating the product passes this specification is submitted with the shop drawings.
- Units should be pre-approved or unconditionally warrantied for at least 10 years and certified to comply with the product's published specifications by an independent laboratory.

b) The interface device(s) shall contain a switch or shut-off mechanism that shall allow the user to turn off AC service to all components of the Video Detection System.

c) The interface device(s) shall contain a connector for interfacing to a configuring device and/or a Windows based computer in the field for the purpose of configuring the Video Detection System, viewing real time video, and for updating the flash memory of the Video Detection System with updated application software.

ITEM 816.01 and **ITEM 816.02** (Continued)

4) The Video Detection System Hardware shall include all necessary cables for interconnection to the traffic signal controller, AC power service, a modem for transport of NTSC video to the traffic operations center, and a configuring device and/or a Windows based computer in the field.

Equipment Finish and Color

All traffic signal equipment, including, but not limited to, signal posts, bases, signal heads, visors (outside), mast arms, doors, pushbutton saddles, controller cabinet, service meter socket boxes, hardware, strapping, and rigid mounting brackets for signals and signs, shall be the color **Gloss Black.** This includes the metal strapping used to secure equipment to the mast arm and shaft. The inside of visors shall also be **Flat Black**. The interior of controller cabinets shall be the color white. The Contractor shall submit to the Engineer, Design Engineer (BETA Group), and City of Taunton for approval, four (4) paint chips and sample finishes on steel of the intended color prior to any work being done under this heading.

Signal heads, doors, visors, mounting brackets, and hardware supplied direct from the manufacturer in the color stipulated above may be acceptable provided it meets or exceeds the finish process for the material indicated below:

1. STEEL EQUIPMENT

Galvanizing

All bolts, screws, nuts, rods, and washers shall be galvanized in accordance with AASHTO M232 and the Standard Specifications. The hardened machine screws may be electroplate galvanized. Stainless steel studs, bolts, screws, nuts, straps, and washers shall not be galvanized. Galvanized hardware need not be painted; however, the ends of bolts, nuts, and washers shall be painted in the field according to section "Touch-up and Repairs." Immediately prior to galvanizing, the steel shall be immersed in a bath of zinc ammonium chloride. The dry kettle galvanizing process shall be used.

All steel components, other than above, shall be galvanized after fabrication in accordance with AASHTO M111. The galvanizing bath shall contain nickel (0.05% to 0.09% by weight) in accordance with Subsection 960.61 of the Standard Specifications.

Galvanized members requiring shop assembly shall be welded and drilled prior to galvanizing.

Coating over Galvanized Steel

Prior to painting, the applicator shall ensure that all components are smooth and without sharp protrusions that would present an injury hazard to pedestrians. Also, the fabricator shall ensure that all welds shall be thoroughly cleaned in accordance with good practice and according to AWD D1.5 and ASTM A123-89a and shall have a suitable surface to accept the galvanizing.

ITEM 816.01 and **ITEM 816.02** (Continued)

In preparation for the two coat painting system, the surface shall be blast cleaned in accordance with the requirements of SSPC-SP-7 "Brush-Off Blast Cleaning" or other method producing equivalent results and uniform profile, to achieve a 1.0 to 1.5 mils anchor profile as indicated be a Keane Tator Profile Comparator or similar device. The creation of the anchor profile shall be performed prior to the formation of "white rust" on the galvanized surface. Following blast cleaning, the zinc coating thickness shall be measured to verify that the coating thickness is in accordance with AASHTO M111.

A two coat painting system shall be applied by the Galvanizer in his own facility within twelve hours of galvanizing the steel components. If the two coat painting system cannot be applied by the Galvanizer within twelve hours of galvanizing, the Galvanizer shall bake the steel components at 375 degrees for two hours prior to SSPC-SP-7 "Brush-Off Blast Cleaning".

The prime coat material shall be a polyamide epoxy applied to minimum dry film thickness of 4.0 to 6.0 mils and force cured as given below for the finish coat.

The finish coat material shall be a two component, catalyzed aliphatic urethane applied by airless spray to a minimum dry film thickness of 4.0 mils.

The color shall be **Gloss Black**, as specified above. The fabricator shall submit to the Engineer for approval, paint chips of the intended color prior to any work being done under this heading.

All finish coat material shall be applied under conditions within the following tolerances:

A. Air Temperature: 10°C min., 32°C max.
B. Surface Temperature: 10°C min., 38°C max.
C. Surface temperature must be at least 5°F above the dew point.

The finish coat shall be cured in a booth capable of maintaining 65°C for 2-4 hours.

Touch-up and Repairs
Should any damage occur to the galvanized coating during shipping or handling at the job site, the Contractor shall repair and touch-up any damaged areas to the satisfaction of the Engineer and the following:

Touch-up of galvanizing before the finish coat is applied shall be accomplished by applying galvanizing repair paint in accordance with Section M7.04.11. The dry film thickness of the applied repair paint shall not be less than 4.0 mils. Applications shall be in accordance with the manufacturer's instructions.

Field touch-up procedures shall conform to the recommendations of the Galvanizer. Touch-up of the finish coat shall be by applying a coating of a two-part urethane, as supplied by the Galvanizer, to achieve a dry film thickness of at least 4.0 mils. Prior to the application of the paint, remove all damaged coatings down to a solidly adhered coating and apply galvanizing repair paint as primer. Allow the primer to dry for at least 4 hours prior to top coating.

ITEM 816.01 and **ITEM 816.02** (Continued)

The Contractor shall also use the touch-up paint material and procedures to paint the galvanized hardware used in field erection that has not been finish coated previously.

2. ALUMINUM EQUIPMENT

All aluminum equipment called for shall have a powder coat finish Gloss Black in color. The coating shall be a polyester-TGIC (triglycidyl isocyanurat) resin system conforming to the following:

Quality	Test	Limits
Abrasion	Taber abraser CS-10, 1000 gram load, 1000 cycles, ASTM D4060	100 mg. maximum weight loss
Adhesion	ASTM D 3359 Initial 1000 hours	 5A 5A
Gloss	ASTM D 523 15°C - 600 hours 15°C - 1000 hours	 82% retention 90% retention (washed)
Hardness	ASTM D 3363	2H - No Gouge
Impact	ASTM D 2794 Direct	Pass 6.59 Nm
Salt Spray Resistance	ASTM B 177 ASTM D 1654 1000 hours unscribed 400 hours scribed	 Table 2-10 Table 1-10
Weather Resistance	ASTM G 23, 1000 hours, 18 min. waterspray, 102 min. light	No film failure
Color	Gloss Black	
Identify	Infrared fingerprint	Match
Flexibility	180° bend; 13mm dia., mandrel within 10 seconds	No breaks, flaking or cracks. Tested with a Q-panel with 2 mils or less of coating
Humidity	ASTM D 2247, 1000 hours	No blister or film failure
Thickness		4 mils± 1 mils
Mar Resistance		Good

A Certificate of Compliance of the powder coating system is required for the Engineer's approval.

Mast Arm Structures
Mast arm structures shall be ornamental traffic mast arm signal poles and bases. Mast arm post and arm shall be fabricated by a manufacturer on the most current list of MassDOT approved fabricators of signs, luminaires, and signal supports. Poles shall be the “Washington” style as manufactured by an approved fabricator. Base shall be a two piece “clam shell” design with a fluted casting surface and removable access door.

ITEM 816.01 and **ITEM 816.02** (Continued)

A traffic signal mast arm system consisting of a tapered pole, tapered mast arm, anchor bolts, two-piece clam shell base, signals, push buttons, signage and all appurtenances.

Design shall be in accordance with AASHTO, "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." 6th edition with latest interim revisions. AASHTO breakaway requirements shall not apply. Shop drawings and wind load calculations (130 mph) shall be submitted and stamped by a professional engineer registered in the Commonwealth of Massachusetts.

The Fabricator shall be certified to AISC Fabricator Certified Quality Program. Proof of this certification will be required to ensure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality traffic pole structures.

All welding shall be in accordance with the American Welding Society (AWS) D1.1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and shall be visually inspected. Longitudinal welds suspected to contain defects shall be particle inspected. All circumferential butt-welded tube splices are to be non-destructively tested. No welding will be allowed at the site at the time of erection.

All structural steel materials are manufactured in the United States of America, and comply with the American Society for Testing and Materials (ASTM) specifications. Mill certifications are supplied as proof of compliance with the specifications.

Calculations and detailed drawings shall be prepared and stamped by a professional engineer, registered in the Commonwealth of Massachusetts and shall demonstrate compliance with the AASHTO specifications. They shall include stress analysis on the mast arm, luminaire arm, pole, base plate, and anchor bolts. Maximum loads and stresses shall be determined for the most critical wind direction.

Pole Shaft

The pole shall be fabricated from coil or plate conforming to the requirements of Section M8.18.1 of the Standard Specifications. The pole shall be round in cross-section and has a constant linear taper of 0.14 in/ft and have 16 evenly spaced sharp vertical flutes. The shaft shall be one piece and contain no circumferential welded splices, and shall be a single ply (no laminated tubes). The pole shaft diameter and steel gauge shall be as required to satisfy AASHTO Standards. Each pole shall be provided with an end cap secured in place with set screws.

ITEM 816.01 and **ITEM 816.02** (Continued)

Signal Mast Arm
The mast arm shall be a "mounting plate" style with an uptilt as detailed in the contract documents and shall conform to the requirements of Section M8.18.1 of the Standard Specifications. The arm shall be round in cross-section and have a constant linear taper of 0.14 in/ft. All mast arms shall be manufactured and shipped in one piece with no circumferential welded splices and shall be of a single ply (no laminated tubes). Each arm is provided with a cast end cap secured in place with set screws. Signal heads and signs on the mast arm shall be fixed mounted.

Base plates shall conform to the requirements of Section M8.18.1 of the Standard Specifications. Plates shall be integrally welded to the tubes with a telescopic joint or a full penetration weld joint with a backing ring.

Anchor bolts shall conform to the requirements of Section M8.01.5 of the Standard Specifications.

Decorative Cast Aluminum Base
The decorative base assembly shall be cast of 356 aluminum alloy and be a two-piece, vertically split design with a base diameter of 36 inches. The overall height of the base shall be 51 inches. The base castings shall be split vertically in half and bolted together forming a smooth and straight match between the halves. All hardware used to secure the vertically split base castings shall be stainless steel and sized so to provide proper securing strength. There shall be a cast aluminum access door in the middle section casting which shall be positioned opposite the hand hole located in the structural steel shaft.

Experience/Warranties
The pole manufacturer shall have been in the business of manufacturing traffic signal post products for the municipal street lighting market for a minimum of ten (10) years. The manufacturer(s) of the steel pole shaft assembly and cast aluminum base shall warrant that they will repair and replace product that fails due to structural defect or faulty workmanship within 5 years from date of shipment. Paint systems shall be warranted for a period of five years against peeling, cracking or excessive fading.

Mast Arm Foundations
Mast arm foundations shall be a concrete cored foundation as shown on the Standard Drawings for Type II Mast Arms Cored Pier Foundations. The design of the foundations are detailed on the Traffic Signal Plans. Subsurface mast arm borings have been provided for all designed foundations on the plans.

The lower portions of all foundations shall be placed directly against undisturbed earth. No forms or reinforcing for foundations shall be set nor shall concrete be placed until the excavation has been inspected by the Engineer and his approval to proceed has been given.

The top of all foundations in sidewalk areas shall be located flush with finish grade. The top of each mast arm foundation shall not be exposed in the sidewalk.

ITEM 816.01 and **ITEM 816.02** (Continued)

Mast Arm Sign Hanger Brackets

Sign hanger brackets for mast arms shall be used in all locations where a sign is to be mounted to the mast arm. Mast arm sign hanger brackets shall consist of a mast arm clamp assembly cast from 356-T6 aluminum alloy or equivalent, vertical support tube extruded from 6063 aluminum or equivalent, stainless steel bands, clamp screw, hardware, and all miscellaneous materials necessary to fix mount the sign to the mast arm.

The sign hanger bracket shall be universally adjustable capable of making horizontal, vertical, and 360 degree rotational adjustments so that any sign mounted on a mast arm can be adjusted to provide proper alignment and sight perpendicular to the flow of traffic.

Vertical support tubes shall be of sufficient length to allow mounting of the sign to within 3 inches of the top and bottom of the sign.

Ornamental Signal Posts and Bases

This portion of the work shall consist of furnishing and installing ornamental pedestrian and vehicle traffic signal poles. Poles shall be the "Washington" style as manufactured by Spring City Electrical Mfg. Co. or equivalent products by Millerbernd Mfg. Co., Valmont, or other approved fabricator. The Ornamental Signal Post shall be suitable for attaching and supporting one or more signals as shown in the plans.

The Fabricator shall be certified to AISC Fabricator Certified Quality Program. Proof of this certification will be required to ensure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality traffic pole structures.

All welding shall be in accordance with the American Welding Society (AWS) D1.1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and are to be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt-welded tube splices shall be non-destructively tested. No welding will be allowed at the site at the time of erection.

All structural steel materials are to be manufactured in the United States of America, and comply with the American Society for Testing and Materials (ASTM) specifications. Mill certifications shall be supplied by the manufacture as proof of compliance with the specifications.

Each post shall include the following major components:

1. Ornamental Base Section – The base shall be cast aluminum alloy ANSI 356 per ASTM B26-95 and shall be of heavy wall construction with a minimum wall thickness of .375 inches. The base shall be a two piece "clam shell" design and shall measure 28 inches in height with a diameter of 23 inches where it rests onto the concrete foundation. The ornamental base component shall have a fluted casting surface and removable access door. The assembled base casting shall weigh 90 pounds ± 5%.

ITEM 816.01 and **ITEM 816.02** (Continued)

2. Fluted Pole Shaft – The aluminum pole shaft shall be fabricated from extruded aluminum alloy 6063 per ASTM B221, B2411 or B429. After fabrication, the pole shaft shall measure 7" diameter at the base plate and taper a uniform 0.14" per ft. The pole shall have a minimum wall thickness of 0.188 inches to support designed wind loads. The pole shaft assembly shall be fluted using the mandrel forming process resulting in 12 equally spaced "flat" tubes. The pole assembly shall then be fully heat treated to achieve a T6 temper after the assembly has been welded. A 4 inch by 7 inch hand hole provision with reinforcing frame shall be installed approximately 18 inches above the pole base plate to maintain the structural integrity of the pole. An electrical grounding lug shall be provided with each pole shaft and shall be located within the pole shaft adjacent to the hand hole

3. Pole Base Flange – The pole base shall be of cast aluminum alloy 356 per ASTM B26 or B108 and be of one-piece construction. The base/shaft connection shall have a tight tolerance fit before welding. The shaft shall be joined to the base with two circumferential welds at the top and bottom of the base. The assembly shall be head treated after welding to achieve maximum material properties.

4. Anchor Bolts – A set of four (4) ¾ inch diameter by 24 inch long, fully hot dipped galvanized anchor bolts shall be furnished with each lighting pole. The manufacturer shall note the anchor bolts yield strength on the shop drawings and structural calculations.

Foundation
Mast arm foundations shall be a concrete cored foundation as shown on the Standard Drawings for Type II Mast Arms Cored Pier Foundations. The design of the foundations are detailed on the Traffic Signal Plans. Subsurface mast arm borings have been provided for all designed foundations on the plans.

The lower portions of all foundations shall be placed directly against undisturbed earth. No forms or reinforcing for foundations shall be set nor shall concrete be placed until the excavation has been inspected by the Engineer and his approval to proceed has been given.

The top of all foundations in sidewalk areas shall be located flush with finish grade. The top of each mast arm foundation shall not be exposed in the sidewalk.

Experience / Warranties
The pole manufacturer shall have been in the business of manufacturing traffic signal post products for the municipal street lighting market for a minimum of ten (10) years. The manufacturer of the stainless steel pole shaft assembly shall warrant that they will repair and replace product that fails due to corrosion, structural defect or faulty workmanship within 25 years from date of shipment. The manufacturer of the cast ductile iron pole base assembly be free from defects in material and workmanship under normal use and operation for 25 years. The definition of "normal use" includes damage resulting from motor vehicles traveling at posted speed limits colliding with the lamp post base. Paint systems shall be warranted for a period of five years against peeling, cracking or excessive fading.

ITEM 816.01 and **ITEM 816.02** (Continued)

Pedestrian Signal Heads
All pedestrian signal heads shall be mounted so that there is a minimum of 24 inches between any part of the housing or visor and the outer face of the curb. All pedestrian signal heads shall be aluminum, painted black.

Pedestrian signals shall be an approved single section 16-inch Light Emitting Diode (LED) type pedestrian signal head capable of displaying international symbols ("Hand/Person Walking" indications) as per the MUTCD with a countdown display.

Backplates
Backplates shall be aluminum with a 5-inch non-louvered profile width and a 3-inch yellow retroreflective border. Only backplates that are listed in the latest MassDOT "Qualified Traffic Control Equipment List" will be used on this project.

Vehicle Signal Heads
All proposed vehicle signal heads shall be aluminum with a black body and black door. When, in judgment of the Engineer, the visibility of existing or proposed signal faces will be obstructed by trees and other vegetation, the contractor shall clear the obstructions for proper sight distance. Any clearing necessary shall be done within the State, County, or City layout, as directed by the Engineer.

TRAFFIC SIGNAL LED MODULE

LED Vehicle and Pedestrian Signal Modules
All signal and pedestrian displays shall be equipped with LED signal modules. All red, amber, green, and pedestrian signal housings with the exception of optically programmed and fiber optic housings and shall conform to the following where applicable:

- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated July 1, 2007
- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement, Dated June 27, 2005.
- ITE's Pedestrian and Countdown Signal Modules Compliant to PTCSI - Part 2 Light Emitting Diode (LED), Dated, February 2011
- On the MassDOT Traffic Signal Approved Equipment List

For an LED module to installed on this project, the LED module shall have approval from the MassDOT Traffic Control Products Approved Equipment Committee and be included on the Traffic Control Products List prior to the date of this proposal

To prevent the LED module warranty from being voided, the connecting leads on the module shall not be cut. The original LED module leads shall be connected to the signal head terminal block as continuous wire without splices.

ITEM 816.01 and **ITEM 816.02** (Continued)

The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

- A failure due to workmanship or material defects within the first 60 months of field operation.
- A greater than 40 percent light output degradation or a fall below the minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation

Accessible Pedestrian Signals

The pedestrian accessible pushbutton shall provide valuable information and cues via both a vibrating arrow button and audible sounds making the intersection accessible for all pedestrians. Informational messages shall be utilized at all pedestrian pushbutton locations. The messages shall conform to the requirements of Section 4E of the MUTCD.

Pedestrian pushbutton controls shall be raised from or flush with their housings and shall be a minimum of 2 inches in the smallest direction. The force required to activate the controls shall be no greater than 5 pounds.

Pedestrian pushbuttons shall be located as close as practicable to the sidewalk curb ramp serving the controlled crossing and shall permit operation from a clear ground space. Pushbuttons shall be located according to the plans and in conformance with Fig 4E-4 of the 2009 MUTCD, with the arrow pointed parallel to the crosswalk being controlled. If two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian pushbuttons and/or legends on the pedestrian pushbutton signs shall clearly indicate which crosswalk signal is actuated by each pedestrian pushbutton. Typically, pushbuttons shall be separated by a minimum 10 foot distance per MUTCD Fig 4E-4. The 5”x8” standard sign (R10-3f) shall be integral to the pushbutton assembly.

Accessible Pedestrian Signals (APS) will be in accordance with the PROWAG (2011-DRAFT), and MUTCD (2009 - Paragraph 2 of Section 4E.11) to provide both audible AND vibrotactile walk indications.

All sounds shall emanate from the unit via a weather-proof speaker that is protected by a vandal resistant screen. The volume of the sounds shall be 5 dB above ambient background sounds to a maximum of 100 dB. The accessible pedestrian pushbutton shall provide the following operating functions:

- Audible Locator tone, tells the pedestrians that the intersection is equipped with accessible pedestrians pushbutton and where it is.
- Acknowledge tone, tells the pedestrians that they have places the call.
- Informational message, tells the pedestrians about the crossing.
- Walk Cycle message, tells the pedestrians when the Walk Sign is on. Each board has three walk cycle messages; Chirp, Cuckoo, or Custom message.
- Visual: A red LED is lit when the pedestrians has placed a call.
- Tactile: The directional vibro-tactile arrow becomes active with the Walk Sign.

ITEM 816.01 and **ITEM 816.02** (Continued)

The pedestrian push buttons shall provide a pushbutton information message for pushbuttons spaced less than 10' apart per MUTCD Section 4E.11.

The accessible pedestrian pushbutton shall be installed at a maximum of 42 inches above the finished sidewalk elevation, the pushbutton shall be raised from or flush with their housings and shall be a minimum of 2 inches in the smallest direction. The force required to activate the controls shall be no greater than 5 pounds.

Optical Emergency Preemption System

The work consists of furnishing and installing optical traffic signal preemption systems ready for operation, as described herein and shown on the plans. Included in the work is the furnishing and installing of traffic signal preemption unit and related equipment, optical detection equipment and all necessary connections to the traffic signal controller. The emergency preemption system equipment shall be included in the latest version of the MassDOT Qualified Traffic Control Equipment List.

The emergency preemption system shall consist of a data-encoded phase selector to be installed within the existing control cabinet. This unit will serve to validate, identify, classify, and record the signal from the optical detectors located on support structures at the intersection. Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans.

The phase selector shall be a rack-mounted plug-in two channel, dual priority device. Programming the phase selector shall be via a PC-based computer utilizing unit specific software. One copy of software on a disk shall be supplied and licensed to the City as part of this contract. A hard copy of final programming data shall be left in the control cabinet. The Contractor shall supply a complete set of interface cables for phase selector to laptop connection.

Emergency vehicles equipped with optical energy emitters transmit optical energy impulses to optical detectors mounted at the intersection. When optical energy impulses are received at the intersection, control of the signals shall transfer from the local controller to show a selected display shown on the plans to assist the vehicle through the intersection without conflict. After the vehicle has passed through the intersection, control of the signals shall then return to the local controller which shall restore the appropriate timings that were in effect prior to preemption.

1. General Operation and Description of Work

The following description of work specifies the responsibilities involved in the installation of optical preemption equipment.

The Contractor is required to supply material and labor (required or shown) for the complete installation of optical preemption equipment at the specified location in this project. Intersection preemption equipment required includes optical detectors, phase selectors, card rack, preemption indicator lights, cable, interfacing of preemption equipment to the local controller, making electrical connections, and all required incidentals.

ITEM 816.01 and **ITEM 816.02** (Continued)

The following are the operational requirements of the optical preemption system:

- Operating sequence, as specified, shall be initiated when detector receives optical energy of the required repetition rate from an emitter.
- Detector shall transform the optical energy signals into electrical signals and transmit the electrical signal to the phase selector for processing.
- Phase selector shall cause the local controller to show a selected display identical to one of the color interval displays normally available in the controller which will assist the emergency vehicles through the intersection without conflict.
- Phase selector shall allow the controller to release from hold and resume normal operation after optical energy signals are lost provided the desired green display has already been obtained.

Detector cable for optical preemption equipment shall meet specifications of the system manufacturer.

The Contractor shall arrange for a trained representative of the manufacturer of the optical energy preemption equipment to perform the following field supervision and turn-on services:

- The representative shall select the proper quantity and place and method of installing all components on each controller, to comply with the operational requirements shown in the preemption schedule included in these special provisions.
- He shall instruct the Contractor and City of Taunton personnel in the procedures of installation and operations.
- He shall be available to assist, supervise, and check all wiring to insure proper operation.
- He shall perform a final checkout to include initial adjustment of range and timing to acceptable standards within the capabilities of the intersection.
- He shall initiate documentation for as-built drawings.
- He shall demonstrate the system and instruct the drivers of fire fighting vehicles in the operation of the system.
- Any operation problems occurring within the next 30 days shall be corrected by the Field Service representative. This requirement is not intended to modify the Contractor's six-month guarantee obligation, as set further in an earlier portion of these Special Provisions.

ITEM 816.01 and **ITEM 816.02** (Continued)

The cost of these field supervision and turn-on services shall be included in the lump sum prices bid for traffic signal controls and no additional payment shall be made therefore.

2. Installation

The preemption equipment manufacturer shall be responsible for preemption system design and documentation.

Preemption System Design and documentation shall include the following:

- Provide the installing agency with locations for detector installation. Suggested detector locations are shown on the plans and may be changed to improve the operation. Notice shall be given to the Engineer prior to any change.
- Provide the controller manufacturer, Engineer, and owner with electrical diagrams.

The installer shall install the equipment consistent with the preemption equipment manufacturer's recommended installation procedures and electrical diagrams in a neat and workmanlike manner.

The preemption equipment manufacturer shall be responsible for operational checkout of the specified preemption functions prior to final acceptance and approval by MassDOT.

Operating checkout includes the following:

- Verifying that the preemption system is properly installed as per the preemption manufacturer's recommendations and the electrical diagrams as provided by the preemption equipment manufacturer.
- Verifying that the priority system timing and range are properly set. Preemption equipment warranties are put into effect.
- Instructing the vehicle drivers or their representative(s) in the operation of the preemption system.

3. Warranty

All components of the preemption system specified herein shall be warranted by the manufacturer to be free of defects in materials and workmanship for a period of two years from the date of delivery or one year from the date of installation, whichever occurs first.

The Contractor shall repair or replace, free of charge to the City of Taunton or MassDOT, any part that fails in any manner during the warranty period, and six months after final acceptance of the project by the Owner.

ITEM 816.01 and **ITEM 816.02** (Continued)

Preemption Confirmation Strobe
A preemption confirmation strobe shall be provided and mounted as shown on the plans. It shall be located in a position where it may be visible from all preemption approaches to each intersection. The light shall be weather tight and consist of a clear (white) strobe which shall be illuminated whenever the controller is in the emergency preemption phase. A separate cable is required for the indicator light; the spare signal cable shall not be used. The indicator light shall meet ITE, NEMA, IMSA, and MassDOT standards.

Testing of Traffic Signal System
The Contractor shall perform testing of the equipment grounding, terminals & facilities, detectors, preemption, and other systems in the presence of the MassDOT personnel and Engineer in accordance with the Standard Specifications. A ground rod shall be installed in the controller cabinet. The contractor shall perform tests of the system to confirm appropriate operation prior to requesting the presence of the Engineer.

Fine Tuning, Testing and Adjustment Period
After the Contractor has finished installing the controller and all other associated signal equipment to operate as specified in the contract documents, the fine tuning, adjusting and testing period shall begin. During this period, the Contractor, under the direction of the Engineer, will make necessary adjustments and tests to insure safe and efficient operation of the equipment. This completion date has taken this testing period into consideration. No request for final acceptance will be considered until successful completion of the testing period.

Existing Traffic Signal Equipment Removed and Stacked
All existing traffic signal equipment shall be removed and stacked. Equipment to be removed and stacked shall include but not limited to: traffic signal heads, posts, bases, traffic signal controllers, cabinets, any and all hangers or brackets, and any other materials as determined by the City of Taunton.

All Traffic Signal Equipment shall be removed and stacked by the contractor and transported by the Contractor to a location designated by the City of Taunton.

Guarantee After Final Acceptance
The Contractor shall diagnose (trouble-shoot) the system and, at his own expenses replace any part of the traffic signal control equipment found to be defective in workmanship, material or manner of functioning within six months from date of final acceptance of all the installations under this Contract. This requirement does not affect the one-year warranty period on equipment specified in Subsection 815.20 of the Standard Specifications.

Upon the date of acceptance of the project by MassDOT, the Contractor shall turn over all guarantees and warranties to MassDOT, where applicable.

ITEM 816.01 and **ITEM 816.02** (Continued)

Record Traffic Signal Layout Plans
It is the responsibility of the Contractor to provide electronic Record traffic signal layout plans indicating all changes made during construction. The plans shall indicate the location of traffic signal equipment retained, removed and reset, and installed, including detectors, signal posts, mast arms and/or strain poles, pedestrian and vehicular signal heads, controller cabinets, conduit, pull boxes and service connections. The plans shall also indicate the final field timing and sequence, major items list, power-pole number, and meter number. Electronic Record plans shall be provided in accordance with MassDOT signal inventory standards, including electronic picture files, one for each approach to the signal. The Contractor shall negotiate a fee with the Designer for the preparation and submission of Record plans of the traffic signal layout to the City prior to the final acceptance of the project.

Miscellaneous Requirements
The actuated controller shall have capability to preempt to a preselected phase by external command. Because this is often overlooked, the Contractor's attention is drawn to the requirements of Section 813.60C, Splicing, relative to four optional methods of splicing in signal bases, Section 813.40C, Ground Electrodes, relative to Requirement 1 - Connection to a Water Piping System, and Section 813.61, Equipment Grounding.

All anchor bolts and bolts for holding hand hole and access covers shall be greased at the time of installation.

All proposed conduit shall be 3 inch Type NM, plastic conduit unless otherwise specified. 3-inch conduit shall be paid for under Item 804.3 and shall not be included in the lump sum bid price for Item 816.01 or Item 816.02.

The Contractor shall make all necessary arrangements with the electric company for the service connections or for any main power cut off when necessary, and bear all charges incurred thereby.

Basis of Payment
Items 816.01 and 816.02 will be paid for at the respective contract unit price, Lump Sum. This price shall include all labor, materials, excavation and backfill, foundation, adjustment of existing traffic signals during construction, removal and stacking of existing equipment, service connections, and incidental costs required to complete the work.

The 3 inch electrical conduit, Type NM Plastic (UL) will be paid for under Item 804.3.

The 12”x12” pull boxes and 24”x24” handholes will be paid for under Items 811.31 and 811.23, respectively.

ITEM 852.11 TEMPORARY PEDESTRIAN BARRICADE FOOT
ITEM 852.12 TEMPORARY PEDESTRIAN CURB RAMP EACH

Work under these items consist of furnishing, deploying, maintaining in proper operating conditions, and removing temporary pedestrian barricades and temporary pedestrian ramps as part of a Temporary Pedestrian Access Route (TPAR) in order to guide pedestrians around a fully- or partially-closed sidewalk. These devices are intended to prevent pedestrians from entering the work area and to prevent pedestrians from inadvertently entering the vehicle travel lane by providing visual and physical separation between each space.

Materials

The Temporary Pedestrian Barricade shall have a continuous bottom rail or edge no more than two (2) inches above the ground and eight (8) inches in height (minimum) to accommodate cane users, have a smooth and continuous hand railing along the top edge no less than 32 inches above the ground and not obstruct or project into the pedestrian path of travel. Barricade walls shall be nearly vertical and generally within the same plane.

If exposed to traffic, Temporary Pedestrian Barricades shall be crashworthy.

The Temporary Pedestrian Curb Ramp shall provide a 48 inch minimum width, with a firm, stable, and non-slip surface. Protective edging with a two (2) inch minimum height shall be installed when the curb ramp or landing platform has a vertical drop of six (6) inches or greater.

The Temporary Pedestrian Curb Ramp walkway and landing area surface shall be of a solid, continuous, contrasting color abutting up to the existing sidewalk.

If a Temporary Pedestrian Curb Ramp leads to a crosswalk, a detectable warning pad must be used at the base of the ramp; if it leads to a protected path that does not conflict with vehicular traffic then a detectable pad shall not be used.

Construction Methods

The Temporary Pedestrian Barricade shall be placed in an area that will provide pedestrians with a TPAR on a smooth, continuous hard surface for its entirety. The geometry and alignment of the facility shall meet the applicable requirements of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities" and the Massachusetts Architectural Access Board.

The recommended width of the TPAR is 60 inches, but if constraints exist a minimum clear width of 48 inches shall be provided along its entirety. If a 60 inch width cannot be accommodated in full, a 60 inch by 60 inch passing space shall be provided every 200 feet or less along the TPAR.

ITEM 852.11 and **ITEM 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 Barricades will be made at the contract price per foot installed in place, including all incidental items. This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition.

Payment for Temporary Pedestrian Curb Ramps will be made at the contract price per each unit installed in place, including all incidental items. This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition.

ITEM 874.45 MISCELLANEOUS SIGNS REMOVED AND RESET EACH

The work under this item shall conform to the relevant provision of Section 800 of the Standard Specifications and the following:

The work shall include removing and resetting existing informational, guide, and directional sign panels on ground-mounted supports at the current or new locations as indicated on the plans. The work will also include the restoration to original condition, of any natural features disturbed in any way or manner by the operation.

Materials for signs removed and reset shall be the existing signs and supports. If in the opinion of the Engineer, the existing sign panel or sign support is unsuitable for reuse, a new sign panel or sign support of a size and composition equal to the existing sign panel shall be furnished, as directed by the Engineer.

The hardware used to attach the sign panel to the new or existing sign support shall be the existing bolts, brackets or clamps, or new and equal quality equipment furnished by the Contractor, as directed by the Engineer.

ITEM 874.45 (Continued)

Construction Methods
Sign panels to be removed and reset shall be cleaned before being remounted on new or existing sign supports.

The Contractor shall replace all sign panels or sign supports that are damaged or lost as a result of the Contractor's operations. The cost of replacing the damaged signs and supports shall be paid by the Contractor.

Work shall also include the excavation (including Class "B" Rock) of any existing foundations, to be removed, to a depth of at least 6 inches below grade and the supplying and placing of compacted gravel.

Method of Measurement
Item 874.45 will be measured for payment by the Each sign removed and reset.

Basis of Payment
Item 874.45 will be paid for at the Contract unit price per Each. This price shall include all labor, materials, equipment dismantling, excavating and removing, loading, transporting, resetting the signs and their supports; gravel backfill; concrete foundations where required, and incidental costs required to complete the work.

Replacement of sign panels that have been determined to be unsuitable for reuse shall be paid for under the appropriate contract bid items.

Any sign panels that have been damaged by the Contractor's operation will be paid for at the Contractor's expense.

Replacement of sign panels that have been determined to be unsuitable for reuse will be paid for under Item 832.

Breakaway Sign post assembly with foundation will be paid for under Item 847.1.

ITEM 874.51 MISCELLANEOUS SIGNS REMOVED AND DISCARDED EACH

The work under this item shall conform to the relevant provision of Section 800 of the Standard Specifications and the following:

The work shall include removing and properly disposing the existing sign panels as shown on the plans, sign supports, foundations, and restoration to original condition, of any natural features disturbed in any way or manner by the operation.

The existing foundations shall be excavated (including Class "B" Rock) to a depth of at least six inches below grade and the resulting hole shall be filled with compacted gravel. The existing signs shall not be removed until the new signs and structures replacing them are ready for traffic or until the Engineer shall permit.

The existing sign panels, hardware, and supports that are removed shall become the property of the Contractor and shall be properly disposed of off the project site.

Method of Measurement
Item 874.51 will be measured for payment by the Each sign removed and properly disposed of off-site.

Basis of Payment
Item 874.51 will be paid for at the contract unit price per Each. This price shall include all labor, materials, equipment, excavation, Class "B" Rock Excavation, gravel backfill, compaction, and restoration of any natural features and incidental costs required to complete the work.

DOCUMENT A00802

DETAIL SHEETS

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CITY/TOWN Taunton
STATIONING: 51+10 to 96+00
DATE AUGUST 2024

YEAR 2024
ROAD: BROADWAY (PHASE 2)
TYPE OF PROJECT: Transportation Improvement

Unclassified Excavation: 15,400 CY
Track Excavation: 870 FT
Class B Trench Excavation: 40 CY
Class B Rock Excavation: 10 CY

Gravel Borrow: 7,900 CY
Crushed Stone: 50 TON
Crushed Stone for Subbase: 2,600 TON
Reinforced Concrete Excavation: 1,900 CY

PROPOSED FULL DEPTH PAVEMENT **AREA = 22,772 SY**

Surface Course: 1 3/4" SUPERPAVE SURFACE COURSE 12.5 POLTYMER (SSC-12.5-P) OVER

Intermediate Course: 2 1/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER

Base Course: 4 1/2" SUPERPAVE BASE COURSE 37.5 (SBC-37.5), PLTACED IN ONE LTAYER OVER

Sub-base: 4" DENSE GRADED CRUSHED STONE FOR SUBBASE OVER 8" GRAVELT BORROW (TYPE B) OR EXISTING GRAVELT MEETING SPECIFICATION TO REMAIN

PROPOSED PAVEMENT MILTLTING AND OVERLAY **AREA = 1,919 SY**

Pavement Milling: 1 3/4" TO 3" PAVEMENT FINE MILTLTING (VARIABLTE), MILTLTING SHALTLT ESTABLTISH 2% CROSS SLTOPE

Surface Course: 1 3/4" SUPERPAVE SURFACE COURSE 12.5 POLTYMER (SSC-12.5-P) OVER

Intermediate Course: 2 1/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

NOTE: TRANSITION AS REQUIRED FOR RESURFACING OVERLTAY WITH SURFACE COURSE AND INTERMEDIATE COURSE

PROPOSED CEMENT CONCRETE SIDEWALTKS, ISLANDS, AND PEDESTRIAN CURB RAMPS **AREA = 4,287 SY**

Surface Course: 4" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, ¾", 610)

Base Course: 8" GRAVELT BORROW, TYPE B

PROPOSED CEMENT CONCRETE DRIVEWAYS AND SIDEWALK AT DRIVEWAYS **AREA = 1,921 SY**

Surface Course: 6" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, ¾", 610)

Base Course: 8" GRAVELT BORROW TYPE B

PROPOSED HOT MIX ASPHALT DRIVEWAYS AND PARKING AREAS **AREA = 1,672 SY**

Surface Course: 1 1/2" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER

Intermediate Course: 2 1/2" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER

Base Course: 8" GRAVELT BORROW TYPE B

PROPOSED HOT MIX ASPHALT SIDEWALKS **AREA = 28 SY**

Surface Course: 1 1/4" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER

Intermediate Course: 1 3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER

Base Course: 8" GRAVELT BORROW

NOTES:

1. ITEM 452. ASPHALT EMULTSION FOR TACK COAT (RS-1H) SHALTLT BE PLTACED AT A RATE OF:
   0.08 GALTLTONS PER SQUARE YARD OVER MILTLTED SURFACES
   0.07 GALTLTONS PER SQUARE YARD OVER CEMENT CONCRETE BASE COURSE
   0.07 GALTLTONS PER SQUARE YARD OVER SMOOTH TIGHT PAVEMENTS PRIOR TO PAVING AN OVERLTAY

2. ITEM 453. HMA JOINT ADHESIVE SHALTLT BE APPLTIED AT ALTLT LTONGITUDINALT JOINTS, TRANSVERSE JOINTS AND SAWCUTS PER SUPPLTEMENTALT SPECIFICATIONS

3. ALTLT PERMANENT PAVEMENT MARKINGS SHALTLT BE THERMOPLTASTIC, SEE SIGN AND PAVEMENT MARKING PLTANS FOR ADDITIONALT DETAILTS.

ITEM 103. TREE REMOVED - DIAMETER UNDER 24 INCHES

LTocation	Station	LT/RT
Broadway	64+60	RT
	67+05	RT

And as required by the Engineer

ITEM 104. TREE REMOVED - DIAMETER 24 INCHES AND OVER

LTocation	Station	LT/RT	Diameter
Broadway	56+09	RT	30"
	64+77	RT	30"

And as required by the Engineer

ITEM 141.1 TEST PIT FOR EXPLORATION

For locations where utility obstructions prevent installation of a catch basin or where the proposed drainage structure type is located in close proximity to existing utilities and needs to be confirmed as required by the Engineer and in any other location as required by the Engineer.

ITEM 146. DRAINAGE STRUCTURE REMOVED

LTocation	Station	LT/RT
Broadway	52+69	RT
	52+74	LT
	55+55	RT
	59+99	LT
	60+21	RT
	60+28	LT
	60+66	RT
	60+83	RT
	62+58	LT
	63+07	RT
	63+13	LT
	63+57	RT
	64+85	LT
	67+83	LT
	68+28	LT
	68+30	LT
	68+33	RT
	73+46	LT
	76+40	LT
	78+16	LT
	78+22	RT
	78+38	RT

ITEM 146. DRAINAGE STRUCTURE REMOVED (Continued)

LTocation	Station	LT/RT
Broadway	79+09	LT
	87+31	LT
	88+59	LT
	91+16	LT
	91+65	RT
	93+70	RT
	93+92	RT

ITEM 184.1 DISPOSAL OF TREATED WOOD PRODUCTS
For removal of existing railway ties.

LTocation	Station	LT/RT	to	Station	LT/RT
Broadway	83+41	RT		87+73	RT

ITEM 220.7 SANITARY STRUCTURE ADJUSTED
As required to adjust line or grade of existing sanitary structures by 6 inches or less.

ITEM 221. FRAME AND COVER
Required at all proposed Manholes, Bradley Heads and Drainage Structure Change in Types.

As required to replace existing broken Frame and Covers.

ITEM 222.1 FRAME AND GRATE – MASSDOT CASCADE TYPE
Required at all proposed Catch Basins, Double Grate Catch Basins, Gutter Inlets.

As required to replace existing broken Frame and Grates.

ITEM 223.2 FRAME AND GRATE(OR COVER) REMOVED AND DISCARDED
Required at locations where the condition of the existing Frame or Grate is not suitable for reuse, as required by Engineer.

ITEM 357.06 6 INCH GATE BOX
To replace existing broken 6 Inch Gate boxes and as required by the Engineer.

ITEM 357.08 8 INCH GATE BOX
To replace existing broken 8 Inch Gate boxes and as required by the Engineer.

ITEM 357.12 12 INCH GATE BOX

To replace existing broken 12 Inch Gate boxes and as required by the Engineer.

ITEM 358. GATE BOX ADJUSTED

As required to adjust line or grade of existing gate boxes.

ITEM 376.1 HYDRANT – EXCLUDING COST OF HYDRANT

Location	Station	LT/RT
Broadway	56+32	RT
	59+85	RT
	70+60	LT
	82+68	LT
	87+66	LT
	90+90	LT
	94+76	LT
Jefferson	10+32	RT
Paull	10+64	LT
Madison	10+49	LT

ITEM 381.3 SERVICE BOX ADJUSTED

Location	Station	LT/RT
Broadway	52+55	RT
	53+61	RT
	54+07	RT
	54+55	RT
	55+11	RT
	55+89	RT
	56+53	RT
	57+85	RT
	58+95	LT
	60+47	LT
	62+06	RT
	63+24	RT
	65+06	LT
	65+49	RT
	66+41	RT
	66+44	RT

ITEM 381.3 SERVICE BOX ADJUSTED (Continued)

Location	Station	LT/RT
Broadway	66+61	LT
	66+84	RT
	67+93	RT
	68+77	RT
	68+96	LT
	69+47	RT
	69+69	LT
	69+70	RT
	69+86	LT
	70+01	RT
	71+06	RT
	71+50	RT
	72+19	RT
	74+37	LT
	79+10	RT
	79+39	LT
	79+93	LT
	82+32	RT
	82+40	RT
	82+43	RT
	83+22	LT
	83+86	RT
	84+97	RT
	85+59	RT
	86+02	LT
	87+42	RT
	87+55	LT
	88+53	RT
	88+96	LT
	89+76	RT
	90+53	RT
	94+24	RT
	95+77	RT

ITEM 472. TEMPORARY ASPHALT PATCHING

For test pit for exploration summarized under Item 141.1, drainage pipes within proposed pavement micromilling and overlay, temporary pavement wedges at driveways, temporary pavement wedges at PCRs, temporary pavement wedges at Project Limits, temporary pothole patching, temporary pavement patching in areas where conduit, drainage and water line work will take place prior to full depth roadway construction, and as required by the Engineer.

ITEM 506. GRANITE CURB TYPE VB - STRAIGHT

Location	Station	LT/RT	to	Station	LT/RT
Broadway	51+55	LT		52+13	LT
	51+55	RT		51+65	RT
	51+93	RT		52+21	RT
	52+39	LT		52+66	RT
	52+47	RT		53+26	RT
	52+95	LT		53+21	LT
	53+44	RT		53+82	RT
	53+47	LT		55+20	LT
	53+52	RT		53+74	RT
	53+91	RT		54+25	RT
	54+00	RT		54+21	RT
	54+45	RT		54+78	RT
	55+02	RT		55+28	RT
	55+53	RT		56+10	RT
	55+55	LT		56+57	LT
	56+36	RT		56+82	RT
	56+96	LT		57+50	LT
	57+06	RT		57+46	RT
	57+14	RT		57+36	RT
	57+82	RT		58+17	RT
	57+84	RT		58+02	RT
	57+93	LT		58+00	LT
	58+20	RT		58+23	RT
	58+40	LT		58+54	LT
	58+48	RT		58+48	RT
	58+49	RT		59+43	RT
	58+59	RT		59+32	RT
	59+05	LT		58+88	LT
	59+73	RT		59+73	RT
	59+87	RT		60+33	RT
	60+26	LT		60+45	LT
	60+92	RT		61+09	RT
	60+91	LT		62+27	RT
	61+66	RT		61+67	RT

ITEM 506. GRANITE CURB TYPE VB – STRAIGHT (Continued)

Location	Station	LT/RT	to	Station	LT/RT
Broadway	61+68	RT		61+72	RT
	61+72	RT		61+75	RT
	61+97	RT		62+27	RT
	62+49	LT		62+53	LT
	62+49	RT		62+93	RT
	63+48	LT		63+66	LT
	63+51	RT		65+10	RT
	63+54	RT		65+17	RT
	63+59	LT		64+74	LT
	63+83	LT		63+92	LT
	63+92	LT		63+92	LT
	63+97	LT		63+97	LT
	63+99	LT		63+99	LT
	63+99	LT		64+81	LT
	65+19	RT		65+19	RT
	65+30	RT		65+30	RT
	65+32	RT		65+69	RT
	65+35	LT		66+01	LT
	65+42	RT		65+78	LT
	66+22	RT		66+52	RT
	66+32	LT		66+71	LT
	66+81	RT		68+02	RT
	67+06	RT		67+52	RT
	67+09	LT		67+74	LT
	67+54	RT		67+54	RT
	67+58	RT		67+58	RT
	67+60	RT		67+84	RT
	67+86	RT		67+86	RT
	67+91	RT		67+91	RT
	67+93	RT		68+06	RT
	68+08	RT		68+08	RT
	68+22	RT		68+22	RT
	68+27	RT		68+34	RT
	68+28	LT		69+13	LT
	68+55	RT		69+16	RT
	69+42	LT		69+46	LT
	69+43	RT		69+84	RT
	69+72	LT		70+08	LT
	70+19	RT		70+43	RT
	70+38	LT		70+63	LT
	70+63	RT		70+68	RT

ITEM 506. GRANITE CURB TYPE VB – STRAIGHT (Continued)

Location	Station	LT/RT	to	Station	LT/RT
Broadway	70+91	RT		71+02	RT
	71+03	LT		71+06	LT
	71+33	RT		71+57	RT
	71+34	LT		71+53	LT
	71+94	LT		72+15	LT
	72+51	LT		73+04	LT
	72+60	RT		73+55	RT
	73+61	LT		73+76	LT
	74+20	LT		74+50	LT
	74+36	RT		74+75	RT
	74+45	LT		74+45	LT
	74+45	LT		74+63	LT
	75+03	LT		75+05	LT
	75+35	LT		75+45	LT
	75+94	RT		76+17	RT
	76+36	RT		76+44	RT
	76+52	LT		77+22	LT
	77+18	RT		77+18	RT
	77+37	LT		77+39	LT
	77+24	RT		78+55	RT
	77+50	LT		77+69	LT
	77+50	LT		77+69	LT
	77+53	LT		77+57	LT
	77+54	LT		77+65	LT
	77+61	LT		77+65	LT
	77+81	LT		77+82	LT
	77+96	LT		78+53	LT
	79+35	LT		79+61	LT
	79+47	RT		80+02	RT
	79+99	LT		80+12	LT
	80+40	RT		80+54	RT
	80+65	LT		81+02	LT
	80+91	RT		81+91	RT
	80+91	RT		82+76	RT
	81+00	RT		82+68	RT
	81+78	LT		82+30	LT
	82+61	LT		82+69	LT
	82+76	RT		82+76	RT
	82+89	LT		83+31	LT
	82+99	LT		84+18	LT
	83+12	LT		84+03	LT
	84+50	RT		84+54	RT
	84+88	RT		85+32	RT

ITEM 506. GRANITE CURB TYPE VB – STRAIGHT (Continued)

Location	Station	LT/RT	to	Station	LT/RT
Broadway	84+97	LT		85+81	LT
	85+60	RT		83+38	RT
	86+13	LT		86+18	LT
	86+46	LT		86+69	LT
	86+62	RT		86+67	RT
	86+88	RT		86+90	RT
	87+15	LT		87+75	LT
	87+30	RT		87+41	RT
	88+35	RT		88+44	RT
	88+54	LT		88+89	LT
	88+83	RT		88+87	RT
	89+14	RT		89+46	RT
	89+45	LT		89+52	LT
	89+72	RT		89+99	RT
	90+29	RT		91+32	RT
	90+55	LT		91+20	LT
	90+79	LT		91+07	LT
	91+65	RT		92+20	RT
	91+65	LT		92+70	LT
	92+62	RT		92+71	RT
	93+05	RT		93+69	RT
	93+17	LT		93+40	LT
	93+84	LT		94+14	LT
	93+92	RT		93+96	RT
	94+29	RT		95+24	RT
	94+58	LT		94+71	LT
	95+39	RT		95+43	RT
	95+61	LT		96+00	LT
Location	**Station**	**LT/RT**	**to**	**Station**	**LT/RT**
Fern St	10+37	RT		10+43	RT
	10+35	LT		10+44	LT
Jefferson St (West)					
	10+63	LT		10+71	LT
	10+41	RT		10+70	RT
Jefferson St (East)					
	10+28	RT		10+36	RT
	10+66	RT		10+70	RT
	10+49	LT		10+66	LT
	10+54	LT		10+66	LT
Paull St	10+32	RT		10+65	RT
	10+44	LT		10+65	LT
	10+54	LT		10+65	LT

ITEM 506. GRANITE CURB TYPE VB – STRAIGHT (Continued)

Location	Station	LT/RT	to	Station	LT/RT
Madison St	10+33	RT		10+43	RT
	10+46	LT		10+50	LT
Broadway Ave	10+41	LT		10+45	LT
	10+27	RT		10+45	LT
Monroe St	10+47	LT		10+51	LT
	10+37	RT		10+50	RT
Washington St (West)					
	10+32	LT		11+44	LT
	10+93	RT		11+42	RT
Washington St (East)					
	10+34	LT		10+72	LT
	10+97	RT		11+16	RT
E. Britania St (West)					
	10+50	RT		10+90	RT
	10+59	LT		10+90	LT
E. Britania St (East)					
	10+49	RT		11+00	RT
	10+60	LT		11+00	LT
Oxford St	10+39	RT		10+50	RT
	10+57	LT		10+60	LT
Avon St	10+42	RT		10+52	RT
	10+57	LT		10+61	LT
James St	10+42	RT		10+51	RT
	10+58	LT		10+61	LT
Whittenton St	10+38	RT		10+48	RT
	10+57	LT		10+58	LT
Jackson St	10+38	RT		10+42	RT
	10+67	LT		10+71	LT

ITEM 506.1 GRANITE CURB TYPE VB – CURVED

Location	Station	LT/RT	to	Station	LT/RT
Broadway	57+40	RT		57+46	RT
	57+78	RT		57+82	RT
	58+02	RT		58+04	RT
	58+17	RT		58+20	RT
	58+48	RT		58+49	RT
	59+43	RT		59+46	RT
	59+73	RT		59+74	RT
	61+67	RT		61+72	RT
	63+04	LT		63+14	LT
	63+50	RT		63+54	RT
	64+81	LT		64+83	LT
	65+17	RT		65+19	RT

ITEM 506.1 GRANITE CURB TYPE VB – CURVED(Continued)

Location	Station	LT/RT	to	Station	LT/RT
Broadway	65+30	RT		65+32	RT
	67+52	RT		67+54	RT
	67+58	RT		67+60	RT
	67+84	RT		67+86	RT
	67+91	RT		67+93	RT
	68+06	RT		68+08	RT
	68+22	RT		68+26	RT
	71+01	LT		71+03	LT
	71+95	RT		71+96	RT
	72+42	RT		72+42	RT
	73+55	RT		73+62	RT
	73+72	RT		73+73	RT
	74+11	RT		74+16	RT
	74+31	RT		74+36	RT
	74+49	LT		74+53	LT
	74+63	LT		74+68	LT
	75+05	LT		75+08	LT
	75+16	LT		75+20	LT
	75+45	LT		75+51	LT
	75+79	RT		75+94	RT
	76+47	LT		75+52	LT
	77+35	RT		77+38	RT
	77+36	LT		77+37	LT
	77+39	LT		77+41	LT
	77+50	LT		77+50	LT
	77+54	LT		77+55	LT
	77+57	LT		77+61	LT
	77+64	LT		77+65	LT
	77+69	LT		77+69	LT
	77+82	LT		77+85	LT
	78+70	LT		78+73	LT
	78+73	RT		78+77	RT
	79+12	LT		79+16	LT
	79+24	RT		79+28	RT
	81+04	LT		81+16	LT
	81+74	LT		81+78	LT
	84+18	LT		84+23	LT
	84+87	LT		84+97	LT
	87+75	LT		87+79	LT
	88+45	LT		88+54	LT
	91+20	LT		91+23	LT
	94+71	LT		94+82	LT
	95+24	RT		95+27	RT
	95+39	RT		95+39	RT
	95+52	LT		95+61	LT

ITEM 506.1 GRANITE CURB TYPE VB – CURVED(Continued)

Location	Station	LT/RT	to	Station	LT/RT
Braodway Ave					
	10+26	RT		10+27	RT
	10+30	LT		10+41	LT
Washington St (East)					
	10+81	RT		10+93	RT
Washington St (East)					
	10+72	LT		11+47	LT
	10+88	RT		10+97	RT
E. Britania St (East)					
	10+48	LT		10+59	LT
E. Britanina St (East)					
	10+58	LT		10+60	LT
Oxford St	10+36	RT		10+39	RT
	10+52	LT		10+57	LT
Avon St	10+39	RT		10+42	RT
	10+51	LT		10+57	LT
James St	10+39	RT		10+42	RT
Whittenton St					
	10+50	LT		10+58	LT
Jackson St	10+62	LT		10+67	LT

ITEM 510. GRANITE EDGING TYPE SA

Location	Station	LT/RT	to	Station	LT/RT
Broadway	74+83	LT		74+84	LT
	74+84	LT		74+88	LT
	74+87	LT		78+89	LT

ITEM 510.1 GRANITE EDGING TYPE SA (RADIUS 10 FEET OR LESS)

Location	Station	LT/RT	to	Station	LT/RT
Broadway	74+83	LT		74+84	LT
	74+84	LT		74+87	LT
	74+88	LT		78+89	LT

ITEM 514. GRANITE CURB INLET - STRAIGHT

Location	Station	LT/RT
Broadway	52+63	LT
	55+57	LT
	59+59	LT
	59+85	LT
	64+83	LT
	65+34	LT
	65+55	RT
	67+70	LT
	68+31	LT
	75+40	LT
	80+00	RT
	78+31	LT
	78+31	RT
	79+03	LT
	79+18	RT
	79+51	RT
	84+92	RT
	87+30	LT
	88+39	RT
	88+59	LT
	91+16	LT
	93+65	RT

ITEM 515. GRANITE CURTB INLTET – CURVED

Location	Station	LT/RT
Broadway	63+08	LT

ITEM 516. GRANITE CURB CORNER TYPE A

Location	Station	LT/RT
Broadway	70+62	RT
	70+70	RT
	86+87	RT
	86+92	RT

ITEM 570.2 HOT MIX ASPHALT CURB TYPE 2

Location	Station	LT/RT	to	Station	LT/RT
Broadway	63+06	LT		63+17	LT

ITEM 580. CURB REMOVED AND RESET

Location	Station	LT/RT	to	Station	LT/RT
Broadway	55+12	RT		55+25	RT
	55+13	LT		55+26	LT
	55+49	LT		55+55	LT
	58+60	RT		59+33	RT
	59+82	RT		60+19	RT
	60+23	RT		60+45	RT
	71+28	RT		71+62	RT
	73+64	RT		74+07	RT
	74+48	RT		74+85	RT
	75+94	RT		76+32	RT
	76+56	LT		77+21	LT
	77+38	RT		78+55	RT
	77+92	LT		78+60	LT
	79+35	LT		79+65	LT
	79+40	RT		80+01	RT
	79+99	LT		80+18	LT
	80+65	LT		81+03	LT
	80+94	RT		82+64	RT
	81+83	LT		82+34	LT
	82+63	LT		82+73	LT
	83+02	LT		84+18	LT
	83+07	RT		84+07	RT
	84+46	RT		84+54	RT
	84+97	LT		85+84	LT
	84+82	RT		85+30	RT
	85+55	RT		86+35	RT
	86+48	LT		86+74	LT
	87+15	LT		87+74	LT
	87+24	RT		87+37	RT
	88+29	RT		88+40	RT
	88+53	LT		88+96	LT
	89+07	RT		89+39	RT
	89+67	RT		89+83	RT
	89+86	LT		90+20	LT
	90+27	RT		91+29	RT
	90+59	LT		91+21	LT
	91+62	RT		92+19	RT
	91+95	LT		92+73	LT
	92+61	RT		92+72	RT
	93+01	RT		93+73	RT
	93+13	LT		93+45	LT
	93+89	RT		93+97	RT

ITEM 580. CURB REMOVED AND RESET (Continued)

Location	Station	LT/RT	to	Station	LT/RT
Broadway	93+93	LT		94+01	LT
	94+25	RT		95+26	RT
	94+47	LT		94+80	LT
	95+61	LT		96+00	LT
Fern St	10+27	RT		10+43	RT
	10+27	LT		10+43	LT
Paull St	10+18	RT		10+36	RT
	10+39	RT		10+65	RT
	10+49	LT		10+56	LT
	10+60	LT		10+65	LT
Washington St (West)					
	10+18	LT		11+44	LT
	10+91	RT		11+42	RT
Washington St (East)					
	10+94	RT		11+16	RT
E. Britania St (West)					
	10+44	RT		10+90	RT
	10+46	LT		10+90	LT
E. Britanina St (East)					
	10+48	RT		11+00	RT
	10+51	LT		10+75	LT
Oxford St	10+44	LT		10+60	LT
	10+44	RT		10+50	RT
Avon St	10+43	RT		10+52	RT
James St	10+41	RT		10+51	RT
Whittenton St	10+40	RT		10+48	RT
Jackson St	10+32	RT		10+51	RT
	10+65	LT		10+71	LT

ITEM 594. CURB RTEMOVED AND STACKED

Station	LT/RT	to	Station	LT/RT
76+46	RT		76+52	RT
77+18	RT		77+24	RT

ITEM 594. CURB REMOVED AND DISCARDED

For existing curb from Item 580. that is unsuitable for reuse.

For curved granite curb and granite curb transitions that is unsuitable for reuse and as required by the Engineer.

ITEM 595. – CURB REMOVED AND DISCARDED

Location	Station	LT/RT
Broadway	55+57	LT
	65+34	LT
	75+93	LT
	81+22	LT

ITEM 596. CURB CORNER REMOVED AND DISCARDED

For all existing curb corners at driveways within the project limits.

Location	Station	LT/RT
Broadway	53+80	RT
	53+94	RT
	54+25	RT
	54+36	RT
	54+84	RT
	54+95	RT
	55+47	RT
	56+14	RT
	63+20	LT
	71+63	RT
	71+78	RT
	71+98	RT
	72+11	RT

ITEM 597. – EDGING REMOVED AND DISCARDED

Location	Station	LT/RT	to	Station	LT/RT
Broadway	56+37	RT		56+88	RT
	57+07	RT		57+44	RT
	61+87	RT		63+03	RT
	62+78	LT		63+01	LT
	63+03	LT		63+11	LT
	63+10	RT		63+14	LT
	63+16	LT		63+19	LT
	63+42	RT		63+55	RT
	63+60	RT		65+14	RT
	65+25	LT		65+32	LT
	65+32	RT		65+84	RT
	65+48	LT		66+07	LT
	66+13	RT		66+58	RT
	66+33	LT		66+77	LT
	66+71	RT		68+04	RT

ITEM 597. – EDGING REMOVED AND DISCARDED

Location	Station	LT/RT	to	Station	LT/RT
Broadway	67+01	LT		67+75	LT
	68+22	RT		68+35	RT
	68+33	LT		69+13	LT
	68+53	RT		69+18	RT
	69+33	RT		69+97	RT
	69+35	LT		69+52	LT
	69+64	LT		70+14	LT
	70+16	RT		70+48	RT
	70+31	LT		70+65	LT
	70+63	RT		70+70	RT
	70+84	RT		71+11	RT
	71+30	LT		71+45	LT
	72+15	LT		72+18	LT
	72+45	LT		72+71	LT
	72+92	LT		72+97	LT
	73+62	LT		73+67	LT
	74+46	LT		74+57	LT
	74+84	LT		74+87	LT
	74+79	LT		74+87	LT

ITEM 669.1 FENCE REMOVED AND STACKED

For all fence within the project limits that is impacted by the proposed work, to be stacked on the owner's property.

Location	Station	LT/RT	to	Station	LT/RT
Broadway	51+55	LT		51+83	LT
	51+88	LT		52+03	LT
	53+21	LT		53+71	LT
	53+71	LT		54+29	LT
	61+27	LT		62+56	LT
	62+04	RT		62+08	RT
	68+25	LT		69+11	LT
	74+44	LT		74+49	LT
	80+60	LT		80+72	LT
	83+09	RT		83+38	RT
	83+45	LT		83+53	RT
	86+39	LT		86+50	LT
	90+57	RT		91+39	RT

ITEM 671.1 FENCE GATE AND GATE POSTS RTEMOVED AND STACKED

Location	Station	LT/RT
Broadway	53+33	LT
	54+05	LT
	91+08	RT

ITEM 711.1 PROPERTY BOUND REMOVED AND RESET

For private property bounds impacted by the proposed work.

ITEM 751.1 LOAM FOR LAWNS
ITEM 765. SEEDING

Location	Station	LT/RT	to	Location	Station	LT/RT
Broadway	51+55	LT		Broadway	51+83	LT
Broadway	51+62	RT		Broadway	51+73	RT
Broadway	51+86	RT		Broadway	52+05	RT
Broadway	51+87	LT		Broadway	52+20	LT
Broadway	52+11	RT		Broadway	52+28	RT
Broadway	52+35	LT		Broadway	52+73	LT
Broadway	52+40	RT		Broadway	52+48	RT
Broadway	52+53	RT		Broadway	53+32	RT
Broadway	52+87	LT		Broadway	53+27	LT
Broadway	53+40	LT		Broadway	54+03	LT
Broadway	53+44	RT		Broadway	53+82	RT
Broadway	53+92	RT		Broadway	54+10	RT
Broadway	54+07	LT		Broadway	54+67	LT
Broadway	54+17	RT		Broadway	54+27	RT
Broadway	54+37	RT		Broadway	54+59	RT
Broadway	54+64	RT		Broadway	54+85	RT
Broadway	54+70	LT		Broadway	54+81	LT
Broadway	54+95	RT		Broadway	55+14	RT
Broadway	55+18	RT		Broadway	55+34	RT
Broadway	55+46	RT		Broadway	55+81	RT
Broadway	55+46	LT		Broadway	55+85	LT
Broadway	55+87	RT		Broadway	56+16	RT
Broadway	55+91	LT		Broadway	56+52	LT
Broadway	56+28	RT		Broadway	56+88	RT
Broadway	58+33	LT		Broadway	58+45	LT
Broadway	60+82	RT		Broadway	60+96	RT
Broadway	61+25	LT		Jefferson St (W)	10+71	LT
Broadway	61+66	RT		Broadway	61+75	RT
Broadway	62+08	RT		Broadway	63+02	RT

ITEM 751.1 LOAM FOR LAWNS
ITEM 765. SEEDING
(Continued)

Location	Station	LT/RT	to	Location	Station	LT/RT
Jeffertson St (E)	10+66	LT		Broadway	64+54	RT
Broadway	64+00	LT		Broadway	64+73	LT
Broadway	64+61	RT		Broadway	65+17	RT
Broadway	64+75	LT		Paul St	10+65	LT
Paul St	10+65	RT		Broadway	65+82	LT
Broadway	65+31	RT		Broadway	65+51	RT
Broadway	65+55	RT		Broadway	65+69	RT
Broadway	65+87	LT		Broadway	66+08	LT
Broadway	66+22	LT		Broadway	66+44	LT
Broadway	66+46	RT		Broadway	66+58	RT
Broadway	66+48	LT		Broadway	66+59	LT
Broadway	66+71	RT		Broadway	66+90	RT
Broadway	66+94	RT		Broadway	67+53	RT
Broadway	67+00	LT		Madison St	10+50	LT
Broadway	67+58	RT		Broadway	67+85	RT
Broadway	67+92	RT		Broadway	68+07	RT
Madison St	10+43	RT		Broadway	69+19	LT
Broadway	68+24	RT		Broadway	68+38	RT
Broadway	68+51	RT		Broadway	68+71	RT
Broadway	68+75	RT		Broadway	68+80	RT
Broadway	68+85	RT		Broadway	69+19	RT
Broadway	69+35	RT		Broadway	69+42	RT
Broadway	69+45	RT		Broadway	69+86	RT
Broadway	69+64	LT		Broadway	69+96	LT
Broadway	69+88	RT		Broadway	69+90	RT
Broadway	70+00	LT		Broadway	70+15	LT
Broadway	70+11	RT		Broadway	70+49	RT
Broadway	70+31	LT		Broadway	70+75	LT
Broadway	70+61	RT		Broadway	70+70	RT
Broadway	70+84	RT		Broadway	71+09	RT
Broadway	71+25	RT		Broadway	71+64	RT
Broadway	71+75	RT		Broadway	71+95	RT
Broadway	72+39	RT		Broadway	73+73	RT
Monroe St	10+44	RT		Broadway	73+67	LT
Broadway	74+11	RT		Washington St (E)	11+48	RT
Broadway	74+57	LT		Broadway	74+67	LT
Broadway	75+08	LT		Washington St (W)	11+44	LT
Washington St (E)	11+47	LT		Broadway	74+46	RT
Washington St (W)	11+42	RT		Broadway	77+36	LT
Broadway	77+18	RT		E Britannia St (E)	11+13	RT
Broadway	77+84	LT		E Britannia St (W)	10+90	LT

ITEM 751.1 LOAM FOR LAWNS
ITEM 765. SEEDING
(Continued)

E Britannia St (W)	10+90	RT	E Brtitannia St (W)	10+72	RT
E Brtitannia St (W)	10+68	RT	Broadway	79+48	LT
Broadway	79+55	LT	Broadway	79+68	LT
Oxford St	10+51	RT	Broadway	82+11	LT
Broadway	82+16	LT	Broadway	82+36	LT
Broadway	82+50	LT	Broadway	82+76	LT
Broadway	82+89	LT	Broadway	83+18	LT
Broadway	83+22	LT	Broadway	83+77	LT
Broadway	83+80	LT	Broadway	84+04	LT
Broadway	84+08	LT	Avon St	10+61	LT
Avon St	10+52	RT	Broadway	85+87	LT
Broadway	85+27	RT	Broadway	85+39	RT
Broadway	85+52	RT	Broadway	85+69	RT
Broadway	85+73	RT	Broadway	86+44	RT
Broadway	86+09	LT	Broadway	86+21	LT
Broadway	86+39	LT	Broadway	86+51	LT
Broadway	86+57	RT	Broadway	86+72	RT
Broadway	87+39	LT	James St	10+61	LT
Broadway	87+71	RT	Broadway	87+82	RT
James St	10+51	RT	Broadway	88+70	LT
Broadway	88+76	LT	Broadway	88+95	LT
Broadway	89+63	RT	Broadway	89+95	RT
Broadway	90+23	RT	Broadway	90+43	RT
Broadway	90+47	RT	Broadway	91+08	RT
Broadway	90+70	LT	Broadway	90+79	LT
Broadway	90+82	LT	Broadway	91+03	LT
Broadway	91+07	LT	Broadway	91+34	LT
Broadway	91+12	RT	Broadway	91+43	RT
Broadway	91+74	LT	Broadway	92+48	LT
Broadway	92+98	RT	Broadway	93+06	RT
Broadway	93+09	RT	Broadway	93+76	RT
Broadway	93+87	RT	Broadway	94+01	RT
Broadway	94+23	RT	Broadway	94+40	RT
Broadway	94+43	RT	Broadway	95+38	RT

ITEM 767.121 SEDIMENT CONTROL BARRIER
For use on all proposed Bradley head structures and as required by Engineer.

DOCUMENT A00804

CITY OF TAUNTON
CONSTRUCTION STANDARDS

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Verizon Telecommunications Specifications

1. Manholes

1.1. Applications

All Verizon communication manhole locations.

1.2. Type

Standard two piece 38Y-1 (6'-0" x 12'-0" x 7'-0" inside dimensions) telephone company communications vault with 24-4" termaducts, 26-½" racking inserts, pulling eyes, sumps and bonding connections.

1.3. Installation

Manholes to be installed level and plumb with a 24" cover on a 12" bed of ¾" gravel. Joint to be sealed with a butyl rubber gasket or equivalent. Installation includes 24" masonry chimney capped with Verizon specific frame and cover on a grout seal. Galvanized steel loop to be placed in the chimney near top for ladder hooks. Galvanized racking and ladder may be left in manholes for telephone company to assemble.

1.4. Accessories

1.4.1. Racking

Verizon standard steel cable racking with support arms galvanized hot dipped to ASTM A153 or mechanical to B695-91.

1.4.2. Ladder

Verizon standard 8' hooked steel ladder galvanized hot dipped to ASTM A153 or mechanical to B695-91.

1.4.3. Frame & Cover

Verizon specific frame with 30" logo cover.

1.5. Providers

The following companies are familiar with Verizon requirements but suppliers are not limited to:

Manholes and Racking:

Chase Precast East Brookfield Rd. 70 N. Brookfield, MA 01535 508-967-8312	Rotundo Precast 41 Almeida Ave Rehoboth, MA 02769 508-336-7600	Utility Precast PO Box 157 153 Cranberry Hwy West Wareham, MA 02576 508-291-1314

Frames & Covers:

East Jordan Iron Works P.O. Box 439 East Jordan, MI 49727 800-874-4100	LeBaron Foundry P.O. Box 746 14 East Union St. Brockton, MA 02303 508-586-3130

Verizon Telecommunications Specifications

2. Conduit

2.1. Applications

All Verizon communication conduit.

2.2. Type

Industry standard type "C" 4 inch Heavy Wall PVC to conform to GTS 8342 or AT&T 8546 or PTS-77 or NEMA TC 10 requirements. Minimum wall thickness to be 0.149 inches. Use only preformed bends and couplings. No hot bending allowed.

2.3. Installation

2.3.1. Duct formation, including concrete encasement, to have 24" minimum cover.

2.3.2. Ducts to be placed on spacers to provide 1" separation between conduits and a 2" envelope around duct bank for concrete encasement. Spacers lock vertically and horizontally. Spacers shall not exceed 8 ft. intervals and shall be placed at each coupling. Intermediate spacers to be used as a cap on the top tier of the duct bank to prevent floating during the pour.

2.3.3. Concrete to be minimum 2000 psi. Vibrator to be used during placement to eliminate gaps between ducts.

2.3.4. Pole sweeps and ducts capped in dirt will not have encasement the last 4' to facilitate relocation and/or future extension. Ducts terminating at pole bases and in dirt for future to have 4" universal plugs.

2.3.5. All ducts terminated in vaults or at base of poles to be roped pneumatically or mechanically for identification and continuity verification.

2.3.6. Minimum 4' radius for all sweeps, including pole sweeps.

2.4. Accessories

2.4.1. Pull Rope

Pull rope to be mule tape, 1500 pound test or greater.

2.4.2. Spacers

Standard 4" spacers to provide at least 1" separation between ducts

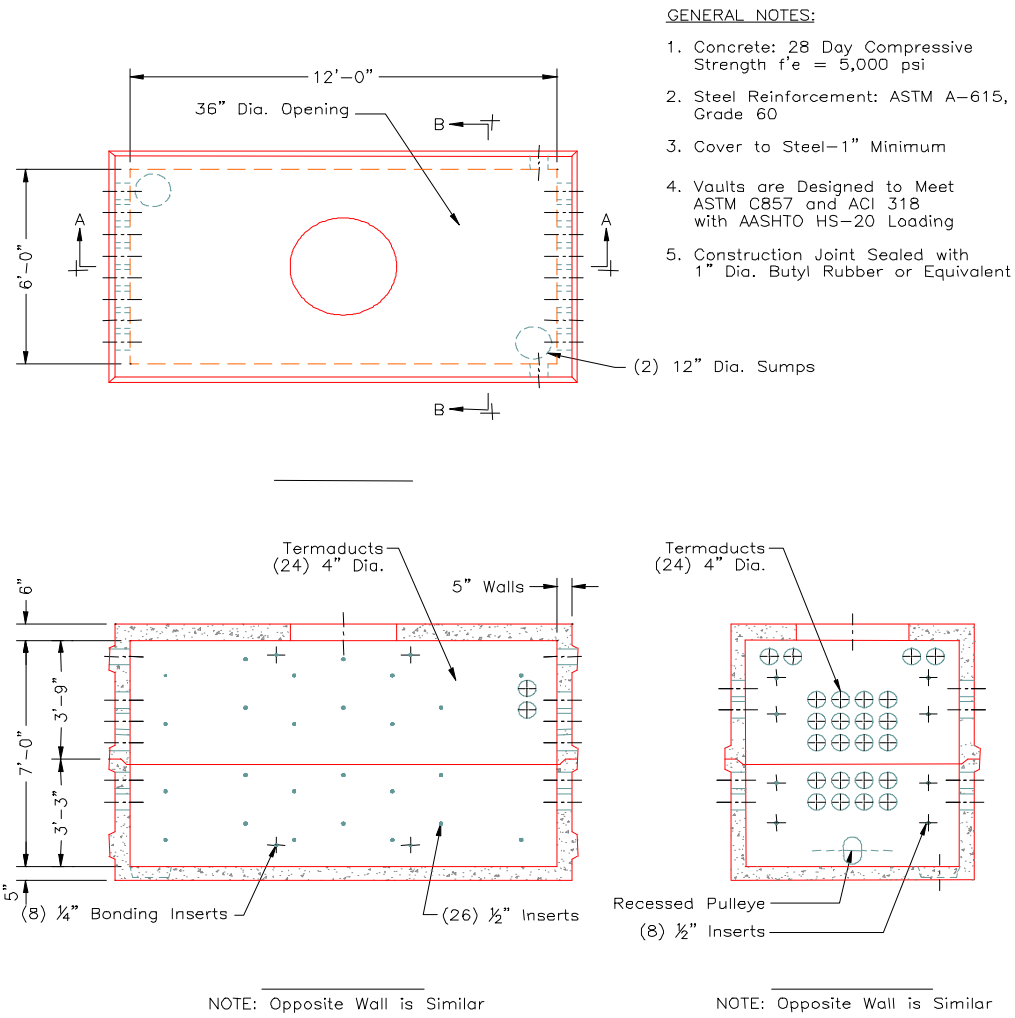
2.4.3. Caps

Standard Universal Plugs with rings to tie pull ropes and provide protection and support to unterminated ducts.

Verizon Telecommunications Specifications

3. Drawings/Attachments

3.1. 38Y-1 Manhole

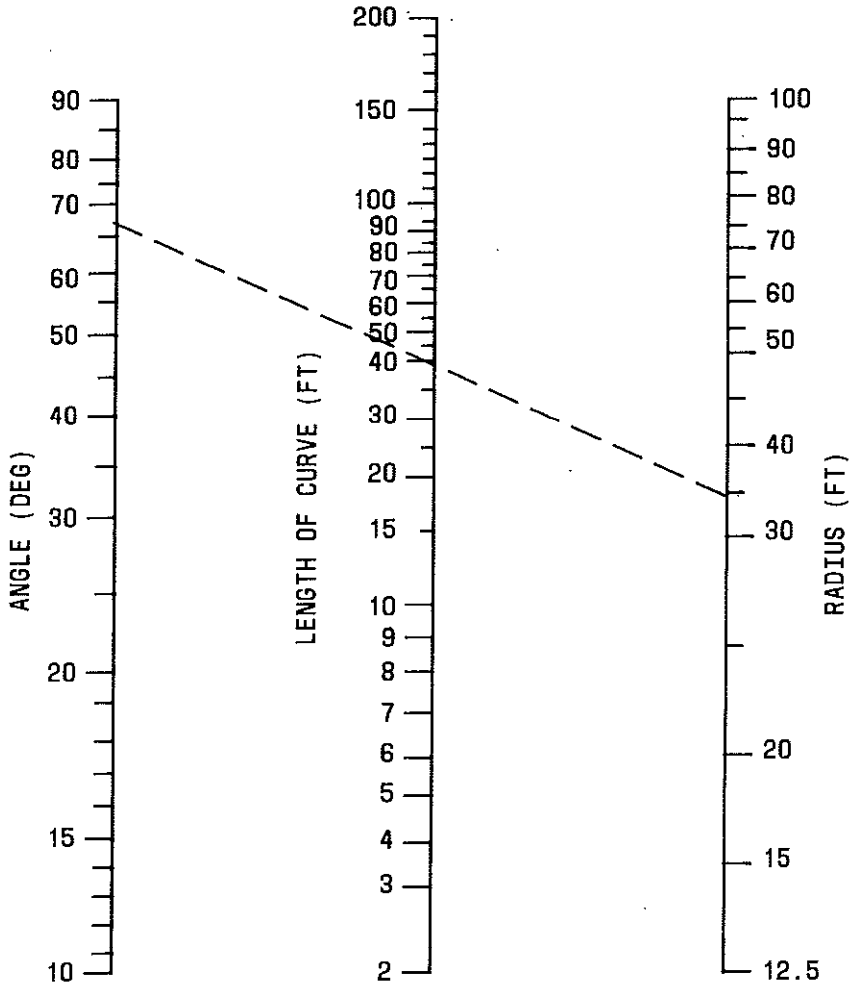


03/04/22

CURVE DESIGN

Practice 919–240–100

The length of a curve can be found using the following nomogram. (Example: The length of a 64–degree, 35–foot radius curve is 40 feet.)



Subsidiary Conduit

Plastic Conduit. Curves are formed using rigid bends (see Pages 8–21).

Steel Pipe. Bends are formed on the job site using a portable pipe bender (see Practice 622–315–200).

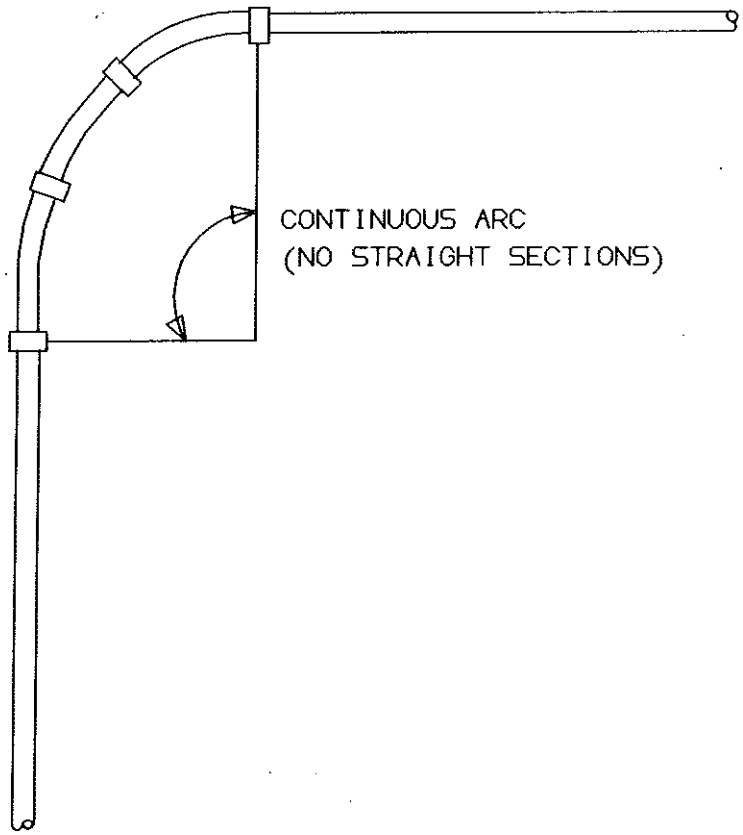
Single–Bore Conduit

Curve Radius 40 Feet or More

Plastic Conduit – Manually bend straight conduit. Conduit must be firmly anchored in trench.

Curve Radius Less Than 40 Feet

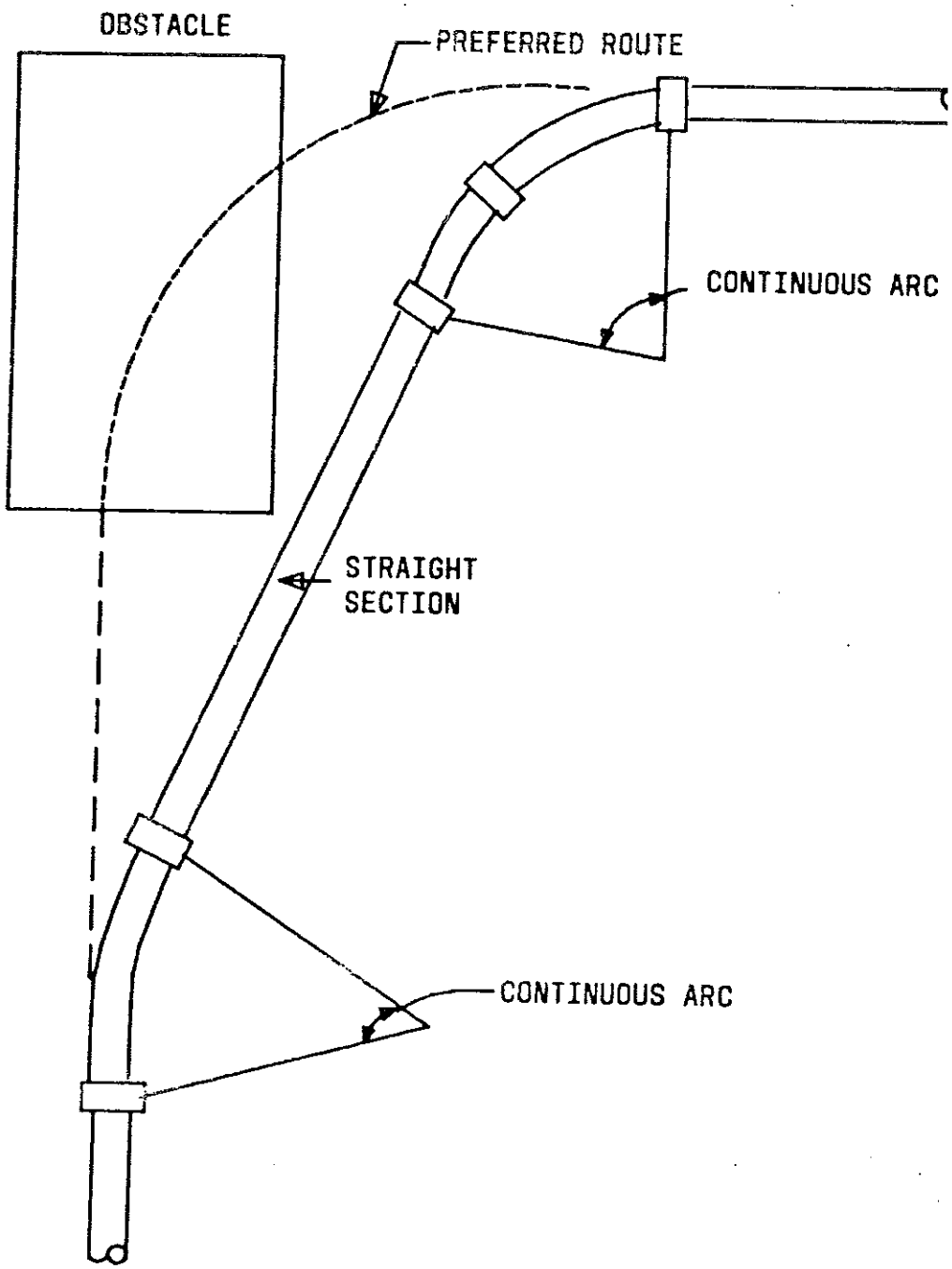
Construct curve in one continuous arc, if possible, using rigid bends without interspersed straight sections, as illustrated below.



For plastic conduit use 15–foot radius bends (7 or 30 degrees, as required. Rigid bends are described on Pages 8–20.

If an obstacle prevents construction of the curve in a single arc, use two arcs connected by a single straight section, as illustrated on Page 8–18.

CONDUIT
Curve Design



CONDUIT AND PIPE

Practice 919–240–400

Factors to Consider in Selecting Type of Conduit

- Material cost and local availability
- Ease of handling
- Ease of joining
- Concrete encasement and backfill requirements
- Soil conditions
- Special conditions (e.g., heat, gas, heavy loads, limited cover).

Advantages of Single–Bore Conduit:

- Lightweight: mechanical handling equipment not required
- Good joint integrity
- Strong, stable structure (if concrete–encased)
- Easily rearranged to avoid obstacles
- Can be pneumatically rodded.

Advantages of Multiple–Bore Conduit

- Long trench openings not required
- Select backfill not required
- Ready–mixed concrete not required.

CONDUIT
Conduit and Pipe

Single–Bore Conduit

Practices 622–020–100, 919–240–400

Straight lengths of single–bore conduit are available as follows:

Material	Length (Ft)	Weight (Lb/Ft		
		Type B	Type C	Type D
Plastic	20*	0.6–1.0	1.0–1.5	1.2–1.7

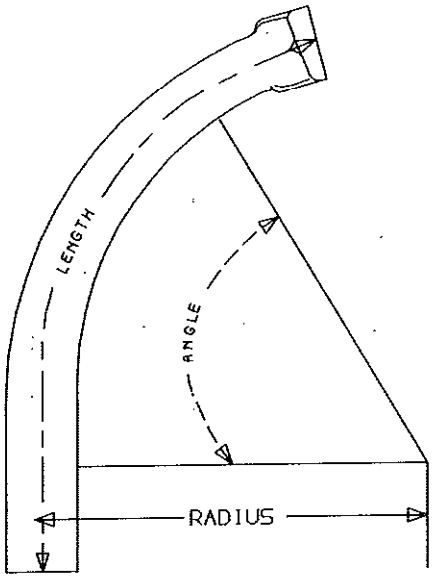
* Longer and shorter lengths available from manufacturer.

Type B (thin wall) requires concrete encasement.

Type C (thick wall) may be buried with selected backfill in straight runs.

Type D is ultraviolet (sunlight) and flame–resistant.

Rigid bends for single-bore conduit are illustrated and listed below.



PLASTIC

RIGID BENDS FOR 4-INCH SINGLE-BORE CONDUIT

Material	Angle (Degrees)	Radius (Feet)	Length (Feet-Inches)
B, C, or D Plastic	7	15	2-4
	30	15	8-4
	30	12	6-9
	45	9	7-7
	45	6	5-3
	45	3	2-10
	90	3	5-3
E Plastic*	90†	3	6-0
	64	3	3-10

* Replaces cast iron for subsidiary conduit.

† Also available in split form for repairs.

For adapters and couplings, see Practices 622-020-100 and 919-240-400.

CONDUIT
Conduit and Pipe

STEEL PIPE

Practice 919–240–400

Steel pipe is used where conduit must be pushed or jacked, where environment is too severe for other conduit, and for submarine crossings. Standard weight pipe is available in the following sizes:

Nominal Size	Plain End		Bell End	
	OD (In.)	ID (In.)	OD (In.)	ID (In.)
1	1.315	1.048	—	—
1-1/2	1.900	1.610	—	—
2	2.375	2.068	—	—
3	3.500	3.068	3.50	3.06
3-1/2	4.000	3.548	4.00	3.54
4	4.500	4.026	4.50	4.02

PLACEMENT

Duct Arrangements

Duct Arrangements are subject to trench width and/or depth constraints imposed by terrain, the presence of other structures, required workman space, etc. The arrangement of ducts in a conduit run should be compatible with the manhole cable racking arrangement. (Refer to "Manholes" later in this section.) Generally, 2–, 3–, or 4–wide arrangements are preferred for single– or double–wall racking. Where a large number of ducts or other circumstances require center racking as well as wall racking, wider duct arrangements may be appropriate.

Separation From Other Structures

Practices 622–100–010, 622–300–205, NESC Rule 320, 919–000–100

The following separations are required for safety of personnel and for protection of telephone equipment:

Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
Railroads (except street railways)	Crossing: 5 feet below top of rail.* Terminating on poles: 12 feet from nearest rail, except 7 feet as sidings
Street railways	3 feet below top of rail.*

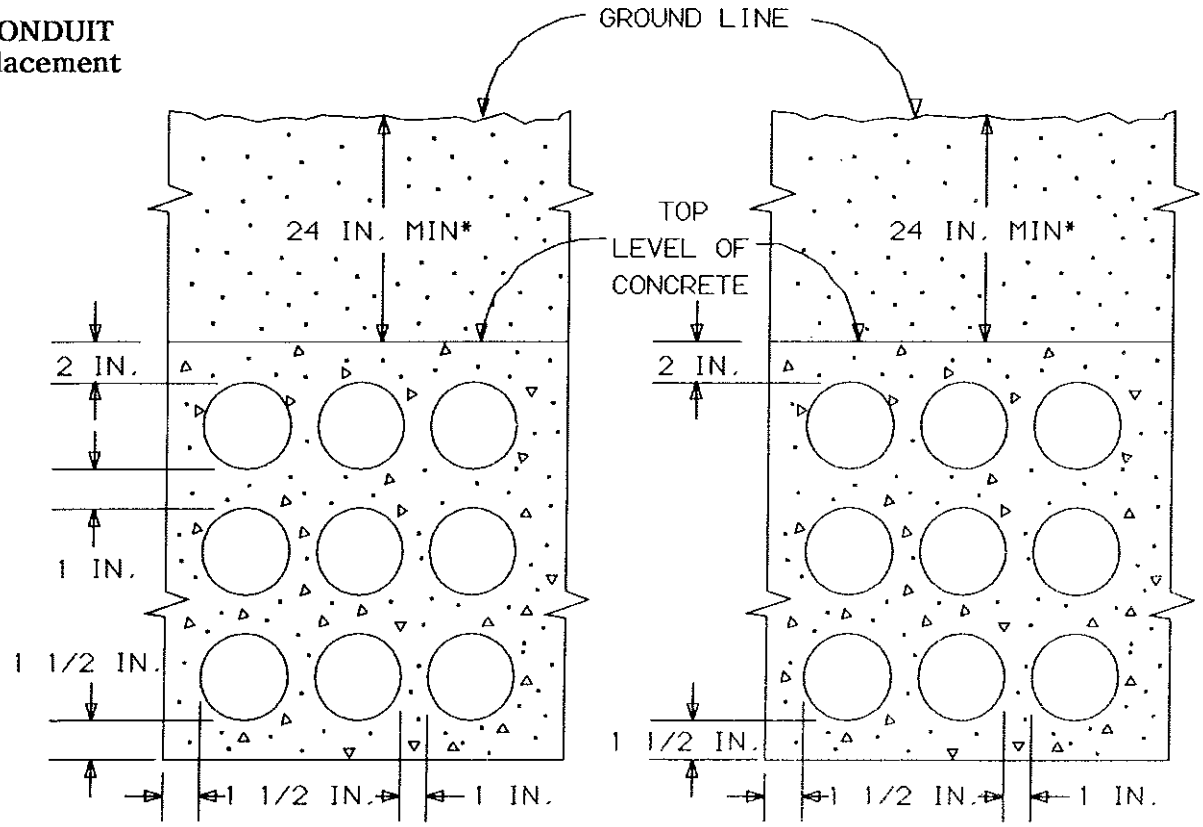
***Exception:** Where impractical, or for other reasons, these clearances may be reduced; however, the top of the conduit or conduit protection shall in no case extend above the bottom of the ballast section which is subject to working or cleaning. Local requirements will prevail.

Spacing and Backfill Requirements

622–020–020
914–240–100
Practice 919–240–400

The next three pages show spacing and backfill requirements for single–bore conduit. The volume of concrete or granular backfill will vary with the trench width and the degree of irregularity of the trench surfaces. Volumes given for each arrangement are for the minimum trench width consistent with the specified clearances. Volumes for sand or granular backfill include an allowance of about 1/12 for compaction.

CONDUIT
Placement



*18 IN. PERMITTED UNDER DRIVEWAYS, SIDEWALKS

CUBIC YARDS OF CONCRETE PER 100 FEET OF TRENCH

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.8	4.9
3-HIGH	5.2	6.6
4-HIGH	6.5	8.3

FOR LARGER FORMATIONS USE:

PLASTIC: .35WH + .35W + .28H

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.4	4.3
3-HIGH	4.2	5.4
4-HIGH	5.1	6.5

FOR LARGER FORMATIONS USE:

PLASTIC: 22WH + .48W + .23H

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

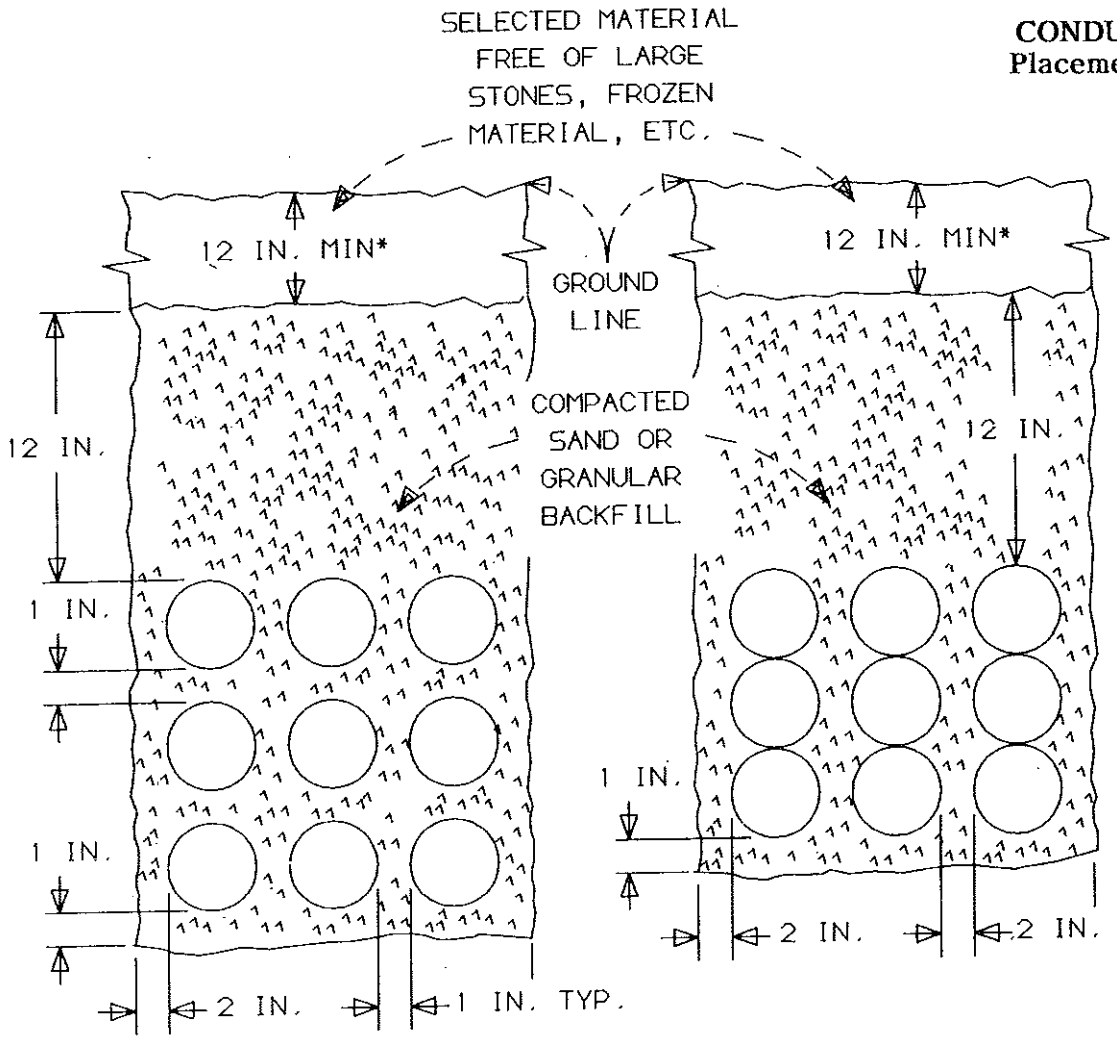
NOTE-OPTIONAL FOR STRAIGHT RUNS OF B PLASTIC.

SINGLE-BORE CONDUIT (ALL TYPES) ON CURVES

NOTE-LIMITED TO 3 TIERS PER POUR. REQUIRES LESS CONCRETE THAN METHOD USING VERT. SEPARATIONS

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

CONDUIT
Placement



CUBIC YARDS OF SAND OR GRANULAR BACKFILL PER 100 FEET OF TRENCH

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	12
3-HIGH	11	14
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .38WH + 1.8W + 4H + 1

C PLASTIC CONDUIT,
STRAIGHT RUNS, ANY
NUMBER OF TIERS

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	13
3-HIGH	12	15
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

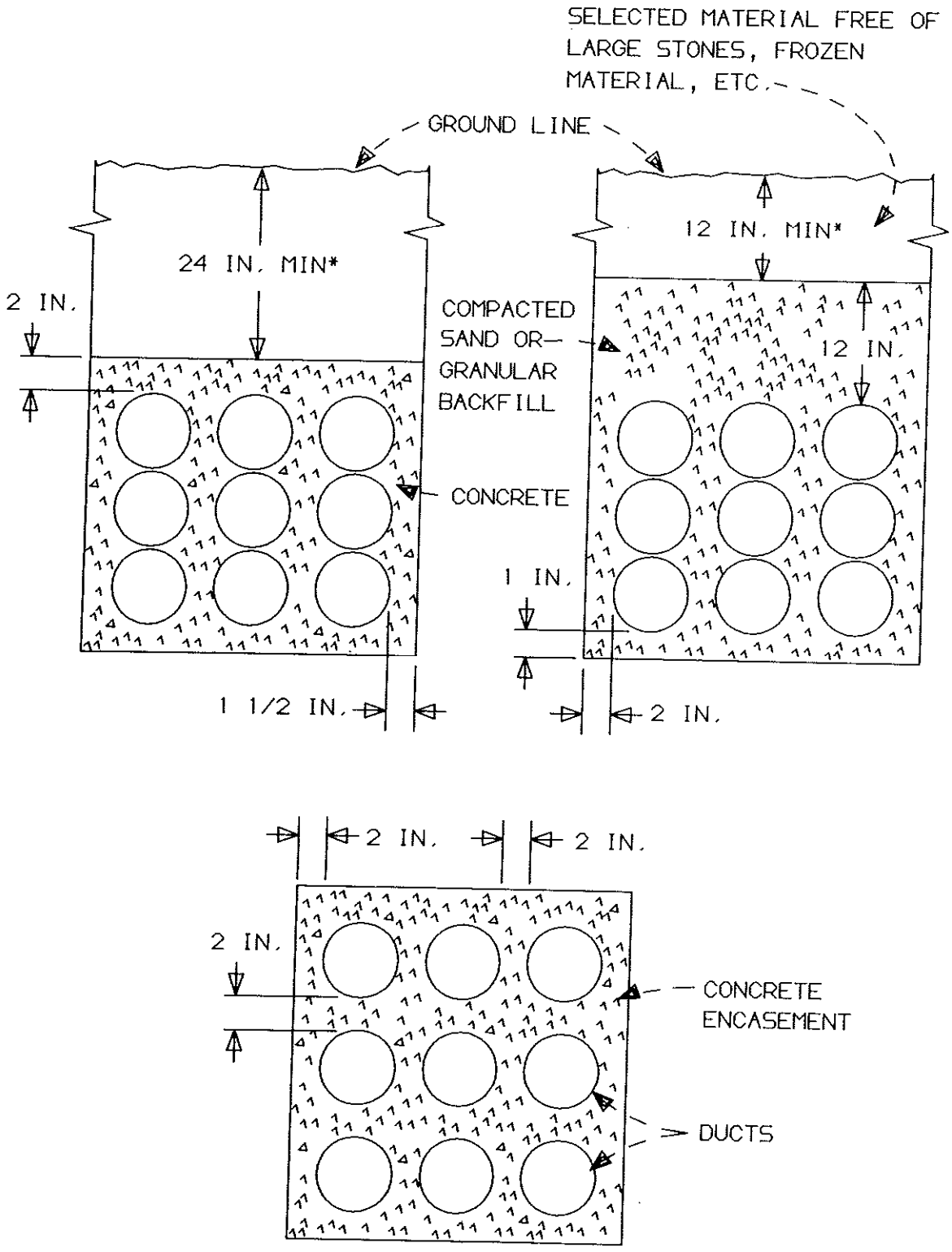
PLASTIC: .36WH + 2.3W + .2H + 7

C PLASTIC CONDUIT,
STRAIGHT RUNS,
UP TO 4 TIERS

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

8-25

CONDUIT
Placement



SINGLE-BORE CONDUIT (ALL TYPES)
AT MANHOLE AND VAULT ENTRANCES

CONDUIT FORMATION

AT&T 622–020–020
914–240–100

CONDUIT FORMATIONS

No. Of DUCTS	Single Bore	Multiple Duct
4	2 Wide x 2 High	One, 4-duct
6	3 Wide x 2 High	One, 6-duct
8	4 Wide x 2 High	Two, 4-duct
9	3 Wide x 3 High	One, 9-duct
10	-	One, 6- duct and One, 4-duct
12	4 Wide x 2 High	Two, 6-duct or One, 12-duct (2)
15	-	One, 9-duct and One, 6-duct
16	4 Wide x 4 High	Four, 4-duct
18	-	Two, 9- duct
20	4 Wide x 5 High	Two, 6-duct and Two, 4-duct
24	4 Wide x 6 High	Four, 6-duct or Two, 12-duct (2)
28	4 Wide x 7 High	-
30	-	Five, 6-duct
32	4 Wide x 8 High	-
36	4 Wide x 9 High	Four, 9-duct (3 wide) and three, 12-duct (2)
40	4 Wide x 10 High	Four, 9-duct (3 wide) and One, 4-duct
Over 40 (1)	-	-

Note 1: Investigate center racking possibilities.
Note 2: 12-duct is available only in F and G concrete conduit.

CONDUIT
Placement

Subsidiary Conduit

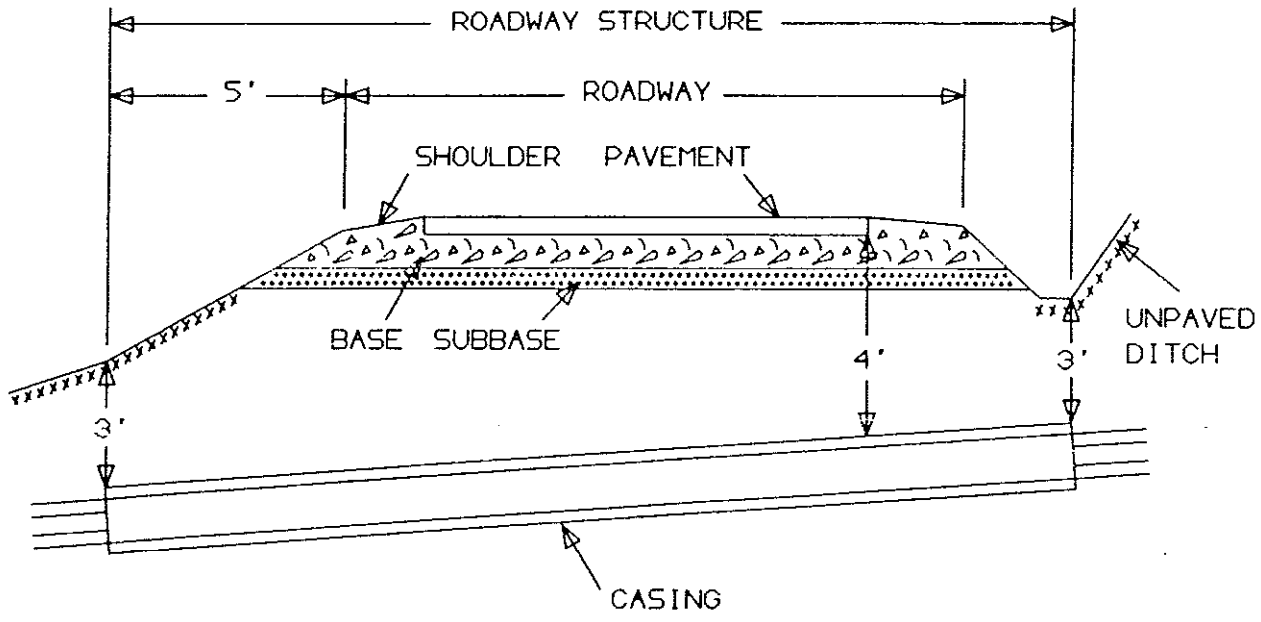
Practice 919–240–400

- Coordinate with builder regarding termination of conduit in a building.
- Use steel pipe or plastic conduit.
- Place in same trench with main conduit, if practicable, and on top of main formation.

Conduit Casings

Practices 919–000–100, 919–240–510

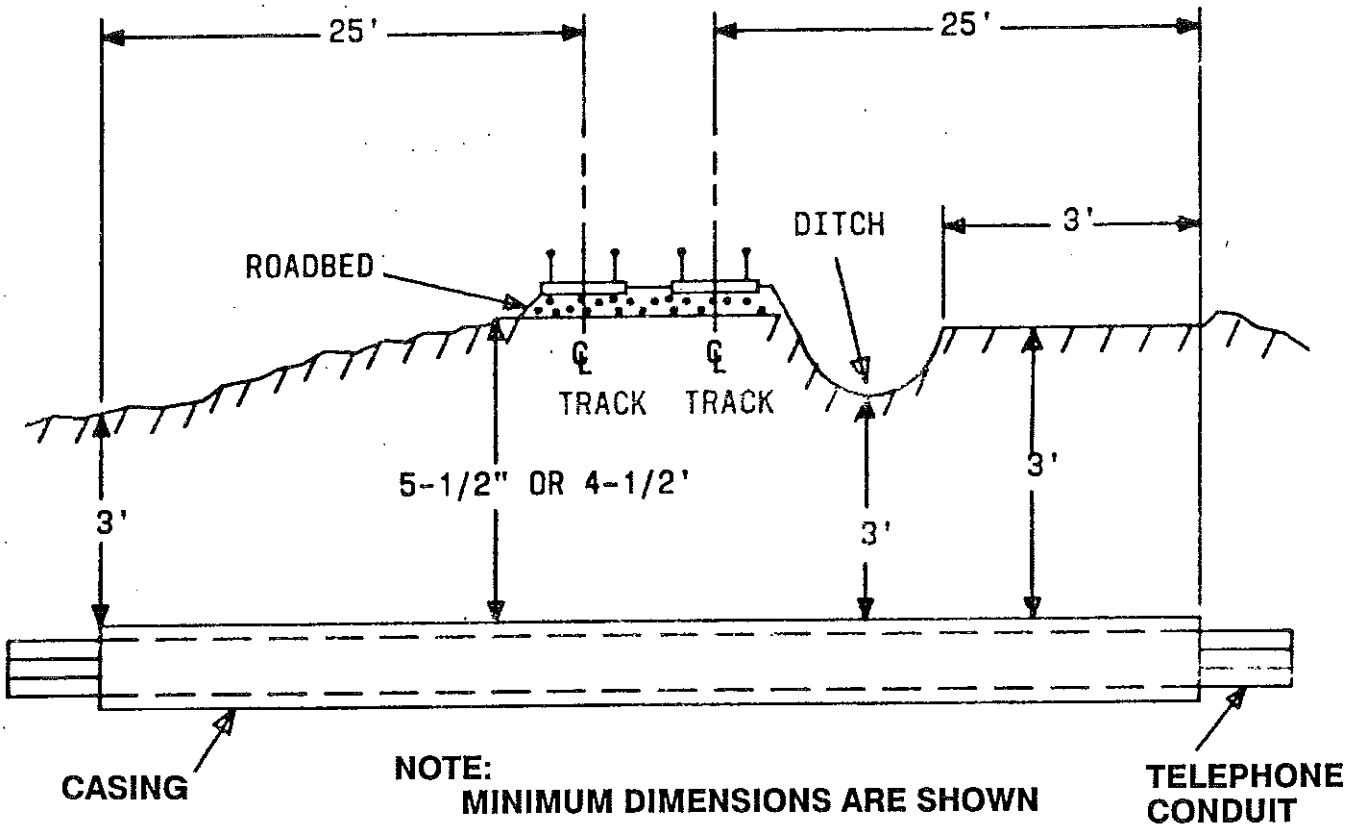
Steel casing pipe is recommended for housing underground conduit under railway and highway crossings. The casings are bored under the crossing to eliminate interference with traffic. Steel casings are also recommended as a supporting structure for conduit placed in unstable soil. Typical installations under a highway and railroad are shown below and on Page 8–29.



NOTE: MINIMUM DIMENSIONS ARE SHOWN

8–28

Conduit Casings Under Highways



Conduit Casings Under Railroads

Note: Design runs to avoid conduit failure due to shearing at junction between casing and regular conduit run, which may result from a difference in settlement rates between casing and regular conduit. Local requirements will prevail.

CONDUIT
Placement
Casings

The table below lists the duct capacity of standard size casings.

STEEL CASING PIPE — DUCT CAPACITY		
Standard Casing OD (Note 1)	Duct Capacity (Max)	
	Bundled Formation (Note 2)	Spaced Formation
12	3	3
16	4	4
18	7	4
20	7	7
24	10	10
30	19	19
36	—	24
42	—	37
48	—	44

Notes:

1. Casings with 22-, 26-, 28-, 34-, and 38-inch diameters are nonstandard sizes and should be avoided.
2. More than 19 ducts in the bundled formation are not recommended and may result in severe deflection of the bottom ducts when top ducts are filled.

The wall thickness of the casing pipe is dependent on several factors such as the live or dynamic load from vehicular traffic, the dead or earth load, and the diameter of the casing used (see table on Page 8–31). The dynamic load is dependent on the type and weight of the vehicle, the type of roadbed, and the depth of the casing. The earth load is dependent on the composition of the soil and the depth of the casing. Dynamic loads decrease and earth loads increase with casing depth.

STEEL CASING WALL THICKNESS	
Nominal Wall Thickness (Inches)	**Nominal Casing Diameter (Inches)**
0.188	under 14
0.219	14 to 16
0.250	18
0.281	20
0.312	22
0.344	24
0.375	26
0.406	28 to 30
0.438	32
0.469	34 to 36
0.500	38 to 48

Bridge Crossings

Practice 919–240–520

The diversity of bridge designs makes it impractical to prescribe a standard method of designing conduit on bridges. However, there are certain fundamentals which must be considered. These are covered in the above practice.

CONDUIT
Trench Work

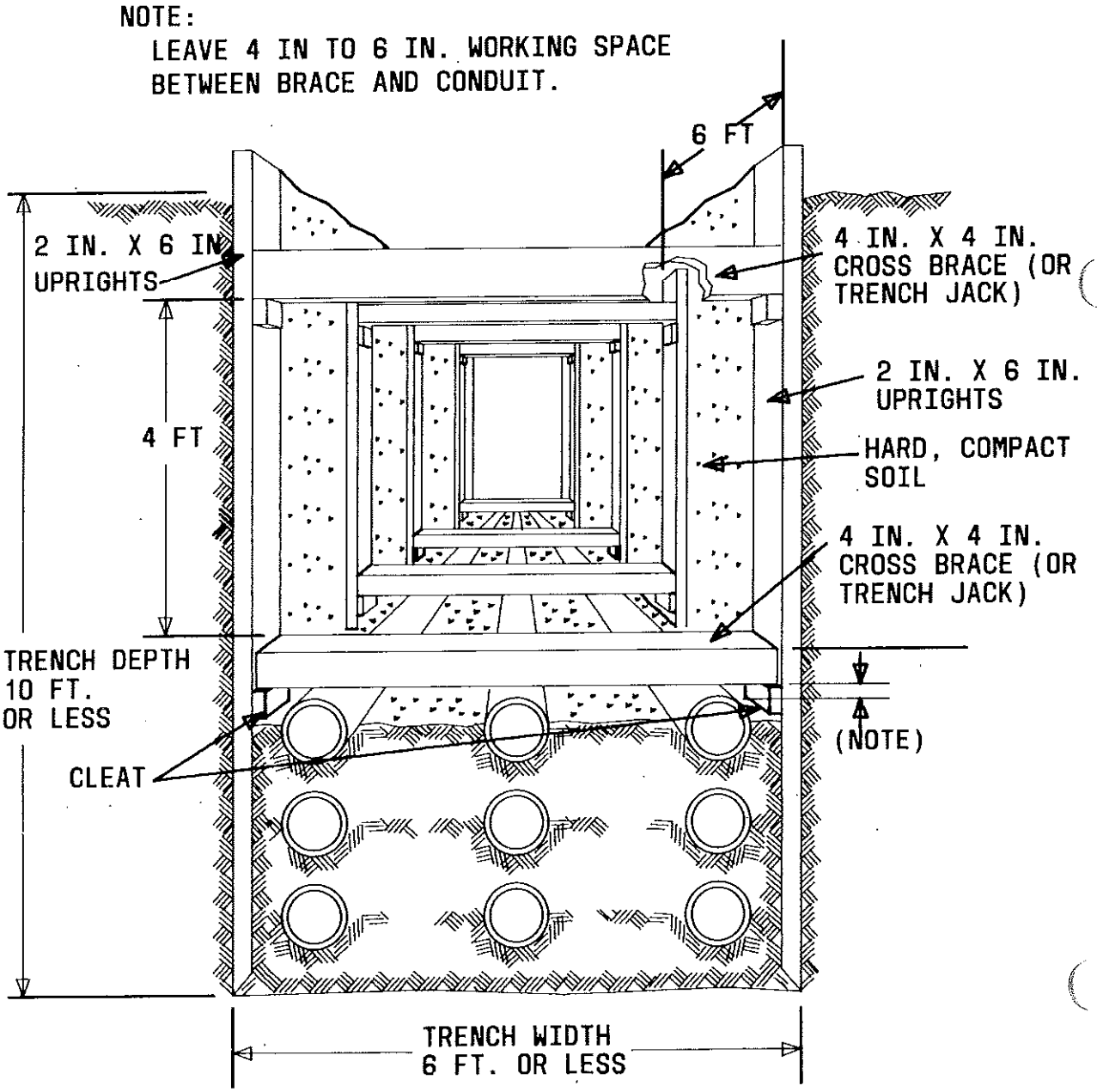
TRENCH WORK

Practice 622–020–020

The Occupational Safety and Health Act (OSHA) requires that all excavations deeper than 5 feet, wherein a craft person is required to enter and work shall have walls shored, sheeted, braced, or otherwise supported unless the excavation is in solid rock, hard shale, hard slag, or where the sidewalls are cut to a slope of 1 foot horizontally for each 2 feet or rise. Typical shoring arrangements are shown as follows.

Trenches less than 5 feet deep should be shored if they constitute a hazardous work location. Someone shall be stationed on the surface to keep the persons in the excavation in sight at all times.

Minimum shoring requirements are shown on the next page.



TRENCH SHORING — MINIMUM REQUIREMENTS
(Wood Member Dimensions in Inches)

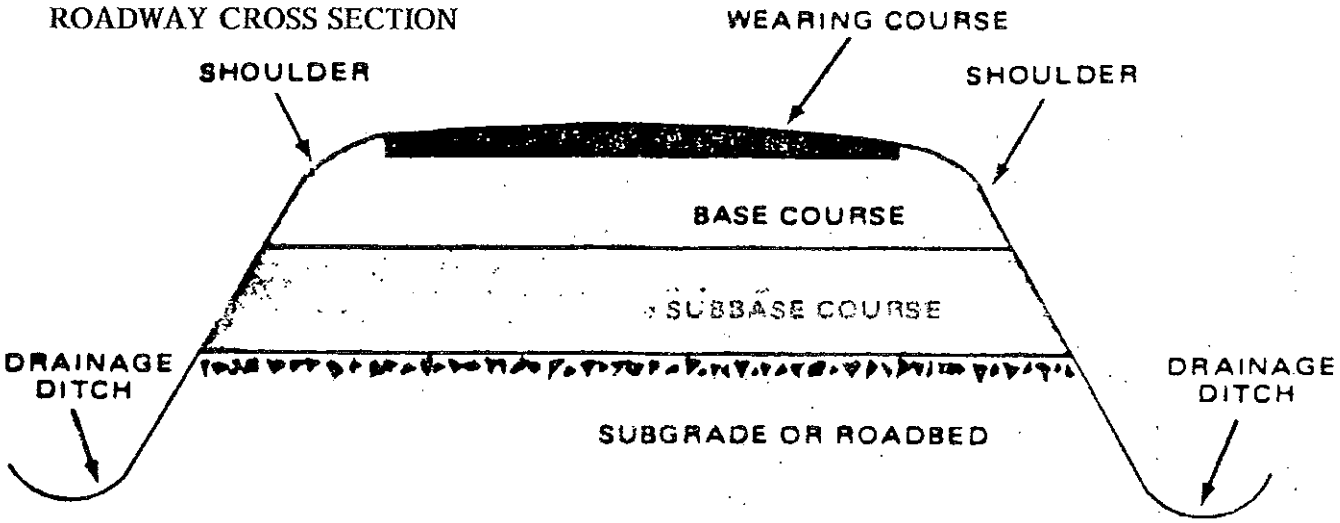
Trench Depth (Ft)	Soil (Note 1)	Uprights		Stringers (Note 2)	Cross Braces for Trench Width up to: (Note 3)			
		Size	Spacing (Ft)		6 Ft	9 Ft	12 Ft	15 Ft
5 to 10	A	3 × 4 or 2 × 6	6	None	4 × 4	4 × 6	6 × 6	6 × 8
	B		3	4 × 6				
	C		Tight	4 × 6	4 × 6	6 × 6	6 × 8	8 × 8
	D		Tight	6 × 8				
10 to 15	A	3 × 4 or 2 × 6 3 × 6	4	4 × 6	4 × 6	6 × 6	6 × 8	8 × 8
	B		2	4 × 6				
	C		Tight	4 × 6	6 × 6	6 × 8	8 × 8	8 × 10
	D		Tight	8 × 10				
15 to 20	All	3 × 6	Tight	4 × 12	6 × 8	8 × 8	8 × 10	10 × 10
>20	All	3 × 6	Tight	6 × 8	8 × 8	8 × 10	10 × 10	10 × 12

Notes:

1. Soil type or condition: A — Hard, compact
   B — Likely to crack
   C — Soft, sandy, or filled
   D — Hydrostatic pressure.
2. Stringer spacing = 4 ft.
3. Cross braces spaced 4 ft vertically, 6 ft horizontally. Trench jacks may be used in lieu of, or in combination with, cross braces.

CONDUIT
Roadway Cross Section

ROADWAY CROSS SECTION



CROSS SECTION OF TYPICAL ROADWAY

NOTE: ROADWAY MAY HAVE ANY COMBINATION OF THE ABOVE COURSES.

Wearing Course

The top layer of material wears off a roadway. It provides a waterproof surface to improve surface drainage and afford protection for the underlying layers against weathering and the abrasive action of traffic. Wearing courses can be classified into two categories:

A. Flexible Type: This type has little "beam" strength. It does not distribute load over the subgrade by its flexural resistance but depends upon the sheer strength of the base and surfacing. Flexible wearing courses may be further classified as follows:

- Intermediate Types: Those in which liquid bituminous materials are used as the binder.
- High Types: Which use asphalt cements and the heaviest grades of tar.

Flexural Type pavement mats are made up of a combination of the following types of coats:

- Prime Coat: A light application of liquid bituminous material used to bind together surface particles and to furnish a bond between the foundation surface and the applied bituminous mat.
- Tack Coat: A light application of liquid bituminous material used as the initial surface treatment to provide a thorough bond between two courses (i.e., the new bituminous mat and concrete pavements, old brick roads, previously treated bituminous surfaces, etc.).

Wearing Course –

- Bituminous Mat: Describes such application or construction which increases the thickness of the wearing course one inch or more.

- Seal Coat: An application of bituminous material followed by a cover of sand or stone chips applied to a new or old pavement which will improve visibility and skid resistance.

B. Rigid Type: This type of pavement includes plain and reinforced Portland cement concrete slabs. With relatively small depths, this type of pavement can transmit wheel loads upon the subgrade by virtue of its flexural strength and load transfer capacity in shear.

Rigid Type pavements are usually made from a cement paste called Portland Cement which combines with water in a chemical reaction called hydration. The resulting paste hardens over a considerable period of time. The adhesive qualities of the past form a strong bond with the aggregate particles to bind them firmly together forming the rock–like structure called concrete. This structure may or may not contain reinforcing such as rebars and/or wire mesh. The hydration of Portland cement can be accelerated (Rapid Curing) by the addition of about 2% calcium chloride by weight of cement. This acceleration is important where concrete is placed in cold weather or where high early strength is required. Agents are also available which will retard the hardening of concrete. This is important in hot weather when the curing is accelerated.

BASE COURSE

The strata of material directly beneath the wearing course. Its purpose is to provide a uniform and non–yielding support for the wearing course and to transfer and distribute traffic wheel loads evenly upon the subgrade. Thickness of this course is generally 5 to 8 inches and is generally made up of the following types of materials: gravel, crushed gravel, crushed rock.

SUB–BASE COURSE

The strata of material found directly beneath the base course and above the subgrade material. Its purpose is to bring the sub–grade material to fairly uniform strength characteristics so that the thickness of the more costly base course can be reduced. It is important that the sub–base have greater stability and bearing power than the sub–grade material that it is to protect.

SUB–GRADE

The bottom layer of material usually composed of existing surface top soil. This course provides for adequate foundation support of the roadway and loads.

CONDUIT
Roadway – Definitions

ROADWAY DEFINITIONS

Gravel

The coarse granular material, larger than sand, resulting from the natural erosion of rock.

Sand

The fine granular material (usually less than ¼" in diameter) resulting from the natural disintegration of rock, or from the crushing of friable sandstone rocks.

Silt

A soft impalpable sediment such as that commonly found in streams or lakes that not only has a fineness of texture but also is weak and unstable as a construction material.

Clay

A material which has a finer particle size than silt and is extremely cohesive and plastic. As indicated above in silts, clay is also weak and unstable as a construction material.

Mixed Soils

A soil composed of two or more of the above 4 classifications.

Washed Aggregate

Natural deposits of sand and gravel usually contain some clay or silt plus injurious amounts of organic coatings on the individual particles which will reduce their usefulness as a construction material. This extraneous material can usually be removed by a process of screening (passing through selves) and washing.

Slump Test

A test designed to measure the consistency of a concrete mix by placing a representative sample into a standardize cone in three equal layers. Each layer is rodded 25 times each. The surface of the top layer is struck off so that the cone is exactly filled. The mold is removed in a vertical direction and the slump (in inches) is measured.

Plant Mix

Asphalt pavement mixed at a mixing plant.

ROADWAY DEFINITIONS – (Cont'd)

Road Mix

Asphalt pavement which can be mixed and placed on the roadway.

Hot Mix, Hot Laid, Cold Mix, Cold Laid

Hot laid mixtures are both mixed and laid hot, whereas the cold laid mixtures may be mixed either hot or cold, but are placed at atmospheric temperatures.

MIX CHARTS

LAY DOWN THICKNESS	MIX NAME	USE	– CONTENTS % – LIQUID ASPHALT	SAND	– INCH STONE – 1/4	3/8	5/8	3/4	FILLER
4"-6"	PLANT MIX	BASE	2.8	5.8	5.8	7.8		77.8	
2"-6"	STABLIZED BASE	BASE	4.5	34.4	8.6	11.4		38.2	2.9
2"-6"	BINDER	INTERMEDIATE COURSE	4.5	34.4	8.6	13.4		38.2	0.9
2"-4"	MABC	TOP	5.2	36.1	8.5	33.2	14.2		2.8
1"-3"	FABC	TOP	5.7	42.4	17.0	32.1			2.8
1"	S.P.	FINE TOP	7.5	65.7	25.0				1.8
1/2"	SHEET	EXTRA FINE TOP	10.0	85.0					5.0
2"	WINTER MIX	TEMP. PVMT.	6.0	42.1	17.0	32.1			2.8

MANHOLES

Practices 622–500–011, 919–240–300

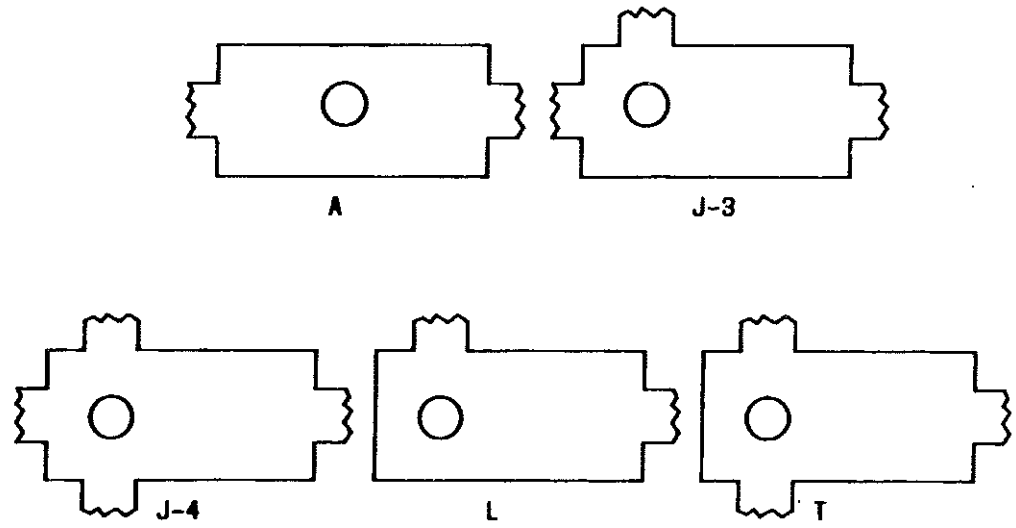
Planning and Design Considerations

- Locate manhole to make optimum use of the connecting conduit structure for cable–placing operations.
- Use precast manholes wherever possible for economy, uniformity, quality control, and quick installation.
- Use cast–in–place construction when: (a) required manhole size exceeds range of precast manholes, (b) obstructions prevent use of precast manholes, (c) manhole is to be rebuilt, or (d) nonstandard designs are required.
- Size manhole for ultimate duct requirements.
- Plug all ducts to minimize entry of water into manholes.

Sizes and Types of Manholes

Basic Manholes

Basic manholes are designated A, J–3, J–4, L, and T, according to the directions in which ducts enter and leave the manhole, as illustrated below.



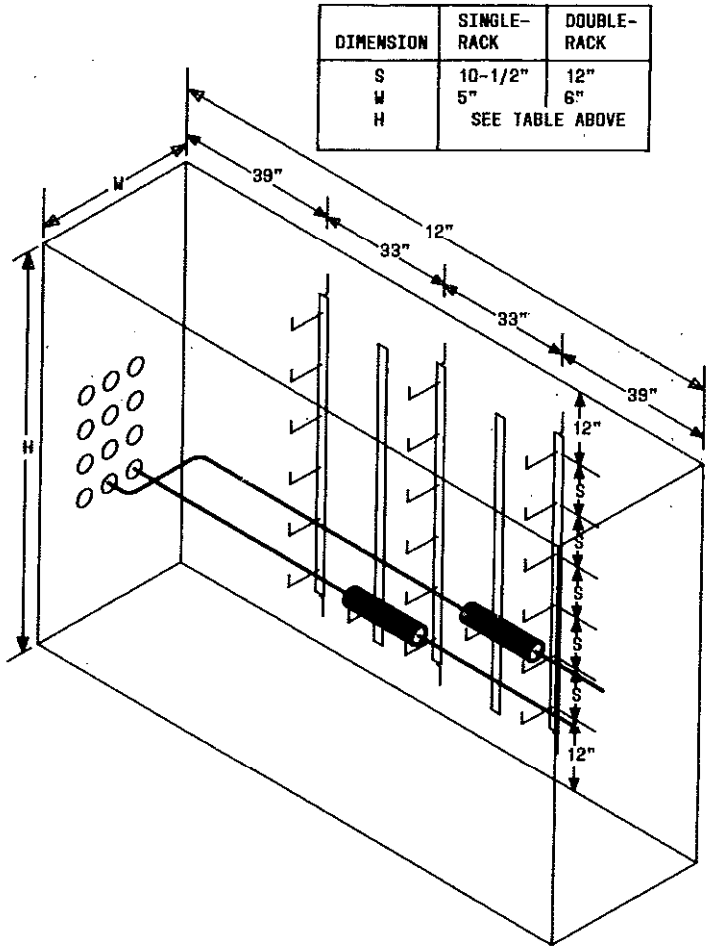
Sizes

Recommended dimensions of basic manholes are shown below. These sizes allow racking space to accommodate one stub for every four main cables. The ultimate number of main cables must be distributed equally among all racking positions.

BASIC MANHOLE INSIDE DIMENSIONS

Type of Racking	Ultimate No. of Main Cables	Width (Ft)	Length (Ft)	Headroom (Ft)
Single	Any	5	12	7 plus one for every two cables in excess of 20
Double	Up to 20	6	12	7
	>20	6	12	7 plus one for every tier of ducts in excess of 20

CONDUIT
Manholes



Center Rack Manholes

When the planned cable capacity calls for a manhole of impractical or uneconomical depth, a wider and shallower cast-in-place manhole may be built and arranged for center racking as well as wall racking. A center rack manhole is essentially a double-width manhole with a center cable racking frame.

For the same depth and type of racking, a center rack manhole is twice as wide as a basic manhole and can accommodate twice as many main cables.

Precast Manhole

Practices 622–506–100, 919–24–300

Precast manholes are available with cast–in single or multiple plastic duct terminators to accept single–bore conduit. Thin concrete knockout sections may also be provided for terminating multiple–bore concrete conduit. The top section contains knockouts for subsidiary or lateral ducts.

Precast manholes for general use are listed below. Manholes for loading and carrier apparatus are listed below and on the next page.

PRECAST GENERAL USE MANHOLES

Basic Manhole Designation	Midsection Designation	Config-uration	Number of Sections	Inside Dimensions (Ft)			Capacity (Number of Main Cables)
				W	L	H	
38Y-4046-1 38Y-4046-3	— —	A J, L, T	2	6	12	7	20
38Y-4046-1 38Y-4046-3	38Y-4049-1 38Y-4049-3	A J, L, T	3*	6	12	10*	28
38Y-4046-1 38Y-4046-3	38Y-4050-1 38Y-4050-3	A J, L, T	3*	6	12	12*	36
38Y-4052	—	A	2	4	8	6	4†

*Including midsection.
†For splicing on light, secondary conduit runs or buried cable runs.

CONDUIT
Manholes

PRECAST CARRIER APPARATUS MANHOLES

Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (Ft) W	L	H	Carrier System	Capacity
38Y-4036-6	—	A	2	6	12	6-1/2	T2	2 dual-cable systems using 52-pair cables, or one dual-cable system using 104-pair cables
38Y-4036-7	—	Single-ended						
38Y-4046-1	—	A	2	6	12	7	T1, T1C	Dual 600-pair cables
38Y-4046-1	38Y-4049-1	A	3*	6	12	10*	T1, T1C	Dual 900-pair cables
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	T1, T1C	Dual 1200-pair cables
38Y-4046-4	—	A	2	6	12	7	T4M	One 22-tube coaxial cable
38Y-4046-4	38Y-4049-4	A	3*	6	12	10*	T4M	Two 22-tube coaxial cables
38Y-4052	—	A	2	4	8	6	T1, T1C	Four 475- or 479-type apparatus cases

*Including midsection.

PRECAST LOADING MANHOLES

Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (Ft) W	L	H	Capacity (Number of Coil Cases) (Note)
38Y-4046-1	–	A	2	6	12	7	4
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	10
38Y-4048	—	A	3	6	15	9	20
38Y-4048	38Y-4051	A	4*	6	15	12*	28

Note: Can vary depending on local practice
*Including midsection.

Seperation from other Structures:

Practice 622–100–100

Minimum reccommended speperation between telephone manholes and outside surfaces of foreign structures are as fellows: Electrical light, power or ther conduits, 3 inches. Pipes such as gas, water, oil mains; 6 inches when crossing and 12 inches when in parrallel.

FRAMES, COVERS, AND COLLARS

Practices 622–520–100, 919–240–300

For frames and covers, the 30-inch size is recommended for all applications and should be specified for use with precast manholes. Although 27-inch frames and covers are available, their use is not generally recommended, particularly where only one manhole opening is provided. It is easier to get into and out of the 30-inch size, especially with a blower or pump hose in the opening, and there is more room for placing apparatus into the manhole. **The 24-inch frame and cover should not be used in new construction.** Available frames and covers are listed below.

MANHOLE FRAMES AND COVERS

Type	Opening Dia. (In.)	Height of Frame (In.)	Remarks
A	27, 30	11	Has inner cover and sealing gasket; recommended for central office, carrier-equipped, loading, and critical junction manholes, or wherever a watertight or secured cover is required
SA	27, 30	5-5/8	Shallow version of A type
G	27, 30	10	Has 4 equally spaced 1-inch diameter holes in the frame flange to permit securing the frame to concrete collars and to 38Y manhole roofs. Used with both the G (nonlocking) and H (locking) covers.
SG	27, 30	5-5/8	Shallow version of G type. Same remarks as G type
R	27, 30	1-1/2	Used where not subject to vehicular traffic
D	30	1-1/2	Modified R with pentagonal head locking bolts
H	30	—	Covers only are equipped with two captive bolts with attached locking plates that engage the rim of either the G or the SG frame.

Caution: **For safety, use only one size frame on manholes with more than one opening.**

CONDUIT
Frames, Covers, and Collars
Duct Assignment and Cable Racking

A manhole collar provides a means for raising the manhole frame and cover to grade. Brick-and-mortar collars and concrete collars may be constructed to any height. Alternatively, the following precast concrete collars can be used, either alone or in combination, to attain the desired height for up to 10 feet of cover.

38Y PRECAST COLLARS		
TYPE	Height (in.)	Use
38Y-4039-1	5-1/2	Not a normal collar, but an apron designed to fit around the manhole cover at grade in unpaved areas to provide a solid, ground level work area.
38Y-4039-3 38Y-4039-9 38Y-4039-15	3 9 15	Used with any of the frames listed on table on page 8-40 except for D and R types. Can also be used under 38Y-4039-15R collar.
38Y-4039-15R	15	Includes a 30-inch R-type frame fabricated into collar. For use with R and D covers.

The above collars can be used with precast or cast-in-place manholes. At least one opening should be provided for manholes up to 12 feet in length, two openings beyond 12 feet in length, and three openings beyond 20 feet in length. The number of manhole openings required is doubled for center racked manholes.

Manhole Extension Rings

Practice 622-520-201

Pavement resurfacing operations sometimes necessitate the raising of manhole covers. This may be conveniently accomplished with manhole extension rings.

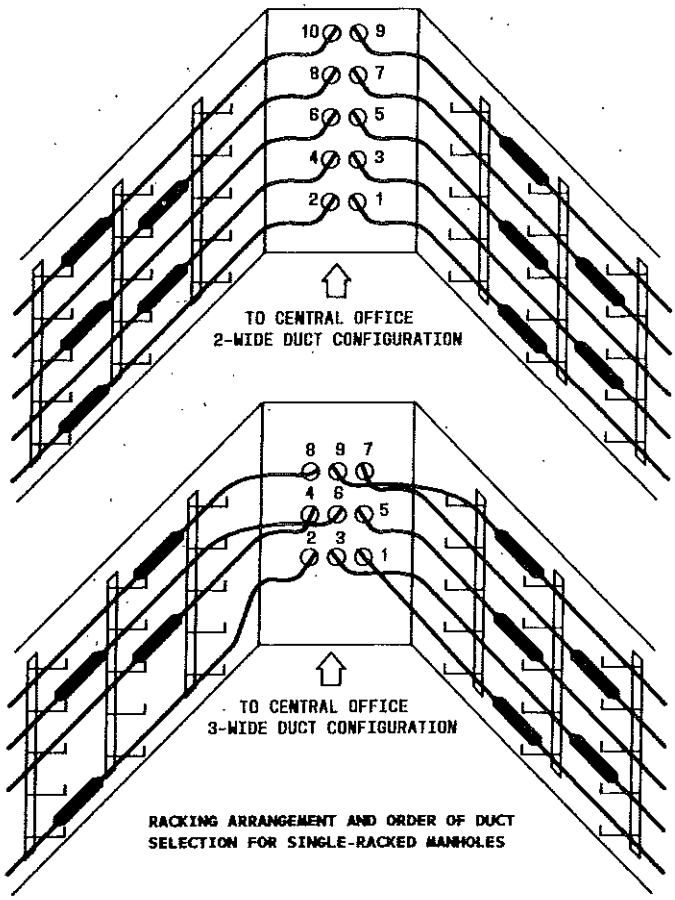
DUCT ASSIGNMENT AND CABLE RACKING

Practices 632-305-215, 919-240-300

Cable rack space should be used in the specified sequence to permit work on cables after placement and to preserve work space for splicing additional cables.

With double–racking arrangements, it is better to use all the outer (against the wall) rack spaces before using any inner (toward the center of the manhole) spaces. With either single or double racking, spaces should be used from the bottom up.

Ducts should be selected to avoid: (1) cable crossovers between the duct entrance and the cable rack, and (2) blockage of future access to vacant ducts. Racking arrangements and order of duct selection for line manholes are shown in the next two illustrations. For A–, L–, and T–type manholes, see referenced practices.

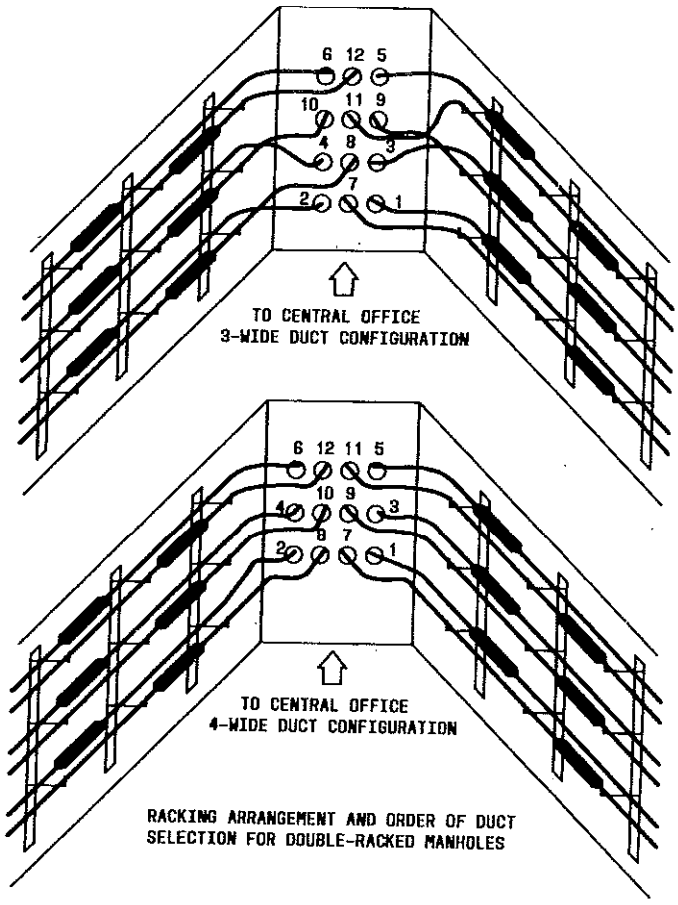


RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR SINGLE-RACKED MANHOLES

CONDUIT
Precast Manholes

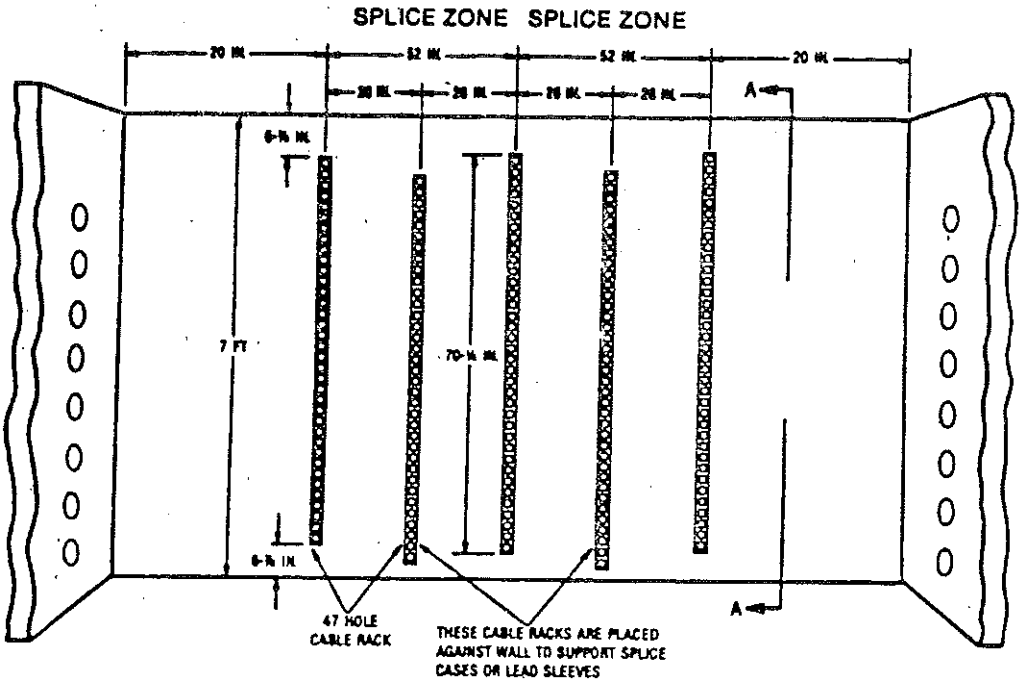
CABLE RACKS

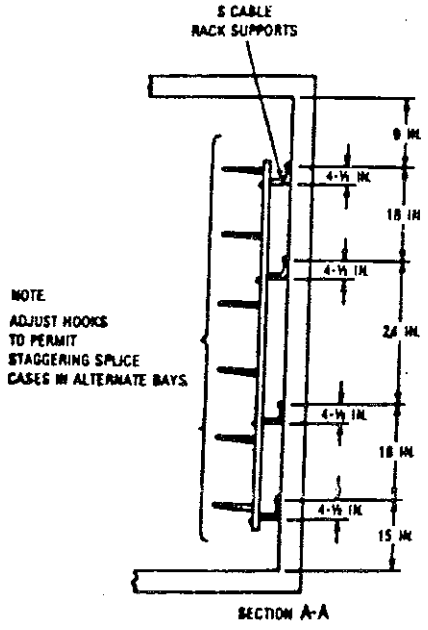
AT&T 622–520–100
919–240–300



RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR DOUBLE-RACKED MANHOLES

CABLE RACKS





NUMBER OF CABLE RACKS PER VERTICAL STRIP OF RACKS

HEAD ROOM	NUMBER OF RACKS			
	14 HOLE RACK	18 HOLE RACK	37 HOLE RACK	47 HOLE RACK
6 ft 6 in.				1
7 ft 0 in.				1
7 ft 6 in.		1	1	
8 ft 0 in.		1	1	
8 ft 6 in.		1		1
9 ft 0 in.		1		1
9 ft 6 in.	2		1	
10 ft 0 in.	2			1
10 ft 6 in.		2	1	
11 ft 0 in.		2		1

SIZE OF RACK	DISTANCE BETWEEN BOLT HOLES
8 Hook Holes	13-½ inches
14 Hook Holes	22 ½ inches
18 Hook Holes	28-½ inches
37 Hook Holes	18 and 24 inches
47 Hook Holes	18 and 24 inches

Cable Racks for

PLACEMENT

Duct Arrangements

Duct Arrangements are subject to trench width and/or depth constraints imposed by terrain, the presence of other structures, required workman space, etc. The arrangement of ducts in a conduit run should be compatible with the manhole cable racking arrangement. (Refer to "Manholes" later in this section.) Generally, 2–, 3–, or 4–wide arrangements are preferred for single– or double–wall racking. Where a large number of ducts or other circumstances require center racking as well as wall racking, wider duct arrangements may be appropriate.

Separation From Other Structures

Practices 622–100–010, 622–300–205, NESC Rule 320, 919–000–100

The following separations are required for safety of personnel and for protection of telephone equipment:

Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
Railroads (except street railways)	Crossing: 5 feet below top of rail.* Terminating on poles: 12 feet from nearest rail, except 7 feet as sidings
Street railways	3 feet below top of rail.*

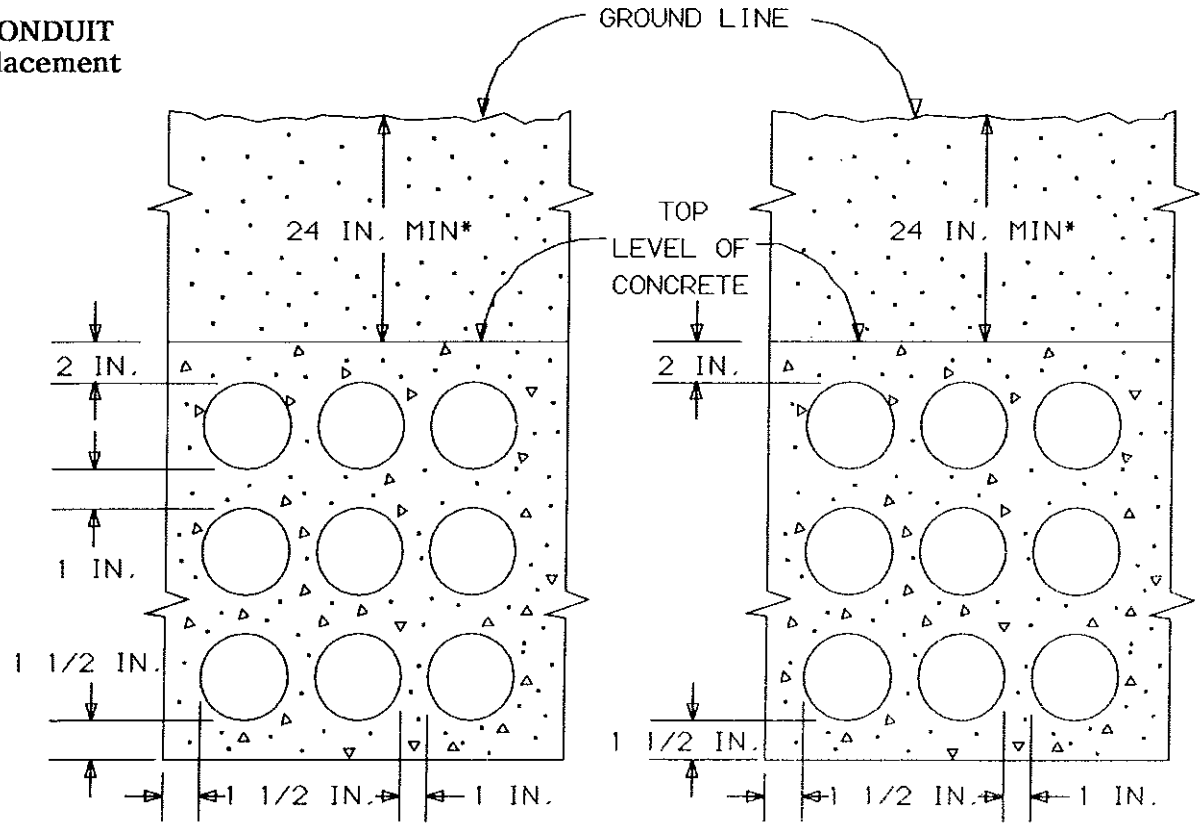
***Exception:** Where impractical, or for other reasons, these clearances may be reduced; however, the top of the conduit or conduit protection shall in no case extend above the bottom of the ballast section which is subject to working or cleaning. Local requirements will prevail.

Spacing and Backfill Requirements

622–020–020
914–240–100
Practice 919–240–400

The next three pages show spacing and backfill requirements for single–bore conduit. The volume of concrete or granular backfill will vary with the trench width and the degree of irregularity of the trench surfaces. Volumes given for each arrangement are for the minimum trench width consistent with the specified clearances. Volumes for sand or granular backfill include an allowance of about 1/12 for compaction.

CONDUIT
Placement



*18 IN. PERMITTED UNDER DRIVEWAYS, SIDEWALKS

CUBIC YARDS OF CONCRETE PER 100 FEET OF TRENCH

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.8	4.9
3-HIGH	5.2	6.6
4-HIGH	6.5	8.3

FOR LARGER FORMATIONS USE:

PLASTIC: .35WH + .35W + .28H

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.4	4.3
3-HIGH	4.2	5.4
4-HIGH	5.1	6.5

FOR LARGER FORMATIONS USE:

PLASTIC: 22WH + .48W + .23H

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

NOTE-OPTIONAL FOR STRAIGHT RUNS OF B PLASTIC.

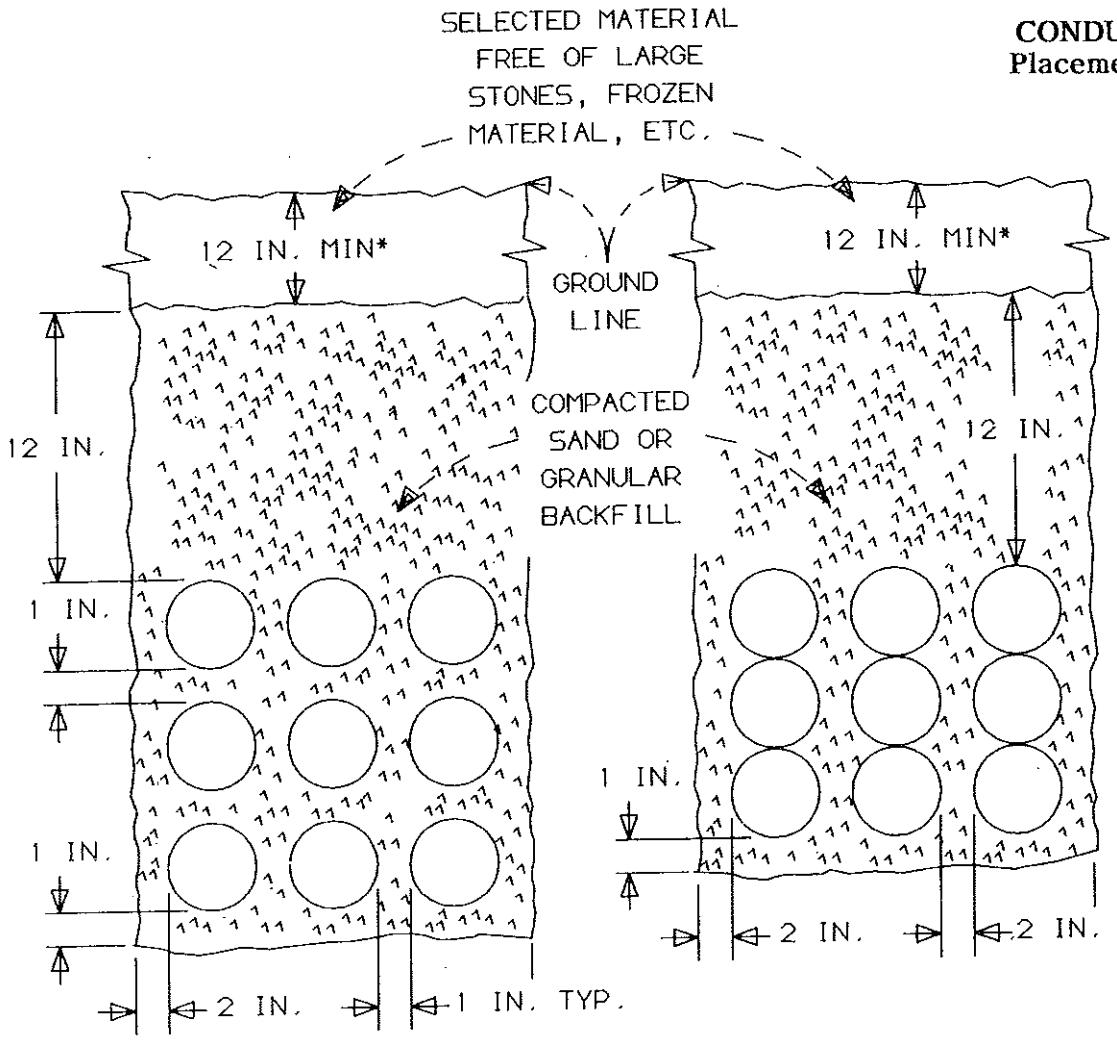
NOTE-LIMITED TO 3 TIERS PER POUR. REQUIRES LESS CONCRETE THAN METHOD USING VERT. SEPARATIONS

SINGLE-BORE CONDUIT (ALL TYPES) ON CURVES

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

8-24

CONDUIT
Placement



CUBIC YARDS OF SAND OR GRANULAR BACKFILL PER 100 FEET OF TRENCH

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	12
3-HIGH	11	14
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .38WH + 1.8W + 4H + 1

C PLASTIC CONDUIT, STRAIGHT RUNS, ANY NUMBER OF TIERS

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	13
3-HIGH	12	15
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .36WH + 2.3W + .2H + 7

C PLASTIC CONDUIT, STRAIGHT RUNS, UP TO 4 TIERS

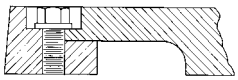
(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

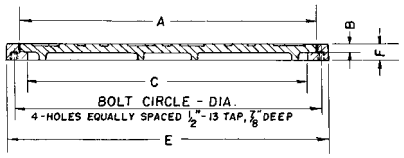
8-25

R-1749 Series
Telephone Design Large Manhole Frame, Solid Lid

Light Duty

Specify if security bolting required (2 per lid).





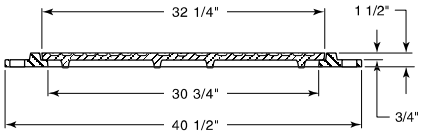
Dimensions in inches

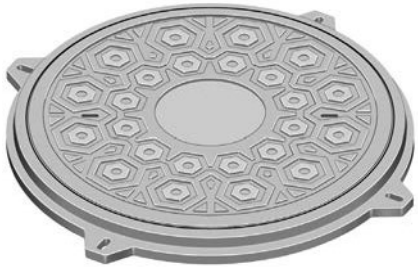
Catalog No.	A	B	C	E	F	Anchor Bolt Circle
R-1749-A	29 1/4	3/4	27 3/4	32	1 1/2	30-1/2
R-1749-B	32 1/4	3/4	30 3/4	35	1 1/2	33-1/2

R-1749-B1
Manhole Frame, Solid Lid

Light Duty

Furnished with four 3/4" x 1" anchor slots on 37" diameter bolt circle.





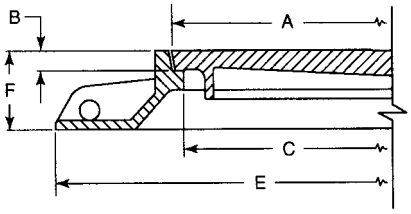
R-1750 Series
Telephone Design Large Manhole Frame, Solid Lid

Heavy Duty

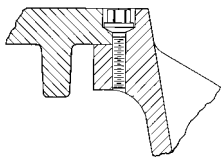
Furnished with machined horizontal and vertical bearing surfaces.

Covers can be bolted to frame with two pentagon head special monel security bolts upon request.

Wrenches available to fit special bolt at extra cost. Advise quantity required.



Illustrating R-1750-B



Dimensions in inches

Catalog No. Standard	Catalog No. Security Bolted	A	B	C	E	F	Anchor Bolt Circle*	Grate Alt.
R-1750-A	R-1750-AB	26	1 3/8	24	43	10		R-2300
R-1750-B	R-1750-BB	29	1 3/8	27	46	10	43-1/2	R-2290
R-1750-B1	R-1750-B1B	29	1 3/8	27	46	5 5/8	43-1/2	R-2290-A
R-1750-B2	R-1750-B2B	29	1 3/8	27	46	3 1/2	43-1/2	
R-1750-C	R-1750-CB	32	1 3/8	30	49	10	43-1/2	
R-1750-C1	R-1750-C1B	32	1 3/8	30	49	5 5/8	43-1/2	
R-1750-C1S	R-1750-C1SB	32	1 3/8	30	46	5 5/8	43-1/2	R-2750
R-1750-CS	R-1750-CSB	32	1 3/8	30	46	10	43-1/2	R-2255

* Furnished standard with four 1" diameter holes in base flange, equally spaced.

PLAN LEGEND

MH 1
W'xL'xH'

Manhole dimensions as given on plans are inside dimensions.
Typical sizes are:
6'x12'x7'
5'x10'x7'
4'x8'x7'
(Size is dictated by cable sizes and amount of splicing expected at the location)

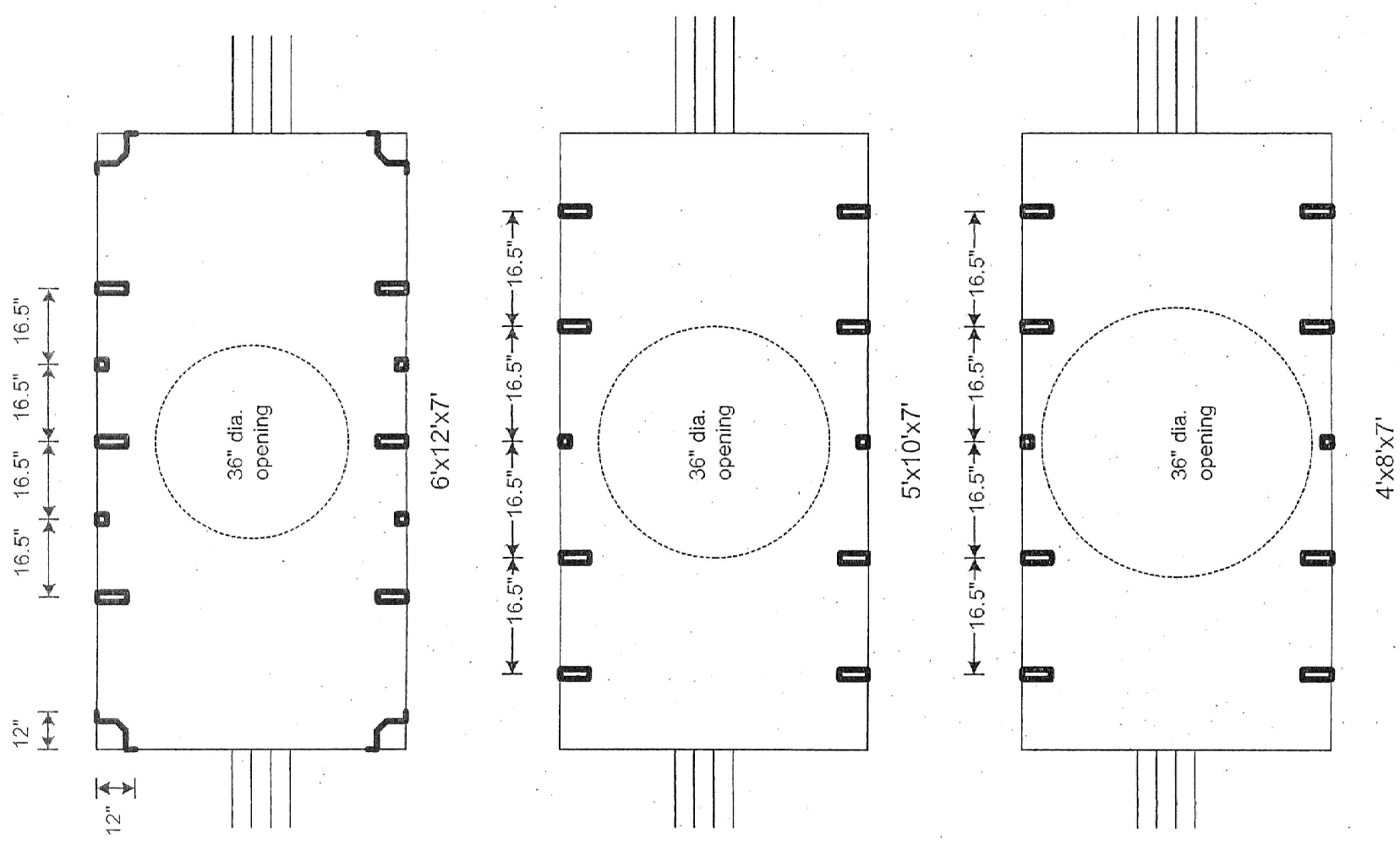
B cable rack support

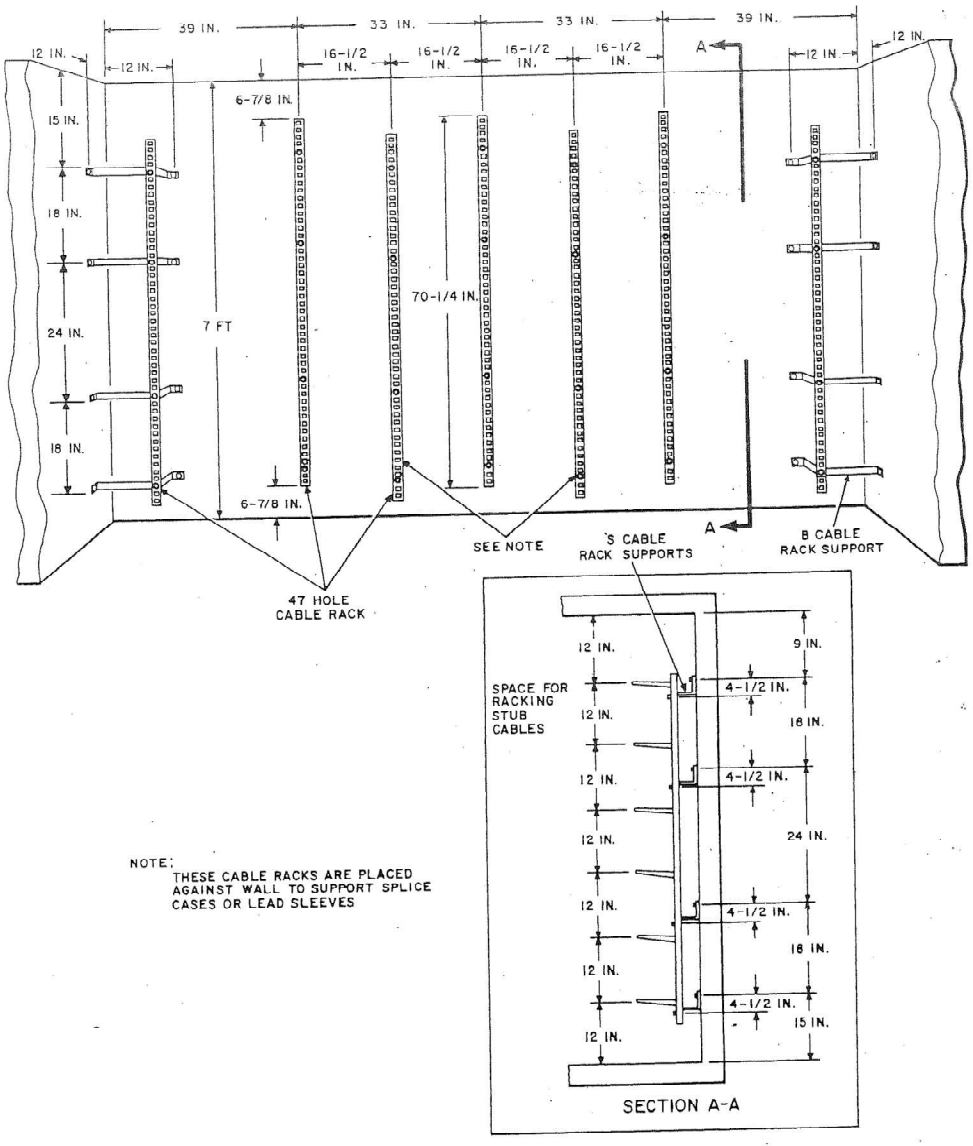
cable racks secured to S cable rack support

cable racks attached directly to wall

(See included practices for description of cable racking hardware.)

MANHOLE DETAILS





NOTE:
THESE CABLE RACKS ARE PLACED AGAINST WALL TO SUPPORT SPLICE CASES OR LEAD SLEEVES

Fig. 9—Location of Cable Racks and Hooks in Typical Double Bay, Double Rack A-Type Manhole

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DOCUMENT A00807

CITY OF TAUNTON
CONSTRUCTION STANDARDS

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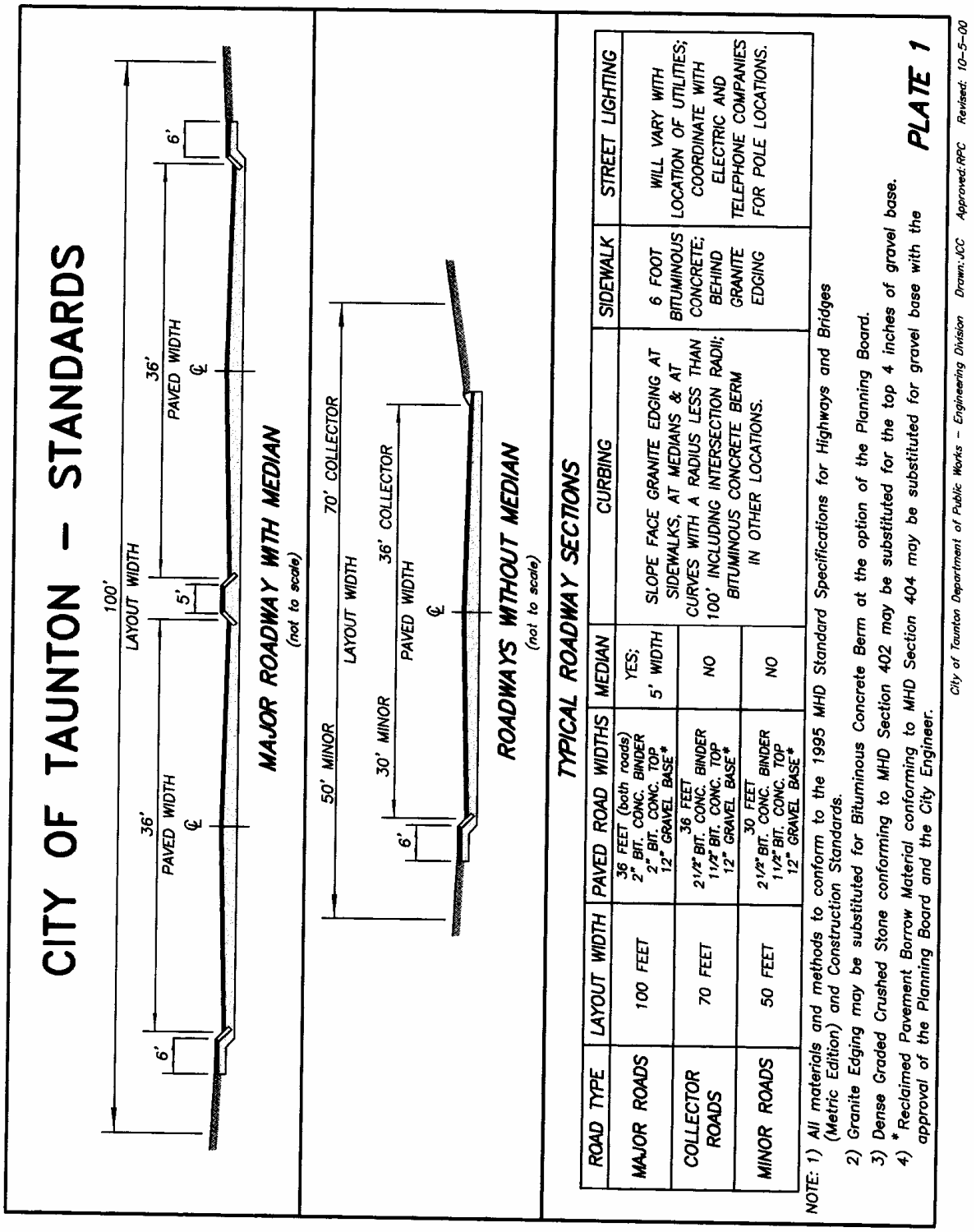
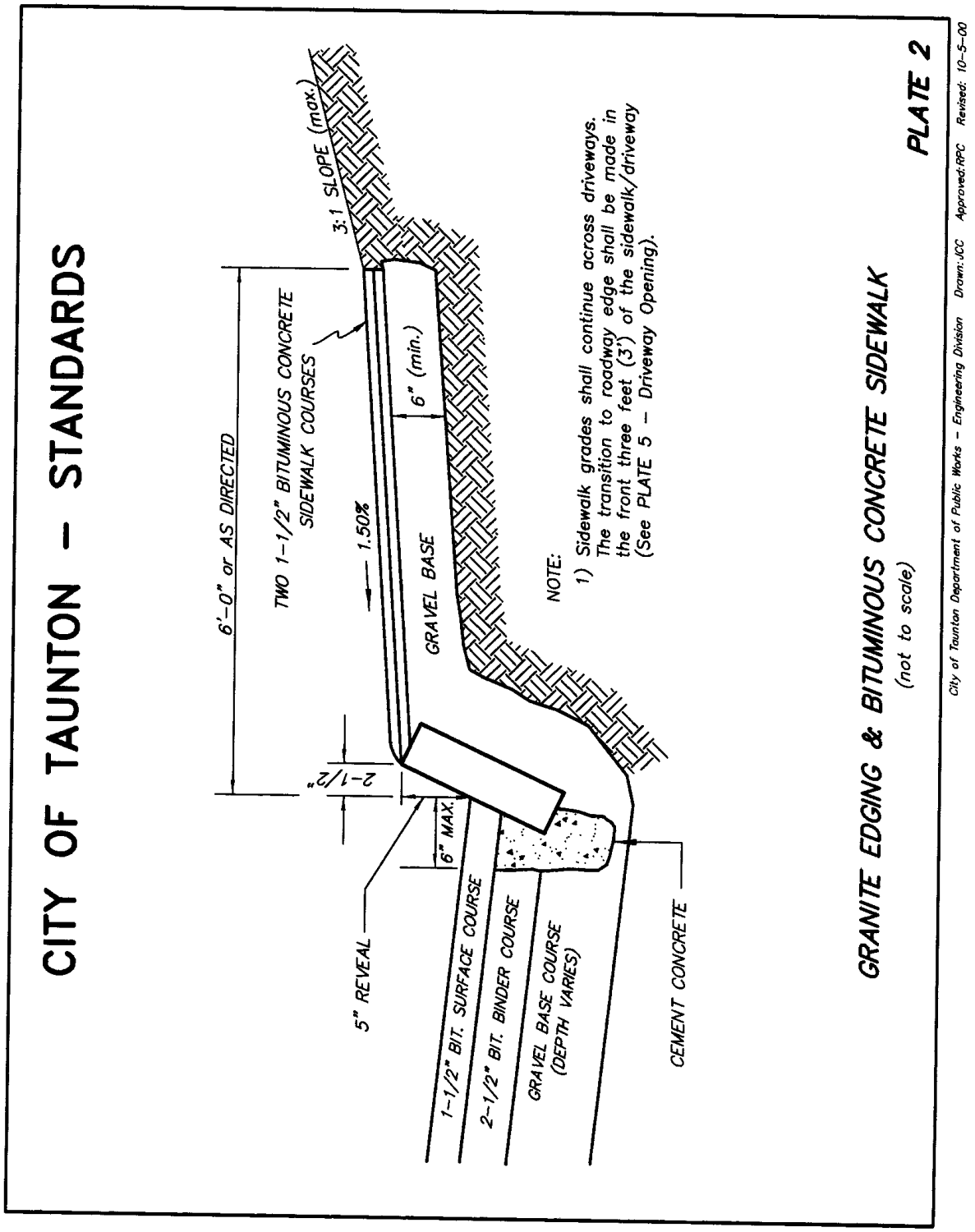
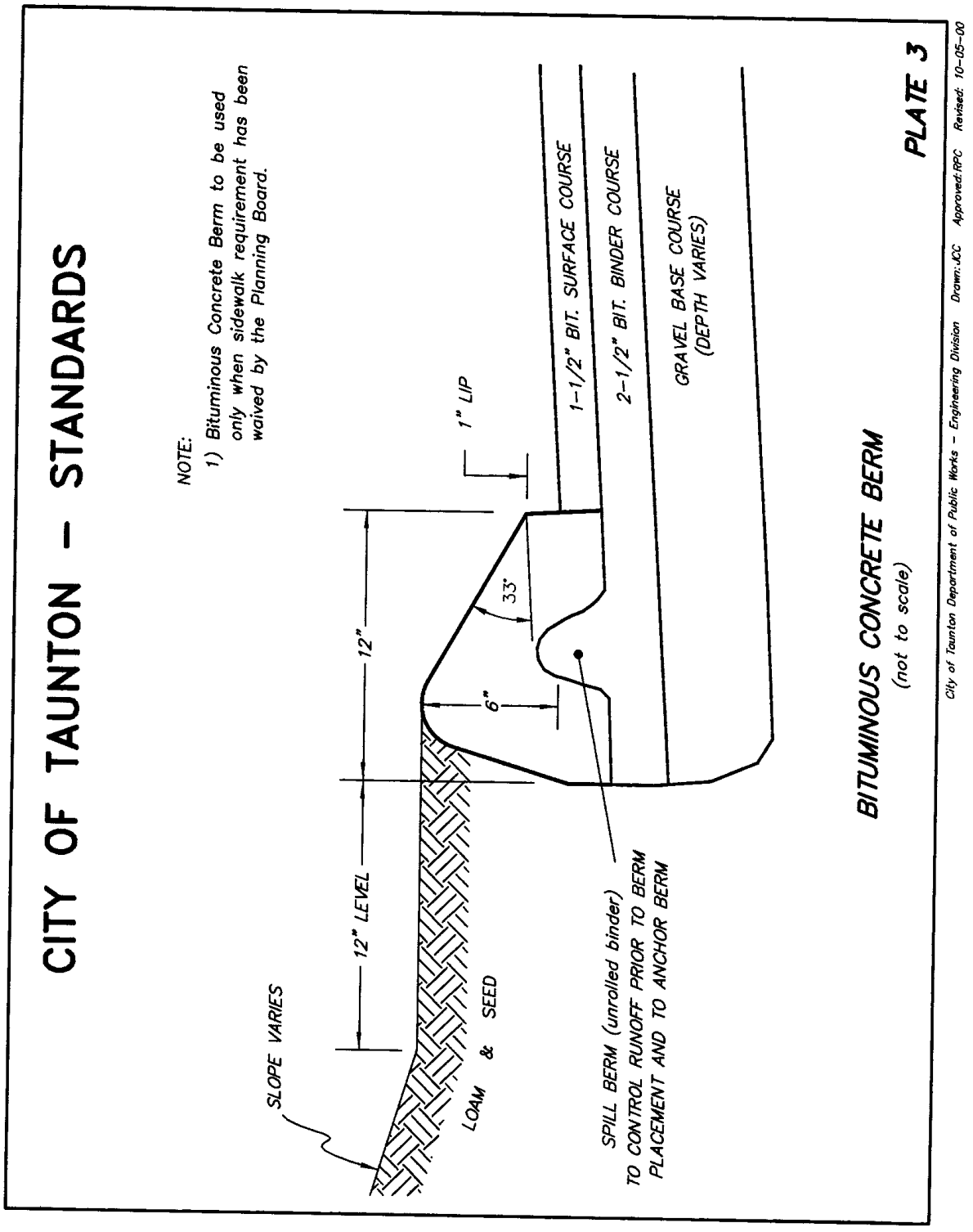
APPENDIX A

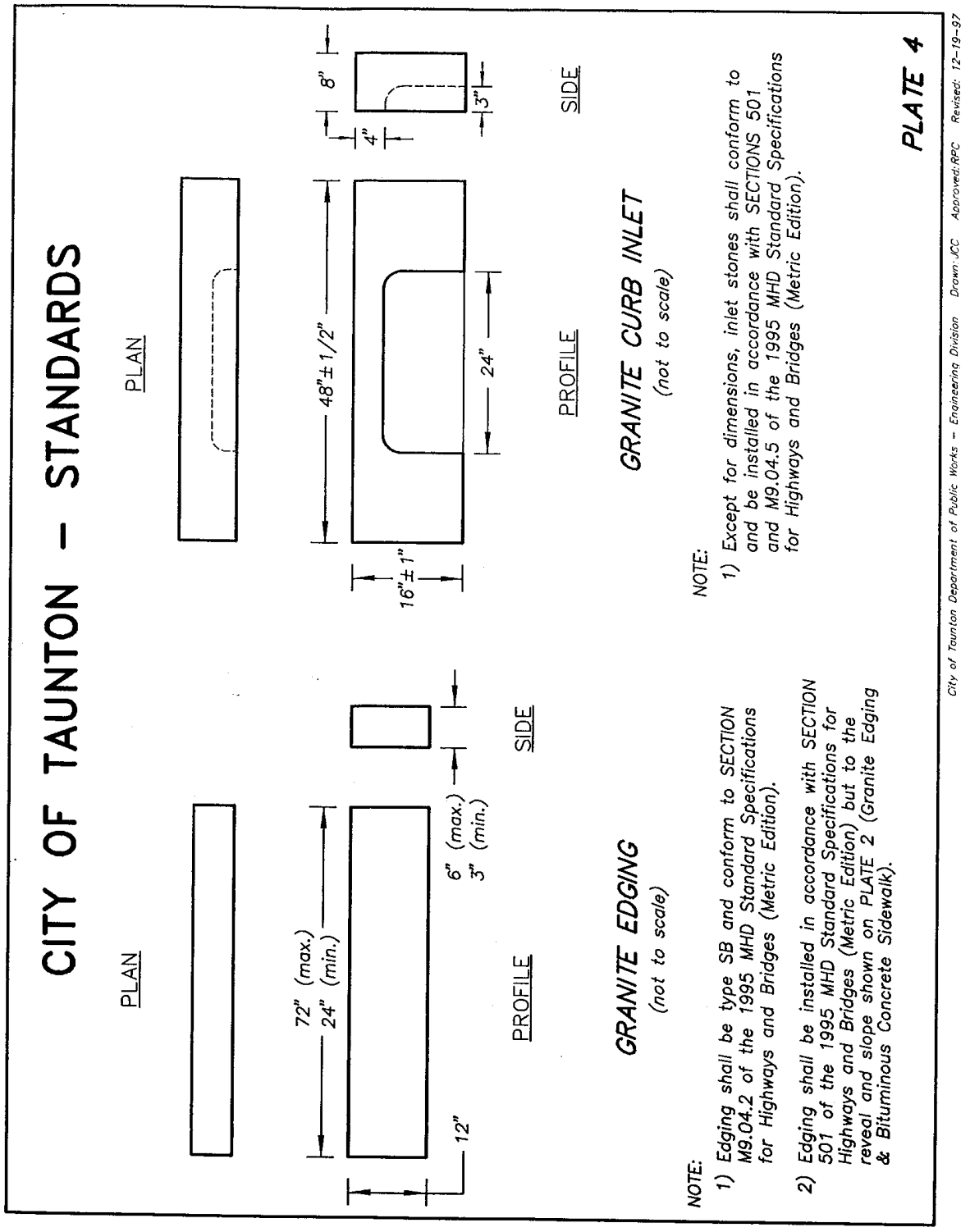
STANDARD DETAILS

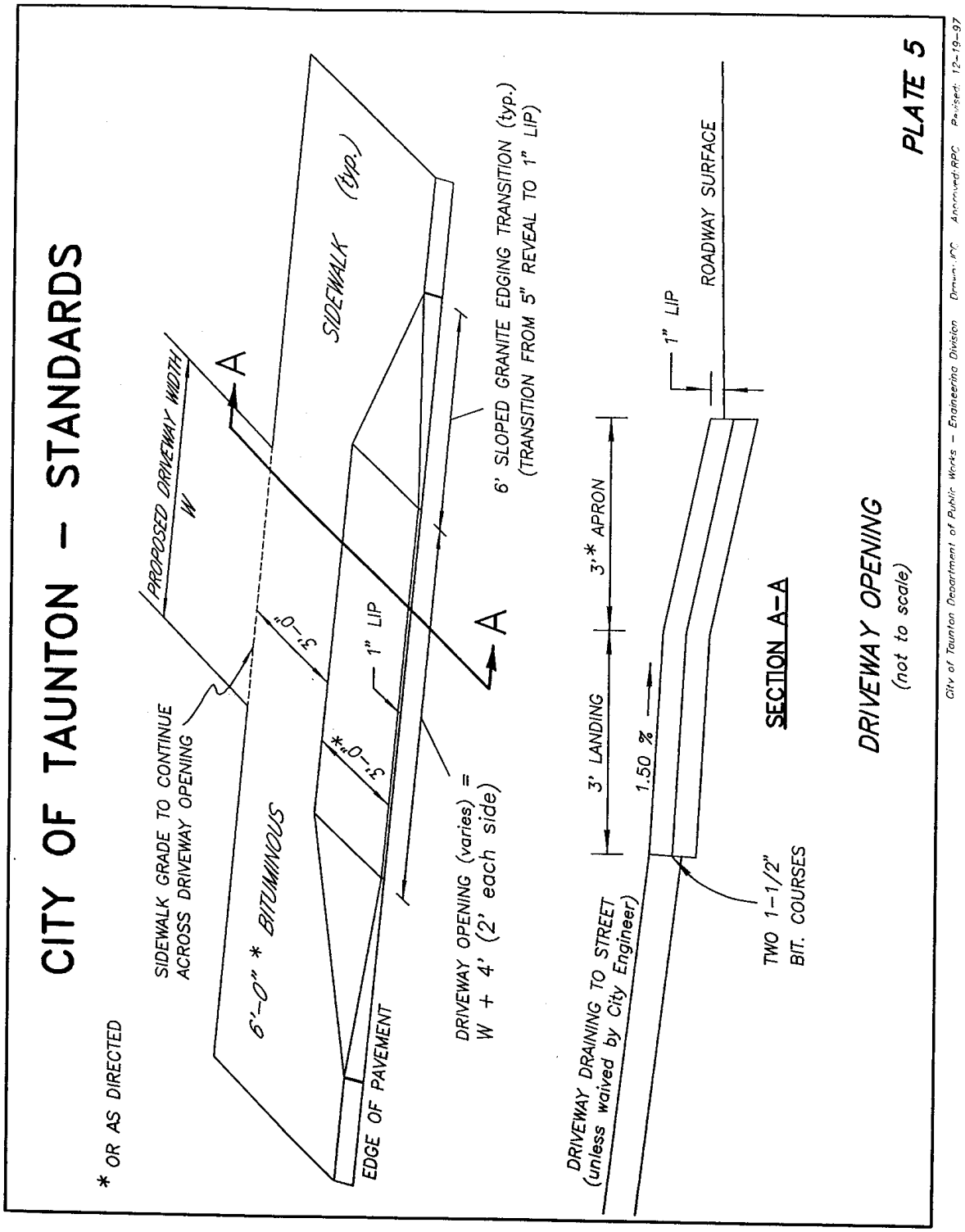
Details shown in Appendix A are the details in use by the City of Taunton Engineering Department as of January, 2001. The Engineering Department should be contacted to obtain any changes in the standard details


CITY OF TAUNTON – STANDARDS
100'
LAYOUT WIDTH
36'
PAVED WIDTH
℄
6'
5'
MAJOR ROADWAY WITH MEDIAN
(not to scale)
70' COLLECTOR
LAYOUT WIDTH
50' MINOR
30' MINOR
36' COLLECTOR
PAVED WIDTH
ROADWAYS WITHOUT MEDIAN
(not to scale)
TYPICAL ROADWAY SECTIONS
ROAD TYPE | LAYOUT WIDTH | PAVED ROAD WIDTHS | MEDIAN | CURBING | SIDEWALK | STREET LIGHTING
MAJOR ROADS | 100 FEET | 36 FEET (both roads) 2" BIT. CONC. BINDER 2" BIT. CONC. TOP 12" GRAVEL BASE* | YES; 5' WIDTH | SLOPE FACE GRANITE EDGING AT SIDEWALKS, AT MEDIANS & AT CURVES WITH A RADIUS LESS THAN 100' INCLUDING INTERSECTION RADII; BITUMINOUS CONCRETE BERM IN OTHER LOCATIONS. | 6 FOOT BITUMINOUS CONCRETE; BEHIND GRANITE EDGING | WILL VARY WITH LOCATION OF UTILITIES; COORDINATE WITH ELECTRIC AND TELEPHONE COMPANIES FOR POLE LOCATIONS.
COLLECTOR ROADS | 70 FEET | 36 FEET 2½" BIT. CONC. BINDER 1½" BIT. CONC. TOP 12" GRAVEL BASE* | NO
MINOR ROADS | 50 FEET | 30 FEET 2½" BIT. CONC. BINDER 1½" BIT. CONC. TOP 12" GRAVEL BASE* | NO
NOTE: 1) All materials and methods to conform to the 1995 MHD Standard Specifications for Highways and Bridges (Metric Edition) and Construction Standards.
2) Granite Edging may be substituted for Bituminous Concrete Berm at the option of the Planning Board.
3) Dense Graded Crushed Stone conforming to MHD Section 402 may be substituted for the top 4 inches of gravel base.
4) * Reclaimed Pavement Borrow Material conforming to MHD Section 404 may be substituted for gravel base with the approval of the Planning Board and the City Engineer.
City of Taunton Department of Public Works – Engineering Division Drawn: JCC Approved: RPC Revised: 10-5-00
PLATE 1


CITY OF TAUNTON - STANDARDS
PLATE 2
GRANITE EDGING & BITUMINOUS CONCRETE SIDEWALK
(not to scale)
City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-5-00
6'-0" or AS DIRECTED
TWO 1-1/2" BITUMINOUS CONCRETE SIDEWALK COURSES
3:1 SLOPE (max.)
1.50%
6" (min.)
GRAVEL BASE
2-1/2"
6" MAX.
5" REVEAL
1-1/2" BIT. SURFACE COURSE
2-1/2" BIT. BINDER COURSE
GRAVEL BASE COURSE (DEPTH VARIES)
CEMENT CONCRETE
NOTE:
1) Sidewalk grades shall continue across driveways. The transition to roadway edge shall be made in the front three feet (3') of the sidewalk/driveway (See PLATE 5 - Driveway Opening).


CITY OF TAUNTON – STANDARDS
NOTE:
1) Bituminous Concrete Berm to be used only when sidewalk requirement has been waived by the Planning Board.
1" LIP
1-1/2" BIT. SURFACE COURSE
2-1/2" BIT. BINDER COURSE
GRAVEL BASE COURSE (DEPTH VARIES)
33°
6"
12"
12" LEVEL
SLOPE VARIES
LOAM & SEED
SPILL BERM (unrolled binder) TO CONTROL RUNOFF PRIOR TO BERM PLACEMENT AND TO ANCHOR BERM
BITUMINOUS CONCRETE BERM
(not to scale)
PLATE 3
City of Taunton Department of Public Works – Engineering Division Drawn: JCC Approved: RPC Revised: 10-05-00


CITY OF TAUNTON – STANDARDS
PLAN
72" (max.)
24" (min.)
12"
PROFILE
6" (max.)
3" (min.)
SIDE
GRANITE EDGING
(not to scale)
NOTE:
1) Edging shall be type SB and conform to SECTION M9.04.2 of the 1995 MHD Standard Specifications for Highways and Bridges (Metric Edition).
2) Edging shall be installed in accordance with SECTION 501 of the 1995 MHD Standard Specifications for Highways and Bridges (Metric Edition) but to the reveal and slope shown on PLATE 2 (Granite Edging & Bituminous Concrete Sidewalk).
PLAN
48"±1/2"
16"±1"
PROFILE
24"
4"
8"
3"
SIDE
GRANITE CURB INLET
(not to scale)
NOTE:
1) Except for dimensions, inlet stones shall conform to and be installed in accordance with SECTIONS 501 and M9.04.5 of the 1995 MHD Standard Specifications for Highways and Bridges (Metric Edition).
City of Taunton Department of Public Works – Engineering Division Drawn: JCC Approved: RPC Revised: 12-19-97
PLATE 4

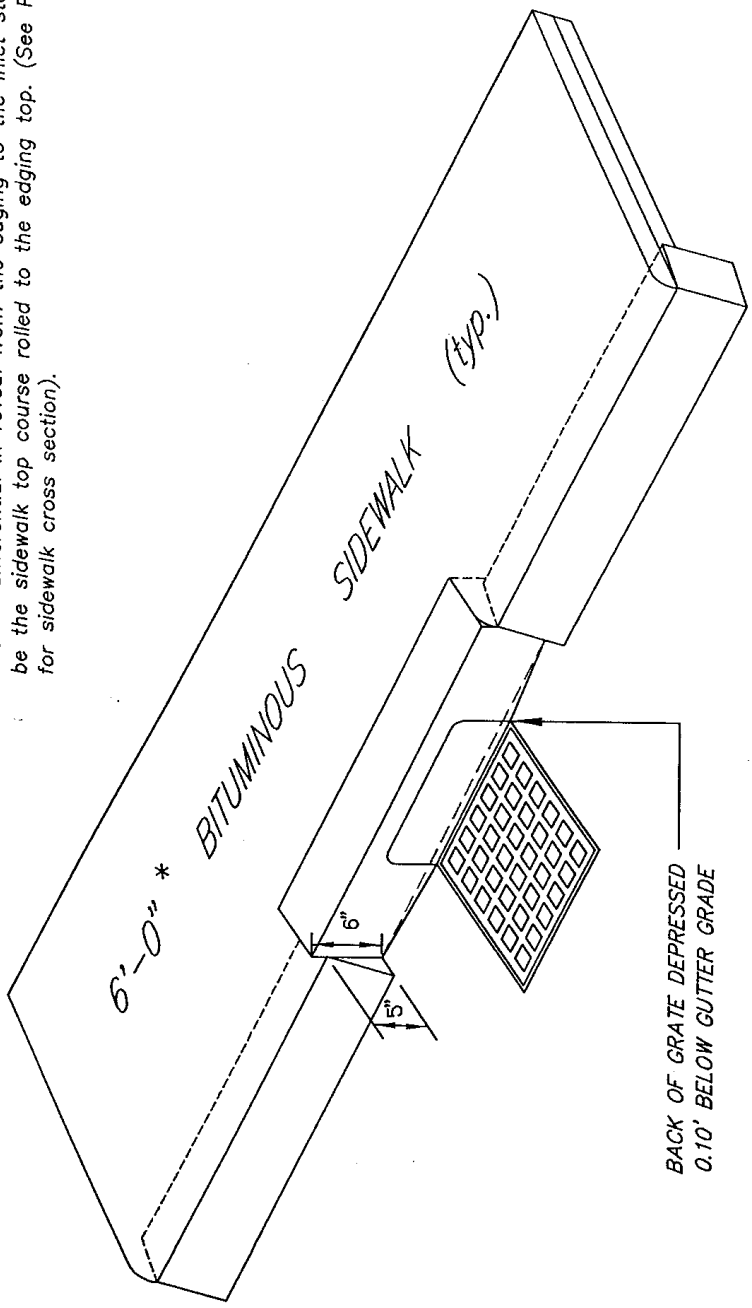

CITY OF TAUNTON – STANDARDS
* OR AS DIRECTED
SIDEWALK GRADE TO CONTINUE ACROSS DRIVEWAY OPENING
PROPOSED DRIVEWAY WIDTH W
A
A
SIDEWALK (typ.)
6'-0" * BITUMINOUS
5'-0"
*5'-0"
1" LIP
EDGE OF PAVEMENT
DRIVEWAY OPENING (varies) = W + 4' (2' each side)
6' SLOPED GRANITE EDGING TRANSITION (typ.) (TRANSITION FROM 5" REVEAL TO 1" LIP)
3' LANDING
3'* APRON
1.50 %
1" LIP
ROADWAY SURFACE
DRIVEWAY DRAINING TO STREET (unless waived by City Engineer)
TWO 1-1/2" BIT. COURSES
SECTION A-A
DRIVEWAY OPENING
(not to scale)
PLATE 5
City of Taunton Department of Public Works – Engineering Division Drawn: RPC Approved: RPC Revised: 12-19-97

CITY OF TAUNTON – STANDARDS

NOTE:

1) 5" Granite Edging reveal shall be maintained up to the inlet stone. The 1" differential in reveal from the edging to the inlet stone will be the sidewalk top course rolled to the edging top. (See PLATE 2 for sidewalk cross section).

* OR AS DIRECTED



INLET STONE TRANSITION TO GRANITE EDGING

(not to scale)

PLATE 6

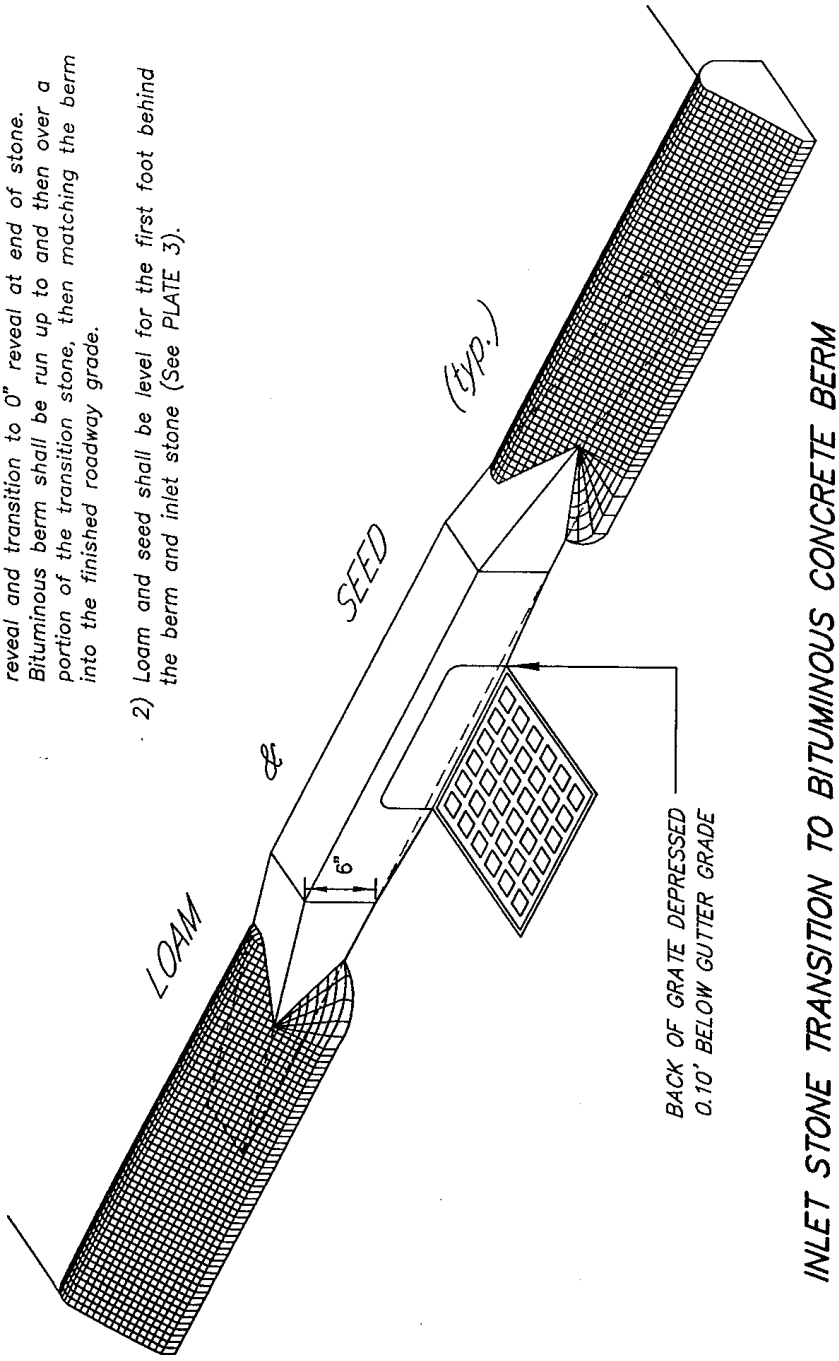
City of Taunton Department of Public Works – Engineering Division Drawn: MC Approved: RPC Revised: 12-19-97

CITY OF TAUNTON – STANDARDS

NOTE:

1) Transition stones shall be same width as inlet stone, three feet (3') in length, and shall match 6" inlet stone reveal and transition to 0" reveal at end of stone. Bituminous berm shall be run up to and then over a portion of the transition stone, then matching the berm into the finished roadway grade.

2) Loam and seed shall be level for the first foot behind the berm and inlet stone (See PLATE 3).

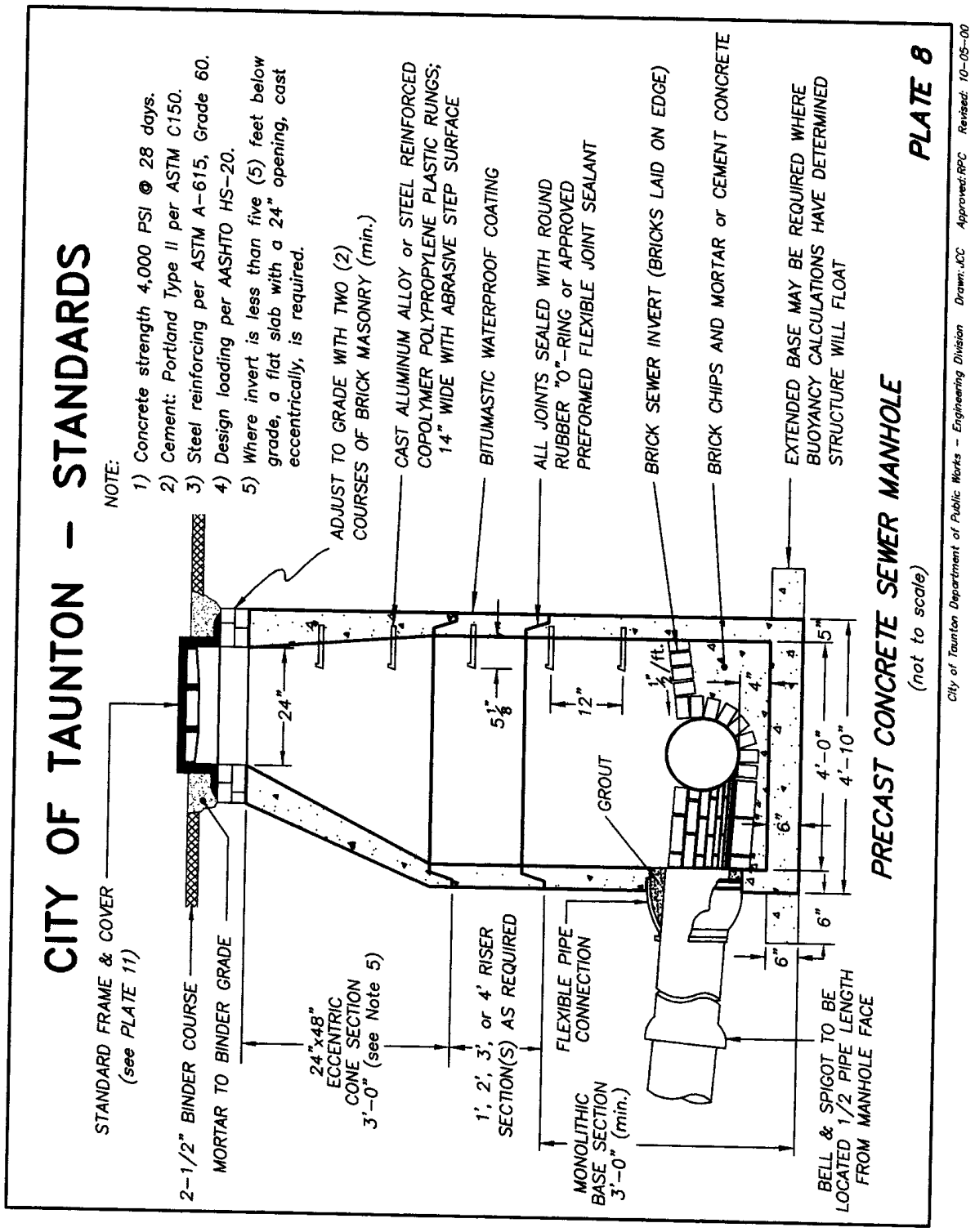


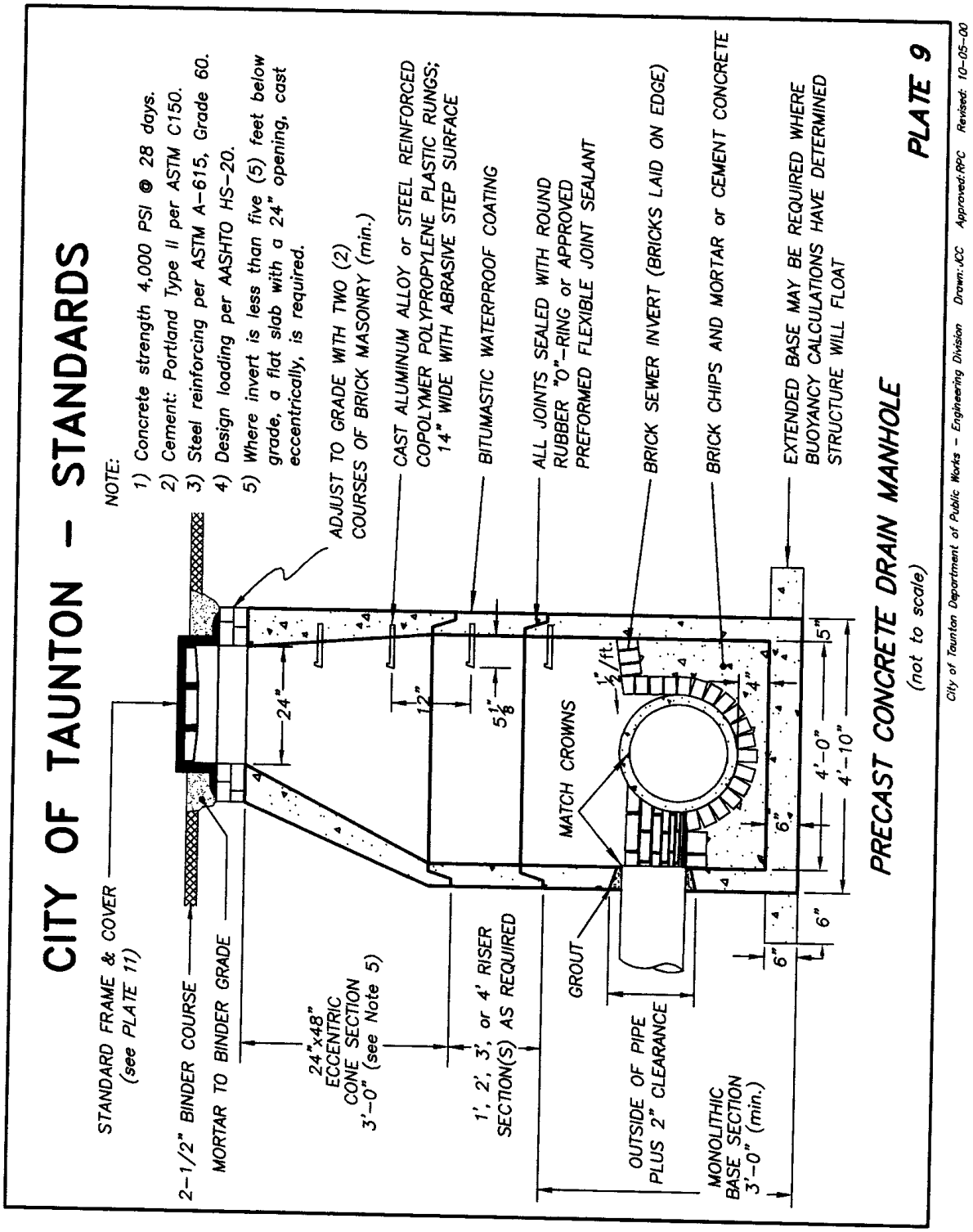
INLET STONE TRANSITION TO BITUMINOUS CONCRETE BERM

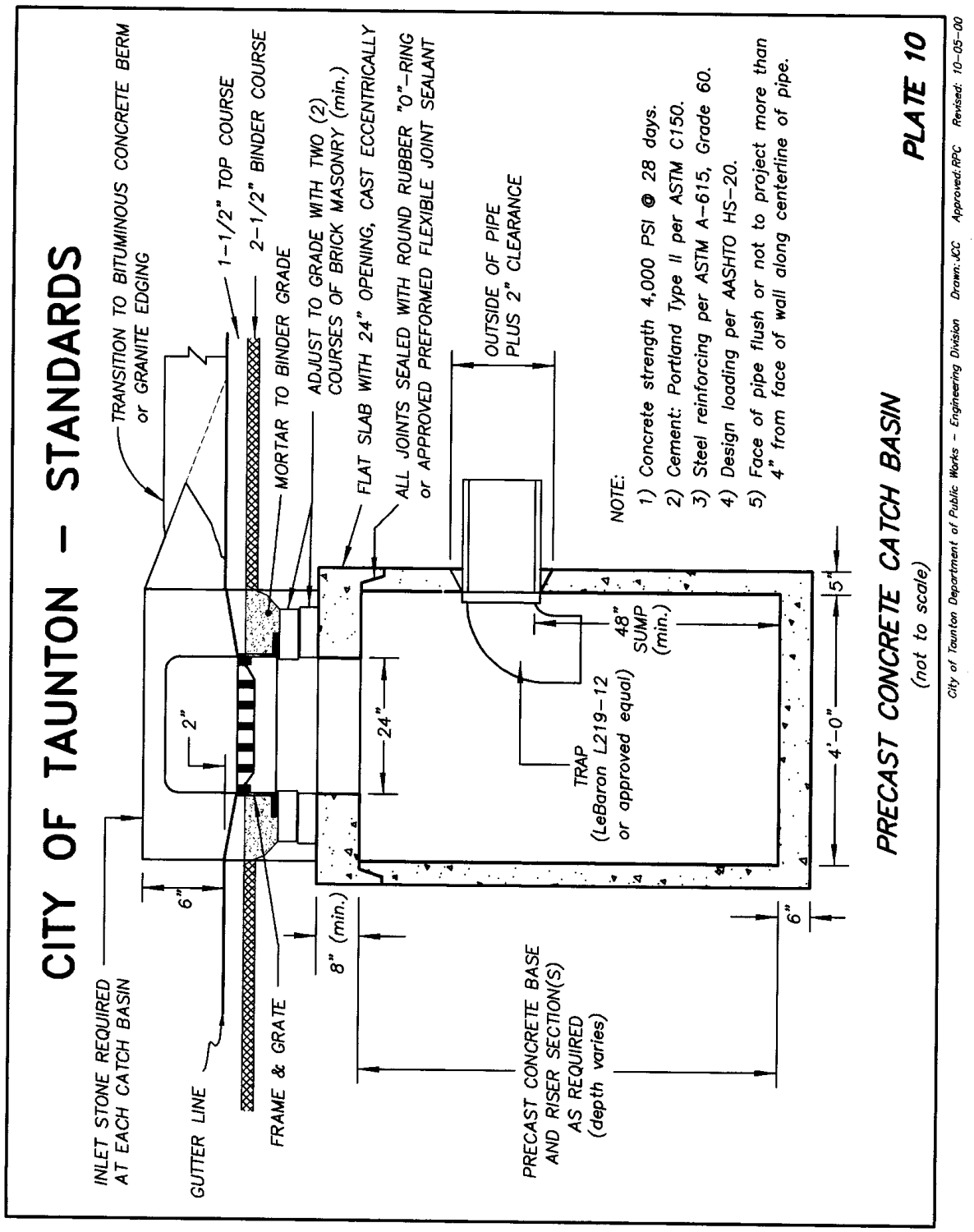
(not to scale)

PLATE 7

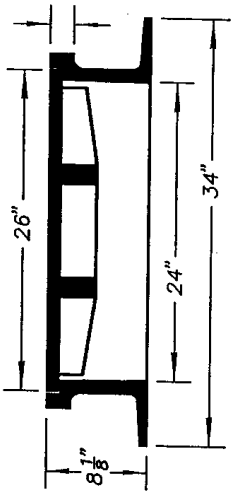
City of Taunton Department of Public Works – Engineering Division Drawn: KPC Approved: RPC Revised: 12-19-97


CITY OF TAUNTON - STANDARDS
NOTE:
1) Concrete strength 4,000 PSI @ 28 days.
2) Cement: Portland Type II per ASTM C150.
3) Steel reinforcing per ASTM A-615, Grade 60.
4) Design loading per AASHTO HS-20.
5) Where invert is less than five (5) feet below grade, a flat slab with a 24" opening, cast eccentrically, is required.
STANDARD FRAME & COVER (see PLATE 11)
2-1/2" BINDER COURSE
MORTAR TO BINDER GRADE
24"x48" ECCENTRIC CONE SECTION 3'-0" (see Note 5)
1', 2', 3', or 4' RISER SECTION(S) AS REQUIRED
MONOLITHIC BASE SECTION 3'-0" (min.)
FLEXIBLE PIPE CONNECTION
BELL & SPIGOT TO BE LOCATED 1/2 PIPE LENGTH FROM MANHOLE FACE
ADJUST TO GRADE WITH TWO (2) COURSES OF BRICK MASONRY (min.)
CAST ALUMINUM ALLOY or STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC RUNGS; 14" WIDE WITH ABRASIVE STEP SURFACE
BITUMASTIC WATERPROOF COATING
ALL JOINTS SEALED WITH ROUND RUBBER "O"-RING or APPROVED PREFORMED FLEXIBLE JOINT SEALANT
BRICK SEWER INVERT (BRICKS LAID ON EDGE)
BRICK CHIPS AND MORTAR or CEMENT CONCRETE
EXTENDED BASE MAY BE REQUIRED WHERE BUOYANCY CALCULATIONS HAVE DETERMINED STRUCTURE WILL FLOAT
GROUT
24"
12"
5 1/8"
1" 1/2 /ft.
4"
6"
4'-0"
4'-10"
5"
6"
PRECAST CONCRETE SEWER MANHOLE
(not to scale)
PLATE 8
City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-05-00


CITY OF TAUNTON – STANDARDS
NOTE:
1) Concrete strength 4,000 PSI @ 28 days.
2) Cement: Portland Type II per ASTM C150.
3) Steel reinforcing per ASTM A-615, Grade 60.
4) Design loading per AASHTO HS-20.
5) Where invert is less than five (5) feet below grade, a flat slab with a 24" opening, cast eccentrically, is required.
STANDARD FRAME & COVER (see PLATE 11)
2-1/2" BINDER COURSE
MORTAR TO BINDER GRADE
24"x48" ECCENTRIC CONE SECTION 3'-0" (see Note 5)
1', 2', 3', or 4' RISER SECTION(S) AS REQUIRED
OUTSIDE OF PIPE PLUS 2" CLEARANCE
MONOLITHIC BASE SECTION 3'-0" (min.)
GROUT
MATCH CROWNS
ADJUST TO GRADE WITH TWO (2) COURSES OF BRICK MASONRY (min.)
CAST ALUMINUM ALLOY or STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC RUNGS; 14" WIDE WITH ABRASIVE STEP SURFACE
BITUMASTIC WATERPROOF COATING
ALL JOINTS SEALED WITH ROUND RUBBER "O"-RING or APPROVED PREFORMED FLEXIBLE JOINT SEALANT
BRICK SEWER INVERT (BRICKS LAID ON EDGE)
BRICK CHIPS AND MORTAR or CEMENT CONCRETE
EXTENDED BASE MAY BE REQUIRED WHERE BUOYANCY CALCULATIONS HAVE DETERMINED STRUCTURE WILL FLOAT
PRECAST CONCRETE DRAIN MANHOLE
(not to scale)
PLATE 9
City of Taunton Department of Public Works – Engineering Division Drawn:JCC Approved:RPC Revised: 10-05-00

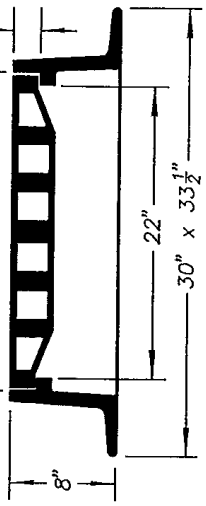

CITY OF TAUNTON – STANDARDS
TRANSITION TO BITUMINOUS CONCRETE BERM or GRANITE EDGING
1-1/2" TOP COURSE
2-1/2" BINDER COURSE
MORTAR TO BINDER GRADE
ADJUST TO GRADE WITH TWO (2) COURSES OF BRICK MASONRY (min.)
FLAT SLAB WITH 24" OPENING, CAST ECCENTRICALLY
ALL JOINTS SEALED WITH ROUND RUBBER "O"-RING or APPROVED PREFORMED FLEXIBLE JOINT SEALANT
OUTSIDE OF PIPE PLUS 2" CLEARANCE
NOTE:
1) Concrete strength 4,000 PSI @ 28 days.
2) Cement: Portland Type II per ASTM C150.
3) Steel reinforcing per ASTM A-615, Grade 60.
4) Design loading per AASHTO HS-20.
5) Face of pipe flush or not to project more than 4" from face of wall along centerline of pipe.
INLET STONE REQUIRED AT EACH CATCH BASIN
GUTTER LINE
FRAME & GRATE
PRECAST CONCRETE BASE AND RISER SECTION(S) AS REQUIRED (depth varies)
TRAP (LeBaron L219-12 or approved equal)
48" SUMP (min.)
6"
8" (min.)
2"
24"
5"
4'-0"
6"
PRECAST CONCRETE CATCH BASIN
(not to scale)
PLATE 10
City of Taunton Department of Public Works - Engineering Division Drawn: JCC Approved: RPC Revised: 10-05-00

CITY OF TAUNTON – STANDARDS



NOTE:
1) Frame and cover shall be LeBaron LB268–3 or equal approved by the City Engineer.
2) Each cover shall read SEWER or DRAIN in 3" lettering according to use.
3) Frame and cover shall be set in full bed of mortar on a minimum of two courses of brick.

SEWER/DRAIN MANHOLE FRAME & COVER
(not to scale)



NOTE:
1) Frame and grate shall be LeBaron LF248–2 or equal approved by the City Engineer.
2) For use when the gutter grade is less than or equal to 3.00%.
3) Frame and cover shall be set in full bed of mortar on a minimum of two courses of brick.

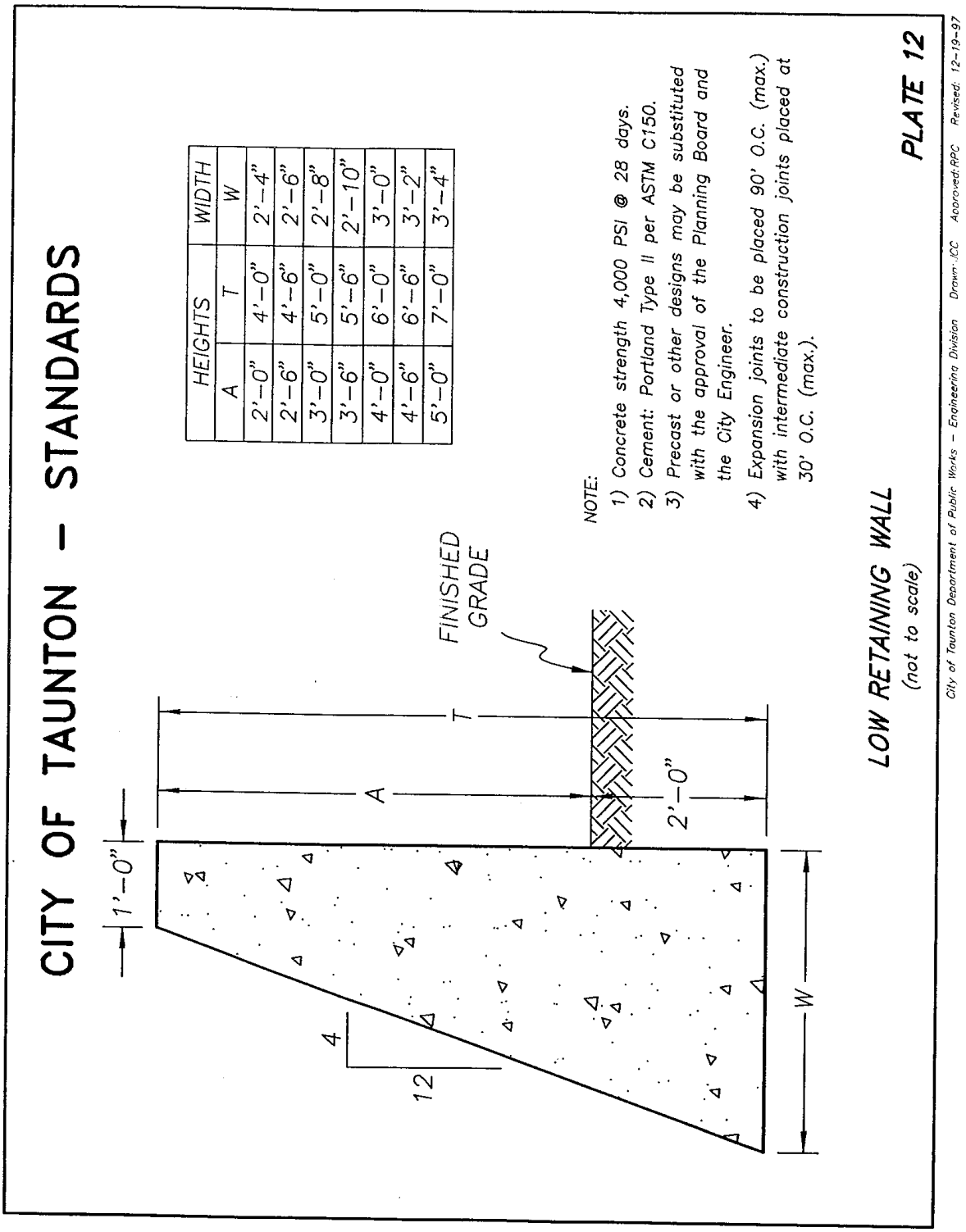
STANDARD CATCH BASIN FRAME & GRATE
(not to scale)

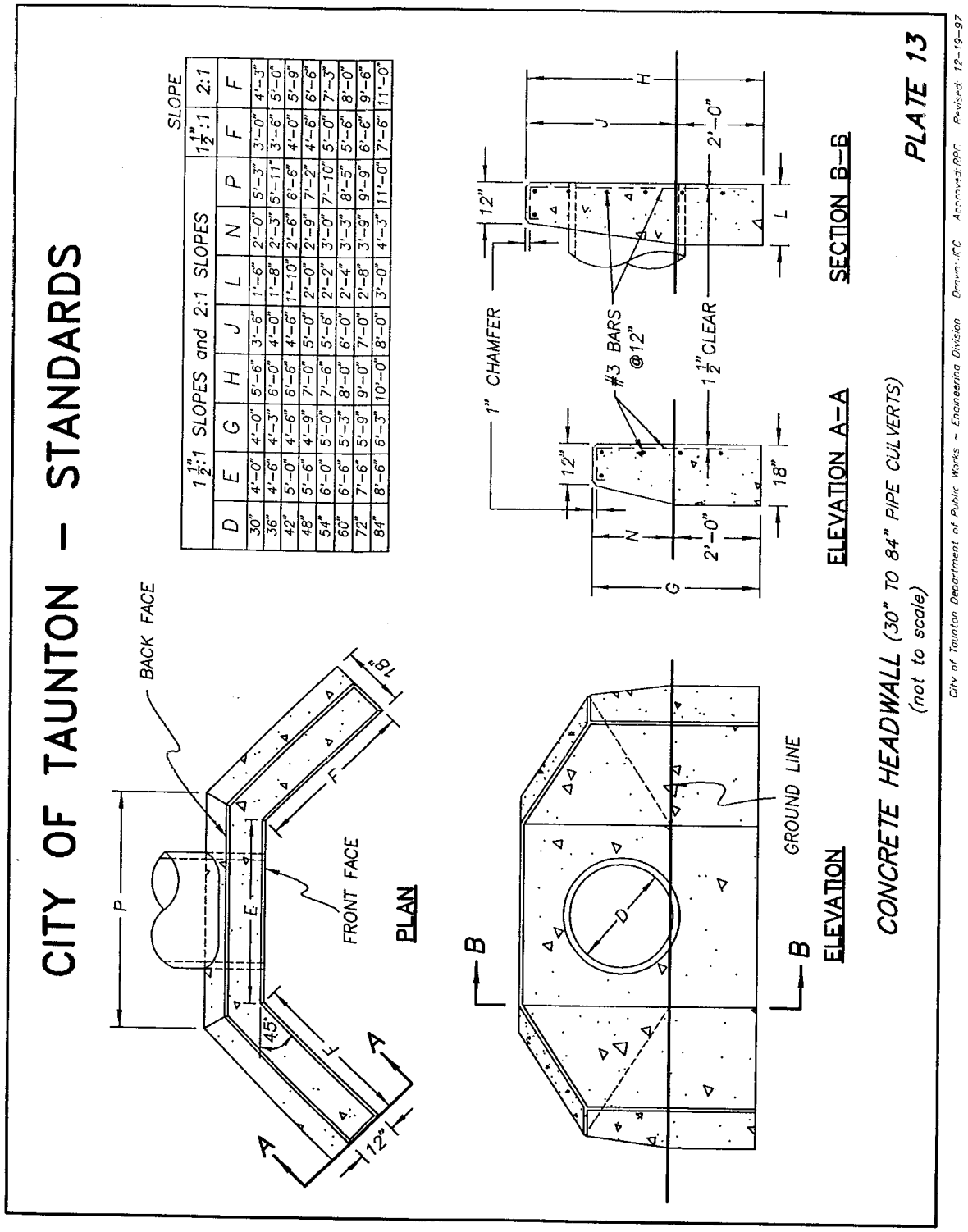
NOTE:
1) Frame and grate shall be LeBaron LK120A or equal approved by the City Engineer.
2) For use when the gutter grade exceeds 3.00%.
3) Frame and cover shall be set in full bed of mortar on a minimum of two courses of brick.

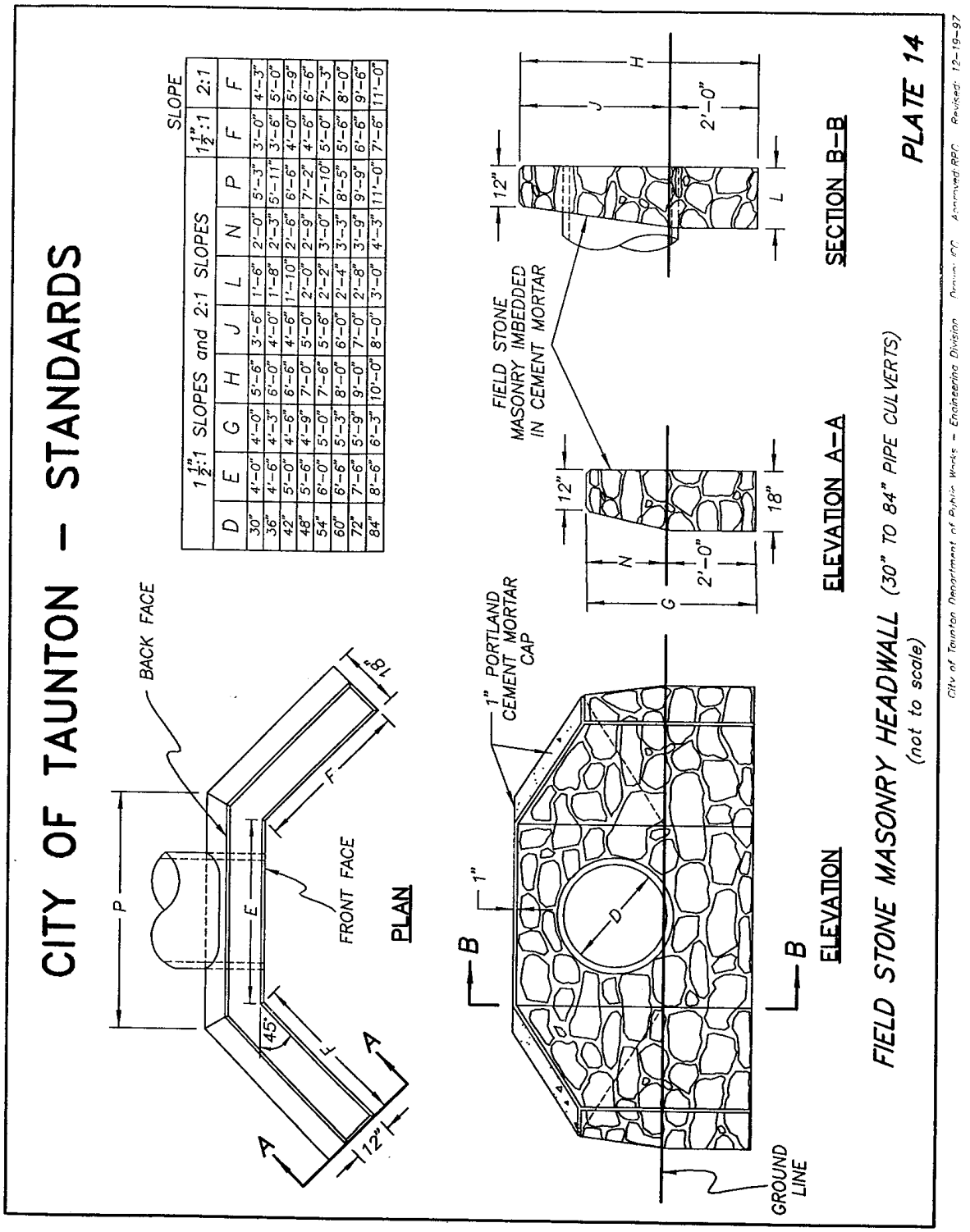
CASCADE FRAME & GRATE
(not to scale)

PLATE 11

City of Taunton Department of Public Works – Engineering Division Drawn: JCC Approved: RPC Revised: 12–19–97


CITY OF TAUNTON – STANDARDS
HEIGHTS
A
T
WIDTH
W
2'–0" 4'–0" 2'–4"
2'–6" 4'–6" 2'–6"
3'–0" 5'–0" 2'–8"
3'–6" 5'–6" 2'–10"
4'–0" 6'–0" 3'–0"
4'–6" 6'–6" 3'–2"
5'–0" 7'–0" 3'–4"
NOTE:
1) Concrete strength 4,000 PSI @ 28 days.
2) Cement: Portland Type II per ASTM C150.
3) Precast or other designs may be substituted with the approval of the Planning Board and the City Engineer.
4) Expansion joints to be placed 90' O.C. (max.) with intermediate construction joints placed at 30' O.C. (max.).
FINISHED GRADE
1'–0"
A
T
2'–0"
W
4
12
LOW RETAINING WALL
(not to scale)
PLATE 12
City of Taunton Department of Public Works – Engineering Division Drawn: JCC Approved: RPC Revised: 12–19–97


CITY OF TAUNTON – STANDARDS
SLOPE
1½":1 SLOPES and 2:1 SLOPES
1½":1
2:1
D E G H J L N P F F
30" 4'-0" 4'-0" 5'-6" 3'-6" 1'-6" 2'-0" 5'-3" 3'-0" 4'-3"
36" 4'-6" 4'-3" 6'-0" 4'-0" 1'-8" 2'-3" 5'-11" 3'-6" 5'-0"
42" 5'-0" 4'-6" 6'-6" 4'-6" 1'-10" 2'-6" 6'-6" 4'-0" 5'-9"
48" 5'-6" 4'-9" 7'-0" 5'-0" 2'-0" 2'-9" 7'-2" 4'-6" 6'-6"
54" 6'-0" 5'-0" 7'-6" 5'-6" 2'-2" 3'-0" 7'-10" 5'-0" 7'-3"
60" 6'-6" 5'-3" 8'-0" 6'-0" 2'-4" 3'-3" 8'-5" 5'-6" 8'-0"
72" 7'-6" 5'-9" 9'-0" 7'-0" 2'-8" 3'-9" 9'-9" 6'-6" 9'-6"
84" 8'-6" 6'-3" 10'-0" 8'-0" 3'-0" 4'-3" 11'-0" 7'-6" 11'-0"
BACK FACE
FRONT FACE
PLAN
ELEVATION
ELEVATION A–A
SECTION B–B
1" CHAMFER
#3 BARS @12"
1½" CLEAR
GROUND LINE
CONCRETE HEADWALL (30" TO 84" PIPE CULVERTS)
(not to scale)
PLATE 13
City of Taunton Department of Public Works – Engineering Division Drawn: JFC Approved: RPC Revised: 12-19-97


CITY OF TAUNTON – STANDARDS
SLOPE
1½":1 SLOPES and 2:1 SLOPES
1½":1
2:1
D E G H J L N P F F
30" 4'-0" 4'-0" 5'-6" 3'-6" 1'-6" 2'-0" 5'-3" 3'-0" 4'-3"
36" 4'-6" 4'-3" 6'-0" 4'-0" 1'-8" 2'-3" 5'-11" 3'-6" 5'-0"
42" 5'-0" 4'-6" 6'-6" 4'-6" 1'-10" 2'-6" 6'-6" 4'-0" 5'-9"
48" 5'-6" 4'-9" 7'-0" 5'-0" 2'-0" 2'-9" 7'-2" 4'-6" 6'-6"
54" 6'-0" 5'-0" 7'-6" 5'-6" 2'-2" 3'-0" 7'-10" 5'-0" 7'-3"
60" 6'-6" 5'-3" 8'-0" 6'-0" 2'-4" 3'-3" 8'-5" 5'-6" 8'-0"
72" 7'-6" 5'-9" 9'-0" 7'-0" 2'-8" 3'-9" 9'-9" 6'-6" 9'-6"
84" 8'-6" 6'-3" 10'-0" 8'-0" 3'-0" 4'-3" 11'-0" 7'-6" 11'-0"
BACK FACE
FRONT FACE
PLAN
45°
12"
1" PORTLAND CEMENT MORTAR CAP
FIELD STONE MASONRY IMBEDDED IN CEMENT MORTAR
ELEVATION
ELEVATION A–A
SECTION B–B
GROUND LINE
FIELD STONE MASONRY HEADWALL (30" TO 84" PIPE CULVERTS)
(not to scale)
PLATE 14
City of Taunton Department of Public Works – Engineering Division Approved RPD Revised: 12-19-97

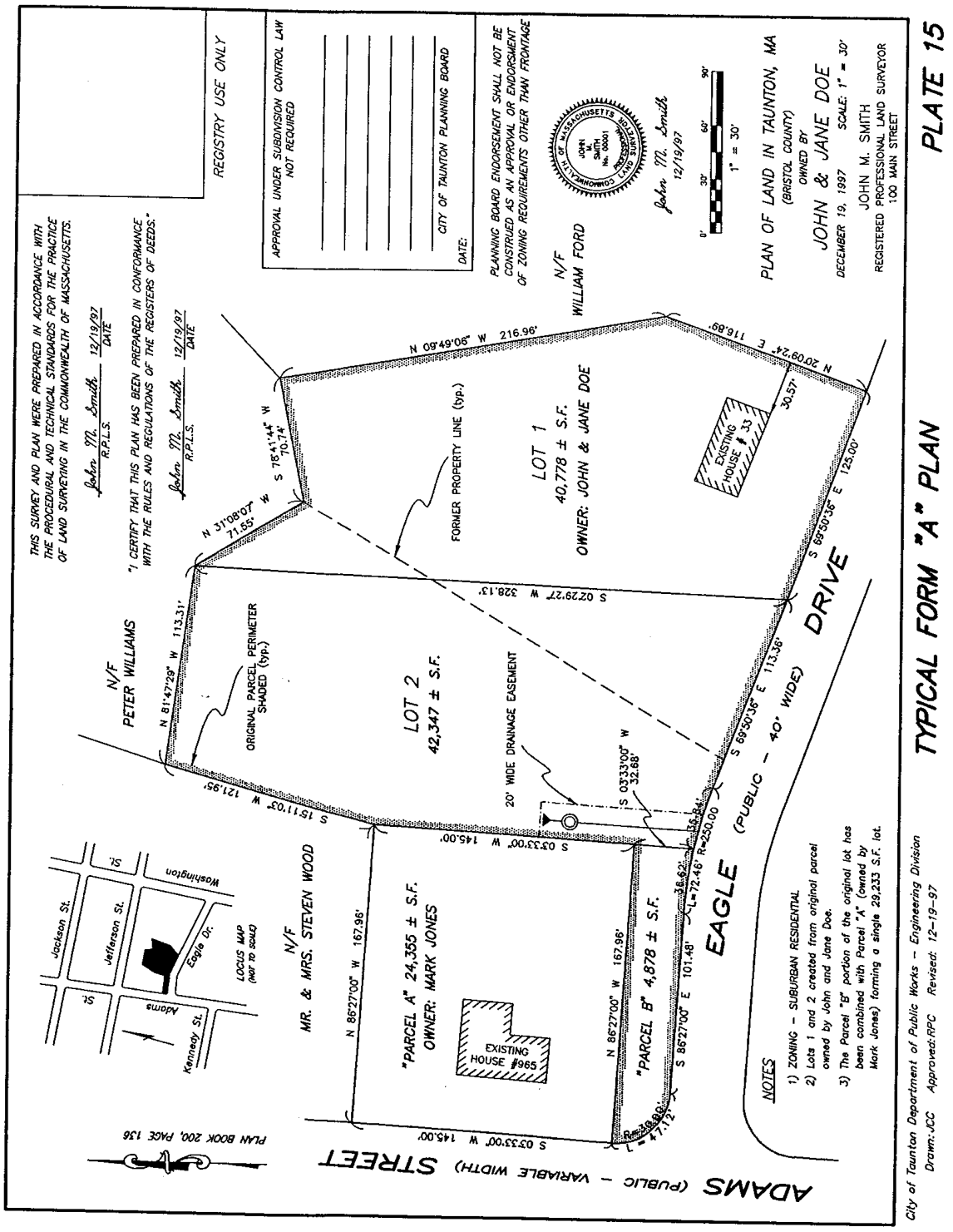


PLATE 15
TYPICAL FORM "A" PLAN
PLAN OF LAND IN TAUNTON, MA
(BRISTOL COUNTY)
OWNED BY
JOHN & JANE DOE
DECEMBER 19, 1997 SCALE: 1" = 30'
JOHN M. SMITH
REGISTERED PROFESSIONAL LAND SURVEYOR
100 MAIN STREET
REGISTRY USE ONLY
APPROVAL UNDER SUBDIVISION CONTROL LAW NOT REQUIRED
CITY OF TAUNTON PLANNING BOARD
DATE:
PLANNING BOARD ENDORSEMENT SHALL NOT BE CONSTRUED AS AN APPROVAL OR ENDORSMENT OF ZONING REQUIREMENTS OTHER THAN FRONTAGE
THIS SURVEY AND PLAN WERE PREPARED IN ACCORDANCE WITH THE PROCEDURAL AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING IN THE COMMONWEALTH OF MASSACHUSETTS.
John M. Smith R.P.L.S. 12/19/97 DATE
"I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS."
John M. Smith R.P.L.S. 12/19/97 DATE
N/F WILLIAM FORD
N/F PETER WILLIAMS
N/F MR. & MRS. STEVEN WOOD
LOT 1 40,778 ± S.F. OWNER: JOHN & JANE DOE
LOT 2 42,347 ± S.F.
"PARCEL A" 24,355 ± S.F. OWNER: MARK JONES
"PARCEL B" 4,878 ± S.F.
EXISTING HOUSE #33
EXISTING HOUSE #965
FORMER PROPERTY LINE (typ.)
ORIGINAL PARCEL PERIMETER SHADED (typ.)
20' WIDE DRAINAGE EASEMENT
N 09°49'06" W 216.96'
N 20°09'24" E 116.89'
S 89°50'36" E 125.00'
S 89°50'36" E 113.38'
S 03°33'00" W 32.68'
S 03°33'00" W 145.00'
S 15°11'03" W 121.95'
S 07°29'27" W 328.13'
N 31°08'07" W 71.65'
S 78°41'44" W 70.74'
N 81°47'29" W 113.31'
N 86°27'00" W 167.96'
S 86°27'00" E 101.48'
R=250.00
L=72.46'
R=250.00
L=7.72'
EAGLE DRIVE (PUBLIC - 40' WIDE)
ADAMS STREET (PUBLIC - VARIABLE WIDTH)
LOCUS MAP (not to scale)
Washington St.
Jackson St.
Jefferson St.
Eagle Dr.
Adams St.
Kennedy St.
PLAN BOOK 200, PAGE 136
NOTES
1) ZONING - SUBURBAN RESIDENTIAL
2) Lots 1 and 2 created from original parcel owned by John and Jane Doe.
3) The Parcel "B" portion of the original lot has been combined with Parcel "A" (owned by Mark Jones) forming a single 29,233 S.F. lot.
City of Taunton Department of Public Works - Engineering Division
Drawn: JCC Approved: RPC Revised: 12-19-97

ALLOCATION OF TOTAL AREA

	SMALL 25 UNITS OR LESS	MEDIUM 25 TO 99 UNITS	LARGE 100 UNITS AND UP
PLAY LOT (smaller children)	2,500 to 5,000 SQ. FT.	5,000 to 7,500 SQ. FT.	10,000 SQ. FT. or 1/4 ACRE
APPARATUS AREA (older children)	2,500 to 5,000 SQ. FT.	5,000 to 7,500 SQ. FT.	20,000 SQ. FT. or 1/2 ACRE
OPEN AREA (informal play and group games)	5,000 to 7,500 SQ. FT.	10,000 to 15,000 SQ. FT.	10,000 SQ. FT. or 1/4 ACRE
PAVED MULTIPLE COURT AREA (games, roller skating, etc.)	NOT NEEDED	7,500 SQ. FT.	10,000 SQ. FT. or 1/4 ACRE
OPEN SPACE (undesignated)	BALANCE OF TOTAL AREA		

IT IS SUGGESTED THAT DEVELOPERS BE ENCOURAGED TO LAY OUT AND EQUIP THESE AREAS, WHICH WILL ENHANCE THE VALUE OF THE PROPERTY, AND WILL ALSO AS A DRAWING CARD TO PROSPECTIVE PURCHASERS.

PLATE 16

City of Taunton Department of Public Works - Engineering Division Drawn: JPC Approved: RPC Revised: 12-19-97

DOCUMENT A00808

PROJECT UTILITY COORDINATION FORM

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Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

9/13/2023
Revision Date:

City/Town:	Project File #:	PUC Completed by:	Utility Pole Set:	
Taunton	608753	RAC	Taunton Municipal Lighting Plant	
Route/Street:	**Resident Engineer:**	**Mass DOT PM:**	**Scheduled Ad Date:**	**Total Poles Relocated:**
Route 138 (Broadway)		Janhavi Limaye	8/17/2024	47

9/9/2024
PRINTED

Consultant:	Contact:	Office #	Cell #	Email
Beta Group Incorporated	Matthew Shute	401-333-2382	401-230-7992	MShute@BETA-Inc.com

Utility Company	Contact	Office #	Cell #	Email	Scope, Budget, Duration Submitted		Reimbursement			Potential for District Initiated Early Relocation *		Utilities On Bridge/Structure		Utilities Underground (UG) /Aerial (OH)	
					Yes	No	Agreement	Non-Reimb'le	Notes	YES	NO	YES	NO	UG	OH
Taunton Municipal Lighting Plant	Joe Fernandes/ Tyler Arruda	(508)-824-5844		josephfernandes@tmlp.com tylerarruda@tmlp.com	x		x			x			x	x	x
Verizon	Karen Mealey/Evan Mcsorley	(774)-409-3160		karen.m.mealey@verizon.com evan.mcsorley@verizon.com	x		x			x			x	x	x
Comcast	Wendy Brown	(978)-848-5163		Wendy_Brown@comcast.com	x		x			x			x		x
Eversource Gas	Brendan Pitts	(508)-895-4818		brendan.pitts@Eversource.com		x			No conflicts per email 5-25-2021					x	

Utility Relocation Notes for MassDOT Contractor

Unless otherwise noted by Contract, the MassDOT Contractor is to provide the District Construction Office with 7 Calendar Days advance notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (for DBB Contracts) and/or Section 9 (of DB Contracts). Note: The durations included below do not include these lead-times. See Additional 'Important Basis notes for Contractor' - on last PUC Form page.

Additional notes:

Suggested Sequence of Relocation (Based on Consultant proposed construction staging)

The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the utilities listed below along with the designer and the City of Taunton. The information provided is the best available information prior to project advertisement.

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

9/9/2024
PRINTED

massDOT Massachusetts Department of Transportation Highway Division

	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	
					Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Should an AR be considered for the Contractor ?	
					Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent		
	C = Contractor	U = Utility Co.			Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility is	Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
Stage : 1	C		Contractor to notify all utilities 30 days prior to start of work. 'Contractor to prefrom clearing and grubbing/ tree trimming. 'Contractor to place new conduit and manhole.							
			UTILITY OPERATIONS - Aerial							
Task: 1			***TMLP -Electric/Fiber***							
	C		Massdot contractor needs to have survey layout completed to determine proper electric pole, anchor, manhole, and conduit locations prior to any electric utiity construction to commence. Any tree trimming and/or removal will need to be completed prior to TMLP commencement.	0	x			x		
		U	Lead time= 4wk.s notice to schedule Installation of electric poles, anchors, manholes, street lights, and conduit.	20	x			x		
		U	Installing wood poles and anchors	31	x			x		
		U	Trim trees to make room for installation of new electric overhead lines.	2	x			x		
		U	lead time= 3 weeks notice to schedule installation of overhead lines and equip. on new poles after new poles are installed.	15	x			x		
		U	Installing overhead lines and equipment on new poles.	45	x			x		
		U	Lead time = 3 weeks notice to schedule splicing of fiber optic cables on new poles	15	x			x		
		U	Splicing TMLP Fiber Optic cables	3	x			x		
		U	lead time = 3 weeks notice to schedule removal of replaced overhead lines and equip. from old poles	15	x			x		
		U	Removal of replaced overhead electric and fiber optic lines.	25	x			x		
		U	lead time = 4 weeks notice to schedule excavation and installation of new underground electric facilities.	20	x			x		
		U	Excavation and construction of underground electric utility relocations	15	x			x		
		U	Installing/replacing underground primary and secondary cables and equip. from manholes to new riser poles.	40	x			x		
		U	Removal of old underground conduits from manholes to old riser poles.	4	x			x		
		U	lead time = 3 weeks notice to schedule removal of old poles once all utilties have removed their plant from poles	15	x			x		
		U	Excavation and construction of underground electric utility relocations	25	x			x		
			Sub-Total	**290**						
Task: 2			***Comcast***							
		U	Build new strand and cable on new poles.	20	x			x		
		U	Splice in new equipment and activate.	5	x			x		
		U	Move Fibers from old pole line to new pole line.	5	x			x		
		U	Wreckout old strand and cable.	4	x			x		
			Sub-Total	**34**						
Task: 3			***Verizon***							
		U	Verizon Line set 19 new jointly owned poles.	16	x			x		
		U	Elco to place 22 new jointly owned poles	0	x			x		
		U	Verizon Line to place all new anchords strand, & guying	40	x			x		
	c		MASSDOT to place new conduit and manhole	0	x			x		
		U	Verizon to inspect contract work	44	x			x		
		U	Verizon to rod and rope conduit	13	x			x		
		U	Verizon to place new cable and transfers	53	x			x		
		U	Splice new cables	80	x			x		
		U	splice to trim out old cables	26	x			x		
		U	remove old copper fiber cables	73	x			x		
		U	verizon to remove strand and guying	12	x			x		
		U	Verizon to remove poles	14	x			x		
			Sub-Total	**371**						
Task: 4			***Eversource Gas***							
		U	**Adjust gas gates	1	x			x		
			Sub-Total	**1**						

IMPORTANT BASIS NOTES - FOR CONTRACTOR

1 Unless otherwise specified in the MassDOT Construction Contract, or unless specifically noted within this PUC Form, these durations (herein) are based upon the Contractor providing *unimpeded access* to the Utility company to perform Utility relocations (see Note 5 - Access).

	RESPONSIBLE PARTY	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
	C = Contractor U = Utility Co.			Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent	Potential Access Restraint (Yes/No)	Reason/Note (optional)
				Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility is	Contractor and Utility are working on-site - but NOT in the same vicinity		
2		"Concurrent Utilities" operations noted herein, are to signify those Utility Company operations that can be worked concurrently (e.g. Utility A and Utility B work on-site together) - MassDOT and the Contractor are to prepare NTPs to Utilities accordingly.							
3		"Potential Access Restraints" noted within this PUC Form are for planning purposes. See MassDOT Contract for Contractual Access Restraints (refer to Subsections 8.02, 8.03, and/or 8.06 for Design Bid Build Contracts and Volume II Section 9 for Design Build Contracts).							
4		Utility non-work periods - For planning purposes, the durations above contain some non work days (contingency) for New England conditions (precipitation, high temperatures, low temperatures, snow, ice). Gas line work however, typically has a seasonal restriction and can NOT be installed from 15-November to 15-March. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-March. The Contractor shall (and the CTD plan) reflect this calendar restriction within the schedule (unless otherwise note).							
5		Access - Unless otherwise noted in the Contract, and in addition to the 'enabling' notes above, the Contractor must provide safe and unimpeded access (for trucks, lifts, cranes, etc.) to the Utilities, to allow for the proposed relocation(s) - including but not limited to snow removal, clearing and grubbing, guard rail removal, barrier removal, tree removal, and grading.							
6		For all MassDOT construction contracts issued after January 2014, the new Utility Coordination/documentation specification is required. This is Section 8.14 in Design-Bid-Build Contracts (see Design-Build index reference for applicable section #).							
7		Prior to starting any and all enabling work for Utilities, the Contractor is to plan in advance with submittals and approved durations.							
8		* Potential District Initiated Early Utility Relocation - if noted herein, the District reserves the right to initiate early utility relocation in advance of the Contract NTP. In submitting a bid price and in the development/basis of the Baseline Schedule, the Contractor shall not plan the Work with the potential benefit of any form of 'early utility relocation.' As a requirement of the Baseline submission, unless otherwise noted in this Specification, the earliest that the first Utility company is to receive the 30 days advance notification to mobilize to the site, will be 7 calendar days after the pre-construction meeting and never sooner than 7 days after the Contract NTP.							
9		** Assumed durations							

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Temporary Traffic Control

Typical Details and
Massachusetts Guidelines
for MassDOT, Municipalities,
Utilities, and Contractors

SHEET INDEX (1 OF 3)

SHEET INDEX (2 OF 3)

STATIONARY OPERATIONS (CONT.) **PAGE**

MOBILE OPERATIONS

SHEET INDEX (3 OF 3)

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-questing, 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.

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.

Other devices, such as flashing lights, flags, delineators, temporary lighting, and portable changeable message signs (PCMS) can be used to provide additional emphasis and visibility.

Workers must protect themselves by being alert to their work situation, wearing safety vests and hard hats, and by facing traffic whenever possible.

Work vehicles can also add protection when they are equipped with truck mounted attenuators, rotating beacons, flashing lights, flashing arrow boards, etc. and are parked between workers and oncoming traffic. However, workers should not position themselves between two closely parked vehicles. No private personal vehicles are allowed within the work site.

PLANNING GUIDELINES

Decisions regarding selection of work area traffic control devices require a knowledge and understanding of the specifics of each work zone. As there may be vast differences between situations, three main variables need to be considered prior to determining the need for, or the selection of, traffic control devices: 1) location of work, 2) type of roadway, and 3) speed of traffic.

Compiling information about these variables will help with planning a safe work area control. Each of these variables is explained below.

Location of Work

The choice of traffic controls needed for a short-term construction, maintenance, or utility operation depends upon the work zone's location. As a general rule, the closer the active work site is to the roadway, the more control devices are needed. Work can take place:

- Away from the shoulder or edge of pavement. No special devices are needed if work is confined to an area 15 or more feet from the edge of the shoulder. A general warning sign, such as ROAD WORK AHEAD, should be used if workers and equipment must occasionally move closer to the roadway.
- On or near the shoulder/ edge of pavement. This area should be signed as if work were on the road itself, since it is part of the roadway users' recovery area. Advance warning and operational signs are needed, as well as channelization devices to direct traffic and keep the work area visible to roadway users.
- On the median of a divided highway. Work in this location may require traffic control in both directions of traffic. Advance warning and channelization devices should be used if the median is narrow.
- On the roadway. This condition requires detailed protection for workers and sufficient warning to roadway users. Advance warning must provide a general message that work is taking place as well as information about specific hazards and specific actions the roadway user must take.

TYPE OF ROADWAY

The characteristics of the roadway also have an important influence on the selection of work area traffic control. The roadway, itself, may present special hazards. You should plan for maximum protection, using the worst hazard present as your guide to signing the work area. Some general considerations are described below for road conditions.

One-way roads: A one-way road requires signage on both sides of the road if it carries two or more lanes in one direction, ensuring roadway users in all lanes are alerted and informed.

Two-way roads:

- **Undivided:** Two-way, undivided roads will usually require controls for both directions of traffic. When the active work site is well off the roadway, controls for the opposite lane may be eliminated.
- **Divided:** Work on divided multi-lane roadways can often be handled as work along a one-way road (i.e. signs are provided along both sides of the roadway along the direction affected). If the work is in the median, both directions of traffic must be controlled, and both approaches should be double signed (i.e. have all 3 advance warning signs on both sides of each direction).

EFFECTS OF SPEED ON WORK ZONES

Speed is an important consideration in the use of work area traffic control devices. As a general rule, the greater the speed of traffic approaching a work area, the greater the size, number, and spacing of control devices.

Size. The standard size for most warning signs is 36 x 36 inches on conventional roadways and 48 x 48 inches on freeways and expressways. Signs larger than the standard 36 x 36 inches may be desirable on high-speed conventional roads.

Position. Install signs far enough in advance of the work area so the roadway users have time to react to them (see charts associated with diagrams for spacing).

OTHER FACTORS

Sight Obstructions. To ensure safety, work areas must be visible. Assess the placement of the temporary traffic control devices by driving through the area, and determine if the devices can be easily seen and provide sufficient time for roadway users to react in a safe manner. Extra precaution should be enacted in areas where horizontal or vertical curves may obstruct a roadway user's clear view of road activities ahead.

Police/Flaggers. It should be noted that the MUTCD does not require police/flaggers for stationary setups. If police/flaggers are used, a police/flagger ahead sign should be used in advance of any point where the police/flagger is stationed to control road users.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL

1. PLAN YOUR WORK

Inspect location of work area and its surroundings.

Analyze:

- Location of work in relation to the traveled way, intersecting road-ways, driveways, and sight distances;
- Type of roadway and traffic involved; and
- Volume and speed of traffic.

Meet and discuss the work and necessary traffic control with the crew.

Study representative illustrations in this guide to develop a temporary traffic control plan (TTCP).

Other Considerations:

- Base your traffic control plan on the premise that all roadway users are unfamiliar with the area.
- The closer the work area location is to traffic, the more controls are needed.
- Plan for maximum protection.
- Select and inspect the temporary control devices needed (including all warning signs), if they are not in good condition, REPLACE THEM!
- Then collect and transport them to the work site.
- Determine their proper placement.
- Install signs and other traffic control devices prior to allowing personnel or equipment onto the roadway.
- Make sure signs are reflective, accurate, clean, and meet specifications. Completely cover any existing permanent signs that will conflict with the messages of the new work area control signs.

2. INSTALLING/REMOVING TEMP. TRAFFIC CONTROL DEVICES

Care must be exercised when installing and removing temporary traffic control (TTC) devices. The traffic control needed to perform the operation safely is dictated by the location on the roadway the operation will occur: in a shoulder or a lane, in the left lane or right, etc. In all cases, installing TTC begins and ends as a mobile operation.

A shadow vehicle with a truck mounted attenuator (TMA) shall be used to protect workers installing and removing TTC devices on all roadways with a posted speed limit of 45 MPH or greater as directed by the engineer. TTC devices shall not be installed or removed from a shadow vehicle with a TMA. TTC devices shall be installed or removed from a work operation vehicle only and a shadow vehicle with a TMA shall be used to protect the workers installing or removing the devices.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL (CONT.)

3. INSTALL TRAFFIC CONTROL DEVICES AT WORK SITE

FOR LOWER SPEED (≤ 40 MPH) ROADWAYS:

1) All devices shall be installed in order with the flow of traffic.

2) Where one direction of traffic is being affected, the first sign installed should be the sign farthest from the work site, and on the same side as the work.

3) Where two directions of traffic are affected, install signs for opposing traffic first, starting with the sign farthest from the work area. When signs for opposing traffic have been installed, install signs on the same side as the work area, again beginning with the sign farthest from the active work site.

4) Once signs are in place, other traffic control devices shall be installed in the same manner as the signs.

FOR HIGHER SPEED (≥ 45 MPH) ROADWAYS:

1) All devices shall be installed in order with the flow of traffic.

2) Install all advance warning signs, beginning with the ROAD WORK XXX (W20-1) sign and ending with the END ROAD WORK/DOUBLE FINES END (MA-R2-10E) sign.

3) Install all signs beginning with the opposite side which will be closed (for a right lane closure; first, install all signs on the left side (shoulder) and then install all signs on the right side (shoulder). No signs shall be erected on the roadway unless delineated by traffic control devices.

4) If required, install shoulder taper as the mobile operation advances.

5) Install arrow board on the shoulder prior to the merging taper or as close to the beginning of the merging taper as possible.

6) Install channelizing devices to form a merging taper. Use of a shadow vehicle with a TMA during installation is required on roads with speed limits of 45 MPH or greater or as directed by the Engineer.

7) Install traffic control devices along the buffer space at the appropriate spacing.

8) Continue placing devices along the work space at the appropriate spacing.

9) Install devices for the termination area as necessary.

10) Place the shadow vehicle with a TMA in advance of the first work crew or hazard approached by motorists. Multiple shadow vehicles may be required based on the number of lane and shoulder closures implemented.

4. INSPECT WORK AREA SIGNING AND CONTROL DEVICES

1) Assess the placement of the temporary traffic control devices by driving through the work area. All approaches to the work zone should be checked.

2) Ensure roadway users will have sufficient time to read signs and react in a safe manner.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL (CONT.)

3) Check visibility of entire work area. If approaching roadway users can't see the work area well, or if they can't see ahead to traffic that may already be queued on the approach because of the work, additional traffic control devices should be deployed.

4) Check to ensure the proper temporary traffic control devices are positioned to protect workers from traffic (where possible).

5) Ensure all workers wear safety vests, hard hats, and all other necessary safety equipment. All worker safety gear should be in good condition. All reflective gear should be clean and highly visible in the dark.

6) Record in the log book the number and location of all signs and devices.

Considerations:

- Work area signs should never be blocked from view or obscured by vegetation, existing signs, or other obstructions.
- Flags, flashing lights, and edge line traffic cones can be used to improve visibility.

5. REMOVE TRAFFIC CONTROL DEVICES AT WORK SITE

All workers and equipment should be clear from work site BEFORE removing signs and other devices.

FOR LOWER SPEED (≤ 40 MPH) ROADWAYS:

1) Remove signs and other devices within the delineated area when work is complete.

2) Remove other traffic control devices in the reverse order in which they were installed

3) Remove signs in the reverse order in which they were installed (i.e. sign closest to the work area to be removed first).

4) When the operation is complete, uncover any existing permanent signs covered in Step 2.

5) Record in the log book the time at which the signs were removed.

FOR HIGHER SPEED (≥ 45 MPH) ROADWAYS:

All TTC devices for a stationary lane closure on a multi-lane roadway, except advance warning signs, should be removed against the flow of traffic in the following sequence:

1) Remove the channelizing devices starting from the end of the activity area working back to the widest part of the merging taper.

2) A shadow vehicle with TMA shall be positioned to protect workers removing devices and work backwards as the setup is removed from the roadway.

PROCEDURES FOR WORK AREA TRAFFIC CONTROL (CONT.)

3) Place the removal vehicle on the shoulder, and remove the channelizing devices from the merging taper by hand onto the work vehicle.

4) Remove the arrow board once traffic is clear and it is safe to do so.

5) Circle back and moving with the flow of traffic, remove the advance warning signs starting with the opposite side from previous lane closure first.

6) At no time shall workers run across the multilane roadway to remove signs on both sides of the road simultaneously.

7) Record in the log book the time at which the signs were removed

RAMP FACILITIES

At all times it is necessary to control the on and off-ramp traffic during the installation and breakdown of traffic control devices. Use of temporary traffic slow-downs or rolling roadblocks is recommended to allow for the safety of workers handing temporary traffic control devices on ramp facilities. A shadow vehicle with a TMA shall be used to protect the workers installing or removing the devices. At no time shall the work operation vehicle be used as the shadow vehicle with the TMA.

USE OF THIS GUIDE

Illustrations showing minimum standards for short-term construction, maintenance, and utility operations are arranged in this guide by type of operation. The users of this guide should compare all illustrated examples and examine their differences. After gathering information about the work zones using the general guidelines as outlined, proceed as follows:

1) Turn to the Index. Consider the type of operations and the type of roadway upon which work will occur.

2) Select the figure that most closely matches the conditions where you plan to work. Remember that all diagrams represent minimum standards.

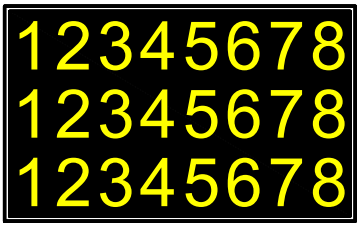
3) Read the title of the illustration to ensure that it is appropriate to your location. Study the layout of traffic control devices and read all notes.

4) Consult the appropriate tables, as directed on each illustration to determine taper length and proper spacing of signs. Notice that distances change when speeds change. Also note that these are guidelines, only, and they must be adapted to your specific work area.

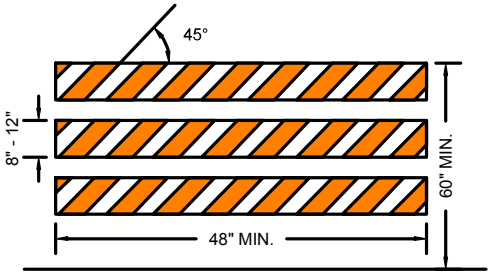
5) Use the **"PROCEDURES FOR WORK AREA TRAFFIC CONTROL"** for assistance in completing all necessary steps to provide effective and safe work area traffic control.

massDOT Massachusetts Department of Transportation Highway Division PAGE 10	Work Zone Safety Standard Details and Drawings	FIGURE 1 TYPICAL TRAFFIC CONTROL DEVICES NOT TO SCALE

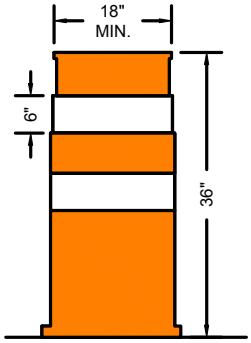
SIGN



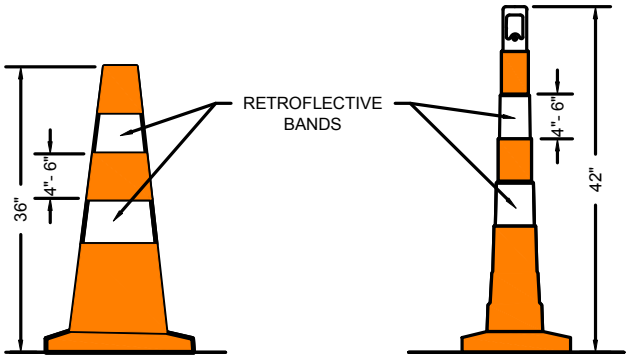
PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)



TYPE III BARRICADE

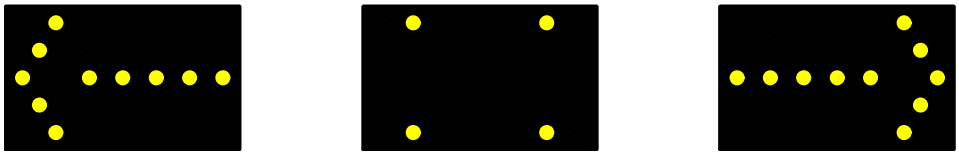


DRUM



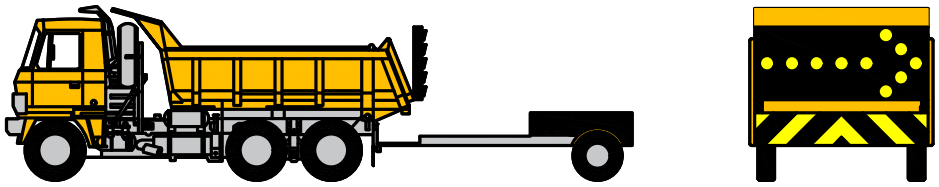
CONES

Cones may be used for all daytime operations. For night work, drums should be used to form the taper(s) and cones can be used along the tangent section of the work setup.



LEFT CAUTION RIGHT

ARROW BOARD (WITH MODE)



TRUCK MOUNTED ATTENUATORS

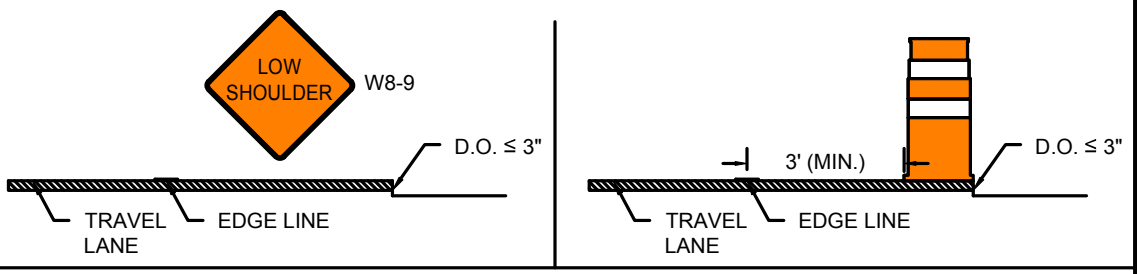
Truck Mounted Attenuators (TMA) shall be positioned between the start of the work area and the end of the designated buffer zone. The TMAs are to be positioned in each temporarily closed lane. This includes shoulders (≥8 feet) whether combined with a travel lane closure or being closed alone. These TMA conditions are required on roadways with speeds of 45 MPH or greater. TMAs can be used on other roadways at the discretion of the engineer. TMAs shall be used for the deployment and removal of all traffic control devices, including all advance warning signs.

SHORT-TERM PAVEMENT EDGE DROP-OFFS

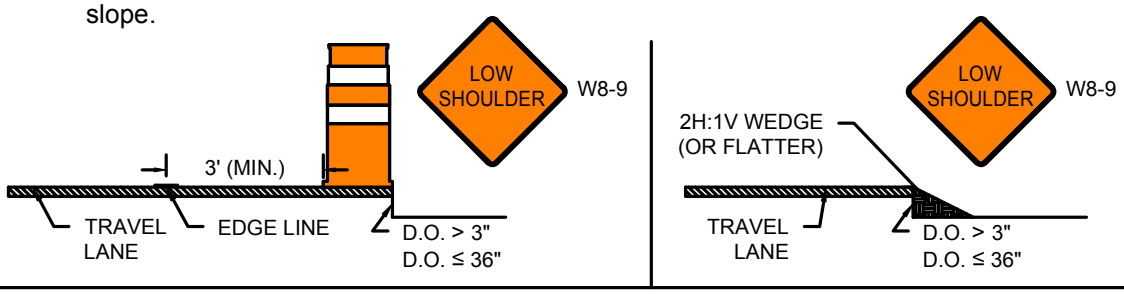
Note that this guidance is adopted from the Roadside Design Guide*, 4th Edition.*

Pavement drop-offs may occur during paving, excavation, and other construction activities. Drop-offs create hazards for vehicles if not properly mitigated. The following applies for all roads with speed limits greater than 30 mph; for roads with speed limits of 30 mph or less, treatments for pavement edge drop-offs are at the discretion of the Engineer. Drop-offs between adjacent, open travel lanes should not exceed 2", and any drop-off in excess of 3" should not be left unattended without one of these mitigation measures applied.

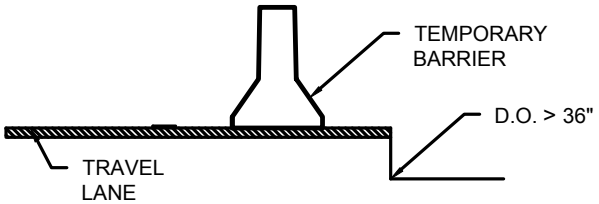
- Shoulder drop-offs 3" or less adjacent to a shoulder or active travel lane should be mitigated by:
  - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment; or
  - ✓ The placement of drums on the traffic side of the drop-off.



- Shoulder drop-offs greater than 3" but less than or equal to 36" should be mitigated by:
  - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment and the placement of drums on the traffic side off the drop-off, offset at least 3' from the travel lane; or
  - ✓ A W8-9 (LOW SHOULDER) sign in advance of and at regular intervals throughout the treatment and the placement of a temporary wedge of material along the face of the drop-off. The wedge should consist of stable material placed on a 2H:1V or flatter slope.



- Shoulder drop-offs greater than 36" must be protected by temporary barrier.



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Work Zone Safety Standard Details and Drawings

FIGURE 2
PAVEMENT EDGE
DROP-OFF GUIDANCE
NOT TO SCALE

massDOT Massachusetts Department of Transportation Highway Division PAGE 12	Work Zone Safety Standard Details and Drawings	TYPICAL DEVICE SPACING

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	320	305	20	55
45-55	500 / 1000 / 1000	660	495	40	40
60-65	1000 / 1600 / 2600	780	645	40	50

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

MINIMUM SPACING OF ADVANCE WARNING SIGNS FOR URBAN ROADWAYS	
ROAD TYPE	DISTANCE BETWEEN SIGNS
URBAN (LOW SPEED)	100 FT
URBAN (HIGH SPEED)	350 FT

NOTES

1. 40 FT = 10 FT PAVEMENT MARKING + 30 FT SKIP

LEGEND


WORK ZONE


CHANNELIZATION DEVICE

FLASHING ARROW BOARD


PORTABLE CHANGEABLE MESSAGE SIGN


TRUCK MOUNTED ATTENUATOR

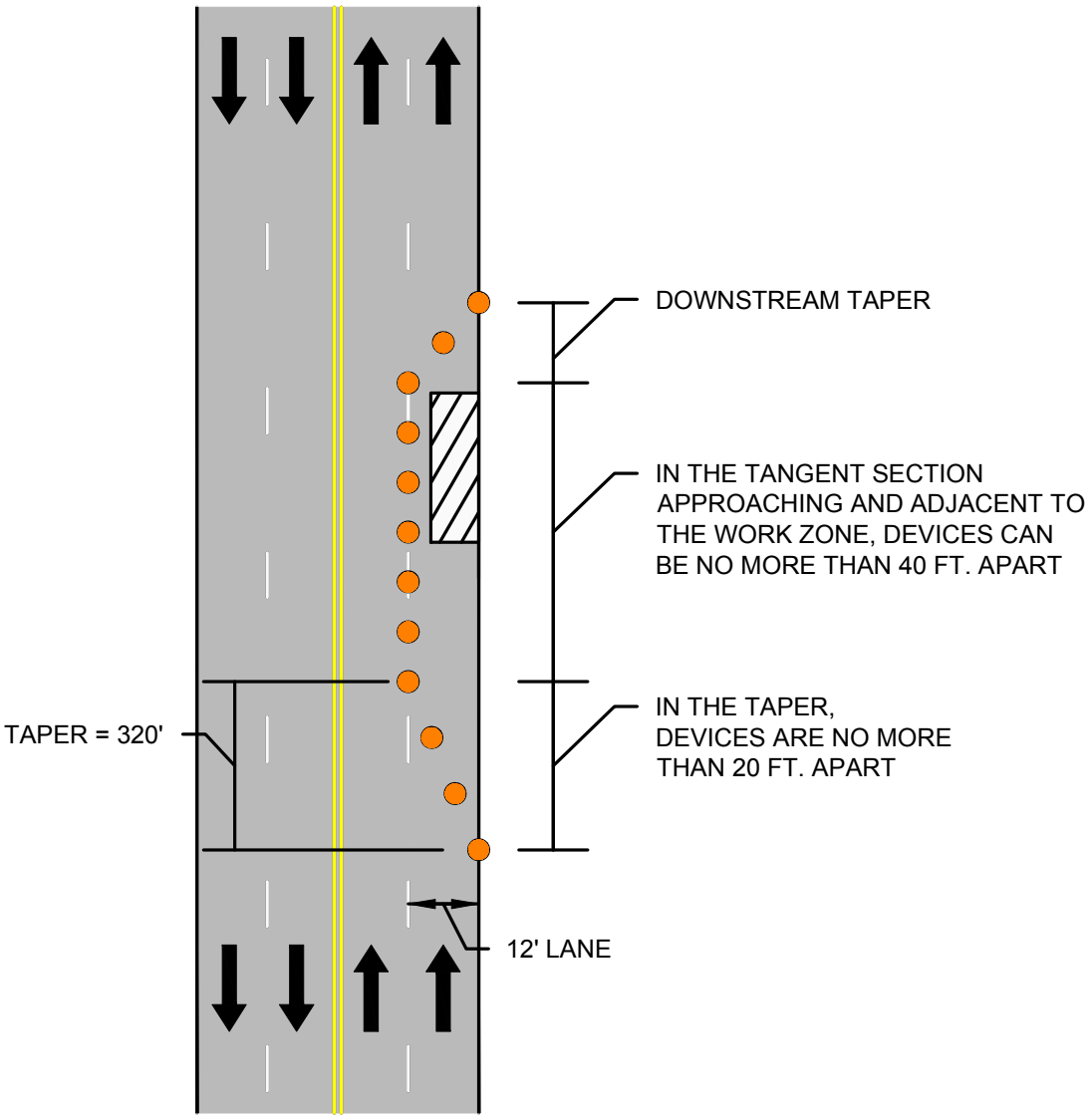
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 13	Work Zone Safety Standard Details and Drawings	FIGURE 3 TYPICAL DEVICE SPACING (AT 30 MPH)

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.

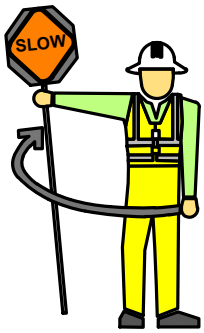
TO STOP TRAFFIC

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.



TO LET TRAFFIC PROCEED

Proper Flagging Stations

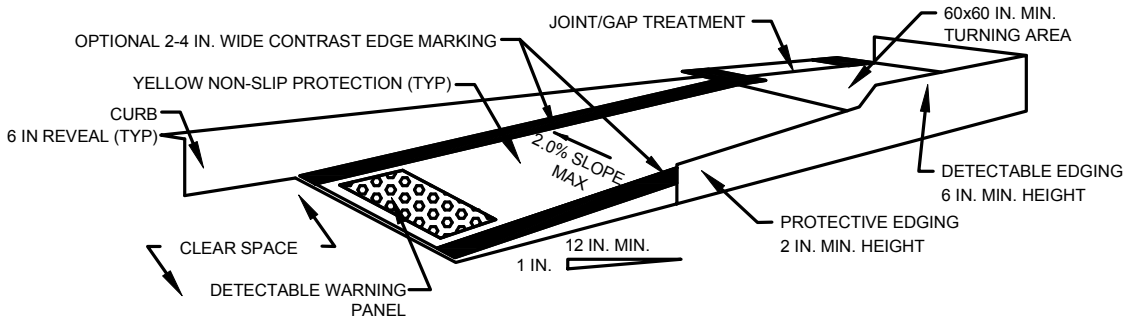
- Good approach sight distance.
- Highly visible to traffic.
- Stand alone away from other machinery and people.
- Stand on right edge of pavement or shoulder- proceed to centerline only when first vehicle has come to stop.
- Have a good escape route.

TO ALERT AND SLOW TRAFFIC

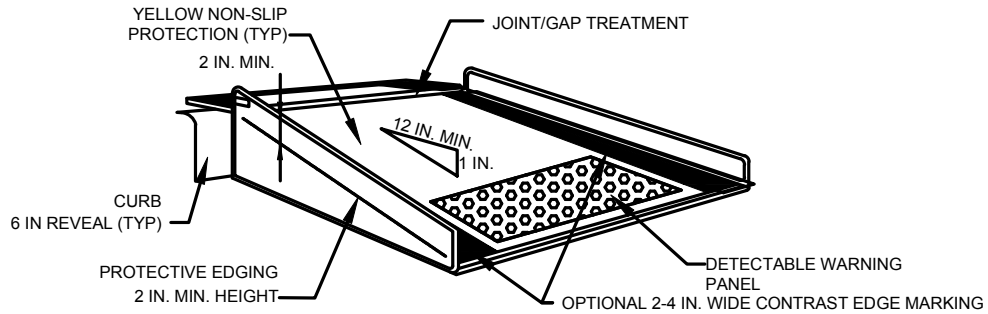
Proper Advance Warning Signs

- 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.

massDOT Massachusetts Department of Transportation Highway Division PAGE 16	Work Zone Safety Standard Details and Drawings	FIGURE 4 TYPICAL PEDESTRIAN DEVICES (1 OF 2) NOT TO SCALE



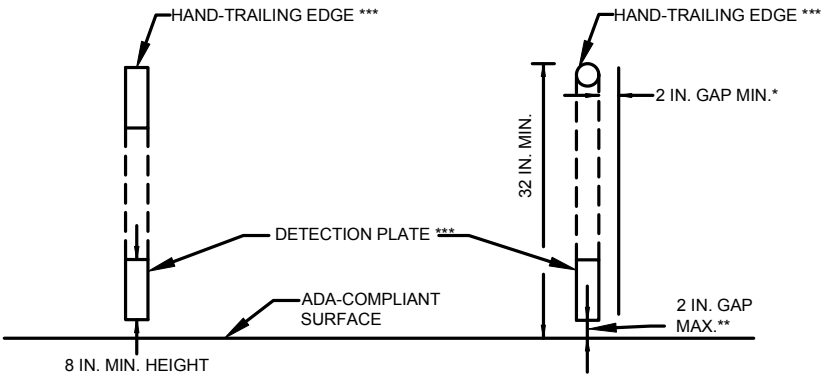
TEMPORARY CURB RAMP-PARALLEL TO CURB



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

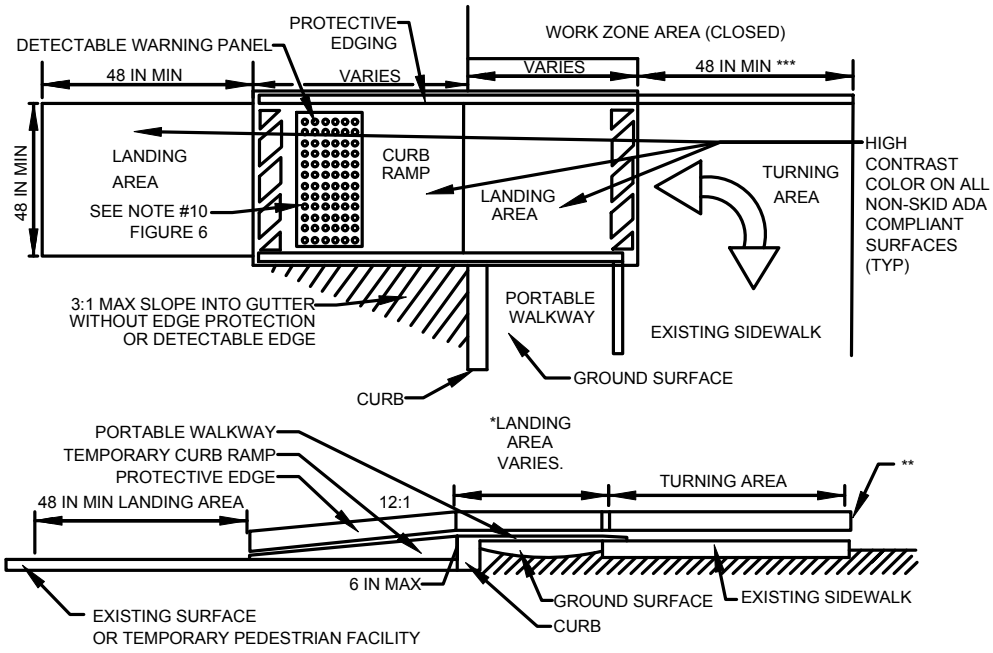
1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE, AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. PROTECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.



CROSS SECTION VIEW

PEDESTRIAN CHANNELIZING DEVICE

* THERE SHALL BE A 2 INCH GAP BETWEEN THE HAND-TRAILING EDGE AND ITS SUPPORT.
** A MAXIMUM 2 INCH GAP BETWEEN THE BOTTOM OF THE BOTTOM RAIL AND THE SURFACE MAY BE USED TO PROVIDE DRAINAGE.
*** THE HAND-TRAILING EDGE AND DETECTION PLATE SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF THE PATH SUCH THAT A PEDESTRIAN USER WITH A LONG CANE CAN FOLLOW IT.



TEMPORARY CURB RAMP

* LANDING AREA USED TO OVERLAP NON-ADA COMPLIANT SURFACES.
** DETECTABLE EDGE REMOVED IF A CONTINUOUS SIDEWALK.
*** 60 IN. IF AN OBSTRUCTION IS AT BACK OF SIDEWALK.

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Work Zone Safety Standard Details and Drawings

FIGURE 5
TYPICAL PEDESTRIAN DEVICES
(2 OF 2)
NOT TO SCALE

massDOT Massachusetts Department of Transportation Highway Division PAGE 18	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED WORK NEAR CURVE

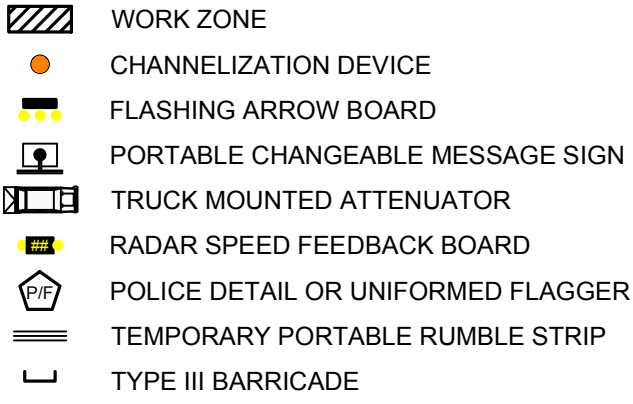
POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	50	100	20	30
45-55	500 / 1000 / 1000	100	150	40	20

* 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



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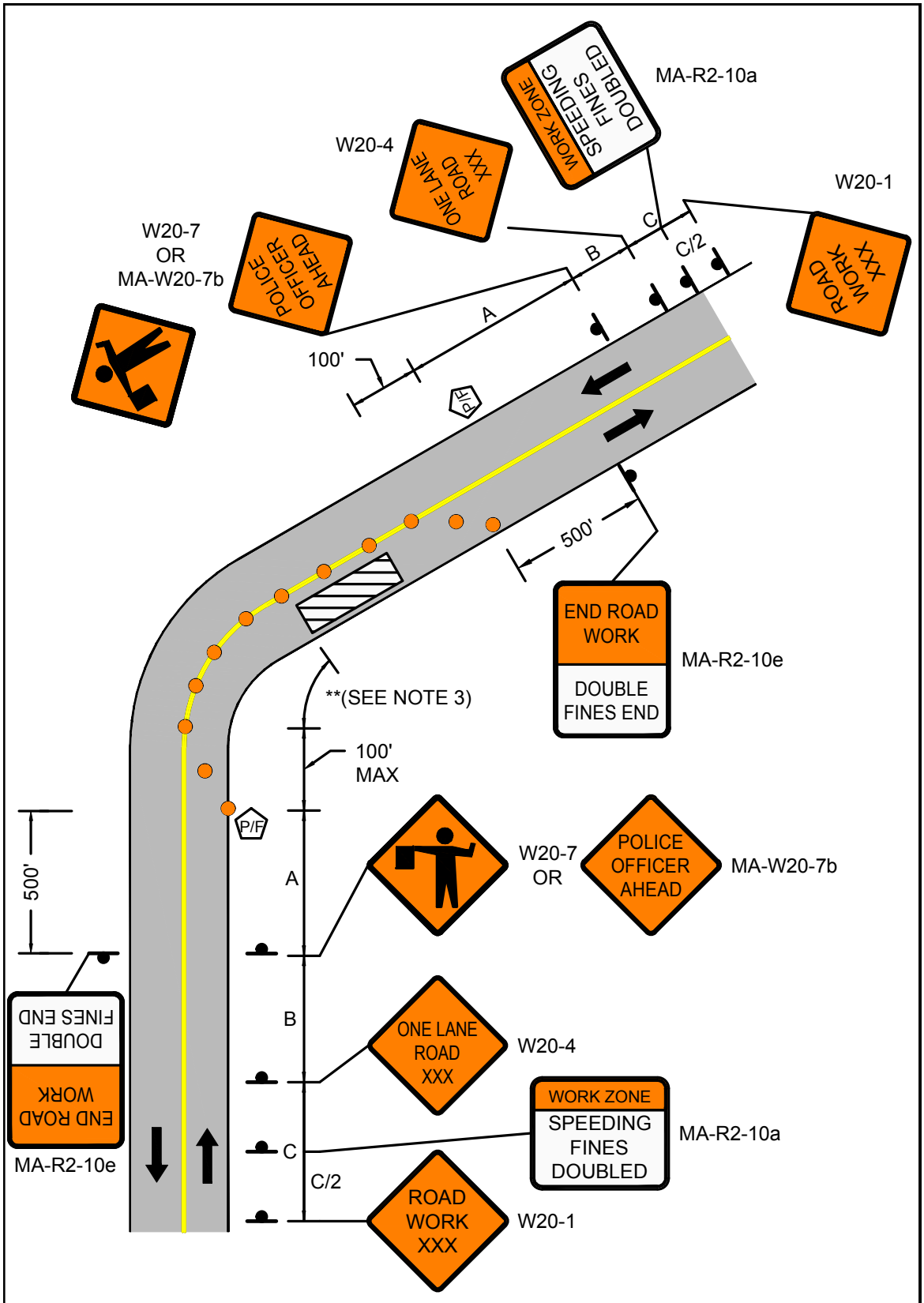


massDOT Massachusetts Department of Transportation Highway Division PAGE 19	Work Zone Safety Standard Details and Drawings	FIGURE 6 STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED WORK NEAR CURVE

massDOT Massachusetts Department of Transportation Highway Division PAGE 20	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	50	100	20	30
45-55	500 / 1000 / 1000	100	150	40	20

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED REGULATORY OR WORK ZONE SPEED	SEPARATION BETWEEN RUMBLE STRIPS
36-mph to 55-mph	15-feet
35-mph and under	10-feet

NOTES

1. IF POLICE DETAIL/UNIFORMED FLAGGER SUPPORT IS REQUIRED, PROVIDE TWO UNITS.
2. MA-R2-10a LOCATED AT C/2.
3. ** OPTIONAL AT THE ENGINEER'S DISCRETION.
4. *** SHALL BE DEPLOYED IF RUMBLE STRIPS ARE PRESENT.

LEGEND


WORK ZONE


CHANNELIZATION DEVICE

FLASHING ARROW BOARD


PORTABLE CHANGEABLE MESSAGE SIGN


TRUCK MOUNTED ATTENUATOR

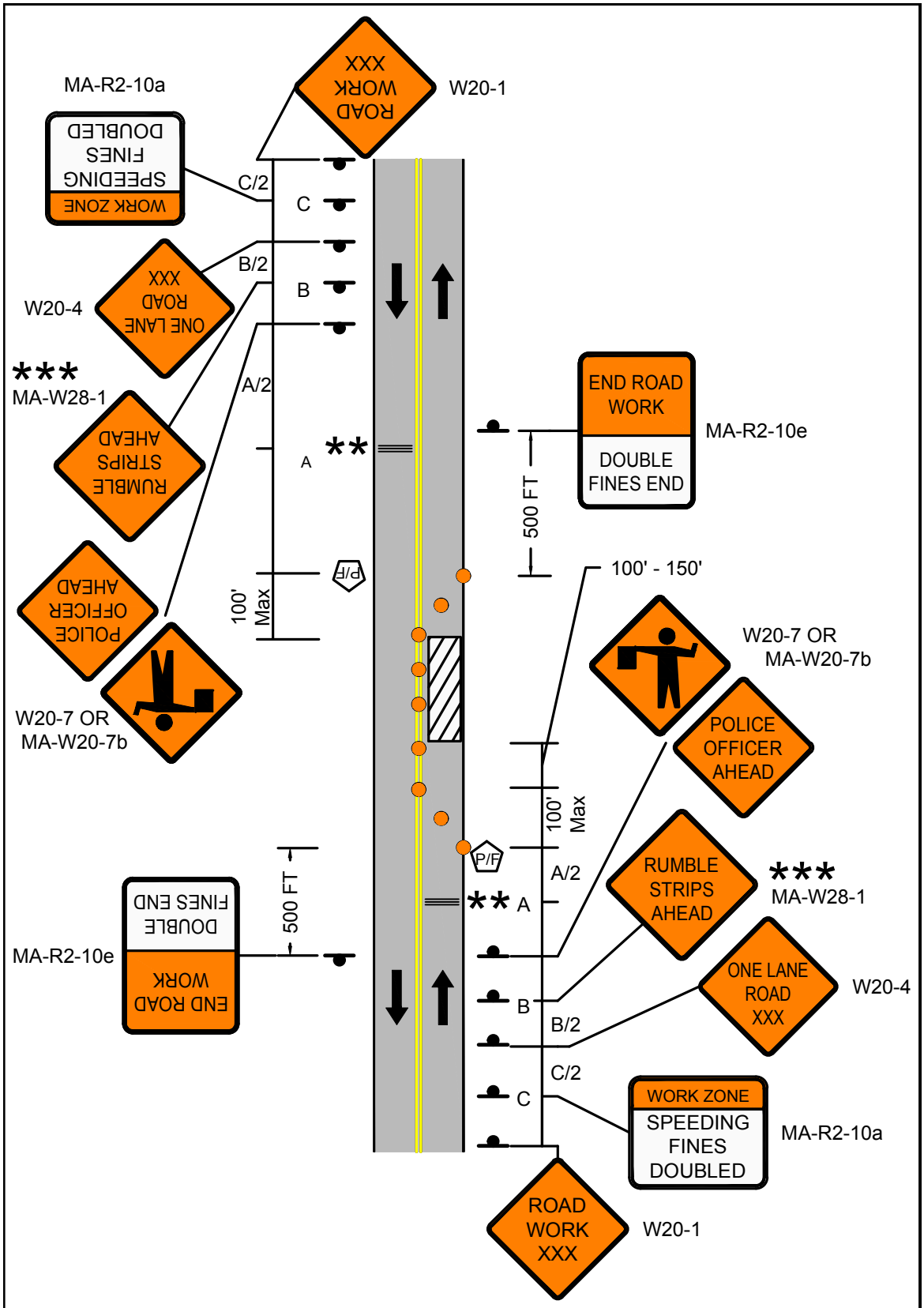
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



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PAGE 21

Work Zone Safety Standard Details and Drawings

FIGURE 7
STATIONARY OPERATIONS
TWO LANE UNDIVIDED ROADWAY
HALF OF ROADWAY CLOSED

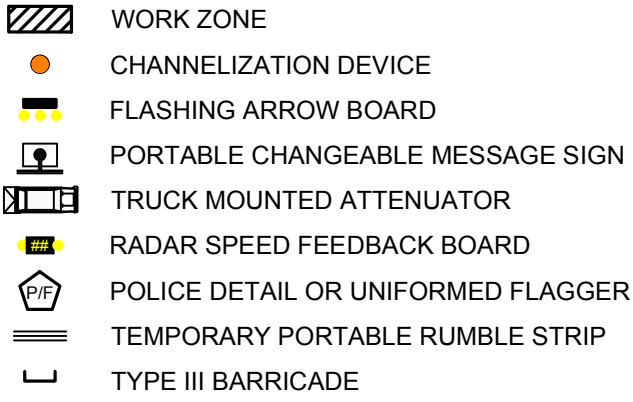
massDOT Massachusetts Department of Transportation Highway Division PAGE 22	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY SHOULDER CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES
1. MA-R2-10a at C/2 and A/2.

LEGEND



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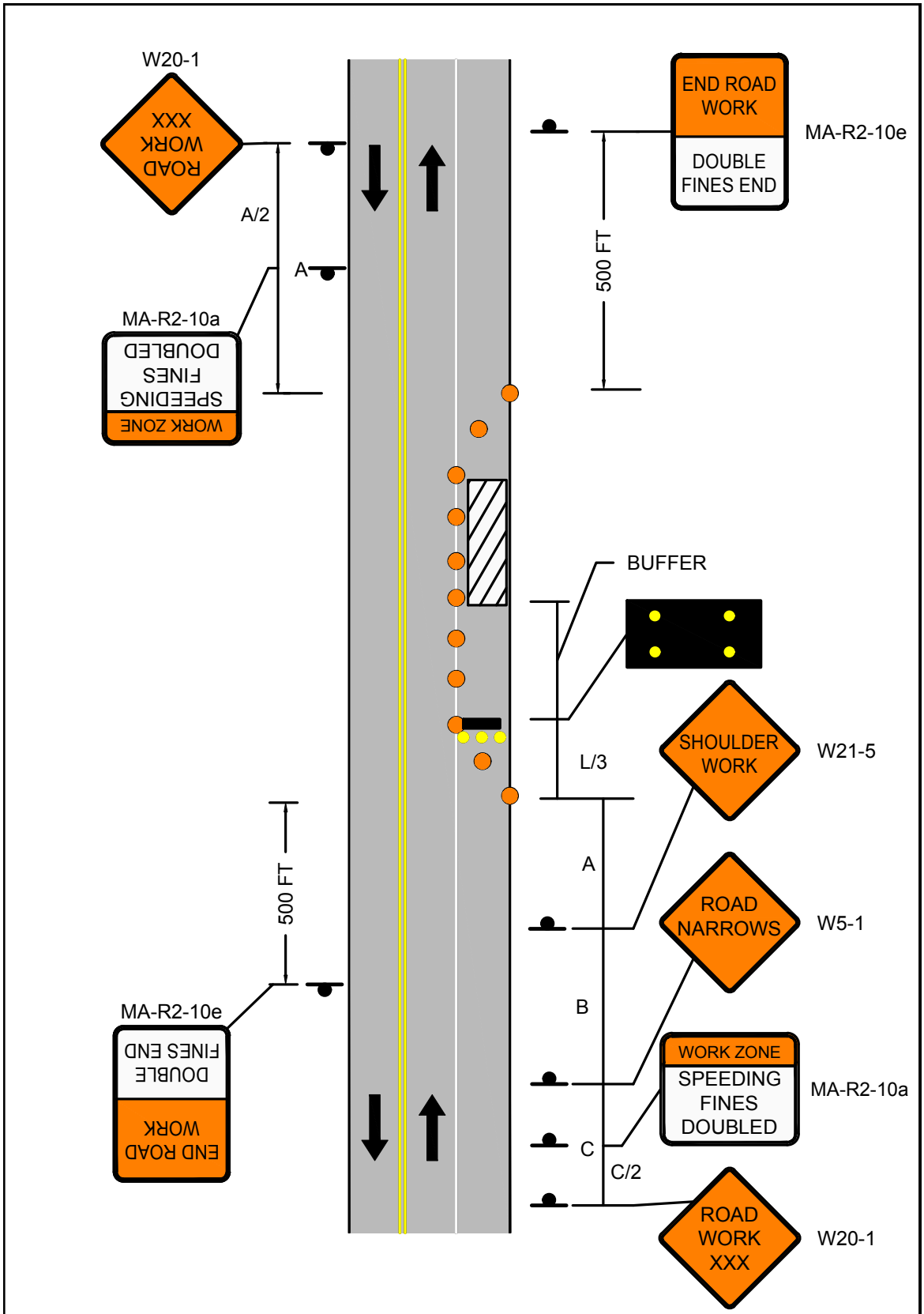


massDOT Massachusetts Department of Transportation Highway Division PAGE 23	Work Zone Safety Standard Details and Drawings	FIGURE 8 STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY SHOULDER CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 24	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY WITH TRAVERSABLE SHOULDER HALF OF ROADWAY CLOSED MAINTAIN TWO-WAY TRAFFIC

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	160	305	20	125
45-55	220	330	495	40	100
60-65	260	390	645	40	115

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

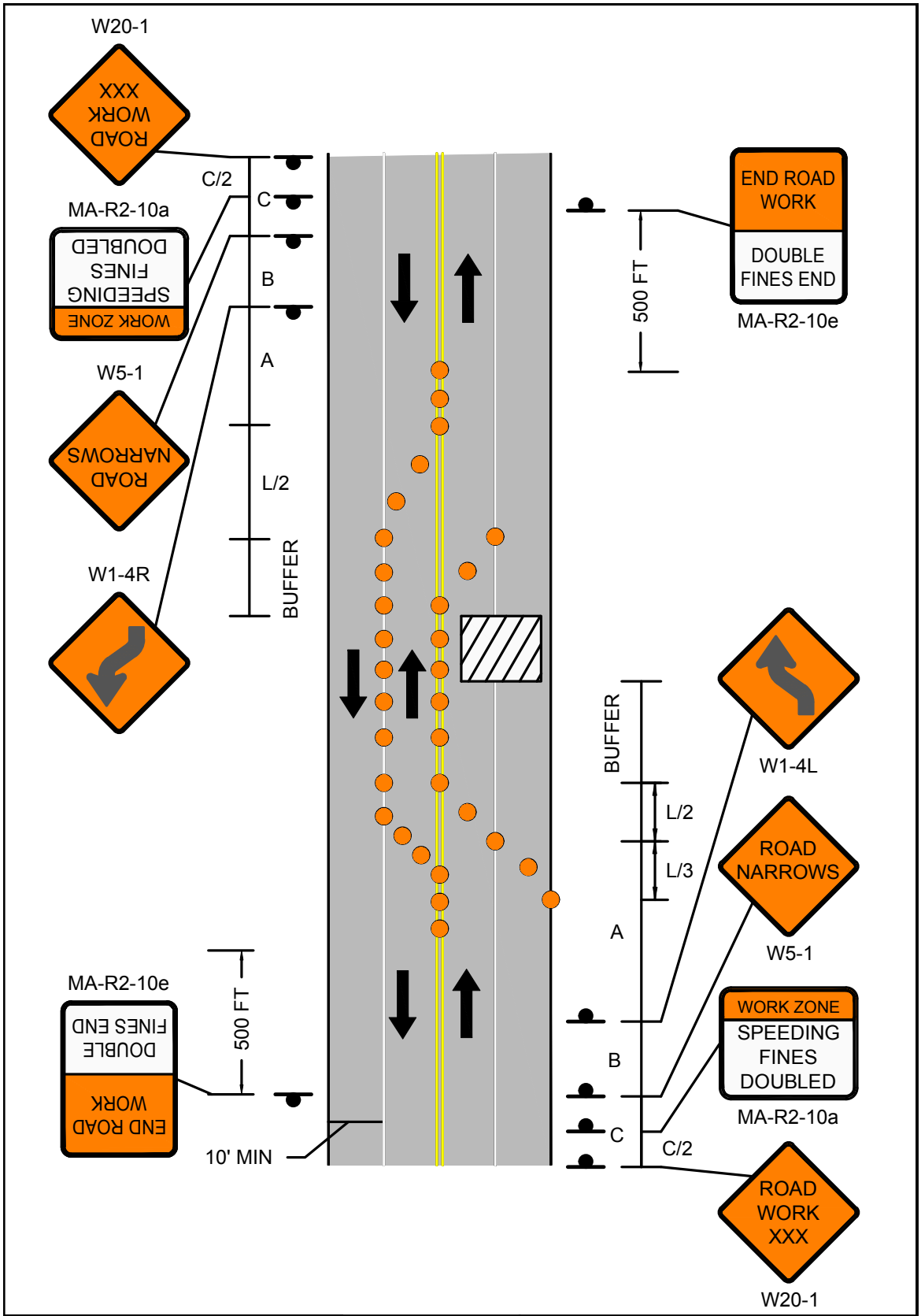
NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND

- WORK ZONE
- CHANNELIZATION DEVICE
- FLASHING ARROW BOARD
- PORTABLE CHANGEABLE MESSAGE SIGN
- TRUCK MOUNTED ATTENUATOR
- RADAR SPEED FEEDBACK BOARD
- POLICE DETAIL OR UNIFORMED FLAGGER
- TEMPORARY PORTABLE RUMBLE STRIP
- TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 25	Work Zone Safety Standard Details and Drawings	FIGURE 9 STATIONARY OPERATIONS TWO LANE UNDIVIDED ROADWAY WITH TRAVERSABLE SHOULDER HALF OF ROADWAY CLOSED MAINTAIN TWO-WAY TRAFFIC

massDOT Massachusetts Department of Transportation Highway Division PAGE 26	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY RIGHT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT A/2 AND C/2.
2. ** OPTIONAL AT THE ENGINEER'S DISCRETION.

LEGEND


WORK ZONE


CHANNELIZATION DEVICE

FLASHING ARROW BOARD


PORTABLE CHANGEABLE MESSAGE SIGN


TRUCK MOUNTED ATTENUATOR

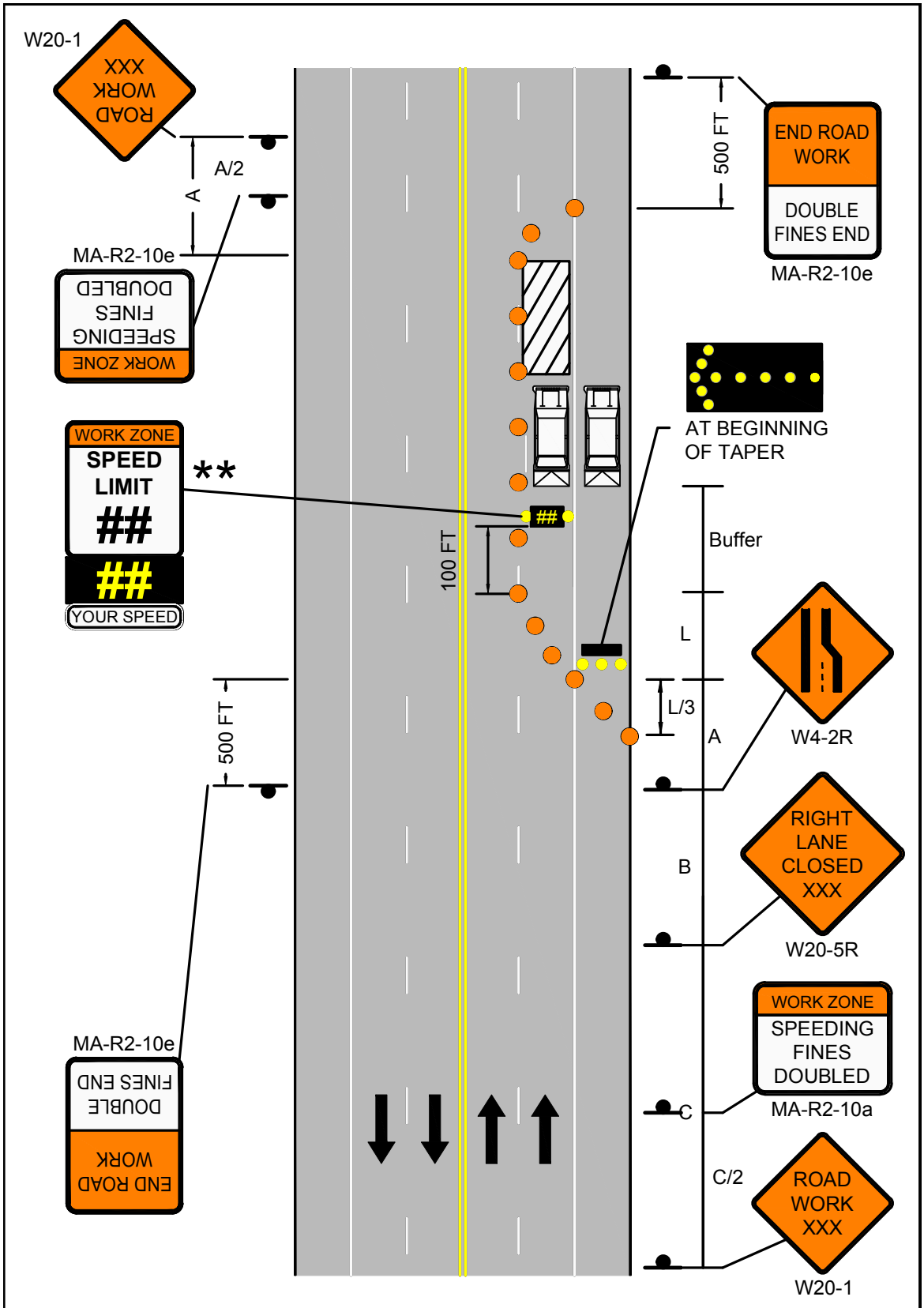
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 27	Work Zone Safety Standard Details and Drawings	FIGURE 10 STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY RIGHT LANE CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 28	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY LEFT LANE CLOSED

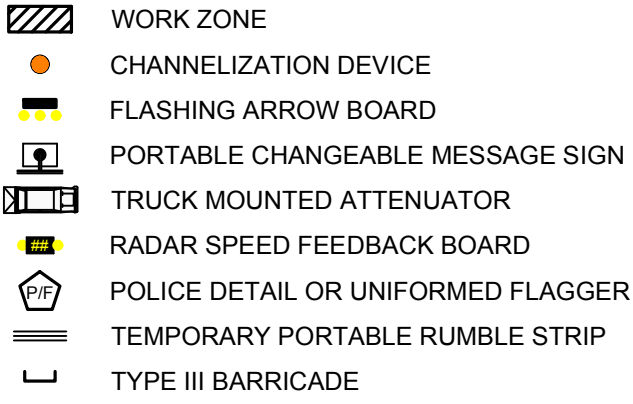
POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	320	305	20	105
45-55	500 / 1000 / 1000	660	495	40	80
60-65	1000 / 1600 / 2600	780	645	40	100

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

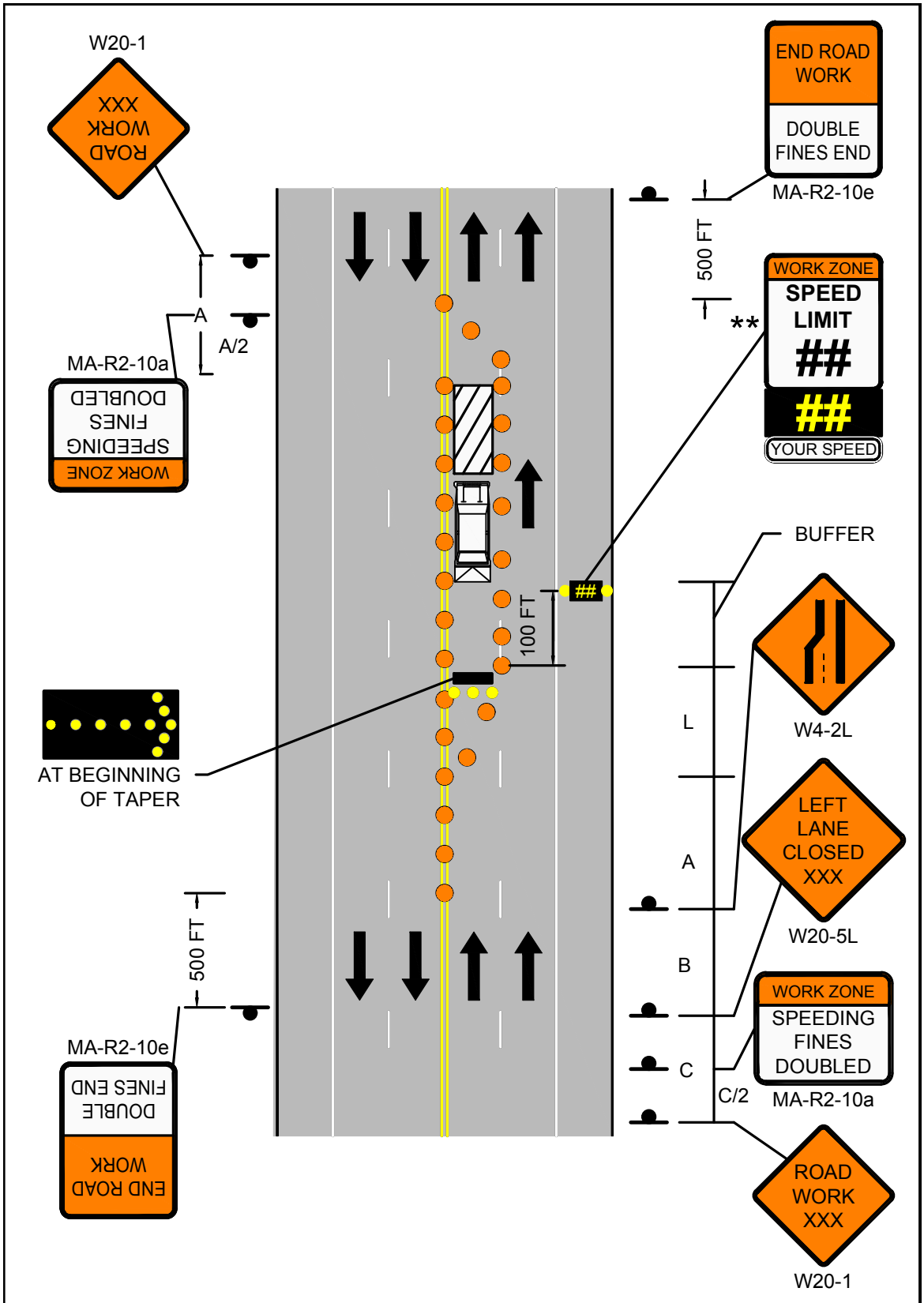
NOTES

1. MA-R2-10a LOCATED AT A/2 AND C/2.
2. ** OPTIONAL AT THE ENGINEER'S DISCRETION. 2' OFFSET FROM EDGE OF TRAVEL LANE TO RADAR SPEED FEEDBACK BOARD IS REQUIRED. BOARD MAY BE MOVED FULLY OR PARTIALLY OFF PAVED SHOULDER, IF REQUIRED.

LEGEND



NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 29	Work Zone Safety Standard Details and Drawings	FIGURE 11 STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY LEFT LANE CLOSED

massDOT Massachusetts Department of Transportation Highway Division 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

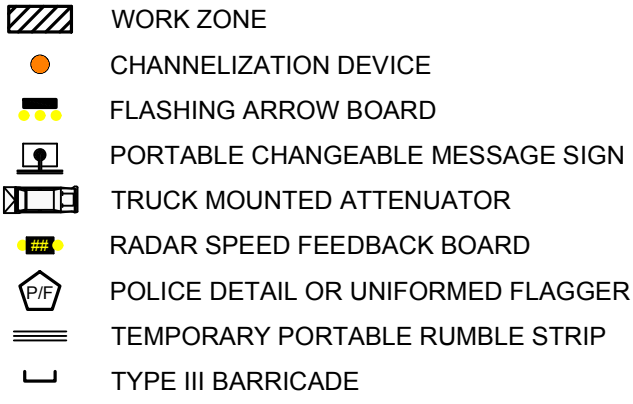
* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

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



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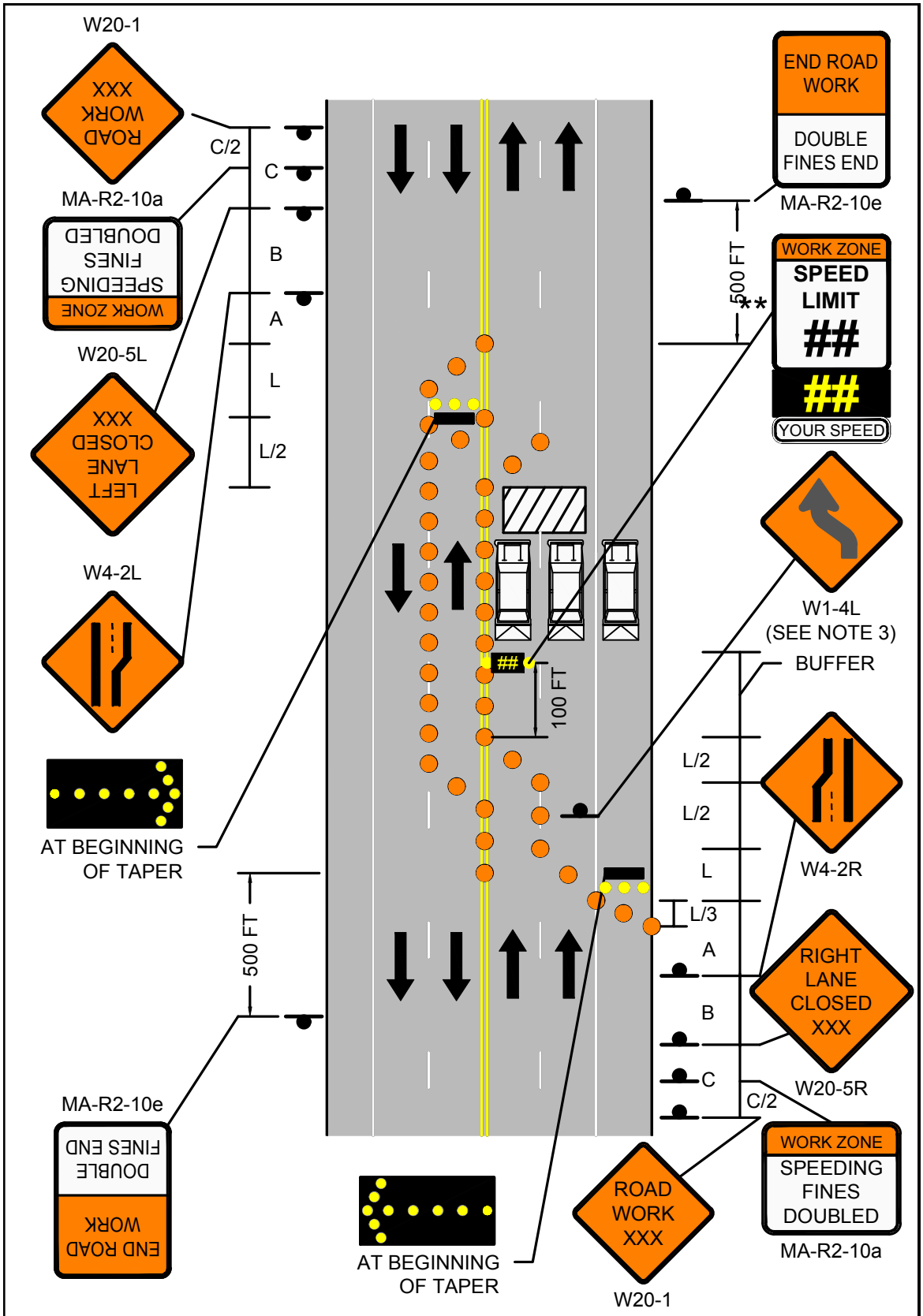


massDOT Massachusetts Department of Transportation Highway Division PAGE 31	Work Zone Safety Standard Details and Drawings	FIGURE 12 STATIONARY OPERATIONS FOUR LANE UNDIVIDED ROADWAY HALF OF ROADWAY CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 32	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY RIGHT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. ** OPTIONAL AT THE ENGINEER'S DISCRETION.

LEGEND


WORK ZONE


CHANNELIZATION DEVICE

FLASHING ARROW BOARD


PORTABLE CHANGEABLE MESSAGE SIGN


TRUCK MOUNTED ATTENUATOR

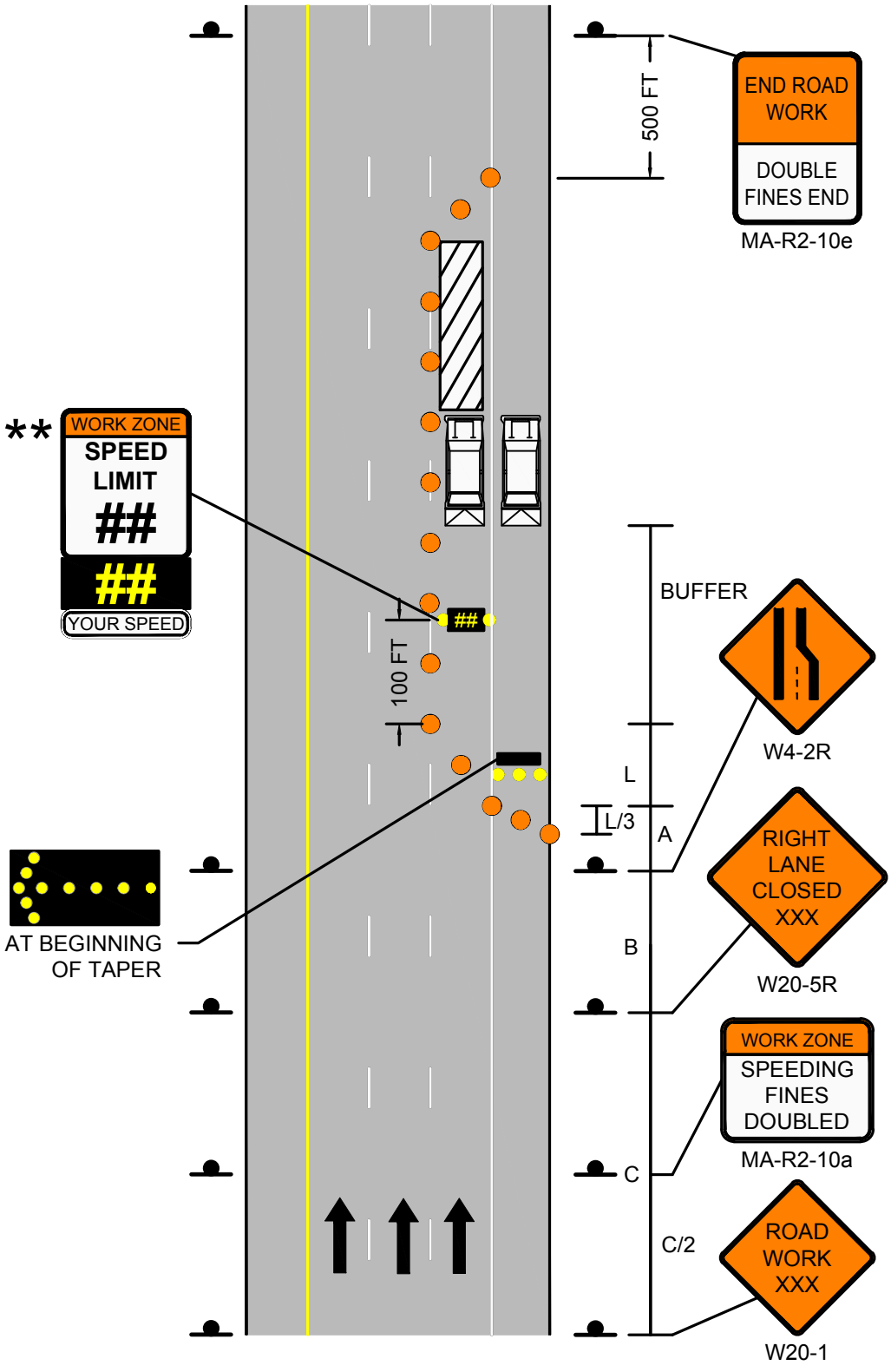
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 33	Work Zone Safety Standard Details and Drawings	FIGURE 13 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY RIGHT LANE CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 34	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY LEFT LANE CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	60
45-55	220	660	495	40	50
60-65	260	780	645	40	55

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. ** OPTIONAL AT THE ENGINEER'S DISCRETION.

LEGEND


WORK ZONE


CHANNELIZATION DEVICE

FLASHING ARROW BOARD


PORTABLE CHANGEABLE MESSAGE SIGN


TRUCK MOUNTED ATTENUATOR

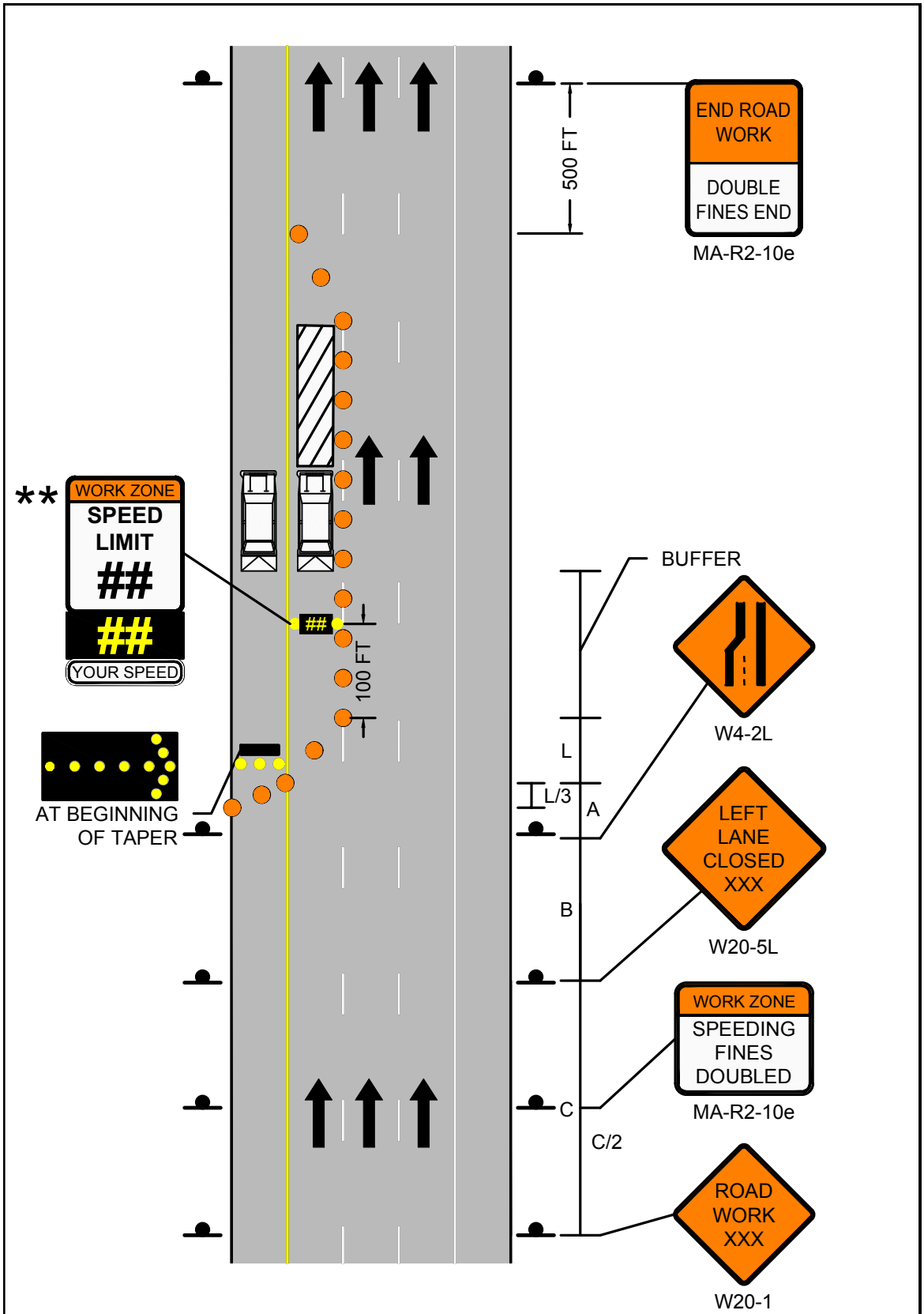
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 35	Work Zone Safety Standard Details and Drawings	FIGURE 14 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY LEFT LANE CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 36	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR RIGHT/CENTER LANES CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TANGENT LENGTH BETWEEN TAPERS T (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	640	305	20	110
45-55	220	660	1320	495	40	100
60-65	260	780	1560	645	40	115

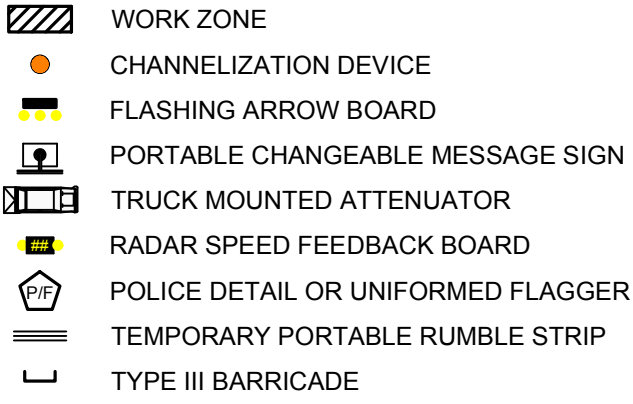
* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. ** OPTIONAL AT THE ENGINEER'S DISCRETION.
3. *** THIS SET OF SIGNS SHALL BE LOCATED AT T/2.

LEGEND



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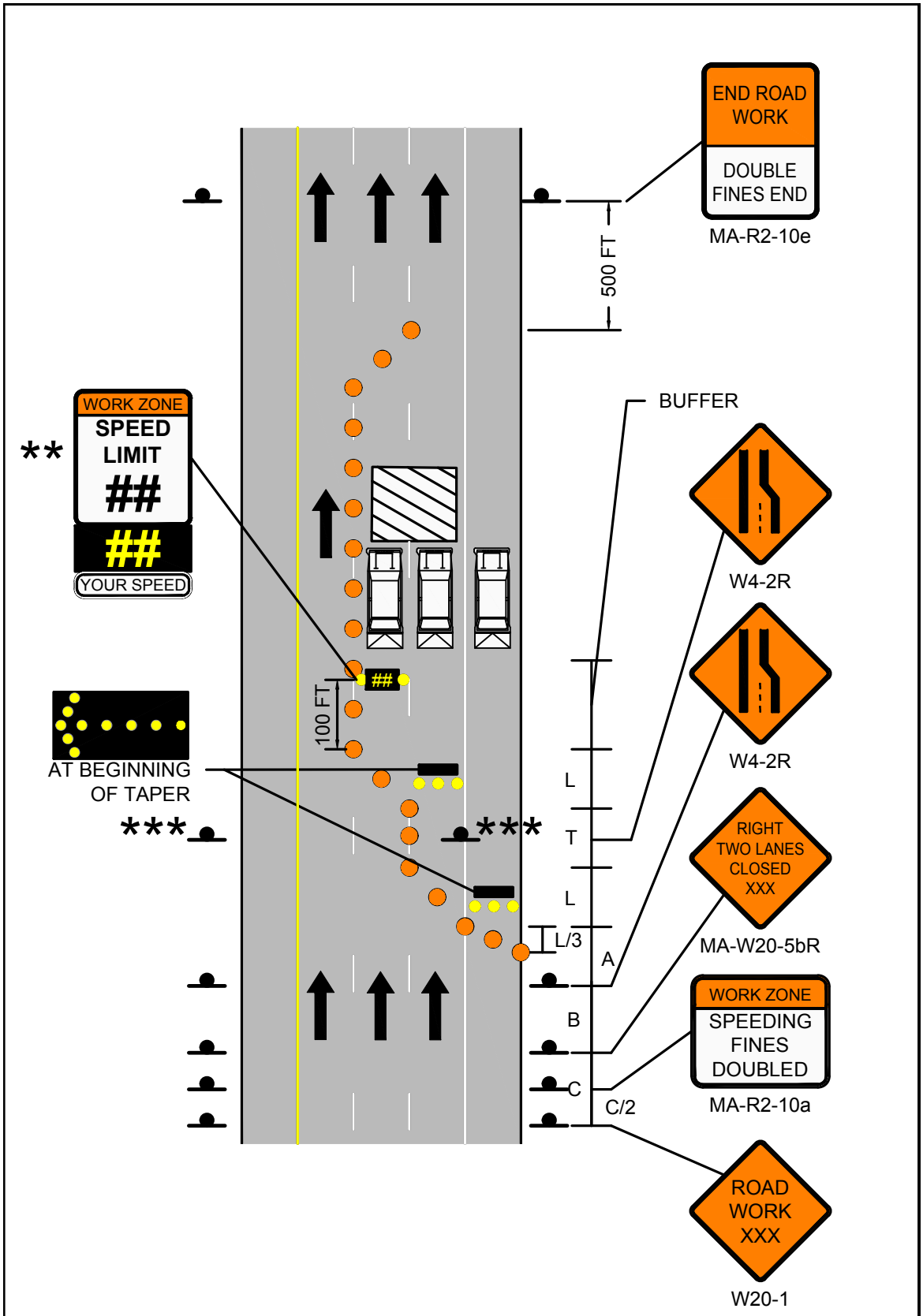


massDOT Massachusetts Department of Transportation Highway Division PAGE 37	Work Zone Safety Standard Details and Drawings	FIGURE 15 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR RIGHT/CENTER LANES CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 38	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR LEFT/CENTER LANES CLOSED

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TANGENT LENGTH BETWEEN TAPERS T (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	640	305	20	110
45-55	220	660	1320	495	40	100
60-65	260	780	1560	645	40	115

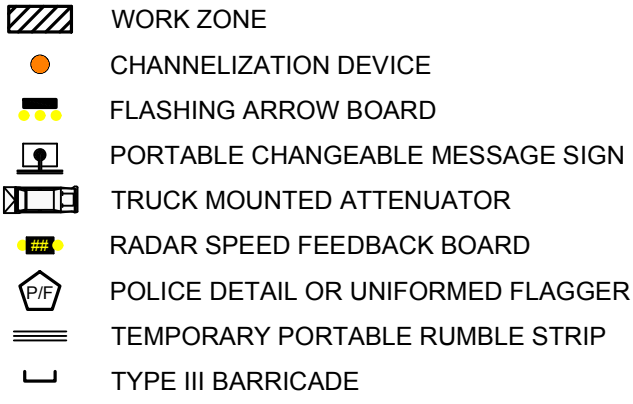
* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.
2. ** OPTIONAL AT THE ENGINEER'S DISCRETION.
3. *** THIS SET OF SIGNS SHALL BE LOCATED AT T/2.

LEGEND



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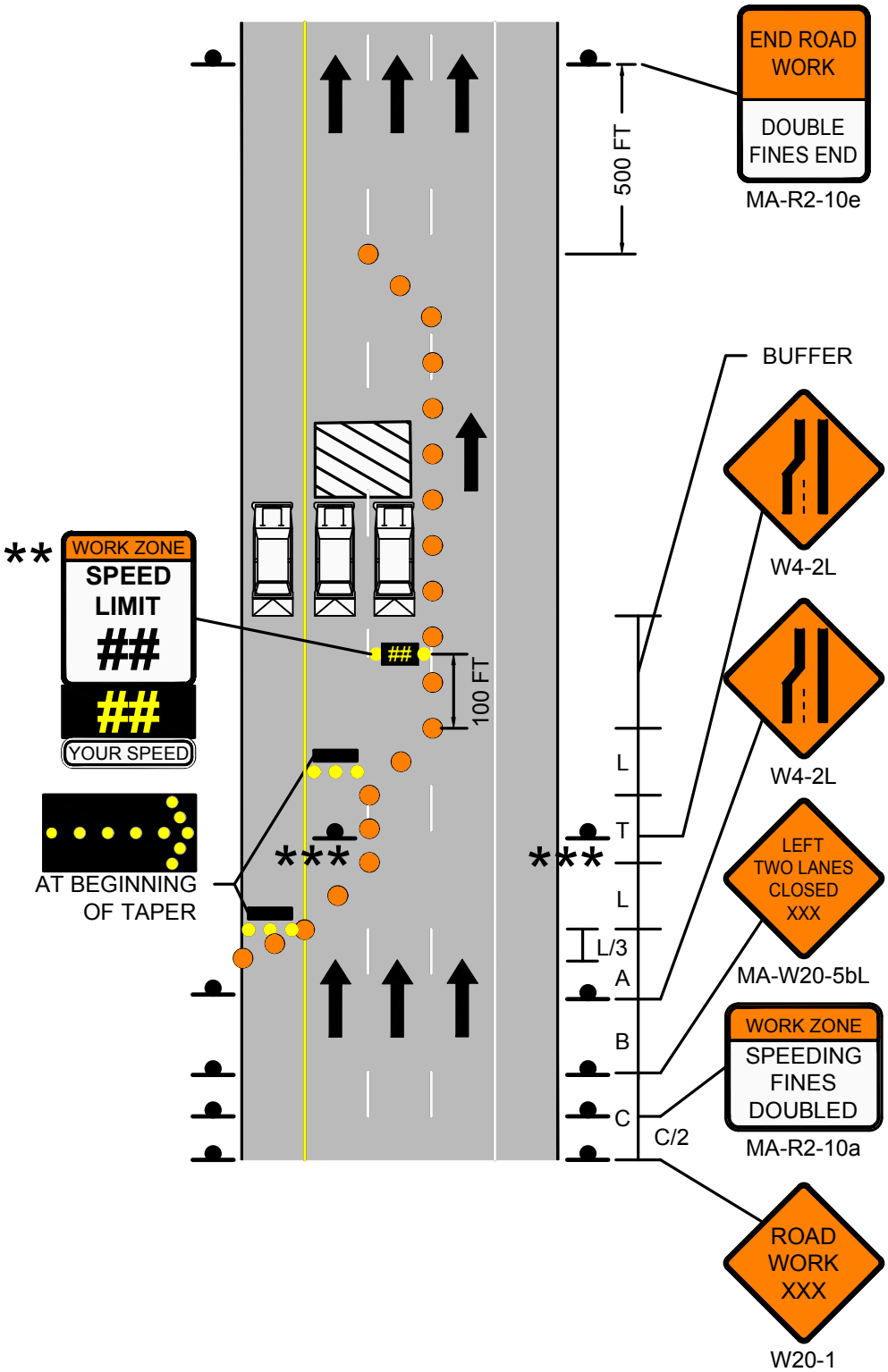


massDOT Massachusetts Department of Transportation Highway Division PAGE 39	Work Zone Safety Standard Details and Drawings	FIGURE 16 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE OR LEFT/CENTER LANES CLOSED

massDOT Massachusetts Department of Transportation Highway Division PAGE 40	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY RIGHT SIDE OF OFF RAMP CLOSED

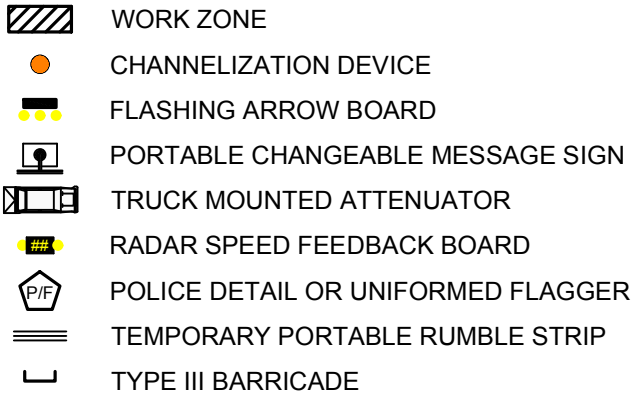
POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	160	305	20	45
45-55	500 / 1000 / 1000	330	495	40	35

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



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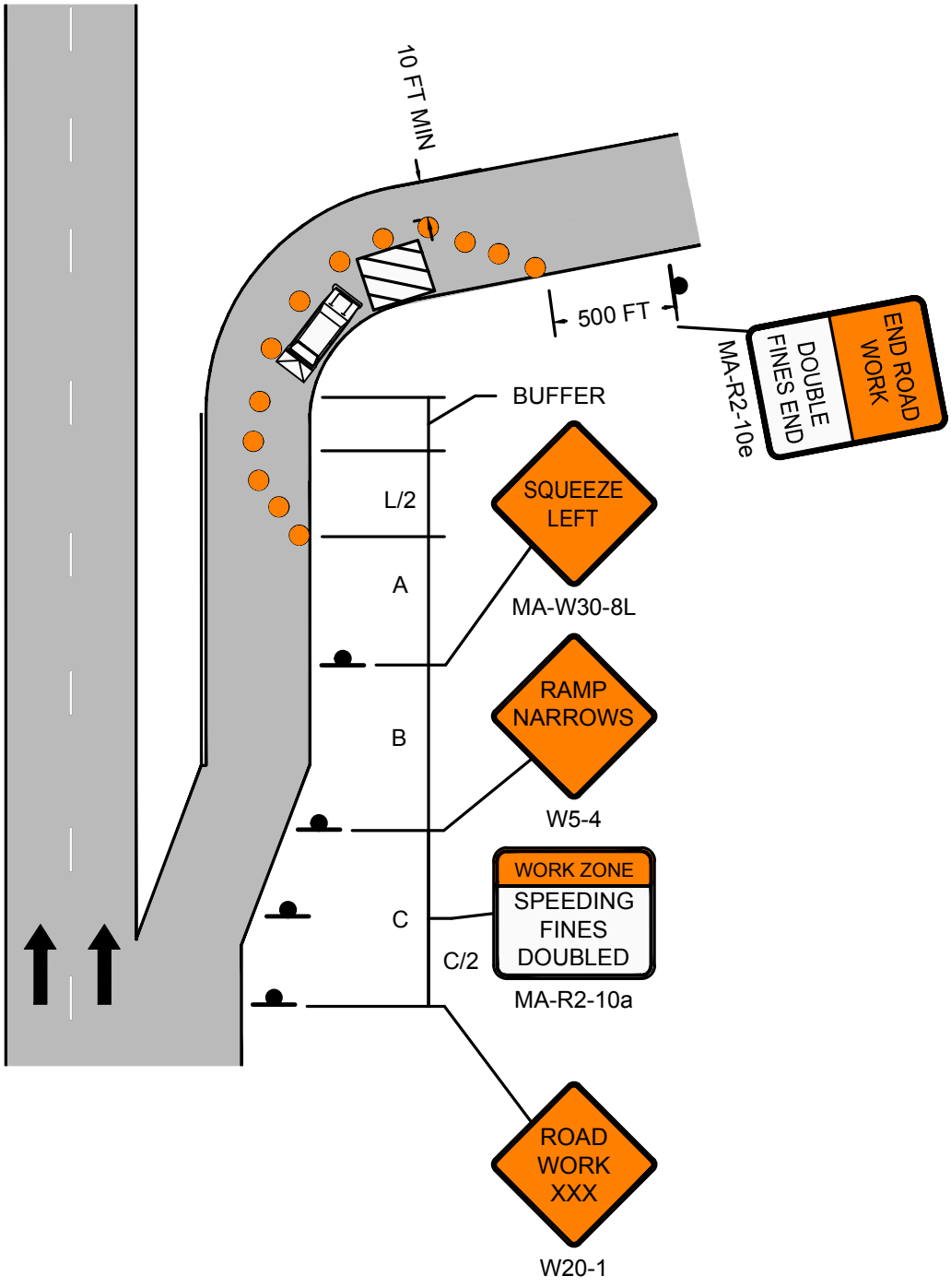


massDOT Massachusetts Department of Transportation Highway Division PAGE 41	Work Zone Safety Standard Details and Drawings	FIGURE 17 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY RIGHT SIDE OF OFF RAMP CLOSED

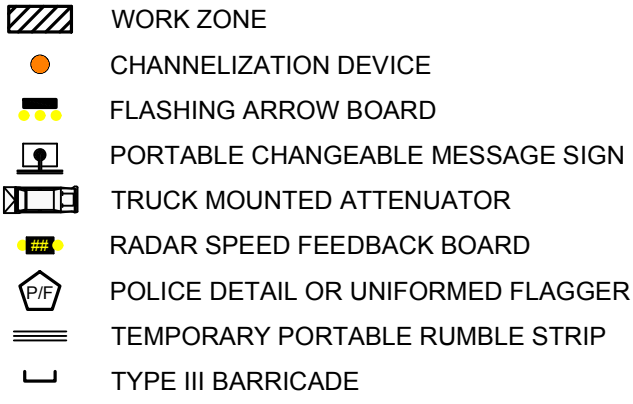
massDOT Massachusetts Department of Transportation Highway Division PAGE 42	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY LEFT SIDE OF OFF RAMP CLOSED

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	500 / 500 / 500	160	305	20	45
45-55	500 / 1000 / 1000	330	495	40	35

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

NOTES
1. MA-R2-10a LOCATED AT C/2.

LEGEND



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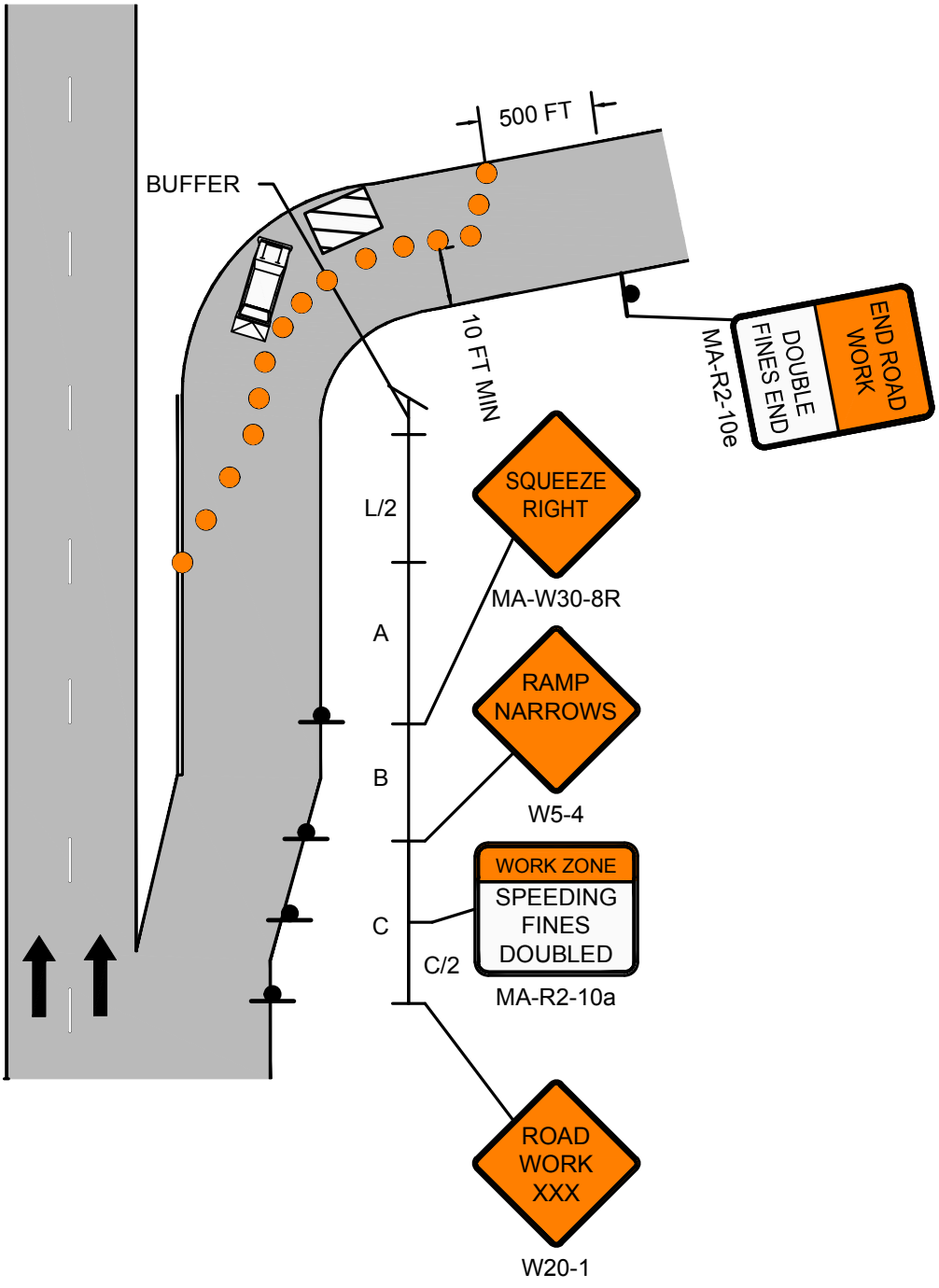


massDOT Massachusetts Department of Transportation Highway Division	Work Zone Safety Standard Details and Drawings	FIGURE 18 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY LEFT SIDE OF OFF RAMP CLOSED PAGE 43

massDOT Massachusetts Department of Transportation Highway Division PAGE 44	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY ROADWORK BEYOND ON RAMP

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)				
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	305	20	175
45-55	220	660	495	40	135
60-65	260	780	645	40	155

* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND


WORK ZONE


CHANNELIZATION DEVICE

FLASHING ARROW BOARD


PORTABLE CHANGEABLE MESSAGE SIGN


TRUCK MOUNTED ATTENUATOR

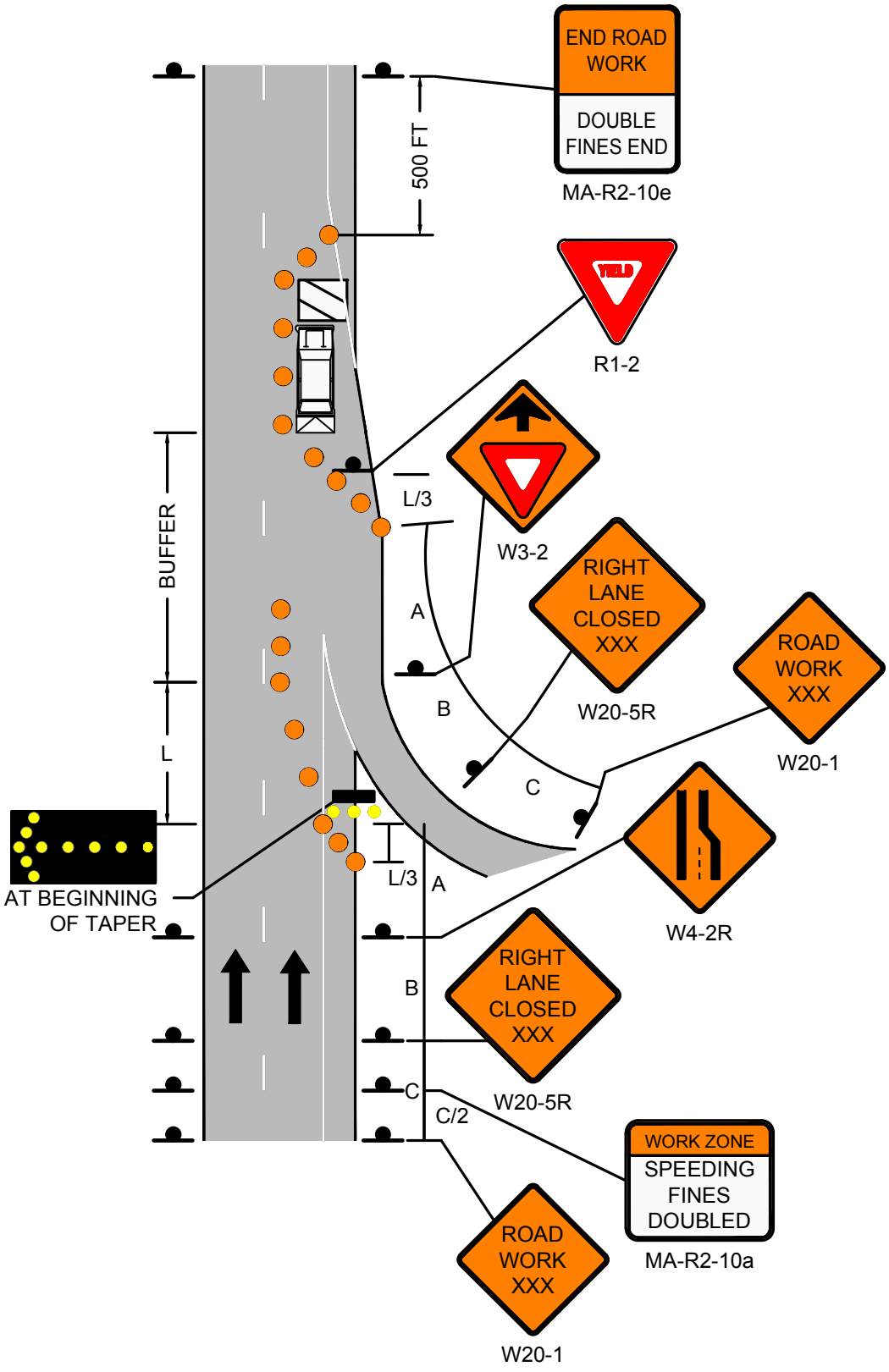
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division

PAGE 45

Work Zone Safety Standard Details and Drawings

FIGURE 19
STATIONARY OPERATIONS
MULTILANE DIVIDED ROADWAY
ROADWORK BEYOND ON RAMP

massDOT Massachusetts Department of Transportation Highway Division PAGE 46	Work Zone Safety Standard Details and Drawings	STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY ROADWORK BEYOND OFF RAMP

POSTED SPEED LIMIT (MPH)	CHANNELIZATION DEVICES (DRUMS OR CONES)					
	SHOULDER TAPER LENGTH (L/3) (FT)	TRAVEL LANE CLOSURE LENGTH (L) (FT)	TRAVEL LANE SHIFT LENGTH (L/2) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES*
25-40	110	320	160	305	20	70
45-55	220	660	330	495	40	55
60-65	260	780	390	645	40	65

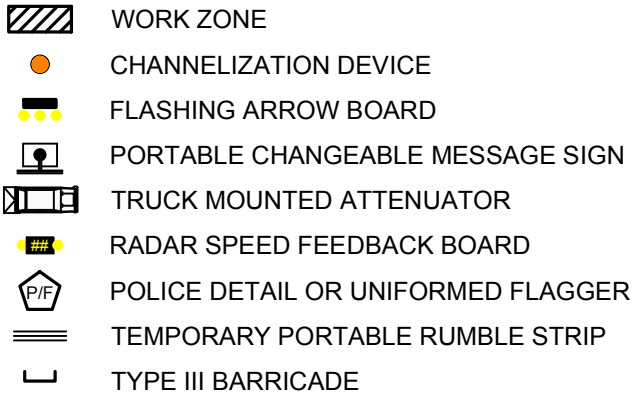
* NUMBER OF DEVICES BASED ON 400 FT WORK ZONE.

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)
25-40	500 / 500 / 500
45-55	500 / 1000 / 1000
60-65	1000 / 1600 / 2600

NOTES

1. MA-R2-10a LOCATED AT C/2.

LEGEND



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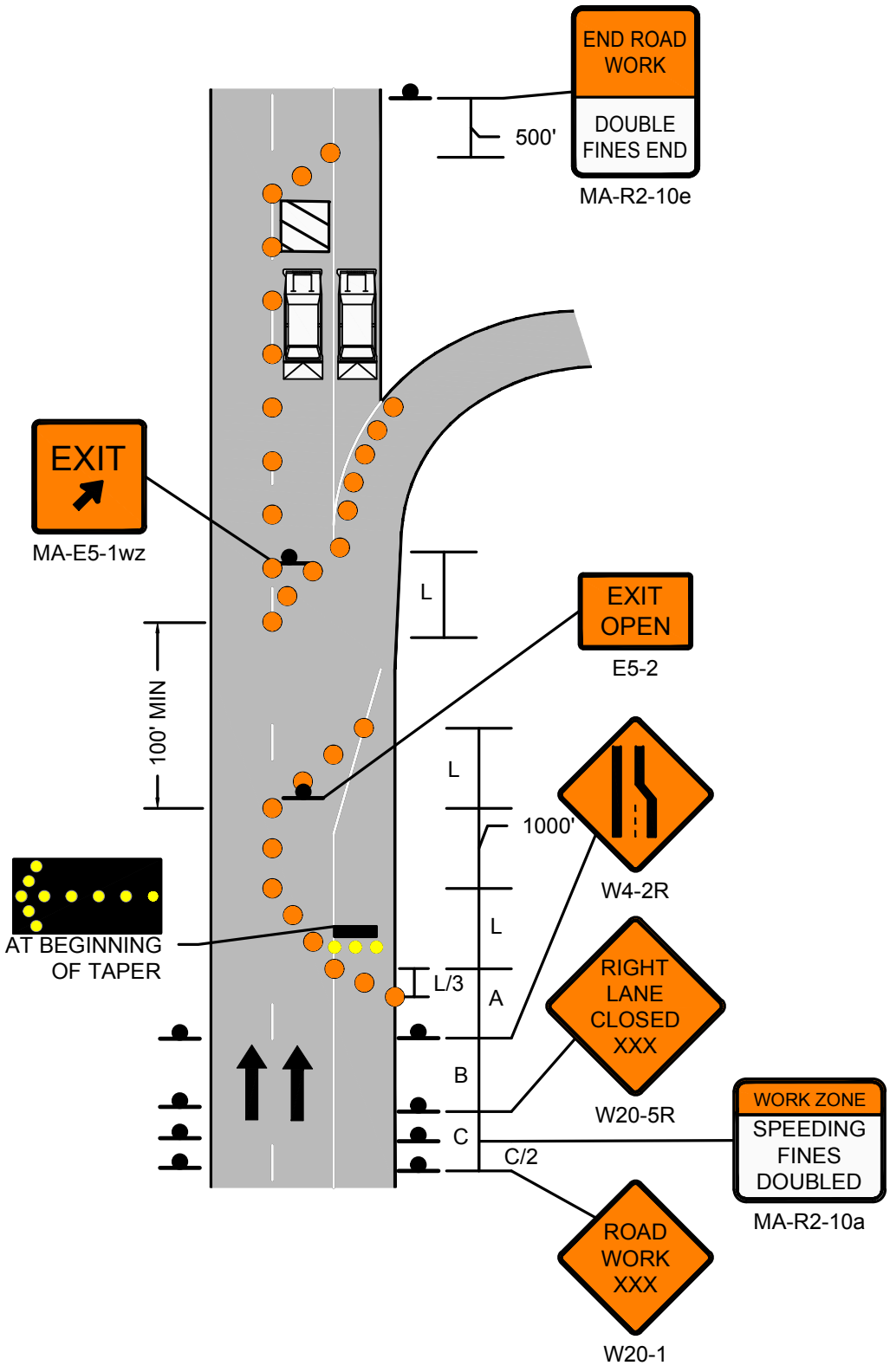


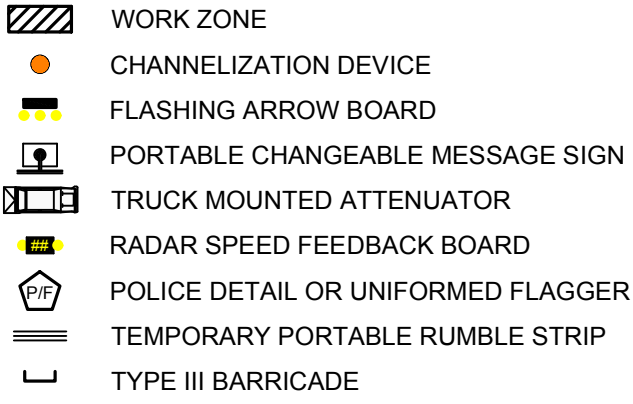
massDOT Massachusetts Department of Transportation Highway Division PAGE 47	Work Zone Safety Standard Details and Drawings	FIGURE 20 STATIONARY OPERATIONS MULTILANE DIVIDED ROADWAY ROADWORK BEYOND OFF RAMP

massDOT Massachusetts Department of Transportation Highway Division PAGE 48	Work Zone Safety Standard Details and Drawings	MULTILANE DIVIDED ROADWAY TYPICAL RAMP CLOSURE

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

NOTES
1. MA-R2-10a LOCATED AT C/2.
2. * NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. ** OPTIONAL AT ENGINEER'S DISCRETION.

LEGEND



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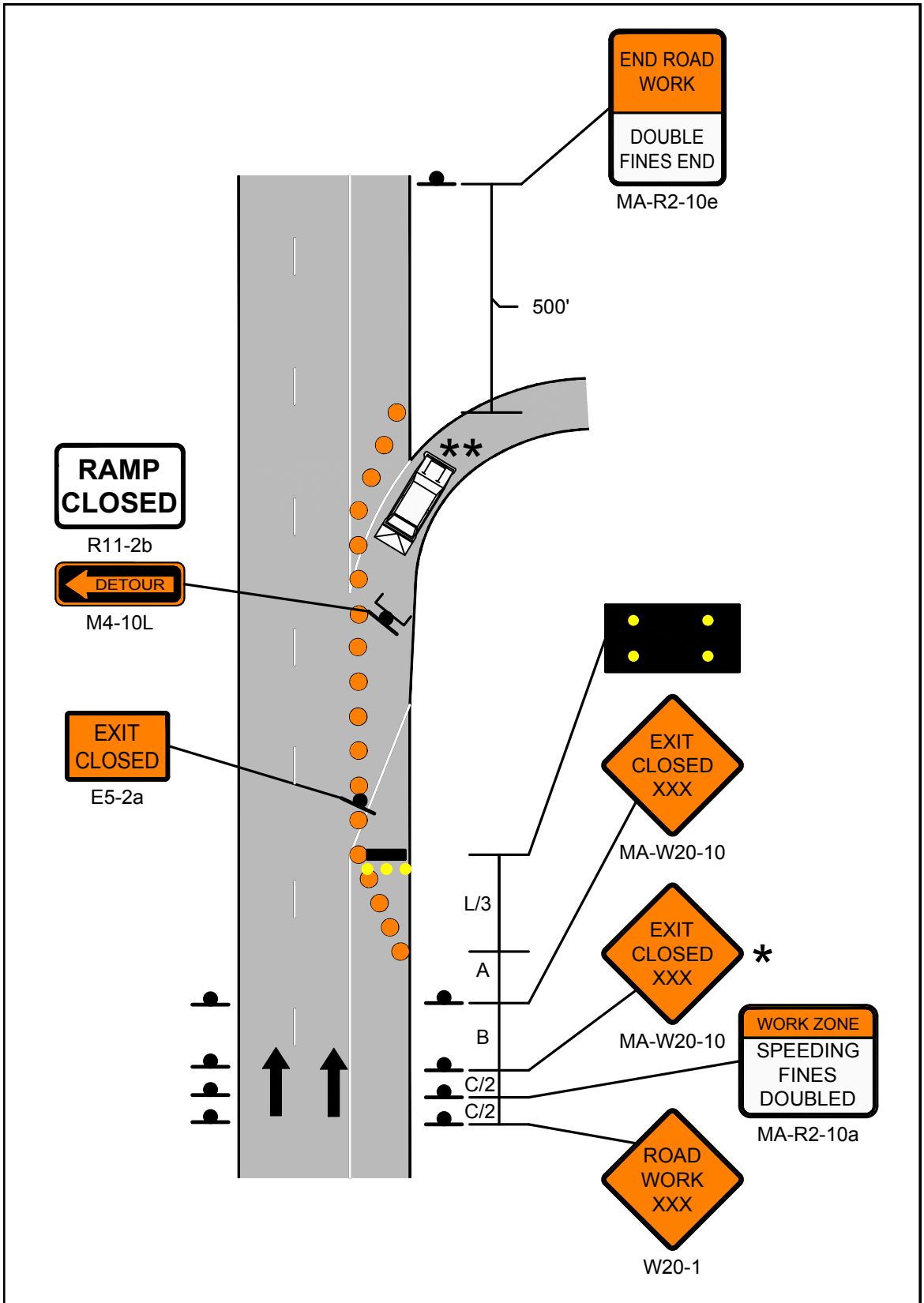


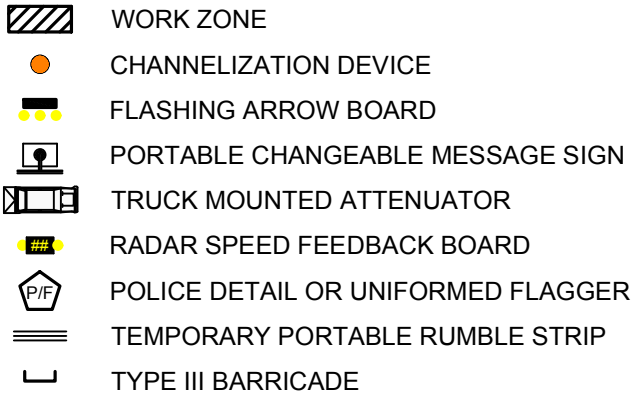
massDOT Massachusetts Department of Transportation Highway Division PAGE 49	Work Zone Safety Standard Details and Drawings	FIGURE 21 MULTILANE DIVIDED ROADWAY TYPICAL RAMP CLOSURE

massDOT Massachusetts Department of Transportation Highway Division PAGE 50	Work Zone Safety Standard Details and Drawings	MULTILANE DIVIDED ROADWAY TYPICAL CLOVERLEAF RAMP CLOSURE

POSTED SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (FT) (A,B,C)	CHANNELIZATION DEVICES (DRUMS OR CONES)			
		SHOULDER TAPER LENGTH (L/3) (FT)	BUFFER ZONE LENGTH (FT)	DEVICE SPACING (FT)	MIN # OF DEVICES
25-40	500 / 500 / 500	110	305	20	45
45-55	500 / 1000 / 1000	220	495	40	30
60-65	1000 / 1600 / 2600	260	645	40	35

NOTES
1. MA-R2-10a LOCATED AT C/2.
2. * NOT REQUIRED IF RIGHT LANE IS CLOSED IN ADVANCE OF EXIT.
3. ** OPTIONAL AT ENGINEER'S DISCRETION.

LEGEND



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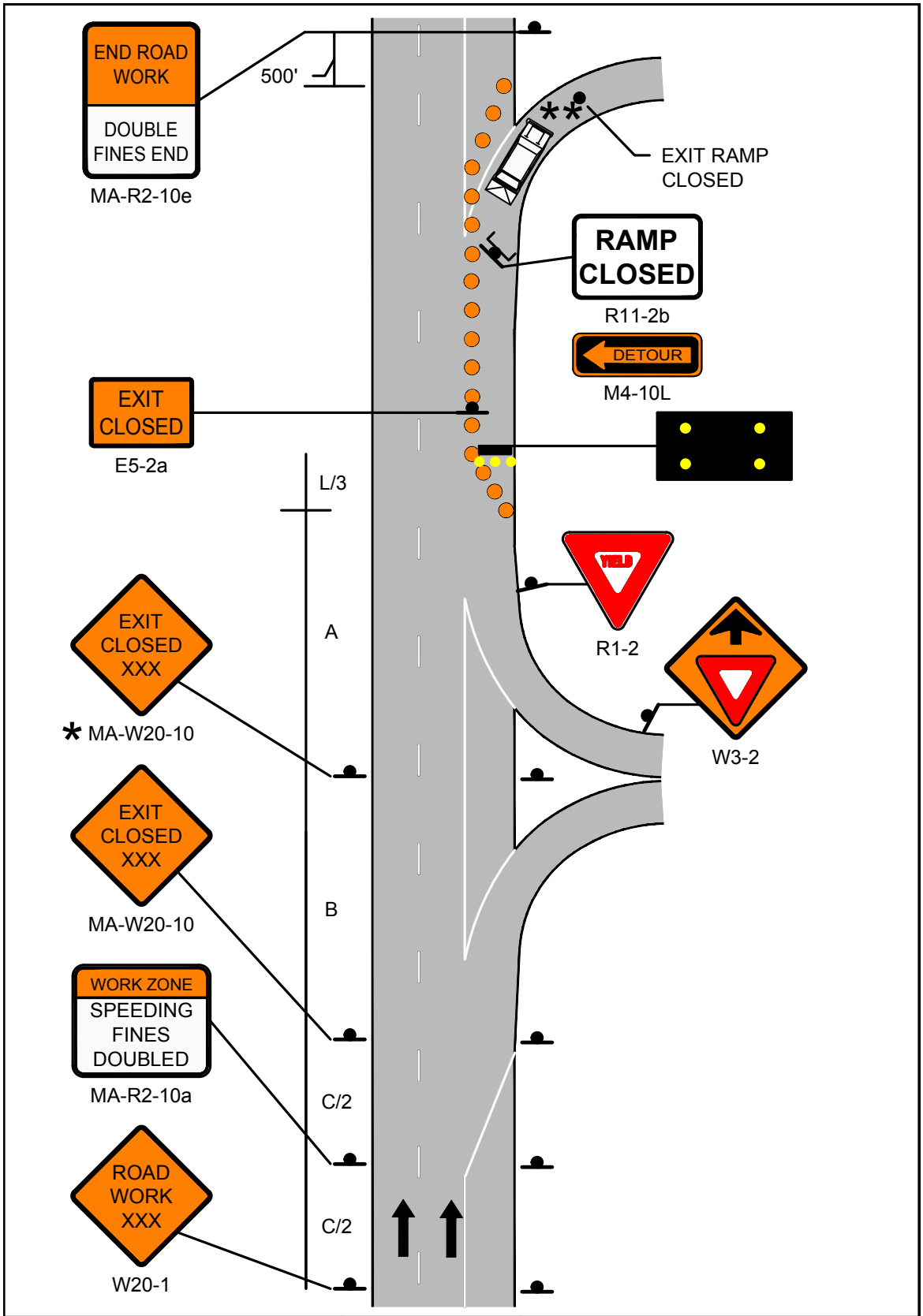


massDOT Massachusetts Department of Transportation Highway Division PAGE 51	Work Zone Safety Standard Details and Drawings	FIGURE 22 MULTILANE DIVIDED ROADWAY TYPICAL CLOVERLEAF RAMP CLOSURE

massDOT Massachusetts Department of Transportation Highway Division PAGE 52	Work Zone Safety Standard Details and Drawings	MULTILANE DIVIDED ROADWAY TYPICAL RAMP CLOSURE ADVANCE SIGNING

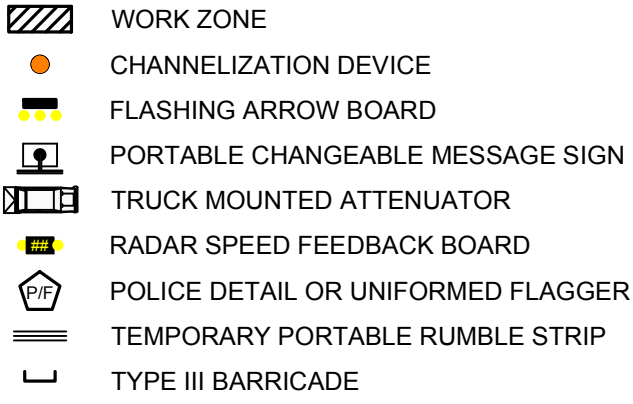
NOTES

1. IF THE CLOSED RAMP IS LOCATED DOWNSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED AT A SUFFICIENT DISTANCE IN ADVANCE OF THE DETOUR ROUTE/RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.

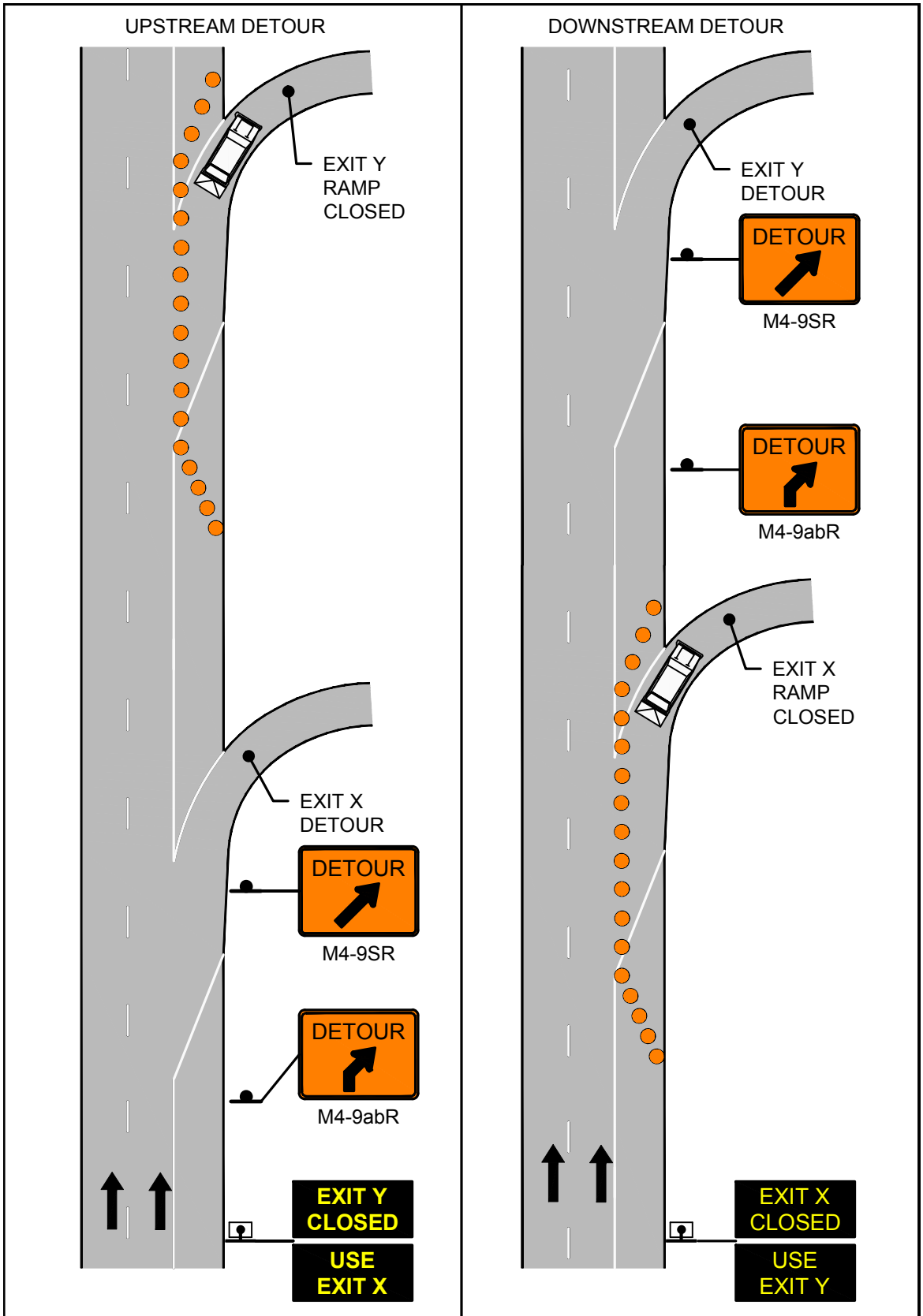
2. IF THE CLOSED RAMP IS LOCATED UPSTREAM FROM THE PROPOSED DETOUR ROUTE/RAMP, A PCMS SHALL BE POSITIONED PRIOR TO THE CLOSED RAMP AND SHOULD STATE WHICH RAMP IS CLOSED AND WHICH SHALL BE USED FOR THE DETOUR.

3. A SUFFICIENT NUMBER OF DETOUR SIGNS (M4-9 SERIES) SHOULD BE DEPLOYED TO PROPERLY DIRECT DETOURED TRAFFIC. SIGN SPACING SHALL BE AT THE DIRECTION OF THE ENGINEER.

LEGEND



NOT TO SCALE



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Work Zone Safety
Standard Details
and Drawings

FIGURE 23
MULTILANE DIVIDED ROADWAY
TYPICAL RAMP CLOSURE
ADVANCE SIGNING

massDOT Massachusetts Department of Transportation Highway Division PAGE 54	Work Zone Safety Standard Details and Drawings	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.

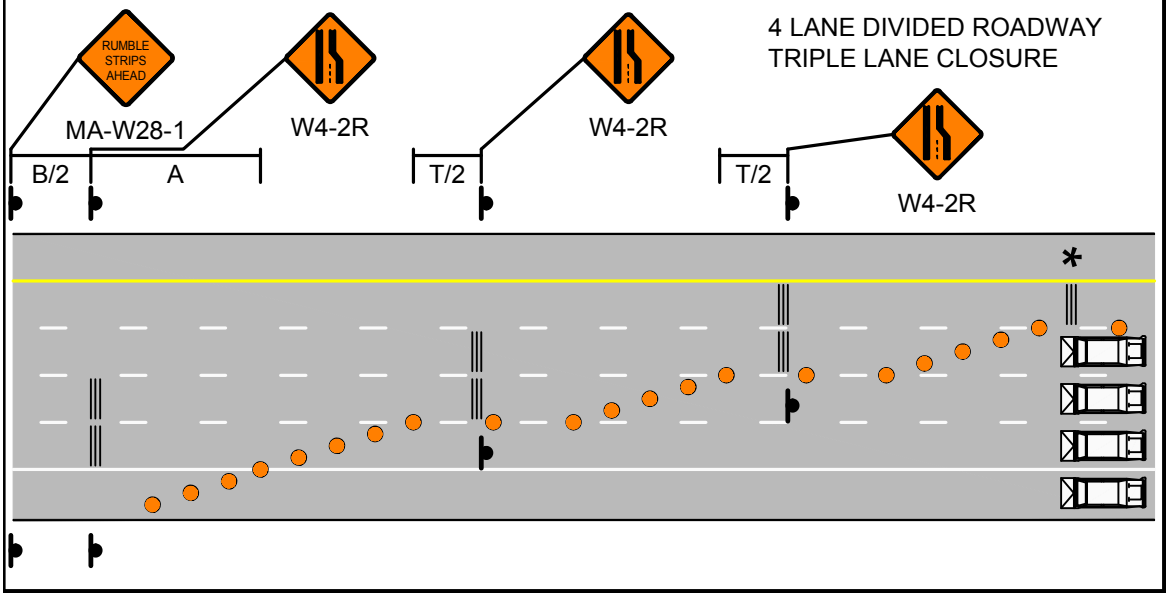
LEGEND

CHANNELIZATION DEVICE

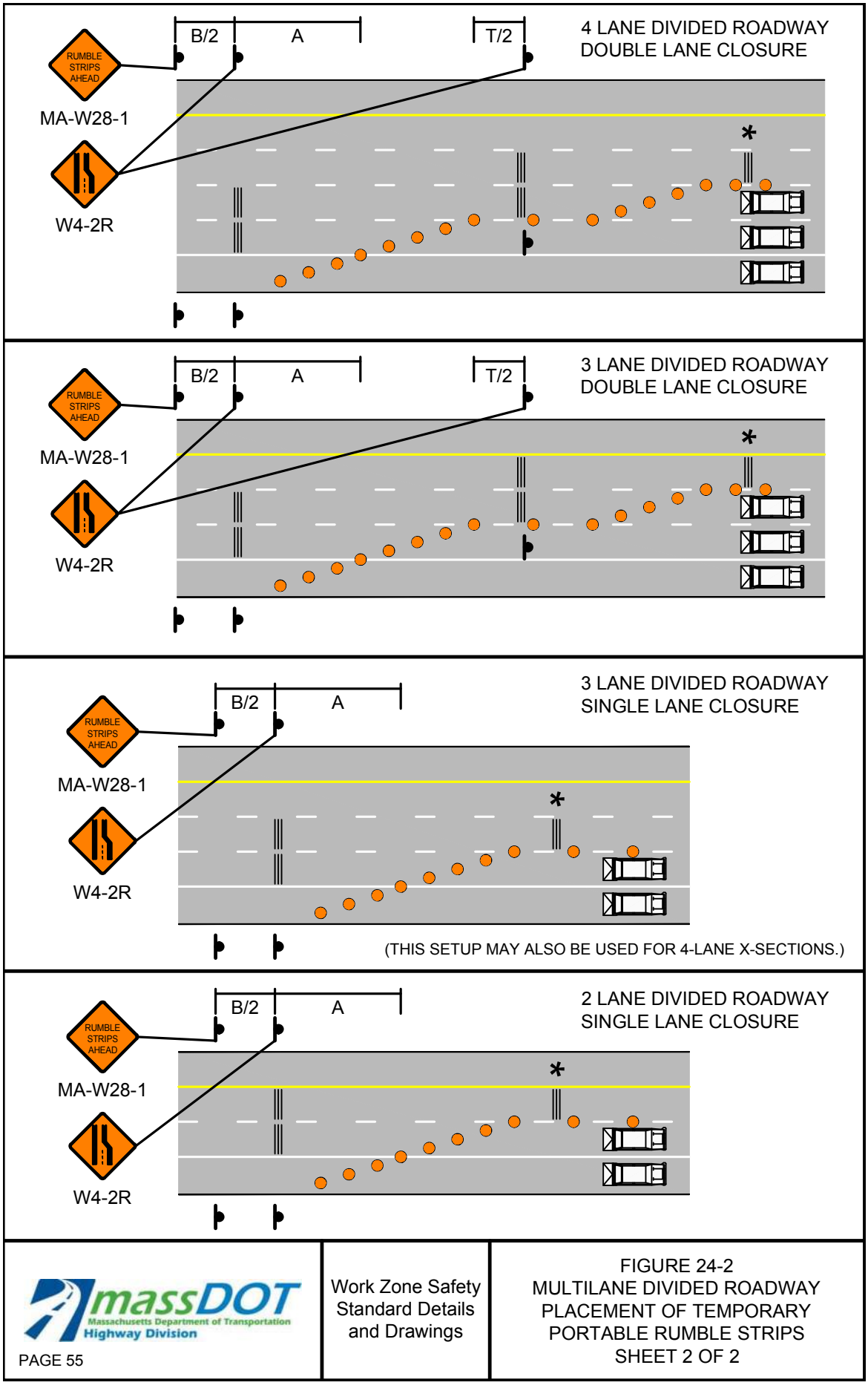
TRUCK MOUNTED ATTENUATOR

TEMPORARY PORTABLE RUMBLE STRIP

NOT TO SCALE



4 LANE DIVIDED ROADWAY
TRIPLE LANE CLOSURE



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Work Zone Safety Standard Details and Drawings

FIGURE 24-2
MULTILANE DIVIDED ROADWAY
PLACEMENT OF TEMPORARY
PORTABLE RUMBLE STRIPS
SHEET 2 OF 2

massDOT Massachusetts Department of Transportation Highway Division PAGE 56	Work Zone Safety Standard Details and Drawings	NOTES FOR MOBILE OPERATIONS

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.

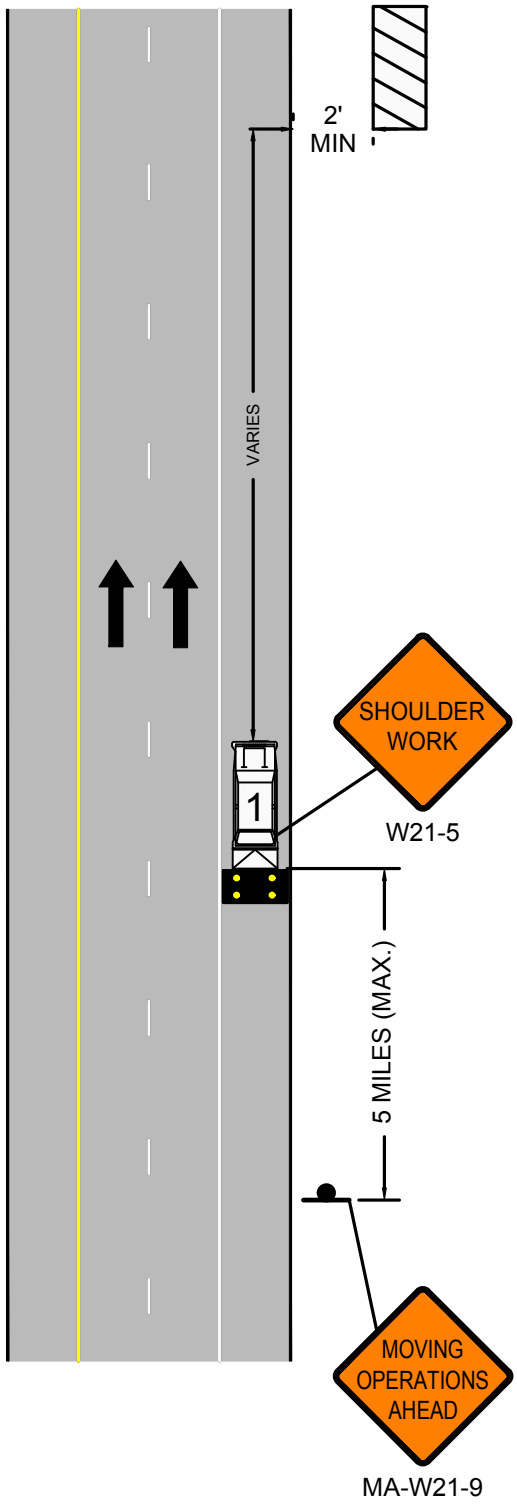
3. All vehicles shown may not be required based upon roadway conditions. However, when needed and practical, additional shadow vehicles and equipment to warn and protect motorists and workers should be used. Based upon roadway conditions, the addition of a police detail with cruiser may be used for additional 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.



LEGEND

WORK ZONE

SHADOW VEHICLE

FLASHING ARROW BOARD
(WITH STATUS)

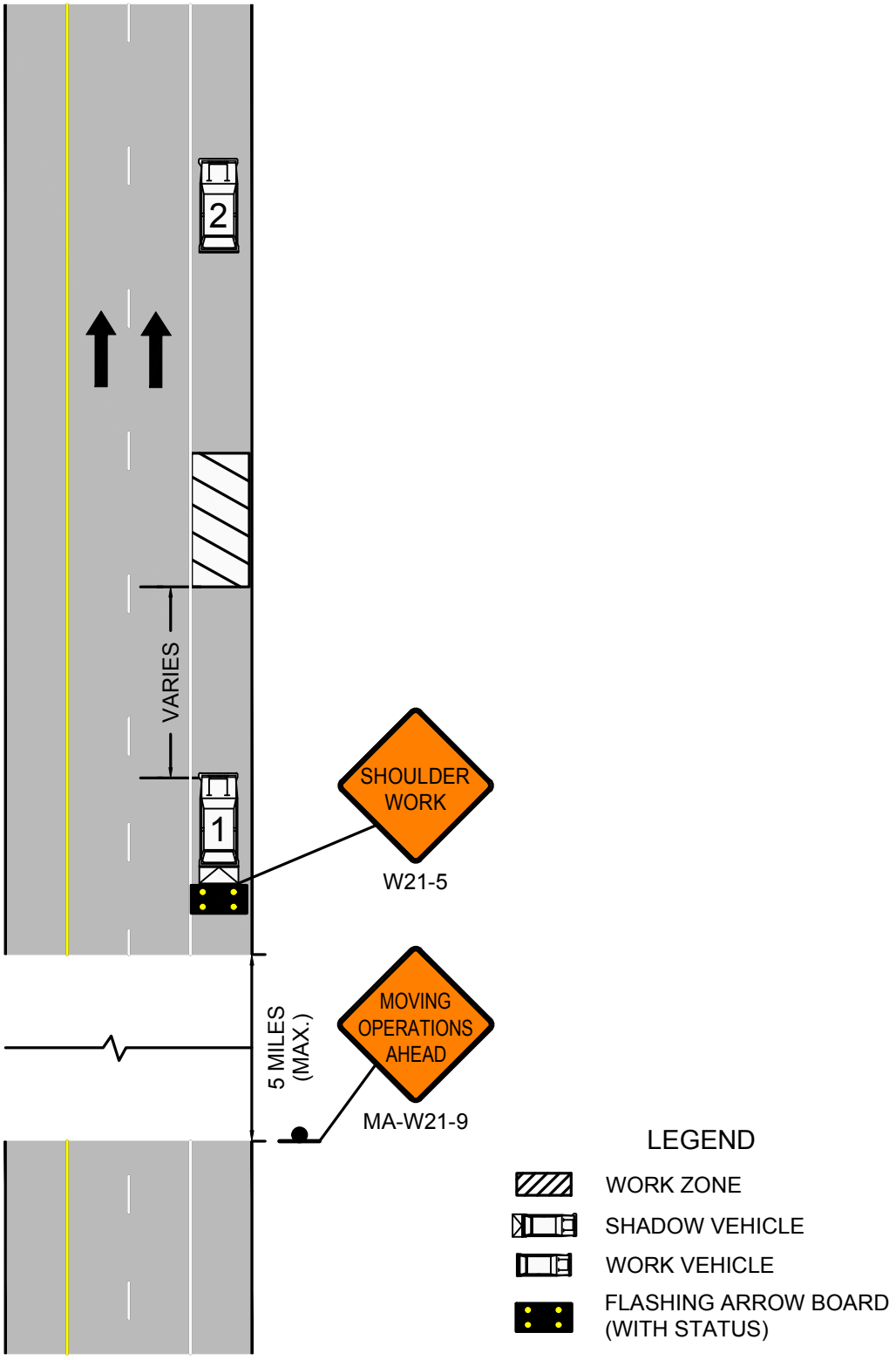
NOT TO SCALE

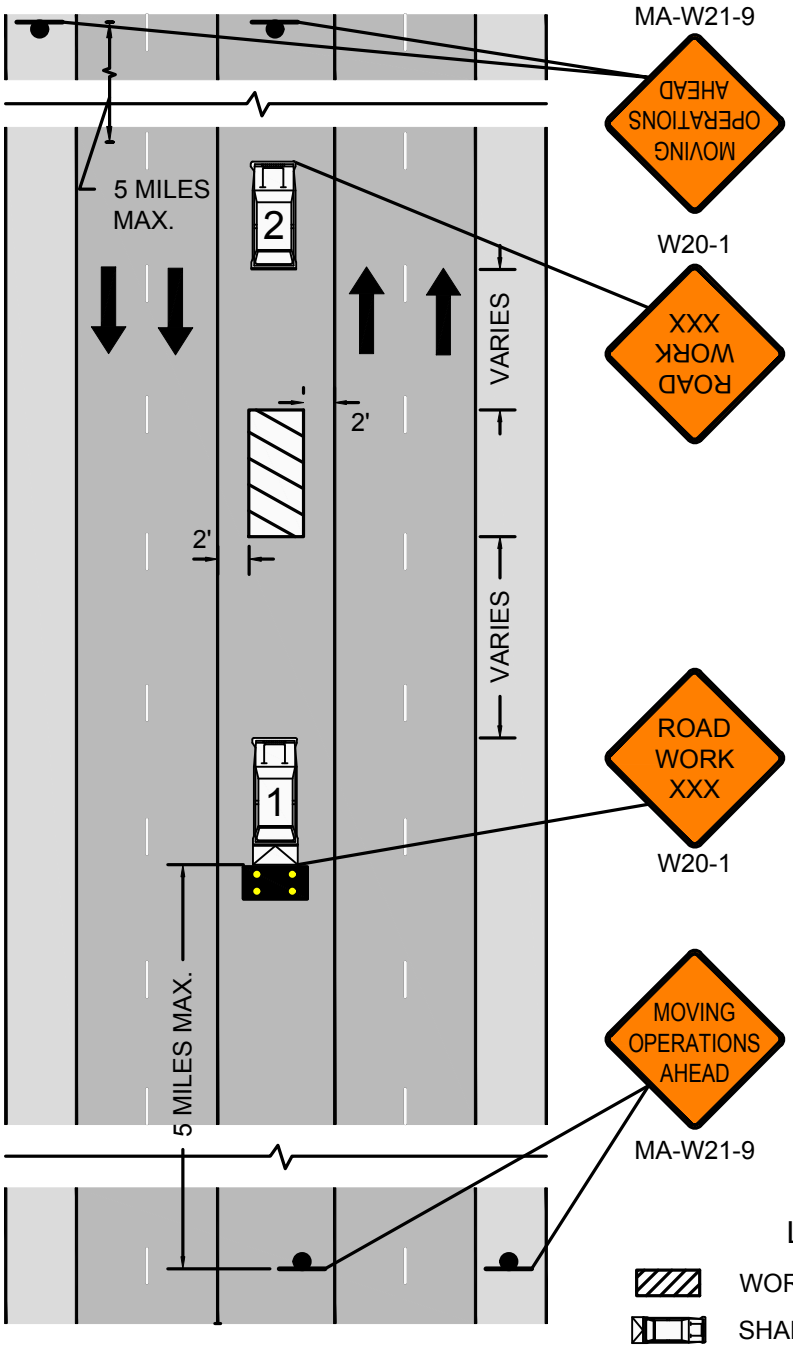
NOTES

1. IF THE WORK AREA IS SUFFICIENTLY AWAY FROM THE EDGE OF ROADWAY (20' MINIMUM) THEN SIGNS AND VEHICLES MAY NOT BE REQUIRED.

massDOT Massachusetts Department of Transportation Highway Division PAGE 57	Work Zone Safety Standard Details and Drawings	FIGURE 25 MOBILE OPERATIONS ANY ROADWAY BEYOND RIGHT SHOULDER

massDOT Massachusetts Department of Transportation Highway Division PAGE 58	Work Zone Safety Standard Details and Drawings	FIGURE 26 MOBILE OPERATIONS ANY ROADWAY SHOULDER





LEGEND

- WORK ZONE
- SHADOW VEHICLE
- WORK VEHICLE
- FLASHING ARROW BOARD (WITH STATUS)

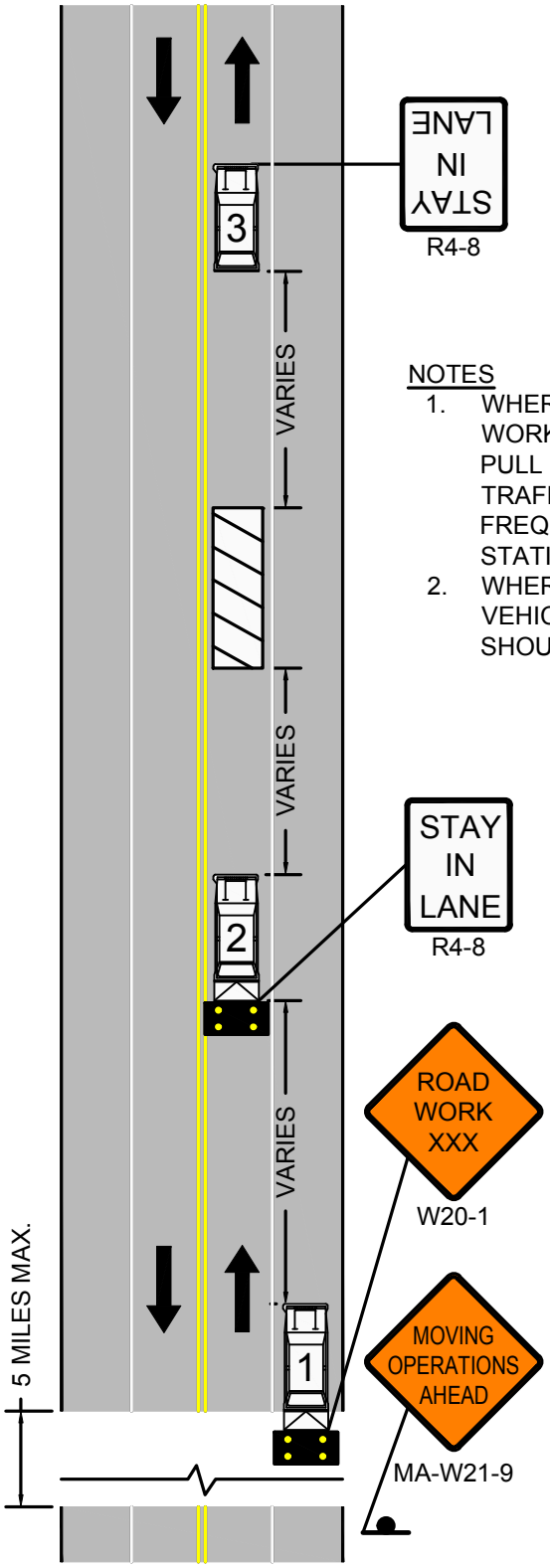
NOT TO SCALE

NOTES

1. IF THE 2' OFFSET CANNOT BE MAINTAINED, A SHORT-TERM STATIONARY SETUP SHOULD BE USED.

massDOT Massachusetts Department of Transportation Highway Division PAGE 59	Work Zone Safety Standard Details and Drawings	FIGURE 27 MOBILE OPERATIONS DIVIDED ROADWAY MEDIAN WORK

massDOT Massachusetts Department of Transportation Highway Division PAGE 60	Work Zone Safety Standard Details and Drawings	FIGURE 28 MOBILE OPERATIONS UNDIVIDED TWO LANE ROADWAY HALF OF ROADWAY CLOSED



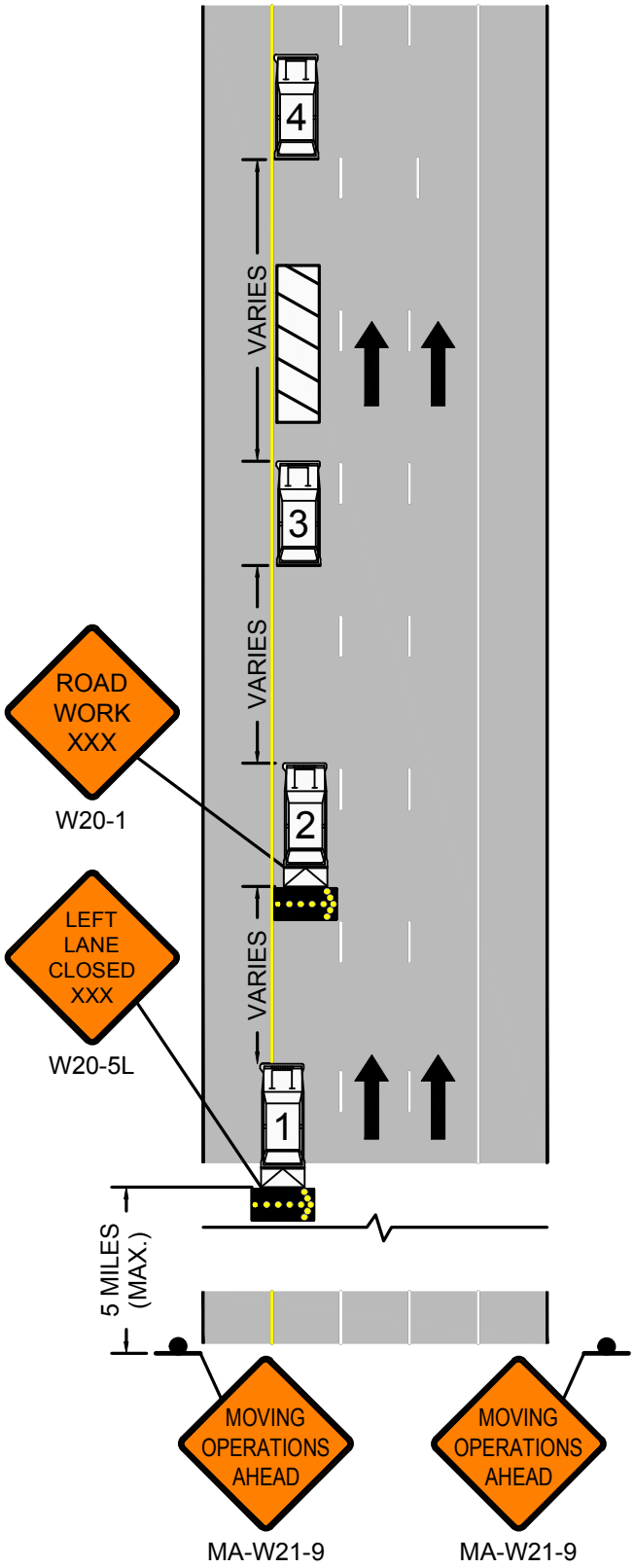
NOTES

1. WHERE PRACTICAL AND WHEN NEEDED, THE WORK AND SHADOW VEHICLE(S) SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS. IF THIS CANNOT BE DONE FREQUENTLY, THEN AN ALTERNATE STATIONARY SETUP SHALL BE DEPLOYED.
2. WHERE A WIDE SHOULDER EXISTS, SHADOW VEHICLE #1 SHOULD DRIVE ON THE SHOULDER.

LEGEND

- WORK ZONE
- SHADOW VEHICLE
- WORK VEHICLE
- FLASHING ARROW BOARD (WITH STATUS)

NOT TO SCALE



LEGEND

- WORK ZONE
- SHADOW VEHICLE
- WORK VEHICLE
- FLASHING ARROW BOARD (WITH STATUS)

NOT TO SCALE

massDOT Massachusetts Department of Transportation Highway Division PAGE 61	Work Zone Safety Standard Details and Drawings	FIGURE 29 MOBILE OPERATIONS MULTILANE DIVIDED ROADWAY LEFT LANE

massDOT Massachusetts Department of Transportation Highway Division

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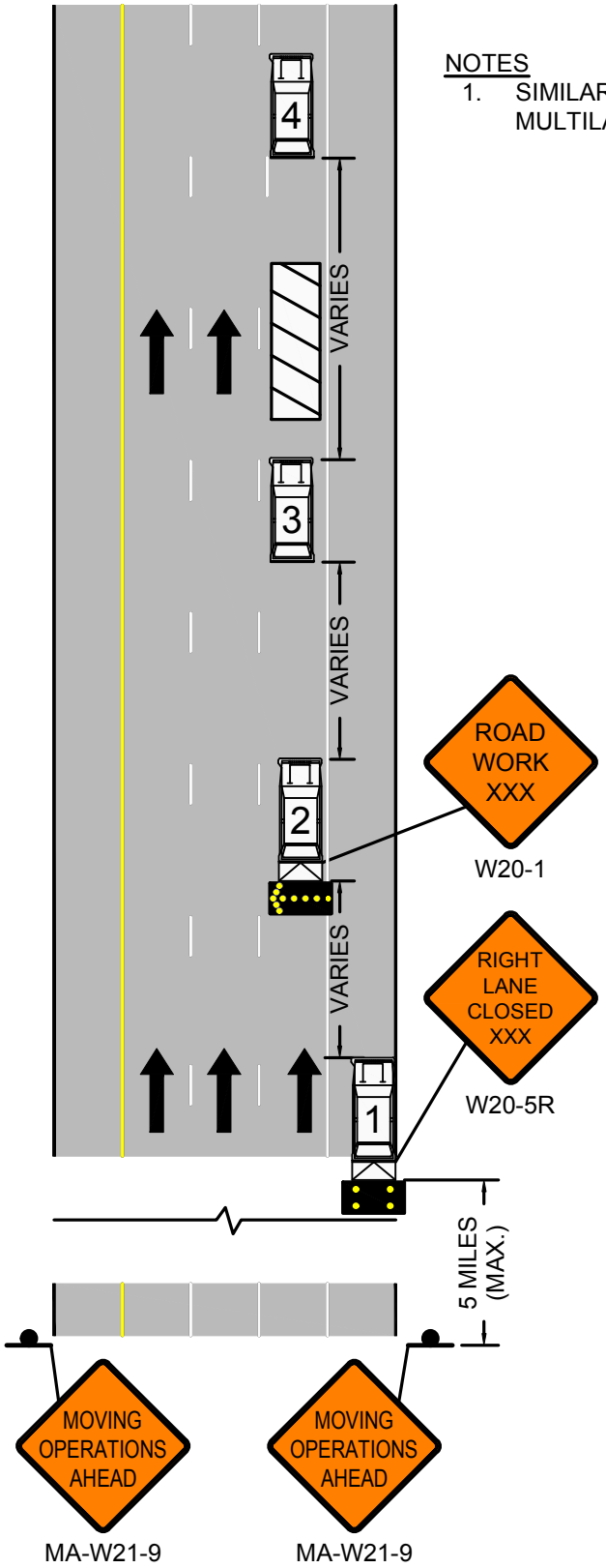
Work Zone Safety Standard Details and Drawings

FIGURE 30
MOBILE OPERATIONS
MULTILANE DIVIDED ROADWAY
RIGHT LANE



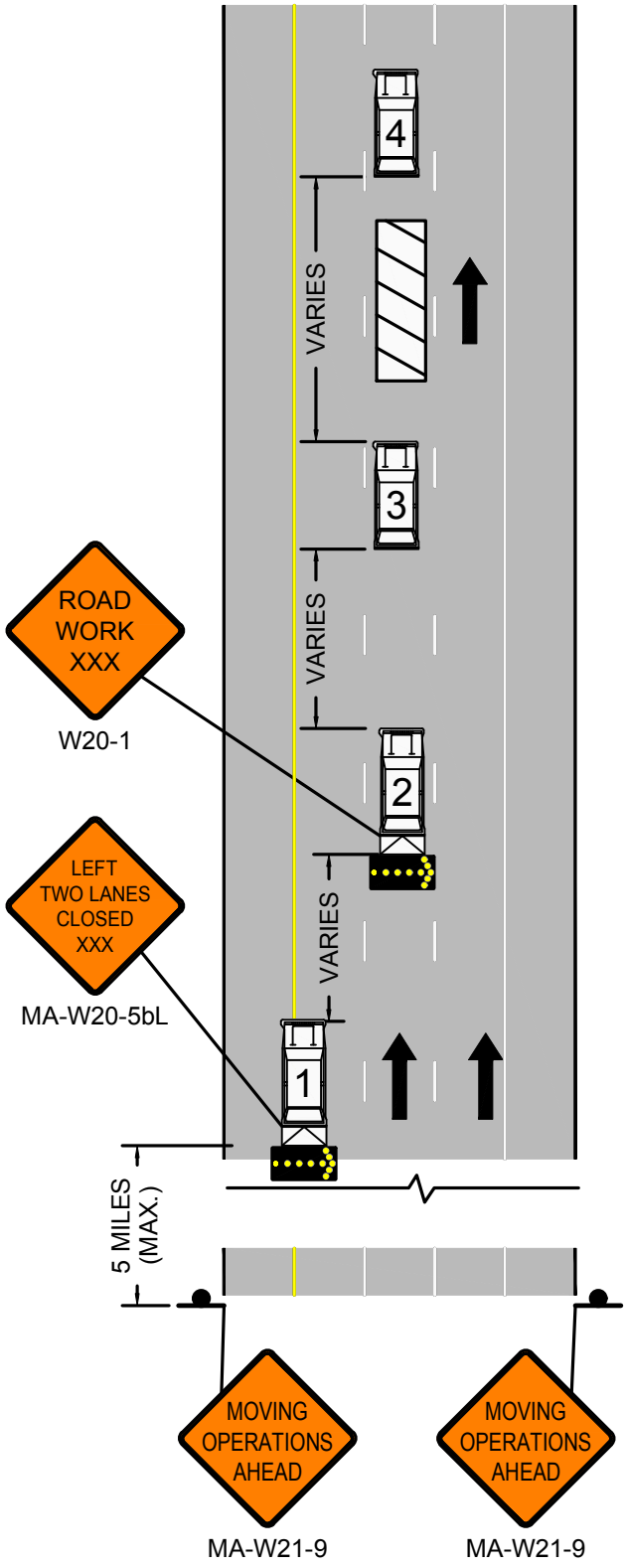
NOTES

1. SIMILAR SETUP MAY BE USED FOR A MULTILANE UNDIVIDED HIGHWAY.

LEGEND

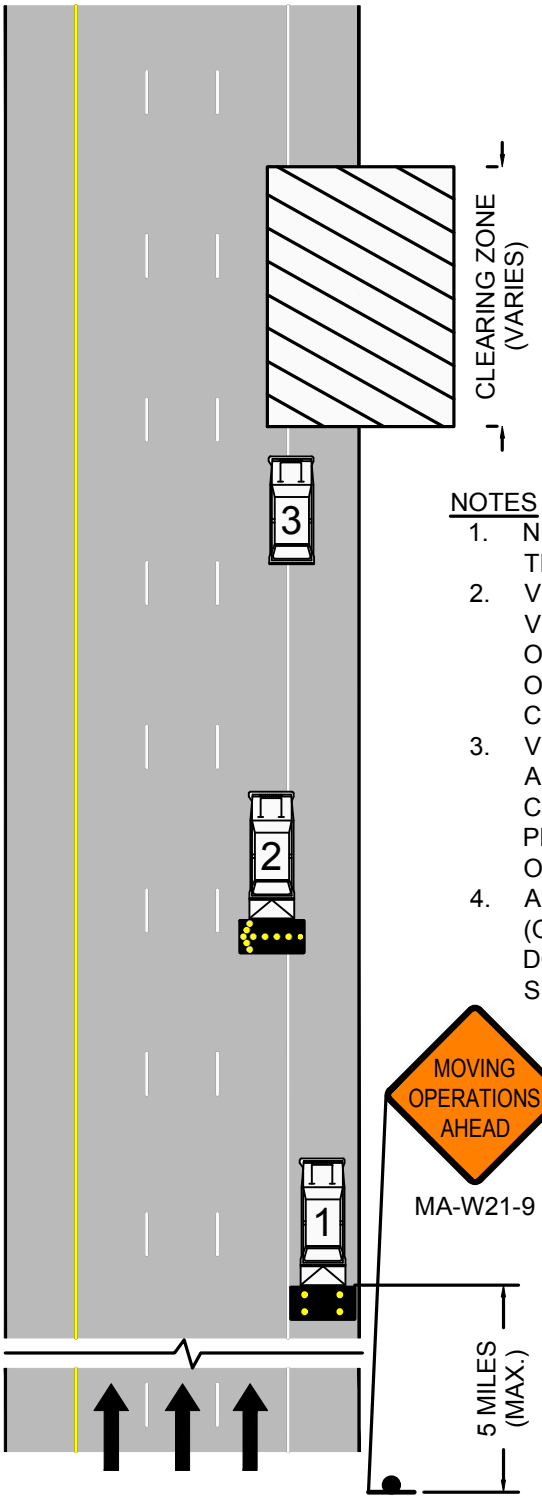
- WORK ZONE
- SHADOW VEHICLE
- WORK VEHICLE
- FLASHING ARROW BOARD (WITH STATUS)

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 63	Work Zone Safety Standard Details and Drawings	FIGURE 31 MOBILE OPERATIONS MULTILANE DIVIDED ROADWAY CENTER LANE

massDOT Massachusetts Department of Transportation Highway Division PAGE 64	Work Zone Safety Standard Details and Drawings	FIGURE 32 MOBILE OPERATIONS POST-STORM CLEANUP OPERATION



NOTES

1. NO OTHER NOTES ARE APPLICABLE TO THIS DETAIL.
2. VEHICLE #3 IS A SNOW/DEBRIS REMOVAL VEHICLE AND SHALL ALWAYS BE AWARE OF THE SURROUNDINGS. MORE THAN ONE VEHICLE MAY BE USED IN THE CLEARING ZONE.
3. VEHICLE #1 SHOULD BE EQUIPPED WITH A PCMS, A TMA, AND STAY IN VISUAL CONTACT WITH VEHICLE #3 WHILE PROVIDING AMPLE WARNING TO ONCOMING TRAFFIC.
4. A POLICE DETAIL WITH BLUE LIGHTS (OPTIONAL) SHALL REMAIN DOWNSTREAM OF VEHICLE #1 IN THE SHOULDER.

LEGEND

- WORK ZONE
- SHADOW VEHICLE
- WORK VEHICLE
- FLASHING ARROW BOARD (WITH STATUS)

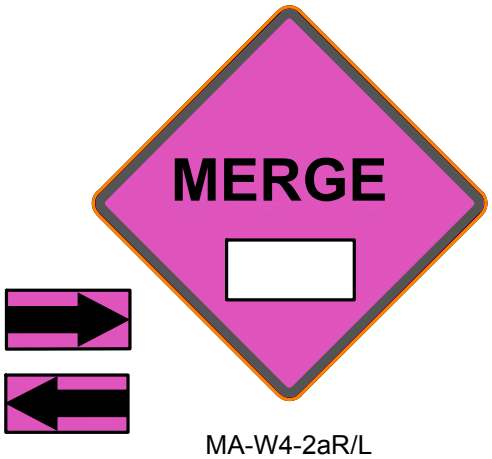
NOT TO SCALE

Notes for Traffic Emergency or Incident Operations

- The goal is to increase awareness of during traffic emergencies or incidents.
- These signs are to be used to differentiate from the traditional construction work zone and an emergency or incident.
- Upon arrival MassDOT First Responders shall assess the magnitude of the scene to determine if the incident is likely to last an hour or more in duration which would trigger the requirement to use these signs.
- Place the "Emergency Ahead" sign on the same side of the road as the incident, if possible, for up to an hour. Emergency response signs should be put up for all incidents and emergencies as soon as possible.
- Place the emergency sign 500 to 1000 feet before the first channelization devices.
- As an incident evolves this sign would be used as a secondary sign with all other emergency controls put in place.
- Only use "MERGE" signs where applicable (Not on 2 lane roads).
- Use MERGE signs on Multi-lane Roads to move traffic away from the incident and keep them in a safe lane.
- Place the MERGE sign about 500 feet before the closure.
- If additional signs are available, they should be placed accordingly as a sign informing people coming in the other direction or on the opposite side of the roadway.
- Use 12 emergency cones spaced 40 to 80 feet apart to form a taper and protect the scene.
- Sequential flashing lights/flares may be used in lieu of or to supplement cones.
- During a major incident that will last for a long duration, the EMERGENCY AHEAD sign should be moved back before an intersecting road or ramp to alert travelers and give them an option of using an alternate route. (Be sure all other devices are in place before moving this sign).

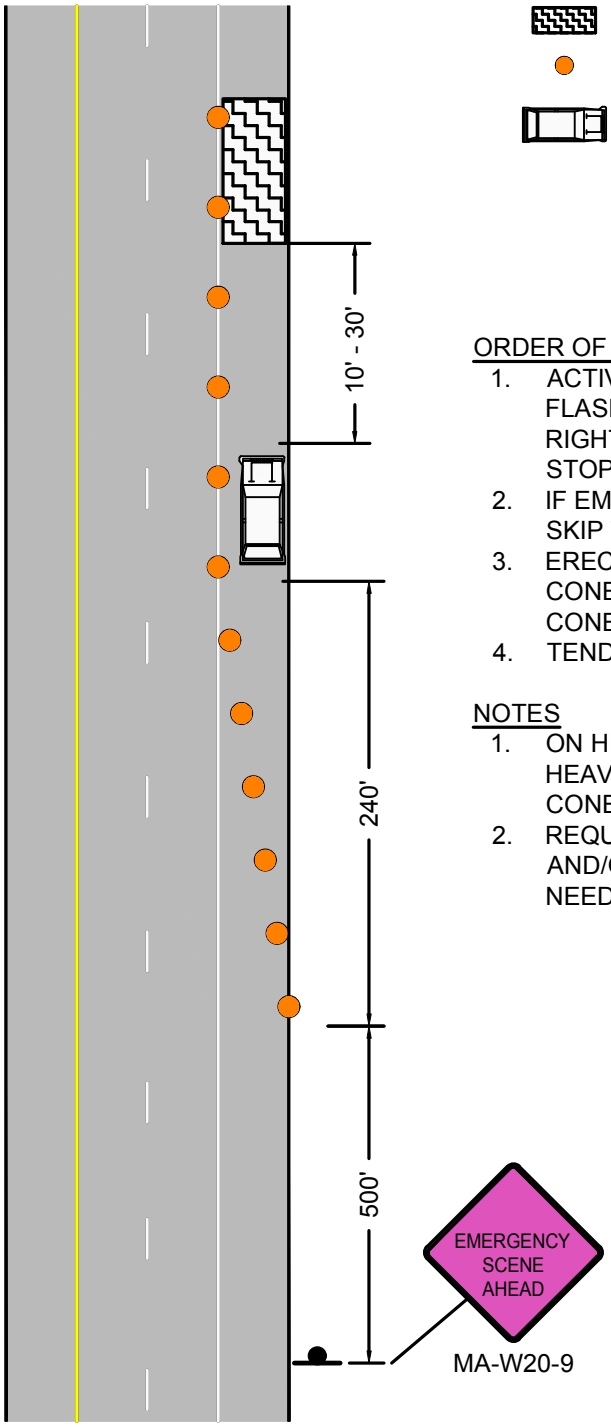
Standard Emergency Signs (36"x36" or 48"x48")

MA-W20-9



MA-W4-2aR/L

massDOT Massachusetts Department of Transportation Highway Division PAGE 66	Work Zone Safety Standard Details and Drawings	FIGURE 33 EMERGENCY RESPONSE ANY ROADWAY SHOULDER ENCROACHMENT



LEGEND

EMERGENCY AREA

CHANNELIZATION DEVICE

EMERGENCY RESPONSE VEHICLE

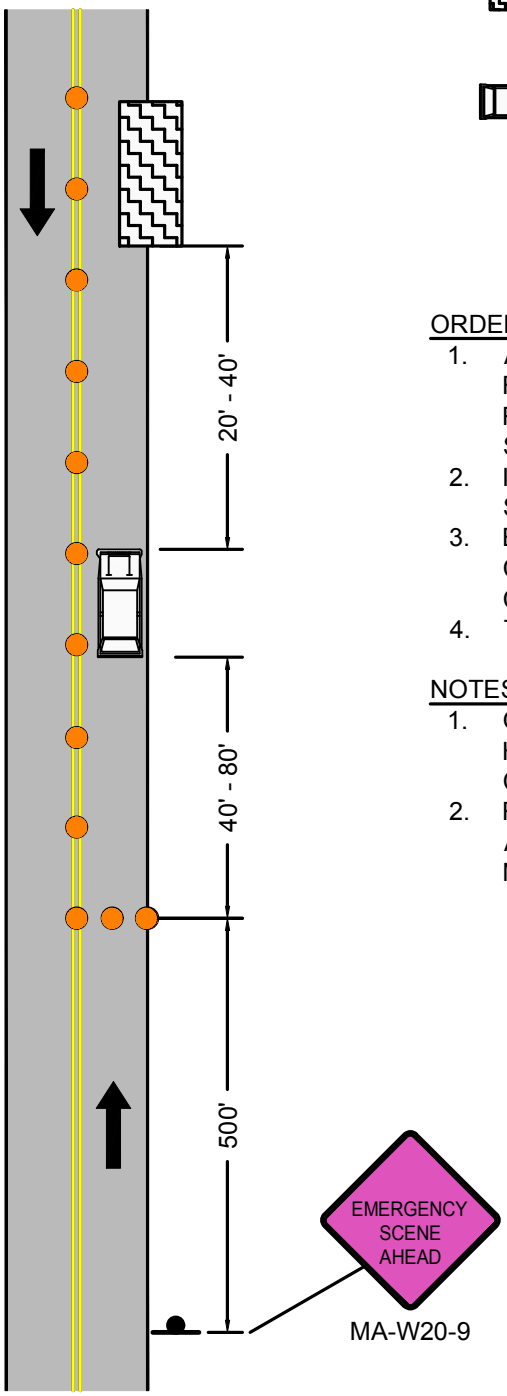
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE RIGHT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



LEGEND

EMERGENCY AREA

CHANNELIZATION DEVICE

EMERGENCY RESPONSE VEHICLE

NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

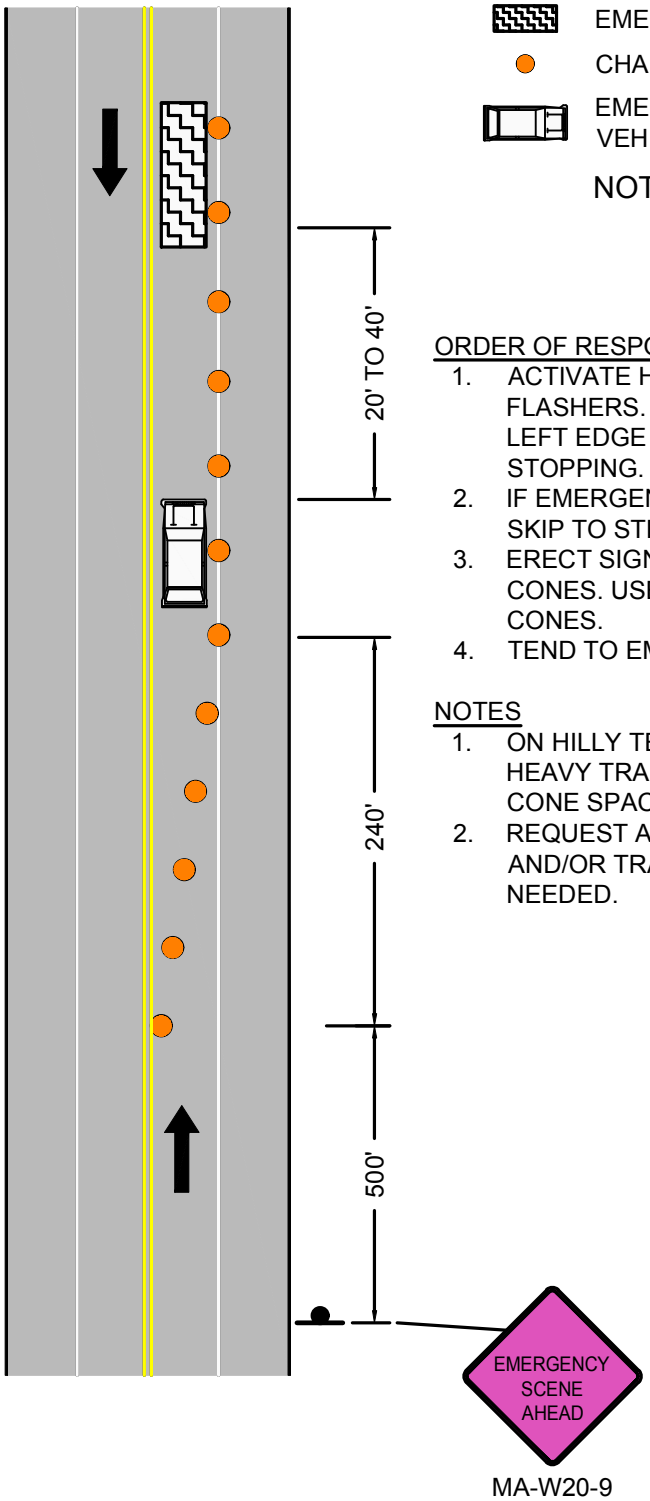
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE RIGHT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

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.

massDOT Massachusetts Department of Transportation Highway Division PAGE 67	Work Zone Safety Standard Details and Drawings	FIGURE 34 EMERGENCY RESPONSE TWO LANE ROADWAY NO SHOULDER TRAVEL LANE ENCROACHMENT

massDOT Massachusetts Department of Transportation Highway Division PAGE 68	Work Zone Safety Standard Details and Drawings	FIGURE 35 EMERGENCY RESPONSE TWO LANE ROADWAY TRAVERSABLE SHOULDER SINGLE LANE ENCROACHMENT



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE

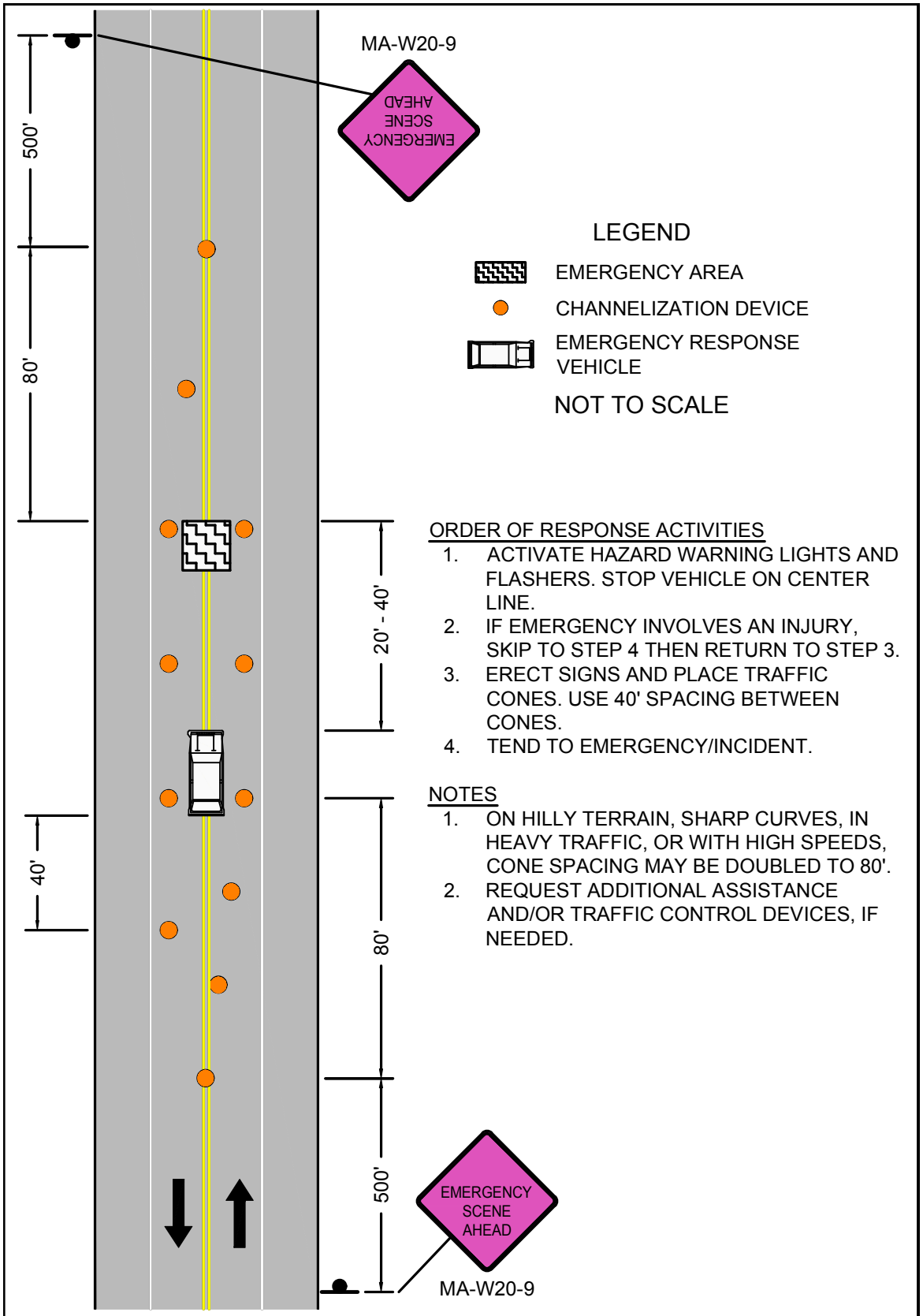
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. PULL VEHICLE OVER TO THE LEFT EDGE OF TRAVEL LANE BEFORE STOPPING.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



ORDER OF RESPONSE ACTIVITIES

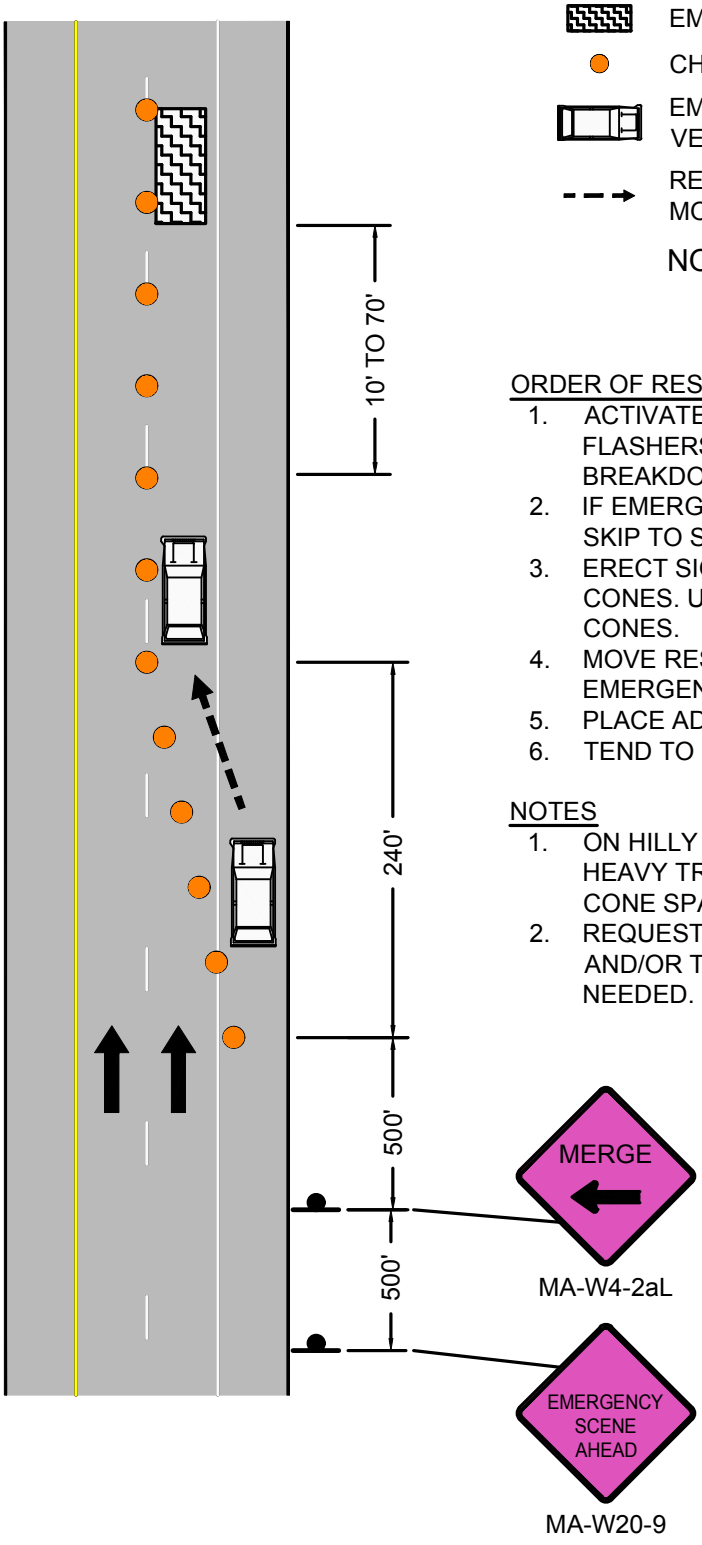
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE ON CENTER LINE.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 4 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. TEND TO EMERGENCY/INCIDENT.

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.

massDOT Massachusetts Department of Transportation Highway Division PAGE 69	Work Zone Safety Standard Details and Drawings	FIGURE 36 EMERGENCY RESPONSE TWO LANE ROADWAY TRAVERSABLE SHOULDER CENTER OF ROADWAY

massDOT Massachusetts Department of Transportation Highway Division PAGE 70	Work Zone Safety Standard Details and Drawings	FIGURE 37 EMERGENCY RESPONSE MULTILANE DIVIDED ROADWAY RIGHT LANE



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE
- RESPONSE VEHICLE MOVEMENT

NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN BREAKDOWN LANE.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 6 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. MOVE RESPONSE VEHICLE BEHIND EMERGENCY.
5. PLACE ADDITIONAL CONES.
6. TEND TO EMERGENCY.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.

LEGEND

EMERGENCY AREA

CHANNELIZATION DEVICE

EMERGENCY RESPONSE VEHICLE

RESPONSE VEHICLE MOVEMENT

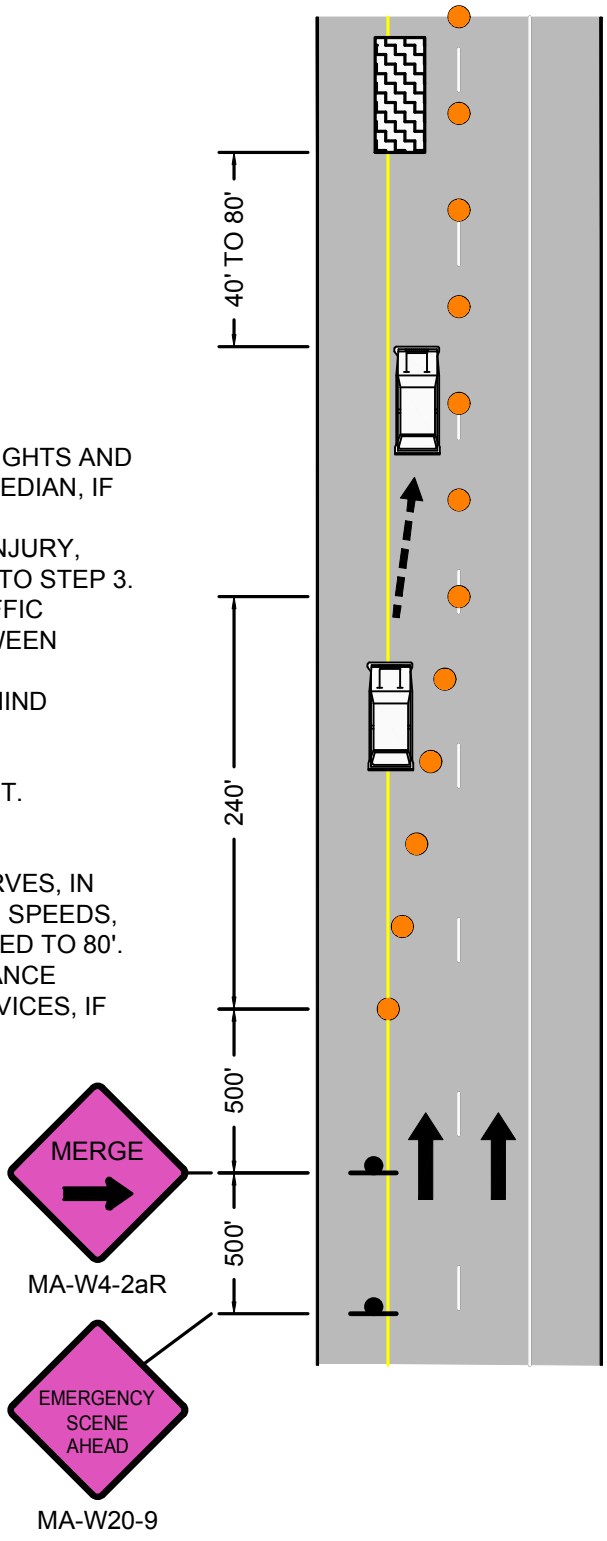
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN MEDIAN, IF PRESENT.
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/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.



massDOT Massachusetts Department of Transportation Highway Division

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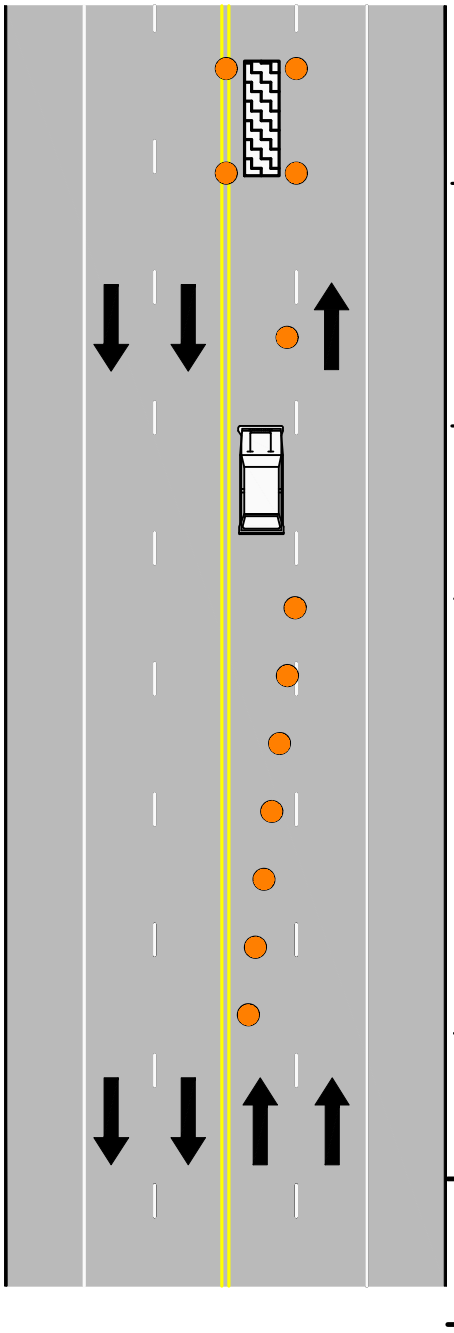
Work Zone Safety Standard Details and Drawings

FIGURE 38
EMERGENCY RESPONSE
MULTILANE DIVIDED ROADWAY
LEFT LANE

massDOT Massachusetts Department of Transportation Highway Division PAGE 72	Work Zone Safety Standard Details and Drawings	FIGURE 39 EMERGENCY RESPONSE MULTILANE UNDIVIDED ROADWAY LEFT LANE



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE

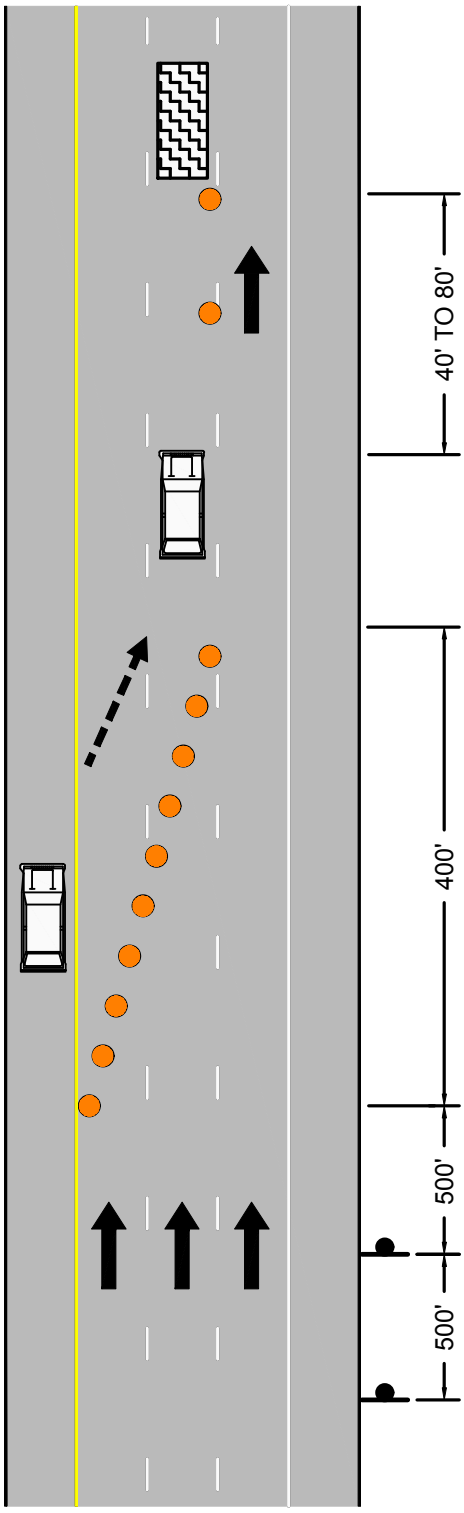
NOT TO SCALE

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.

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.



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE
- RESPONSE VEHICLE MOVEMENT

NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

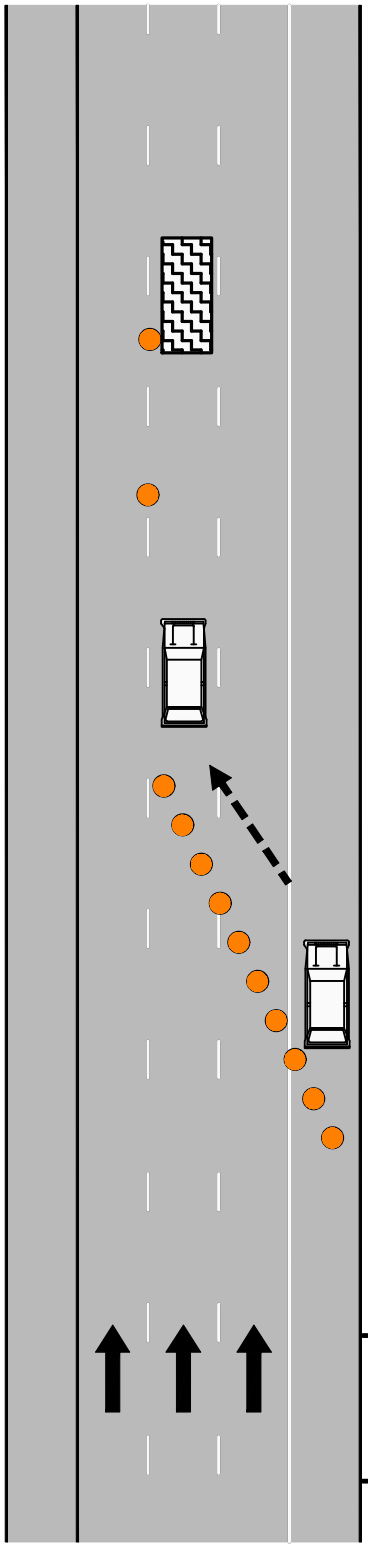
1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN MEDIAN, IF PRESENT.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 6 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. MOVE RESPONSE VEHICLE BEHIND EMERGENCY.
5. PLACE ADDITIONAL CONES.
6. TEND TO EMERGENCY/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.

massDOT Massachusetts Department of Transportation Highway Division PAGE 73	Work Zone Safety Standard Details and Drawings	FIGURE 40 EMERGENCY RESPONSE MULTILANE DIVIDED ROADWAY MIDDLE LANE APPROACH FROM LEFT

massDOT Massachusetts Department of Transportation Highway Division PAGE 74	Work Zone Safety Standard Details and Drawings	FIGURE 41 EMERGENCY RESPONSE MULTILANE DIVIDED ROADWAY MIDDLE LANE APPROACH FROM RIGHT



LEGEND

- EMERGENCY AREA
- CHANNELIZATION DEVICE
- EMERGENCY RESPONSE VEHICLE
- RESPONSE VEHICLE MOVEMENT

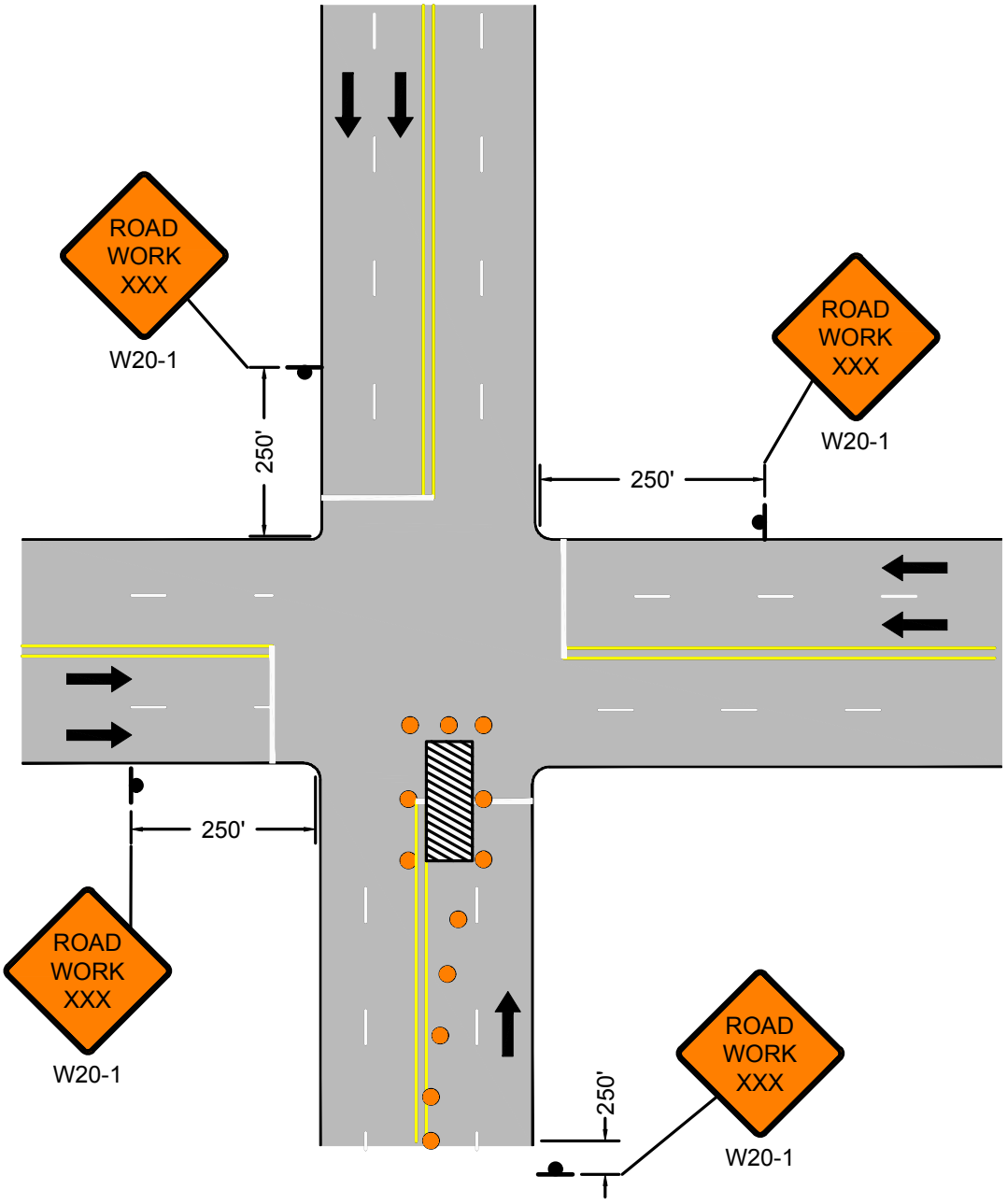
NOT TO SCALE

ORDER OF RESPONSE ACTIVITIES

1. ACTIVATE HAZARD WARNING LIGHTS AND FLASHERS. STOP VEHICLE IN BREAKDOWN LANE.
2. IF EMERGENCY INVOLVES AN INJURY, SKIP TO STEP 6 THEN RETURN TO STEP 3.
3. ERECT SIGNS AND PLACE TRAFFIC CONES. USE 40' SPACING BETWEEN CONES.
4. MOVE RESPONSE VEHICLE BEHIND EMERGENCY.
5. PLACE ADDITIONAL CONES.
6. TEND TO EMERGENCY.

NOTES

1. ON HILLY TERRAIN, SHARP CURVES, IN HEAVY TRAFFIC, OR WITH HIGH SPEEDS, CONE SPACING MAY BE DOUBLED TO 80'.
2. REQUEST ADDITIONAL ASSISTANCE AND/OR TRAFFIC CONTROL DEVICES, IF NEEDED.



LEGEND

WORK ZONE

CHANNELIZATION DEVICE

NOT TO SCALE

NOTES

1. DURATION OF WORK = 20 MINUTES OR LESS.
2. EQUIPMENT: 12 CONES + 4 PORTABLE SIGNS.
3. CONE SPACING IS 20 FEET.
4. SINGLE WORK VEHICLE PARKED/STOPPED.
5. POLICE DETAIL REQUIRED.

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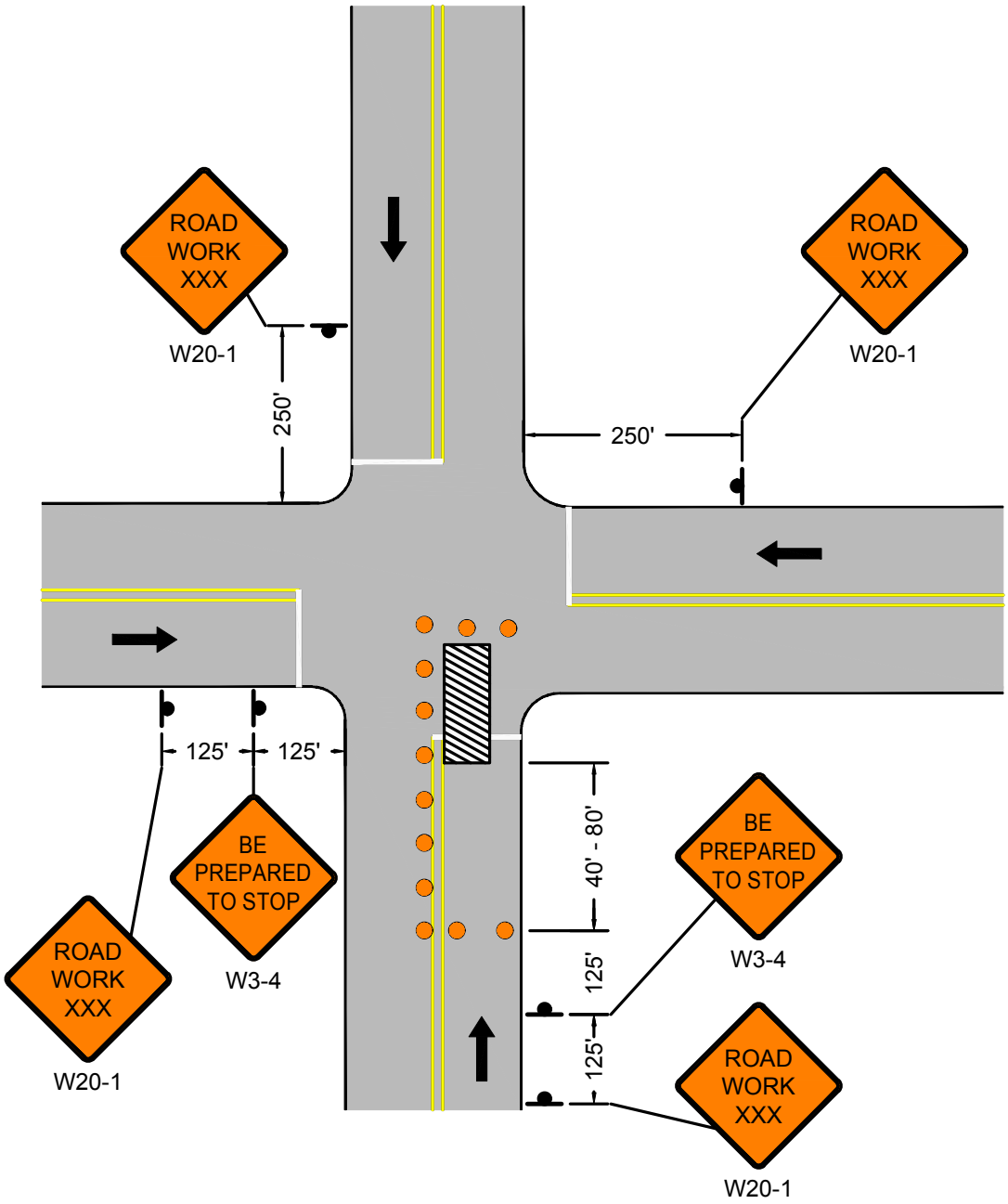
PAGE 75

Work Zone Safety Standard Details and Drawings

FIGURE 42
TRAFFIC SIGNAL REPAIR WORK
MULTILANE UNDIVIDED ROADWAY
LEFTMOST OR LEFT TURNING LANE

massDOT Massachusetts Department of Transportation Highway Division PAGE 76	Work Zone Safety Standard Details and Drawings	FIGURE 43 TRAFFIC SIGNAL REPAIR WORK TWO LANE UNDIVIDED ROADWAY ONE LEG OF INTERSECTION



LEGEND

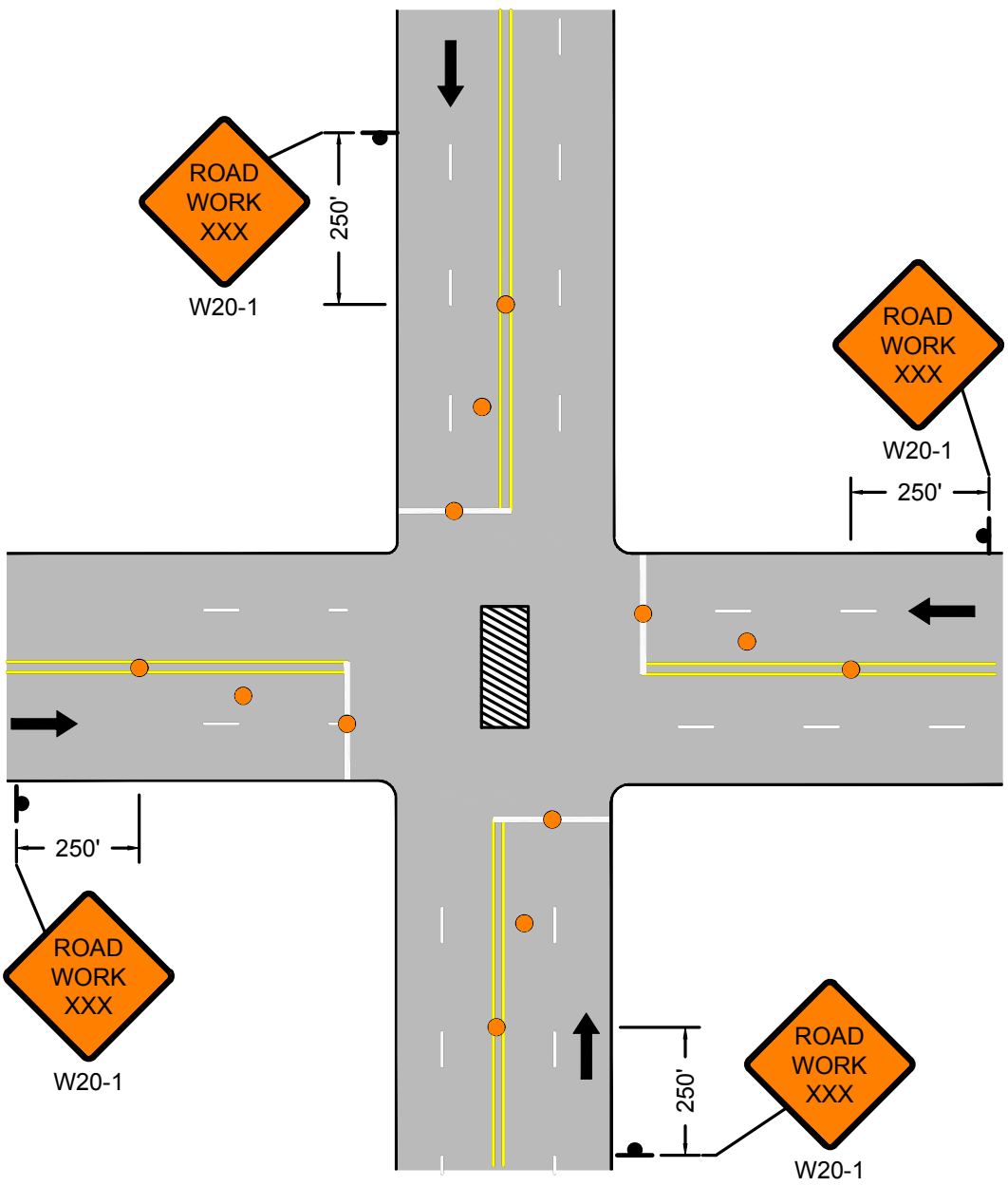
WORK ZONE

CHANNELIZATION DEVICE

NOT TO SCALE

NOTES

1. DURATION OF WORK = 20 MINUTES OR LESS.
2. EQUIPMENT: 12 CONES + 6 PORTABLE SIGNS.
3. CONE SPACING IS 20 FEET.
4. SINGLE WORK VEHICLE PARKED/STOPPED.
5. POLICE DETAIL REQUIRED.



LEGEND

WORK ZONE

CHANNELIZATION DEVICE

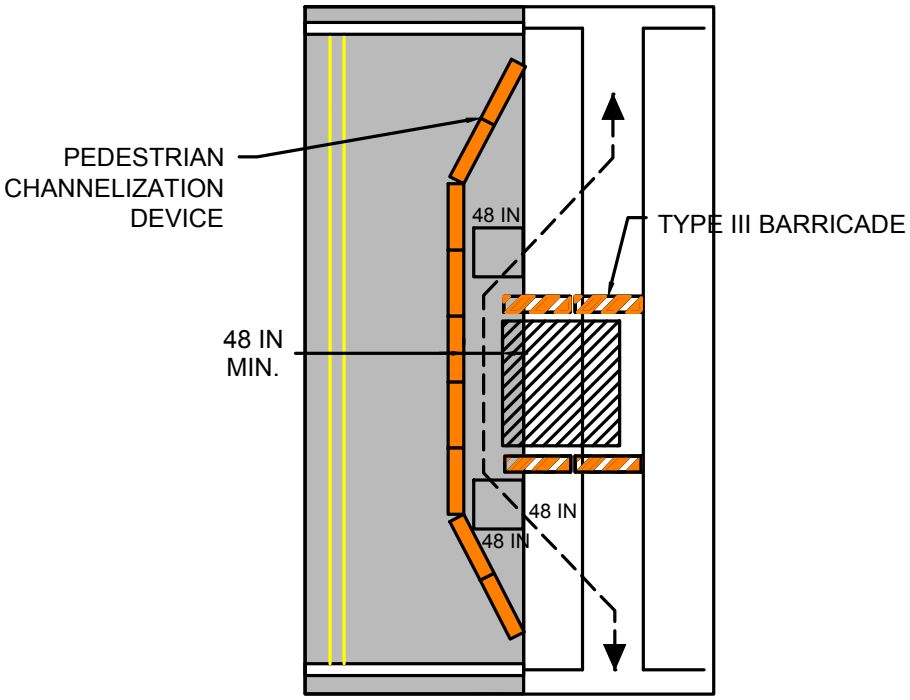
NOT TO SCALE

NOTES

1. DURATION OF WORK = 20 MINUTES OR LESS.
2. EQUIPMENT: 12 CONES + 4 PORTABLE SIGNS.
3. CONE SPACING IS 20 FEET.
4. SINGLE WORK VEHICLE PARKED/STOPPED.
5. POLICE DETAIL REQUIRED.

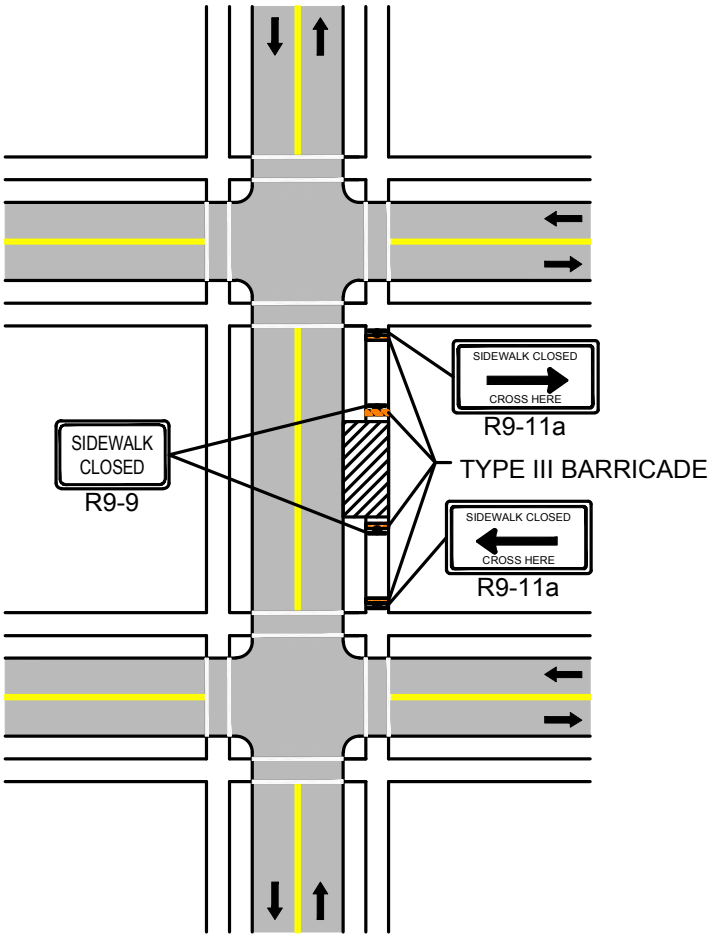
massDOT Massachusetts Department of Transportation Highway Division PAGE 77	Work Zone Safety Standard Details and Drawings	FIGURE 44 TRAFFIC SIGNAL REPAIR WORK MULTILANE UNDIVIDED ROADWAY CENTER OF INTERSECTION

massDOT Massachusetts Department of Transportation Highway Division PAGE 78	Work Zone Safety Standard Details and Drawings	FIGURE 45 PEDESTRIAN BYPASS



NOTES:

1. WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
2. A PEDESTRIAN CHANNELIZATION DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ALONG THE FULL LENGTH OF THE TEMPORARY PEDESTRIAN ROUTE.
3. WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT.
4. THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
5. THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THE SIDEWALK EXCEEDS 200 FEET THEN A 5 FOOT BY 5 FOOT PASSING ZONE SHALL BE PROVIDED NEAR THE MID-POINT OF THE CLOSURE.
6. THE PROTECTIVE REQUIREMENTS OF A TTC WORK ZONE MAY HAVE AN IMPACT IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN PROVIDING PEDESTRIAN DELINEATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
7. ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL TO ASSIST WITH NAVIGATION AROUND THE CLOSURE/WORK AREA MAY BE CONSIDERED AS AN OPTION IN PLACE OF PROVIDING ADA/AAB DEVICES FOR WORK FOR CLOSURES LASTING 4 HOURS OR LESS.
8. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN; VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE. THESE DETAILS ARE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DETERMINED BY THE ENGINEER.



NOTES:

1. CLOSURE OF A SIDEWALK FACILITY SHALL CONSTITUTE THE PROVISION FOR MANAGING PEDESTRIAN TRAFFIC AND ACCOMMODATING ALL USERS. IF THE EXISTING PEDESTRIAN ACCESS ROUTE(S) CAN BE TEMPORARILY RELOCATED ALONG THE EXISTING SIDEWALK , AND SAID FACILITY PROVIDES A MINIMUM WIDTH OF 48-INCHES OF SOLID, SMOOTH UNOBSTRUCTED SURFACE, THEN NO DETOURING OF THE ROUTE SHALL BE REQUIRED. DELINEATION OF THE WORK AREA IS STILL REQUIRED.

2. IF IT IS NECESSARY TO DIVERT PEDESTRIAN TRAFFIC TO AN ALTERNATE ROUTE ACROSS THE ROADWAY FROM THE EXISTING FACILITY, THE FIGURE ABOVE SHALL BE FOLLOWED TO PROVIDE ADEQUATE DIRECTION TO PEDESTRIANS. ALTERNATE ROUTE SHALL PROVIDE THE SAME LEVEL OF ACCOMMODATION AS THE FACILITY THAT IS BEING DETOURED AND RETAIN ADA COMPLIANCE IN ITS ENTIRETY.

3. FOR EMERGENCY OR SHORT-DURATION SIDEWALK CLOSURES OF 4-HOURS OR LESS, IT IS OPTIONAL TO HAVE ON-DEMAND PEDESTRIAN ASSISTANCE PERSONNEL AVAILABLE AT ALL TIMES DURING THE CLOSURE TO ASSIST THOSE MOBILITY CHALLENGED PERSONS WHO REQUIRE ADDITIONAL ASSISTANCE TO SAFELY NAVIGATE AROUND THE WORK AREA IN LIEU OF A FULL DETOUR.

massDOT Massachusetts Department of Transportation Highway Division 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

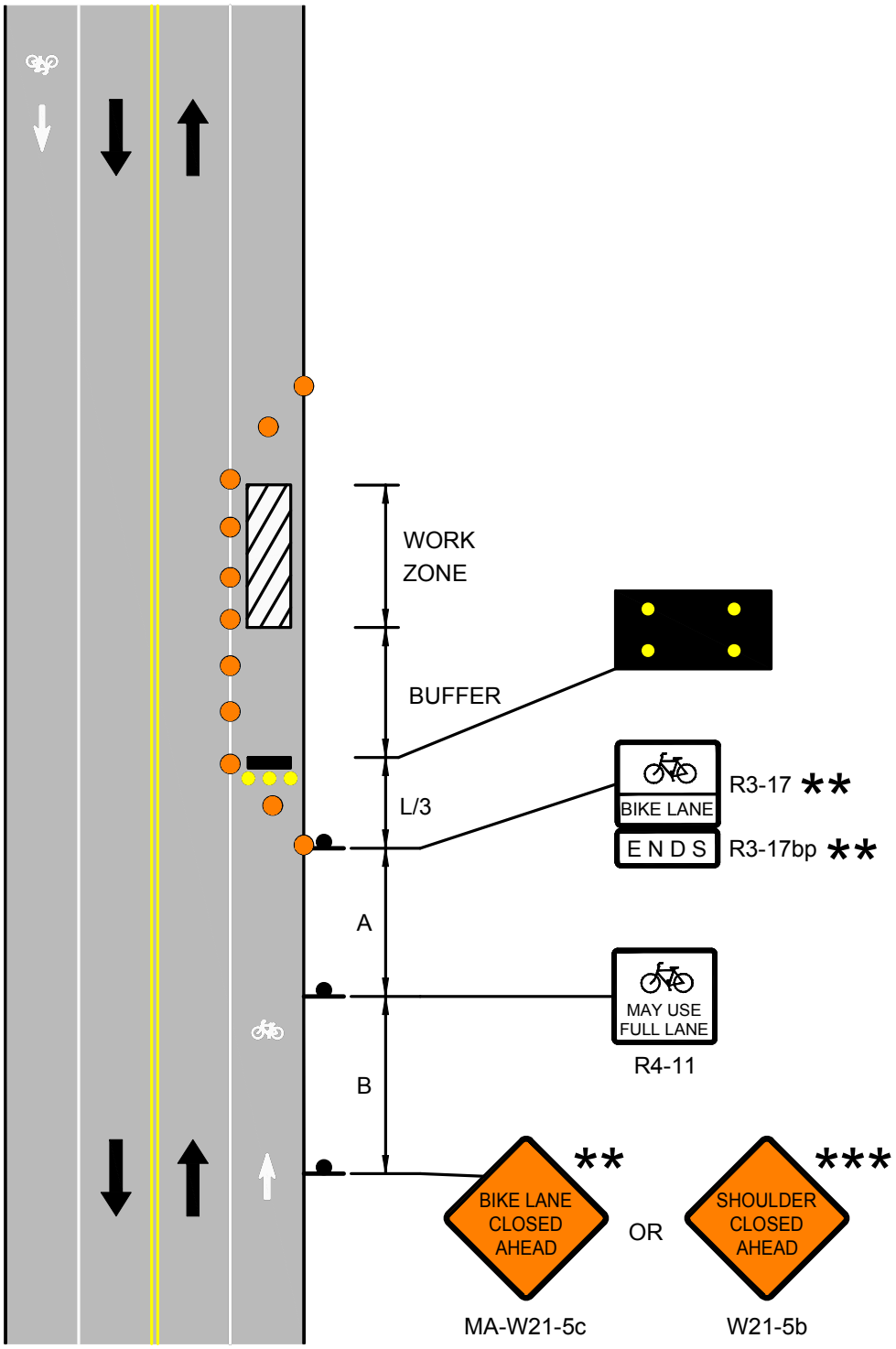
RADAR SPEED FEEDBACK BOARD

POLICE DETAIL OR UNIFORMED FLAGGER

TEMPORARY PORTABLE RUMBLE STRIP

TYPE III BARRICADE

NOT TO SCALE



massDOT Massachusetts Department of Transportation Highway Division PAGE 81	Work Zone Safety Standard Details and Drawings	FIGURE 48 STATIONARY OPERATIONS BIKE LANE CLOSURE

Rev. June, 2017

DOCUMENT A00817

CITY OF TAUNTON
WATER DIVISION
SPECIFICATIONS

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Taunton Water Division

Water System Installation and Materials Specifications

Effective January 1, 2017

General

All plans for new construction are subject to final approval by the Taunton DPW Water Division with regards to size and location of all Water Mains, Gate valves, Fire Hydrants, Water Services, and Water Meters.
These standards may be amended from periodically to meet current safety and design standards.

Water Main Size:

The minimum size of all new water mains for new construction shall be 8 inch. Water Mains will be installed on the same side of the street for the entire length of the street. The size of the water mains installed within any development Public or Private must provide the following:

- The water main design must also provide for a minimum of 20 PSI during fire flow conditions at peak demand times. The flow rates shall meet or exceed the minimum ISO (Insurance Services Office) requirements for the applicable construction.
- No Dead end water main shall be more than 1000 feet in length without looping back to the water system to allow for adequate flow to maintain water quality.

Water Services:

The minimum size pipe for a new water service shall be 1 inch. However, larger sizes may be required to meet minimum flow and pressure requirements. The city will use the chart on located on **Appendix A** to determine if a larger service is required. The size of the service will be determined by the city.

- All curb stops will be set at the property line of the building being served.
- During peak usage provide the customer with a minimum of 15 Gallons per minute at 40 Pounds per square inch (PSI) of pressure on the first floor of each residence or commercial property.
- Water services cannot be run along a public roadway, if the premises to be served is beyond the end of an existing water main, the water main will have to be extended to the farthest property line of the premises.
- All Buildings, single family homes, duplexes, triplexes, commercial, Industrial buildings etc. must each have their own water service tapped at the water main.
- On ductile Iron or Cast Iron water main, 1" Service taps will be the directly tapped into the water main. On PVC or AC (Transite) pipe all taps will require the use of a saddle. All 1 ½" and 2" taps on all pipe types require service saddles.
- Domestic water services cannot be tapped off a fire line. They must originate at the water main, no exceptions.

Water Main Gate Valves:

All water gates that connect to the city's water system shall meet the city minimum specifications. - The maximum distance between inline water main gates is 1000 feet.

- Each intersection will have either a three way gate assembly for a side street, or a four way gate for a cross street.
- All water main gates must be within public ways.

Fire Hydrants:

Fire hydrants shall be installed as follows

- Fire Hydrants shall be no more than 500 feet apart.
- The first Fire hydrant on a new road shall be located no farther than 500 feet from the nearest Fire hydrant in the existing water system.
- Fire hydrants will be installed on the same side of the road as the water main unless otherwise approved by the water department. All fire Hydrants will be installed using anchor tees with the auxiliary Fire hydrant gate mounted directly to the tee. The breakaway flanges must be 3 to 5 inches from ground level. Fire hydrants installed within a sidewalk shall be set so the bolts on the breakaway flange can be accessed without cutting the sidewalk. All Fire Hydrants will be red in color.
- Fire hydrants must be installed on dead end line.
- On dead end installations the Fire hydrant should be connected using a reducer with a 6" auxiliary valve. Mega Lug style retainer glands shall be used on the reducer, auxiliary gate, and Fire Hydrant. Depending on ground conditions a thrust block may be needed.
- Fire hydrants will have a minimum of 1/3 cubic yards or ½" to ¾" crushed stone to allow for proper drainage.
- All Fire Hydrants will be installed per manufactures instructions.

Pipe & Joint Restraints

All new construction will be required to use restraining glands similar to the EBBA Iron Mega lug system, on all Tee's bends reducers/increasers, gate valves (including inline valves), and Fire Hydrants.
Upon approval from the water department where necessary the city may allow the use of threaded rod for the installation of Fire risers. Fire risers shall also have a thrust block poured and tied to bend to prevent movement.

Thrust Blocks

Thrust blocks are required on bends and tees. Thrust Blocks will be properly sized based on ANSI/AWWA C150/21.50 or latest revision for ductile Iron Pipe

Plans for proposed extension to the water system:

All proposed plans shall be drawn and stamped by a Massachusetts registered engineer, and include the following:

- Plans can either be submitted on 24" x 36" sheets or 22" x 34" sheets.
- The plans must show all proposed water mains, gates, Fire Hydrants, proposed water services.

- All Plans must be approved by the Water Division prior to installation. The water department generally requires 72 hours for approval but may take longer for more complex designs.
- Fire services require a fire flow test as close as possible to the connection point.
- The proponent of the new connection must prove there will be no negative effect on the existing water system. A negative impact on the existing system may trigger the proponent to make upgrades within the water system as part of the approval should they decide to proceed with the project. The city's water division if needed will use its consulting engineer to review the information supplied to make this determination.

Cross Connections

The City of Taunton Water Division is responsible under Commonwealth of Massachusetts Drinking Water Regulations 310 CMR 22.22 is required to make sure that there is no possibility of a Potable water source coming in contact with a Non Potable Source without the proper backflow devices installed.

All new facilities where a cross connection may exist must submit a backflow device plan to the city as along with their plans. The plan must show the proposed locations for all the devices within the facility. While the proper installation of each device is overseen by the Plumbing inspector, the Water division is responsible for the location of each device to make sure the water supply is properly protected from water source to point of domestic use per the US EPA and Massachusetts DEP. The city must survey all new commercial facilities to track compliance.

Pressure testing:

All new water mains will be tested to according to AWWA C-600 latest revision. The pressure test will be completed by a third party approved by the Water Division and witnessed by the Water Division.

- Pressure testing shall be done prior to the chlorination of the new lines.
- The Water division shall be notified of the date and time of the test (a minimum of 48 hours)
- The initial flooding of the mains will be controlled by the city. Once flooded the company preforming the pressure test may flush the lines to remove air from the lines. At no time will the contractor use a flow rate of more than 500 GPM to remove air.
- All hydrant branches within the test area must be open during the pressure test.
- The test pressure shall be 150 PSI and be held for 2 hours
- Any leakage if any shall be equal to or less than the amount as determined in AWWA C-600 or latest revision, Section 4.2. Any section of water main shall be considered unsuitable if the leakage is greater than the amount in the AWWA C-600 or latest revision, section 4.2.
- A failed pressure/leakage test will result in the installation contractor having to locate and repair the leak in a method approved by the city. The pressure test must then be redone and pass the test.
- Upon completion a written report of the test preformed must be supplied by the third party preforming the testing. The report should include at a minimum the date and time

of the pressure test, pipe diameter, and length tested, any problems, leaks encountered during the test. If for any reason the AWWA C-600 leakage calculations are used, the calculation and result must be included on the test report. The leakage calculations are subject to review prior to the city accepting the pressure test as having passed.

New Water Line Disinfection:

All new water lines installed within the distribution system must be disinfected in strict accordance with AWWA standard C-651 latest revision.

- Disinfection must be performed using Calcium Hypochlorite granules dissolves in water drawn from the distribution system and pumped continuously into the new water line until a chlorine residual is seen at the blow off location.
- Chlorination shall be performed by a third party approved by the city and witnessed by a city official. Disinfection companies may under the supervision of the city operate the water gates & Fire hydrants in the water line being treated to allow proper distribution of the chlorine.
- Before chlorination is begins, the lines should be flushed at a rate of 500 GPM until the water runs clear of discolored water and debris. Only one Fire hydrant will be allowed to be opened at a time for flushing new mains.
- Sampling and chlorination taps will be through a corporation stop in the water main with either copper or Polyethylene tuning to chlorinate and sample from. **No** Fire Hydrants or hoses will be used for chlorination or sampling of the mains. Sample locations along new water main shall be no more than 1000' apart.
- Prior to scheduling the pressure test, the contractor should notify the City's water treatment plant to schedule a time to draw the water samples. The City will take the samples Monday thru Thursday from 8AM to 2:30PM. Once taken the samples take 48 hours to process for Coliform and HPC's as required by DEP.
- If a line should fail the bacteria testing, the contractor will have to re-chlorinate & flush the lines that failed and be resampled by the city.
- No lines will be allowed to be put into service without passing the bacteria test.
- The third party contractor shall submit a written copy of the chlorination of the water main which should include at a minimum; the date and time of the chlorination, the pipe length and diameter, the location of the chlorination point and bleeder / test points, the amount of chlorine used, the chlorines % strength, and verification that 50 ppm chlorine residual was reached at each test point.

Water Mains being put into service:

Prior to a new water main being placed into service, the new lines must pass both a Leak test and Bacteria testing.

- The Water division or its agent must have witnessed all the work relating to the construction to make sure all the construction has been done in accordance with the city's installation requirements.
- The engineer will supply an as-built plan including a PE stamp which will show all new piping and the certification points. The plan must also include three tie points for each

water main gate and service box. On Water Mains 12" and larger as-built plans will include depth profiles including the location and depth of all other utilities that cross the water main. This plan is subject to review buy the Taunton Water Division prior to acceptance.

Water Services:

New water services will not be put into service until the water line has been inspected and an inspection card has been issued. All water service installations must be inspected prior to backfilling. The request for inspection must be made at least 24 hours advance notice. Monday inspections must be requested by Friday at noon. All water services must be installed with a single continuous piece of pipe. On long services (over 300 ft.) any couplings installed must be indicated on the as built drawing. The water Service Acceptance card must be signed at the time of inspection. The inspection card will be required at the time a meter is requested.

Pipe Installation

All water mains and appurtenances shall be installed according to the attached details. Water piping shall be installed with a minimum of 5 feet of cover and no more than 7 feet without prior approval of the Water Division. Horizontal clearance from other utilities must have a minimum of 10 feet Per Mass Department of Chapter 9 regulations. A vertical clearance of at least 18 inches shall be maintained when crossing other utilities. All water lines must be installed over drain and sewer lines Per Mass Department of Chapter 9 regulations. In the event that a water line has to pass under a sewer or drain line the sewer or drain line must be placed in a sleeve with a water tite seal at either end.

At no time will a water line share the same trench with another utility. Shelving a trench for another utility is not permitted for any reason. Where a water service line and sewer lateral must cross the water line must be located above the sewer line.

Fire hydrants will not be used during construction without the use of a backflow control device and water meter. People wishing to use a hydrant for construction purposes are required to go to the water department to fill out a rental agreement and pay a deposit for the equipment along with and initial water usage fee.

Approval of Materials

Only new materials shall be incorporated into the work. All materials shall be supplied by the contractor and are subject to the approval of the Taunton Water Division.

Prior to beginning work, the contractor shall submit to the Water Division specification sheets for the materials and related equipment to be used in the construction of the new water line. Such data shall contain enough detail to allow the city to form an opinion as to the materials conformity to the specification contained within this. This information shall be submitted no

later than 5 days prior to the start of the work so the city has sufficient time to review the materials.

The materials on the job shall be free from defects and conform to the approved specifications.

All materials which do not conform to the specifications provided or have been damaged in shipment shall be promptly removed from the construction site.

Materials Specifications

General:

The Taunton Water Division is willing to review requests for the use of "or equal" materials. The Water Division has the sole right to decide whether materials are equal to what is listed in the specification, and will do so with the following stipulations:

1) It is the sole responsibility of the person/company making the request to supply all necessary documentation to prove the materials will serve the function equally or better, and are of equal or better design and quality. The city may request additional information if it deems necessary to properly review new products.
2) The Water Division may retain professional services to review these requests.
3) Sufficient time must be given to the water Division to perform the review.

All materials regardless of the manufacturer must meet all applicable ANSI/AWWA standards as well as NSF standards for materials to be used with drinking water.

Pipe for Water Main

All new water main shall be ductile iron pipe and shall conform to AWWA standard C-151 latest revision, Class 52 manufactured by US Pipe, Griffin Pipe Co., Atlantic States pipe or approved equal.

Polyvinyl chloride (PVC) and Fused High Density Polyethylene Pipe (HDPE) water Main may be used in special circumstances may only be used under special approval in applications where Ductile Iron may not be suitable. PVC pipe shall conform to AWWA C-900 latest revision, Class 150, with Cast iron outside diameters. PVC shall be free from any visible UV deterioration. Any signs of deterioration will be grounds denying the use of the pipe. All PVC pipe is subject to approval prior to use. HDPE pipe shall meet the latest version of AWWA C901/C906, ASTM D2239, ASTM D2737, ASTM D3035, and F714.

Fittings

All fitting shall conform to AWWA standard C-153 latest revision, Made of ductile iron, compact, Mechanical Joint, double cement lined, and bitumen coated, Manufactured by US Pipe, American Cast Iron Pipe, SIMGA, or approved equal. All gland bolts must be ductile iron

Restrained Joints

Retainer glands shall be Meg-A-Lug type as manufactured by EBBA Iron, Series 2100, or approved equal. Restrained Joints may be used for some thrust applications. Some applications may require thrust blocks in place of or in addition to the retainer glands.

Gate Valves

All gate valves will meet AWWA standard C509 latest revision, be mechanical joint, have O-ring stem seals, and have an epoxy coated body. All Gates must be **OPEN RIGHT.** All gates from 4" through 16" will be designed vertical installation. Gates Larger than 20" through 36" will be the horizontal design with a bypass valve. The larger Gates will have a geared reduction to assist in opening and closing.

Butterfly Valves

Butterfly valves of any size **WILL NOT** be allowed within the City's water distribution system.

Water Gate Valve Boxes

Every Gate valve will gave a gate box equal to Bibby STE-Croix or Bingham & Taylor 2 piece 5-¼", sliding type adjustable top, roadway gate boxes with 13 lb. covers with "WATER" label in the casting. If extensions are needed to bring the casting to grade, the intermediate style sliding extension must be used. There must be a minimum of 6" of overlap between the top and bottom sections of all gate boxes.

Corporation Stops

1", 1 ½", and 2" Corporation Stops will conform to AWWA C800 Standards (ASTM B584) Certified to be lead free and meet NSF/ANSI standards 61. All corporation stops will be **OPEN RIGHT,** be the ball valve type with the AWWA CC standard thread with pack joint suitable for use with copper tubing or copper tubing sized plastic pipe (CTS). All corporations will be rated for 300 PSI and include any needed restraints. Corporation stops shall be equal to Mueller 300 series, Ford Brass FB 1000, or approved equal.

Curb Stops

1", 1 ½", and 2" Curb Stops will conform to AWWA C800 Standards (ASTM B584) Certified to be lead free and meet NSF/ANSI standards 61. All corporation stops will be **OPEN RIGHT,** be the ball valve type with pack joints on both ends suitable for use with copper tubing or copper tubing sized plastic pipe (CTS). All corporations will be rated for 300 PSI and include any needed restraints. Curb Stops will **NOT** have drains. Curb Stops will include a hole drilled in the Key to allow for the attachment of a curb box rod. Curb stops will be equal to the Mueller 300 series with Mueller 110 compression connections, Ford Brass B44 series with locking pack joint nuts, or approved equal.

Curb Boxes

Each curb Box will have an Erie Style Curb Box with an arch style base and include and include a 36" long rod with brass cotter pin for attachment. Boxes shall have a bituminous coating for corrosion resistance. Curb Boxes shall have the two hole top with the "WATER" label cast in the top. For 1 ½" or 2" curb Stops a curb box base adapter will be used. Boxes and adapters shall be manufactured by Ford meter box, Bibby Ste-Croix or approved equal.

Meter Valves

All 1" meter valves will be Angle ball valve type with handle. Valves will have copper tube sized compression fitting with a meter nut corresponding to the meter size (5/8", ¾" 1"). All valves will Brass meeting AWWA/ANSI C800 Lead free, meeting NSF61 for potable water use.

Larger valves will be approved by the city depending on the installation. In all cases the valves supplied will need to meet the AWWA/ANSI C800, lead free, meeting NSF61 standard for potable water use.

Water Meters

All water meters up to 2" will be supplied by the Taunton water division. Meters 3" and larger will be purchased and by the contractor in accordance with the Water Divisions meter specification. Prior to the installation of the water meter the plumber must have the meter spacer and coupling in place. Meter spacers are available from the water department. Depending on the plumbing arrangement below is a table of approximate laying lengths for the meter and tail pieces.

Service Saddles

Service saddles shall be Ductile Iron with 12 Mill Epoxy Coating with 2 Stainless Steel Straps. The Saddle will meet AWWA/ANSI Standard C800 and NSF61 for use in potable water. All saddles shall have the AWWA CC standard thread. Saddles shall be manufactured by Smith-Blair series 317, Mueller DR 2S series, or approved equal.

Tapping Sleeves

For 4 inch or larger wet taps on existing water mains, a full diameter ductile iron mechanical joint sleeve must be used. Tapping sleeves will be made of Ductile Iron constructed to ASTM A536 standards mechanical joint rated for 250 PSI. All sleeves must have a test port for air testing. Tapping sleeves shall be manufactured by American flow control series 2800, Mueller H-615, or approved equal.

Tapping Valves

Tapping valves shall conform to AWWA/ANSI C515, NSF61 approved for potable water. All valves will be **Open Right,** epoxy coated, with resilient wedge. The valve will have one side flanged and one side mechanical Joint. Tapping valves must be supplied by the same manufacturer as the tapping sleeve to be used. Tapping sleeves shall be manufactured by American Flow Control, Mueller, or approved equal.

Fire Hydrants

Fire Hydrants shall conform to AWWA C502, FM 1510, and UL 246 listed. The hydrant main valve will be 5-1/4", **OPEN LEFT**. All hydrants will have two 2-1/2" NST and one 4 1/2" NST pumper nozzle. Fire hydrants will be equipped with a break away traffic flange which is field repairable. Fire hydrants will have bury depth to match the finished grade. Hydrants will have a 6" mechanical joint connection. All fire hydrants shall be from one of the following manufacturers, Mueller Super Centurion 250, or the American Darling B-84-B5 by American Flow Control.

Water Service Tubing

All water service tubing will be a minimum of 1" in diameter. All copper water service tubing will be Lead free, Type K, with Soft Temper meeting ASTM standard B-88.

Polyethylene Water service pipe meeting AWWA C901-08 Standard for copper tubing sized (CTS) pipe rated for 200 PSI. The tubing must be ANSI/NSF 61 certified for use with potable water.

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: TAUNTON Project File Number: 608753

Contract Number: 128103

Project Description: Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)

All AutoCAD files are provided solely as a courtesy to facilitate public access to information. MassDOT attempts to provide current and accurate information but cannot guarantee so. MassDOT provides such documents, files or other data "as is" without any warranty of any kind, either expressed or implied, including but not limited to, accuracy, reliability, omissions, completeness and currentness. The Commonwealth of Massachusetts and its Consultants shall not be liable for any claim for damages, including lost profits or other consequential, exemplary, incidental, indirect or special damages, relating in any way to the documents, files or other data accessible from this file, including, but not limited to, claims arising out of or related to electronic access or transmission of data or viruses. Because data stored on electronic media can deteriorate undetected or be modified without our knowledge, MassDOT cannot be held liable for its completeness or correctness. MassDOT makes no representation as to the compatibility of these files beyond the version of the stated CAD software.

By signing this form, I agree that it shall be my responsibility to reconcile this electronic data with the conformed contract documents, and that only the conformed contract documents shall be regarded as legal documents for this Project. I understand that this authorization does not give me the right to distribute the files. I agree to the terms above and wish to receive the AutoCAD files.

This signed form shall be emailed to the Highway Design Engineer at the MassDOT -Highway Division at the following email address:

DOTHighwayDesign@dot.state.ma.us
Attn: AutoCAD Files

Name of person requesting AutoCAD files: _____

Affiliation/Company: _____

Address: _____

_____

Telephone number: _____

Email address: _____

Signature/Date: _____

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DOCUMENT A00870

MASSACHUSETTS
DIVISION OF FISHERIES AND WILDLIFE

NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM

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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: February 16, 2023
Project code: 2023-0046489
Project Name: 608753 - TAUNTON- CORRIDOR IMPROVEMENTS AND RELATED WORK ON BROADWAY (ROUTE 138)

Subject: Concurrence verification letter for the '608753 - TAUNTON- CORRIDOR IMPROVEMENTS AND RELATED WORK ON BROADWAY (ROUTE 138)' 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 February 16, 2023 to verify that the **608753 - TAUNTON- CORRIDOR IMPROVEMENTS AND RELATED WORK ON BROADWAY (ROUTE 138)** (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 March 31, 2023. This NLAA determination does not require reinitiation. For projects requiring consultation after the effective date of March 31, 2023, please use the 2023 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
- Plymouth Redbelly Turtle *Pseudemys rubriventris bangsi* Endangered

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

NAME

608753 - TAUNTON- CORRIDOR IMPROVEMENTS AND RELATED WORK ON BROADWAY (ROUTE 138)

DESCRIPTION

608753 - TAUNTON- CORRIDOR IMPROVEMENTS AND RELATED WORK ON BROADWAY (ROUTE 138), FROM PURCHASE STREET TO JACKSON STREET (PHASE 2)

Work on this project includes roadway reconstruction, sidewalk reconstruction, installation of ADA compliant curb ramps, drainage upgrades, pavement marking and sign upgrades on Route 138 for a length of 3/4 mile. This project proposes to improve multimodal accommodation, accessibility and mobility along the corridor. In addition, traffic signals at Route 138/East/West Brittania Street and the Route 138/Purchase Street will be reconstructed. This is the second phase of corridor improvements proposed on Route 138 (Broadway) in the City of Taunton.

Plymouth Redbelly Turtle: After consulting with the Massachusetts Natural Heritage and Endangered Species Program (NHESP), it was determined that there is no data to suggest the presence of habitat and/or individuals at this project location

Monarch Butterfly: Candidate Species only, no conservation measures at this time.

DETERMINATION KEY RESULT

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the threatened Northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

QUALIFICATION INTERVIEW

1. Is the project within the range of the Indiana bat[1]?

   [1] See Indiana bat species profile

   Automatically answered
   No

2. Is the project within the range of the Northern long-eared bat[1]?

   [1] See Northern long-eared bat species profile

   Automatically answered
   Yes

3. Which Federal Agency is the lead for the action?

   A) Federal Highway Administration (FHWA)

4. Are *all* project activities limited to non-construction[1] activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

   [1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

   No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/ rail surfaces[1]?

   [1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

   No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum[1]?

   [1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

   No

7. Is the project located **within** a karst area?

   No

8. Is there *any* suitable[1] summer habitat for Indiana Bat or NLEB **within** the project action area[2]? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   [2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat.

   Yes

9. Will the project remove *any* suitable summer habitat[1] and/or remove/trim any existing trees **within** suitable summer habitat?

   [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

   Yes

10. Will the project clear more than 20 acres of suitable habitat per 5-mile section of road/rail?

    No

11. Have presence/probable absence (P/A) summer surveys[1][2] been conducted[3][4] **within** the suitable habitat located within your project action area?

    [1] See the Service's summer survey guidance for our current definitions of suitable habitat.

    [2] Presence/probable absence summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate distance from hibernacula) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

    [3] For projects within the range of either the Indiana bat or NLEB in which suitable habitat is present, and no bat surveys have been conducted, the transportation agency will assume presence of the appropriate species. This assumption of presence should be based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

    [4] Negative presence/probable absence survey results obtained using the summer survey guidance are valid for a minimum of two years from the completion of the survey unless new information (e.g., other nearby surveys) suggest otherwise.

    No

12. Does the project include activities **within documented NLEB habitat**[1][2]?

    [1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

    [2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

    No

13. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

    Yes

14. 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?

    B) During the inactive season

15. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

    Yes

16. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

    No

17. Are *all* trees that are being removed clearly demarcated?

    Yes

18. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?

    No

19. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

    No

20. Does the project include slash pile burning?

    No

21. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

    No

22. 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

23. Will the project involve the use of **temporary** lighting *during* the active season?

    Yes

24. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting will be used?

    Yes

25. Will the project install new or replace existing **permanent** lighting?

    No

26. 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

27. Will the activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

28. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/ structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season[1]?

    [1] Coordinate with the local Service Field Office for appropriate dates.

    Yes

29. 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

30. Will the project raise the road profile **above the tree canopy**?

    No

31. 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.

32. 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

33. Is the habitat removal portion of this project consistent with a Not Likely to Adversely Affect determination in this key?

    Automatically answered
    Yes, because the tree removal/trimming that occurs outside of the NLEB's active season occurs greater than 0.5 miles from the nearest hibernaculum, is less than 100 feet from the existing road/rail surface, includes clear demarcation of the trees that are to be removed, and does not alter documented roosts and/or surrounding summer habitat within 0.25 miles of a documented roost.

34. **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

35. **Tree Removal AMM 1**
    Can *all* phases/aspects of the project (e.g., temporary work areas, alignments) be modified, to the extent practicable, to avoid tree removal[1] in excess of what is required to implement the project safely?

    Note: Tree Removal AMM 1 is a minimization measure, the full implementation of which may not always be practicable. Projects may still be NLAA as long as Tree Removal AMMs 2, 3, and 4 are implemented and LAA as long as Tree Removal AMMs 3, 5, 6, and 7 are implemented.

    [1] The word “trees” as used in the AMMs refers to trees that are suitable habitat for each species within their range. See the USFWS’ current summer survey guidance for our latest definitions of suitable habitat.

    Yes

36. **Tree Removal AMM 3**
    Can tree removal be limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits)?

    Yes

37. **Tree Removal AMM 4**
Can the project avoid cutting down/removal of *all* (1) **documented**[1] Indiana bat or NLEB roosts[2] (that are still suitable for roosting), (2) trees **within** 0.25 miles of roosts, and (3) documented foraging habitat any time of year?

[1] The word documented means habitat where bats have actually been captured and/or tracked.

[2] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

Yes

38. **Lighting AMM 1**
Will *all* **temporary** lighting be directed away from suitable habitat during the active season?

Yes

PROJECT QUESTIONNAIRE

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

   Yes

2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

   No

3. How many acres[1] of trees are proposed for removal between 0-100 feet of the existing road/rail surface?

   [1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

   0.4

AVOIDANCE AND MINIMIZATION MEASURES (AMMS)

This determination key result includes the committment to implement the following Avoidance and Minimization Measures (AMMs):

TREE REMOVAL AMM 4

Do not remove **documented** Indiana bat or NLEB roosts that are still suitable for roosting, or trees within 0.25 miles of roosts, or
documented foraging habitat any time of year.

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.

TREE REMOVAL AMM 1
Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to avoid tree removal.

LIGHTING AMM 1
Direct temporary lighting away from suitable habitat during the active season.

TREE REMOVAL AMM 2
Apply time of year restrictions for tree removal when bats are not likely to be present, or limit tree removal to 10 or fewer trees per project at any time of year within 100 feet of existing road/ rail surface and **outside of documented** roosting/foraging habitat or travel corridors; visual emergence survey must be conducted with no bats observed.

TREE REMOVAL AMM 3
Ensure tree removal is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits).

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT

This key was last updated in IPaC on February 02, 2023. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the 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: Trevor Burns
Address: 10 Park Plaza
City: Boston
State: MA
Zip: 02116
Email trevor.b.burns@dot.state.ma.us
Phone: 8573010759

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

DOCUMENT A00875

POLICY DIRECTIVE P-22-001
AND
POLICY DIRECTIVE P-22-002

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massDOT Massachusetts Department of Transportation Highway Division

Number: P-22-001
Date: 9/23/22

POLICY DIRECTIVE

Jonathan Gulliver (signature on original)
HIGHWAY ADMINISTRATOR

Off-Site Stockpiling of Soil from MassDOT Construction Projects

Purpose

The purpose of this Policy Directive is to formally establish a policy and procedures for managing and stockpiling soil generated and transported from MassDOT construction projects. This Policy Directive does not supersede any Federal, State, or Local regulations.

Date of Effect

This Policy Directive is effective immediately for all projects, including active construction projects.

For active construction projects and for other projects advertised prior to October 15, 2022, changes to the contract documents needed to implement the requirements of this Policy Directive will be considered on a case-by-case basis and shall be approved by the District Highway Director, as necessary.

For projects advertised on or after October 15, 2022, MassDOT will include the requirements and implementation procedures of this Policy Directive in the construction contract documents.

Policy Requirements

This policy is intended to prevent the off-site relocation of excavated soil generated from MassDOT projects to areas near residential receptors and to control potential fugitive dusts and/or contaminants. To that end, excavated soil may not be moved from the project site without knowledge of the content of the material. Knowledge may include visual field observations for presence of staining, odor, and/or debris, screening with a photoionization detector (PID), laboratory analysis, and/or site history. Pavement millings and other non-soil materials are not subject to the requirements of this Policy Directive.

Moving soil from a MassDOT project site to a temporary off-site storage location must be approved in writing by the District Highway Director.

The Contractor must select a storage location that is at least 500 feet away from residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially

zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.

Temporary off-site storage of excavated soil from a MassDOT project is only permissible at a location approved and permitted by MassDOT. The temporary storage location should be located within the same municipality where the soil was excavated, where possible. Stockpiled soil must be securely covered, and appropriate measures must be taken to minimize fugitive dust and erosion.

Signs indicating the source of the soil, the date the soil was generated, and contact information must be erected and maintained until the stockpiled soils are transported to a disposal facility or reused on the project site.

Implementation Procedures

To ensure that off-site storage of excavated soils is managed properly on MassDOT projects, this policy requires the following:

1. **Off-Site Stockpile Storage Locations**
    a. The Contractor shall provide proposed off-site storage locations to the Engineer for approval at least 30 days prior to transporting soil off site. Off-site storage locations should be in the same municipality as the work site.
    b. The Contractor shall keep excavated soil on site until adequately characterized to the satisfaction of the Engineer.
    c. The Contractor shall provide notification of the approved off-site storage location to the local Board of Health and the Town Manager's/Mayor's Office at least 7-days prior to transporting soil off site.
    d. The Contractor shall provide the Engineer with at least 3-days' notice prior to transporting soil off site.
    e. For off-site storage locations on MassDOT property, the Contractor is required to obtain an Access Permit through the District Permits Office prior to storage of soil or other materials. MassDOT will issue these permits at no cost to the Contractor. Information to be submitted by the Contractor as part of the permit application shall include:
        i. A description of material to be stored off-site, including available analytical data;
        ii. A figure of the location with distances to residences and residential receptors; and
        iii. Anticipated duration of temporary storage.
    f. Stockpile locations should not be within 500 feet of residential receptors (e.g., residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities).
        i. If the stockpile location must be within 500 feet of residential receptors, then soil must be less than RCS-1 (per 310 CMR 40.1600) and free of potentially hazardous or regulated items.

g. For off-site storage locations on non-MassDOT property, the Contractor must notify the property owner(s) at least 7 days prior to transporting material.
h. Exceptions to these rules will be reviewed by MassDOT and may be approved by the District Highway Director on a case-by-case basis.

2. Off-Site Stockpile Management

a. The Contractor shall keep soil stockpiles on impermeable surfaces (e.g., asphalt or concrete) or on 10-mil polyethylene sheeting.
b. The Contractor shall cover soil stockpiles with 10-mil polyethylene sheeting and surround with a berm made of hay bales, straw wattles, or similar.
    i. Piles that are actively being worked on must be covered and re-secured at the end of the work shift.
c. The Contractor shall label stockpiles with signs, including:
    i. Location of origin (including any Release Tracking Numbers)
    ii. Stockpile ID number (including MassDOT District office-assigned tracking ID, if different)
    iii. Date of initial accumulation
    iv. Applicable telephone numbers for the Contractor and MassDOT.
d. The Contractor shall mitigate fugitive dust at storage locations under the direction of an appropriately trained/certified environmental professional.
e. The Contractor shall remedy noncompliance with this policy within 48 hours.
f. The Contractor shall remedy noncompliance with this policy on the SAME DAY for potentially hazardous material, as determined by the Engineer.
g. The Contractor shall handle excavated soil according to federal, state, and local regulations.
h. The Contractor shall use appropriate shipping documents for all movements of excavated soil on public roadways (e.g., Bill of Lading, Material Shipping Record, Manifest, Asbestos Waste Shipment Record, etc.).

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massDOT Massachusetts Department of Transportation Highway Division

Number: P-22-002
Date: 9/23/22

POLICY DIRECTIVE

Jonathan Gulliver (signature on original)
HIGHWAY ADMINISTRATOR

Use of MassDOT Property for Staging and other Construction-Related Operations

Purpose

This Policy Directive is intended to address the use of MassDOT property by MassDOT Contractors for construction staging and other construction-related operations that are not specifically defined in the construction contract. Such use of MassDOT property will only be allowed if permitted by the District Office in accordance with 700 CMR 13.00, Approval of Access to MassDOT Highways and Other Property. This includes the use of MassDOT property for staging, laydown, and storage of equipment and materials, including soil excavated from a project site.

This Policy Directive requires the Contractor/applicant to obtain a Non-Vehicular Access Permit from MassDOT to use MassDOT property for these purposes.

This Policy Directive is effective immediately and applies to all MassDOT construction projects.

General Permit Considerations and Conditions

In addition to other normal MassDOT Access Permit procedures, MassDOT shall consider the following during the application, review, implementation and monitoring processes of Access Permits required by this Policy Directive:

- Storage and placement of the Contractor's equipment and materials should not be allowed within the clear zone of the roadway.
- Stockpiled soils should not be located within 500 feet of residential receptors, as defined herein to include, but not be limited to, residential dwellings, residentially zoned property, schools, daycare facilities, playgrounds, parks, recreational areas, hospitals, elderly housing and convalescent facilities.
- The Contractor/applicant shall identify the access/egress locations of the proposed storage areas. MassDOT will only approve locations determined to be safe for roadway users, construction workers and the general public.
- The Contractor may be required to submit a Traffic Management Plan and/or Lighting Plan for MassDOT review and approval as part of the permit application, depending on the proposed use of the area.

- The Contractor shall submit the permit application through MassDOT's online State Highway Access Permit System (SHAPS).
- MassDOT will waive the permit application fee for any application received from a MassDOT Contractor for any permit required by this Policy Directive and will waive any subsequent amendment and extension fees that may otherwise be required.
- MassDOT will review the permit application in accordance with applicable standard procedures and will apply standard permit terms and conditions, as necessary.
- The Resident Engineer will verify that the permit is approved before allowing the Contractor to use the affected area for the requested purpose.
- Areas permitted are for use by the approved applicant only and are not to be shared with or used by other vendors. Subcontractors specifically engaged with the applicant working on the specific MassDOT project will be allowed to use the area in accordance with the terms of the permit.
- Permits are issued on an annual basis and will require the Contractor to file for an extension each year to continue use.

Exemptions from Permit Requirements

Equipment and materials being used for active construction operations and located within the work zone of the construction contract are exempt from this permit requirement, provided they do not interfere with the safety or operation of the roadway or the work zone. Examples of these types of exempt uses are:

- Equipment and materials parked or stored within a protected (barriered) work zone.
- Materials placed in the work zone prior to same-day installation or use.
- Soils excavated temporarily and scheduled to be replaced, such as for trenching operations or for installation of drainage structures.

DOCUMENT B00420

PROPOSAL

TAUNTON

For: **Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the City of TAUNTON in Bristol 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:

Broadway (Route 138)

Beginning – Station 51+10.00 +/-
Ending –Station 96+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 **1,685 CALENDAR DAYS** upon receipt of a Notice to Proceed, except that if the completion date falls between December 1 and March 15 then the same number of days beyond December 1st will be extended after March 15th.

The Work of this project is described by the following Items and quantities.

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Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
100.	1	SCHEDULE OF OPERATIONS - FIXED PRICE $67500 AT Sixty Seven Thousand Five Hundred Dollars LUMP SUM	$67,500.00	$67,500.00
102.	0.3	SELECTIVE CLEARING AND THINNING AT _____ PER ACRE		
102.2	1	TREE TRIMMING AT _____ LUMP SUM		
102.511	15	TREE PROTECTION – ARMORING & PRUNING AT _____ EACH		
102.521	660	TREE AND PLANT PROTECTION FENCE AT _____ PER FOOT		
102.55	50	ARBORIST AT _____ PER HOUR		
103.	2	TREE REMOVED - DIAMETER UNDER 24 INCHES AT _____ EACH		
104.	2	TREE REMOVED - DIAMETER 24 INCHES AND OVER AT _____ EACH		
120.1	15,400	UNCLASSIFIED EXCAVATION AT _____ PER CUBIC YARD		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
127.1	1,900	REINFORCED CONCRETE EXCAVATION AT _____ PER CUBIC YARD		
129.5	870	TRACK EXCAVATION AT _____ PER FOOT		
141.1	100	TEST PIT FOR EXPLORATION AT _____ PER CUBIC YARD		
142.	40	CLASS B TRENCH EXCAVATION AT _____ PER CUBIC YARD		
144.	10	CLASS B ROCK EXCAVATION AT _____ PER CUBIC YARD		
146.	29	DRAINAGE STRUCTURE REMOVED AT _____ EACH		
151.	7,900	GRAVEL BORROW AT _____ PER CUBIC YARD		
153.	220	CONTROLLED DENSITY FILL - EXCAVATABLE AT _____ PER CUBIC YARD		
156.	50	CRUSHED STONE AT _____ PER TON		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
170.	31,000	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ PER SQUARE YARD		
180.01	1	ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AT _____ LUMP SUM		
180.02	200	PERSONAL PROTECTION LEVEL C UPGRADE AT _____ PER HOUR		
180.03	100	LICENSED SITE PROFESSIONAL SERVICES AT _____ PER HOUR		
181.11	13,900	DISPOSAL OF UNREGULATED SOIL AT _____ PER TON		
181.12	2,350	DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY AT _____ PER TON		
181.13	2,350	DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY AT _____ PER TON		
181.14	30	DISPOSAL OF HAZARDOUS WASTE AT _____ PER TON		
184.1	30	DISPOSAL OF TREATED WOOD PRODUCTS AT _____ PER TON		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
201.	29	CATCH BASIN AT _____ EACH		
201.6	8	CATCH BASIN - BRADLEY HEAD AT _____ EACH		
202.	3	MANHOLE AT _____ EACH		
203.1	6	SPECIAL MANHOLE - 5 FOOT DIAMETER AT _____ EACH		
204.11	5	GUTTER INLET - SPECIAL AT _____ EACH		
220.	65	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH		
220.2	10	DRAINAGE STRUCTURE REBUILT AT _____ PER FOOT		
220.3	2	DRAINAGE STRUCTURE CHANGE IN TYPE AT _____ EACH		
220.5	9	DRAINAGE STRUCTURE REMODELED AT _____ EACH		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
220.6	5	SANITARY STRUCTURE REBUILT AT _____ PER FOOT		
220.7	18	SANITARY STRUCTURE ADJUSTED AT _____ EACH		
221.	19	FRAME AND COVER AT _____ EACH		
222.1	36	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		
223.2	40	FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED AT _____ EACH		
227.3	50	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT AT _____ PER CUBIC YARD		
227.31	3,150	REMOVAL OF DRAINAGE PIPE SEDIMENT AT _____ PER FOOT		
227.4	14	MASONRY PLUG AT _____ PER SQUARE FOOT		
238.06	50	6 INCH DUCTILE IRON PIPE AT _____ PER FOOT		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
238.10	50	10 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
238.12	335	12 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
241.12	320	12 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
241.15	20	15 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
241.18	100	18 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
241.24	40	24 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
243.12	100	12 INCH REINFORCED CONCRETE PIPE CLASS IV AT _____ PER FOOT		
244.12	60	12 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
303.06	50	6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
303.12	80	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
309.	2,135	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
347.1	100	1 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
357.06	5	6 INCH GATE BOX AT _____ EACH		
357.08	5	8 INCH GATE BOX AT _____ EACH		
357.12	10	12 INCH GATE BOX AT _____ EACH		
358.	70	GATE BOX ADJUSTED AT _____ EACH		
376.1	10	HYDRANT - EXCLUDING COST OF HYDRANT AT _____ EACH		
376.3	10	HYDRANT - REMOVED AND STACKED AT _____ EACH		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
381.	15	SERVICE BOX AT _____ EACH		
381.3	55	SERVICE BOX ADJUSTED AT _____ EACH		
402.	2,600	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER CUBIC YARD		
415.2	2,000	PAVEMENT FINE MILLING AT _____ PER SQUARE YARD		
440.	12,000	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL AT _____ PER POUND		
443.	70	WATER FOR ROADWAY DUST CONTROL AT _____ PER 1000 GALLONS		
450.231	2,500	SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) AT _____ PER TON		
450.32	3,200	SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) AT _____ PER TON		
450.42	5,800	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
451.	100	HMA FOR PATCHING AT _____ PER TON		
452.	3,500	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
453.	10,100	HMA JOINT SEALANT AT _____ PER FOOT		
472.	430	TEMPORARY ASPHALT PATCHING AT _____ PER TON		
506.	4,800	GRANITE CURB TYPE VB - STRAIGHT AT _____ PER FOOT		
506.1	550	GRANITE CURB TYPE VB - CURVED AT _____ PER FOOT		
509.	1,300	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT AT _____ PER FOOT		
509.1	620	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - CURVED AT _____ PER FOOT		
510.	30	GRANITE EDGING TYPE SA AT _____ PER FOOT		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
510.1	10	GRANITE EDGING TYPE SA (RADIUS 10 FEET OR LESS) AT _____ PER FOOT		
514.	22	GRANITE CURB INLET - STRAIGHT AT _____ EACH		
515.	1	GRANITE CURB INLET - CURVED AT _____ EACH		
516.	4	GRANITE CURB CORNER TYPE A AT _____ EACH		
570.2	15	HOT MIX ASPHALT CURB TYPE 2 AT _____ PER FOOT		
580.	1,400	CURB REMOVED AND RESET AT _____ PER FOOT		
590.	35	CURB REMOVED AND STACKED AT _____ PER FOOT		
594.	2,900	CURB REMOVED AND DISCARDED AT _____ PER FOOT		
595.	4	CURB INLET REMOVED AND DISCARDED AT _____ EACH		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
596.	15	CURB CORNER REMOVED AND DISCARDED AT _____ EACH		
597.	1,360	EDGING REMOVED AND DISCARDED AT _____ PER FOOT		
628.314	2	TEMPORARY IMPACT ATTENUATOR, REDIRECTIVE, TL-2 AT _____ EACH		
628.4	2	TEMPORARY IMPACT ATTENUATOR, REMOVED AND RESET AT _____ EACH		
669.1	540	FENCE REMOVED AND STACKED AT _____ PER FOOT		
671.1	3	FENCE GATE AND GATE POSTS REMOVED AND STACKED AT _____ EACH		
691.1	1	BOULDER REMOVED AND STACKED AT _____ EACH		
697.1	70	SILT SACK AT _____ EACH		
701.	3,700	CEMENT CONCRETE SIDEWALK AT _____ PER SQUARE YARD		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
701.1	2,000	CEMENT CONCRETE SIDEWALK AT DRIVEWAYS AT _____ PER SQUARE YARD		
701.2	650	CEMENT CONCRETE PEDESTRIAN CURB RAMP AT _____ PER SQUARE YARD		
702.	380	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY AT _____ PER TON		
711.1	10	PROPERTY BOUND REMOVED AND RESET AT _____ EACH		
740.	56	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) AT _____ PER MONTH		
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.1	150	LOAM FOR LAWNS AT _____ PER CUBIC YARD		
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN AT _____ LUMP SUM		
765.	1,300	SEEDING AT _____ PER SQUARE YARD		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
767.121	580	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
767.6	25	AGED PINE BARK MULCH AT _____ PER CUBIC YARD		
802.406	1,080	4 INCH TELEPHONE CONDUIT - TYPE NM (6 BANK) AT _____ PER FOOT		
804.3	1,200	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) AT _____ PER FOOT		
811.23	5	ELECTRIC HANDHOLE - SD2.023 AT _____ EACH		
811.31	15	PULL BOX 12 X 12 INCHES - SD2.031 AT _____ EACH		
813.79	1	INTERCONNECT CABLE SYSTEM AT _____ LUMP SUM		
816.01	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 AT _____ LUMP SUM		
816.02	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2 AT _____ LUMP SUM		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
825.2	1	RRFB (2-POST ASSEMBLY SYSTEM) AT _____ EACH		
832.	300	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
847.1	55	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		
848.1	12	SIGN SUP (N/GUIDE)+RTE MKR W/2 BRKWAY POST ASSEMBLIES-STEEL AT _____ EACH		
850.41	250	ROADWAY FLAGGER AT _____ PER HOUR		
851.1	550	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	1,075	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
852.11	800	TEMPORARY PEDESTRIAN BARRICADE AT _____ PER FOOT		
852.12	4	TEMPORARY PEDESTRIAN CURB RAMP AT _____ EACH		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
853.1	5	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		
853.2	100	TEMPORARY BARRIER (TL-2) AT _____ PER FOOT		
853.21	100	TEMPORARY BARRIER REMOVED AND RESET AT _____ PER FOOT		
854.016	53,750	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ PER FOOT		
854.036	2,050	TEMPORARY PAVING MARKINGS - 6 INCH (TAPE) AT _____ PER FOOT		
854.1	30	PAVEMENT MARKING REMOVAL AT _____ PER SQUARE FOOT		
856.	1,680	ARROW BOARD AT _____ PER DAY		
856.12	2,220	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ PER DAY		
859.	60,000	REFLECTORIZED DRUM AT _____ PER DAY		

Project # 608753	Contract # 128103			
Location : TAUNTON				
Description : Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to Jackson Street (Phase 2)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
864.02	100	PAVEMENT ARROW AND LEGENDS - TAPE AT _____ PER SQUARE FOOT		
864.04	1,250	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) AT _____ PER SQUARE FOOT		
866.106	16,000	6 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
866.112	7,200	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.106	8,000	6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
874.	32	STREET NAME SIGN AT _____ EACH		
874.45	6	MISCELLANEOUS SIGNS REMOVED AND RESET AT _____ EACH		
874.51	76	MISCELLANEOUS SIGNS REMOVED AND DISCARDED AT _____ EACH		
903.	5	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE AT _____ PER CUBIC YARD		
Total Qty:	307,091.3			

DOCUMENT B00853

SCHEDULE OF PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBES)

PRIME BIDDER: _____

DATE OF BID OPENING: _____ PROJECT NO.: 608753

FEDERAL AID PROJECT NO. STP-0035(059)

PROJECT LOCATION: TAUNTON

Name, Address, and Phone Number(s) of DBE	Name of Activity	(a)† DBE Contractor Activity Amount *Construction Work*	(b) DBE Other Business Amount *Services, Supplies, Material*	(c) Total amount eligible for credit under rules in Section 6 of Document 00719 - DBE Special Provisions
Total Bid Amount	TOTALS:	$	$	$
$	DBE Percentage of Total Bid:	%	%	%

†*Column (a) must be at least one-half of the DBE participation goal. Attach additional sheets as necessary.*

Is MassDOT Document B00855 (Joint Check Approval) being submitted for any of the above? ☐ Yes ☐ No ☐ Not Known at This Time

Will any of the contractors listed above be using a third party (i.e. manufacturer) to deliver materials or perform any portion of work by a third party? ☐ Yes ☐ No

CERTIFICATION: I HEREBY DECLARE, TO THE BEST OF MY KNOWLEDGE, THAT **I HAVE READ THE SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES - DOCUMENT 00719.** BOTH THIS SCHEDULE AND THE RELEVANT AND ACCOMPANYING LETTER(S) OF INTENT ARE IN FULL COMPLIANCE WITH THE PROVISIONS OF, AND IN ACCORDANCE WITH, TITLE 49 CODE OF FEDERAL REGULATIONS, PART 26 (49 CFR Part 26).

SIGNATURE:_____ DATE_____

NAME AND TITLE (*PRINT*):_____

EMAIL ADDRESS: _____TEL NO.:_____

*** END OF DOCUMENT ***

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DOCUMENT B00854

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 1 of 2)

TO: _____ (Prime Bidder)

FROM: _____ (DBE Firm)

RE: PROJECT NO.: 608753 FEDERAL AID PROJECT NO.: STP-0035(059)

PROJECT LOCATION: TAUNTON

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.

_____ Date_____
DBE Company Authorized Signature

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 2 of 2)

DATE OF BID OPENING: _____

PROJECT NUMBER: 608753

FEDERAL AID PROJECT NUMBER: STP-0035(059)

PROJECT LOCATION: TAUNTON

PRIME BIDDER: _____

DBE COMPANY NAME: _____

Item number if applicable	NAICS Code	Description of Activity with notations such as Services, or Brokerage, Installation Only, Material Only, or Complete	Quantity	Unit Price	Amount
			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: _____

Rev'd 9/20/19

*** END OF DOCUMENT ***

DOCUMENT B00855

DBE JOINT CHECK ARRANGEMENT APPROVAL FORM

(to be submitted by Prime Contractor)

Contract No: 128103 **Project No.** 608753 **Federal Aid No.:** STP-0035(059)

Location: TAUNTON **Bid Opening Date:** _____

Project Description: Corridor Improvements and Related Work on Broadway (Route 138), from Purchase Street to _____

We have received the attached request for the use of a joint check arrangement from _____ _____ , a DBE on the above- referenced Contract and _____ _____, a Material Supplier/Vendor for the subject Contract. The DBE has complied with the requirements of 49 CFR Part 26.55(c)(1). In particular, the DBE has:

- a written agreement with the material supplier/vendor;
- applied for credit with the subject material supplier and has supplied the vendor's response;
- shown that it will place all orders to the subject material supplier/vendor;
- made and retains all decision-making responsibilities concerning the materials; and
- provided a Joint Check Agreement that is acceptable to MassDOT;

As the Contractor for the Project, we agree to issue joint checks (made payable to the Material Supplier/Vendor and the DBE) for payment of sums due pursuant to invoices from the Supplier/Vendor and DBE.

Contractor:

_____ _____
Company Name Signature
Duly Authorized

_____
Printed Name

_____ _____
Date Title

SubContractor:

_____ _____
Company Name Signature –
Duly Authorized

_____
Printed Name

_____ _____
Date Title

*** END OF DOCUMENT ***

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DOCUMENT B00856

JOINT VENTURE AFFIDAVIT

(All Firms)

- All Information Requested By This Schedule Must Be Answered. Additional Sheets May Be Attached.
- If, there is any change in the information submitted, the Joint Venture parties must inform MassDOT Pre-Qualifications Office (and, if one of the companies is a DBE, the Director of Contract Compliance, Office of Civil Rights) *prior* to such change, in writing, either directly or through the Prime Contractor if the Joint Venture is a subcontractor.
- If the Joint Venture Entity will be the bidder on a prime Contract, it must bid and submit all required documents (insurance, worker's compensation, bonds, etc.) in the name of the Joint Venture Entity.

I. Name of Joint Venture: _____

Type of Entity if applicable (Corp., LLC):_____Filing State _____

Address of joint venture: _____

_____

Phone No(s) for JV Entity: _____E-mail:_____

Contact Person(s)_____

Tax ID/EIN of Joint Venture: _____Vendor Code:_____

II. Identify each firm or party to the Joint Venture:

Name of Firm: _____

Address: _____

Phone : _____E-mail:_____

Contact person(s) _____

Name of Firm: _____

Address: _____

Phone: _____E-mail:_____

Contact Person(s)_____

III. Describe the role(s) of the each party to the Joint Venture:

_____

_____

IV. Attach a copy of the Joint Venture Agreement. The proposed Joint Venture Agreement should include specific details including, but not limited to: (1) the contributions of capital and equipment; (2) work items to be performed by each company's forces, (3) work items to be performed under the supervision of any DBE Venturer; (4) the commitment of management, supervisory and operative personnel employed by the DBE to be dedicated to the performance of the Project; and (5) warranty, guaranty, and indemnification clauses.

V. Attach any applicable Corporate or LLC Votes, Authorizations, etc.

VI. Ownership of the Joint Venture:

A. What is the percentage(s) of each company's ownership in the Joint Venture?

ownership percentage(s): _____

ownership percentage(s): _____

B. Specify percentages for each of the following (provide narrative descriptions and other detail as applicable):

1. Sharing of profit and loss: _____

2. Capital contributions:

(a) Dollar amounts of initial contribution: _____

(b) Dollar amounts of anticipated on-going contributions: _____

(c) Contributions of equipment (specify types, quality and quantities of equipment to be provided by each firm): _____

_____

4. Other applicable ownership interests, including ownership options or other agreements, which restrict or limit ownership and/or control:

_____

_____

5. Provide copies of all other written agreements between firms concerning bidding and operation of this Project or projects or contracts.

6. Identify all current contracts and contracts completed during the past two (2) years by either of the Joint Venture partners to this Joint Venture:

_____

_____

VII. Control of and Participation in the Joint Venture. Identify by name and firm those individuals who are, or will be, responsible for and have the authority to engage in the following management functions and policy decisions. (Indicate any limitations to their authority such as dollar limits and co-signatory requirements.):

A. Joint Venture check signing:

_____

_____

B. Authority to enter Contracts on behalf of the Joint Venture:

_____

_____

C. Signing, co-signing and/or collateralizing loans:

_____

_____

D. Acquisition of lines of credit:

_____

_____

E. Acquisition and indemnification of payment and performance bonds:

_____

_____

F. Negotiating and signing labor agreements:

_____

_____

G. Management of contract performance. *(Identify by name and firm only)*:

1. Supervision of field operations: _____
2. Major purchases: _____
3. Estimating: _____
4. Engineering: _____

VIII. Financial Controls of Joint Venture:

A. Which firm and/or individual will be responsible for keeping the books of account?

_____

_____

B. Identify the "Managing Partner," if any, and describe the means and measure of their compensation:

_____

_____

C. What authority does each firm have to commit or obligate the other to insurance and bonding companies, financing institutions, suppliers, subcontractors, and/or other parties participating in the performance of this Contract or the work of this Project?

_____

IX. Personnel of Joint Venture: State the approximate number of personnel (by trade) needed to perform the Joint Venture's work under this Contract. Indicate whether they will be employees of the majority firm, DBE firm, or the Joint Venture.

	Firm 1 (number)	Firm 2 (number)	Joint Venture (number)
Trade			
Professional			
Administrative/Clerical			
Unskilled Labor			

Will any personnel proposed for this Project be employees of the Joint Venture?: _____

If so, who: _____

A. Are any proposed Joint Venture employees currently employed by either firm?

Employed by Firm 1: _____ Employed by firm 2 _____

B. Identify by name and firm the individual who will be responsible for Joint Venture hiring: ____

_____

X. Additional Information. Please state any material facts and additional information pertinent to the control and structure of this Joint Venture.

_____

_____

XI. AFFIDAVIT OF JOINT VENTURE PARTIES. The undersigned affirm that the foregoing statements and attached documents are correct and include all material information necessary to identify and explain the terms and operations of our Joint Venture and the intended participation of each firm in the undertaking. Further, the undersigned covenant and agree to provide to MassDOT current, complete and accurate information regarding actual Joint Venture work, payments, and any proposed changes to any provisions of the Joint Venture, or the nature, character of each party to the Joint Venture. We understand that any material misrepresentation will be grounds for terminating any Contract awarded and for initiating action under Federal or State laws concerning false statements.

Firm 1	Firm 2
Signature Duly Authorized	Signature Duly Authorized
Printed Name and Title	Printed Name and Title
Date	Date

*** END OF DOCUMENT ***