RM

COMMONWEALTH OF MASSACHUSETTS

CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	601776-132090
P.V. =	$8,067,000.00
PLANS	YES

FOR

Federal Aid Project No. NHP(BRR-ON)/HIP(BR)-0036(020)X
Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2
over MBTA Redline

in the City of

CAMBRIDGE

In accordance with the STANDARD SPECIFICATIONS
for HIGHWAYS and BRIDGES dated 2025

This Proposal to be opened and read: **TUESDAY, SEPTEMBER 23, 2025 at 2:00 P.M.**

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DOCUMENT 00104

NOTICE TO CONTRACTORS

Electronic proposals for the following project will be received through the internet using www.bidx.com 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 www.bidx.com.

TUESDAY, SEPTEMBER 23, 2025 at 2:00 P.M. **
CAMBRIDGE

Federal Aid Project No. NHP(BRR-ON)/HIP(BR)-0036(020)X
Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2
over MBTA Redline

****Date Subject to Change**

PROJECT VALUE = $8,067,000.00

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

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

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

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

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

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

NOTICE TO CONTRACTORS (Continued)

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

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

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

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 $635.00 per ton, Portland cement $425.13 per ton, diesel fuel $2.924 per gallon, and gasoline $2.449 per gallon, and Steel Base Price Index 354.8. 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, AUGUST 23, 2025

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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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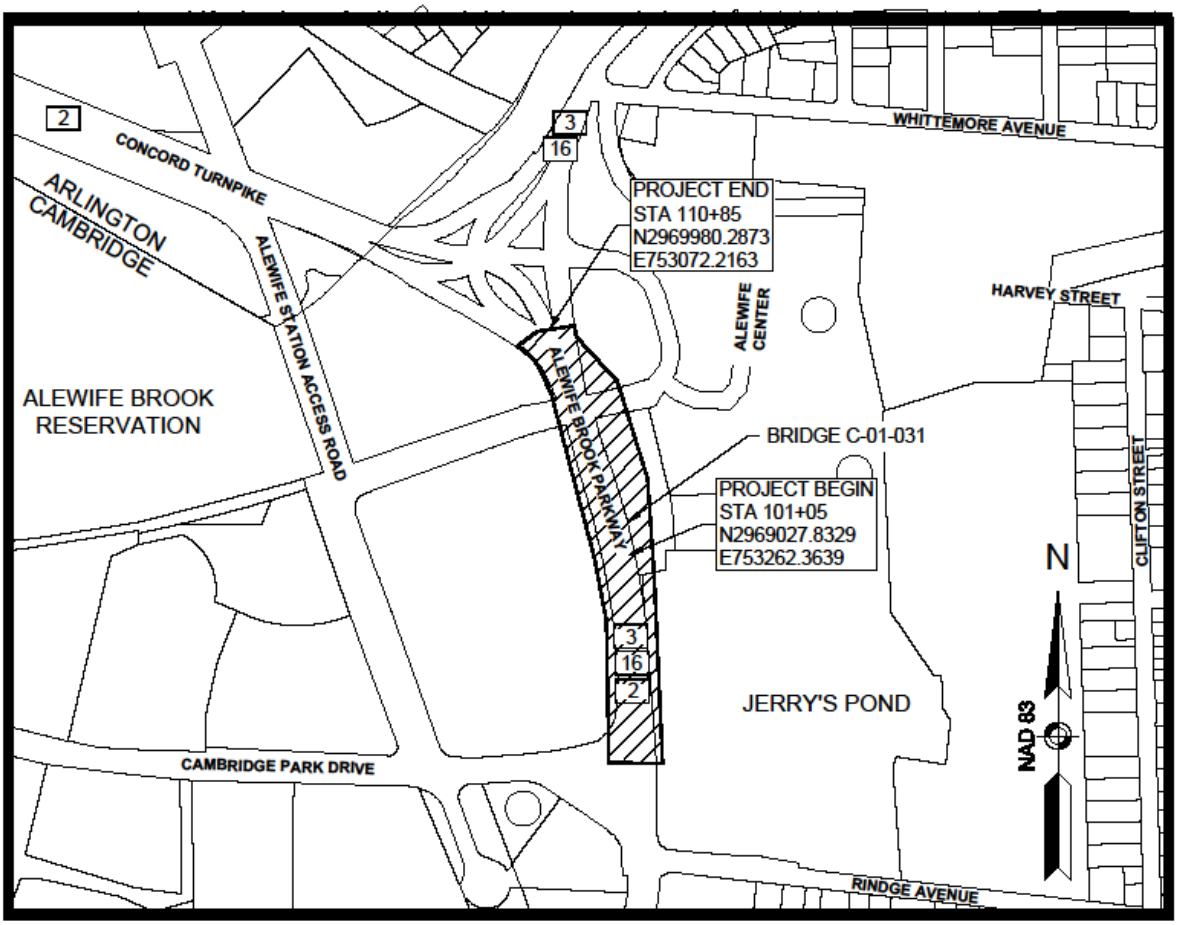
DOCUMENT 00331

LOCUS MAP

CAMBRIDGE

Federal Aid Project No. NHP(BRR-ON)/HIP(BR)-0036(020)X
Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2
over MBTA Redline



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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

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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: 04-16-25

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2025, the SUPPLEMENTAL SPECIFICATIONS, the 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; the 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING and the CONSTRUCTION STANDARD DETAILS are available online at https://www.mass.gov/massdot-highway-division-manuals-and-publications

SPECIAL PROVISIONS FOR RIGHT-TO-KNOW ACT REQUIREMENTS

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

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

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

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

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

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

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

ALTERNATIVE DISPUTE RESOLUTION
Forum, Choice of Law and Mediations:

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

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DOCUMENT 00715

SUPPLEMENTAL SPECIFICATIONS

JUNE 30, 2025

The 2025 *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 2.00: PROPOSAL REQUIREMENTS AND CONDITIONS

Subsection 2.09: Rejection of Proposals
Replace the first bullet in the third paragraph with the following:

- award of the contract would result in the Bidder exceeding the Aggregate Bonding Capacity or the Single Bonding Capacity established by its Surety Company, or the Bidder's Proposal exceeds its Single Contract Limit, or the Bidder was not prequalified in the specified class of work on or before the time of bid opening; or

SECTION 7.00: LEGAL RELATIONS AND RESPONSIBILITY TO PPUBLIC

Subsection 7.05: Insurance Requirements
Change the title of paragraph A to Workers' Compensation Insurance

Subsection 7.22: Labor, Lodging, Board, Maximum Hours of Employment, Weekly Payment, Keeping of Payroll Records.
In the second paragraph replace the word "workman" to "worker" and the word "workmen" to "workers".

Replace the third paragraph with the following:

Attention of Bidders is called to MGL Chapter 149, Section 148 requiring the weekly payment of employee wages.

SECTION 9.00: MEASUREMENT AND PAYMENT

Subsection 9.03: Payment for Extra Work

Replace paragraph B., first paragraph, numbers (2) and (3) with the following.

(2) Plus 13 percent of direct labor, for the estimated costs of Federal Insurance Contribution Act (FICA) including Medicare; Federal Unemployment Tax Act (FUTA); State Unemployment Tax Act (SUTA), which includes Unemployment Insurance, the Workforce Training Fund Program,-Employer Medical Assistance Contribution, and COVID-19 Recovery Assessment; Earned Sick Time (EST) Law (940 CMR 33.00); and Paid Family and Medical Leave (PFML) Act (458 CMR 2.00); or, as an alternative to the above 13 percent, the Contractor may elect to use actual rates for FICA, FUTA, SUTA, EST and PFML provided the actual rates are supported with verifiable documentation and shall be subject to review by MassDOT Audit Operations.

(3) Plus the estimated cost of Workers' Compensation and Liability Insurance, Health, Welfare and Pension benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies;

In paragraph B., second paragraph, number (3), replace the word "Workmen's" with "Workers'".

DIVISION II

CONSTRUCTION DETAILS

SECTION 300: WATER SYSTEMS

SUBSECTION 301: WATER SYSTEMS

Subsection 301.60G: Laying Pipe
Revise the third paragraph to read as follows:

Pipe sections shall be laid with the bell on the upgrade end. Before laying the pipe, the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry.

Subsection 301.80: Method of Measurement
Delete the words cast iron in the first paragraph.

Replace the second paragraph with the following:

Fittings, consisting of bends, tees, caps, wyes, sleeves, reducers, increasers, blow-off fittings and other special fittings, apply only when new materials are necessary and which are not specifically provided for under other items in the Proposal. Fittings other than new will not be paid separately but only under the applicable pipe items. When new fittings are measured separately for payment, the length of pipe occupied by the fittings will not be measured for payment.

SECTION 800: TRAFFIC CONTROL DEVICES

SUBECTION 850: TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS

Subsection 850.29: Temporary Barrier and Temporary Barrier Removed and Reset
Delete this subsection.

Subsection 850.49: Temporary Barrier
Delete this subsection.

Subsection 850.69: Temporary Barrier and Temporary Barrier Removed and Reset
Delete this subsection.

Subsection 850.80: Method of Measurement
Delete the fifth paragraph from the end of this subsection.

Subsection 850.81: Basis of Payment
Delete the sixth and seventh paragraphs from the end of this subsection.

SUBECTION 853: TEMPORARY BARRIER

Subsection 853.: Temporary Barrier
Add this new subsection:

DESCRIPTION

853.20: General

Work under this Subsection consists of furnishing, placing, adjusting, resetting, maintaining, and removing temporary barrier.

MATERIALS

853.40: General

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

Material	Section
Precast, Prestressed, and Prefabricated Concrete Products	M4.09.0
Temporary Barrier	M10.16.0
Limited Deflection Temporary Barrier	M10.16.1
Delineators for Temporary Barrier	M10.16.2

The Contractor shall supply a temporary barrier system that meets or exceeds the Test Level (TL) designated in the description of the bid item.

If the Contractor uses a proprietary temporary barrier system, it shall be listed on the QTCE.

Temporary barrier segments that appear to be damaged or in otherwise unsuitable condition may be rejected or ordered to be replaced by the Engineer at no additional cost.

853.41: Deflection

The deflection of a temporary barrier system is defined as the measured deflection, permanent and/or dynamic, during MASH Test Designation 2-11 (for TL-2) or Test Designation 3-11 (for TL-3).

The Contractor shall supply a temporary barrier system that is equal to or less than the maximum allowable deflection (permanent and/or dynamic) for each run of temporary barrier, as shown in the Plans or stated in the Special Provisions. If no distinction between permanent and temporary deflection is shown in the plans or Special Provisions, then dynamic deflection shall govern.

853.42: Precast Concrete Barriers

Precast Concrete Barriers used as temporary barriers shall be fabricated in accordance with M4.09.0: Precast, Prestressed, and Prefabricated Concrete Products. The Contractor shall submit a Certificate of Compliance (CoC) attesting to meeting this requirement.

853.43: Delineation

Delineators installed at 20-ft intervals throughout the entire barrier run shall be included. The delineators shall conform to M10.16.2: Delineators for Temporary Barrier. Delineators that may act as a washer on a bolted connection shall not be used unless specifically allowed by the barrier manufacturer. Delineators that are damaged, are no longer reflective, or go missing while temporary barrier is deployed shall be replaced in kind by the Contractor.

Delineators may be top or side-mounted to the barrier and oriented in a manner to maximize reflectivity to approaching traffic.

Temporary barrier placed on the right side of the travel way, or top-mounted and separating two or more lanes traveling in the same direction, shall use white delineators. Temporary barrier placed on the left side of the travel way shall use amber or yellow delineators; if separating two-way traffic and top-mounted, the delineator shall be double-sided.

853.44: Anchored Barrier

Temporary barrier systems that include an anchor system in order to meet performance requirements of the contract and/or meet MASH testing requirements may be accepted for use at the discretion of the Department.

Barrier that utilizes an anchor system shall use the same pattern, placement, and material of anchors that was used in MASH crash testing.

853.45: Shop Drawings

Within 30 days of the Notice to Proceed, the Contractor shall provide Shop Drawings showing the proposed temporary barrier system and confirming that it conforms to 853.40: General and will meet the allowable deflection requirements as described in 853.41: Deflection.

If anchors are proposed, the means, methods, pattern, placement, and materials for anchoring and subsequent pavement and/or deck repairs following removal of the temporary barrier system shall be included in the Shop Drawing submittal. If the use of an anchor system is rejected by the Department, the Contractor shall select an unanchored system that meets or exceeds the contract specified performance requirements, at no additional cost.

Shop Drawings for proprietary barrier systems shall include manufacturer's instructions for installation.

CONSTRUCTION METHODS

853.60: General

A Traffic Management Plan approved by the Department is required prior to the installation of the temporary barrier system.

The Contractor shall install temporary barrier systems in accordance with the Plans.

Barrier ends shall not be exposed to approaching traffic during installation. Crashworthy shielding or attenuation shall be provided at all times.

Proprietary temporary barrier systems shall be installed per the manufacturer's instructions.

The Contractor shall not place any breaks in the temporary barrier system that will result in sections that are shorter than the tested minimum length-of-need (LON) under MASH Test 2-11 (for TL-2) or 3-11 (for TL-3). Exceptions shall be allowed for gate systems or changeable length segments placed over expansion joints, if those barrier segment types have been determined to be crashworthy per MASH.

Temporary barrier shall not be placed on unpaved surfaces, unless otherwise shown in the Plans.

The Contractor shall not store materials, vehicles, or other equipment within the measured dynamic deflection envelope, as defined in 853.41: Deflection.

853.61: Temporary Barrier Removed and Reset

Temporary Barrier Removed and Reset consists of relocating a string of temporary barrier from one alignment to another to support the sequence and phasing of construction, as shown in the Plans.

Temporary Barrier Removed and Reset does not include moving all or a portion of the temporary barrier system to gain access to a work area, for the convenience of the Contractor, or to realign units that have moved due to construction activities or a traffic incident.

853.62: Quality Control Inspection

After temporary barrier installation is completed, the Contractor shall perform a Quality Control (QC) Inspection in the presence of the Engineer. QC Inspection activities shall include, but are not limited to the following reviews:

- Installation location per the approved Plans.
- Alignment and connection mechanism between adjacent barrier segments.
- Alignment and connection mechanism between barrier segment and attenuator, if present.
- Anchor system installation, if present.

For proprietary barrier systems, the QC Inspection shall also include any manufacturer-specific inspection details or criteria found in the installation instructions.

Work behind the barrier shall not commence until the QC Inspection has been accepted by the Engineer.

COMPENSATION

853.80: Method of Measurement

Temporary Barrier will be measured by the foot installed, in place.

Temporary Barrier Removed and Reset will be measured by the foot removed and reset.

853.81: Basis of Payment

Temporary Barrier will be paid for at the contract unit price per foot which shall provide full compensation for fabrication, storage, transport, furnishment, installation, delineation, alignment, maintenance, repair, and final removal of the temporary barrier.

Temporary Barrier Removed and Reset will be paid for at the contract unit price per foot which shall provide full compensation for removing, relocating, transporting, and installing new anchorage (if used). If more than one accepted temporary barrier system is approved for use in a single contract, the unit cost for Temporary Barrier Removed and Reset shall not differ among systems.

All costs associated with fabrication, installation, and maintenance of temporary barrier delineators shall be considered incidental to the cost of the item.

All costs associated with Shop Drawings and COCs shall be considered incidental to the item.

All costs associated with patching or repairing the road surface or bridge deck due to the installation and removal of temporary barrier and/or anchors for a temporary barrier system shall be considered incidental to the cost of the item.

853.82: Payment Items

Item number	Description	Unit
853.2	Temporary Barrier (TL-2)	Foot
853.21	Temporary Barrier Removed and Reset	Foot
853.23	Temporary Barrier (TL-3)	Foot
853.33	Temporary Barrier – Limited Deflection (TL-3)	Foot

SECTION 900: STRUCTURES

SUBECTION 902: ULTA HIGH PERFORMANCE CONCRETE

Subsection 902.32: Mockup
In Table 902.32-1 change the Link Slab width to 2 ft – 0 in. and change the Joint Header width to 0 ft – 6 in.

Subsection 902.32: - 902.38
Renumber section 902.32 Surface Preparation to 902.33 Surface Preparation and renumber section 902.33 through 902.38 to 902.34 through 902.39.

DIVISION III

MATERIALS SPECIFICATIONS

SECTION M2: AGGREGATES AND RELATED MATERIALS

Subsection M2.01.0 Crushed Stone
Replace the fourth paragraph and the associated asterisk notes with the following;

The crushed stone shall have a maximum 45% wear as determined by the Los Angeles Abrasion Test (AASHTO T 96)

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUIT

Subsection M5.01.0 Joint Materials for Pipe
Replace this subsection with the following:

- Jute or oakum furnished for use in pipe joints shall be of an accepted grade approved for common usage.
- Mortar shall conform to the requirements of M4.04.0: Cementitious Grout, Mortar and Concrete Products
- Standard couplers as approved by the manufacturer shall be used to join corrugated metal pipe
- Rubber ring or plastic gaskets for concrete pipe joints, or manholes section joints shall be of tough, flexible, chemical-resistant material, and of such size and shape as to ensure satisfactory pipe joints when incorporated in the work and shall conform to AWWA C153.
- Rubber gasket joints for ductile iron pipe shall be Styrene-Butadiene Rubber (SBR), Ethylene Propylene Diene Monomer (EPDM) or Nitrile and conform to AWWA C111

Subsection M5.05.03.B Gate Valves
Replace this subsection with the following:

Gate valves shall conform to the requirements of AWWA Standard C500 and/or to the type used by the municipality as specified in the Special Provisions.

SECTION M7: PAINTS, PROTECTIVE COATINGS AND PAVEMENT MARKINGS

Subsection M7.01.04 Fast Drying White and Yellow Waterborne Traffic Paint
Replace the subsection with the following:

Approved waterborne traffic paint shall be tested in accordance with AASHTO M 348 and be listed on the QCML The dry paint film shall be under the Toxicity Characteristic Leaching Procedure (TCLP) limits for all contaminants listed in 40 CFR 261.24. The markings shall be installed using reflective glass beads meeting the requirements of M7.01.07. For waterborne yellow paint use Organic Yellow No. 65 or No. 75 pigment.

SECTION M9: MISCELLANEOUS MATERIALS

Subsection M9.12.0 Reflectors for Barriers
Delete this subsection.

SECTION M10: TRAFFIC CONTROL DEVICES

Subsection M10.16.0: Temporary Barrier
Subsection M10.16.1: Limited Deflection Temporary Barrier
Subsection M10.16.2: Delineators for Temporary Barrier
Add these new subsections.

M10.16.0: Temporary Barrier

All Temporary Barrier shall be tested to MASH crash testing standards and the results of the following crash test designations must fall within the acceptable impact tolerances and evaluation criteria shown in Table 2-2A of MASH:

- Test Level 2: 2-10, 2-11
- Test Level 3: 3-10, 3-11

M10.16.1: Limited Deflection Temporary Barrier

To be classified as a Limited Deflection Temporary Barrier, the results of MASH Test Designation 3-11 must result in a measured dynamic deflection of 24 in. or less.

M10.16.2: Delineators for Temporary Barrier

Delineators for Temporary Barrier shall consist of a housing, retroreflective material, and an adhesive or mechanical fastener.

Housings for Delineators for Temporary Barrier shall be fabricated from a lightweight polymer material. Metal housings shall not be permitted.

Retroreflection shall be achieved using an acrylic reflector or retroreflective sheeting directly applied to the housing. If used, retroreflective sheeting shall be factory applied and conform to ASTM D4956 Type IV, Type V, or Type IX. A minimum of 8 $in.^2$ of reflective material shall be visible on any traffic-facing portion of the delineator.

Delineators shall be attached to temporary barriers using a manufacturer-approved adhesive or mechanical fastener.

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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-

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POLICY

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

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

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

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

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 **10 %**
(*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
II. Nondiscrimination
III. Non-segregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
XI. Certification Regarding Use of Contract Funds for Lobbying
XII. Use of United States-Flag Vessels:

ATTACHMENTS

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

I. GENERAL

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

10. Assurances Required:

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

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

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages (29 CFR 5.5)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2. Withholding (29 CFR 5.5)

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

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

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

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

(2) A contracting agency for its 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 14, 2025

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	$0.55
2	ASTM A27 (AASHTO M103) Steel Castings, H-Pile Points & Pipe Pile Shoes (See Note below.)	$0.76
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	$0.76
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	$0.78
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	$0.82
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	$0.77
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	$0.82
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	$0.77
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	$0.85
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	$0.78
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	$0.85
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	$0.78
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	$0.89
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	$0.96
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	$1.47
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	$0.85
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	$0.78
18	ASTM A276 Type 316 Stainless Steel	$4.42
19	ASTM A240 Type 316 Stainless Steel	$4.42
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	$1.52
21	ASTM A53 Grade B Structural Steel Pipe	$0.96
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	$0.96
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	$0.76
24	ASTM 252, Grade 2 Permanent Steel Casing	$0.76
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	$0.80
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	$1.45
27	ASTM A572 / A572M, Grade 50 Sheetpiling	$1.45
28	ASTM A36/36M, Grade 50	$0.82
29	ASTM A570, Grade 50	$0.80
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	$0.82
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	$0.96
32	AREA 140 LB Rail and Track Accessories	$0.50

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: 132090 **Project No.** 610776 **Federal Aid No.:** NHP(BRR-ON)/HIP(BR)-0036(020)X

Location: CAMBRIDGE

Project Description: Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline

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

MAURA HEALY
Governor
KIM DRISCOLL
Lt. Governor

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

LAUREN JONES
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority:	MassDOT Highway	**City/Town:**	CAMBRIDGE
Contract Number:	132090		
Description of Work:	CAMBRIDGE - Federal Aid Project No. NHP(BRR-ON)/HIP(BR)-0036(020)X Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline		
Job Location:	US Rte 3/Rte 16/Rte 2 over MBTA Redline		

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 within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.05	$15.41	$20.17	$0.00	$0.00	$77.63
	12/1/2025	$42.05	$15.41	$21.78	$0.00	$0.00	$79.24
	6/1/2026	$43.05	$15.41	$21.78	$0.00	$0.00	$80.24
	8/1/2026	$43.05	$15.91	$21.78	$0.00	$0.00	$80.74
	12/1/2026	$43.05	$15.91	$23.52	$0.00	$0.00	$82.48
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$41.12	$15.41	$20.17	$0.00	$0.00	$76.70
	12/1/2025	$41.12	$15.41	$21.78	$0.00	$0.00	$78.31
	6/1/2026	$43.12	$15.41	$21.78	$0.00	$0.00	$80.31
	8/1/2026	$43.12	$15.91	$21.78	$0.00	$0.00	$80.81
	12/1/2026	$43.12	$15.91	$23.52	$0.00	$0.00	$82.55
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.24	$15.41	$20.17	$0.00	$0.00	$77.82
	12/1/2025	$42.24	$15.41	$21.78	$0.00	$0.00	$79.43
	6/1/2026	$43.24	$15.41	$21.78	$0.00	$0.00	$80.43
	8/1/2026	$43.24	$15.91	$21.78	$0.00	$0.00	$80.93
	12/1/2026	$43.24	$15.91	$23.52	$0.00	$0.00	$82.67
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	1/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"							
AIR TRACK OPERATOR LABORERS LABORERS - ZONE 1	6/1/2025	$48.35	$9.90	$9.25	$9.65	$0.00	$77.15
	12/1/2025	$49.85	$9.90	$9.25	$9.65	$0.00	$78.65
	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.90	$9.90	$9.25	$9.65	$0.00	$81.70
	6/1/2027	$54.50	$9.90	$9.25	$9.65	$0.00	$83.30
	12/1/2027	$56.10	$9.90	$9.25	$9.65	$0.00	$84.90
	6/1/2028	$57.78	$9.90	$9.25	$9.65	$0.00	$86.58
	12/1/2028	$59.45	$9.90	$9.25	$9.65	$0.00	$88.25
For apprentice rates see "Apprentice- LABORER"							
AIR TRACK OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$48.45	$9.90	$9.25	$9.65	$0.00	$77.25
	12/1/2025	$49.95	$9.90	$9.25	$9.65	$0.00	$78.75
	6/1/2026	$51.50	$9.90	$9.25	$9.65	$0.00	$80.30
	12/1/2026	$53.00	$9.90	$9.25	$9.65	$0.00	$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	6/1/2025	$43.80	$14.50	$4.30	$6.75	$0.00	$69.35
	12/1/2025	$44.80	$14.50	$4.30	$6.75	$0.00	$70.35
ASPHALT RAKER LABORERS LABORERS - ZONE 1	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
ASPHALT RAKER (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
LABORERS	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BACKHOE/FRONT-END LOADER	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BARCO-TYPE JUMPING TAMPER	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
LABORERS	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
LABORERS - ZONE 1	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER	6/1/2025	$48.35	$9.90	$9.25	$9.65	$0.00	$77.15
LABORERS	12/1/2025	$49.85	$9.90	$9.25	$9.65	$0.00	$78.65
LABORERS - ZONE 1	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.90	$9.90	$9.25	$9.65	$0.00	$81.70
	6/1/2027	$54.50	$9.90	$9.25	$9.65	$0.00	$83.30
	12/1/2027	$56.10	$9.90	$9.25	$9.65	$0.00	$84.90
	6/1/2028	$57.78	$9.90	$9.25	$9.65	$0.00	$86.58
	12/1/2028	$59.45	$9.90	$9.25	$9.65	$0.00	$88.25
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY)	6/1/2025	$48.45	$9.90	$9.25	$9.65	$0.00	$77.25
LABORERS	12/1/2025	$49.95	$9.90	$9.25	$9.65	$0.00	$78.75
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	$51.50	$9.90	$9.25	$9.65	$0.00	$80.30
	12/1/2026	$53.00	$9.90	$9.25	$9.65	$0.00	$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
BOILER MAKER	1/1/2024	$48.12	$7.07	$14.60	$6.00	$0.00	$75.79
BOILERMAKERS LOCAL 29							
BOILERMAKERS LOCAL 29							

Construction

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

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
2	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
3	70.00	$33.68	$7.07	$10.03	$4.20	$0.00	$54.98
4	75.00	$36.09	$7.07	$10.74	$4.50	$0.00	$58.40
5	80.00	$38.50	$7.07	$11.45	$4.80	$0.00	$61.82
6	85.00	$40.90	$7.07	$12.18	$5.10	$0.00	$65.25
7	90.00	$43.31	$7.07	$12.88	$5.40	$0.00	$68.66
8	95.00	$45.71	$7.07	$13.62	$5.70	$0.00	$72.10

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (BOSTON)	8/1/2025	$67.95	$11.49	$15.57	$8.02	$0.00	$103.03
	2/1/2026	$69.30	$11.49	$15.57	$8.02	$0.00	$104.38
	8/1/2026	$71.50	$11.49	$15.57	$8.02	$0.00	$106.58
	2/1/2027	$72.90	$11.49	$15.57	$8.02	$0.00	$107.98

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.98	$11.49	$15.57	$8.02	$0.00	$69.06
2	60.00	$40.77	$11.49	$15.57	$8.02	$0.00	$75.85
3	70.00	$47.57	$11.49	$15.57	$8.02	$0.00	$82.65
4	80.00	$54.36	$11.49	$15.57	$8.02	$0.00	$89.44
5	90.00	$61.16	$11.49	$15.57	$8.02	$0.00	$96.24

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.65	$11.49	$15.57	$8.02	$0.00	$69.73
2	60.00	$41.58	$11.49	$15.57	$8.02	$0.00	$76.66
3	70.00	$48.51	$11.49	$15.57	$8.02	$0.00	$83.59
4	80.00	$55.44	$11.49	$15.57	$8.02	$0.00	$90.52
5	90.00	$62.37	$11.49	$15.57	$8.02	$0.00	$97.45

BULLDOZER/GRADER/SCRAPER OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN	6/1/2025	$48.85	$9.90	$9.25	$9.80	$0.00	$77.80

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS	12/1/2025	$50.35	$9.90	$9.25	$9.80	$0.00	$79.30
LABORERS - FOUNDATION AND MARINE	6/1/2026	$51.90	$9.90	$9.25	$9.80	$0.00	$80.85
	12/1/2026	$53.40	$9.90	$9.25	$9.80	$0.00	$82.35
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING LABORER	6/1/2025	$47.70	$9.90	$9.25	$9.80	$0.00	$76.65
LABORERS	12/1/2025	$49.20	$9.90	$9.25	$9.80	$0.00	$78.15
LABORERS - FOUNDATION AND MARINE	6/1/2026	$50.75	$9.90	$9.25	$9.80	$0.00	$79.70
	12/1/2026	$52.25	$9.90	$9.25	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING TOP MAN	6/1/2025	$48.03	$9.90	$9.25	$9.80	$0.00	$76.98
LABORERS	12/1/2025	$49.53	$9.90	$9.25	$9.80	$0.00	$78.48
LABORERS - FOUNDATION AND MARINE	6/1/2026	$51.08	$9.90	$9.25	$9.80	$0.00	$80.03
	12/1/2026	$52.58	$9.90	$9.25	$9.80	$0.00	$81.53
For apprentice rates see "Apprentice- LABORER"							
CARBIDE CORE DRILL OPERATOR	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
LABORERS	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
LABORERS - ZONE 1	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
CARPENTER	3/1/2025	$60.46	$9.83	$11.47	$8.50	$0.00	$90.26
CARPENTERS	9/1/2025	$61.96	$9.83	$11.47	$8.50	$0.00	$91.76
CARPENTERS -ZONE 1 (Metro Boston)	3/1/2026	$63.46	$9.83	$11.47	$8.50	$0.00	$93.26
	9/1/2026	$64.96	$9.83	$11.47	$8.50	$0.00	$94.76
	3/1/2027	$66.46	$9.83	$11.47	$8.50	$0.00	$96.26

Apprentice: CARPENTER

Effective Date: 3/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$27.21	$9.83	$0.00	$1.73	$0.00	$38.77
2	45.00	$27.21	$9.83	$0.00	$1.73	$0.00	$38.77
3	55.00	$33.25	$9.83	$0.00	$3.40	$0.00	$46.48
4	55.00	$33.25	$9.83	$0.00	$3.40	$0.00	$46.48
5	70.00	$42.32	$9.83	$11.41	$5.10	$0.00	$68.66
6	70.00	$42.32	$9.83	$11.41	$5.10	$0.00	$68.66
7	80.00	$48.37	$9.83	$11.44	$6.80	$0.00	$76.44
8	80.00	$48.37	$9.83	$11.44	$6.80	$0.00	$76.44

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	4/1/2025	$38.54	$7.56	$4.47	$5.00	$0.00	$55.57
CARPENTERS	10/1/2025	$39.34	$7.56	$4.47	$5.00	$0.00	$56.37
CARPENTERS -ZONE 1 (Wood Frame)	4/1/2026	$40.14	$7.56	$4.47	$5.00	$0.00	$57.17
	10/1/2026	$40.94	$7.56	$4.47	$5.00	$0.00	$57.97
	4/1/2027	$41.74	$7.56	$4.47	$5.00	$0.00	$58.77

All Aspects of New Wood Frame Work

Apprentice: CARPENTER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$27.88	$9.83	$0.00	$1.73	$0.00	$39.44
2	45.00	$27.88	$9.83	$0.00	$1.73	$0.00	$39.44
3	55.00	$34.08	$9.83	$0.00	$3.40	$0.00	$47.31
4	55.00	$34.08	$9.83	$0.00	$3.40	$0.00	$47.31
5	70.00	$43.37	$9.83	$11.41	$5.10	$0.00	$69.71
6	70.00	$43.37	$9.83	$11.41	$5.10	$0.00	$69.71
7	80.00	$49.57	$9.83	$11.44	$6.80	$0.00	$77.64
8	80.00	$49.57	$9.83	$11.44	$6.80	$0.00	$77.64

Apprentice: CARPENTER WOOD FRAME

Effective Date: 4/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$19.27	$7.56	$0.00	$0.00	$0.00	$26.83
2	50.00	$19.27	$7.56	$0.00	$0.00	$0.00	$26.83
3	55.00	$21.20	$7.56	$0.00	$2.00	$0.00	$30.76
4	55.00	$21.20	$7.56	$0.00	$2.00	$0.00	$30.76
5	70.00	$26.98	$7.56	$4.47	$3.00	$0.00	$42.01
6	70.00	$26.98	$7.56	$4.47	$3.00	$0.00	$42.01
7	80.00	$30.83	$7.56	$4.47	$4.00	$0.00	$46.86
8	80.00	$30.83	$7.56	$4.47	$4.00	$0.00	$46.86

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$19.67	$7.56	$0.00	$0.00	$0.00	$27.23
2	50.00	$19.67	$7.56	$0.00	$0.00	$0.00	$27.23
3	55.00	$21.64	$7.56	$0.00	$2.00	$0.00	$31.20
4	55.00	$21.64	$7.56	$0.00	$2.00	$0.00	$31.20
5	70.00	$27.54	$7.56	$4.47	$3.00	$0.00	$42.57
6	70.00	$27.54	$7.56	$4.47	$3.00	$0.00	$42.57
7	80.00	$31.47	$7.56	$4.47	$4.00	$0.00	$47.50
8	80.00	$31.47	$7.56	$4.47	$4.00	$0.00	$47.50

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (BOSTON)	7/1/2024	$49.19	$13.35	$16.43	$7.78	$1.80	$88.55

Apprentice: CEMENT MASONRY/PLASTERING

Effective Date: 7/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.60	$13.35	$16.43	$0.00	$0.00	$54.38
2	60.00	$29.51	$13.35	$16.43	$2.78	$1.80	$63.87
3	65.00	$31.97	$13.35	$16.43	$3.78	$1.80	$67.33
4	70.00	$34.43	$13.35	$16.43	$4.78	$1.80	$70.79
5	75.00	$36.89	$13.35	$16.43	$5.78	$1.80	$74.25
6	80.00	$39.35	$13.35	$16.43	$6.78	$1.80	$77.71
7	90.00	$44.27	$13.35	$16.43	$7.78	$1.80	$83.63

CHAIN SAW OPERATOR LABORERS LABORERS - ZONE 1	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75

For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$59.51	$15.55	$13.25	$3.25	$0.00	$91.56
	12/1/2025	$60.98	$15.55	$13.25	$3.25	$0.00	$93.03
	6/1/2026	$62.31	$15.55	$13.25	$3.25	$0.00	$94.36
	12/1/2026	$63.79	$15.55	$13.25	$3.25	$0.00	$95.84

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$37.52	$15.55	$13.25	$3.25	$0.00	$69.57
	12/1/2025	$38.47	$15.55	$13.25	$3.25	$0.00	$70.52
	6/1/2026	$39.33	$15.55	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$40.28	$15.55	$13.25	$3.25	$0.00	$72.33

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

DELEADER (BRIDGE) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 1	1/1/2025	$58.46	$9.95	$11.85	$12.10	$0.00	$92.36

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.23	$9.95	$0.00	$0.00	$0.00	$39.18
2	55.00	$32.15	$9.95	$0.00	$6.66	$0.00	$48.76

Construction

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

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
3	60.00	$35.08	$9.95	$0.00	$7.26	$0.00	$52.29
4	65.00	$38.00	$9.95	$0.00	$7.87	$0.00	$55.82
5	70.00	$40.92	$9.95	$11.85	$8.47	$0.00	$71.19
6	75.00	$43.85	$9.95	$11.85	$9.08	$0.00	$74.73
7	80.00	$46.77	$9.95	$11.85	$9.68	$0.00	$78.25
8	90.00	$52.61	$9.95	$11.85	$10.89	$0.00	$85.30

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
DEMO: ADZEMAN	6/2/2025	$47.75	$9.90	$9.25	$9.65	$0.00	$76.55
LABORERS	12/1/2025	$49.25	$9.90	$9.25	$9.65	$0.00	$78.05
LABORERS - ZONE 1	6/1/2026	$50.80	$9.90	$9.25	$9.65	$0.00	$79.60
	12/7/2026	$52.30	$9.90	$9.25	$9.65	$0.00	$81.10
	6/7/2027	$53.90	$9.90	$9.25	$9.65	$0.00	$82.70
	12/6/2027	$55.50	$9.90	$9.25	$9.65	$0.00	$84.30
	6/5/2028	$57.18	$9.90	$9.25	$9.65	$0.00	$85.98
	12/4/2028	$58.85	$9.90	$9.25	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	6/2/2025	$48.75	$9.90	$9.25	$9.65	$0.00	$77.55
LABORERS	12/1/2025	$50.25	$9.90	$9.25	$9.65	$0.00	$79.05
LABORERS - ZONE 1	6/1/2026	$51.80	$9.90	$9.25	$9.65	$0.00	$80.60
	12/7/2026	$53.30	$9.90	$9.25	$9.65	$0.00	$82.10
	6/7/2027	$54.90	$9.90	$9.25	$9.65	$0.00	$83.70
	12/6/2027	$56.50	$9.90	$9.25	$9.65	$0.00	$85.30
	6/5/2028	$58.18	$9.90	$9.25	$9.65	$0.00	$86.98
	12/4/2028	$59.85	$9.90	$9.25	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BURNERS	6/2/2025	$48.50	$9.90	$9.25	$9.65	$0.00	$77.30
LABORERS	12/1/2025	$50.00	$9.90	$9.25	$9.65	$0.00	$78.80
LABORERS - ZONE 1	6/1/2026	$51.55	$9.90	$9.25	$9.65	$0.00	$80.35
	12/7/2026	$53.05	$9.90	$9.25	$9.65	$0.00	$81.85
	6/7/2027	$54.65	$9.90	$9.25	$9.65	$0.00	$83.45
	12/6/2027	$56.25	$9.90	$9.25	$9.65	$0.00	$85.05
	6/5/2028	$57.93	$9.90	$9.25	$9.65	$0.00	$86.73
	12/4/2028	$59.60	$9.90	$9.25	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: CONCRETE CUTTER/SAWYER	6/2/2025	$48.75	$9.90	$9.25	$9.65	$0.00	$77.55
LABORERS	12/1/2025	$50.25	$9.90	$9.25	$9.65	$0.00	$79.05
LABORERS - ZONE 1	6/1/2026	$51.80	$9.90	$9.25	$9.65	$0.00	$80.60
	12/7/2026	$53.30	$9.90	$9.25	$9.65	$0.00	$82.10
	6/7/2027	$54.90	$9.90	$9.25	$9.65	$0.00	$83.70
	12/6/2027	$56.50	$9.90	$9.25	$9.65	$0.00	$85.30
	6/5/2028	$58.18	$9.90	$9.25	$9.65	$0.00	$86.98
	12/4/2028	$59.85	$9.90	$9.25	$9.65	$0.00	$88.65

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"							
DEMO: JACKHAMMER OPERATOR LABORERS LABORERS - ZONE 1	6/2/2025	$48.50	$9.90	$9.25	$9.65	$0.00	$77.30
	12/1/2025	$50.00	$9.90	$9.25	$9.65	$0.00	$78.80
	6/1/2026	$51.55	$9.90	$9.25	$9.65	$0.00	$80.35
	12/7/2026	$53.05	$9.90	$9.25	$9.65	$0.00	$81.85
	6/7/2027	$54.65	$9.90	$9.25	$9.65	$0.00	$83.45
	12/6/2027	$56.25	$9.90	$9.25	$9.65	$0.00	$85.05
	6/5/2028	$57.93	$9.90	$9.25	$9.65	$0.00	$86.73
	12/4/2028	$59.60	$9.90	$9.25	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: WRECKING LABORER LABORERS LABORERS - ZONE 1	6/2/2025	$47.75	$9.90	$9.25	$9.65	$0.00	$76.55
	12/1/2025	$49.25	$9.90	$9.25	$9.65	$0.00	$78.05
	6/1/2026	$50.80	$9.90	$9.25	$9.65	$0.00	$79.60
	12/7/2026	$52.30	$9.90	$9.25	$9.65	$0.00	$81.10
	6/7/2027	$53.90	$9.90	$9.25	$9.65	$0.00	$82.70
	12/6/2027	$55.50	$9.90	$9.25	$9.65	$0.00	$84.30
	6/5/2028	$57.18	$9.90	$9.25	$9.65	$0.00	$85.98
	12/4/2028	$58.85	$9.90	$9.25	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$78.11	$10.08	$11.62	$10.04	$0.00	$109.85
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A $69.83, 3A $91.79,4A $102.14 Total Rate							
DIVER TENDER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A $54.20, 3A $73.93,4A $82.05 Total Rate							
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$83.69	$10.08	$11.62	$12.67	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"							
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"							
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888 DRAWBRIDGE - SEIU LOCAL 888	7/1/2020	$26.77	$6.67	$3.93	$0.00	$0.16	$37.53

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ELECTRICIAN ELECTRICIANS LOCAL 103 ELECTRICIANS LOCAL 103	3/1/2025	$64.26	$13.00	$14.31	$8.72	$0.00	$100.29
	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
	3/1/2026	$67.37	$13.00	$14.40	$8.72	$0.00	$103.49
	9/1/2026	$69.28	$13.00	$14.46	$8.72	$0.00	$105.46
	3/1/2027	$70.47	$13.00	$14.49	$8.72	$0.00	$106.68
	9/1/2027	$72.39	$13.00	$14.55	$8.72	$0.00	$108.66
	3/1/2028	$73.59	$13.00	$14.59	$8.72	$0.00	$109.90

Apprentice: ELECTRICIAN

Effective Date: 3/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$25.70	$13.00	$0.77	$0.00	$0.00	$39.47
2	40.00	$25.70	$13.00	$0.77	$0.00	$0.00	$39.47
3	45.00	$28.92	$13.00	$13.25	$3.92	$0.00	$59.09
4	45.00	$28.92	$13.00	$13.25	$3.92	$0.00	$59.09
5	50.00	$32.13	$13.00	$13.34	$4.36	$0.00	$62.83
6	55.00	$35.34	$13.00	$13.44	$4.80	$0.00	$66.58
7	60.00	$38.56	$13.00	$13.54	$5.23	$0.00	$70.33
8	65.00	$41.77	$13.00	$13.63	$5.67	$0.00	$74.07
9	70.00	$44.98	$13.00	$13.73	$6.10	$0.00	$77.81
10	75.00	$48.20	$13.00	$13.83	$6.54	$0.00	$81.57

Apprentice: ELECTRICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$26.47	$13.00	$0.79	$0.00	$0.00	$40.26
2	40.00	$26.47	$13.00	$0.79	$0.00	$0.00	$40.26
3	45.00	$29.78	$13.00	$13.27	$3.92	$0.00	$59.97
4	45.00	$29.78	$13.00	$13.27	$3.92	$0.00	$59.97
5	50.00	$33.09	$13.00	$13.37	$4.36	$0.00	$63.82
6	55.00	$36.39	$13.00	$13.47	$4.80	$0.00	$67.66
7	60.00	$39.70	$13.00	$13.57	$5.23	$0.00	$71.50
8	65.00	$43.01	$13.00	$13.67	$5.67	$0.00	$75.35
9	70.00	$46.32	$13.00	$13.77	$6.10	$0.00	$79.19
10	75.00	$49.63	$13.00	$13.87	$6.54	$0.00	$83.04

ELEVATOR CONSTRUCTOR ELEVATOR CONSTRUCTORS LOCAL 4 ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2022	$65.62	$16.03	$10.71	$9.50	$0.00	$101.86

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2022

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: ELEVATOR CONSTRUCTOR							
Effective Date: 1/1/2022							
Step / Percent		**Apprentice Base Wage**					
1 / 50.00		$32.81	$16.03	$0.00	$0.00	$0.00	$48.84
2 / 55.00		$36.09	$16.03	$10.71	$9.50	$0.00	$72.33
3 / 65.00		$42.65	$16.03	$10.71	$9.50	$0.00	$78.89
4 / 70.00		$45.93	$16.03	$10.71	$9.50	$0.00	$82.17
5 / 80.00		$52.50	$16.03	$10.71	$9.50	$0.00	$88.74
ELEVATOR CONSTRUCTOR HELPER ELEVATOR CONSTRUCTORS LOCAL 4 ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2022	$45.93	$16.03	$10.71	$9.50	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"							
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	5/1/2025	$53.22	$15.30	$13.15	$3.25	$0.00	$84.92
	11/1/2025	$54.51	$15.30	$13.15	$3.25	$0.00	$86.21
	5/1/2026	$55.95	$15.30	$13.15	$3.25	$0.00	$87.65
	11/1/2026	$57.24	$15.30	$13.15	$3.25	$0.00	$88.94
	5/1/2027	$58.67	$15.30	$13.15	$3.25	$0.00	$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	5/1/2025	$54.82	$15.30	$13.15	$3.25	$0.00	$86.52
	11/1/2025	$56.12	$15.30	$13.15	$3.25	$0.00	$87.82
	5/1/2026	$57.57	$15.30	$13.15	$3.25	$0.00	$89.27
	11/1/2026	$58.87	$15.30	$13.15	$3.25	$0.00	$90.57
	5/1/2027	$60.32	$15.30	$13.15	$3.25	$0.00	$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	5/1/2025	$26.22	$15.30	$13.15	$3.25	$0.00	$57.92
	11/1/2025	$26.98	$15.30	$13.15	$3.25	$0.00	$58.68
	5/1/2026	$27.83	$15.30	$13.15	$3.25	$0.00	$59.53
	11/1/2026	$28.59	$15.30	$13.15	$3.25	$0.00	$60.29
	5/1/2027	$29.44	$15.30	$13.15	$3.25	$0.00	$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIRE ALARM INSTALLER ELECTRICIANS LOCAL 103 ELECTRICIANS LOCAL 103	3/1/2025	$64.26	$13.00	$14.31	$8.72	$0.00	$100.29
	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
	3/1/2026	$67.37	$13.00	$14.40	$8.72	$0.00	$103.49
	9/1/2026	$69.28	$13.00	$14.46	$8.72	$0.00	$105.46
	3/1/2027	$70.47	$13.00	$14.49	$8.72	$0.00	$106.68
	9/1/2027	$72.39	$13.00	$14.55	$8.72	$0.00	$108.66
	3/1/2028	$73.59	$13.00	$14.59	$8.72	$0.00	$109.90

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- ELECTRICIAN"							
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING ELECTRICIANS LOCAL 103 ELECTRICIANS LOCAL 103	3/1/2025	$51.41	$13.00	$13.92	$6.98	$0.00	$85.31
	9/1/2025	$52.94	$13.00	$13.97	$6.98	$0.00	$86.89
	3/1/2026	$53.90	$13.00	$14.00	$6.98	$0.00	$87.88
	9/1/2026	$55.42	$13.00	$14.04	$6.98	$0.00	$89.44
	3/1/2027	$56.38	$13.00	$14.07	$6.98	$0.00	$90.43
	9/1/2027	$57.91	$13.00	$14.12	$6.98	$0.00	$92.01
	3/1/2028	$58.87	$13.00	$14.15	$6.98	$0.00	$93.00
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"							
FIREMAN (ASST. ENGINEER) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$47.02	$15.55	$13.25	$3.25	$0.00	$79.07
	12/1/2025	$48.19	$15.55	$13.25	$3.25	$0.00	$80.24
	6/1/2026	$49.25	$15.55	$13.25	$3.25	$0.00	$81.30
	12/1/2026	$50.43	$15.55	$13.25	$3.25	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FLAGGER & SIGNALER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$28.09	$9.90	$9.25	$9.65	$0.00	$56.89
	12/1/2025	$28.09	$9.90	$9.25	$9.65	$0.00	$56.89
	6/1/2026	$29.21	$9.90	$9.25	$9.65	$0.00	$58.01
	12/1/2026	$29.21	$9.90	$9.25	$9.65	$0.00	$58.01
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
FLOORCOVERER FLOORCOVERERS LOCAL 2168 FLOORCOVERERS LOCAL 2168 ZONE I	3/1/2025	$57.73	$8.83	$11.47	$8.80	$0.00	$86.83
	9/1/2025	$59.23	$8.83	$11.47	$8.80	$0.00	$88.33
	3/1/2026	$60.73	$8.83	$11.47	$8.80	$0.00	$89.83
	9/1/2026	$62.23	$8.83	$11.47	$8.80	$0.00	$91.33
	3/1/2027	$63.73	$8.83	$11.47	$8.80	$0.00	$92.83

Apprentice: FLOORCOVERER

Effective Date: 3/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.98	$8.83	$0.00	$1.76	$0.00	$36.57
2	45.00	$25.98	$8.83	$0.00	$1.76	$0.00	$36.57
3	55.00	$31.75	$8.83	$0.00	$3.52	$0.00	$44.10
4	55.00	$31.75	$8.83	$0.00	$3.52	$0.00	$44.10
5	70.00	$40.41	$8.83	$11.47	$5.28	$0.00	$65.99
6	70.00	$40.41	$8.83	$11.47	$5.28	$0.00	$65.99
7	80.00	$46.18	$8.83	$11.47	$7.04	$0.00	$73.52
8	80.00	$46.18	$8.83	$11.47	$7.04	$0.00	$73.52

Apprentice: FLOORCOVERER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$26.65	$8.83	$0.00	$1.76	$0.00	$37.24

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: FLOORCOVERER							
Effective Date: 9/1/2025							
Step / Percent		**Apprentice Base Wage**					
2 / 45.00		$26.65	$8.83	$0.00	$1.76	$0.00	$37.24
3 / 55.00		$32.58	$8.83	$0.00	$3.52	$0.00	$44.93
4 / 55.00		$32.58	$8.83	$0.00	$3.52	$0.00	$44.93
5 / 70.00		$41.46	$8.83	$11.47	$5.28	$0.00	$67.04
6 / 70.00		$41.46	$8.83	$11.47	$5.28	$0.00	$67.04
7 / 80.00		$47.38	$8.83	$11.47	$7.04	$0.00	$74.72
8 / 80.00		$47.38	$8.83	$11.47	$7.04	$0.00	$74.72
FORK LIFT/CHERRY PICKER	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GENERATOR/LIGHTING PLANT/HEATERS	6/1/2025	$37.52	$15.55	$13.25	$3.25	$0.00	$69.57
OPERATING ENGINEERS LOCAL 4	12/1/2025	$38.47	$15.55	$13.25	$3.25	$0.00	$70.52
OPERATING ENGINEERS LOCAL 4	6/1/2026	$39.33	$15.55	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$40.28	$15.55	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	1/1/2025	$53.75	$9.95	$11.85	$12.10	$0.00	$87.65
GLAZIERS LOCAL 35							
GLAZIERS LOCAL 35 (ZONE 1)							
Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)							
Effective Date: 1/1/2025							
Step / Percent		**Apprentice Base Wage**					
1 / 50.00		$26.88	$9.95	$0.00	$0.00	$0.00	$36.83
2 / 55.00		$29.56	$9.95	$0.00	$6.66	$0.00	$46.17
3 / 60.00		$32.25	$9.95	$0.00	$7.26	$0.00	$49.46
4 / 65.00		$34.94	$9.95	$0.00	$7.87	$0.00	$52.76
5 / 70.00		$37.63	$9.95	$11.85	$8.47	$0.00	$67.90
6 / 75.00		$40.31	$9.95	$11.85	$9.08	$0.00	$71.19
7 / 80.00		$43.00	$9.95	$11.85	$9.68	$0.00	$74.48
8 / 90.00		$48.38	$9.95	$11.85	$10.89	$0.00	$81.07
HOISTING ENGINEER/CRANES/GRADALLS	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58

Construction

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

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$32.08	$0.00	$0.00	$0.00	$0.00	$32.08
2	60.00	$35.00	$15.55	$13.25	$3.25	$0.00	$67.05
3	65.00	$37.91	$15.55	$13.25	$3.25	$0.00	$69.96
4	70.00	$40.83	$15.55	$13.25	$3.25	$0.00	$72.88
5	75.00	$43.75	$15.55	$13.25	$3.25	$0.00	$75.80
6	80.00	$46.66	$15.55	$13.25	$3.25	$0.00	$78.71
7	85.00	$49.58	$15.55	$13.25	$3.25	$0.00	$81.63
8	90.00	$52.50	$15.55	$13.25	$3.25	$0.00	$84.55

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$32.88	$0.00	$0.00	$0.00	$0.00	$32.88
2	60.00	$35.87	$15.55	$13.25	$3.25	$0.00	$67.92
3	65.00	$38.86	$15.55	$13.25	$3.25	$0.00	$70.91
4	70.00	$41.85	$15.55	$13.25	$3.25	$0.00	$73.90
5	75.00	$44.84	$15.55	$13.25	$3.25	$0.00	$76.89
6	80.00	$47.82	$15.55	$13.25	$3.25	$0.00	$79.87
7	85.00	$50.81	$15.55	$13.25	$3.25	$0.00	$82.86
8	90.00	$53.80	$15.55	$13.25	$3.25	$0.00	$85.85

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
HVAC (DUCTWORK)	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
SHEETMETAL WORKERS LOCAL 17	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
SHEETMETAL WORKERS LOCAL 17 - A							
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (ELECTRICAL CONTROLS)	3/1/2025	$64.26	$13.00	$14.31	$8.72	$0.00	$100.29
ELECTRICIANS LOCAL 103	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
ELECTRICIANS LOCAL 103	3/1/2026	$67.37	$13.00	$14.40	$8.72	$0.00	$103.49
	9/1/2026	$69.28	$13.00	$14.46	$8.72	$0.00	$105.46
	3/1/2027	$70.47	$13.00	$14.49	$8.72	$0.00	$106.68
	9/1/2027	$72.39	$13.00	$14.55	$8.72	$0.00	$108.66
	3/1/2028	$73.59	$13.00	$14.59	$8.72	$0.00	$109.90
For apprentice rates see "Apprentice- ELECTRICIAN"							
HVAC (TESTING AND BALANCING - AIR)	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
SHEETMETAL WORKERS LOCAL 17	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
SHEETMETAL WORKERS LOCAL 17 - A							
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (TESTING AND BALANCING -WATER)	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38
PIPEFITTERS LOCAL 537							
PIPEFITTERS LOCAL 537							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HVAC MECHANIC PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HYDRAULIC DRILLS LABORERS LABORERS - ZONE 1	6/1/2025	$48.35	$9.90	$9.25	$9.65	$0.00	$77.15
	12/1/2025	$49.85	$9.90	$9.25	$9.65	$0.00	$78.65
	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.90	$9.90	$9.25	$9.65	$0.00	$81.70
	6/1/2027	$54.50	$9.90	$9.25	$9.65	$0.00	$83.30
	12/1/2027	$56.10	$9.90	$9.25	$9.65	$0.00	$84.90
	6/1/2028	$57.78	$9.90	$9.25	$9.65	$0.00	$86.58
	12/1/2028	$59.45	$9.90	$9.25	$9.65	$0.00	$88.25
For apprentice rates see "Apprentice- LABORER"							
HYDRAULIC DRILLS (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$48.45	$9.90	$9.25	$9.65	$0.00	$77.25
	12/1/2025	$49.95	$9.90	$9.25	$9.65	$0.00	$78.75
	6/1/2026	$51.50	$9.90	$9.25	$9.65	$0.00	$80.30
	12/1/2026	$53.00	$9.90	$9.25	$9.65	$0.00	$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	9/1/2024	$56.92	$14.75	$9.52	$10.09	$0.00	$91.28
	9/1/2025	$60.34	$14.75	$9.52	$10.09	$0.00	$94.70
	9/1/2026	$63.76	$14.75	$9.52	$10.09	$0.00	$98.12

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$28.46	$14.75	$9.27	$5.05	$0.00	$57.53
2	60.00	$34.15	$14.75	$9.32	$6.05	$0.00	$64.27
3	70.00	$39.84	$14.75	$9.37	$7.06	$0.00	$71.02
4	80.00	$45.54	$14.75	$9.42	$8.07	$0.00	$77.78

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$30.17	$14.75	$9.27	$5.05	$0.00	$59.24
2	60.00	$36.20	$14.75	$9.32	$6.05	$0.00	$66.32
3	70.00	$42.24	$14.75	$9.37	$7.06	$0.00	$73.42
4	80.00	$48.27	$14.75	$9.42	$8.07	$0.00	$80.51

IRONWORKER/WELDER IRONWORKERS LOCAL 7 IRONWORKERS LOCAL 7 (BOSTON AREA)	3/16/2025	$56.79	$9.00	$12.70	$14.45	$0.00	$92.94
	9/16/2025	$57.87	$9.05	$12.75	$14.50	$0.00	$94.17

Construction

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

Apprentice: IRONWORKER/WELDER

Effective Date: 3/16/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$34.07	$9.00	$12.70	$4.25	$0.00	$60.02
2	75.00	$42.59	$9.00	$12.70	$4.25	$0.00	$68.54
3	85.00	$48.27	$9.00	$12.70	$4.45	$0.00	$74.42
4	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
5	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
6	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Apprentice: IRONWORKER/WELDER

Effective Date: 9/16/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$34.72	$9.05	$12.75	$4.50	$0.00	$61.02
2	75.00	$43.40	$9.05	$12.75	$4.50	$0.00	$69.70
3	85.00	$49.19	$9.05	$12.75	$4.50	$0.00	$75.49
4	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
5	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
6	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
JACKHAMMER & PAVING BREAKER OPERATOR	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
LABORERS	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
LABORERS - ZONE 1	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORER	6/1/2025	$47.60	$9.90	$9.25	$9.65	$0.00	$76.40
LABORERS	12/1/2025	$49.10	$9.90	$9.25	$9.65	$0.00	$77.90
LABORERS - ZONE 1	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.15	$9.90	$9.25	$9.65	$0.00	$80.95
	6/1/2027	$53.75	$9.90	$9.25	$9.65	$0.00	$82.55
	12/1/2027	$55.35	$9.90	$9.25	$9.65	$0.00	$84.15
	6/1/2028	$57.03	$9.90	$9.25	$9.65	$0.00	$85.83
	12/1/2028	$58.70	$9.90	$9.25	$9.65	$0.00	$87.50

Apprentice: LABORER

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

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

Apprentice: LABORER

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$28.56	$9.90	$9.25	$9.65	$0.00	$57.36
2	70.00	$33.32	$9.90	$9.25	$9.65	$0.00	$62.12
3	80.00	$38.08	$9.90	$9.25	$9.65	$0.00	$66.88
4	90.00	$42.84	$9.90	$9.25	$9.65	$0.00	$71.64

Apprentice: LABORER

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$29.46	$9.90	$9.25	$9.65	$0.00	$58.26
2	70.00	$34.37	$9.90	$9.25	$9.65	$0.00	$63.17
3	80.00	$39.28	$9.90	$9.25	$9.65	$0.00	$68.08
4	90.00	$44.19	$9.90	$9.25	$9.65	$0.00	$72.99

LABORER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$47.70	$9.90	$9.25	$9.65	$0.00	$76.50
	12/1/2025	$49.20	$9.90	$9.25	$9.65	$0.00	$78.00
	6/1/2026	$50.75	$9.90	$9.25	$9.65	$0.00	$79.55
	12/1/2026	$52.25	$9.90	$9.25	$9.65	$0.00	$81.05

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$28.62	$9.65	$9.25	$9.65	$0.00	$57.17
2	70.00	$33.39	$9.65	$9.25	$9.65	$0.00	$61.94
3	80.00	$38.16	$9.65	$9.25	$9.65	$0.00	$66.71
4	90.00	$42.93	$9.65	$9.25	$9.65	$0.00	$71.48

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$29.52	$9.90	$9.25	$9.65	$0.00	$58.32
2	70.00	$34.44	$9.90	$9.25	$9.65	$0.00	$63.24
3	80.00	$39.36	$9.90	$9.25	$9.65	$0.00	$68.16
4	90.00	$44.28	$9.90	$9.25	$9.65	$0.00	$73.08

LABORER: CARPENTER TENDER LABORERS LABORERS - ZONE 1	6/1/2025	$47.60	$9.90	$9.25	$9.65	$0.00	$76.40
	12/1/2025	$49.10	$9.90	$9.25	$9.65	$0.00	$77.90
	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2026	$52.15	$9.90	$9.25	$9.65	$0.00	$80.95
	6/1/2027	$53.75	$9.90	$9.25	$9.65	$0.00	$82.55
	12/1/2027	$55.35	$9.90	$9.25	$9.65	$0.00	$84.15
	6/1/2028	$57.03	$9.90	$9.25	$9.65	$0.00	$85.83
	12/1/2028	$58.70	$9.90	$9.25	$9.65	$0.00	$87.50
For apprentice rates see "Apprentice- LABORER"							
LABORER: CEMENT FINISHER TENDER	6/1/2025	$47.60	$9.90	$9.25	$9.65	$0.00	$76.40
LABORERS	12/1/2025	$49.10	$9.90	$9.25	$9.65	$0.00	$77.90
LABORERS - ZONE 1	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.15	$9.90	$9.25	$9.65	$0.00	$80.95
	6/1/2027	$53.75	$9.90	$9.25	$9.65	$0.00	$82.55
	12/1/2027	$55.35	$9.90	$9.25	$9.65	$0.00	$84.15
	6/1/2028	$57.03	$9.90	$9.25	$9.65	$0.00	$85.83
	12/1/2028	$58.70	$9.90	$9.25	$9.65	$0.00	$87.50
For apprentice rates see "Apprentice- LABORER"							
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	6/2/2025	$47.75	$9.90	$9.25	$9.65	$0.00	$76.55
LABORERS	12/1/2025	$49.25	$9.90	$9.25	$9.65	$0.00	$78.05
LABORERS - ZONE 1	6/1/2026	$50.80	$9.90	$9.25	$9.65	$0.00	$79.60
	12/7/2026	$52.30	$9.90	$9.25	$9.65	$0.00	$81.10
	6/7/2027	$53.90	$9.90	$9.25	$9.65	$0.00	$82.70
	12/6/2027	$55.50	$9.90	$9.25	$9.65	$0.00	$84.30
	6/5/2028	$57.18	$9.90	$9.25	$9.65	$0.00	$85.98
	12/4/2028	$58.85	$9.90	$9.25	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
LABORERS	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
LABORERS - ZONE 1	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
LABORERS	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
LABORER: MULTI-TRADE TENDER	6/1/2025	$47.60	$9.90	$9.25	$9.65	$0.00	$76.40
LABORERS	12/1/2025	$49.10	$9.90	$9.25	$9.65	$0.00	$77.90
LABORERS - ZONE 1	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.15	$9.90	$9.25	$9.65	$0.00	$80.95
	6/1/2027	$53.75	$9.90	$9.25	$9.65	$0.00	$82.55
	12/1/2027	$55.35	$9.90	$9.25	$9.65	$0.00	$84.15
	6/1/2028	$57.03	$9.90	$9.25	$9.65	$0.00	$85.83
	12/1/2028	$58.70	$9.90	$9.25	$9.65	$0.00	$87.50

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"							
LABORER: TREE REMOVER LABORERS LABORERS - ZONE 1	6/1/2025	$47.60	$9.90	$9.25	$9.65	$0.00	$76.40
	12/1/2025	$49.10	$9.90	$9.25	$9.65	$0.00	$77.90
	6/1/2026	$50.65	$9.90	$9.25	$9.65	$0.00	$79.45
	12/1/2026	$52.15	$9.90	$9.25	$9.65	$0.00	$80.95
	6/1/2027	$53.75	$9.90	$9.25	$9.65	$0.00	$82.55
	12/1/2027	$55.35	$9.90	$9.25	$9.65	$0.00	$84.15
	6/1/2028	$57.03	$9.90	$9.25	$9.65	$0.00	$85.83
	12/1/2028	$58.70	$9.90	$9.25	$9.65	$0.00	$87.50
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 LABORERS - ZONE 1	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
MARBLE & TILE FINISHERS BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$52.08	$11.49	$15.57	$6.05	$0.00	$85.19
	2/1/2026	$53.16	$11.49	$15.57	$6.05	$0.00	$86.27
	8/1/2026	$54.92	$11.49	$15.57	$6.05	$0.00	$88.03
	2/1/2027	$56.04	$11.49	$15.57	$6.05	$0.00	$89.15

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.04	$11.49	$15.57	$6.05	$0.00	$59.15
2	60.00	$31.25	$11.49	$15.57	$6.05	$0.00	$64.36
3	70.00	$36.46	$11.49	$15.57	$6.05	$0.00	$69.57
4	80.00	$41.66	$11.49	$15.57	$6.05	$0.00	$74.77
5	90.00	$46.87	$11.49	$15.57	$6.05	$0.00	$79.98

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
MARBLE MASONS,TILELAYERS & TERRAZZO MECH BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$67.97	$11.49	$15.57	$7.99	$0.00	$103.02
	2/1/2026	$69.32	$11.49	$15.57	$7.99	$0.00	$104.37
	8/1/2026	$71.52	$11.49	$15.57	$7.99	$0.00	$106.57
	2/1/2027	$72.92	$11.49	$15.57	$7.99	$0.00	$107.97

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.58	$11.49	$15.57	$6.05	$0.00	$59.69
2	60.00	$31.90	$11.49	$15.57	$6.05	$0.00	$65.01
3	70.00	$37.21	$11.49	$15.57	$6.05	$0.00	$70.32
4	80.00	$42.53	$11.49	$15.57	$6.05	$0.00	$75.64
5	90.00	$47.84	$11.49	$15.57	$6.05	$0.00	$80.95

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.99	$11.49	$15.57	$7.99	$0.00	$69.04
2	60.00	$40.78	$11.49	$15.57	$7.99	$0.00	$75.83
3	70.00	$47.58	$11.49	$15.57	$7.99	$0.00	$82.63
4	80.00	$54.38	$11.49	$15.57	$7.99	$0.00	$89.43
5	90.00	$61.17	$11.49	$15.57	$7.99	$0.00	$96.22

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.66	$11.49	$15.57	$7.99	$0.00	$69.71
2	60.00	$41.59	$11.49	$15.57	$7.99	$0.00	$76.64
3	70.00	$48.52	$11.49	$15.57	$7.99	$0.00	$83.57
4	80.00	$55.46	$11.49	$15.57	$7.99	$0.00	$90.51
5	90.00	$62.39	$11.49	$15.57	$7.99	$0.00	$97.44

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
MILLWRIGHT (Zone 1)	1/6/2025	$50.53	$10.08	$11.47	$10.25	$0.00	$82.33
MILLWRIGHTS LOCAL 1121 MILLWRIGHTS LOCAL 1121 - Zone 1	1/5/2026	$53.03	$10.08	$11.47	$10.25	$0.00	$84.83

Apprentice: MILLWRIGHT (Zone 1)

Effective Date: 1/6/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$27.79	$10.08	$0.00	$5.64	$0.00	$43.51
2	65.00	$32.84	$10.08	$0.00	$6.66	$0.00	$49.58
3	75.00	$37.90	$10.08	$11.47	$7.69	$0.00	$67.14
4	85.00	$42.95	$10.08	$11.47	$8.71	$0.00	$73.21

Apprentice: MILLWRIGHT (Zone 1)

Effective Date: 1/5/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$29.17	$10.08	$0.00	$5.64	$0.00	$44.89
2	65.00	$34.47	$10.08	$0.00	$6.66	$0.00	$51.21
3	75.00	$39.77	$10.08	$11.47	$7.69	$0.00	$69.01
4	85.00	$45.08	$10.08	$11.47	$8.71	$0.00	$75.34

MORTAR MIXER LABORERS LABORERS - ZONE 1	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$25.97	$15.30	$13.15	$3.25	$0.00	$57.67
	12/1/2025	$26.63	$15.30	$13.15	$3.25	$0.00	$58.33
	6/1/2026	$27.22	$15.30	$13.15	$3.25	$0.00	$58.92
	12/1/2026	$27.89	$15.30	$13.15	$3.25	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$31.80	$15.30	$13.15	$3.25	$0.00	$63.50
	12/1/2025	$32.60	$15.30	$13.15	$3.25	$0.00	$64.30
	6/1/2026	$33.32	$15.30	$13.15	$3.25	$0.00	$65.02
	12/1/2026	$34.12	$15.30	$13.15	$3.25	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 1	1/1/2025	$58.46	$9.95	$11.85	$12.10	$0.00	$92.36

Apprentice: PAINTER (BRIDGES/TANKS)

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.23	$9.95	$0.00	$0.00	$0.00	$39.18
2	55.00	$32.15	$9.95	$0.00	$6.66	$0.00	$48.76
3	60.00	$35.08	$9.95	$0.00	$7.26	$0.00	$52.29
4	65.00	$38.00	$9.95	$0.00	$7.87	$0.00	$55.82
5	70.00	$40.92	$9.95	$11.85	$8.47	$0.00	$71.19
6	75.00	$43.85	$9.95	$11.85	$9.08	$0.00	$74.73
7	80.00	$46.77	$9.95	$11.85	$9.68	$0.00	$78.25
8	90.00	$52.61	$9.95	$11.85	$10.89	$0.00	$85.30

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 PAINTERS LOCAL 35 - ZONE 1	1/1/2025	$55.15	$9.95	$11.85	$12.10	$0.00	$89.05

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.58	$9.95	$0.00	$0.00	$0.00	$37.53
2	55.00	$30.33	$9.95	$0.00	$6.66	$0.00	$46.94
3	60.00	$33.09	$9.95	$0.00	$7.26	$0.00	$50.30
4	65.00	$35.85	$9.95	$0.00	$7.87	$0.00	$53.67
5	70.00	$38.61	$9.95	$11.85	$8.47	$0.00	$68.88
6	75.00	$41.36	$9.95	$11.85	$9.08	$0.00	$72.24
7	80.00	$44.12	$9.95	$11.85	$9.68	$0.00	$75.60
8	90.00	$49.64	$9.95	$11.85	$10.89	$0.00	$82.33

PAINTER (SPRAY OR SANDBLAST, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 1	1/1/2025	$53.21	$9.95	$11.85	$12.10	$0.00	$87.11

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.61	$9.95	$0.00	$0.00	$0.00	$36.56

Construction

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

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	55.00	$29.27	$9.95	$0.00	$6.66	$0.00	$45.88
3	60.00	$31.93	$9.95	$0.00	$7.26	$0.00	$49.14
4	65.00	$34.59	$9.95	$0.00	$7.87	$0.00	$52.41
5	70.00	$37.25	$9.95	$11.85	$8.47	$0.00	$67.52
6	75.00	$39.91	$9.95	$11.85	$9.08	$0.00	$70.79
7	80.00	$42.57	$9.95	$11.85	$9.68	$0.00	$74.05
8	90.00	$47.89	$9.95	$11.85	$10.89	$0.00	$80.58

PAINTER / TAPER (BRUSH, NEW) *	1/1/2025	$53.75	$9.95	$11.85	$12.10	$0.00	$87.65

* If 30% or more of surfaces to be painted are new construction,
NEW paint rate shall be used.
PAINTERS LOCAL 35
PAINTERS LOCAL 35 - ZONE 1

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.88	$9.95	$0.00	$0.00	$0.00	$36.83
2	55.00	$29.56	$9.95	$0.00	$6.66	$0.00	$46.17
3	60.00	$32.25	$9.95	$0.00	$7.26	$0.00	$49.46
4	65.00	$34.94	$9.95	$0.00	$7.87	$0.00	$52.76
5	70.00	$37.63	$9.95	$11.85	$8.47	$0.00	$67.90
6	75.00	$40.31	$9.95	$11.85	$9.08	$0.00	$71.19
7	80.00	$43.00	$9.95	$11.85	$9.68	$0.00	$74.48
8	90.00	$48.38	$9.95	$11.85	$10.89	$0.00	$81.07

PAINTER / TAPER (BRUSH, REPAINT)	1/1/2025	$51.81	$9.95	$11.85	$12.10	$0.00	$85.71

PAINTERS LOCAL 35
PAINTERS LOCAL 35 - ZONE 1

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$25.91	$9.95	$0.00	$0.00	$0.00	$35.86
2	55.00	$28.50	$9.95	$0.00	$6.66	$0.00	$45.11
3	60.00	$31.09	$9.95	$0.00	$7.26	$0.00	$48.30
4	65.00	$33.68	$9.95	$0.00	$7.87	$0.00	$51.50
5	70.00	$36.27	$9.95	$11.85	$8.47	$0.00	$66.54
6	75.00	$38.86	$9.95	$11.85	$9.08	$0.00	$69.74
7	80.00	$41.45	$9.95	$11.85	$9.68	$0.00	$72.93
8	90.00	$46.63	$9.95	$11.85	$10.89	$0.00	$79.32

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$47.70	$9.90	$9.25	$9.65	$0.00	$76.50
	12/1/2025	$49.20	$9.90	$9.25	$9.65	$0.00	$78.00
	6/1/2026	$50.75	$9.90	$9.25	$9.65	$0.00	$79.55
	12/1/2026	$52.25	$9.90	$9.25	$9.65	$0.00	$81.05
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
PANEL & PICKUP TRUCKS DRIVER TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$41.88	$15.41	$20.17	$0.00	$0.00	$77.46
	12/1/2025	$41.88	$15.41	$21.78	$0.00	$0.00	$79.07
	6/1/2026	$42.88	$15.41	$21.78	$0.00	$0.00	$80.07
	8/1/2026	$42.88	$15.91	$21.78	$0.00	$0.00	$80.57
	12/1/2026	$42.88	$15.91	$23.52	$0.00	$0.00	$82.31
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
For apprentice rates see "Apprentice- PILE DRIVER"							
PILE DRIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16

Apprentice: PILE DRIVER

Effective Date: 8/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.11	$10.08	$0.00	$2.53	$0.00	$37.72
2	55.00	$30.68	$10.08	$0.00	$5.07	$0.00	$45.83
3	70.00	$39.05	$10.08	$11.62	$7.60	$0.00	$68.35
4	80.00	$44.63	$10.08	$11.62	$10.14	$0.00	$76.47

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38

Apprentice: PIPEFITTER & STEAMFITTER

Effective Date: 3/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$27.55	$12.70	$0.30	$8.75	$0.00	$49.30
2	45.00	$31.00	$12.70	$13.05	$8.75	$0.00	$65.50
3	60.00	$41.33	$12.70	$13.05	$8.75	$0.00	$75.83
4	70.00	$48.22	$12.70	$13.05	$8.75	$0.00	$82.72
5	80.00	$55.10	$12.70	$13.05	$8.75	$0.00	$89.60

PIPELAYER LABORERS LABORERS - ZONE 1	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
PIPELAYER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12 PLUMBERS & GASFITTERS LOCAL 12	3/2/2025	$69.84	$14.32	$12.31	$8.00	$0.00	$104.47

Apprentice: PLUMBERS & GASFITTERS

Effective Date: 3/2/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	$24.44	$14.32	$4.61	$2.80	$0.00	$46.17
2	40.00	$27.94	$14.32	$5.22	$3.20	$0.00	$50.68
3	55.00	$38.41	$14.32	$7.07	$4.40	$0.00	$64.20
4	65.00	$45.40	$14.32	$8.30	$5.20	$0.00	$73.22
5	75.00	$52.38	$14.32	$9.53	$6.00	$0.00	$82.23

PNEUMATIC CONTROLS (TEMP.) PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
PNEUMATIC DRILL/TOOL OPERATOR LABORERS LABORERS - ZONE 1	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWDERMAN & BLASTER LABORERS	6/1/2025	$48.60	$9.90	$9.25	$9.65	$0.00	$77.40
	12/1/2025	$50.10	$9.90	$9.25	$9.65	$0.00	$78.90

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS - ZONE 1	6/1/2026	$51.65	$9.90	$9.25	$9.65	$0.00	$80.45
	12/1/2026	$53.15	$9.90	$9.25	$9.65	$0.00	$81.95
	6/1/2027	$54.75	$9.90	$9.25	$9.65	$0.00	$83.55
	12/1/2027	$56.35	$9.90	$9.25	$9.65	$0.00	$85.15
	6/1/2028	$58.03	$9.90	$9.25	$9.65	$0.00	$86.83
	12/1/2028	$59.70	$9.90	$9.25	$9.65	$0.00	$88.50
For apprentice rates see "Apprentice- LABORER"							
POWDERMAN & BLASTER (HEAVY & HIGHWAY)	6/1/2025	$48.70	$9.90	$9.25	$9.65	$0.00	$77.50
LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$50.20	$9.90	$9.25	$9.65	$0.00	$79.00
	6/1/2026	$51.75	$9.90	$9.25	$9.65	$0.00	$80.55
	12/1/2026	$53.25	$9.90	$9.25	$9.65	$0.00	$82.05
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWER SHOVEL/DERRICK/TRENCHING MACHINE	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (CONCRETE)	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (DEWATERING, OTHER)	6/1/2025	$37.52	$15.55	$13.25	$3.25	$0.00	$69.57
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$38.47	$15.55	$13.25	$3.25	$0.00	$70.52
	6/1/2026	$39.33	$15.55	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$40.28	$15.55	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
READY MIX CONCRETE DRIVERS after 4/30/12	8/1/2022	$30.40	$11.91	$15.25	$0.00	$0.00	$57.56
(Drivers Hired After 4/30/2012) TEAMSTERS 25 (Metro) - Aggregate TEAMSTERS 25 (Metro) - Aggregate							
READY-MIX CONCRETE DRIVER	8/1/2022	$34.41	$11.91	$15.25	$0.00	$0.00	$61.57
TEAMSTERS 25 (Metro) - Aggregate TEAMSTERS 25 (Metro) - Aggregate							
RECLAIMERS	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
RIDE-ON MOTORIZED BUGGY OPERATOR	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
LABORERS LABORERS - ZONE 1	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
ROLLER/SPREADER/MULCHING MACHINE	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	8/1/2025	$53.53	$13.28	$12.67	$9.03	$0.00	$88.51
ROOFERS LOCAL 33	2/1/2026	$54.78	$13.28	$12.67	$9.03	$0.00	$89.76
ROOFERS LOCAL 33							

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.77	$13.28	$6.52	$9.03	$0.00	$55.60
2	60.00	$32.12	$13.28	$12.67	$9.03	$0.00	$67.10
3	65.00	$34.79	$13.28	$12.67	$9.03	$0.00	$69.77
4	75.00	$40.15	$13.28	$12.67	$9.03	$0.00	$75.13
5	85.00	$45.50	$13.28	$12.67	$9.03	$0.00	$80.48

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.39	$13.28	$6.52	$9.03	$0.00	$56.22
2	60.00	$32.87	$13.28	$12.67	$9.03	$0.00	$67.85
3	65.00	$35.61	$13.28	$12.67	$9.03	$0.00	$70.59
4	75.00	$41.09	$13.28	$12.67	$9.03	$0.00	$76.07
5	85.00	$46.56	$13.28	$12.67	$9.03	$0.00	$81.54

ROOFER SLATE / TILE / PRECAST CONCRETE	8/1/2025	$53.78	$13.28	$12.67	$9.03	$0.00	$88.76
ROOFERS LOCAL 33	2/1/2026	$55.03	$13.28	$12.67	$9.03	$0.00	$90.01
ROOFERS LOCAL 33							
For apprentice rates see "Apprentice- ROOFER"							
SHEETMETAL WORKER	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
SHEETMETAL WORKERS LOCAL 17	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
SHEETMETAL WORKERS LOCAL 17 - A							

Construction

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

Apprentice: SHEETMETAL WORKER

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	42.00	$25.61	$14.91	$6.13	$0.00	$0.00	$46.65
2	42.00	$25.61	$14.91	$6.13	$0.00	$0.00	$46.65
3	47.00	$28.66	$14.91	$11.01	$1.25	$1.62	$57.45
4	47.00	$28.66	$14.91	$11.01	$1.25	$1.62	$57.45
5	52.00	$31.71	$14.91	$11.74	$1.50	$1.74	$61.60
6	52.00	$31.71	$14.91	$11.74	$1.75	$1.75	$61.86
7	60.00	$36.59	$14.91	$12.90	$2.00	$1.93	$68.33
8	65.00	$39.64	$14.91	$13.63	$2.25	$2.04	$72.47
9	75.00	$45.74	$14.91	$15.09	$2.75	$2.28	$80.77
10	85.00	$51.83	$14.91	$16.55	$2.75	$2.49	$88.53

Apprentice: SHEETMETAL WORKER

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	42.00	$26.43	$14.91	$6.19	$0.00	$0.00	$47.53
2	42.00	$26.43	$14.91	$6.19	$0.00	$0.00	$47.53
3	47.00	$29.58	$14.91	$10.93	$1.25	$1.62	$58.29
4	47.00	$29.58	$14.91	$10.93	$1.25	$1.62	$58.29
5	52.00	$32.72	$14.91	$11.66	$1.50	$1.74	$62.53
6	52.00	$32.72	$14.91	$11.66	$1.75	$1.75	$62.79
7	60.00	$37.76	$14.91	$12.84	$2.00	$1.93	$69.44
8	65.00	$40.90	$14.91	$13.58	$2.25	$2.04	$73.68
9	75.00	$47.20	$14.91	$15.06	$2.75	$2.28	$82.20
10	85.00	$53.49	$14.91	$16.53	$2.75	$2.49	$90.17

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.34	$15.41	$20.17	$0.00	$0.00	$77.92
	12/1/2025	$42.34	$15.41	$21.78	$0.00	$0.00	$79.53
	6/1/2026	$43.34	$15.41	$21.78	$0.00	$0.00	$80.53
	8/1/2026	$43.34	$15.91	$21.78	$0.00	$0.00	$81.03
	12/1/2026	$43.34	$15.91	$23.52	$0.00	$0.00	$82.77
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.63	$15.41	$20.17	$0.00	$0.00	$78.21
	12/1/2025	$42.63	$15.41	$21.78	$0.00	$0.00	$79.82
	6/1/2026	$43.63	$15.41	$21.78	$0.00	$0.00	$80.82
	8/1/2026	$43.63	$15.91	$21.78	$0.00	$0.00	$81.32
	12/1/2026	$43.63	$15.91	$23.52	$0.00	$0.00	$83.06
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	3/1/2025	$72.14	$11.51	$7.30	$16.50	$0.00	$107.45

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Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: SPRINKLER FITTER							
Effective Date: 3/1/2025							
Step / Percent		**Apprentice Base Wage**	**Health**	**Pension**	**Annuity**	**Supplemental Unemployment**	**Total Rate**
1 / 35.00		$25.25	$11.51	$13.07	$0.00	$0.00	$49.83
2 / 40.00		$28.86	$11.51	$13.90	$0.00	$0.00	$54.27
3 / 45.00		$32.46	$11.51	$14.73	$0.00	$0.00	$58.70
4 / 50.00		$36.07	$11.51	$15.55	$0.00	$0.00	$63.13
5 / 55.00		$39.68	$11.51	$16.37	$0.00	$0.00	$67.56
6 / 60.00		$43.28	$11.51	$17.20	$0.00	$0.00	$71.99
7 / 65.00		$46.89	$11.51	$18.03	$0.00	$0.00	$76.43
8 / 70.00		$50.50	$11.51	$18.85	$0.00	$0.00	$80.86
9 / 75.00		$54.11	$11.51	$19.67	$0.00	$0.00	$85.29
10 / 80.00		$57.71	$11.51	$20.50	$0.00	$0.00	$89.72
STEAM BOILER OPERATOR	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TELECOMMUNICATION TECHNICIAN	3/1/2025	$51.41	$13.00	$13.92	$6.98	$0.00	$85.31
ELECTRICIANS LOCAL 103	9/1/2025	$52.94	$13.00	$13.97	$6.98	$0.00	$86.89
ELECTRICIANS LOCAL 103	3/1/2026	$53.90	$13.00	$14.00	$6.98	$0.00	$87.88
	9/1/2026	$55.42	$13.00	$14.04	$6.98	$0.00	$89.44
	3/1/2027	$56.38	$13.00	$14.07	$6.98	$0.00	$90.43
	9/1/2027	$57.91	$13.00	$14.12	$6.98	$0.00	$92.01
	3/1/2028	$58.87	$13.00	$14.15	$6.98	$0.00	$93.00
Apprentice: TELECOMMUNICATION TECHNICIAN							
Effective Date: 3/1/2025							
Step / Percent		**Apprentice Base Wage**	**Health**	**Pension**	**Annuity**	**Supplemental Unemployment**	**Total Rate**
1 / 45.00		$23.13	$13.00	$0.69	$0.00	$0.00	$36.82
2 / 45.00		$23.13	$13.00	$0.69	$0.00	$0.00	$36.82
3 / 50.00		$25.71	$13.00	$13.15	$3.49	$0.00	$55.35
4 / 50.00		$25.71	$13.00	$13.15	$3.49	$0.00	$55.35
5 / 55.00		$28.28	$13.00	$13.23	$3.84	$0.00	$58.35
6 / 60.00		$30.85	$13.00	$13.31	$4.19	$0.00	$61.35
7 / 65.00		$33.42	$13.00	$13.38	$4.54	$0.00	$64.34

Construction

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

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 3/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
8	70.00	$35.99	$13.00	$13.46	$4.89	$0.00	$67.34
9	75.00	$38.56	$13.00	$13.54	$5.24	$0.00	$70.34
10	80.00	$41.13	$13.00	$13.61	$5.58	$0.00	$73.32

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$23.82	$13.00	$0.71	$0.00	$0.00	$37.53
2	45.00	$23.82	$13.00	$0.71	$0.00	$0.00	$37.53
3	50.00	$26.47	$13.00	$13.17	$3.49	$0.00	$56.13
4	50.00	$26.47	$13.00	$13.17	$3.49	$0.00	$56.13
5	55.00	$29.12	$13.00	$13.25	$3.84	$0.00	$59.21
6	60.00	$31.76	$13.00	$13.33	$4.19	$0.00	$62.28
7	65.00	$34.41	$13.00	$13.41	$4.54	$0.00	$65.36
8	70.00	$37.06	$13.00	$13.49	$4.89	$0.00	$68.44
9	75.00	$39.71	$13.00	$13.57	$5.24	$0.00	$71.52
10	80.00	$42.35	$13.00	$13.65	$5.58	$0.00	$74.58

TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$66.89	$11.49	$15.57	$8.02	$0.00	$101.97
	2/1/2026	$68.24	$11.49	$15.57	$8.02	$0.00	$103.32
	8/1/2026	$70.44	$11.49	$15.57	$8.02	$0.00	$105.52
	2/1/2027	$71.84	$11.49	$15.57	$8.02	$0.00	$106.92

Apprentice: TERRAZZO FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.45	$11.49	$15.57	$8.02	$0.00	$68.53
2	60.00	$40.13	$11.49	$15.57	$8.02	$0.00	$75.21
3	70.00	$46.82	$11.49	$15.57	$8.02	$0.00	$81.90
4	80.00	$53.51	$11.49	$15.57	$8.02	$0.00	$88.59
5	90.00	$60.20	$11.49	$15.57	$8.02	$0.00	$95.28

Apprentice: TERRAZZO FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.12	$11.49	$15.57	$8.02	$0.00	$69.20
2	60.00	$40.94	$11.49	$15.57	$8.02	$0.00	$76.02

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: TERRAZZO FINISHERS							
Effective Date: 2/1/2026							
Step / Percent		**Apprentice Base Wage**					
3 / 70.00		$47.77	$11.49	$15.57	$8.02	$0.00	$82.85
4 / 80.00		$54.59	$11.49	$15.57	$8.02	$0.00	$89.67
5 / 90.00		$61.42	$11.49	$15.57	$8.02	$0.00	$96.50
TEST BORING DRILLER	6/1/2025	$51.70	$9.90	$9.25	$9.80	$0.00	$80.65
LABORERS	12/1/2025	$53.20	$9.90	$9.25	$9.80	$0.00	$82.15
LABORERS - FOUNDATION AND MARINE	6/1/2026	$54.75	$9.90	$9.25	$9.80	$0.00	$83.70
	12/1/2026	$56.25	$9.90	$9.25	$9.80	$0.00	$85.20
For apprentice rates see "Apprentice- LABORER"							
TEST BORING DRILLER HELPER	6/1/2025	$47.82	$9.90	$9.25	$9.80	$0.00	$76.77
LABORERS	12/1/2025	$49.32	$9.90	$9.25	$9.80	$0.00	$78.27
LABORERS - FOUNDATION AND MARINE	6/1/2026	$50.87	$9.90	$9.25	$9.80	$0.00	$79.82
	12/1/2026	$52.37	$9.90	$9.25	$9.80	$0.00	$81.32
For apprentice rates see "Apprentice- LABORER"							
TEST BORING LABORER	6/1/2025	$47.70	$9.90	$9.25	$9.80	$0.00	$76.65
LABORERS	12/1/2025	$49.20	$9.90	$9.25	$9.80	$0.00	$78.15
LABORERS - FOUNDATION AND MARINE	6/1/2026	$50.75	$9.90	$9.25	$9.80	$0.00	$79.70
	12/1/2026	$52.25	$9.90	$9.25	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
TRACTORS/PORTABLE STEAM GENERATORS	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT	8/1/2025	$42.92	$15.41	$20.17	$0.00	$0.00	$78.50
TEAMSTERS JOINT COUNCIL NO. 10	12/1/2025	$42.92	$15.41	$21.78	$0.00	$0.00	$80.11
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	6/1/2026	$43.92	$15.41	$21.78	$0.00	$0.00	$81.11
	8/1/2026	$43.92	$15.91	$21.78	$0.00	$0.00	$81.61
	12/1/2026	$43.92	$15.91	$23.52	$0.00	$0.00	$83.35
TUNNEL WORK - COMPRESSED AIR	6/1/2025	$59.93	$9.90	$9.25	$10.25	$0.00	$89.33
LABORERS	12/1/2025	$61.43	$9.90	$9.25	$10.25	$0.00	$90.83
LABORERS (COMPRESSED AIR)	6/1/2026	$62.98	$9.90	$9.25	$10.25	$0.00	$92.38
	12/1/2026	$64.48	$9.90	$9.25	$10.25	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	6/1/2025	$61.93	$9.90	$9.25	$10.25	$0.00	$91.33
LABORERS	12/1/2025	$63.43	$9.90	$9.25	$10.25	$0.00	$92.83
LABORERS (COMPRESSED AIR)	6/1/2026	$64.98	$9.90	$9.25	$10.25	$0.00	$94.38
	12/1/2026	$66.48	$9.90	$9.25	$10.25	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR	6/1/2025	$52.00	$9.90	$9.25	$10.25	$0.00	$81.40
LABORERS	12/1/2025	$53.50	$9.90	$9.25	$10.25	$0.00	$82.90
LABORERS (FREE AIR TUNNEL)	6/1/2026	$55.05	$9.90	$9.25	$10.25	$0.00	$84.45
	12/1/2026	$56.55	$9.90	$9.25	$10.25	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE)	6/1/2025	$54.00	$9.90	$9.25	$10.25	$0.00	$83.40
LABORERS	12/1/2025	$55.50	$9.90	$9.25	$10.25	$0.00	$84.90
LABORERS (FREE AIR TUNNEL)	6/1/2026	$57.05	$9.90	$9.25	$10.25	$0.00	$86.45
	12/1/2026	$58.55	$9.90	$9.25	$10.25	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL	8/1/2025	$42.34	$15.41	$20.17	$0.00	$0.00	$77.92
TEAMSTERS JOINT COUNCIL NO. 10	12/1/2025	$42.34	$15.41	$21.78	$0.00	$0.00	$79.53
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	6/1/2026	$43.34	$15.41	$21.78	$0.00	$0.00	$80.53
	8/1/2026	$43.34	$15.91	$21.78	$0.00	$0.00	$81.03
	12/1/2026	$43.34	$15.91	$23.52	$0.00	$0.00	$82.77
WAGON DRILL OPERATOR	6/1/2025	$47.85	$9.90	$9.25	$9.65	$0.00	$76.65
LABORERS	12/1/2025	$49.35	$9.90	$9.25	$9.65	$0.00	$78.15
LABORERS - ZONE 1	6/1/2026	$50.90	$9.90	$9.25	$9.65	$0.00	$79.70
	12/1/2026	$52.40	$9.90	$9.25	$9.65	$0.00	$81.20
	6/1/2027	$54.00	$9.90	$9.25	$9.65	$0.00	$82.80
	12/1/2027	$55.60	$9.90	$9.25	$9.65	$0.00	$84.40
	6/1/2028	$57.28	$9.90	$9.25	$9.65	$0.00	$86.08
	12/1/2028	$58.95	$9.90	$9.25	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	6/1/2025	$47.95	$9.90	$9.25	$9.65	$0.00	$76.75
LABORERS	12/1/2025	$49.45	$9.90	$9.25	$9.65	$0.00	$78.25
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	$51.00	$9.90	$9.25	$9.65	$0.00	$79.80
	12/1/2026	$52.50	$9.90	$9.25	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
WASTE WATER PUMP OPERATOR	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
WATER METER INSTALLER	3/2/2025	$69.84	$14.32	$12.31	$8.00	$0.00	$104.47
PLUMBERS & GASFITTERS LOCAL 12							
PLUMBERS & GASFITTERS LOCAL 12							
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"							

Outside Electrical

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CABLE TECHNICIAN (Power Zone) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$29.67	$9.25	$0.89	$1.00	$0.00	$40.81
CABLEMAN (Underground Ducts & Cables) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$42.03	$9.25	$1.26	$9.01	$0.00	$61.55
DRIVER / GROUNDMAN CDL OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$34.62	$9.25	$1.04	$9.03	$0.00	$53.94
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$27.20	$9.25	$0.82	$1.00	$0.00	$38.27
EQUIPMENT OPERATOR (Class A CDL) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$42.03	$9.25	$1.26	$13.09	$0.00	$65.63
EQUIPMENT OPERATOR (Class B CDL) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$37.09	$9.25	$1.11	$9.76	$0.00	$57.21
GROUNDMAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$27.20	$9.25	$0.82	$1.00	$0.00	$38.27
GROUNDMAN -Inexperienced (<2000 Hrs.) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 For apprentice rates see "Apprentice- LINEMAN"	8/30/2020	$22.25	$9.25	$0.82	$1.00	$0.00	$33.32
JOURNEYMAN LINEMAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	8/30/2020	$49.45	$9.25	$1.48	$16.00	$0.00	$76.18

Apprentice: JOURNEYMAN LINEMAN

Effective Date: 8/30/2020

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$29.67	$9.25	$0.89	$2.50	$0.00	$42.31
2	65.00	$32.14	$9.25	$0.96	$2.50	$0.00	$44.85
3	70.00	$34.62	$9.25	$1.04	$2.50	$0.00	$47.41
4	75.00	$37.09	$9.25	$1.11	$4.00	$0.00	$51.45

Outside Electrical

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: JOURNEYMAN LINEMAN							
Effective Date: 8/30/2020							
Step / Percent		**Apprentice Base Wage**	**Health**	**Pension**	**Annuity**	**Supplemental Unemployment**	**Total Rate**
5 / 80.00		$39.56	$9.25	$1.19	$4.00	$0.00	$54.00
6 / 85.00		$42.03	$9.25	$1.26	$4.00	$0.00	$56.54
7 / 90.00		$44.51	$9.25	$1.34	$6.00	$0.00	$61.10
TELEDATA CABLE SPLICER OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	2/4/2019	$30.73	$4.70	$0.92	$2.25	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	2/4/2019	$28.93	$4.70	$0.89	$2.25	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	2/4/2019	$28.93	$4.70	$0.89	$2.25	$0.00	$36.77

Additional Apprentice Information

All apprentices must be registered with the Division of Apprenticeship Training(DAS) in accordance with M.G.L.c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L.c. 149, §§ 26-27D.

Apprentice ratios are established by DAS pursuant to M.G.L.c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements(CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate.

Parties having questions regarding what ratio to use should contact DAS.

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

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:

   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

   d. "Minority" includes:

      (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $ 10,000 the provisions of the specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

   f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

   g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

   h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11 The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as many be required by the Government and keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

APPENDIX A

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

Area covered: Goal for Women apply nationwide

Goals and 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 00880

Revised January 12, 2022

DEPARTMENT OF LABOR

Employment Standards Administration

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONTRACTS

"General Decision Number: MA20250021 07/18/2025

Superseded General Decision Number: MA20240021

State: Massachusetts

Construction Type: Highway

County: Middlesex County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally
required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658.
Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

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 $17.75 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 2025.
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 $13.30 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 2025.

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	01/03/2025
1	03/21/2025
2	07/11/2025
3	07/18/2025

ELEC0103-007 03/01/2025

	Rates	Fringes
ELECTRICIAN	$ 64.26	36.99

ENGI0004-026 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 57.83	33.70
Group 2	$ 57.18	33.70

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:
A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

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

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* IRON0007-031 03/16/2025

	Rates	Fringes
IRONWORKER (ORNAMENTAL, REINFORCING, AND STRUCTURAL)	$ 56.79	37.10

LABO0039-002 06/01/2018

	Rates	Fringes
LABORER		
Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 33.50	22.92
Landscape	$ 33.25	22.92

PAIN0035-023 07/01/2024

	Rates	Fringes
PAINTER (Steel)	$ 56.76	36.00

SUMA2014-011 01/11/2017

	Rates	Fringes
CARPENTER, Includes Form Work	$ 47.93	19.46
CEMENT MASON/CONCRETE FINISHER	$ 56.70	21.08
LABORER: Common or General	$ 36.58	19.40
LABORER: Concrete Saw (Hand Held/Walk Behind)	$ 41.78	18.37
LABORER: Guardrail Installation	$ 37.70	15.37
OPERATOR: Crane	$ 57.61	0.00
OPERATOR: Forklift	$ 64.67	0.00
OPERATOR: Mechanic	$ 48.14	17.02
OPERATOR: Piledriver	$ 44.46	16.94
OPERATOR: Post Driver (Guardrail/Fences)	$ 41.49	23.07
PAINTER: Spray (Linestriping)	$ 40.87	13.86

PILEDRIVERMAN.....$ 45.65 23.33

TRAFFIC CONTROL: Flagger.....$ 23.00 20.44

TRAFFIC CONTROL:
Laborer-Cones/
Barricades/Barrels -
Setter/Mover/Sweeper.....$ 44.49 12.41

TRUCK DRIVER: Concrete Truck....$ 33.69 15.79

TRUCK DRIVER: Dump Truck.....$ 38.92 9.73

TRUCK DRIVER: Flatbed Truck.....$ 48.53 0.00

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

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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 classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by

computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the 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. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were 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. The date, 01/03/2024 in the example, 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:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests
for summaries of surveys, should be directed to the WHD Branch
of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

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

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be
directed to the WHD Branch of Construction Wage Determinations.
Requests can be submitted via email to BCWD-Office@dol.gov or
by mail 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 an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail 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 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.

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END OF GENERAL DECISION"

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DOCUMENT A00801

SPECIAL PROVISIONS

CAMBRIDGE

Federal Aid Project No. NHP(BRR-ON)/HIP(BR)-0036(020)X
Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2
over MBTA Redline

Labor participation goals for this Project shall be 15.3% for minorities and 6.9% for women for each job category. The goals are applicable to both Contractor's and Subcontractor's on-site construction workforce. Refer to Document 00820 for details.

SCOPE OF WORK

All work under this Contract shall be done in conformance with the *2025 Standard Specifications for Highways and Bridges, the Supplemental Specifications* contained in this book, the *Construction Standard Details* in effect as of June, 2025, 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 latest edition of The *American Standard for Nursery Stock*, the Plans and these Special Provisions.

The work under this Contract includes, but is not limited to, the superstructure replacement of Bridge No. C-01-031 Alewife Brook Parkway (US 3/ RT 16/ RT 2) over the MBTA Redline Tunnel and all other incidental items required to complete the work as shown on the Plans, specified herein, and as required by the Engineer. Project limits (length and stations) are included on the title sheet of the plans. The proposed work will increase the expected design life of the bridge and enhance safety for all roadway users.

The superstructure replacement includes demolition of the existing superstructure in its entirety, demolition of the existing backwalls and approach slabs, partial demolition of the existing abutment beam seats as shown on the plans, and removal of an existing shoring system. It also includes construction of a new superstructure using precast bridge units (PBUs), new wearing surface, precast approach slabs, precast backwalls, precast beam seats, a cast-in-place sidewalk and safety curb, S3-MTL4 bridge railings, CM-MTL3 bridge railing, precast highway guardrail transitions, and reconstruction of the curtain walls at each corner. Temporary utility relocation will be required for utilities during staged construction. A temporary utility support structure is anticipated. Impacted utilities include electric, gas, and water. Temporary lighting will be required during construction.

The approach roadway work is comprised of excavation, full depth pavement, mill and overlay, demolition of existing approach sidewalks, proposed approach sidewalks, removing and resetting granite curbing, new guardrail, pavement markings, and other incidental work as shown on the plans. Work also includes reconstruction of the shared use path and brick area underneath the bridge.

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.

INSURANCE REQUIREMENTS

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

Railroad Operations Directorate: Section F:

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

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

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

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

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

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

SUBSECTION 7.05 INSURANCE REQUIREMENTS (Continued)

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

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

The contractor shall be aware of the latest MBTA insurance limits / requirements. See the following link for more information: https://www.mbtarealty.com/licenses.html

Paragraph 4

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

CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 3:00 P.M. on the Tuesday of the previous week before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address massdotspecifications@dot.state.ma.us The MassDOT proposal 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 Years Day (Federal Holiday)
No work on major arterial roadways from 5:00 AM on the day before until the normal start of business on the next subsequent business day. No work on local roadways on the holiday without permission by the DHD and the local police chief.

Martin Luther King's Birthday (Federal Holiday)
No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

President's Day (Federal Holiday)
No work restrictions due to traffic concerns, however work on local roadways requires permission by the DHD and local police chief.

Evacuation Day (Suffolk County State Holiday)
No work restrictions due to traffic concerns.

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

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

HOLIDAY WORK RESTRICTIONS (Continued)

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.

TRUCK SAFETY DEVICES
(Supplementing Subsection 7.04: Motor Vehicles)

All motor vehicles subject to Section 7 of Chapter 90 to be operated under this Contract shall be equipped with safety devices as provided therein and in 540 CMR 4.00.

By December 31, 2025, the Contractor shall certify to the Registry of Motor Vehicles, in a manner prescribed by the Registrar, that all applicable vehicles are equipped with Lateral Protective Devices, Convex Mirrors, Cross Over Mirror(s) and Back Up Cameras in accordance with the requirements of 540 CMR 4.00.

The Contractor shall provide evidence satisfactory to the Department to demonstrate compliance with the above certification requirement for all applicable vehicles operated under this Contract by the Contractor and its subcontractors and vendors in a manner set forth by the Department. Thereafter, the Contractor shall have an affirmative obligation to continue to provide such evidence of compliance on an ongoing basis and no later than 7 days after certification with the Registry of Motor Vehicles of any additional vehicles operated under this Contract by the Contractor and its subcontractors and vendors.

Non-compliance with respect to a vehicle that is subject to 540 CMR 4.00 may subject the Contractor to statutory fines as established in M.G.L. c. 90, § 7 and/or contractual remedies up to and including termination of the Contract.

LANE CLOSURES AND TRAFFIC MANAGEMENT
(Supplementing Subsection 7.09)

For all changes to the traffic patterns within the entirety of the project limits, the Contractor is to provide notice of traffic set up to the City of Cambridge's Traffic Enforcement Unit and Transportation Department at least 72 hours prior to the traffic pattern change. Contacts are below:

Deputy Buckowe Yam
Traffic Unit Superintendent
617-349-4365

James (Jim) Wilcox
City Engineer
617-349-6426
jwilcox@cambridgema.gov

In addition, the Contractor shall coordinate with MassDOT, Department of Conservation & Recreation (DCR), the City of Cambridge's Police Department, Town of Belmont's Police Department, Town of Arlington's Police Department, the City of Cambridge's Transportation Department, and the MBTA regarding the advanced warning and notice of all detours, closures, and weekend traffic set ups. The Contractor shall provide the detour routes and closures for the impacted streets and bicycle and pedestrian facilities to the parties noted above at least 30 days prior to the scheduled set up for review.

LANE CLOSURES AND TRAFFIC MANAGEMENT (Continued)
(Supplementing Subsection 7.09)

The Contractor is hereby notified that the Temporary Traffic Control Plan anticipates a full roadway closure and detour of Alewife Brook Parkway, as well as lane closures and crossovers on Alewife Brook Parkway, within a defined timeframe. All closures and detours are subject to the approval of MassDOT District 6 Highway Director.

The majority of the demolition and construction of Bridge No. C-01-031 is anticipated to occur during two (2) 55-hour weekends starting Friday at 10PM and ending Monday at 5AM. These weekends shall not be consecutive.

During these two weekends, travel will be restricted to one (1) lane in each direction on Alewife Brook Parkway for the majority of the time. During a 10-hour beam erection period starting Saturday night, all traffic will be detoured away from the bridge and directed to use alternate travel routes. Only one (1) lane will be maintained on the bridge for emergency and construction vehicles, and a police detail will be required to coordinate emergency vehicles crossing the bridge with the Contractor. In the event that a truck does not follow the detour signs and approaches the bridge, the Contractor and police detail will coordinate to allow the trucks to travel over the bridge, similar to the emergency vehicles, if it is unable to turn around.

The remaining work activities on this project are expected to be done during weekday daytime hours utilizing a standard 8 hour, 5 day work week, with the Prime Contractor and Subcontractors working on the same shift. During the standard weekday timeframe, two (2) lanes in each direction must be maintained on Alewife Brook Parkway. Certain activities may be completed utilizing standard off-peak (nighttime) lane closures and shall be completed within the work schedule hours shown in the contract documents. It should be noted that the typical nighttime lane closures may only be approved for certain days of the week and may not be approved for all 7 days in a given week.

Pedestrians and bicyclists are anticipated to be detoured on Alewife Brook Parkway over the bridge from Pre-Stage 1 through Stage 3 construction.

Extensive public outreach is anticipated for this project. Public Outreach will be completed by HNTB, the designer of record and consultant of MassDOT, in addition to the requirements for the Contractor as stated in these Special Provisions. See Public Involvement section below.

PUBLIC INVOLVEMENT

The work under this Heading consists of providing project construction information to the public for the duration of construction. To disseminate Project information the Contractor shall employ a robust outreach and communications strategy. The Contractor shall coordinate all Public Outreach responsibilities with MassDOT.

Contractor responsibilities shall include

1. Preparing and transmitting Public Meeting notification materials;
2. Preparing Public Meeting presentation materials;
3. Organizing and conducting Public Meetings;
4. Preparing and transmitting traffic updates and construction advisories with mapping, graphics, and narratives;
5. Preparing and transmitting responses to public inquiries, comments and complaints;
6. Establishing and maintaining a Project website with (a minimum of) monthly updates, through MassDOT;
7. Preparing and maintaining Project website media;
8. Performing outreach to local residents and stakeholders.

Products under this Heading shall be provided in electronic format, and hardcopy if requested by the Resident Engineer.

PUBLIC OUTREACH PROGRAM

Within thirty (30) Calendar Days of Notice to Proceed, the Contractor shall submit to MassDOT a Public Outreach Plan for review and approval. Included in the Contractor's submission shall be the credentials of their subcontractor, referred herein as Public Outreach Specialist and their personnel proposed to perform Public Outreach activities.

The Public Outreach Specialist shall develop a Project webpage at a minimum of sixty (60) days prior to the first Public Meeting, subject to MassDOT or Engineer review and approval. The webpage shall be functioning at a minimum thirty (30) days prior to the first Public Meeting.

All outreach information shall be listed on the Project webpage, including (but not limited to): contact information, up-to-date traffic advisories, traffic controls with supporting graphics and narrative to describe traffic management, a look-ahead at travel impacts for the upcoming two-week period, a projected monthly construction activities narrative, monthly updated schedule, and a Project specific email address. The website shall offer visitors to register for email updates and shall provide information on travel resources. The Public Outreach Specialist shall be responsible for maintaining the email register and emailing updates.

Major changes in traffic management configuration shall be communicated through press releases prepared by the Public Outreach Specialist, subject to the Resident Engineer's review and approval.

PUBLIC OUTREACH PROGRAM (Continued)

The Contractor shall designate management staff within its own workforce and provide their contact information to the Resident Engineer as part of the Public Outreach Plan. This staff shall provide assistance to the Resident Engineer and the Public Outreach Specialist to ensure timely deliveries of Project website content and responsiveness to public inquiries and complaints.

The Contractor shall maintain a system for documenting all contact with abutters, property owners, the MBTA, DCR, City of Cambridge, residents, the general public, and the media. The Contractor shall provide the Resident Engineer an electronic copy of all public contact records. The electronic file shall be submitted by the 1st calendar day of each month and shall include all correspondences and record of communications made prior to the 25th calendar day of the previous month.

The Contractor shall notify MassDOT and the City of Cambridge's Transportation Department, Police Department, MBTA, DCR, and the Town of Belmont's Police Department at least thirty (30) days prior to any scheduled detours, closures, or weekend traffic setups

The Contractor and/or Public Outreach Specialist shall distribute flyers to residents, businesses, and organizations within a 1-mile radius of the project area at least two-weeks prior to the start of construction activities, as well as two-weeks prior to each of the two anticipated 55-hour bridge replacement weekends and two-week prior to any major traffic change and/or the start of any major work activities. This includes but not limited to those on Cambridge Park Drive, Rindge Avenue, and Alewife Brook Parkway such as the 402 Rindge Ave. property. These flyers shall be prepared by the Contractor and subject to the Resident Engineer's review and approval.

PUBLIC MEETINGS

Public meetings shall be hybrid, in-person and virtual, allowing virtual participation/attendance. The Contractor shall hold one (1) public meeting to encompass all affected communities thirty (30) days prior to the commencement of construction activities.

The Contractor shall hold one (1) public meeting thirty (30) days prior to each of the two anticipated 55-hour bridge replacement weekend.

The Contractor shall also hold a public meeting thirty (30) days prior to any major traffic changes and the start of any major work activities.

The Contractor shall prepare slides, handouts, visuals and other materials necessary to present the information for the meetings in coordination with the Resident Engineer. The Contractor shall procure an ADA-accessible meeting room/location, preferably a municipal facility in proximity to the Project site. The Resident Engineer will have final approval of any meeting room/location. The meeting shall also be publicly accessible through a MassDOT-approved electronic meeting platform(s). The Contractor shall prepare and transmit to local media a MassDOT-approved meeting notification for both in-person and virtual meeting attendance. The notice shall also be posted to the Project webpage, and the Contractor shall work with the Resident Engineer to advertise the upcoming public meetings to surrounding communities, local businesses, and MBTA commuters.**PUBLIC MEETINGS** (Continued)

The Contractor shall provide the necessary staff, displays, renderings, and hand-outs to adequately portray the proposed construction. The construction schedule and traffic control details associated with each change in construction shall be presented to the public. All materials to be used and/or distributed shall be provided for review and approval by the Resident Engineer at minimum one (1) week prior to the public meeting.

The Contractor shall submit the meeting summary within two (2) workdays following the Public Meeting to the Resident Engineer. At a minimum, the summary shall include a list of attendees, comments received, issues or concerns raised, copies of hand-outs, displays, and other presentation materials.

The Contractor shall provide electronic versions (in Adobe Acrobat .pdf format) of display boards and other materials presented at the Public Meeting to the Resident Engineer. The Public Meeting presentation shall be available on the Project website following the meeting.

WORK ACCESS – DISTRICT 6

These procedures shall reestablish the District's guidelines regarding the submission and administration of Access Work Requests and meetings within the District. All parties requesting access to the District 6 Right of Way (including MHS), shall adhere to the following procedures (whether an in-house or out-house request.) All out-house or third-party requests shall be submitted under an active Contract; Permit, or other approved document allowing or requiring the need to request access. Access Work Requests will be approved on a weekly basis.

The Contractor is required to complete an "Access Work Request" form and submit the completed form via email to District6AWRequest@dot.state.ma.us by noontime Wednesday of the week preceding the work (unless otherwise noted). Forms which are incorrectly filled out, submitted beyond this time or outside this email address will not be accepted.

Access Work Requests shall be initialed by the respective DOT representative where applicable. The "Representative" shall refer to the person who is responsible for overseeing the respective operation(s) requestion access. (i.e. Resident Engineer, Bridge/Tunnel Inspector, etc.) This person should also be responsible to ensure requests are submitted in line with any access constraints in the Contract, Permit, etc.

Each Thursday at 9 am, the District will host an in-person AWR meeting (no virtual option) at the District 6 office (185 Kneeland St.) with parties requesting access (roadway or other) for the following week. Attendance is recommended. The weekly Access Work meeting will provide the opportunity to review requests, establish priorities, discuss and sort out potential conflicts, etc. as well as highlight potential long-term Access needs. After the weekly meeting, the District will meet internally to review requests, confirm priorities and finalize a schedule for the following week. MassDOT notifications (approvals and denials) and a final schedule, will be delivered via email by noon on Friday.

Cancellations shall be submitted to the email; District6AWRequest@dot.state.ma.us at least 2 hours prior to the end of the most recent day shift (i.e., 7am- 3:30pm). Failure to notify the District within the specified time may result in back-charges for any costs incurred. Excessive cancellations or no-shows will be addressed at the District's discretion.

The District will make every effort to provide as much advanced notice as possible for any necessary cancellations or restrictions due to scheduled or emergency events (i.e. weather, special events, etc.).

Weekly Schedule revisions will be handled on a case-by-case basis and not guaranteed. Any revisions to the established schedule will be at the District's discretion.

WORK ACCESS – DISTRICT 6 – CASTING PROTOCOLS

Contractor shall not access or perform work on any MassDOT casting without written authorization through the Access Work Program.

1. MassDOT castings to be accessed shall be inspected by the requester prior to AWR request. Contractor shall note any deficiencies and or issues on the AWR request.
2. A note shall be made in the Daily Diary noting structure#, station, or other identifying marker (along w/photo). The time casting was opened and time it was secured shall be noted as well as the work performed.
3. Type of manhole being opened (electric, drainage, etc.) – if electric, MassDOT Electrical Engineer shall be notified prior to access and all electrical circuits shall be locked out per Lock Out Tag Out (LOTO) procedures.
4. All castings shall be secure, free of movement and have 100% of bolts installed prior to opening to traffic. All bolts shall be coated with a MassDOT approved anti-seize prior to reinstallation. MHs that exhibit movement shall be welded.
5. In order to address bolts that cannot be re-secured, the Contractor should have at all times either a:
    a. Welder capable of welding covers back (electric welding only in tunnel) (Ref Approved Welding Detail)
    b. Means to drill and tap new bolt of same length and dimension of existing
6. MassDOT personnel shall inspect and sign off on casting prior to Contractor leaving location (along w/photo)
7. All MassDOT roadway castings shall comply with “Engineering Directive E-16-003 for Manholes and Catch Basins approved on May 18, 2016.” Castings encountered that do not comply shall be reported in writing the District Construction Engineer or Maintenance Engineer, as appropriate - provide photos.

SECTION 8.00: PROSECUTION AND PROGRESS

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.

WEEKEND SET UP SCHEDULE

A minimum of 90 days prior to the first 55-hour weekend (MS01), the Contractor shall provide the Engineer for review and approval a Detailed Schedule consistent with the requirements of the "Short Term Construction Schedule", covering the period from 2 weeks prior and 2 weeks after MS01. The submittal shall include an hour-by-hour Focused Schedule for the duration of the weekend closure. The Detailed and Focused schedules, with revisions, shall be included in subsequent Short Term Construction Schedule presentations as part of the Contract Progress Meeting.

No separate payment will be made for the development of the hour-by-hour schedule, but all costs in connection therewith shall be included in the unit bid price for Item 722.2.

SUBSECTION 8.03 PROSECUTION OF WORK

Add/amend the following at the end of the Section:

CONTRACTUAL MILESTONES

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

MS01 – Completion of First 55-Hour Weekend Set-Up – The Contractor shall achieve this milestone by completing the required construction activities to demolish and construct the eastern half of the bridge and reopen Alewife Brook Parkway back to two (2) lanes in each direction by **5:00 A.M. Monday** following the first 55-hour weekend set-up.

MS02 – Completion of Second 55-Hour Weekend Set-Up – The Contractor shall achieve this milestone by completing the required construction activities to demolish and construct the remaining portion of the bridge and reopen Alewife Brook Parkway back to two (2) lanes in each direction by **5:00 A.M. Monday** following the second 55-hour weekend set-up.

MS03 – Completion of Stage 1 and Stage 2 activities – The Contractor shall achieve this milestone by completing the required construction activities included under Stage 1 and 2 within one (1) construction season (April 1st through October 31st).

SUBSECTION 8.11 FAILURE TO COMPLETE WORK ON TIME

Add/amend the following at the end of the Section:

The available window of opportunity for reducing lanes on Alewife Brook Parkway is severely limited and will require extensive public outreach to reduce traffic volumes on Alewife Brook Parkway. Delaying the reopening will cause significant user delays and costs to drivers. Additionally, the feasibility window of time for Alewife Brook Parkway weekend lane closures and crossovers has been determined to be short, and any extension of work requiring Alewife Brook Parkway weekend lane closures and crossovers would cause significant regional delay and cost as well as extend project completion.

MassDOT believes that the schedule savings can be achieved if the Contractor uses innovative methodologies and techniques as well as extended work hours. There will be no incentive or disincentive associated with Milestone #03. This Contract includes the following Incentive/Disincentive for Milestones #01 and #02.

INCENTIVE / DISINCENTIVE REQUIREMENTS

MS01 – Completion of First 55-Hour Weekend Set-Up

- If the Contractor successfully achieves Milestone #01 at 5:00 A.M. Monday following the first 55-hour weekend set-up, there shall be no Incentive payment or Disincentive payment.
- If the Contractor successfully achieves Milestone #01 before 5:00 A.M. Monday following the first 55-hour weekend set-up, for each Hour the Contractor achieves the Milestone before 5:00 A.M., MassDOT shall pay an Incentive Payment of $12,000 per Hour up to the maximum Milestone #01 Incentive amount of $120,000.
- If the Contractor fails to achieve the Milestone at 5:00 A.M. Monday following the first 55-hour weekend set-up, MassDOT shall access the Contractor a Disincentive Deduction of $12,000 per hour. The maximum Disincentive amount shall not exceed $120,000.

MS02 – Completion of Second 55-Hour Weekend Set-Up

- If the Contractor successfully achieves Milestone #02 at 5:00 A.M. Monday following the second 55-hour weekend set-up, there shall be no Incentive payment or Disincentive payment.
- If the Contractor successfully achieves Milestone #02 before 5:00 A.M. Monday following the second 55-hour weekend set-up, for each Hour the Contractor achieves the Milestone before 5:00 A.M., MassDOT shall pay an Incentive Payment of $12,000 per Hour up to the maximum Milestone #02 Incentive amount of $120,000.
- If the Contractor fails to achieve the Milestone at 5:00 A.M. Monday following the second 55-hour weekend set-up, MassDOT shall access the Contractor a Disincentive Deduction of $12,000 per hour. The maximum Disincentive amount shall not exceed $120,000.

For purposes of determining whether the Contractor shall receive an Incentive Payment, the dates and timeframes set forth in the Milestones will not be adjusted under any circumstances for any reason, cause, or circumstance whatsoever, regardless of fault, save and expect in the instance of a catastrophic event and/or declared state of emergency.

UTILITY CONTACT LIST

Cambridge - Pole Data	NSTAR/Verizon
District Utility/Constructability Engineer	
MassDOT District 6 Middlesex County	Ruben Diaz Jr. 857-368-6184 Ruben.diazjr@dot.state.ma.us
Electric	
Eversource Electric "A" 1165 Massachusetts Avenue Dorchester, MA 02125	Ned Sadowski 617-541-5714 ned.sadowski@eversource.com
Gas	
Enbridge 8 Wilson Way Westwood, MA 02090	Kathy M. Aruda 508-938-7728 Kathleen.aruda@enbridge.com
Eversource Gas 157 Cordaville Road, 3113 Southborough, MA 01772	Jeffrey Evans-Mongeon 508-305-6970 jeffrey.Evans-Mongeon@eversource.com
Telephone	
Verizon 385 Myles Standish Blvd. Taunton, MA 02780	Karen Mealey 774-409-3160 karen.m.mealey@verizon.com
Water	
Cambridge Water Department 250 Fresh Pond Parkway Cambridge, MA 02138	Richard Holly 617-349-4788 rholly@cambridgema.gov
MWRA 2 Griffin Way Chelsea, MA 02150	Ralph Francesconi 617-461-3573 Ralph.Francesconi@mwra.com
Sewer	
MWRA 2 Griffin Way Chelsea, MA 02150	Kevin McKenna 617-305-5956 Kevin.McKenna@mwra.com
Cambridge DPW- Engineering 147 Hampshire St Cambridge, MA 02139	Kathy Watkins 617-349-4800 kwatkins@cambridgema.gov
Railroad	
MBTA Archives & Digital Asset Preservation 10 Park Plaza Boston, MA 02116	Sylvia Welsh archives@mbta.com

UTILITY CONTACT LIST (Continued)

Cable	
Comcast Cable Corporation PO Box 6505, 5 Omni Way Chelmsford, MA 01824	Wendy Brown 978-848-5163 wendy_brown@comcast.com
Crown Castle 80 Central Street Boxborough, MA 01719	Mark Bonanno 508-616-7818 mark.bonanno@crowncastle.com
AT&T / Siena Engineering Group / Teleport Communications America 50 Mall Road – Suite 203 Burlington, MA 01803	Erica Hudson 781-221-8400 x7041 Erica.hudson@sienaengineeringgroup.com
Eversource Fiber 247 Station Drive, Mail Stop: SUM SE 320 Westwood, MA 02090	Bechir Khoury 781-441-3864 Bechir.khoury@eversource.com
Lightpath 100 Quannapowitt Pkwy Wakefield, MA, 01880	Jeff Harrington 617-999-5371 Jeff.harrington@lightpathfiber.com
Fire Alarm	
Cambridge Electrical Department 250 Fresh Pond Parkway Cambridge, MA 02138	Mark Melo 617-349-4925 mamelo@cambridgema.gov
DPW	
Cambridge DPW- Engineering 147 Hampshire St Cambridge, MA 02139	Kathy Watkins 617-349-4800 kwatkins@cambridgema.gov
Other	
MCI-Verizon Business P.O. Box 600 Charlton, MA 01507	Stephan Parretti 508-248-1305 Stephen.parretti@verizon.com
Vicinity Energy 15 Elkins Street South Boston, MA 02127	Chad Joyce 508-901-0717 chad.joyce@vicinityenergy.us
Extenet Systems 3030 Warrenville Road – Suite 340 Lisle, IL 60532	Chad Wagner 617-529-0973 cwagner1@extenetsystems.com
Verizon Wireless Small Cell 20 Alexander Drive Wallingford, CT 06492	Liz Glidden Elizabeth.glidden@verizonwireless.com
Zayo Group 2 Royce Lane Westfield, MA 01886	Richard Moran 978-844-7525 Richard.moran@zayo.com
Lumen 1025 Eldorado Blvd. Broomfield, CO 80021	Renoy Thomas 516-712-3041 relocations@lumen.com
Raytheon Technologies 870 Winter Street Waltham, MA 02451	Doug Flynn flynn@rtx.com
CSX Transportation 2000 West Cabot Blvd – Ste 130 Langhorne, PA 19047	Michael Sliper Michael_sliper@csx.com

SUBSECTION 8.14 UTILITY COORDINATION, DOCUMENTATION, AND MONITORING RESPONSIBILITIES

A. GENERAL

In accordance with the provisions of Section 8.00 Prosecution and Progress, utility coordination is a critical aspect to this Contract. This section defines the responsibility of the Contractor and MassDOT, with regard to the initial utility relocation plan and changes that occur as the prosecution of the Work progresses. The Engineer, with assistance from the Contractor shall coordinate with Utility companies that are impacted by the Contractor's operations. To support this effort, the Contractor shall provide routine and accurate schedule updates, provide notification of delays, and provide documentation of the steps taken to resolve any conflicts for the temporary and/or permanent relocations of the impacted utilities. The Contractor shall provide copies to the Engineer of the Contractor communication with the Utility companies, including but not limited to:

- Providing advanced notice, for all utility-related meetings initiated by the Contractor.
- Providing meeting minutes for all utility-related meetings that the Contractor attends.
- Providing all test pit records.
- Request for Early Utility work requirements of this section (see below).
- Notification letters for any proposed changes to Utility start dates and/or sequencing.
- Written notification to the Engineer of all apparent utility delays within seven (7) Calendar Days after a recognized delay to actual work in the field – either caused by a Utility or the Contractor.
- Any communication, initiated by the Contractor, associated with additional Right-of-Way needs in support of utility work.
- Submission of completed Utility Completion Forms.

B. PROJECT UTILITY COORDINATION (PUC) FORM

The utility schedule and sequence information provided in the Project Utility Coordination Form (if applicable) is the best available information at the time of the bid and has been considered in setting the contract duration. The Contractor shall use all of this information in developing the bid price and the Baseline Schedule Submission, inclusive of the individual utility durations sequencing requirements, and any work that has been noted as potentially concurrent utility installations.

C. INITIATION OF UTILITY WORK

The Engineer will issue all initial notice-to-proceed dates to each Utility company based on either the:

1) Contractor's accepted Baseline Schedule
2) An approved Early Utility Request in the form of an Early Utility sub-net schedule (in accordance with the requirements of this Subsection)
3) An approved Proposal Schedule

C.1 - BASELINE SCHEDULE – UTILITY BASIS

The Contractor shall provide a Baseline Schedule submission in accordance with the requirements of Subsection 8.02 and inclusive of all of the information provided in the PUC Form that has been issued in the Contract documents. This is to include the utility durations, sequencing of work, allowable concurrent work, and all applicable considerations that have been depicted on the PUC Form.

SUBSECTION 8.14 (Continued)

C.2 – EARLY UTILITY REQUEST – (aka SUBNET SCHEDULE) PRIOR TO THE BASELINE
All early utility work is defined as any anticipated/required utility relocations that need to occur prior to the Baseline Schedule acceptance. In all cases of proposed early utility relocation, the Contractor shall present all known information at the pre-construction conference in the form of a 'sub-net' schedule showing when each early utility activity needs to be issued a notice-to-proceed. The Contractor shall provide advance notification of this intent to request early utility work in writing at or prior to the Pre-Construction meeting. Prior to officially requesting approval for early utility work, the Contractor shall also coordinate with MassDOT and all utility companies (private, state or municipal) which may be impacted by the Contract. If this request is acceptable to the Utilities and to MassDOT, the Engineer will issue a notice-to-proceed to the affected Utilities, based on these accepted dates.

C.3 – PROPOSAL SCHEDULE - CHANGES TO THE PUC FORM
If the Contractor intends to submit a schedule (in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02) that contains durations or sequencing that vary from those provided in the Project Utility Coordination (PUC) Form, the 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.

In order to demonstrate that a critical path delay has been caused by a third-party Utility, the Contractor must demonstrate, through the requirements of the monthly Progress Schedule submissions and the supporting contract records associated with Subsection 8.02, 8.10 and 8.14, that the delays were beyond the control of the Contractor.

SUBSECTION 8.14 (Continued)

All documentation provided in this section is subject to the review and verification of the Engineer and, if required, the Utility Owner. In accordance with MassDOT Specifications, Division I, Subsection 8.10, a Time Extension will be granted for a delay caused by a Utility, only if the actual duration of the utility work is in excess of that shown on the Project Utility Coordination Form, and only if;

1) proper Notification of Delay was provided to MassDOT in accordance with the time requirements that are specified in this Section
2) the utility delay is a critical path impact to the Baseline Schedule (or most recently approved Progress Schedule)

E. LOCATION OF UTILITIES

The locations of existing utilities are shown on the Contract drawings as an approximation only. The Contractor shall perform a pre-construction utility survey, including any required test pits, to determine the location of all known utilities no later than thirty (30) calendar days before commencing physical site work in the affected area.

F. POST UTILITY SURVEY – NOTIFICATION

Following completion of a utility survey of existing locations, the Contractor will be responsible to notify the Engineer of any known conflicts associated with the actual location of utilities prior to the start of the work. The Engineer and the Contractor will coordinate with any utility whose assets are to be affected by the Work of this Contract. A partial list of utility contact information is provided in the Project Utility Coordination Form.

G. MEETINGS AND COOPERATION WITH UTILITY OWNERS

The Contractor shall notify the Engineer in advance of any meeting they initiate with a Utility Owner's representative to allow MassDOT to participate in the meeting if needed.

Prior to the Pre-Construction Meeting, the Contractor should meet with all Utility Owners who will be required to perform utility relocations within the first 6 months of the project, to update the affected utilities of the Project Utility Coordination Form and all other applicable Contract requirements that impact the Utilities. The Contractor shall copy the Engineer on any correspondence between the Utility Owner and the Contractor.

H. FORCE ACCOUNT / UTILITY MONITORING REQUIREMENTS

The Engineer will be responsible for recording daily Utility work force reports. The start, suspension, re-start, and completion dates of each of the Utilities, within each phase of the utility relocation work, will be monitored and agreed to by the Engineer and the Contractor as the work progresses.

I. ACCESS AND INSPECTION

The Contractor shall be responsible for allowing Utility owners access to their own utilities to perform the relocations and/or inspections. The Contractor shall schedule their work accordingly so as not to delay or prevent each utility from maintaining their relocation schedule.

EVERSOURCE EMERGENCY TELEPHONE NUMBERS

GAS:
Outage/ Emergency: 800-592-2000
New Service: 866-678-2744
Customer Support: 800-592-2000

ELECTRIC:
Outage/ Emergency: 800-592-2000 or 844-726-7562
New Service: 1-888-633-3797 (1-888-need pwr)
Customer Support: 1-800-340-9822

COMPLIANCE WITH THE NATIONAL DEFENSE AUTHORIZATION ACT

(Supplementing Subsection 7.01)

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

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

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

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

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

BIDDERS LIST

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

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

BUILD AMERICA BUY AMERICA PREFERENCE

On Federally-aid projects the Buy America (23.CFR § 635.410) and Build America, Buy America Act. 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

(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.

BUILD AMERICA BUY AMERICA PREFERENCE (Continued)

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.

All articles, materials, and supplies should be classified as an iron or steel product, a manufactured product, or another product as specified by law or in 2 CFR part 184 (such other products specified by law or in 2 CFR part 184 include "excluded materials" and "construction materials"); an article, material, or supply must not be considered to fall into multiple categories.

NOTE: The requirements for manufactured products indicated in paragraph (2) above are not in effect for this contract.

TRAFFIC OFFICERS AND RAILROAD FLAGGING SERVICE
(Supplementing Subsection 7.11)

Under the provisions of Chapter 634 of the Acts of 1971, the railroad (excluding MBTA) shall furnish, without cost, the necessary flag protection on the railroad right-of-way which may be required for the performance of the work. For MBTA railroad, MassDOT will pay the Contractor for flagging costs in accordance with the procedure described in Subsection 7.11.

For non-Chapter 634 bridges MassDOT will pay the Contractor for flagging costs in accordance with the procedure described in Subsection 7.11.

The Contractor, however, is responsible for all costs incurred in restoring tracks that have been disturbed by the Contractor's operations. Contractor shall comply with the requirements of the Railroad Special Provisions.

MBTA RAILROAD COORDINATION / ACCESS TO MBTA PROPERTY

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

The Contractor will have to perform construction related activities on, over, under, within or adjacent to railroad property owned or controlled by the MBTA.

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

The Contractor will be required to enter into a license agreement (right of entry) with the MBTA for this project. The Contractor shall reference the following website for insurance, license, etc. information: www.mbtarealty.com/licenses.

The Contractor shall develop a work plan for review and approval by the MBTA for all work performed on the Alewife Linear Path/Red Line tunnel roof.

Loading Restrictions on Tunnel

The subject bridge, Bridge No. C-01-031, spans over the Alewife Linear Path which sits directly on top of the MBTA Red Line tunnel. The Contractor shall not store/place heavy equipment or materials on the Red Line tunnel, except for MBTA approved equipment and materials essential for the work identified under Items 950.1 and 992.3. An aerial image identifying this area has been provided herein for reference.

The exiting bridge plans (MBTA Red Line Extension Northwest Contract No. 091-601) have also been provided in Document A00860 included herein.

MBTA RAILROAD COORDINATION / ACCESS TO MBTA PROPERTY (Continued)

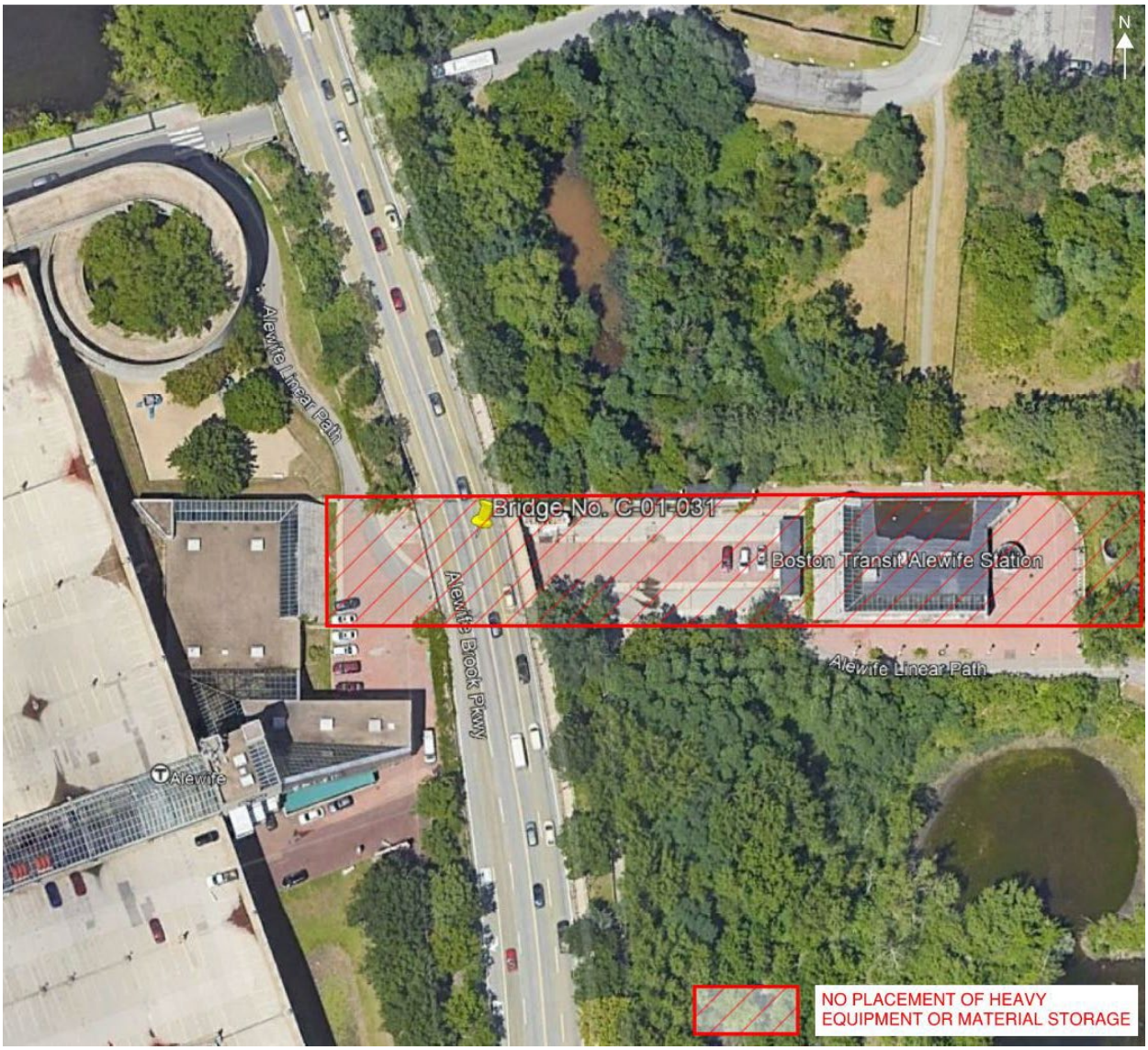

Figure 1: Aerial Image of Site

ADDITIONAL PROJECT COORDINATION

The Contractor shall be aware there are several on-going and planned projects adjacent to and near this project site. The Contractor shall coordinate work access and schedules with all projects as needed. A list of some of the known projects is below but is not necessarily all inclusive:

1. IQHQ's Alewife Park Project – Alewife Headhouse Improvement Project
2. MBTA Red Line Hi-Rail Access Tunnel Project
3. MBTA Alewife Roof Urgent Repair Project

GENERAL REQUIREMENTS FOR DEMOLITION AND WORK INVOLVING PAINTED STEEL

(02/06/2020)

Demolition and work involving painted steel shall conform to the requirements of Subsection 961 of the Standard Specifications.

Work Involving Painted Steel

Hazardous materials shall be removed in the immediate area of any intended welding, heating, saw cutting or burning of steel. Hazardous material removal is required to allow the demolition of structural steel, railings, drainage systems, utility supports, steel lamp posts, etc.

The contractor shall assume that the coatings on the steel contain lead (Pb), unless otherwise determined by testing. The contractor shall certify in writing to the Engineer the results of all testing, and shall also certify that any lead (Pb) coated steel removed from the project was not reused or buried, but was sent to a scrap metal recycling facility.

Implement and maintain programs and procedures, which comply with the requirements of this specification and all applicable standards and regulations. Comply with all applicable regulations even if the regulation is not specifically referenced herein. If a state or local regulation is more restrictive than the regulation of this specification, follow the more restrictive requirements.

This requirement is intended only for the demolition and preparation prior to repair and does not include provisions for recoating of steel.

Environmental

All applicable portions of Subsections 961.65 “Worker Protection” and 961.66 “Environmental Protection and Monitoring” shall be followed when performing this work.

During chemical stripping a hand washing facility may be used in lieu of a decontamination/changing facility.

Hazardous material shall be collected during the disassembly and disposed of as outlined in Subsection 961.68 “Handling of Hazardous Waste and Reporting Release Programs”.

The applicable submittals shall be according to Subsection 961.69 “Submittals”.

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

Cleaning/Removal

Cutting Or Burning Of Steel

All surfaces to be welded, heated, saw cut or burned shall be cleaned so as to remove all contaminants and/or hazardous materials, which could be discharged to the environment as a function of the subsequent operations.

Lead paint shall be removed in its entirety in an area prescribed by a 6 inch (15 cm) minimum offset from the required work. The paint removal operation may be dry abrasive blasting, wet abrasive blasting or chemical stripping.

Proper level of containment shall be used when performing this work in accordance with Subsection 961.67 "Containment". Full containment is not required during chemical stripping operation however; the Contractor shall install proper shielding and/or tarpaulins under the chemical stripping operations in order to catch all debris generated during this procedure. A cleaned area must be inspected and approved before the demolition operations are started.

During cleaning operations the Contractor shall be required to furnish and erect temporary floodlights illuminating the steel surface at a minimum of 30-foot candles. This lighting shall be used in areas where there is insufficient lighting for proper cleaning operations and inspection. The Contractor shall supply electrical power.

The Contractor shall provide support for interim and final inspection of the bridge during cleaning operations. This support shall include the necessary traffic controls and safe access to the work.

Mechanical Disassembly Of Steel

All surfaces to be mechanically disassembled by shear cutting or removing bolts or rivets shall not require deleading. When shear cutting or removing bolts or rivets, the Contractor shall not use any method that will cause dust and/or particles to be emitted and/or dispersed into the environment to an extent that would expose the workers above the Action Levels of 30µg/m3.

For purposes of limiting the lead (Pb) dust, the Contractor will be required to dampen the lead paint work areas.

The contractor shall install a proper shielding and/or tarpaulins under all lead-paint-coated surfaces to be shear cut or bolts or rivets ordered removed in order to catch any loose lead paint chips, dust or particles.

PIGEON WASTE

The Contractor shall remove and dispose of the pigeon waste and any other debris accumulated on the steel members and bridge seats in areas where work is being performed. Pigeon waste and debris material contaminants will require special handling and disposal in accordance with all Federal, state, and local requirements. No separate payment will be made for removal and disposal of pigeon waste. Cost shall be incidental to the contract pay items.

EMERALD ASH BORER ADVISORY

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

EQUIVALENT SINGLE AXLE LOADS (ESALS)

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is 8.6 Million 18-kip (80-kn) ESALs.

2026 FIFA WORLD CUP – BOSTON, MASSACHUSETTS

The 2026 FIFA World Cup will be held at Gillette Stadium in Foxborough and related events will be held throughout the region. Matches and Fan Fest activities are scheduled from June 11, 2026 through July 19, 2026. MassDOT will impose work restrictions as necessary to minimize traffic impacts during FIFA events when the Contractor's operations could impact vehicular traffic, particularly on interstate highways and major arterials throughout the region and local roads near the event site. No additional compensation will be allowed for work restrictions except as determined under Subsection 8.10

NORTHERN LONG-EARED BAT AND TRICOLORED BAT PROTECTION

The northern long-eared bat (*Myotis septentrionalis*; NLEB) and tricolored bat (*Perimyotis subflavus*; TCB) are listed as federally endangered or proposed endangered, respectfully, under the Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (USFWS) developed this guidance to address ESA compliance and promote conservation of NLEB and TCB. MassDOT, on behalf of FHWA, submitted a Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key Consultation through Information for Planning and Consultation (IPaC) and generated a May Affect, Not Likely to Adversely Affect (NLAA) determination (see **Document A00855 included herein**). Subsequently, the project has completed Section 7 consultation under the ESA.

In advance of the uplisting of the TCB to endangered under the ESA, the following Avoidance and Minimization Measures (AMMs) must be strictly adhered to in order to protect NLEB and TCB 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 AMMs

- The Contractor shall ensure all personnel working in on the project site are aware of all environmental commitments related to NLEB and TCB, including all applicable AMMs. NLEB and TCB information (https://www.fws.gov/midwest/endangered/mammals/nleb/ and https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus) shall be made available to all personnel.

- On July 11, 2023, MassDOT Highway Division Environmental Services conducted a northern long-eared bat summer presence/absence survey, in accordance with the 2023 survey guidelines. The survey did not confirm the presence of NLEB and/or TCB. If work is proposed by the Contractor past July 11, 2028, additional review is required by the MassDOT Highway Division's Environmental Services Section, and additional review and restrictions may be required by the USFWS.

Lighting AMMs

- Direct temporary lighting away from suitable habitat during the active season: **April 15 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).

NORTHERN LONG-EARED BAT AND TRICOLORED BAT PROTECTION (Continued)

Bridge AMMs

- On July 13, 2023, MassDOT Highway Division Environmental Services, conducted a northern long-eared bat bridge/structure bat assessment, in accordance with the USFWS guidelines. The assessment did not find presence of, or evidence of use by bats, and as stated within the guidelines, the assessment is valid for two years. If bridge work is not complete July 13, 2025, assessment of the bridge for the presence of, or evidence of use by, bats shall be completed by the MassDOT Wildlife Unit prior to continuing bridge work. The Contractor shall notify the MassDOT Wildlife Unit no later than fourteen (14) days prior to July 13, 2025 to provide adequate time for inspection. If bats are found to be present, or, if there is evidence of bat usage, work at the bridge shall not commence until after the MassDOT Wildlife Unit has completed coordination with the US Fish and Wildlife Service to determine the appropriate follow up or mitigation actions.

SOIL EXCAVATION, STOCKPILING, AND OFF-SITE REMOVAL/DISPOSAL

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. Quantities for soil disposal are based on the project design, existing knowledge of soil contamination in the project area, the presence of known risk factors for soil contamination in the project area, and the designer's best professional judgment.

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. The Contractor is responsible for identifying a suitable stockpile location.

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.

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 as defined by the schedule type set forth below. These requirements are in addition to any requirements imposed in other sections.

This section establishes the requirement for scheduling submissions. There are four schedule types identified as types A, B, C and D.

All schedules shall be prepared and submitted in accordance with this specification and 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.

Type A –

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded & Resource Loaded CPM
- Resources Graphic Reporting
- Cash Flow Projections from the CPM
- Cash Flow Charts
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software and computer

Type B –

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded & Resource Loaded CPM
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software and computer

Type C –

- 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 and computer

SECTION 722 (Continued)

Type D -

- Bar chart schedule updated monthly or at the request of the Engineer
- Short-term Construction Schedule
- Monthly Projected Spending Report (PSR)

EQUIPMENT, PERSONNEL

722.40 General

A. **Software Requirements**

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. The computer and software shall be maintained and serviced at no additional cost to the Department.

B. Scheduler Requirements

The Scheduler shall be approved 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.

SCHEDULING METHODS

722.60 General

A. **Schedule Planning Session**

The Contractor shall conduct a schedule planning session prior to submission of the Baseline Schedule. This session will be attended by the Department and its consultants. During this session, the Contractor shall present its planned approach to the project including, but not limited to:

1. the Work to be performed by the Contractor and its subcontractors;
2. the planned construction sequence and phasing; planned crew sizes;
3. summary of equipment types, sizes, and numbers to be used for each work activity;
4. all early work related to third party utilities;
5. identification of the most critical submittals and projected submission timelines;
6. estimated durations of major work activities;
7. the anticipated Critical Path of the project and a summary of the activities on that Critical Path;
8. a summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges;

SECTION 722 (Continued)

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 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**

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. Rejected Baseline Schedules shall be resubmitted within fifteen (15) Calendar Days after receipt of the Engineer's comments.
2. Contract Progress Schedule / Monthly Update Reviews / Recovery Schedules
   The Engineer will respond to each submittal within twenty-one (21) Calendar Days. Rejected schedules shall be resubmitted by the Contractor within five (5) Calendar Days after receipt of the Engineer's comments.

The Engineer's review comments shall not be construed as direction to change the Contractor's means and methods. The review and acceptance of the CPM schedule does not relieve the Contractor of the responsibility for accomplishing the work within the contract required completion dates. Omissions and errors in the accepted CPM schedule shall not excuse performance less than that required by the Contract.

722.61 Schedule Content and Preparation Requirements

All schedules 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
and the following:

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 schedule shall clearly define the progression of the Work from the Notice to Proceed (NTP) to Contractor Field Completion (CFC) by using separate activities, or including attributes within appropriate activities, to address each of the following:

1. Notice to Proceed
2. Work Breakdown Structure
3. The Critical Path is clearly defined and organized.
4. Float shall be clearly identified.
5. Detailed activities to satisfy permit requirements.
6. Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
7. 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.
8. 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.
9. Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before procuring and fabricating.
10. Each component of the Work defined by specific activities.
11. Right-of-Way (ROW) takings that have been identified in the Contract.
12. Early Utility Relocation (by others) that has been identified in the Contract.
13. Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third-party work affecting the Contract.
14. 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
15. 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
16. Limitations of Work – time of year restrictions and any other limitations identified in the contract
17. Traffic work zone set-up and removal, night work and phasing
18. Material Certifications
19. Milestones listed in Subsection 8.03 - Prosecution of Work or elsewhere in the Contract Documents
20. For Type A and B Contracts only: All items to be paid for, 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.

SECTION 722 (Continued)

21. Contractor's request for validation of FBU (ready to open to traffic)
22. Full Beneficial Use (FBU) Contract Milestone per the following requirements: The majority of contract Work has been completed and the asset(s) has been opened for full multi-modal transportation use, except for limited contract work items that do not materially impair or hinder the intended public use of the transportation facility. All anticipated lane takings have been completed, except for minor, short term work items and as defined in Subsection 8.03 - Prosecution of Work
23. The Department's confirmation of completed work to allow for FBU.
24. Contractor's request for validation of Substantial Completion
25. Department generated punch list of twenty-one (21) Calendar Days
26. Substantial Completion Contract Milestone as defined in the standard specifications.
27. Punch list 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
28. Contractor confirmation that all punchlist work and documentation has been completed.
29. Physical Completion of the Work Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
30. Documentation Completion per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
31. Contractor Field Completion Contract Milestone (which can also be considered the completion date) per the following requirements: All physical contract Work is complete including punchlist. The Contractor has fully de-mobilized from field operations and as defined in Subsection 5.11

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 of 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.

SECTION 722 (Continued)

Should there be an activity with a duration that is determined by the Engineer to be unreasonable, the Contractor will be asked to provide a basis of the duration using bid documents, historic production rates for similar work, or other form of validation that is acceptable to the Engineer. Should the Contractor and the Engineer be unable to agree on reasonable activity durations, the Engineer will, at a minimum, note the disagreement in the Baseline Schedule Review along with a duration the Engineer considers reasonable and the basis for that duration. A schedule that contains a substantial number of activities with durations that are deemed unreasonable by the Engineer will not be accepted.

E. MATERIALS ON HAND

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.

G. ACTIVITY IDENTIFICATION NUMBERS

The Contractor shall use the activity identification numbering system specified in the MassDOT Highway Division Contractor Construction Schedule Toolkit.

H. ACTIVITY CODES

The Contractor shall use the activity codes specified in the MassDOT Highway Division Contractor Construction Schedule Toolkit.

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. All calendars shall extend two years beyond the current project completion date.

Project Special Provisions identify specific calendar restrictions some 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.
- Planting seasons for trees, shrubs and grasses and wetlands mitigation work.

SECTION 722 (Continued)

- 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. 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.
- Turtle and/or Fish Migration Periods and/or other in-water work restrictions: Refer to the Project Special Provisions for specific restrictions.
- Working over Waterways Restricted Periods.
- Night-time paving and striping operations, traffic, and temperature 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.

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.
6. Leads such as leads, lags, SS, SF, & FF relationships without the expressed permission of the Department.

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.

Each Submission shall, at a minimum, include the following:

a. Narrative
b. Schedule submittals shall be signed by the Scheduler
c. Schedule Printout - All Activities
d. Schedule Printout - Critical Path Layout
e. Schedule Printout - Remaining Work
f. Schedule Printout - Top 3 Float Path
g. Work Breakdown Structure (WBS) Summary
h. Project Spending Report (PSR) in Portable Document Format (.PDF)
i. Project Spending Report (PSR) in Microsoft Excel spreadsheet (.XLS)
j. Oracle Primavera P6 Schedule File (.XER)

All digital file submittals will be labeled with the following information.

- Contract Number
- Project Number
- Project locations (i.e., town(s))
- Brief description
- Submittal description (i.e., UP07)
- Data Date (MM-DD-YY)
- File Description (i.e., Critical Path)

Example: C110464 (P606309) - Orange Route 2 over 202 – UP23 (07-15-22) - Critical Path

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.

SECTION 722 (Continued)

3. provide all references to any Notice of Delay that has been issued, within the time period of the Contract Progress Schedule Update, by letter to the Engineer. Note that any Notice of Delay that is not issued by letter will not be recognized by the Engineer. See Subsection 722.64.A – Notice of Delay.
4. provide a description of each third-party utility's planned vs. actual progress and note any that are trending late or are late per the durations and commitments as provided in the PUC Form; provide a description of the five (5) most important responses needed from the Department and the need date for the responses in order to maintain the current Schedule of Record.
5. provide a description of all critical issues that are not within the control of the Contractor or the Department (third party) and any impact they had or may have on the Critical Path.
6. provide a description of any possible considerations to improve the probability of completing the project early or on time.
7. compare Early and Late Dates for activities on the Critical Path and describe reasons for changes in the top three (3) most critical paths.
8. describe the Contractor's plan, approach, methodologies, and resources to be employed for completing the various operations and elements of the Work for the top three (3) most critical paths. For update schedules, describe and propose changes to those plans and verify that a Proposal Schedule is not required.
9. describe, in general, the need for shifts that are not 5 days/week, 8 hours/day, the holidays that are inserted into each calendar and a tabulation of each calendar that has been used in the schedule.
10. describe any out-of-sequence logic and provide an explanation of why each out-of-sequence activity does not require a correction, if one has not been provided, and an adequate demonstration that these changes represent the basis of how these activities will be built, including considerations for resources, dependencies, and previously approved production rates.
11. identify any possible duration increases resulting from actual or anticipated unit price item quantity overruns as compared to the baseline duration, with a corresponding suggestion to mitigate any possible delays to the Critical Path. If the delay is anticipated to impact the Critical Path, refer to Subsections 4.06 – Increased or Decreased Contract Quantities and 8.10 – Determination and Extension of Contract Time for Completion and submit a letter to the Engineer notifying of a potential delay.
12. include a schedule log consisting of the name of the schedule, the data date and the date submitted.
13. include and describe any notifications, communications and coordination meetings with third-parties such as utility companies that occurred from the last update including personnel names, job titles and contact information, date of meeting(s)/correspondence(s), topics discussed, and reasons the third party provided for deviations from the PUC form.

SECTION 722 (Continued)

B. **CPM Bar Charts**

One (1) timescaled 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 timescaled 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.

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.

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.
4. any variance to the estimated contract quantity shall be shown.

E. Resource Graphs (Type A only)

Monthly and cumulative resource graphs for the remaining Contract period using the Early Dates and Late Dates in the Contract Progress Schedule shall be included as part of each schedule submittal.

SECTION 722 (Continued)

F. Projected Spending Reports

A Projected Spending Report (PSR) shall be prepared and submitted monthly. 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. The Projected Spending Report (PSR) shall be depicted in a tabular format and provided in both an .XLS and .PDF.

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

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 two months (approximately 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 asbuilt sequencing and asbuilt dates for completed and inprogress activities. Asbuilt 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.

Contract Progress Schedules that extend performance beyond the Contract Time or beyond any Contract Milestone shall not be approved by the Engineer. The Contractor shall submit a Recovery Schedule, or a Time Entitlement Analysis, if any Contract Progress Schedule/Monthly Update indicates a failure to meet the Contract Dates.

SECTION 722 (Continued)

D. Short-Term Construction Schedule

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a spreadsheet format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule and may be at a greater level of detail. The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work for the two (2) week period prior and all planned work for the following three (3) week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities. Short-Term Construction Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements.

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 fifteen (15) 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 a 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 fifteen (15) 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 demonstrate the schedule impacts most efficiently 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 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. 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 or Contract Progress Schedule.

C. Recovery Schedules

The Contractor shall promptly report to the Engineer all schedule delays during the prosecution of the Work. Contract Progress Schedules that predict performance extended beyond the Contract Time or beyond any Contract Milestone shall not be approved as the schedule of record. This requirement is critical to the Department's ability to make informed decisions regarding Contract Time and costs.

The Contractor shall submit a Recovery Schedule within fifteen (15) Calendar Days of a Contract Progress Schedule submission that shows failure to meet the Contract Dates unless a recovery schedule is waived by the Department. Waiving the recovery schedule does not relieve the contractor of the responsibility for the delay. The Department may revoke the waiver of a Recovery Schedule, at which time a Recovery Schedule shall be submitted within fifteen (15) Calendar Days of the Contractor being notified.

Changes represented in accepted Recovery Schedules shall be incorporated into the next Contract Progress Schedule.

SECTION 722 (Continued)

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 or 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 acceleration including 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. Proposal Schedules that contain a cost element shall be submitted with a separate Cost Proposal.

Changes represented in the 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.

E. Disputes

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.

The Contractor may dispute a decision by the Engineer by filing a claim notice within seven (7) days after the Contractor's request for additional time has been denied or if the Contractor does not accept the number of days granted in a time extension. The Contractor's claim notice shall include a revised time entitlement analysis that sufficiently explains the basis of the time-related claim. Failure to submit the required time entitlement analysis with the claim notice shall result in denial of the Contractor's claim. A determination on the Contractor’s claim shall be in accordance with Subsection 7.16 Claims of Contractor for Compensation. Pending resolution of any dispute, the last schedule accepted by the Engineer will remain the Contract Schedule of Record.

SECTION 722 (Continued)

722.65 Schedule Type D Requirements

This section is to detail the requirements for Type D Schedules and is separate from the requirements listed above. These schedules are intended for a project in which a more formal schedule would not be practical.

Schedules for Type D projects shall be submitted for each work assignment. The Schedule Type D shall be submitted electronically in .XLS and .PDF format and meet the following requirements.

The schedule requirements for work assignments that are anticipated to last three weeks or less shall conform to the requirements for Short-term Construction Schedules below.

Work assignments that are anticipated to last longer than three weeks shall submit a bar chart baseline and provided update schedules upon request of the engineer as required under Bar Chart Schedule below in addition to meeting the Short-term Construction schedule requirements.

A. **Bar Chart Schedule**

A Bar Chart that shall include the following:

- Work Assignment start date.
- Activities to identify.
  - Major work operations broken down to be no longer than 14 days.
  - Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before procuring and fabricating.
  - 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.
  - The review and return of shop drawings, procedures, and other required submittals, approved or with comments, the duration of which shall be shown as thirty (30) Calendar Days,
  - Detailed activities to satisfy permit requirements.
  - Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
  - Project Close out activities including a 21-calendar day creation of a punchlist activity and 30 calendar day minimum completion of punchlist activity.
- Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third-party work affecting the Contract.
- Access Restraints – restrictions on access to areas of the Work
- Traffic work zone set-up and removal, night work and phasing
- Contract Milestones including Full beneficial Use, Substantial Completion and Contractor Field Completion

The Bar Char Schedule shall be provided at the beginning of the project and updated with each work order created for the project.

SECTION 722 (Continued)

B. **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 spreadsheet 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. See schedule toolkit for suggested format.

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 on the assignment for the two week period prior and all planned work for the following three 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.

C. **Project Spending Report (PSR)**

A Projected Spending Report (PSR) shall be prepared and submitted monthly. The PSR shall be for all active work assignments, broken down by work assignment. 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. The Projected Spending Report (PSR) shall be depicted in a tabular format and provided in both an .XLS and .PDF

SECTION 722 (Continued)

COMPENSATION

722.80 Method of Measurement

Schedule of Operations (Type A, B and C)

The project bid documents specify the fixed-price amounts to be paid to the Contractor for the Project Schedule requirements contained herein. Each bidder shall include this fixed price bid item amounts in their bid. Failure to do so may be grounds for the rejection of the bid.

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.

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.

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:

$$\text{Monthly Payment} = \frac{\text{Remaining Fixed Price amount (80\% of the Item Cost.)}}{\text{Contract Duration in whole months} - 2 \text{ months}}$$

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.

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. The monthly payment will be the basis for this Equitable Adjustment.

Schedule of Operations (Type D)

For projects assigned with Type D schedule requirements, all scheduling work shall be considered incidental to the project with no separate payment under this section.

SECTION 722 (Continued)

722.81 Basis of Payment

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.

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 (including monthly progress schedules, short-term schedules, project spending reports, TEAs, recovery schedules or impacted schedules) shall be included in this work.

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. The late submission of Impacted schedules, including TEAs, recovery schedules and proposal schedules will result in the forfeiture of the monthly payment for the month in which they were due and subsequent months until the submission is made. Late submission of missed submittals 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 Engineer withholding of full or partial payments of all work performed.

722.82 Payment Items

722.1	SCHEDULE OF OPERATIONS (TYPE A) - FIXED PRICE $_____	LUMP SUM
722.2	**SCHEDULE OF OPERATIONS (TYPE B) - FIXED PRICE $_____**	**LUMP SUM**
722.3	SCHEDULE OF OPERATIONS (TYPE C) - FIXED PRICE $_____	LUMP SUM

ITEM 100.95 GEOTECHNICAL MONITORING AND INSTRUMENTATION LUMP SUM

DESCRIPTION

A. This Section specifies surveying, furnishing, installing, protecting, reading, reporting, maintaining and removing instrumentation as part of a Geotechnical Monitoring Program required for evaluation of ground movements during construction, and their effects on adjacent structures. The locations of all instruments and monitoring points are to be included in Submittals as indicated in Submittals below. The Work includes implementing required remedial and precautionary measures based on instrumentation data. Work to be performed on or within MBTA structures requires coordination with the MBTA and must be performed in accordance with MBTA requirements as explained on the MBTA Realty Licenses website: www.mbtarealty.com/licenses.

The "Design Engineer" specified herein is the Engineer of Record.

B. Geotechnical instrumentation shall be provided for monitoring of the following activities:
   1. Excavation support systems for replacement of superstructure.
   2. Vibration-producing activity.

C. The purpose of this program is to provide data which when used with other observations and measurements will be the basis of:
   1. Pre-construction baseline data for comparison with construction and post-construction data.
   2. Evaluation of adequacy of ground support systems, compaction, or other vibration-producing construction activity and any required modifications of such systems or operations.

D. Work in connection with the Geotechnical Monitoring Program shall include, but not necessarily be limited to the following:
   1. Furnishing and installing geotechnical instrumentation and respective readouts.
   2. Surveying, monitoring, reporting and interpreting instrumentation data.

E. Instrumentation Layout
   1. Locations and type of instruments to be installed are to be included in the Submittals.
   2. The Design Engineer and MassDOT reserve the right to modify the instrument layout as is deemed necessary to monitor the impact of the Contractor's proposed method of construction.

F. Related work specified elsewhere:

Item 100.951	Pre-construction and Post-Construction Surveys
Item 953.1	Excavation Support System for Bridge No. C-01-031

ITEM 100.95 (Continued)

G. The Design Engineer, MassDOT and MBTA are not responsible for the safety of the Work based on data from the Contractor's monitoring program.

QUALITY ASSURANCE

A. All equipment shall be approved by the Design Engineer, MassDOT and MBTA.

B. Materials, designs and construction shall be of highest quality to provide robust, and vibration resistant instruments. Accuracy and dependability of equipment shall be selected considering changes in temperature, humidity, stray currents or other adverse conditions that may be encountered.

C. Installation procedures acceptable to the Design Engineer and/or MassDOT shall be developed for each type of instrumentation. All instrumentation shall be installed in presence of the Design Engineer and or MassDOT.

D. Qualifications

1. Manufacturer: Select a firm regularly engaged in the manufacture of monitoring instrumentation of the type specified herein.

2. Personnel:

a. Geotechnical Instrumentation Engineer: Employ a Professional Engineer, registered in the Commonwealth of Massachusetts, specializing in geotechnical engineering, who has experience in installation of instruments of the type specified in this Section in accordance with the manufacturer's recommendations and to the satisfaction of the Design Engineer and MassDOT. The Contractor's Geotechnical Instrumentation Engineer shall supervise and direct instrument installation technicians and shall be responsible for instrument installation monitoring, reduction and interpretation of instrumentation monitoring data.

b. Qualified geotechnical instrumentation personnel must be available on call at all times during the work that would affect geotechnical instrumentation.

c. Provide a Land Surveyor, Registered in the Commonwealth of Massachusetts, responsible for layout and subsequent verification of all instrument locations and elevations.

ITEM 100.95 (Continued)

E. Tolerances

1. Establish the initial coordinates of each instrument at the point of installation to 0.03 foot or less.
2. Establish the initial elevation of settlement reference points to 0.005 feet. Achieve level circuit closure with an error of closure of 0.01 foot, or less.

F. The Geotechnical Engineer may perform supplemental monitoring of instrumentation and will require Contractor support as follows:

1. Make probes, sensors, and read-out devices available as required.

2. Coordinate activities to minimize interference.

3. Remove obstruction from line of sight when requested by the Geotechnical Instrumentation Engineer.

4. Temporarily cease activities that create hazards to instrument monitoring or surveying personnel.

G. A factory calibration shall be conducted on all instruments prior to shipment. Certification shall be provided to indicate that the test equipment used for this purpose is calibrated and maintained in accordance with the test equipment manufacturer's calibration requirements.

H. A final quality assurance inspection shall be made prior to shipment. During the inspection, a checklist shall be completed to indicate each inspection and test detail. A completed copy of the checklist shall be supplied with each instrument.

I. Contractor shall provide the manufacturer's warranty for each portable readout unit furnished for the Geotechnical Instrumentation Engineer's monitoring program.

SUBMITTALS

A. Qualifications:

1. Submit qualifications of Geotechnical Instrumentation Engineer

B. Shop Drawings:

1. Submit Shop Drawings of instrumentation location layout and details before installation. Indicate methods of installation and maintenance for instrumentation systems. See the MBTA Realty License website for specific submittal requirements working in MBTA ROW. Instrumentation location layout and data will be made available to MassDOT and MBTA for review.

ITEM 100.95 (Continued)

C. Documentation:

1. Submit manufacturer's catalogs and printed installation instructions for instruments furnished.

2. Submit, within 24 hours of completion of equipment installation, installation notes, initial readings, and monitoring data taken immediately after installation.

D. Certification:

1. Submit certification of equipment manufacturers, supervision, installation crews, and monitoring personnel at least 21 calendar days prior to installation.

2. Submit certificates of equipment calibration.

E. Monitoring Documentation:

1. Submit proposed forms to be used for recording observations, monitoring and reporting data. Submit a sample showing proposed format for recording of readings, calculations and plots.

2. Submit the following within 12 hours after monitoring any instrument:

a. A copy of the data sheet containing a cumulative history of all readings, including weather conditions at time of each reading.

b. A copy of the plot of measured value versus time, which also includes a time history of construction activity likely to influence such readings (e.g. depth of excavation, presence of heavy equipment).

3. Each week the Contractor shall submit to MassDOT and the Design Engineer a weekly data report by e-mail, in Excel or other spreadsheet format approved by the Engineer.

RESPONSIBILITIES OF CONTRACTOR

A. Furnish components of instrumentation that are to be installed during construction, portable readout units for the Contractor's use, and install instruments. The Contractor shall protect and maintain installed instruments and replace or repair damaged or inoperative instruments.

B. Collect, reduce, process, plot, interpret, and report data from instrumentation, henceforth the monitoring program.

C. Contractor is responsible for obtaining all necessary permits for installation of all specified instruments.

ITEM 100.95 (Continued)

D. The Contractor shall be responsible for monitoring ground conditions, as necessary, to ensure the safe performance of the work. The Contractor may use data provided by the minimum specified instrumentation for this purpose but shall be independently responsible to determine whether these data are adequate and available on a timely basis to protect property and provide safety. The minimum instrumentation program required by this specification does not relieve the Contractor of responsibility for providing additional instrumentation if such additional instrumentation is necessary to provide safety and protect property.

JOB CONDITIONS

A. Disclosure of Instrumentation Data:

1. Do not disclose instrumentation monitoring data to third parties and do not publish instrument monitoring data without the prior approval of MassDOT. The data from the instrumentation program shall be the property of the MassDOT and MBTA.

2. Be responsible for interpretation of instrumentation data as input to evaluating excavation performance and controlling settlements to prevent damage to structures, facilities and utilities.

B. Determine exact location of the instruments to be installed in the field with approval of the Design Engineer and/or MassDOT.

MONITORING SCHEDULE

A. All equipment and installation accessories required for operation of instrumentation system and recording of measurements shall be furnished by Contractor and shall be available at least four (4) weeks in advance of construction in the area where they are to be installed and shall be securely stored where they will not suffer physical damage or damage arising from excessive moisture, extremes of temperature or other adverse conditions.

B. Tilt plates, surface settlement points, and vertical settlement points shall be installed and initial surveys complete a minimum of two (2) weeks prior to any construction activity related to excavation or installation of earth support system.

C. The instruments shall be monitored in accordance with the requirements of Table 1 specified herein.

D. If, in the opinion of the Design Engineer and/or MassDOT, there appears to be excessive movement, the monitoring points shall be surveyed as often as deemed necessary by the Design Engineer and/or MassDOT, at no additional cost to the MassDOT or MBTA. Repeat the survey, then take action and contact the Design Engineer and/or MassDOT.

ITEM 100.95 (Continued)

PRODUCTS

MATERIALS FOR INSTRUMENTATION

A. All instrumentation hardware, protective covers, read-out equipment, and equipment and materials necessary to conduct the monitoring program shall be purchased or rented by the Contractor. Prior to installation, all materials and equipment shall be available for inspection by the Geotechnical Instrumentation Engineer to ensure compliance with these specifications.

B. All graduations shall be in U.S. Customary Units, for example feet, inches, pounds.

C. Accuracy of all instruments shall have appropriate precision to report reading values to be compared to the threshold and limiting values provided in Table 2.

DEFORMATION MONITORING POINTS

A. Deformation monitoring points (DMPs) shall be used to monitor vertical and horizontal deformation of various facilities at selected locations shown on the shop drawings.

B. The following types of DMPs shall be used to monitor deformation:

1. Surface Settlement Points (SSP) shall consist of a 2-in.-long masonry nail with an identification tag. The nail shall be manufactured from hardened, zinc-plated steel. The nail shall have ribbed threads along its shank and a conical point. It shall also have an indent in the center of its head to receive a surveyor's plumb bob. The identification tag shall be 1-1/2-in. dia. x 3/32-in. thick with a punched number for identification. The masonry nail shall be placed through the central hole in the identification tag and driven into an asphalt-covered surface such that the identification tag lies directly between the asphalt covered surface and the head of the masonry nail.

2. Vertical Monitoring Points (VMP) shall be used to monitor movements of structures, and shall consist of a 5/16 in. dia. x 4-1/2 in. long (or longer) hex bolt, ASTM A307-UNC Thread, screwed into a 1 in. long x 5/16 in. dia. tamp in screw anchor. The anchor and the casing shall meet the requirements of Federal Specification FF-S-325 Group 1, Type 1, Class 1. A 5/16 in. dia. x 3/4 in. long carriage bolt shall replace the 4-1/2 in. long (or longer) hex bolt when readings are not being taken.

CRACK MONITORS

A. Provide portable comparator/reticule crack monitor system, with linear scale 0.75 in. long, graduated every 0.005 in. (0.127 mm), and a triplet lens to create a flat optical field over the entire reticule area.

ITEM 100.95 (Continued)

TILTMETERS

A. Tiltmeter base plates shall be: Model 50307300 by Slope Indicator Company, Mukilteo, WA 98275; Model 716-2 by Applied Geomechanics, Santa Cruz, CA 95062; Model 6201 by Geokon Inc., Lebanon, NH 03766; or approved equal. Readout units shall be compatible with the selected base plate and shall provide tilt readings to a resolution of 10 arc seconds.

TAPE EXTENSOMETER

A. Provide tape extensometers and carrying cases manufactured by RS Technical Instruments Ltd., Coquitlam, BC, Canada; model 51811500 as manufactured by Slope Indicator Co., Mukilteo, WA; model 1600 as manufactured by Geokon, Inc., Lebanon, NH; or approved equal. Tape length shall be 60 feet minimum.

B. Provide anchorage points from the same commercial source as the tape extensometers.

C. Provide calibration frame from the same commercial source as the tape extensometers.

1. Calibration frame shall consist of a 5-ft length of a C6x8.2 steel channel, with a 10 inch x 6 inch x ¼ inch thick steel plate welded to the channel at each end. The channel and the plate shall be made from black A36 steel. All corners shall be rounded. Provide anchorage point fixed to each plate, with sufficient clearance above the channel to mount the tape extensometer.

SEISMOGRAPHS

A. Provide portable seismographs for monitoring the velocities of ground vibrations and air overpressure levels resulting from construction activities. Provide model MR2002 manufactured by Syscom Instruments and provided by Geocomp Corporation, 1145 Massachusetts Avenue, Boxborough, MA 01719; model SSU 2000DK as manufactured by Geosonics Inc., Warrandale, PA; model Blastmate II as manufactured by Instantel Inc., Ottawa, Ontario, Canada; model VMS-200 as manufactured by Thomas Instruments, Inc., Spofford, NH, or approved equivalent. The seismograph shall have the following minimum features:

1. Seismic range: 0.01 to 8 inches per second with an accuracy of 5% and no more than a 3 db roll off at the low frequency end.

2. Flat frequency response: 2 to 200 Hertz.

3. Three component sensor.

4. Two power sources: Internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for up to 24 hours.

ITEM 100.95 (Continued)

5. Capable of internal dynamic calibration.

6. Instruments must be capable of producing strip chart recordings of readings on site within one hour of obtaining the readings. Provide computer software to perform frequency analyses of data obtained on magnetic disks.

7. Continuous monitoring mode must be capable of recording peak velocities.

8. Sound level frequency response: flat within ±3db from 2 to 200 Hz."

EXECUTION

GENERAL REQUIREMENTS

A. All instruments shall be installed in the presence of the Design Engineer and/or MassDOT.

B. Contractor's Geotechnical Instrumentation Engineer shall be fully responsible for the installation, testing, calibration, reading, maintenance of the instrumentation, interpretation of the field readings and implementation of appropriate corrective measures. Verify the reliability of all installed instruments a minimum of 2 weeks prior to construction.

C. Location and arrangement of the instrumentation shall be planned so that monitoring can continue until completion as described in Table 1. Adequate access for maintenance and reading of the instrumentation shall be provided.

D. All instruments shall be securely fixed such that they are capable of resisting movement and pressure changes underground, or vandalism and adverse climatic conditions at surface locations.

E. The Contractor shall install, monitor, and interpret data from instrumentation, in addition to that specified herein, that the Contractor deems necessary to ensure the safety of personnel and the Work, at no additional cost to the MassDOT. Data shall be reported to the Design Engineer and/or MassDOT as specified herein. Maintain records relating to problems encountered, delays, unusual aspects of the installation, and details of any events that may have a bearing on instrument behavior. These records should be submitted along with monitoring data.

F. Baseline data collection will begin as soon as installation of the instrumentation is complete. Threshold and limiting values currently proposed are shown in the Table 1.

G. Recommendations for threshold and limiting values will be provided by the Contractor to MassDOT and MBTA following a period of monitoring to establish baseline values.

ITEM 100.95 (Continued)

INSTALLATION OF INSTRUMENTS

A. Install the equipment according to the manufacturers' recommendations.

B. Testing shall be undertaken as necessary to ensure satisfactory functioning of the equipment at each stage of the installation. In particular, adequate precautions shall be taken to protect the instruments from harmful effects of groundwater.

C. Instruments found to be malfunctioning at any time shall be replaced within one day.

INSTALLATION OF DEFORMATION MONITORING POINTS

A. Deformation monitoring points (DMPs) shall be installed at the locations shown on the approved Working Drawings or as directed by the Design Engineer and/or MassDOT.

B. After installation of a DMP, determine as-built location in horizontal position to an accuracy of +/- 0.03 ft, and in elevation to an accuracy of +/- 0.005 ft.

INSTALLATION OF CRACK MONITORS

A. Cracks to be monitored on structures shall be identified and marked clearly for identification purposes at locations determined by the pre-construction survey performed by the Contractor and as approved by the Design Engineer and MassDOT.

B. The initial reading of crack monitors where installed shall be documented and photographed with date stamped.

INSTALLATION OF TILTMETERS

A. Tiltmeter base plates shall be installed at locations shown on the approved Working Drawings with adhesives or bolts in accordance with the manufacturer's recommendations.

INSTALLATION OF TAPE EXTENSOMETER

A. Tape extensometer anchorage points shall be installed at the locations shown on the approved Shop Drawings or as directed by the Design Engineer and MassDOT.

B. After anchorage points are installed, record as-built locations on installation record sheets with sufficient dimensions so that they can be replaced if they are destroyed during construction.

ITEM 100.95 (Continued)

INSTALLATION OF SEISMOGRAPHS

A. Monitoring of vibrations by seismographs shall be performed as a minimum at all locations shown on the approved Working Drawings, and also on other facilities that may be affected by construction activities where the Contractor deems necessary to monitor vibration levels. At each facility, geophones shall be placed as appropriate on the ground at points between three and six feet from the faces of buildings, on the structure of buildings and on the floor slab near the closest exterior face of the buildings.

B. Geophones shall be firmly mounted on the surface slab of concrete or asphalt, firmly set in undisturbed soil, or rigidly attached to the structure of buildings and shall be left in place for a time adequate to achieve the monitoring schedule specified herein.

MAINTENANCE OF INSTRUMENTATION

A. Prevent damage to the instruments and ancillary equipment during handling, installation and subsequent operation. Maintain all the instruments required for monitoring in a satisfactory working order for the duration of the monitoring program. Should an instrument become damaged or become non-functional, it shall be the Contractor's responsibility to replace, within one day, the damaged instrument to the satisfaction of the Design Engineer and the Geotechnical Instrumentation Engineer at no additional cost to the MassDOT.

B. Ensure that all the instrumentation in use has been correctly calibrated. Carry out periodic checks to confirm the validity of calibration of equipment in accordance with the manufacturer's instructions and carry out any adjustments that are found necessary. Suspect readings shall be repeated.

C. Keep records of all calibration certificates and, when necessary, send equipment off site for re-calibration by an independent accredited testing laboratory.

D. Record the location of all instrumentation on as-installed Working Drawings. As-installed drawings shall include the routing of all cabling. Hidden electrical instrumentation shall be identifiable by color codes and/or tagged cables. The reference coding shall also be recorded on the as-installed drawings.

E. Ensure that electrical instrumentation is not adversely affected by other temporary or permanent electrical services.

INSTRUMENT READING AND RECORDS

A. Instruments shall be read as soon as possible after installation to establish datum readings that shall be established from a minimum of two independent reading operations giving consistent results. The method of reading shall be as recommended by the manufacturer.

ITEM 100.95 (Continued)

B. Monitoring Schedule

1. Monitor instrumentation in accordance with the schedule shown in Table 1.

2. Monitor instrumentation more frequently, if instrumentation detects significant anomalous or suddenly changing readings.

C. In the event of any change in circumstances, for example the influence of the construction of other structures nearby, the program of readings shall recommence.

D. The same recording devices shall be used at any given location through the monitoring program. If for any reason this becomes impracticable, due to instrument breakage for example, new datum readings shall be taken immediately with a replacement instrument, and the new instrument used for the future readings. Similarly, should a monitoring location become unavailable, the instrument previously read from this point shall, within one week, be read from an alternative point, the latter then being used for subsequent readings.

E. Readings shall, wherever possible, be taken by the same personnel. Should the personnel be replaced for any reason, a series of duplicate readings shall be carried out by the out-going person and the replacement.

TRACK MONITORING PROGRAM

A. Provide continuous monitoring of all tracks within 100 feet of construction activities to assure that movements do not exceed the tolerances specified herein at any time during construction. Provide all survey data in reduced form to the MBTA in order that any required track adjustments can be made by MBTA field crews. All costs associated with monitoring and any track adjustments shall be borne by the Contractor with no compensation by the MBTA.

B. Track Tolerances are included in Table 2.

LIMITING INSTRUMENTATION READINGS

A. The Contractor shall perform all work in a manner to prevent instrumentation readings from exceeding limiting values specified in Table 2. Where the Contractor's operations result in instrumentation readings approaching the limiting values in Table 2, the Contractor shall modify his means and methods so that the work may be accomplished without exceeding the limiting values. Any delays or modifications to the Contractor's means and methods shall be at no additional cost to MassDOT and MBTA.

ITEM 100.95 (Continued)

DATA REDUCTION, PROCESSING, PLOTTING AND REPORTING

A. The Contractor's instrumentation personnel and surveyors shall reduce, process, plot, and report data from the Contractor's monitoring program.

B. Each week the Contractor shall submit to the Design Engineer and MassDOT a weekly data report as specified herein. The weekly data report shall be bound and indexed and shall include:

1. A section for each type of instrument. This section shall include: a brief description of the cumulative changes in instrument readings, a brief description of the changes in readings from the previous weekly data report, a table summarizing instruments, actual readings, and if any limiting readings have been reached. Raw and reduced data collected during the week, on summary tables (8-1/2in. x 11in. sheets of paper). Plots of data versus time and including key construction activities and other events that could influence changes in the data shall be shown. Plots of like instruments shall be done at the same scale to facilitate graphical comparison.

2. A description of work being performed during the week by the Contractor and any possible activity in the area that may have an effect on instrument readings. Describe groundwater control and temporary relief operations, including pump locations, times of operation, and estimated quantity of flow.

C. Plots of seismograph data shall be in the form of strip charts. Strip charts shall be used to monitor continuously, and record peak particle velocities produced each minute of continuous vibration producing activity as defined in Table 1. Contractor shall provide the following data:

1. A permanent record of peak particle velocity for each minute from the specific start to finish time specified in Table 1. This permanent record shall be in the form of a scaled histogram strip chart printed onto 8-1/2 in. x 11 in. non-fading paper. The strip chart should also indicate the time and magnitude of maximum peak particle velocity measured during each one-hour interval of the monitoring period.

2. A tabular summary report printed on 8-1/2 in. x 11 in. paper summarizing the maximum peak particle velocity measured during each hour of monitoring.

DAMAGE TO INSTRUMENTATION

A. The Contractor shall protect all instruments and appurtenant fixtures, leads, connections, and other components of instrumentation systems from damage due to construction operations, weather, traffic, and vandalism.

ITEM 100.95 (Continued)

B. If an instrument is damaged or inoperative, the Contractor's instrumentation personnel shall repair or replace the damaged or inoperative instrument within 24 hours, at no additional cost to the Engineer. The Design Engineer and MassDOT will be the sole judge of whether repair or replacement is required. The Design Engineer and MassDOT may impose a work stoppage in the vicinity of the damaged or inoperative instrument until it is again operational, at no additional cost to MassDOT.

C. Contractor shall repair or replace at its own cost any of the readout devices used for the Contractor's monitoring program that become damaged, inoperative, or, in the judgment of the Design Engineer and MassDOT, unreliable.

ITEM 100.95 (Continued)

TABLE 1 - MONITORING SCHEDULE

INSTRUMENT	SCHEDULE
All Instruments	(1) One reading immediately after installation. (2) One reading each workday until, as determined by the Design Engineer, repeatability indicates that any data changes resulting from the installation process have ceased. (3) Formal initial reading. (4) One reading immediately prior to any construction of the associated facility. Thereafter, reading frequency shall follow the schedule given below.
Railroad Track Monitoring Points	Within one hundred feet of excavation, one reading daily or every three (3) feet of completed excavation, whichever is more frequent. Readings shall be taken more frequently if limiting values are exceeded. After backfilling to finished grade, readings shall be taken weekly for one week.
Crack Monitor	One reading every five (5) feet of completed excavation or every week, whichever is more frequent, until excavation has reached full depth. Readings shall be taken once daily if limiting values are exceeded and until the readings have equilibrated to the satisfaction of the Design Engineer. Readings will continue to be taken weekly until the end of any support of excavation installation within 100 feet of the instrument and backfilling of the excavation.
Deformation Monitoring Points and Tiltmeters	One reading every five (5) feet of completed excavation or every week, whichever is more frequent, until excavation has reached full depth. Readings shall be taken once daily if limiting values are exceeded and until the readings have equilibrated to the satisfaction of the Design Engineer. Readings will continue to be taken weekly until the end of any support of excavation installation within 100 feet of the instrument and backfilling of the excavation.
Tape Extensometer	One reading every day while excavation is open. One reading every day while internal struts are loaded during demolition and construction.
Seismographs	Formal initial background seismograph readings shall be taken prior to the beginning of excavation, installation of excavation support, compaction, or other vibration-producing construction activity. Initial readings on facilities shall consist of a minimum of 24 hours of continuous monitoring of peak particle velocities, which shall be printed to a strip chart. During this period, particle velocities shall be read with a minimum sensitivity of 0.002 in./sec. Prior to the beginning of a vibration-producing construction activity within 100 feet of a vibration monitoring location, determine peak particle velocity and corresponding frequencies, (i.e. full wave form data, produced by individual or discrete events caused by vibration-producing activities) to establish the maximum energy which can be used without surpassing acceptable vibration levels as specified in Table 2. During vibration-producing construction activity, record vibrations continuously with the threshold trigger level of the seismograph set at 50% of the limit specified in Table 2. Monitoring shall continue until completion of the construction activity or until the Contractor has demonstrated to the satisfaction of the Design Engineer, that the construction activity will not exceed the limits specified in Table 2. Monitoring and full wave form data shall be recorded and submitted.

ITEM 100.95 (Continued)

TABLE 2 - THRESHOLD AND LIMITING INSTRUMENTATION READINGS

INSTRUMENT	THRESHOLD VALUE	LIMITING VALUE
Railroad monitoring points	To be selected based on preconstruction data	Horizontal ± 0.5 inches; Vertical ± 0.5 inch
Deformation Monitoring Points	1/8" above ambient tunnel movements	0.5 inch
Tiltmeters	L/5000 above ambient tunnel movements	0.5 inch
Crack Monitor	2 mm	Note (1)
Tape Extensometer	To be selected based on preconstruction data	0.25 inch
Seismograph	To be selected based on preconstruction data	See Table 3

TABLE 2 NOTES:

1. Crack monitor data shall be evaluated by the Contractor in conjunction with DMP data.

ITEM 100.95 (Continued)

TABLE 3 - RESPONSE VALUES
VIBRATION ACCEPTANCE CRITERIA WITH SEISMOGRAPHS

RESPONSE VALUES FOR ALL SEISMOGRAPHS

STRUCTURAL CATEGORY	f(Hz)	PEAK PARTICLE VELOCITY (ppv) Limiting Value (in/sec)
I	1-30	0.5
	30-60	0.5-0.7*
II	1-30	0.3
	30-60	0.3-0.5*
III	1-30	0.2
	30-60	0.2-0.3*
IV	1-30	0.12
	30-60	0.12-0.2*

NOTES:

1. Limiting Value: (*) the lower value applies to 30 Hz, the upper to 60 Hz, with interpolation in between.

2. Vibration acceptance criteria for building based on Swiss Standard SN640312. This standard allows acceptance criteria according to building type and the frequency and type of expected construction related vibrations. For the purpose of this Project, the acceptance criteria of the Swiss Standard were converted to English units (inches per second), and are incorporated in this table.

3. f(Hz) = frequency in hertz.

4. Strict vibration thresholds and limits have been established for buildings in the vicinity of the construction. The Contractor is advised that due to the close proximity of the construction to some of these buildings, construction means and methods may need to be altered or restricted to operate within the range of vibration established.

5. Response values for airblast overpressure are based on peak airblast levels with a 2-Hz descriptor, as recommended by the U.S. Bureau of Mines.

6. Structural Category Definitions:

Location	Structural Category
Alewife Station building	To be defined
Alewife Headhouse building	To be defined

ITEM 100.95 (Continued)

BASIS OF PAYMENT

Item 100.95 will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, furnishing, installing, protecting, reading, reporting, maintaining instrumentation, removing instrumentation, engineering services, submittals, and all incidental costs required to complete the work.

ITEM 100.951 **PRE-CONSTRUCTION AND POST-CONSTRUCTION SURVEYS** **LUMP SUM**

DESCRIPTION OF WORK

A. Work Included: This Section specifies the following work.
   1. The Contractor shall provide (1) a pre-construction survey, and (2) a post-construction survey for the existing buildings near the Bridge. These are the Alewife Station building and the Alewife Headhouse located within a distance of 200 feet from the superstructure replacement. Additionally, the Contractor shall provide a pre-construction and post-construction survey of the Red Line Tunnel within a distance of 200 feet from the superstructure replacement.
   2. The Contractor shall incorporate a narrated color video and photographs of conditions reviewed in the pre-construction and post-construction survey. The Contractor shall employ the services of a professional commercial photography firm to prepare the photographs and video of the project.
   3. As part of both the pre-construction survey and the post-construction survey, the Contractor shall provide a field survey around the perimeter of these buildings to determine elevations and locations of existing surface features within 50 feet.
   4. Authorities: MBTA and MassDOT

B. Related Work:

   Item 100.95. Geotechnical Monitoring and Instrumentation.

SUBMITTALS

A. **Professional Engineer Qualifications:** Within 15 days of Notice to Proceed, submit the qualifications of the Professional Engineer that will perform the pre-construction survey, the monitoring during the construction period, and the post-condition survey.

B. **Photographer Qualifications:** Prior to performing any photography and video work, submit the qualifications of the professional commercial photography firm that will be performing the photography and video recording work. Include a list of past projects to demonstrate compliance with this Section. For each project, include the project name, location, owner, year, name of the general contractor, and current address and phone number of the owner or owner's representative.

ITEM 100.951 (Continued)

C. **Surveys and Reports:** Submit copies of pre-construction surveys, and post-construction surveys as follows:
   1. The pre-construction survey report, including photos and videos, shall be submitted via e-Builder to the Authorities at least 30 days before the start of construction. Field survey data shall be included on the drive in both AutoCAD 2018 .dxf and PDF formats.
   2. Monitoring reports shall be submitted via e-Builder to the Authorities within 5 days of the completion of monitoring field work.
   3. The post-construction survey report, including photos and videos, shall be submitted via e-Builder to the Authorities, after construction activities have concluded, but no later than the Contract's Substantial Completion. Field survey data shall be included on the drive in both AutoCAD 2018/2023 .dxf and PDF formats. The post-construction survey report and related materials shall be included among the "Record Documents" to be submitted and approved prior to the Final Acceptance Inspection by the completion of the project.

D. **Photographs:**
   1. Submit via e-Builder digital images at the time of development Enclose each photograph in a clear plastic photo holder.
   2. Photographs will become the property of the Authorities and may not be published without written permission of the Authorities.

E. **Releases:** Submit written releases from the photographer, videographer, and photographic studio covering all videos and photographs.

QUALITY ASSURANCE

A. **Qualifications**
   1. Employ the services of a professional commercial photographer who has successfully performed at least three construction photography projects of similar size and character to that specified in this project within the past five years.
   2. Qualifications of the firm performing the pre-construction survey and post-construction survey building inspections:
      a. Inspections shall be performed by or under the direct supervision of a Registered Professional Engineer, licensed in the Commonwealth of Massachusetts. The Professional Engineer shall have at least 5 years of experience in inspection of existing structures.

DELIVERY, STORAGE, AND HANDLING

A. **Packing and Shipping**
   1. Transmit hard copies of reports in protective packaging to prevent damage to contents.

ITEM 100.951 (Continued)

PRE-CONSTRUCTION SURVEY

A. **Notice:** Provide notice in writing to the building's owners and Authorities at least 7 days prior to conducting the preconstruction survey. Advise in the notice the dates on which the pre-construction survey will be performed so the building's owners and Authorities will have representatives present during the examination.

B. **Survey:** Complete the pre-construction inspection condition survey for all existing features within 50 feet of the office building and Right-of-way as indicated. The pre-construction survey shall be performed prior to any demolition or construction activities. Conduct a detailed examination to include interior and exterior visual surveys. Examination of shall include, but not be limited to:
   1. Interior and exterior building components/features including, but not limited to, roof, windows, walls, foundations, steel framing, concrete slabs, utilities, and all other existing features.
   2. Within 50 feet of the building, include curbs, fencing, concrete slabs, railroad tracks utilities, drains, and all other existing features.
   3. Note all deficiencies and damage within the report.

C. **Videos and Photographs:** Take narrated color video and color photographs showing visually evident structural faults including, but not limited to, locations and sizes of concrete spalls and cracks in walls and slabs; damaged masonry or steel framing; damaged utilities, exposed wires/cables; damaged windows and doorways; damage to foundations. Include damaged finishes, windows and doorways, tightness of fit of doors and windows in their respective jambs and roof deficiencies. Video voice over descriptions of defects shall be provided.

D. **Field Verifications:** Field verification of existing features required for proposed work may also be performed during this time or otherwise incorporated in the Contractor's construction schedule.

E. **Additional Survey:** The Contractor may elect to perform the pre-construction inspection survey on buildings, structures, and site features not included in the limits specified in this Section. Such additional preconstruction inspection surveys shall be performed at no additional cost to the Authorities and MassDOT.

F. **Draft and Final Survey Report:** Prepare a draft pre-construction survey report for review and approval by the Authorities. Prepare a final pre-construction inspection survey report that responds to Authorities comments on the draft report.

POST-CONSTRUCTION SURVEY

A. **Survey**: Upon conclusion of construction activities, perform an examination similar to the pre-construction condition survey. The post-construction condition survey shall include everything (all limits, items noted under Article 1.5) inspected in the pre-construction condition survey.

ITEM 100.951 (Continued)

B. **Survey Engineer:** The same engineer who performed the pre-construction survey and the periodic inspections shall perform the post-construction survey.

C. **Vantage Point of Photographs:** Photographs shall be taken at the same locations and from the same view as the pre-construction survey photos.

D. **Notice:** Provide notice in writing to the Authorities at least 7 days prior to conducting the post-construction survey. Advise in the notice the dates on which the post-construction survey will be performed so the Authorities may have representatives present during the final examination.

E. **Discrepancies and Damage:** Any discrepancies or new damage noted by the engineer during the survey shall be immediately brought to the attention of the Authorities.

F. **Draft and Final Survey Reports:** Prepare a draft post-construction survey report for review and approval by the Authorities. Prepare a final post-construction inspection survey report that responds to Authorities comments on the draft report. Clearly note any discrepancies or new damage in the survey report.

RESOLUTION AND DISCREPANCIES AND NEW DAMAGE

A. **Root Cause Analysis:** At the request of the Authority, the same engineer who conducted the surveys shall perform a root cause analysis relating to any discrepancies or new damage.

B. **Repairs:** Any new damage shown to be the result of construction work shall be repaired by the Contractor to the satisfaction of the Authorities at the Contractor's expense.

PRODUCTS

VIDEO RECORDINGS

A. **Format:** Digital recorded and submitted via e-Builder.

B. **Video Identification:**

1. Video Number: ####-yyy
   Where: #### = Contract Number
   yyy = Video number, sequentially numbered from 001
2. Clearly identify and indicate:
   a. Project name and Contract No.
   b. General description of the subject(s) of the video
   c. Location of video recording with respect to the key plan lettered areas shown on the Drawings.
   d. Date(s)

C. **Log of Videos:** Provide a binder with the log of all videos taken for this Contract. Format of the log shall be tabular and shall include a description of each video that includes all the information specified in Article 2.1.B of this Section.

ITEM 100.951 (Continued)

PHOTOGRAPHS

A. **Print Identification:**

1. Photograph Number: ####-yyy-zz
   Where: #### = Contract Number
   yyy = Roll of film, sequentially numbered from 001 (if applicable)
   zz = Photograph number, sequentially numbered from 01 for each roll of film.
2. Clearly identify and indicate:
   a. Project name and Contract No.
   b. The location where the photograph was taken with respect to the key plan lettered areas shown on the Drawings.
   c. The view/orientation of the photograph (compass direction and vertical declination of view (e.g., horizontal, looking up, looking down, etc.)
   d. Identification of main features in view.
   e. Any other data and information pertinent to the purpose and identification of the exposure.
   f. Date and time.
   g. Weather conditions (for exterior shots).
3. Each print shall be identified with information on it in a manner that results in minimum interference with exposure printed.

EXECUTION

Not used.

BASIS OF PAYMENT

Item 100.951 will be paid for at the Contract LUMP SUM price, which price shall include full compensation for all labor, materials, equipment, engineering Services, submittals, reporting, and all incidental costs required to complete the work.

Partial payment for Item 100.951 Pre- and Post- Construction Survey will be on a percent of the lump sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by MassDOT. Up to two partial payments will be accepted.

END OF SECTION

ITEM 102.2 TREE TRIMMING LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsections 8.08 and 101 of the Standard Specifications and the following.

The work under this Item 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)

DESCRIPTION OF WORK

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.

ITEM 102.2 (Continued)

BASIS OF PAYMENT

Item 102.2 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, certifications, materials, equipment, apparatus, tools, certified arborist services, and all incidental costs required to complete the work.

ITEM 102.3 HERBICIDE TREATMENT OF INVASIVE PLANTS HOUR

This work must be performed by persons who meet the qualifications below and are approved by the Landscape Design Section.

Work under this Item consists of herbicide treatment of invasive plants currently existing within the project limits and as directed. Works shall be if and as required by the Engineer in coordination with the MassDOT Landscape Architect. Work shall be only if determined necessary should Japanese knotweed be found within the limits of soil disturbance and herbicide is required to prevent spread.

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

Payment is per hour on-site and shall be compensation for a minimum crew of 2 licensed applicators, 2 back-pack sprayers and mist-blowers, a properly equipped spray truck with spray hoses, and a tank with sufficient capacity for a full day of work. If there is only one applicator, hourly payment shall be adjusted to 50 percent of the unit price.

Date and time stamped photos indicating start and stop time of work must be submitted if requested.

This item is not intended for manual removal of plants.

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

Herbicide shall be applied during daytime hours only.

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

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

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

ITEM 102.3 (Continued)

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

Areas identified for vegetation control measures shall be as shown on the plans and as determined in the field by the Engineer and a MassDOT Landscape Architect. Contact at MassDOT Landscape Design Section may be contacted at: George.batchelor@state.ma.us.

QUALIFICATIONS

The applicators shall submit and meet the qualifications outlined below. A list of contractors specializing in invasive management and approved by MassDOT Landscape Design Section is available on the following website: https://www.mass.gov/lists/landscape-design-and-roadside-maintenance under Invasive Plant Management.

Requirements

1. Company must provide proof of qualifications by providing the following:
   a. Narrative describing company, its expertise and experience with invasive plant control.
   b. Demonstrate experience with herbicide treatment as part of restorations and in sensitive areas.
   c. Describe company's technical qualifications and past performance.

2. Company must meet licensing requirements:
   a. All crew applicators must have a Massachusetts Commercial Applicator License (CORE).
   b. At least one or more applicator must have a ROW certification, if required for work.
   c. Company must provide name(s) of applicator(s) and Applicator License/Certification number for all contractor crew leaders working on the project.
   d. Company must provide documentation of any warnings, penalties or fines received in the last three (3) years.

3. Company must provide proof of experience with invasive plant control and include following:
   a. At least five (5) references from prior invasive plant control work completed in last five (5) years. Provide contact information including address, phone number and email.
   b. Provide a summary of each of these projects including nature of the problem, specific invasive vegetation treated, dates and period of treatment, methodologies used, and summary of success or not in terms of meeting performance objectives. Include summary of equipment used.
   c. Photo documentation of these projects.
   d. GPS coordinates of project locations, if available.
4. Crew leader must have expertise with invasive plant control and provide the following:
   a. Have held Core license for at least five (5) years.
   b. Resume listing five (5) or more years of experience applying pesticides with the company or with another company specializing in vegetation management.

ITEM 102.3 (Continued)

SUBMITTALS

No work shall begin without approval of the submittals.

Submittals include the following items:

Herbicide Use Report

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

Photo Documentation

Digital photos with date and time of herbicide application work, showing start time and completion time, are required and must be submitted for measurement of payment upon request.

MATERIALS

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

METHODS

Methods, herbicides used, and time of treatment shall be approved by the MassDOT Landscape Architect.

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

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

Herbicide Applications

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

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

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

ITEM 102.3 (Continued)

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

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

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

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

Disposal Of Invasive Plant Material

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

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

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

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

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

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

Follow-Up Treatment

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

ITEM 102.3 (Continued)

MEASURE OF SUCCESS

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

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

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

Payment will be based upon verified time spent on the project doing herbicide applications as agreed upon with the MassDOT Engineer and Landscape Architect and upon receipt and approval of submittals. Payment will not include travel time to and from the Contractor's place of business and nor time for investigative field trips.

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

ITEM 102.511 TREE PROTECTION – ARMORING AND 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, including 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 Sections 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.

MATERIALS

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.

ITEM 102.521 (Continued)

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.

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.

ITEM 102.521 (Continued)

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.

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 fencing.

- Sixty (60) percent of the value payment will be made when 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 102.523 TREE AND PLANT PROTECTION – VISIBILITY STAKES FOOT

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

Work under this item consists of furnishing, installing, removing, replacing, resetting visibility stakes, and final removal of stakes.

The purpose of the visibility stakes is to delineate a Tree and Plant Protection Zone (TPPZ), signifying a construction work-free zone, thereby preventing damage to tree roots, tree trunks, soil, and all other vegetation; as shown on the Drawings, or 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.

MATERIALS

Stakes shall be wood stakes or metal U-Channel stakes or similar as approved by the Engineer. Stakes shall be a minimum of 48 inches tall, measured from the ground, with a minimum of 12 inches embedment (total stake length of 60 inches), and painted orange for visibility. Stakes shall be set at the distance necessary to remain highly visible, but no farther than four (4) feet apart. The Engineer shall determine if closer spacing is required.

If required to establish a more effective protection zone, the Contractor shall supply and install signage to notify workers of the intended purpose of the visibility stakes and the TPPZ.

ESTABLISHMENT OF THE TPPZ

Visibility stakes 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.

The line of stakes shall be located as close to the work zone limit and as far from tree trunk(s) as possible to maximize the area to be protected. Stakes shall run parallel and adjacent to construction activity to create a visual barrier between the work zone and the root zone or designated limit of plants and soils to be protected.

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

The Contractor shall not engage in any construction activity within the TPPZ without the approval of the Engineer, including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets. Accessing or traversing the TPPZ shall not be permitted.

ITEM 102.523 (Continued)

METHOD OF WORK

Stakes shall be installed prior to any construction work or staging activities and be maintained in a vertical position. Stakes shall be repositioned or replaced where and as necessary for optimum effectiveness. Repositioning, replacement and adding additional stakes shall be incidental to this item. Delineation line shall not be moved without prior approval by the Engineer.

Stakes that are broken, no longer visible, or otherwise no longer function for the intended purpose shall be immediately replaced.

The TPPZ shall be protected 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, stakes shall be removed and disposed off-site by the Contractor.

REQUIRED WORK WITHIN THE TPPZ

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

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

TREE AND PLANT DAMAGES OR LOSS

If the TPPZ is 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) 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 damage will be assumed. Action shall be taken as specified below.

In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense, 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 damage, the Contractor shall take corrective action immediately using methods approved by the Engineer, in coordination with the Arborist.

ITEM 102.523 (Continued)

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

If the recommendation 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 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

Item 102.523 Visibility Stakes will be measured and paid for payment by the linear FOOT, complete in place.

This will include all labor, materials, equipment, maintenance, resetting, final removal/disposal of the stakes, damage repaired, and all incidental cost required to complete 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 visibility stakes.

- Sixty (60) percent of the value payment will be made when stakes have been maintained to function as specified for the intended duration and removed and disposed off-site at the completion of protective measure requirement.

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

In the event of irreparable damage due to lack of or improper protective measures being taken, no compensation shall be given, in addition to the assessed damages deducted from the contract price of the work.

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

DESCRIPTION

The work under this Item is for the services of a Certified Arborist. Arborist shall be an International Society of Arboriculture (ISA) Certified Arborist or a Massachusetts Certified Arborist. The Arborist shall have at least 10 years of experience in tree care, including tree protection during construction, and shall demonstrate a familiarity with the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 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, stating areas, and access routes; recommending removal of diseased, damaged or otherwise unhealthy trees that pose a potential safety hazard; evaluating effects of construction on future health of trees close to proposed work; and recommending and/or overseeing tree work and care.

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

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

SUBMITTALS

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

ITEM 102.55 (Continued)

SCOPE OF WORK

The Arborist shall be responsible for the following tasks:

- Initial Evaluation and Report
  - recommend and prioritize trees that require removal as appropriate to contract scope, project limits, and project intent;
  - review and modify, if necessary, tree protection measures shown on the drawings
  - review and mark limits of protective fencing for trees and groups of trees to be retained;
  - review and recommend protection measures for high priority trees;
  - submit a marked-up Construction Plan that briefly notes recommendations and decisions made in the field;
  - submit a corresponding report including photo documentation;
- Oversight
  - direct or execute pruning of branches and/or roots, air spading, and/or other tree care operations
- Monitoring and Inspections
  - periodically inspect fencing and ensure root zones are properly protected and clear of equipment and materials as required by the Engineer
  - reevaluate tree protection measures for various phases of a project, if required by the Engineer
  - submit inspection notes with relevant and dated photos to the Engineer.
- Special Care
  - oversee tree pruning if required for trees that receive root pruning

METHODS

Prior to any work, the Arborist shall walk the site with the Contractor, the Engineer, the Town Tree Warden, and 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.

If prior to or during construction the Contractor identifies a tree is in conflict with proposed work, the Arborist shall be consulted and a site visit shall be performed with the Arborist, the Contractor, the Engineer, and the MassDOT Landscape Architect to evaluate the existing tree with respect to the proposed work, per the direction of the Resident Engineer.

If the Arborist determines a tree shall be removed in order to execute the work, all removal shall be in accordance with Section 101 of the MassDOT Standard Specifications. Work associated with the removal shall be paid for under Item 103 Tree Removal.

Trees to be removed shall be painted or otherwise marked.

ITEM 102.55 (Continued)

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

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

MEASUREMENT AND BASIS OF PAYMENT

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

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

ITEM 114.1 DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. C-01-031 (4DR) LUMP SUM

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

The work under this Item shall consist of furnishing all labor, materials, and equipment necessary to perform the demolition of the bridge superstructure of the existing Bridge No. C-01-031 (4DR), to the limits shown on the Plans, miscellaneous items as noted below, or as directed by the Engineer. Except as specified, all materials and debris shall become the property of the Contractor and shall be disposed of properly.

The demolition of the superstructure includes staged removal of the superstructure as shown in the plans. The Contractor shall remove and dispose the following: the bridge wearing surface, concrete deck slab, sidewalk, safety curb, bridge rail, reinforced concrete prestressed beams, bearings, utility bay and utilities within the utility bay, and as required by the Engineer.

The demolition of superstructure also includes the removal of the existing timber shoring towers in their entirety including the shoring beams, jacks, and hardware. The Contractor shall deliver all materials associated with the existing towers to the MassDOT District 6 Maintenance Facility.

The partial substructure demolition for Bridge No. C-01-031 is described and paid for under Item 127.1 Reinforced Concrete Excavation.

The Contractor must conduct a field investigation prior to submitting bids to get familiar with the scope of work and bridge condition. The Contractor shall verify all conditions, dimensions, and materials in the field and shall base their bid on their own findings without additional compensation for variances from the Plans or these Special Provisions regarding actual conditions for the materials to be removed.

The Contractor shall take all measures necessary to protect pedestrian and vehicular traffic from their construction operations. Materials shall be removed carefully so as to avoid damage to adjacent utilities. During the prosecution of this work, the Engineer may reject the use of any method or equipment, which causes undue vibration or possible damage to the remaining superstructure or any part thereof. No explosives shall be used.

The Contractor shall not place heavy equipment or store equipment/materials on the pedestrian path below the bridge, located atop the red line tunnel roof. See aerial image in the up front section of these Special Provisions for the general work zone restriction.

ITEM 114.1 (Continued)

Demolition shall be carried out in a staged manner in accordance with the approved demolition plan, with strict adherence to the requirement that no heavy equipment be placed on, or materials stored atop, the pedestrian path located above the Red Line tunnel roof. All cranes and lifting equipment shall be positioned outside the restricted area, and lifting operations shall be carefully planned to maintain safe distances and clearances. Removed materials shall be promptly transported to designated disposal or staging areas away from the tunnel roof. To prevent debris from falling onto the pedestrian path or tunnel structure, the Contractor shall install temporary protective shielding or catch platforms.

The anticipated superstructure demolition sequence is as follows:

1. Cut the existing lateral anchorage strand at the stage line.
2. Saw cut the wearing surface and topping slab along the joints between beams.
3. Lift each beam and transport it to the designated staging area for subsequent demolition.

The Contractor shall locate and protect from damage all existing utilities. The Contractor shall contact utility companies to verify existing utilities and locations and coordinate proposed utility locations prior to demolition and construction.

The Contractor is responsible for providing temporary protective shielding or similar to prevent debris from falling onto the pedestrian path below Bridge No. C-01-031 during demolition and construction. Temporary protective shielding shall be incidental to this item.

SUBMITTALS

The Contractor shall prepare and submit a demolition plan and procedure to the Engineer for review and approval describing the proposed sequence, method of demolition and equipment for the demolition and disposal of all materials including checked calculations sufficient to substantiate the adequacy of the proposed method. In addition, demolition plans, details, schedules and submittals shall be provided for each stage of construction required by the project in accordance with the Plans. It shall also include a schedule of operations, methods of utility protection or relocation (if required), and disposal locations.

The demolition plan shall also discuss protection and/or relocation of utilities needed prior to demolition.

The Contractor shall be solely responsible for maintaining the stability of the existing structures, at all times, during the demolition and construction operations. Any designs for temporary strengthening or bracing of portions of the existing structure to remain are the responsibility of the Contractor. Design of temporary strengthening or bracing of portions of the existing structure shall be included in the demolition plan and procedure package. Temporary shoring of existing beams for Bridge No. C-01-031, as shown on the plans is covered under Item 950.1 Temporary Shoring.

ITEM 114.1 (Continued)

The demolition procedures and any necessary calculations and drawings shall bear the stamp of a Professional Engineer registered in the Commonwealth of Massachusetts certifying that all existing structural members are suitably braced and supported throughout the demolition process. Work shall not commence until the Engineer has given written approval of the method of demolition.

As a minimum, the following information shall be included in the submittal:

- Plan showing the location of the travel lanes, utilities, and other appurtenances in areas of demolition including those lanes temporarily closed to traffic during each stage of demolition.
- Plan showing limits of superstructure removal which shall include layout of deck sawcut lines.
- The location of cranes, crane capacities, rigging, tools, or other proposed lifting equipment, both horizontally and vertically, and their operating radii. Surcharge loads on the existing tunnel walls and Alewife Brook Parkway retaining walls and calculations proving that the existing structures will not be affected by the construction equipment.
- Lifting equipment information including rating data and pick weight computations. Information shall include counterweights to be used and boom capability (crane capacity shall be adequate for 150 percent of the total pick weight which shall include spreaders and other material). Crane capacity shall be as shown on manufacturers capacity charts after all reductions taken.
- If the cranes and other heavy equipment are to be placed on the bridge superstructure, the Contractor shall provide calculations, stamped by a Professional Engineer registered in Commonwealth of Massachusetts, demonstrating that the existing bridge has the capacity to support the proposed construction loads. Shoring towers and/or strengthening of existing members shall be provided if necessary. The Contractor's construction methods, materials, and design calculations shall also be provided.
- The type, size, arrangement and capacity of slings, shackles or other lifting and connecting devices including relative technical data.
- The crane mat design, including at a minimum two mat layers, supporting the Contractor's loads and equipment that ensures uniform distribution of the crane loading.
- Critical bearing pressures beneath crane supports, allowable bearing pressures, external stability, and global slope stability as determined by a Geotechnical Engineer retained by the Contractor, any temporary ground modifications or crane mats required, any utility protection requirements as stipulated by the owners of the utilities
- Calculations demonstrating that the connections to the existing bridge components to be lifted are adequate and will not exceed allowable stresses in the lifting system or the existing component being lifted.
- The order of lifts, repositioning of equipment and weights, and location and method of attaching deadmen.
- Methods, materials and design calculations for temporary structures or the strengthening or bracing of a member (either temporarily or permanently) for demolition purposes.
- Roadway clearance envelopes as needed, as well as clearance envelopes during crane operations including tail swing.

ITEM 114.1 (Continued)

- Plan showing limits of proposed precast bridge elements to be installed adjacent to the proposed demolition. Plan shall also provide working points for staged demolition coordinated with the proposed precast bridge elements.

The Contractor shall not proceed with demolition until the Engineer has given a written acceptance of the plan. Any changes to this demolition procedure will require prior review by the Engineer. The Contractor shall also obtain approval of the demolition plan from the MBTA prior to proceeding with demolition and provide documentation of that approval to the Engineer.

Any lifting plans for the demolition procedure shall conform to the requirements of Subsection 960 of the Standard Specifications. The Contractor's demolition method shall take into consideration any utilities and drainage structures near the bridge, traffic on Alewife Brook Parkway and the pedestrian path beneath the bridge. Debris from construction must be carefully contained within the work zone and prevented from falling below the bridge. The Contractor shall be required to remove any debris which is generated by demolition from the site immediately and to restore portions of the site affected by the operation to their original undisturbed condition or better. The Contractor shall also be responsible for dust control as a result of the demolition operations. The Contractor shall take care not to damage any existing structural components that have been designated to remain, or any newly constructed structural components, as shown on the Plans. Any structural components so designated that are damaged or otherwise made unsatisfactory for continued use by the Contractor's operations, as determined by the Engineer, shall be replaced or repaired to the satisfaction of the Engineer by the Contractor at his/her own expense.

CONSTRUCTION METHODS

Demolition of Bridges

Staged demolition of these structures shall be in accordance with the accepted demolition plan and required details as shown on the Plans. No blasting or use of explosives is permitted.

The Contractor shall not place heavy equipment or store equipment/materials on the pedestrian path below the bridge, located atop redline tunnel roof.

The Contractor's means and methods of construction shall not damage any retained elements of the existing or proposed bridge and the red line tunnel beneath the bridge. Any damage done to the retained portions of the Project by the Contractor's operations shall be repaired to the original condition as required by the Engineer, at the Contractor's expense.

BASIS OF PAYMENT

Item 114.1 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, equipment, temporary shoring, temporary shielding, submittals, engineering services, sawcutting, disposal fees necessary, transportation, and all incidental costs required to complete the work.

The substructure demolition is described and paid for under Item 127.1 Reinforced Concrete Excavation.

ITEM 119.5 CONSTRUCTION NOISE CONTROL LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsection 7.02 of the Standard Specifications, and the following:

The intent of this Item is to minimize construction noise within construction areas, lay-down areas, and communities adjacent to the construction site. The Contractor and all subcontractors, suppliers, and vendors, shall comply with all applicable local noise regulations, specification requirements, and noise level limits specified herein.

This Item specifies requirements for the Contractor to perform all necessary noise monitoring tasks including response to community complaints. All requirements of this Item will be overseen by an approved Acoustical Engineer employed by the Contractor.

The Contractor will use equipment with efficient noise-suppression devices and employ other noise abatement measures such as enclosures and barriers necessary for the protection of the public. In addition, the Contractor will schedule and conduct operations in a manner that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the Work and to occupants of buildings in the vicinity of the Work.

In no case will the restrictions identified in this Item limit the Contractor's responsibility for compliance with all Federal, state, and local safety ordinances and regulations. The Contractor shall also review and follow the City of Cambridge Noise Ordinance found in chapter 8.16 of the City of Cambridge's Code of Ordinances.

Link to document:
https://library.municode.com/ma/cambridge/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.16NOCO&searchText=

TERMS USED

Noise is any audible sound which has the potential to annoy or disturb humans, or to cause an adverse psychological or physiological effect on humans.

Daytime refers to the period from 7 AM to 6 PM local time daily, except Sundays and Federal holidays.

Evening refers to the period from 6 PM to 10 PM local time daily, except Sundays and Federal holidays.

Nighttime refers to the period from 10 PM to 7 AM local time daily, as well as all day Sundays and Federal holidays.

Noise-Sensitive Locations shall mean locations where particular sensitivities to noise exist, such as residential areas, institutions, hospitals, and parks.

ITEM 119.5 (Continued)

Nuisance Noise refers to sound levels that annoy or disturb a reasonable person of normal sensitivities, but do not necessarily exceed the noise limits specified herein.

Lot-line refers to the line separating a parcel of land from another parcel or from the street.

Background Noise will be defined as the measured ambient noise level associated with all existing environmental, transportation, and community noise sources in the absence of any audible construction activity.

dBA will be defined as the sound level (in decibels referenced to 20 micro-Pascals) as measured using the A-weighting network on a sound level meter, in accordance with ANSI Standard S1.4.

Lmax will be defined as the maximum measured sound level at any instant in time as measured over a specified time period.

Leq will be defined as the equivalent sound level, or the continuous sound level that represents the same acoustic energy as the varying sound levels over a specified time period.

L10 will be defined as the sound level exceeded 10 percent of the time for a specified time period.

Slow specifies a time constant of 1 second for the root-mean-square (RMS) detector used by a sound level meter in accordance with ANSI Standard S1.4.

Impact Noise is noise produced from impact devices with discernible separation in sound pressure maxima. Examples for impact equipment include, but are not limited to, blasting, clam shovel or chisel drops, pavement breakers, jackhammers, hoe rams, mounted impact hammers, and impact pile drivers (but not vibratory pile drivers). Table 3 specifies types of equipment which are considered to emit impact or continuous noise. Non-impact equipment is considered to emit continuous noise.

SUBMITTALS

Submit the name, address, and qualifications of the Acoustical Engineer, as specified in this Item for review and acceptance.

Develop and submit for approval a Noise Control Plan (NCP) that outlines in detail the measures to be implemented by the Contractor to comply with this Item. Any modifications to the approved NCP must be submitted for review and approval prior to implementation.

Submit weekly Noise Compliance Reports to MassDOT summarizing the previous week's measured noise data, noise complaint investigation details and results, and any mitigative actions taken.

Submit (as needed) shop and working drawings, computations, material data, and other descriptions for abatement measures used such as Temporary Noise Barriers, Acoustical Barrier Enclosures, or Noise Control Curtains as specified in this Item. Drawings and computations will be stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts.

ITEM 119.5 (Continued)

CONSTRUCTION LIMITATIONS

NOISE LEVELS

Daytime, evening, and nighttime construction cumulative noise levels at noise-sensitive locations and other noise monitoring locations will not exceed the limits specified in Tables 1 & 2, or 5 dBA above surrounding background noise levels (whichever is louder), unless the noise exceedances occur when mitigation consistent with this specification is utilized as determined by MassDOT. The lot-line noise criteria will apply to all points on a given lot-line of an affected receptor.

Background noise levels shall be field measured prior to the development of the noise control plan and submit to the Engineer for review. The field measures noise levels shall be incidental to this Item.

In addition, equipment operating under full load shall not exceed the Lmax noise limits specified in Table 3, unless noise exceedances occur when mitigation consistent with this specification is utilized as determined by MassDOT. The 50-feet noise emission limits specified in Table 3 will apply to the entire operation in which the equipment is engaged. Table 3 also provides distinction as to which equipment is considered to emit impact or continuous noise.

Work shall be performed in a manner to prevent nuisance conditions such as noise which exhibits a specific audible frequency or tone (e.g., backup alarms, unmaintained equipment, brake squeal) or impact noise (e.g., jackhammers, hoe rams). MassDOT shall make any final interpretation concerning whether or not nuisance noise conditions exist. MassDOT has the authority to stop the Work until nuisance noise conditions are resolved, without additional time or compensation for the Contractor.

EQUIPMENT OPERATIONS

If night work is allowed by MassDOT, impact and vibratory pile driving shall be prohibited during the nighttime period (i.e., 10 PM to 7 AM).

If night work is allowed by MassDOT, the use of all impact devices, including hoe rams, jackhammers, chiseling devices, and pavement breakers, shall be prohibited during the nighttime hours (i.e., 10 PM to 7 AM). Any necessary use of impact devices between 10 PM and 7 AM must be reviewed by MassDOT in advance and allowed as an exception only upon sufficient justification.

The Contractor shall use approved truck haul routes to minimize noise at residential and other noise-sensitive receptor sites.

ITEM 119.5 (Continued)

If night work is allowed by MassDOT, all equipment with backup alarms operated during the hours of 10 PM to 7 AM by the Contractor, vendors, suppliers, and subcontractors on the construction site shall be equipped with either broadband "white noise" backup alarms, self-adjusting ambient-sensitive backup alarms, or manually adjustable alarms. The ambient-sensitive alarms shall automatically adjust to a maximum of 5 dBA over the surrounding background noise levels. The manually adjustable alarms shall be set at the lowest setting required to be audible above the surrounding background noise. Installation and use of the alarms shall be consistent with the performance requirements of the current revisions of Society of Automotive Engineering (SAE) J994, J1446, and OSHA regulations.

Or, if work is allowed by MassDOT between the hours of 10 PM to 7 AM, the Contractor will use in lieu of audible backup alarms an appropriate alternative safety method in accordance with OSHA regulations (29 CFR Part l926, Subpart "O", l926.6Ol.b.4 and l926.6O2.a.9.) and accepted Health and Safety Plan that is to be submitted by the Contractor. This applies to all vehicles and equipment operated by the Contractor, vendors, suppliers, and subcontractors on the construction site.

Per State regulations, engine idling for trucks is limited to 5 minutes maximum.

ACOUSTICAL ENGINEER

The Acoustical Engineer identified in this Article shall oversee all requirements of this Item.

The Acoustical Engineer shall have the following minimal qualifications:

Bachelor of Science or higher degree from a qualified program in engineering, physics, or architecture offered by an accredited university or college, and five (5) years' experience in noise control engineering and construction noise analysis; or current enrollment as a Board-certified Member in the Institute of Noise Control Engineering (INCE).

Demonstrated substantial and responsible experience in preparing and implementing construction noise controls and monitoring plans on construction projects conducted in an urban setting, calculating construction noise levels, and designing and overseeing the implementation of construction noise monitoring and abatement measures.

If at any point, in the judgment of MassDOT, the quality of the Acoustical Engineer's submittals proves to be repeatedly unacceptable, then MassDOT can require the submittal and selection of an alternative Acoustical Engineer meeting the requirements in this Article.

NOISE MEASUREMENTS

NOISE MONITORING EQUIPMENT

All noise measurement and monitoring tasks shall be performed by the Contractor with the oversight of their approved Acoustical Engineer.

ITEM 119.5 (Continued)

Noise measurements shall be performed with an instrument that is in compliance with criteria for a Type 1 (Precision) or Type 2 (General Purpose) Sound Level Meter as defined in the current version ANSI Standard S1.4.

The sound level meter shall be capable of measuring A-weighted noise levels in dBA and operating with an RMS 'slow' time response setting.

Sound level meters shall be capable of measuring Lmax and L10 noise metrics over 20 minute intervals and displaying those results in the field without the need for post-processing of data.

All sound level meters, microphones, and calibrators shall undergo certified laboratory calibration conformance testing at least once a year. The calibration certificate shall be submitted to the Engineer.

NOISE MONITORING METHODS

The sound level meter and the acoustic calibrator shall be calibrated and certified annually by the manufacturer or other independent certified acoustical laboratory. The sound level meter shall be field calibrated using an acoustic calibrator, according to the manufacturer's specifications, prior to and after each measurement.

All measurements shall be performed using the A-weighting network and the RMS 'slow' response of the sound level meter.

The measurement microphone shall be fitted with an appropriate windscreen, shall be located 5 feet above the ground, and shall be at least 5 feet away from the nearest acoustically reflective surface.

Noise monitoring shall not be performed during precipitation or when wind speeds are greater than 15 mph unless the microphone is protected in such a manner as to negate the acoustic effects of rain and high winds.

BACKGROUND NOISE MONITORING

Background noise measurements, expressed in dBA slow, shall be collected for at least 24 hours over two non-consecutive days Monday through Saturday and one Sunday at noise monitoring receptor locations as specified Table 3 and Figure 1 prior to the start of construction. Background noise L10 levels shall be arithmetically averaged into single L10 levels defining the background noise for daytime (7 AM - 6 PM), evening (6 PM - 10 PM), and nighttime (10 PM - 7 AM) timeframes, respectively.

CONSTRUCTION NOISE MONITORING

Noise level measurements shall be taken at each noise-sensitive location during ongoing construction activities at least once each week during the applicable daytime, evening, and nighttime period.

ITEM 119.5 (Continued)

The time period duration for each noise measurement shall be 20 minutes.

Construction noise measurements shall coincide with daytime, evening, and nighttime periods of maximum noise-generating construction activity, and shall be performed during the construction phase or activity that has the greatest potential to exceed noise level limitations. Compliance noise measurements with the noise limits in Tables 1 and 2 shall be performed at a point on a given lot-line which is the closest to the construction activity.

All measurements shall be taken at the affected receptor lot-line. In situations where the Work site is within 50 feet of a lot-line, the measurement shall be taken from a point along the lot-line such that a 50 feet minimum distance is maintained between the sound level meter and the construction activity being monitored.

MATERIALS

GENERAL

All equipment and materials specified in this Item will remain the property of the Contractor or subcontractors, vendors, and suppliers, as applicable.

NOISE REDUCTION MATERIALS AND EQUIPMENT

Noise reduction materials may be new or used. Used materials shall be of a quality and condition to perform their designed function.

Noise reduction equipment and materials may include, but not be limited to:

Shields, shrouds, or intake and exhaust mufflers.

Noise-deadening material to line hoppers, conveyor transfer points, storage bins, or chutes.

Noise barriers using materials consistent with the Temporary Noise Barrier materials specified in this Item.

Noise curtains using materials consistent with the Noise Control Curtains materials as specified in this Item.

If night work is allowed by MassDOT, all equipment with backup alarms operated during the hours of 10 PM to 7 AM by the Contractor, vendors, suppliers, and subcontractors on the construction site shall be equipped with either broadband “white noise” backup alarms, self-adjusting ambient-sensitive backup alarms, or manually adjustable alarms. The ambient-sensitive alarms shall automatically adjust to a maximum of 5 dBA over the surrounding background noise levels. The manually adjustable alarms shall be set at the lowest setting required to be audible above the surrounding background noise. Installation and use of the alarms shall be consistent with the performance requirements of the current revisions of Society of Automotive Engineering (SAE) J994, J1446, and OSHA regulations.

ITEM 119.5 (Continued)

All equipment used on the construction site, including jackhammers and pavement breakers, shall have exhaust systems and mufflers that have been recommended by the manufacturer as having the lowest associated noise.

The local power grid shall be used wherever feasible to limit generator noise. Where a generator is necessary, it will have the maximum noise muffling capability recommended by the manufacturer to meet the noise emission limits specified in Table 3.

TEMPORARY NOISE BARRIERS

MATERIALS

Temporary noise barriers shall be constructed of 3/4-inch Medium Density Overlay (MDO) plywood sheeting, or other material of equivalent utility and appearance having a surface weight of two pounds per square foot (2 lbs/sq.ft.) or greater. The temporary noise barriers shall have a Sound Transmission Class of STC-30, or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90.

Prefabricated acoustic barriers are available from various vendors. An equivalent barrier design can be submitted as specified in this Item in lieu of the plywood barriers described above.

The temporary noise barriers shall be lined on one side with glass fiber, mineral wool, or other similar noise curtain type noise-absorbing material at least 2-inches thick and have a Noise Reduction Coefficient rating of NRC-0.85, or greater, based on certified sound absorption coefficient data taken according to ASTM Test Method C423.

The materials used for temporary noise barriers shall be sufficient to last throughout the duration of construction for this Contract and will be maintained in good repair.

CONSTRUCTION DETAILS

Noise barrier panels shall be attached to support frames constructed to provide a moveable barrier designed to withstand 80 mph wind gust loads plus a 30 percent factor of safety.

When noise barrier units are joined together, the mating surfaces of the barrier sides shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that will completely fill the gaps, and be dense enough to attenuate noise.

The noise barrier height will be designed to break the line-of-sight and provide at least a 5 dBA insertion loss between the noise producing equipment and the upper-most story of the receptor(s) requiring noise mitigation. If for practicality or feasibility reasons, which are subject to the review and approval of MassDOT, a barrier cannot be built to provide noise relief to all stories, then it must be built to the tallest achievable height.

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ACOUSTICAL BARRIER ENCLOSURES

MATERIALS

The acoustical barrier enclosure shall consist of durable, flexible composite material featuring a noise barrier layer bonded to sound-absorptive material on one side.

The noise barrier layer shall consist of rugged, impervious material with a surface weight of at least one pound per square foot (1 lbs/sq.ft.). The sound absorptive material shall include a protective face and be securely attached to one side of the flexible barrier over the entire face.

The acoustical material used shall be weather and abuse resistant and exhibit superior hanging and tear strength during construction. The material shall have a minimum breaking strength of 120 lbs/in. per FTMS 191 A-M5102 and minimum tear strength of 30 lbs/in. per ASTM D117. Based on the same test procedures, the absorptive material facing shall have a minimum breaking strength of 100 lbs/in. and a minimum tear strength of 7 lbs/in.

The acoustical material shall be corrosion resistant to most acids, mild alkalis, road salts, oils, and grease.

The acoustical material shall be fire retardant and be approved by the local fire department with jurisdiction over the proposed location for installation prior to procurement. It shall also be mildew resistant, vermin proof, and non-hygroscopic.

The acoustical material shall have a Sound Transmission Class of STC-25 or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient rating of NRC-0.70 or greater, based on certified sound absorption coefficient data taken according to ASTM Test Method C423.

The Contractor shall submit the name of the manufacturer, properties of the material to be furnished, and two (2) one-foot square samples to MassDOT for review prior to submittal of design and detailed engineering as specified in this Item.

CONSTRUCTION DETAILS

The acoustical barrier enclosure shall be designed to effectively cover a noise producing source and break the line-of-sight to reduce noise affecting nearby noise-sensitive receptors.

The acoustical material shall be installed in vertical and horizontal segments with the vertical segments extending the full enclosure height. All seams and joints shall have a minimum overlap of 2 inches and be sealed using double grommets. Construction details shall be performed according to the manufacturer's recommendations.

The Contractor shall be responsible for the design, detailing, and adequacy of the framework and supports, ties, attachment methods, and other appurtenances required for the proper construction of the acoustical barrier enclosure.

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The design and details for the acoustical noise barrier enclosure framework and supports shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The Contractor shall submit the design and detailed engineering drawings to MassDOT as specified in this Item.

NOISE CONTROL CURTAINS

MATERIALS

Noise control curtains shall consist of durable, flexible, composite material featuring a noise barrier layer bonded to sound-absorptive material on one side. The noise barrier layer shall consist of a rugged, impervious material with a surface weight of at least one pound per square foot (1 lbs/sq.ft). The sound absorptive material shall include a protective face and be securely attached to one side of the flexible barrier over the entire face.

The noise curtain material used shall be weather and abuse resistant and exhibit superior hanging and tear strength during construction. The curtain's noise barrier layer material shall have a minimum breaking strength of 120 lbs/in. per FTMS 191 A-M5102 and minimum tear strength of 30 lbs/in. per ASTM D117. Based on the same test procedures, the noise curtain absorptive material facing shall have a minimum breaking strength of 100 lbs/in. and a minimum tear strength of 7 lbs/in.

The noise curtain material shall be corrosion resistant to most acids, mild alkalies, road salts, oils, and grease. It also will be mildew resistant, vermin proof, and non- hygroscopic.

The noise curtain material shall be fire retardant and be approved by the local fire department with jurisdiction over the proposed location for installation prior to procurement.

Noise control curtains shall have a Sound Transmission Class of STC-30 or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient rating of NRC-0.85 or greater, based on certified sound absorption coefficient data taken according to ASTM Test Method C423.

The Contractor shall submit the name of the manufacturer, properties of the material to be furnished, and two (2) one-foot square samples to MassDOT for review prior to submittal of the design and detailed engineering drawings as specified in this Item.

CONSTRUCTION DETAILS

The noise curtains shall be designed to effectively reduce noise affecting nearby noise-sensitive receptors. The curtains shall be secured above, at the ground, and at intermediate points by framework and supports designed to withstand 80 mph wind gust loads plus a 30 percent factor of safety.

ITEM 119.5 (Continued)

The curtains shall be installed in vertical and horizontal segments with the vertical segments extending the full curtain height to the ground. All seams and joints shall have a minimum overlap of 2 inches and be sealed using Velcro or double grommets spaced 12 inches on center. Curtains shall be fastened to framework and guardrails with wire cable 12 inches on center. Construction details shall be performed according to the manufacturer's recommendations.

The curtain height shall be designed to break the line-of-sight and provide at least a 5 dBA insertion loss between the noise producing equipment and the upper-most story of the receptor(s) requiring noise mitigation. If for practicality or feasibility reasons, which are subject to the review and approval of MassDOT, a curtain system cannot be built to provide noise relief to all stories, then it must be built to the tallest achievable height.

The Contractor shall be responsible for the design, detailing, and adequacy of the framework and supports, ties, attachment methods, and other appurtenances required for the proper installation of the noise control curtains.

The design and details for the noise control curtains framework and supports shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The Contractor shall submit the design and detailed engineering drawings to MassDOT as specified in this Item.

NOISE REDUCTION METHODS

The Contractor shall use all reasonable efforts to implement the noise reduction methods listed below to minimize construction noise emission levels. Noise reduction methods shall include, but not be limited to:

Using: 1) concrete crushers or pavement saws for concrete deck removal, demolitions, or similar construction activity; 2) pre-augering equipment to reduce the duration of impact or vibratory pile driving; 3) local power grid to reduce the use of generators.

Attaching: 1) intake and exhaust mufflers, shields, or shrouds; 2) noise-deadening material to inside of hoppers, conveyor transfer points, or chutes.

Maintaining: 1) equipment mufflers and lubrication; 2) precast decking or plates; 3) on-site roadways to minimize surface irregularities to prevent unnecessary noise.

Limiting: 1) the number and duration of equipment idling on the site; 2) the use of annunciators or public address systems; 3) the use of air- or gasoline-driven hand tools.

Configuring: 1) the construction site in a manner that keeps loud equipment and activities as far as possible from noise-sensitive locations; 2) barrels or signage to detour traffic away from plated trenches.

Scheduling: 1) Construction events and limiting usage times to minimize noise, especially during nighttime hours and near sensitive abutters.

ITEM 119.5 (Continued)

Constructing: 1) noise barriers and/or noise curtain systems.

Minimizing: 1) noise from the use of backup alarms using measures that meet OSHA regulations. This includes use of "white noise" alarms, self-adjusting backup alarms, manually adjustable alarms on low setting, use of observers, and scheduling of activities so that alarm noise is minimized.

Preventing: 1) nuisance noise conditions such as from squealing equipment, backup alarms, radios and public address systems, etc.

COMPLAINT PROCEDURE

The objective of the complaint procedure is to ensure that public and agency noise complaints are addressed and resolved consistently and expeditiously.

To facilitate the handling of noise complaints from the public, the Contractor shall arrange for and maintain a noise complaint hotline (either by phone, text, email and/or website). The hotline shall be able to receive and log the details of noise complaints 24-hours a day. The Contractor shall immediately forward any noise complaints to the Acoustical Engineer and MassDOT.

The Contractor's Acoustical Engineer shall respond to and investigate the noise complaint in the most expeditious manner possible. In the event that noise levels measured by the Acoustical Engineer exceed allowable limits as specified in this Item, or work being performed is resulting in nuisance noise conditions as determined by MassDOT, the Contractor shall immediately use noise reduction materials and methods to reduce noise levels or to alleviate the nuisance conditions.

The Contractor shall submit the details, investigation response, and actions taken for each noise complaint to MassDOT as described in this Item.

BASIS OF PAYMENT

Item 119.5 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, equipment, submittals, engineering services, complaint procedure management, and all incidental costs required to complete the work.

Payment will be made in three equal amounts. One third (1/3) of the LUMP SUM will be paid when the first mobilization payment is paid, 1/3 of the LUMP SUM will be paid at the midpoint of construction as determined by MassDOT, and 1/3 of the LUMP SUM will be paid at Substantial Completion.

TABLES 1, 2, 3 AND FIGURE 1 FOLLOW

ITEM 119.5 (Continued)

TABLE 1. CONSTRUCTION NOISE LOT- LINE LIMITS (b), (c), (d)

Noise Receptor Location Land-Use	L10 Level (dBA, slow) (whichever is greater)	Lmax Level (dBA, slow)
DAYTIME (7 AM to 6 PM)		
Residential Areas	75 or Background+5 (a)	85 or 90 (a)
Commercial Areas	80 or Background+5 (a)	None
Industrial Aras	85 or Background+5 (a)	None
EVENING (6 PM to 10 PM)		
Residential Areas	Background+5	85
Commercial Areas	None	None
Industrial Areas	None	None
NIGHTTIME (10 PM to 7 AM)		
Residential Areas		
If Background < 70 dBA	Background+5	80
If Background >= 70 dBA	Background+3	80
Commercial Areas	None	None
Industrial Areas	None	None

NOTES:

(a) Noise from impact equipment is exempt from the L10 requirement, however it is still subject to a lot-line Lmax limit of 90 dBA.

(b) All measurements shall be taken at the affected lot-line. In situations where the work site is within 50 feet of a lot-line, the measurement shall be taken from a point along the lot-line such that a distance of 50 feet is maintained between the sound level meter and the construction activity being monitored.

(c) Lot-line noise limits shall apply to all points along the receptor's lot-line.

(d) L10 noise readings are averaged over 20 minute intervals. Lmax noise readings occur instantaneously.

ITEM 119.5 (Continued)

TABLE 2. RECEPTOR LOCATIONS, BACKGROUND NOISE LEVELS, AND LOT-LINE NOISE CRITERIA

Site No.	Receptor Location and Address	Land-Use	Background Noise L10 dBA slow			Lot-Line Criteria L10 dBA slow			Lot-Line Criteria Lmax dBA slow		
			D	E	N	D	E	N	D	E	N
NV-1	Alewife MBTA Station	Com							None	None	None
NV-2	Fresh Pond Apartments 364 Rindge Avenue	Res							85/90	85	80
NV-3	IQHQ Alewife Park	Ind							None	None	None

NOTES:

"D" is Daytime defined as 7 AM to 6 PM
"E" is Evening defined as 6 PM to 10 PM
"N" is Nighttime defined as 10 PM to 7 AM
"Res" indicates the land-use of the receptor is "Residential"
"Com/Inst" indicates the land-use of the receptor is "Commercial" or "Institutional"
"Ind" indicates the land-use of the receptor is "Industrial"
"N/A" indicates that data was either not available or criteria limits do not apply

ITEM 119.5 (Continued)

TABLE 3. CONSTRUCTION EQUIPMENT 50-FEET NOISE EMISSION LIMITS (a), (b)

Equipment Category	Lmax Noise Limit at 50 ft, dBA, slow (c)	Is Equipment an Impact Device? (d)	Acoustic Usage Factor (e)
All other equipment > 5 HP	85	No	50 %
Auger Drill Rig	84	No	20 %
Backhoe	78	No	40 %
Bar Bender	80	No	20 %
Blasting	94	Yes	1 %
Boring Jack Power Unit	80	No	50 %
Chain Saw	84	No	20 %
Clam Shovel	87	Yes	20 %
Compactor (ground)	80	No	20 %
Compressor (air)	78	No	40 %
Concrete Batch Plant	83	No	15 %
Concrete Mixer Truck	79	No	40 %
Concrete Pump Truck	81	No	20 %
Concrete Saw	90	No	20 %
Crane (mobile or stationary)	81	No	20 %
Dozer	82	No	40 %
Drill Rig Truck	79	No	20 %
Drum Mixer	80	No	50 %
Dump Truck	76	No	40 %
Excavator	81	No	40 %
Flat Bed Truck	74	No	40 %
Front End Loader	79	No	40 %
Generator (25 KVA or less)	73	No	50 %
Generator (more than 25 KVA)	81	No	50 %
Gradall	83	No	40 %
Grader	85	No	40 %
Grapple (on backhoe)	85	No	40 %
Horizontal Boring Hydraulic Jack	80	No	25 %
Hydra Break Ram	90	Yes	20 %
Impact Pile Driver (diesel or drop)	95	Yes	20 %
Insitu Soil Sampling Rig	84	No	20 %
Jackhammer	85	Yes	20 %
Man Lift	75	No	20 %
Mounted Impact Hammer (hoe ram)	90	Yes	20 %
Paver	77	No	50 %
Pavement Scarifier	85	No	20 %
Pickup Truck	75	No	40 %
Pneumatic Tools	85	No	50 %
Pumps	77	No	50 %
Refrigerator Unit	73	No	100 %
Rivet Buster / Chipping Gun	79	Yes	20 %
Rock Drill	81	No	20 %
Roller	80	No	20 %
Sand Blasting	90	No	20 %
Scraper	84	No	40 %
Shears (on backhoe)	90	No	40 %
Slurry Plant	78	No	100 %
Slurry Trenching Machine	80	No	50 %
Soil Mix Drill Rig	80	No	50 %
Tractor	84	No	40 %
Vacuum Excavator (vac-truck)	85	No	40 %
Vacuum Street Sweeper	80	No	10 %
Ventilation Fan	79	No	100 %
Vibrating Hopper	85	No	50 %
Vibratory Concrete Mixer	80	No	20 %
Vibratory Pile Driver	95	No	20 %
Warning Horn	83	No	5 %
Welder / Torch	73	No	40 %

NOTES:

(a) Noise from impact equipment is exempt from the L10 requirement, however it is still subject to a lot-line Lmax limit of 90 dBA.

(b) Measured at 50 feet from the construction equipment, with an RMS "slow" (1 sec.) time constant.

(c) Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

(d) "Impact" equipment is assumed to produce separate discernable sound pressure maxima.

(e) Acoustic Usage Factor" represents the percent of time that equipment is assumed to be running at full power while working on site.

ITEM 119.5 (Continued)

FIGURE 1. NOISE RECEPTOR LOCATIONS

ITEM 127.1 REINFORCED CONCRETE EXCAVATION CUBIC YARD

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

The work under this Item consists of furnishing all labor, materials and equipment necessary for the removal and disposal of all substructure reinforced concrete for Bridge No. C-01-031 as shown on the plans or as directed by the Engineer.

Limits of reinforced concrete excavation for Alewife Brook Parkway over the MBTA red line Tunnel include:

- full demolition and removal of existing backwalls
- partial demolition and removal of existing beam seats or as directed by the Engineer.
- removal of existing approach slabs

The Contractor shall protect pedestrian and vehicular traffic from their construction operations. Materials shall be removed carefully so as to avoid damage to adjacent utilities. During the prosecution of this work, the Engineer may reject the use of any method or equipment, which causes undue vibration or possible damage to the remaining superstructure or any part thereof. No explosives shall be used.

The Contractor is responsible for providing temporary protective shielding or similar to prevent debris from falling onto the pedestrian path below Bridge No. C-01-031 during demolition and construction.

CONSTRUCTION METHODS

Materials shall be removed carefully as to avoid injury to persons and damage to the remaining portions of the structure. All materials removed shall become the property of the Contractor and shall be removed from the site and properly disposed of. The Contractor shall obtain approval from the Engineer for his methods of accomplishing the work under the Item before commencing work.

The Contractor shall use pneumatic or power hammers, with a maximum mass of 25 lbs., approved by the Engineer when removing concrete specified under Item 127.1. During the prosecution of the work associated with Item 127.1, the Engineer may reject the use of any prior approved method or equipment that causes excessive vibration or possible damage to the remaining structure.

The Contractor shall use suitable means to prevent demolition material and debris, including deteriorated portions of adjacent portions of existing structures unintentionally dislodged during demolition, from falling below the bridge. The Contractor shall protect existing utilities in place from damage during their operations.

ITEMS 127.1 (Continued)

The Contractor shall not place heavy equipment or store equipment/materials on the pedestrian path below the bridge, located atop the red line tunnel. See aerial image in the up front section of these Special Provisions for the general work zone restriction.

The Contractor's means and methods of reinforced concrete excavation shall not damage any retained elements of the existing or proposed bridge and the red line tunnel beneath the bridge. Any damage done to the retained portions of the Project by the Contractor's operations shall be repaired to the original condition as required by the Engineer, at the Contractor's expense.

SUBMITTALS

The Contractor shall prepare and submit a Reinforced Concrete Excavation Plan and procedure to the Engineer for review and approval describing the proposed sequence, method of concrete excavation, equipment for the excavation and disposal of all materials, and checked calculations sufficient to substantiate the adequacy of the proposed method. In addition, reinforced concrete excavation plans, details, schedules and submittals shall be provided for each stage of construction required by the project in accordance with the Plans. It shall also include a schedule of operations, method of utility protection or relocation (if required), and disposal locations.

The reinforced concrete excavation plan and any other necessary calculations and drawings shall bear the stamp of a Professional Engineer registered in the Commonwealth of Massachusetts certifying that all existing structural members are suitably braced and supported throughout the work. Work shall not commence until the Engineer has given written approval of the method of demolition.

METHOD OF MEASUREMENT

Item 127.1 will be measured for payment by the CUBIC YARD for all concrete excavated and removed as shown on the plans or as required by the Engineer, complete in place.

BASIS OF PAYMENT

Item 127.1 will be paid at the Contract unit price per CUBIC YARD, which price shall include all labor, tools, equipment, materials, submittals, disposal, and all incidental costs required to complete the work.

Saw cutting, as shown on the Plans, shall be considered incidental to the work under Item 127.1 and no further compensation will be allowed.

Temporary shielding and preventing debris from entering the pedestrian path below is incidental to this Item.

ITEM 127.12 REINFORCED CONCRETE EXCAVATION FOR SUBSTRUCTURE REPAIRS CUBIC YARD

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

The work under this Item consists of furnishing all labor, materials and equipment necessary for the concrete removal for deep concrete repairs (Type A and Type B as shown on the plans) associated with surface rehabilitation of the existing reinforced concrete abutments or as directed by the Engineer. The Contractor is advised to conduct a field investigation prior to bidding to establish approximate limits of the repairs.

Existing deteriorated concrete shall be removed to the limits of sound concrete as directed by the Engineer. The concrete shall be removed to provide a minimum of 1" clearance behind existing bars to provide sufficient clearance for placement of repair concrete, as detailed on the plans.

The Contractor shall take all measures necessary to protect pedestrian and vehicular traffic from their construction operations. Materials shall be removed carefully so as to avoid damage to adjacent utilities (if applicable). During the prosecution of this work, the Engineer may reject the use of any method or equipment, which causes undue vibration or damage to the remaining superstructure or any part thereof. No explosives shall be used.

All materials removed under this Item shall be removed from the job site and properly disposed of. The Contractor will not be paid for the removal of any concrete beyond the limits described under this Item and approved by the Engineer.

CONSTRUCTION METHODS

The lateral limits of each area to be repaired will be marked by the Contractor and subsequently approved by the Engineer. The Contractor shall coordinate with the Engineer the location of repairs through sounding or other approved testing methods and agreed upon by the Engineer prior to the execution of repair.

The outlines of each such area shall be cut to a depth of ½" minimum, 1" maximum with an approved power-saw capable of making straight cuts. In the event that reinforcing steel is encountered within the outer ½" depth during sawing operations, the depth of sawcut shall immediately be adjusted to a shallower depth so as not to damage the steel bars. If directed by the Engineer, saw cutting shall again be carried down to the ½" depth at other locations of repair provided reinforcing steel is not again encountered. Where over-breakage occurs resulting in a featheredge, the featheredge shall be squared up to a vertical edge in an approved manner. Where sawing is impractical, the area shall be outlined by chisel or other approved means.

ITEM 127.12 (Continued)

At the limits of concrete removal, the concrete shall be removed in a neat and worker like manner to produce straight and square joints. Care shall be taken during the removal of the designated portions to avoid damaging the portions that are to remain in place. Removal of concrete adjacent to areas that are to remain shall be performed by means of suitable power and hand tools to the accepted limits. Power tools that cause over-breakage of concrete will not be allowed. Any damage caused by the Contractor to existing sound concrete to remain in place shall be repaired or replaced by the Contractor or the limits of removal extended to remove damaged material to produce a straight and square joint. Any sound reinforcing steel damaged during the concrete removal operations shall be repaired or replaced at the Contractor's expense and as directed by the Engineer. New reinforcing steel shall be attached beside existing reinforcing steel with a minimum splice length as indicated and directed by the Engineer.

The Contractor's means and methods of construction shall not damage any retained elements of the existing or proposed bridge and the red line tunnel beneath the bridge. Any damage done to the retained portions of the Project by the Contractor's operations shall be repaired to the original condition as required by the Engineer, at the Contractor's expense.

The Contractor shall not place heavy equipment or store equipment/materials on the pedestrian path below the bridge, located atop the red line tunnel. See aerial image in the up front section of these Special Provisions for the general work zone restriction.

SUBMITTALS

The Contractor shall prepare and submit a Reinforced Concrete Repair plan and procedure to the Engineer for review and approval describing the proposed sequence of the repairs including the method of concrete removal and equipment for the removal and disposal of the materials. The Reinforced Concrete Repair plan and procedure shall include drawings locating and identifying the concrete spalls to be repaired as identified by sounding of the concrete and coordination with the Engineer.

All necessary calculations and drawings shall bear the stamp of a Professional Engineer registered in the Commonwealth of Massachusetts. Work shall not commence until the Engineer has given written approval of the submittals.

METHOD OF MEASUREMENT

Item 127.12 will be measured for payment by the CUBIC YARD of reinforced concrete for substructure repairs excavated and disposed, complete in place.

BASIS OF PAYMENT

Item 127.12 will be paid for at the Contract unit price per CUBIC YARD, which price shall include all labor, materials, tools, equipment, sawcutting, submittals, disposal, and all incidental costs required to complete the work.

See Item 905.2 for further information on concrete repairs.

ITEM 180.01 ENVIRONMENTAL HEALTH AND SAFETY PROGRAM LUMP SUM

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

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

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

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

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

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

ITEM 180.01 (Continued)

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

Method of Measurement and Basis of Payment

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

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

ITEM 180.02 PERSONAL PROTECTION LEVEL C UPGRADE 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, media (i.e. soils, sediments, surface water and/or groundwater) requiring evaluation and/or management under the Massachusetts Contingency Plan (MCP) may be encountered. 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 a site walk, field screening, sampling, analysis and characterization of potentially contaminated media, preparation and implementation 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 MCP. LSP services shall also be necessary to temporarily move material generated on the project to an off-site storage location.

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 Massachusetts Department of Environmental Protection (DEP) shall be submitted for all work assignments listed for the LSP and environmental technicians. Upon approval of the LSP Qualifications, the LSP will be designated as the LSP of Record unless MassDOT designates in writing otherwise. The LSP of Record will serve as the primary point of contact for all hazardous material matters on the project.

The LSP shall evaluate soil and/or sediment with discoloration, odor, elevated field screening results, presence of petroleum liquid or sheen 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 media. Any enhanced management of contaminated soil to ensure proper stockpiling and storage is incidental to the LSP Services item. The LSP shall evaluate the need for confirmatory sampling prior to backfill in areas where contaminated material has been excavated and disposed off-site for compliance with applicable regulatory requirements. The Engineer shall approve the locations of the testing sites prior to the sampling.

ITEM 180.03 (Continued)

Contaminated media shall be handled in accordance with all applicable state and federal statutes, regulations, and policies. The LSP shall adequately evaluate contaminated media for compliance with the requirements of the MCP and Department Policies.

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 both shall 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 tabular format which tracks the excavation, stockpiling, analysis and reuse/disposal of all known/suspect contaminated media. These records shall be up-to-date and submitted to the Engineer on a bi-weekly basis. The LSP shall review and summarize the laboratory data from any analyses performed on contaminated media in a tabular format and compare the results to applicable reporting thresholds. A report shall be delivered to the Engineer outlining the material sampling methods, laboratory analysis results, evaluation of applicable regulatory exemptions, reporting obligations, 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, damages, and enforcement requirements imposed by applicable regulatory agencies for failure to meet regulatory and contract timeframes. No compensation will be provided for such fines, damages, and enforcement actions.

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

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

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

ITEM 180.03 (Continued)

LABORATORY TESTING IN SUPPORT OF LSP SERVICES

Laboratory testing provides for analytical testing in support of LSP services related to maintaining MCP compliance, such as delineating the extent and type of contamination present. Sampling and testing for disposal purposes are not included and are incidental to Items 181.11-181.14.

In order to maintain compliance with the MCP and Department Policies 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. No sampling shall be conducted without prior approval from the Engineer. The samples shall be delivered to a DEP-certified laboratory using proper chain-of-custody documentation for analyses which, depending upon site conditions and suspected and/or identified contaminants of concern, may include, but are not limited to, metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polycyclic aromatic hydrocarbons (PAHs), extractable petroleum hydrocarbons (EPHs) and volatile petroleum hydrocarbons (VPHs). Subsequent testing, depending upon initial results, may be required for Toxicity Characteristic Leaching Procedure (TCLP) analyses (EPA Method 1311) for metals.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

LSP Services for work under this item will be measured per person, per hour of service provided by LSP, Environmental Technicians and other approved personnel. Travel time shall not be included in the billable hours.

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.

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.

ITEM 180.03 (Continued)

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

This Item is for LSP work for compliance with the MCP and Department Policies. LSP hours and any laboratory testing related to off-site disposal of excess soil and sediment is incidental to Items 181.11-181.14 (including, but not limited to, disposal characterization, disposal package preparation, landfill acceptance, shipment paperwork preparation, field screening, and tracking).

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.

CLASSES OF CONTAMINATED SOILS

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

ITEMS 181.11 through 181.14(Continued)

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

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

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

ITEMS 181.11 through 181.14(Continued)

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

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

MONITORING/SAMPLING/TESTING REQUIREMENTS

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

ITEMS 181.11 through 181.14(Continued)

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

WASTE TRACKING:

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

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

DECONTAMINATION OF EQUIPMENT

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

ITEMS 181.11 through 181.14(Continued)

REGULATORY REQUIREMENTS

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

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

SUBMITTALS

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

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

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

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

ITEMS 181.11 through 181.14(Continued)

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

II. Stockpiling, Transport, and Disposal.

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

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

Disposal and Recycling Facilities:

1. Provide the name, address, applicable licenses and approved waste profile for disposal and/or recycling location(s) where contaminated soil will be disposed. Present information substantiating the suitability of proposed sites to receive classifications of materials intended to be disposed there, including the ability of the facility to accept anticipated volumes of material.

2. Provide a summary of the history of compliance actions for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. Material should not be sent to facilities which are actively considered by the DEP, USEPA or other responsible agency to be in violation of federal, state or local hazardous waste or hazardous material regulations. MassDOT reserves the right to reject any facility on the basis of poor compliance history.

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

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

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

ITEMS 181.11 through 181.14(Continued)

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

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

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

Method Of Measurement And Basis Of Payment

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

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

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

ITEMS 181.11 through 181.14 (Continued)

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

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

ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS LUMP SUM

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

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

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

REGULATIONS

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

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

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

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

ITEM 182.1 (Continued)

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

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

454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

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

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

Massachusetts Division of Industrial Safety 45 CMR 10.00

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

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

BASIS OF PAYMENT

Item 182.1 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, tools, equipment, and all incidental costs required to complete the work as described and as required by the Engineer.

No separate payment will be made for the protection of general public, private property, the proper inspecting and testing of the material, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 182.2 REMOVAL OF ASBESTOS FOOT

The work shall include the removal and satisfactory disposal of existing asbestos. The Contractor's attention is directed to the fact that existing asbestos shall be inspected and tested prior to removal, to determine if special removal and disposal is required. The Contractor shall follow all the rules and regulations stated in "ITEM 182.1 INSPECTION AND TESTING FOR ASBESTOS". If asbestos is present, the Contractor shall follow all the rules and regulations stated in the section "REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS", under this item. The Contractor should notify and coordinate his/her efforts with the proper utility accordingly.

REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS
This section specifies the requirements for the handling and removal of asbestos containing material. The Contractor must perform all asbestos handling and removal work in accordance with these specifications and the following additional requirements.

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

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

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

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

ITEM 182.2 (Continued)

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

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

454 CMR 28.00 Removal, Containment and Encapsulation of Asbestos

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

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

Massachusetts Division of Industrial Safety 45 CMR 10.00

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

Wherever there is a conflict or overlap of the above references, the most stringent provision shall apply.

All asbestos material shall be removed and properly disposed of by a contractor or subcontractor with a current Massachusetts Abatement Contractors License issued by the Department of Labor Standards. Work shall be supervised by a competent person as required by OSHA in 29 CFR 1926 to ensure regulatory compliance. This person must have completed a course at an EPA Training Center or equivalent course in asbestos abatement procedures, have had a minimum of four years on-the-job training and meet any additional requirements set forth in 29 CFR 1926 for a Competent Person. This person must also be certified by the Commonwealth as an Asbestos Supervisor and Asbestos Project Designer as required by 454 CMR 28.00.

Asbestos removal work shall be coordinated with all other work under the contract and shall be completed prior to performing any activities which could disturb the asbestos material or produce airborne asbestos fibers.

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

ITEM 182.2 (Continued)

NOTIFICATION AND PERMITS

The Contractor shall prepare a formal pre-notification form at least ten (10) days prior to the start of asbestos removal work. This form must be submitted to the appropriate Regional Office of the Massachusetts Department of Environmental Protection and to the U.S. Environmental Protection Agency Region I Air and Hazardous Material Division. A copy of the submitted forms must be provided to the Engineer and kept at the work site.

Prior to starting any work, the Contractor shall also obtain any required asbestos removal permit(s) from the city/town. A copy of the permit(s) must be provided to the Engineer and posted at the work site.

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

STANDARD OPERATING PROCEDURES

The standard operating procedure shall ensure the following:

1. Proper site security including posting of warning signs and restricting access to prevent unauthorized entry into the work spaces.

2. Proper protective clothing and respiratory protection prior to entering the work spaces.

3. Safe work practices including provisions for communications; exclusion of eating, drinking, smoking, or use of procedures or equipment that would in any way reduce the effectiveness of respiratory protection or other engineering controls.

4. Proper exit practices from the work space though the showering and decontamination facilities.

5. Removing asbestos containing material in ways that minimize release of fibers.

6. Packing, labeling, loading, transporting and disposing of contaminated material in a way that minimizes or prevents exposure and contamination.

7. Emergency evacuation of personnel, for medical or safety (fire and smoke) so that exposure will be minimized.

8. Safety from accidents in the work space, especially from electrical shocks, slippery surfaces and entanglements in loose hoses and equipment.

9. Provisions for effective supervision and OSHA - specified personnel air monitoring for exposure during work.

ITEM 182.2 (Continued)

REQUIRED SUBMITTALS

The Contractor shall submit to the Engineer the following listed items at least ten (10) calendar days prior to the start of asbestos work. No asbestos removal work activities shall commence until these items are reviewed by the Engineer, unless otherwise waived. Submittals shall be clearly labeled and in sufficient detail to enable the Engineer to form an opinion as to its conformity to the specifications.

1. Name, experience and DLS certification of proposed Supervisors and Foreman responsible for asbestos work.

2. Summary of workforce by disciplines and a notarized statement documenting that all proposed workers, by name, have received all required medical exams and have been properly trained and certified for asbestos removal work, respirator use and appropriate Massachusetts DLS, EPA and OSHA standards.

3. Notarized statement that workers are physically fit and able to wear and use the type of respiratory protection proposed for the project. Notarized certification signed by an officer of the abatement contracting firm that exposure measurements, medical surveillance and worker training records are being kept in conformance with 29 CFR 1926.

4. Written plan of action and standard operating procedures (HASP) to include: location and layout of decontamination areas; sequencing of asbestos work; detailed schedule of work activities by date and interface with other project activities which affect work performance; methods used to assure safety and security; worker protection and exposure monitoring; contingency and emergency evacuation procedures; detailed description of methods to be employed to control pollution; waste handling procedures.

5. Written respiratory protection program specifying level of protection intended for each operation required by the project and details of daily inspection and maintenance elements.

6. Copies of the U.S. EPA, State and local asbestos removal pre-notification forms. If applicable, lists and copies of all permits, licenses, or manifests which will be applied for and used.

7. Name, location and applicable approval certificates for primary and secondary landfill for disposal of asbestos-containing or asbestos contaminated waste. Name, address and licenses number(s) of hauler permitted to transport waste. (Submit copies of completed manifests upon disposal).

The Contractor must provide copies of daily inspection and record logs upon request of the Engineer, at any time during project. This information will include but is not limited to work area entry data, respirator inspections and maintenance, HEPA-exhaust inspections and maintenance and other work applicable activities or reports of accidents or unusual events.

ITEM 182.2 (Continued)

METHOD OF MEASUREMENT

ITEM 182.2 will be measured for payment by the FOOT for the complete removal and disposal of the asbestos containing material.

BASIS OF PAYMENT

Item 182.2 will be paid for at the Contract unit price per FOOT, which price shall include all labor, materials, tools, equipment, and all incidental costs required to complete the work specified above and as required by the Engineer.

No separate payment will be made for the protection of general public, private property, the proper inspecting and testing of the material, but all costs in connection therewith shall be included in the Contract unit price bid.

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 fence and/or 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 222.5 BICYCLE-SAFE SCUPPER GRATE EACH

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

The work under this Item includes furnishing and installing grates on the existing scuppers beneath the bridge. These scupper grates are in need of replacement. The existing grates are approximately 20" square and 3" thick. Replacement grates shall be bicycle-safe, with perpendicular grate bars. Grates used shall conform to the detail shown in the construction plan sheet.

Only grates installed on existing scuppers as indicated in the construction plans will be included under this Item.

Catch basin frames and grates and manhole frames and covers shall be selected from the MassDOT Qualified Construction Material List.

METHOD OF MEASUREMENT

Item 222.5 will be measured for payment by the EACH bicycle-safe scupper grate furnished and installed, complete in place.

BASIS OF PAYMENT

Item 222.5 will be paid for at the Contract unit price per EACH, which price shall include all labor, material, equipment, and all incidental costs required to complete the work.

ITEM 316.12 12 INCH WATER MAIN REMOVED AND DISCARDED FOOT

The work under this Item shall conform to the relevant provisions of Subsection 301 of the Standard Specifications, American Water Works Association (AWWA) standards and the following:

CONSTRUCTION

All water mains to be abandoned shall be physically removed and disposed of by the Contractor. Any water main to be abandoned shall be cut at its connection to a live main and physically disconnected. A watertight ductile iron cap with concrete backing shall be installed on the live main. If a gate valve or corporation stop exists at the connection, it shall be closed.

A trench of sufficient width and depth shall be excavated so that the present pipe can be removed.

All joints shall then be opened and the pipe removed in its original sectional lengths.

Disposal of the removed pipe shall be at the expense of the Contractor.

Trench excavations for pipe removal shall be backfilled in conformance with the relevant provisions of Subsection 150.64.

METHOD OF MEASUREMENT

Item 316.12 will be measured for payment by the FOOT of 12 inch water main removed and discarded.

BASIS OF PAYMENT

Item 316.12 will be paid for at the Contract unit price per FOOT, which price shall include all labor, materials, tool, equipment, disposal, and all incidental costs required to complete the work.

ITEM 358.3 GATE AND GATE BOX REMOVED AND DISCARDED EACH

The work under this Item shall conform to the relevant provisions of Subsection 301 of the Standard Specifications and the following:

All removed gate valves and boxes shall be physically removed and discarded by the Contractor.

METHOD OF MEASUREMENT

Item 358.3 will be measured for payment by the EACH Gate and Gate box removed and discarded.

BASIS OF PAYMENT

Item 358.3 will be paid for at the Contract unit price per EACH, which price shall include all labor, material, equipment, excavation, backfill, and all incidental costs required to complete the work.

Curb stops encountered and determined to be removed are considered incidental to this Item.

ITEM 371.10 10 INCH COUPLING EACH
ITEM 371.12 12 INCH COUPLING EACH

The work under these Items shall conform to the relevant provisions of Subsection 301 of the Standard Specifications and the following:

The work under these Items shall include furnishing and installing Restrained Insulated Mechanical Couplings as necessary for the connection of the proposed water service on the proposed bridge to the existing 10-inch water service south of the proposed bridge and to the 12-inch main on Alewife Brook Parkway.

Restrained Insulated Mechanical Couplings shall be as detailed on the Plans and installed at the locations shown therein. Couplings shall be rated for a working pressure of 250 psi.

All couplings, adapters, and other devices necessary to complete the work shall be specifically manufactured for the purpose of the intended use and shall be approved for use by the City of Cambridge and the Engineer.

METHOD OF MEASUREMENT

Item 371.10 and Item 370.12 will be respectively measured for payment by the EACH 10 inch or 12 inch coupling installed, complete in place.

BASIS OF PAYMENT

Item 371.10 and Item 370.12 will be paid for at the respective Contract unit price per EACH, which prices shall include all labor, material, equipment, submittals, excavation, backfill, and all incidental costs required to complete the work.

ITEM 440.01 CONSTRUTION DUST CONTROL LUMP SUM

Work under this Item shall conform to the relevant provisions of Subsections 7.02 and 440 of the Standard Specifications, and the following:

The Contractor is responsible for controlling construction related dust emissions at all times during the work of this Contract, 24 hours per day, 7 days per week, including nonworking hours, weekends, and holidays. Dust suppression in the form of light water sprays, foams, dust suppressants and calcium chloride must be implemented to control dusting during trenching and excavation and demolition operations. Work shall be conducted in a manner that will not result in nuisance dust conditions (i.e., visible airborne dust cloud).

The Contractor is responsible for controlling dust during concrete demolition to reduce the amount of silica dust created in accordance with OSHA 29 CFR 1926 Subpart Z.

Intrusive activities may be reduced or curtailed under high wind or heavy rain conditions if the Engineer deems continued operations to be safety hazard to the workers.

The Contractor is responsible for monitoring dust in accordance the USEPA and National Air Quality Ambient Standards, Department of Environmental Protection (DEP) regulations and the HASP during all construction operations.

SUBMITTALS

Prior to starting any work, the Contractor shall develop and submit for approval a dust control plan that outlines in detail the measures to be implemented. The plan shall include details as to how dust emissions will be controlled and/or minimized for demolition activities, earthwork activities, including excavation, stockpiling of material, and transportation on public roadways.

The Contractor shall submit shop and working drawings, computations, material data, and other descriptions for wind screens, barriers, and supports. Wind screens, barriers, and supports shall be designed to withstand 80 mph wind loads plus a 30% gust factor. Drawings and computations shall be stamped by a Registered Professional Engineer of the Commonwealth of Massachusetts.

The Contractor’s submittal shall include details describing, providing, installing, and removing tarps or other vertical barriers as may be required during concrete repairs to the abutments and during demolition of the bridge corners to isolate dust and debris in the vicinity of occupied work areas.

Prior to starting any work, the Contractor shall develop and submit for approval a dust monitoring plan that outlines in detail the measures to be implemented. The plan shall include details as to how dust will be monitored during the construction period.

ITEM 440.01 (Continued)

MATERIALS

The material for this work shall be of the kind described below, shown on the plans and shall meet the requirements of the following subsections of Division III, Materials of the Standard Specifications:

1. Water
2. Calcium chloride M9.01.0
3. As needed, soil stabilizer shall be non-toxic, non-corrosive, and environmentally safe.
4. Wind screens shall be a durable fabric mesh of 50 percent porosity, attached to a fence.
5. Wind barriers shall be solid wood panels, solid durable fabric attached to a fence, or other solid barriers intended to block the passage of the wind.
6. As needed, covers for stockpiles shall be UV resistant plastic tarps with a minimum 4 mil thickness.
7. Seeding for Erosion control shall conform to M6.03.01.

CONSTRUCTION SITE DUST CONTROL

Water or calcium chloride shall be used to provide dust control. The Contractor shall apply water as necessary, or as required by the Engineer to control dust. Several applications per day may be necessary to control dust depending on weather conditions and the work activity being performed.

Soil stabilizers such as polymer emulsion-based products shall be applied per the manufacturer directions for the area where dust control is needed. Both water and soil stabilizer application equipment shall consist of sprinkler pipelines, tanks, tank trucks, or other devices that are capable of providing regulated flow, uniform spray, and positive shut-off.

Calcium chloride shall be applied at a rate of 1.5 pounds per square yard, or as required by the Engineer to control dust. Water shall not be applied to any roadway surface when freezing conditions occur.

The Contractor shall ensure that vegetation and the soil to be used for vegetation are not treated. The use of petroleum products for dust suppression is prohibited.

Wind screens and/or wind barriers shall be provided in locations where they would be effective in minimizing the spread of dust. The location of wind screen and/or wind barrier placement shall be submitted as part of the Contractor's dust control plan. For pedestrian sidewalks that are located immediately adjacent to an active work zone, wind barriers should be used and placed between the active work zone and the pedestrian sidewalk. Both wind screens and wind barriers can be moved as necessary as the active work area shifts within a work zone. The Contractor shall keep wind screens and wind barriers in good conditions all the time.

Compressed air for cleaning debris from any surface or structure will be permitted only when in compliance with the approved dust control plan.

Only wet cutting of concrete block, concrete, and/or asphalt surfaces is allowed.

ITEM 440.01 (Continued)

PUBLIC ROADWAY DUST CONTROL

Vehicles leaving the construction site shall have no mud or dirt on the vehicle body or wheels. Haul truck cargo areas shall be securely covered during material transport on public roadways.

Material with high water content shall not be allowed to leak from truck cargo areas during transport over public roadways.

Vehicle mud and dirt carryout, material spills and soil wash-out onto public roadways and walkways and other paved areas shall be immediately cleaned up by the Contractor.

At work zone egress points, the Contractor shall use power sweeping which consists of vacuuming, wet power sweeping, regenerative air sweeping, or wet power broom sweeping on paved roadways. Dry sweeping is prohibited.

On haul roadways, the Contractor shall use vacuum power sweeping to keep roadways clear from dust and dirt.

CONTROL OF EARTHWORK DUST

During batch drop operations (i.e., earthwork with front-end loader, clamshell bucket, or backhoe) the free drop height of excavated or aggregate material shall be minimized to prevent the generation of dust.

To prevent spills during transport, freeboard space shall be maintained between the material load and the top of the truck cargo bed rail.

CONTROL OF STOCKPILE DUST

The Contractor shall employ one or more of the following methods to prevent the release of dust from stockpiles. The method to be used shall be submitted for review and approval as part of the dust control plan specified under Submittals.

1. Water shall be used during active stockpile load-in, load-out and maintenance activities.
2. UV resistant plastic tarps on stockpiles, secured with sandbags or an equivalent method to prevent the covers from being dislodged by the wind. The Contractor shall repair or replace covers whenever damaged or dislodged, without additional compensation,
    a. Soil stabilizers applied to the surface of inactive stockpiles,
    b. Seeding shall consist of hydroseeding inactive stockpiles. Seeding shall conform to M6.03.1.

DEMOLITION DUST CONTROL MEASURES

Water shall be used during demolition.
During transport of demolition debris, the truck cargo area shall be securely covered.

ITEM 440.01 (Continued)

DUST MONITORING MEASURES

The quantity and location of dust monitoring equipment will be determined by the LSP. At least three (3) dust monitors will be placed down-wind, and three (3) dust monitors will be placed up-wind of the current construction activities as directed by the LSP. Dust particulate matter will be measured in the ambient air as PM-10, a real-time weighted average from the start of the shift. Results will be monitored on a continual basis to ensure dust particulate matter does not exceed the 150-ug/m3 (0.150-mg/3) action level per USEPA National Ambient Air Quality Standards (NAAQS) and described in the Project-approved SS-HASP. The LSP or a qualified representative will be present during all operations causing dust for monitoring. If any dust particulate matter exceeds the action level, the qualified representative will cease all dust causing activities and notify a superintendent. At that point, either additional dust suppression methods will be put in place, changes will be made to demolition equipment/methodology, or demolition operations will remain on hold until weather conditions change. Dust monitoring measures and protection shall be installed at outdoor dining facilities in the vicinity of the portals.

BASIS OF PAYMENT

Item 440.01 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, equipment, required submittals, water for dust control, calcium chloride for dust control, required barriers, and all incidental costs required to complete the work.

Payment of 20% of the Lump Sum will be made upon MassDOT's approval of the Dust Control Plan.

Payment of 80% of the Lump Sum will be paid in equal monthly installments based on the anticipated schedule of monitoring in accordance with the Contractor's approved schedule.

ITEM 655.3 WOOD RAIL FENCE FOOT

The work under this item shall conform to the relevant provisions of Section 600 of the Standard Specifications and the following:

The work under this Item shall consist of the furnishing and installation of wood rail fence, as shown on the plans and as required by the Engineer.

SUBMITTALS

The Contractor shall submit to the Engineer for approval a complete set of shop drawings, showing the layout of all fencing, including bolt holes.

QUALITY ASSURANCE

Beams that contain unsound knots and shakes, excessive checking or other defects that may be detrimental to their structural integrity will be rejected and shall not be used in the proposed work.

MATERIALS

Wood posts and rails shall be Eastern Spruce, 1450 grade or better, or other approved species. Wood shall be paintable pressure treated lumber in accordance with the requirements of the Standard Specifications of the American Wood Preservers Association (AWPA) and shall be marked to indicate the wood grade and preservative standard.

Rail and posts shall be cut to length and have bolt holes drilled before pressure treatment is applied. Precutting shall be accurately done as enlarging of the pre-drilled holes, or the boring of new holes, or the re-cutting of post and rail lengths, will not be permitted.

The lumber shall be in sound condition, free from worm holes, knots, longitudinal heart cracks, soft sap wood, fungus, and deformation (twisting or cupping) that cannot be removed during installation using normal installation methods and tools. Natural drying checks to a maximum of 1/8 inch width will be acceptable.

All connectors, fasteners, and hardware shall be either stainless steel type 304 or 316 alloy or shall be Hot-dip galvanized meeting the requirements of ASTM A153 and A123, with 2 ounces of zinc coating per square foot minimum. Fasteners, connectors, and hardware used together shall be of the same type.

ITEM 655.3 (Continued)

EXECUTION

Posts shall be set plumb in excavated holes at the line and grade shown on the plans. Post holes shall be backfilled with suitable material and thoroughly compacted in layers not exceeding 12 inches in depth utilizing either a handheld tamp or tamping rammer.

The Contractor shall take care in the handling of the rails. Any damaged timbers shall be replaced by the Contractor at the discretion of the Engineer and at no additional cost.

Wood rails shall be erected to form a smooth continuous rail conforming to the required line and grade. Butt adjoining rail sections with a maximum separation between adjoining rail sections of 1/16 inch. Contractor shall comply with all PROWAG and ADA requirements as they relate to this item.

Rails shall be butt jointed at alternate posts or as directed. Hammering or other forceful method of inserting bolt shall not be used.

The Contractor is cautioned that within the limits of this project, buried cables for utilities, which may be energized, may be present.

METHOD OF MEASUREMENT

Item 655.3 will be measured for payment by the FOOT of wood rail fence, as measured along the top rail from center to center of end posts, installed, complete in place.

BASIS OF PAYMENT

Item 655.3 will be paid for at the Contract unit price per FOOT, which price shall include all submittals, cutting, installing the timber, excavation and back fill, all labor, materials, transportation, equipment, and all incidental costs required to complete the work.

ITEM 669. FENCE REMOVED AND STACKED FOOT

The work under this Item shall conform to the relevant provisions of Section 600 and Subsection 665 of the Standard Specifications and the following:

The work under this Item shall include the careful removal of existing fencing, posts, braces, and gates from their present locations as shown on the plans or as required by the Engineer. The existing fencing shall be neatly stacked at locations shown on the plans.The work under this Items shall also include the excavation of foundations (if any), disposal of the concrete, backfilling with compacted gravel of the holes resulting from foundation excavation.

METHOD OF MEASUREMENT

Item 669. will be measured for payment by the FOOT in its original position from outside to outside of end post. The quantity to be paid for will be the length in feet of actual fence removed and stacked.

BASIS OF PAYMENT

Item 669. will be paid for at the Contract unit price per FOOT, which price shall include all labor, material, equipment, excavation, backfilling, removal of foundations, transportation, and all incidental costs 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.

CONSTRUCTION

Silt sacks shall be installed in retained existing and proposed catch basins and drop inlets within the project limits and as required by the Resident Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions, and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and disposed of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

When emptying the silt sack, the contractor shall take all due care to prevent sediment from entering the structure. Any silt or other debris found in the drainage system at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the insert be deposited on site and used in construction.

All curb openings shall be blocked to prevent stormwater from bypassing the device.

All debris accumulated in silt sacks shall be handled and disposed of as specified in Section 227 of the Standard Specifications

ITEM 697.1 (Continued)

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 706.15 BRICK PAVERS REMOVED AND STACKED SQUARE YARD

Brick pavers located underneath Bridge No. C-01-031 that are to be disturbed shall be removed and stacked at a location determined by the Massachusetts Bay Transportation Authority (MBTA).

CONSTRUCTION METHODS

The Contractor shall give at least 48 hours written notice to the MBTA prior to removing the brick pavers. The Contractor shall coordinate with the MBTA for location to stack the brick pavers.

METHOD OF MEASUREMENT

Item 706.15 will be measured for payment by the SQUARE YARD of brick pavers removed and stacked.

BASIS OF PAYMENT

Item 706.15will be paid at the Contract unit price per SQUARE YARD, which price shall include all labor, tools, equipment, materials, and all incidental costs required to complete the work including coordination with the property owner and transporting the pavers.

ITEM 706.9 TEXTURIZED DECORATIVE PAVEMENT SQUARE YARD

The work under this Item shall consist of preparing pavement surface and installation of Texturized Decorative Pavement underneath Bridge No. C-01-031 in accordance with manufacturer's specifications and the following.

MATERIALS

The products used in this surfacing system shall meet the material specifications and conform to the minimum following physical and performance properties: hot-applied resin-based compound developed specifically for use on asphalt or cement concrete, with superior adhesion, flexibility and abrasion resistance characteristics, as well as color stability, chemical resistance and scrub ability.

Texturized Decorative Pavement Material:

Color:
Color for pavement shall be "Colonial Brick Red". The material shall be manufactured with sufficient pigment to meet FHWA Docket No. FHWA-99-6910 Table 5 and Table 6 as revised and corrected. The pigment system must not contain heavy metals nor any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limit as specified in relevant Federal Regulations.

The material to be utilized in the Texturized Decorative Pavement shall conform to the following physical properties.

GRADE	45	60
TRAFFIC	LIGHT/MEDIUM	HEAVY
AVERAGE TEMP. RANGE	25-113 DEGREES F	25-140 DEGREES F
WHEEL TRACKING @ 113F	LESS THAN 1 MM/HR	LESS THAN 1 MM/HR
WHEEL TRACKING @ 140F	N/A LESS THAN 5 MM/HR	
DENSITY	2.12	2.12
CONE FLOW TEST (5 HRS @ 194 F)	15% MAXIMUM	15% MAXIMUM
PLANE TEST (5 HRS @ 194 F)	5% MAXIMUM	5% MAXIMUM
INDENT @ 104 F	25 DMM MAXIMUM	50 DMM MAXIMUM
INDENT @ 104 F	N/A	75 DMM MAXIMUM
ASH CONTENT	90% MAXIMUM	90% MAXIMUM
SKID RESISTANCE VALUE	55-70	55-70

Contractor will submit a shop drawing of the pattern, color, installation method and certification of approved installer prior to placement of any texturized decorative pavement.

ITEM 706.9 (Continued)

Equipment Required:

Contractor must possess and be familiar with the specialized machinery necessary to perform the procedures as outlined and contained within this technical specification package, including, but not limited to, appropriate trucks, compressors, miscellaneous asphalt equipment, dispensers, applicators, cutters and/or specialized tools etc.

INSTALLATION

Preparation of Asphalt Surface

Pavement to be replaced shall be sawcut in neat lines. The pavement shall be excavated to an approximate depth of 4 inches. Contractor shall place a 2.5 inch layer of Superpave Intermediate Course – 19.0 (SIC-19.0) as shown on the plans. The Contractor shall immediately remove all residue material resulting from this work. All excavated material shall be disposed of by the Contractor offsite.

Installation of Texturized Decorative Pavement:

The Contractor shall be responsible for the preparation, placement and patterning of Texturized Decorative Pavement. This synthetic paving material shall be composed of a hot-applied, resin-based compound formulated with a color stable pigment throughout that can be surface textured to simulate a running bond brick pattern.

The Contractor will be required to overlay the Texturized Decorative Pavement in previously prepared recessed pavement surfaces as described above, as directed and approved by the Owner.

The installer must be a manufacturer authorized applicator, experienced with this specialized system, satisfactory to the Owner.

Using manufacturer prescribed methods and equipment, the Contractor shall adequately heat and uniformly mix the material(s) together. The Owner will select the application color(s) from the available pigments supplied by the manufacturer. Maximum heating temperature of the completed formulation is 440 degrees Fahrenheit.

The Contractor shall then apply the heated, mixed material to the surface of the hardened, structurally sound, asphalt pavement, as directed. The material shall be spread and leveled to the desired build thickness of 1.5 inches, using manufacturer’s specialized ironing tools, heated sufficiently to smooth the surface to a state of readiness for texturizing. No material shall be applied when precipitation is present.

ITEM 706.9 (Continued)

Texturizing will begin immediately after leveling has occurred, while the material is still hot enough to allow the mold selected, to adequately penetrate the surface and create the desired pattern or form. Once the finished surface has cooled sufficiently, the application area may be opened to vehicular and/or pedestrian traffic.

Any residue resulting from this work shall be removed and disposed of in a proper manner off site.

The completed work area shall be left in a neat and clean condition, satisfactory to the Engineer.

Special care must be exercised by the Contractor during the operation of work to save from harm and injury, any structure, public or private, situated above or below the surface and lying within the scope of the project. If during the execution of the work, the Contractor, through willfulness or carelessness, permits or causes any damage, the cost of satisfactory repair or replacement shall be the financial responsibility of the Contractor.

METHOD OF MEASUREMENT

Item 706.9 will be measured for payment by the SQUARE YARD of texturized decorative pavement installed, complete in place.

BASIS OF PAYMENT

Item 706.9 will be paid for at the Contract unit price per SQUARE YARD, which price shall include all labor, material, tools and equipment, submittals, and all incidental cost required to complete the work.

No separate payment will be made for cold plane or saw cut but all costs in connection therewith shall be included in Item 706.9.

The Superpave Intermediate Course – 19.0 (SIC-19.0) will be paid for separately under Item 450.32.

ITEM 741. ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE B) MONTH

The work under this Item shall conform to the relevant provisions of Subsection 740 of the Standard Specifications and the following:

Two computer systems and a printer system meeting minimum requirements set forth below including installation, maintenance, power, paper, disks, and other supplies shall be provided at the Resident Engineer's Office:

All equipment shall be UL approved and Energy Star compliant.

The Computer System shall meet the following minimum criteria or better:

Processor:	Intel, 3.5 GHZ
System Memory (RAM):	12 GB
Hard Drive:	500 GB
Optical Drive:	DVD-RW/DVD+RW/CD-RW/CD+RW
Graphics Card:	8 GB
Network Adapter:	10/100 Mbit/s
USB Ports:	6 USB 3.0 ports
Keyboard:	Generic
Mouse:	Optical mouse with scroll, MS-Mouse compliant
Video/Audio	the computer system shall be 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 741. (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) (not including the bypass tray)
- 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
- 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 systems, 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 767.121 SEDIMENT CONTROL BARRIER FOOT

The work under this item shall conform to the relevant provisions of Subsections 670, 751 and 767 of the Standard Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment control barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes with biodegradable natural fabric (i.e., cotton, jute, burlap) are intended to be the primary sedimentation control barrier. Photo-biodegradable fabric shall not be used.

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- 9-inch compost filter tubes
- Straw bales which shall be trenched

No straw wattles may be used. Additional compost filter tubes (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

When required by permits, additional sediment barrier shall be stored on-site for emergency use and replacement for the duration of the contract.

Where shown on the plans or when required by permits, sedimentation fence shall be used in addition to compost filter tubes and straw bales and shall be compensated under that item.

Sediment control barriers shall be installed in the approximate location as shown on the plans and as required so that no excavated or disturbed soil can enter mitigation areas or adjacent wetlands or waterways. If necessary to accommodate field conditions and to maximize effectiveness, barrier locations may be shifted with approval from the Engineer. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

MATERIALS AND CONSTRUCTION

Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer’s instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

ITEM 767.121 (Continued)

Compost Filter Tube

Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

Straw Bales

Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

ITEM 767.121 (Continued)

Sedimentation Fence

Materials and Installation shall be per Section 670.40 and 670.60 of the Standard Specifications and the following:

Sedimentation fence shall only be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

MAINTENANCE

Maintenance of the sediment control barrier shall be per Section 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

DISMANTLING & REMOVING

Barriers shall be dismantled and/or removed, as required, when construction work is complete, and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and sedimentation fence, shall be removed and disposed off-site by the Contractor.

ITEM 767.121 (Continued)

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grass mix).
- Sedimentation fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 767.121 will be measured and paid for at the contract unit price per foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Additional barrier, such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

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 811.38 **ELECTRIC HANDHOLE REMOVED AND RESET** **EACH**

The work under this Item shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The work under this Item shall consist of removing and resetting existing electric handholes.

Existing handholes shall only be removed once the existing wire and conduit has been removed and the Engineer has given approval for the removal.

The Contractor shall exercise particular care in the dismantling, removal, transporting and resetting of the existing lighting handholes designated to be reused. Any structure that is damaged through carelessness or lack of protection by the Contractor shall be replaced at the Contractor's expense.

METHOD OF MEASUREMENT

Item 811.38 will be measured for payment by the EACH electric handhole removed and reset, complete in place.

BASIS OF PAYMENT

Item 811.38 will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment, excavation, backfill, surface restoration, and all incidental costs required to complete the work.

ITEM 812.09 LIGHT STANDARD FOUNDATION PRECAST EACH

The work under this Item shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

- Foundations shall be pre-cast concrete, having 4,000 psi minimum 28-day compressive strength and be cast at a MassDOT approved pre-casting facility.
- Foundations shall support the effective projected area of the specified pole, arm(s), luminaire(s), and accessories under wind conditions.
- Anchor bolts shall be set in a welded cage or properly positioned by the tie wire to stirrups.
- The anchor bolt locations and projection shall be compatible with the required bolting pattern for the highway lighting pole.
- Ground rods shall be included with the foundations and be compatible with grounding lug on associated lighting equipment.
- Materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.
- Light Standard Foundation to be designed and stamped by a Registered Professional Engineer in the Commonwealth of Massachusetts.

METHOD OF MEASUREMENT

Item 812.09 will be measured for payment by the EACH light standard foundation precast installed, complete in place.

BASIS OF PAYMENT

Item 812.09 will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment, excavation, compaction and backfill, engineering services, submittals, and all incidental costs required to complete the work.

ITEM 812.102 LIGHT STANDARD FOUNDATION REMOVAL EACH

The work under this Item shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The work under this Item consists of the full depth removal and disposal of select existing street light pole foundations as shown on the Plans. The Contractor shall backfill with compacted gravel all holes resulting from the removal of the existing light pole foundation and restore the area to match existing conditions of adjacent areas.

Contact owners of electrical lines prior to removal or disconnection of lighting. Electrical work to conform with the National Electric Code (NEC). Caution shall be taken not to disturb or damage the adjacent electrical conduit or conductors necessary to maintain operation of the lighting system. Contractor to identify if foundations are required to maintain operation of the existing highway lighting system, and if so, install handhole in the location of the foundation to maintain operation.

METHOD OF MEASUREMENT

Item 812.102 will be measured for payment by the EACH light standard foundation removed.

BASIS OF PAYMENT

Item 812.102 will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, removal, disposal, tools, equipment, excavation, backfill, surface restoration, and all incidental costs required to complete the work.

ITEM 820.111 HIGHWAY LIGHTING – UNDERPASS LIGHTING SYSTEM LUMP SUM

The work under this Item shall conform to the relevant provisions of Section 800 and 900 of the Standard Specifications and the following:

Existing underpass lighting system is owned and maintained by the MBTA. Contractor to coordinate outages and switching/disconnections/access with the MBTA. Existing circuit is connected to the emergency panelboard in electric room P09 located on the Alewife station platform.

Contractor to maintain path lighting on either side of the bridge throughout construction. Temporary Illumination for walkways under the bridge are to be paid under Item 853.82.

Electrical work to conform with National Electric Code (NEC). Caution shall be taken not to disturb or damage the adjacent electrical conduit or conductors necessary to maintain operation of the lighting system. Contractor to identify if foundations are required to maintain operation of the existing highway lighting system, and if so, identify means to temporarily maintain operation.

The individual items of work shall include but not necessarily be limited to: removing, transporting, and storing the existing luminaires; removing and disposing existing cable, conduit, junction boxes and supports.

Furnishing and installation of new conduit supports, lighting support assemblies, conduits and cabling. Final installation to match existing configuration.

Re-installation of existing luminaires in similar locations on the proposed bridge as shown on the plans. Reattachment hardware along the bridge abutments shall be in accordance with the plans. Reattachment hardware along the bridge fascia shall be incidental to the precast-bridge-units (PBUs) under Item 995.

The Contractor shall exercise particular care in the dismantling, removal, transporting and resetting of the existing luminaires designated to be reused. Any luminaire that is damaged through carelessness or lack of protection by the Contractor shall be replaced at the Contractor's expense. Contractor to advise the Engineer prior to removal of luminaire if luminaire appears to be not fit to be reused.

BASIS OF PAYMENT

Item 820.111 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, tools, equipment, and all incidental costs required to complete the work.

Reattachment hardware along the bridge fascia to be paid for under the bridge lump sum Item 995.

ITEM 829.06 ROADSIDE GUIDE SIGN AND SUPPORT REMOVED AND DISCARDED EACH

The work under this Item shall include removal and disposal of existing ground mounted and overhead guide sign panels, sign supports including foundations, associated excavations, the supplying and placing of compacted gravel, and the restoration to original condition of any natural features disturbed in any way or manner by the operation.

The existing sign panels, hardware, and supports that are removed shall become the property of the Contractor and shall be properly disposed of the project site. Work shall also include the excavation (including Class "B" rock) of any existing foundations to be removed to a depth of at least one foot below grade outside of roadways, and to at least three feet below grade within proposed roadways.

METHOD OF MEASUREMENT

Item 829.06 will be measured for payment by the EACH roadside guide sign and support assembly removed and discarded. EACH assembly shall include all removals and disposals regardless of the number of existing sign panels and supports at that installation.

BASIS OF PAYMENT

Item 829.06 will be paid for at the Contract unit price per EACH, which price shall include all labor, materials, equipment, removal, loading, transporting, discarding, excavation and disposal of the existing foundations, supplying and placing of gravel backfill and compaction, and all incidental costs required to complete the work.

Loam For Roadsides and Seeding as part of the restoration work will be paid for under Item 751 and Item 765 respectively.

ITEM 852.11 TEMPORARY PEDESTRIAN BARRICADE FOOT
ITEM 852.12 TEMPORARY PEDESTRIAN CURB RAMP EACH

Description

Work under these items consist of furnishing, deploying, maintaining in proper operating conditions, and removing temporary pedestrian barricades and temporary pedestrian ramps as part of a Temporary Pedestrian Access Route (TPAR) in order to guide pedestrians around a fully- or partially-closed sidewalk. These devices are intended to prevent pedestrians from entering the work area and to prevent pedestrians from inadvertently entering the vehicle travel lane by providing visual and physical separation between each space.

Materials

The Temporary Pedestrian Barricade shall have a continuous bottom rail or edge no more than two (2) inches above the ground and eight (8) inches in height (minimum) to accommodate cane users, have a smooth and continuous hand railing along the top edge no less than 32 inches above the ground and not obstruct or project into the pedestrian path of travel. Barricade walls shall be nearly vertical and generally within the same plane.

If exposed to traffic, Temporary Pedestrian Barricades shall be crashworthy.

The Temporary Pedestrian Curb Ramp shall provide a 48 inch minimum width, with a firm, stable, and non-slip surface. Protective edging with a two (2) inch minimum height shall be installed when the curb ramp or landing platform has a vertical drop of six (6) inches or greater.

The Temporary Pedestrian Curb Ramp walkway and landing area surface shall be of a solid, continuous, contrasting color abutting up to the existing sidewalk.

If a Temporary Pedestrian Curb Ramp leads to a crosswalk, a detectable warning pad must be used at the base of the ramp; if it leads to a protected path that does not conflict with vehicular traffic then a detectable pad shall not be used.

Construction Methods

The Temporary Pedestrian Barricade shall be placed in an area that will provide pedestrians with a TPAR on a smooth, continuous hard surface for its entirety. The geometry and alignment of the facility shall meet the applicable requirements of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities" and the Massachusetts Architectural Access Board.

The recommended width of the TPAR is 60 inches, but if constraints exist a minimum clear width of 48 inches shall be provided along its entirety. If a 60 inch width cannot be accommodated in full, a 60 inch by 60 inch passing space shall be provided every 200 feet or less along the TPAR.

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.

ITEM 852.11 and ITEM 852.12 (Continued)

The TPAR shall be kept clear of debris, snow, and ice and the Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall not obstruct drainage.

Removal and/or resetting of Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall be considered incidental.

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 853.81 TEMPORARY ILLUMINATION FOR PEDESTRIAN DETOUR LUMP SUM

The work under this item shall conform to the relevant provisions of Subsections 820 and 850 of the Standard Specifications and the following:

The work under this Item consists of temporary illumination of walkways along pedestrian detour routes as identified on the plans.

Temporary lighting shall meet the following requirements:

a) 2 FC Average
b) Average to Minimum Uniformity Ratio of 3:1

Contractor shall maintain service for any existing service panel circuits throughout construction.

Contractor to provide temporary lighting as required from the time any walkways are impacted or taken out of service until the final lighting is installed and fully functional.

CONSTRUCTION METHODS

The Contractor shall provide power to adequately energize the lighting equipment specified. If generators are used, generator placement and wiring shall be in compliance with the Massachusetts Electrical Code and OSHA safety standards.

The Contractor shall furnish to the Engineer a Multi-function digital luminance meter, complete with instructions and capable of measuring from 0.01 to 200 fc. The illumination on the project shall be monitored at random intervals for conformance to the specifications set forth herein. Substandard illumination shall be sufficient reason for the Engineer to stop all affected work until the substandard situation is corrected.

BASIS OF PAYMENT

Item 853.81 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, equipment, required submittals, cables, conduits, temporary luminaires, and all incidental costs required to complete the work.

Payment of 20% of the Lump Sum price will be made upon MassDOT's approval of the Temporary Lighting Plan.

Payment of 80% of the Lump Sum price of this Item will be paid in equal monthly installments based on the anticipated schedule of monitoring in accordance with the Contractor's approved schedule

ITEM 853.82 TEMPORARY ILLUMINATION FOR WALKWAY UNDER BRIDGE LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsections 820 and 850 of the Standard Specifications, the General Lighting Requirements, and the following:

The work under this Item consists of temporary illumination of all under bridge walkways throughout the staged construction.

Temporary lighting is required under the bridge walkways to ensure that the following criteria is met:

a) 2 FC average
b) Avg:Min Uniformity Ratio: 3:1

Contractor shall maintain service for any existing service panel circuits throughout construction. Contractor shall coordinate any outages or temporary connections with the MBTA.

Contractor to provide temporary lighting as required from the time any existing lighting/load centers are impacted or taken out of service until the final lighting is installed and fully functional.

BASIS OF PAYMENT

Item 853.82 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, equipment, required submittals, cables, conduits, temporary luminaires, and all incidental costs required to complete the work.

Payment of 20% of the Lump Sum price will be made upon MassDOT's approval of the Temporary Lighting Plan.

Payment of 80% of the Lump Sum price will be paid in equal monthly installments based on the anticipated schedule of monitoring in accordance with the Contractor's approved schedule

ITEM 859.1 REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS DAY

The work under this Item shall conform the relevant provisions of Subsection 850 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, maintaining in proper operating conditions, and removing reflectorized drums, and any necessary ballast, equipped with sequential flashing warning lights.

MATERIALS

Reflectorized drums shall be listed on the MassDOT Qualified Traffic Control Equipment List. Reflective sheeting on drums shall meet or exceed ASTM D4956 Type VIII. All drums shall be maintained in a satisfactory manner including the removal of oils, dirt, and debris that may cause reduced retroreflectivity.

The Contractor shall use one of the following sequential flashing warning light systems unless otherwise approved by the Engineer:

1. Empco-Lite LWCSD.
2. pi-Lit® Sequential Barricade-Style Lamp; or
3. Unipart Dorman SynchroGUIDE.

Sequential flashing warning lights shall be secured to reflectorized drums per the light manufacturer's specifications.

CONSTRUCTION METHODS

The first ten (10) drums in any merging or shifting taper as designated in the Temporary Traffic Control Plan shall be equipped with sequential flashing warning lights. These lights shall be operating, at a minimum, between dusk and dawn when the taper is deployed.

The successive flashing of the sequential warning lights shall occur from the upstream end of the merging or shifting taper to the downstream end of the taper in order to identify the desired vehicle path. Each warning light in the sequence shall be flashed at a rate of not less than 55, nor more than 75 times per minute.

Warning lights shall be powered off when drums are not deployed in a taper.

ITEM 859.1 (Continued)

METHOD OF MEASUREMENT

A group of ten (10) reflectorized drums with sequential flashing warning lights is considered one (1) unit and will be measured by the day. Each period of up to 24 hours during which this unit is in use will be measured as one day regardless of the number of times that the drums are positioned, repositioned, removed, or returned to service.

BASIS OF PAYMENT

Reflectorized Drums with Sequential Flashing Warning Lights will be paid for at the contract unit price per day, which shall include full compensation for furnishing, positioning, repositioning, and removing the group of ten (10) drums as directed by the Engineer.

ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED EACH

The work under this Item shall consist of the dismantling, removing, transporting and discarding of existing street, warning, regulatory and guide signs and their supports, as directed by the Engineer.

Also included is the excavation of the existing foundations. If in the opinion of the Engineer, the existing foundation will not interfere with new construction, it may be removed to a depth of 3 feet below the existing grade under roadway surfaces and one foot below existing grade under all other surfaces. The hole shall be backfilled with gravel and compacted, and the existing surfaces restored or replaced in kind.

The existing signs shall not be removed until the new signs and structures replacing them are ready for traffic unless otherwise directed by the Engineer.

Traffic signs to be discarded shall become the property of the Contractor and shall be removed from the project site by the Contractor.

METHOD OF MEASUREMENT

Item 874.41 will be measured for payment by the EACH traffic sign removed and discarded.

BASIS OF PAVEMENT

Item 874.41 will be paid for at the Contract unit price per EACH, which price shall include all labor, equipment, material, dismantling, removing, transporting and discarding of the signs and their supports, excavation and disposal of the existing foundations, supplying and placing of gravel backfill and compaction, and the restoration or replacement in kind of disturbed surfaces, and all incidental costs required to complete the work.

ITEM 905.2 5000 PSI, 3/8 INCH, 710 HP CEMENT CONCRETE CUBIC YARD

All work under this Item shall conform to the relevant Provisions of Subsection 901 of the Standard Specifications and the following:

The work under this Item shall consist of furnishing and placing 5000 PSI, 3/8 Inch, 710 Cement Concrete for deep concrete repairs (Type A and Type B as shown on the plans) for the abutments to limits indicated on the plans and as directed by the Engineer.

The Contractor shall obtain approval from the Engineer that the concrete excavation has been performed in accordance with requirements of Item 127.12 and of all formwork prior to placing substructure repair concrete.

All cost(s) associated with the addition of any admixture to the cement concrete including admixtures intended to improve the flow or consolidation of the concrete shall be considered incidental to this Item.

The cement concrete shall be properly consolidated using appropriately sized vibrators.

Preparation of Concrete Surfaces:

All concrete surfaces to be rehabilitated or repaired/patched shall be roughened and cleaned of all laitance, dirt, grease, oil, other contaminants. An epoxy bonding compound shall be applied to the cleaned concrete surfaces of existing concrete that are to be bonded to fresh concrete. Epoxy bonding compound shall be paid for under Item 964.1.

All reinforcing steel encountered shall be cleaned by mechanical cleaning and high pressure washing with water that contains no detergents or bond inhibiting chemicals. Where active corrosion has occurred (that which would inhibit bonding), sandblast steel to white metal finish. The cleaned reinforcing steel shall be coated with a zinc rich coating conforming to Material Subsection M7.04.11 before being covered with new concrete.

Damage to the existing reinforcing steel to remain shall be repaired at the Contractor's expense. If any existing reinforcement bars need to be replaced due to damage, the Contractor shall do so at the direction of the Engineer. The Contractor shall notify the Engineer of any extensive deterioration uncovered during abutment concrete repair work. If any existing reinforcement bars need to be replaced due to existing condition, the Contractor shall do so at the direction of the Engineer.

The forms shall be filled with water 24 hours prior to placement of the cement concrete. Alternatively, immediately prior to placement of the cement concrete, the excavated areas shall receive a thorough application of water from a pressure washer capable of delivering 1500 psi at the nozzle for a minimum of 10 minutes. Any remaining water should be blown out to produce a saturated surface dry (SSD) condition, using oil free compressed air.

ITEM 905.2 (Continued)

METHOD OF MEASUREMENT

Item 905.2 will be measured for payment by the CUBIC YARD of 5000 psi, 3/8 inch, 710 HP cement concrete placed, complete in place.

BASIS OF PAYMENT

Item 905.2 will be paid for at the Contract unit price per CUBIC YARD, which price shall include all labor, materials, tools, equipment, including the installation and subsequent removal of any formwork, coating of the steel reinforcing (including bars drilled into existing concrete), damage to existing steel and replacement of existing steel, and all incidental costs required to complete the work.

ITEM 909.3 CRACK REPAIR FOOT

The work under this Item consists of the repair of cracks in the existing sound concrete of the abutments and retaining walls as shown on the Plans and/or as required by the Engineer.

Removal of all loose, delaminated concrete, and repair of these areas shall be completed according to the provisions of Special Provisions 127.1, and 905.2 prior to commencement of this work.

MATERIALS

Only materials which are on the MassDOT Qualified Construction Materials list as applicable for pressure injection are acceptable.

The Contractor shall submit manufacturer's literature completely describing products. The materials shall be delivered clearly marked with legible and intact labels containing the manufacturer's name, brand name, and identification of the temperatures which conform to the manufacturer's recommendations and instructions. The manufacturer of the repair materials shall certify that the material meets the requirements of these specifications.

Injection Epoxy

The injection material shall be a two-component, moisture insensitive, 100% solid, low viscosity, high strength, epoxy resin adhesive suitable for the injection repair of cracks in concrete.

The System shall be 100% solids with Component A being completely reactive with Component B. The system shall be suitable for use on damp surfaces but shall not be used when temperature is 50°F or below.

The materials shall be in conformance with current ASTM C-881. The two components shall be combined immediately prior to use in accordance with the written instructions of the supplier or have a delivery system employing a static mixer nozzle to ensure the proper mix percentages of Components A and B. Component A shall contain a bisphenol A, epichlorohydrin epoxy resin. Component B shall contain one or more curing agents, which upon mixing with Component A will cause the mixture to harden from 40 degrees F to 100 degrees F. The mixtures shall have the following physical characteristics @ 77°F:

Viscosity – Approximately 375 cps

Tensile Strength (7 day) – 7500 psi

Elongation at Break (7 day) – 1% minimum (ASTM D638) Compressive Modulus (7 day) – 2.5 x 105 (ASTM D695) Heat Deflection Temperature (7 day) - 124°F (ASTM D648) Bond Strength (2 day) – 1500 psi (ASTM C-882)

ITEM 909.3 (Continued)

Epoxy Sealing Compound

The sealer used to seal cracks prior to injection shall consist of a two-component, non-sag paste epoxy adhesive. This material shall be used for the repair and sealing of cracks and other minor damaged areas in concrete.

It shall be suitable for patching on horizontal, vertical, and overhead applications. It shall develop high early strength and achieve final cure in seven (7) days. This material shall not be used when the concrete or ambient temperature is below 50 degrees F or above 100 degrees F. It shall be suitable for damp and moist applications.

The materials shall conform to ASTM C881, and components A & B shall be similar to that specified for the injection epoxy.

Characteristics Of The Paste Mixture

When Components A and B are mixed according to the manufacturer's instructions, the mixture will have a paste of gel consistency such that a ½" thick layer of the mixture will not sag or drip from an overhead surface throughout the temperature range from 50 degrees F to 100 degrees F. It shall also have the following characteristics at 77°F:

Tensile Strength (7 day) – 4500 psi

Elongation at Break (7 day) – 0.5% minimum (ASTM D638) Compression Yield Strength (7 day) – 14,000 psi Compressive Modulus (7 day) – 3.0 x 105 psi (ASTM D695) Heat Deflection Temperature (7 day) - 126°F (ASTM D648) Bond Strength (7 day) – 2000 psi (ASTM C-882)

Slant Shear Strength – 75,000 psi.

CONSTRUCTION METHODS

Existing cracks shown on the plans and designated by the Engineer to be repaired by pressure injection shall be bonded by penetration with an epoxy adhesive in accordance with the epoxy manufacturer's recommendations and the following:

The Contractor shall comply with all manufacturer's instructions and recommendations regarding safety. The surrounding work, vehicles and vegetation shall be protected from damage by epoxy injection materials and operation.

Injection

Surface preparation shall be completed in accordance with the manufacturer's specifications.

ITEM 909.3 (Continued)

No epoxy injection, or surface sealing shall be performed when the concrete temperature, or ambient temperature, is, or is expected to fall below 50 degrees F during the 24 hours following the time of epoxy injection. Application or injection of the epoxy at temperature lower than that allowed by this specification shall only be done with the written approval of the Engineer. The Contractor may utilize surface mounted ports provided that performance is acceptable to the Engineer.

All working personnel shall be familiar with the equipment, materials and procedures to be used during the operation. Extra equipment to assure the continuous injection of epoxy, in the event of equipment failure, shall be provided.

Any debris within the crack(s) shall be removed by vacuuming or other methods acceptable to the Engineer. The area shall be surface wiped with a suitable solvent, if specified by the manufacturer. Adequate ventilation shall be provided when using solvents, and smoking or other fire initiating devices shall be barred from the work area.

Voids adjacent to cracks due to spalls or other damage to the concrete shall be patched with 5000 psi, 3/4 IN, HP 685 Cement Concrete under Item 905.2. or an approved cementitious mortar for patching under Item 909.2 as appropriate and shall be properly cured prior to performing the pressure injection crack repair.

Epoxy Sealing Compound

Ports, if used, shall be surfaced mounted to a spacing in accordance with the manufacturer's specifications, or as approved by the Engineer, for blind side injection of this crack.

The epoxy injection shall begin from the lowest port and move up as the epoxy is seen flowing out of the following port. If in a certain amount of time, designated by the Engineer, the following port shows no flow, then another port shall be placed in between the two ports and the sequence shall start again.

After an injection process has been completed, and the epoxy allowed to cure for six (6) hours or more, the injection ports, surface seal and any spillage shall be ground off flush with the original surface, using a hand grinder. Any damage to concrete occurring during the cleanup procedure shall be repaired in a manner as approved by the Engineer, at no additional cost to the Department.

The epoxy components shall be mixed and placed according to the manufacturer's recommendations, subject to the approval of the Engineer.

METHOD OF MEASUREMENT

Item 909.3 will be measured for payment by the FOOT of crack repair sealed by pressure injection, complete in place.

BASIS OF PAYMENT

Item 909.3 will be paid for at the Contract unit price per FOOT, which price shall include all labor, materials, equipment, submittals, and all incidental costs required to complete the work.

ITEM 950.1 TEMPORARY SHORING LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsection 960 of the Standard Specifications and the following:

The work under this Item consists of the design, fabrication, installation, and removal of a temporary shoring system for supporting existing Beam 3 along its span. The shoring shall be supported by towers positioned in front of the existing abutments. The shoring shall be configured in such a manner that the loads from existing Beam 3 are transferred to the shoring towers prior to the partial demolition of the superstructure to prevent any displacements.

Manufactured shoring towers may be used to support the existing beam and support live traffic throughout construction.

The Contractor shall satisfy themselves, by their own investigation and research, regarding all conditions and material affecting the work to be done. Contractor shall note that there is an existing timber shoring system below the two westernmost beams (existing Beams 1 and 2) at the face of each abutment. Details of this existing system are included herein as Document A00865.

The Contractor shall notify the Engineer if the condition of the existing beams deviates from the latest inspection report while the existing beams are still in place. If the deviations are determined to be significant, the Contractor may need to stop all construction activities per the direction of the Engineer.

The Contractor shall not place heavy equipment or store equipment/materials on the red line tunnel roof, except for MBTA approved equipment and materials essential for the installation of the shoring system. The shoring system and installation methods shall be submitted to the Engineer for review and approval.

The Contractor’s means and methods of construction shall not damage any retained elements of the existing or proposed bridge and the red line tunnel beneath the bridge. Any damage done to the retained portions of the Project by the Contractor’s operations shall be repaired to the original condition as required by the Engineer, at the Contractor’s expense.

MATERIALS

All structural steel shall be in new or good condition and shall confirm to the minimum requirements of AASHTO M270, Grade 36 or 50. All high strength bolts shall conform to the requirements of AASHTO M164 or M253.

ITEM 950.1 (Continued)

SUBMITTALS

The Contractor shall submit the structural plans, details, and design for the temporary shoring system to the Engineer for approval. The contract plans and details pertaining to the temporary shoring system are shown for schematic purposes only. It is the Contractor's responsibility to fully design and detail the temporary shoring system in accordance with latest version published as of the opening bid date of the AASHTO Guide Design Specifications for Bridge Temporary Works.

The Contractor shall submit his/her proposed erection procedures and methods to be used including crane capacity and location, equipment, tools, devices etc. to the Engineer for approval. The requirements for equipment and all procedures utilized shall be in conformance with the intent of Subsection 960.61B Erection of the Standard Specifications.

Prior to commencing the erection, the Contractor shall prepare and submit to the Engineer for review the complete assembly and erection plans, elevations, details, part lists, erection sequence, installation procedures, and design of the temporary shoring system.

All submittals shall be stamped by a Professional Structural Engineer registered in the Commonwealth of Massachusetts. Erection may not commence until design, assembly and erection plans have been approved by the Engineer.

The Contractor shall ensure the stability of the structure during erection.

The method and sequence of erection shall be the responsibility of the Contractor and shall be coordinated with the affected utility companies, the MBTA, DCR, and the City of Cambridge.

BASIS OF PAYMENT

Item 950.1 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, materials, equipment, design, plans, submittals, installing, maintenance, and all incidental costs required to complete the work. The basis of payment will be based on temporarily shoring existing Beam 3 only.

ITEM 953.1 EXCAVATION SUPPORT SYSTEM LUMP SUM
BRIDGE NO. C-01-031(4DR)

The work under this Item shall conform to the relevant provisions of Subsections 140, 940, 950, 955 of the Standard Specifications and the following:

The work under this Item consists of designing, furnishing and installing, and removing (where approved by the Engineer) support of excavation systems to maintain the existing grades during demolition and construction at Bridge No. C-01-031 in stages. The excavation support systems proposed for the construction of the bridge are shown schematically on the plans. The limits of the excavation support systems shall be determined by the Contractor and submitted for approval by the Engineer.

The Contractor is advised to conduct a field investigation prior to bidding. Contractor shall verify all conditions, dimensions and materials in the field and shall base his/her bid on his/her own findings without any additional compensation for variances from the Plans or these Special Provisions regarding actual conditions.

The excavation support system shall be determined by the Contractor and submitted for acceptance by the Engineer. Any necessary tieback anchors, deadman anchors, and/or temporary bracing are considered incidental to this Item. The Contractor shall maintain/avoid/protect or relocate existing utilities as needed. The protection or relocation of existing utilities to facilitate the excavation support system is incidental to this Item.

At the Contractors option, support of excavation may be utilized to complete the proposed work at other locations not noted on the plans. Any support of excavation proposed by the Contractor shall meet the requirements of this specification.

The excavation support systems provided shall be independent and not cause damage to the permanent or existing structures when removed (where approved by the Engineer). Removal of temporary SOE is in accordance with Section 3.2.5.7 of Part I of the MassDOT LRFD Bridge Manual.

The support of excavation system shall be designed and detailed to avoid impacting the existing utilities in the vicinity of the proposed work. Any modifications to the support of excavation system to accommodate the existing utilities shall be incidental to this Item.

The Contractor is responsible for control of groundwater and surface runoff drainage to allow excavation work to be performed in the dry. This work is incidental to the items and will not be considered for additional compensation. The Contractor is responsible for removing portions of the excavation support system which may interfere with staged construction as indicated on the plans.

ITEM 953.1 (Continued)

The Contractor is responsible for installation of survey deformation monitoring points (DMPs) to monitor movements that may be detrimental to performance of roadway, and structures. This work is incidental to the items and will not be considered for additional compensation.

GEOTECHNICAL INSTRUMENTATION AND MONITORING

Geotechnical instrumentation and monitoring is required at the following locations for Excavation Support System.

Deformation Monitoring

The Contractor shall furnish, install, protect, replace, monitor, and report on survey deformation monitoring points (DMPs) at the following locations as a minimum:

1. Where the excavation support systems extend within the zone of influence of existing roadways, structures, or utilities, DMPs shall be established a minimum of one every 25 linear feet along the top of the excavation support wall, to measure horizontal displacements during the Work.
2. Utility DMPs, spaced at 25 feet on center, shall be installed and monitored on existing utilities located within 25 feet of excavation support systems.

The Contractor's registered Surveyor and Geotechnical Monitoring Consultant shall monitor and evaluate the instrumentation. The Contractor shall perform a baseline survey of each DMP consisting of two sets of independent readings prior to the beginning of excavation and demolition. During excavation, DMPs shall be monitored one time daily until excavation is complete. The Contractor shall provide survey data to the Engineer for review within 24 hours of collection of data. The number of points to be monitored on a daily basis and the frequency of monitoring may be increased or decreased in agreement with the Engineer based on the results of the monitoring. Survey data shall be reported to an accuracy of 0.01 feet.

The following Threshold and Limiting Values for monitoring points shall be used:

MONITORING TARGET	THRESHOLD VALUE	LIMITING VALUE
Structure DMP (hor. and vert.)	0.25 inch	0.5 inch
Utility DMP (vertical)	0.25 inch	0.5 inch
Excavation Support DMP		
horizontal	1.0 inch	2.0 inch
vertical	0.5 inch	1.0 inch

ITEM 953.1 (Continued)

The movement criteria are intended only to establish a guideline, and in no way relieve the Contractor of his responsibility for preventing detrimental movements or damage causing structural distress in the various structures, roadways, or embankment. The Contractor shall provide all measures necessary to control movements to within the established performance criteria, or to lesser amounts as required to prevent damage. The Engineer may require the Contractor to take steps to control movements to levels which are lower, at no additional cost to the Owner, if in the Engineer's opinion the measured or observed movements are detrimental or damaging.

The work shall be executed in such a manner as to prevent damage to existing structures and other public and private property and existing improvements. The Contractor shall protect existing improvements from damage caused by settlement, lateral movement, loss of ground, undermining, washout, and other potential hazards which may be initiated by underpinning operations. Damage to existing facilities shall be repaired by the Contractor at his own expense.

If a Threshold Value is reached the Contractor shall increase the instrument monitoring frequency as directed by the Engineer, install and monitor additional instruments as directed by the Engineer and implement remedial measures so the Limiting Value is not reached. If a Limiting Value is reached the Contractor shall stop work immediately and notify the Engineer and take immediate remedial action.

Vibration Monitoring

Where vibratory construction methods (e.g., demolition or installation of excavation support members) are used within a distance of 100 feet of existing buildings, the Contractor shall provide all labor and equipment to monitor and report vibrations during the Work.

Contractor shall conduct vibration monitoring using portable seismographs to measure vibration levels resulting from construction activities. Provide at least two seismographs which have been calibrated within the previous three months to a standard that is traceable to the National Bureau of Standards. Seismograph monitoring locations shall be mutually agreed upon by the Engineer and Contractor. Vibrations shall be monitored on a continuous basis during excavation or support installation that use vibration or impact methods.

If vibration levels are found to exceed the maximum limits shown below, Contractor shall revise his construction operations as necessary to reduce vibration levels, at no additional cost to MassDOT. The Engineer may require the Contractor to perform additional vibration monitoring if, in the opinion of the Engineer, conditions warrant such action.

ITEM 953.1 (Continued)

Vibration monitoring shall be conducted by persons trained in the use of a seismograph and records shall be analyzed and results reported by persons familiar with analyzing and reporting the frequency content of a seismograph record. Limit construction vibrations to prevent damage to any adjacent building, structure, utilities, pipes, or other features near the site. The Contractor is solely responsible to determine the maximum vibration tolerable at each location. However, in no case shall the following peak particle velocity criteria be exceeded.

Frequency (Hz)	Maximum Peak Particle Velocity (in. per. sec.)
Over 40	2.0
30 to 40	1.5
20 to 30	1.0
Less than 20	0.5

Contractor shall provide written reports of monitoring results to the Engineer within 24 hours of monitoring.

EARTH AND/OR EXCAVATION SUPPORT SYSTEM REQUIREMENTS

The Contractor shall submit to the Engineer for approval an earth support system design that is designed to carry all of the applicable AASHTO loads, as applicable. The earth support system must be designed and stamped by a qualified Professional Engineer registered in the Commonwealth of Massachusetts experienced in the type and complexity of excavation support required for this project. Complete detailed drawings and calculations shall be submitted to the Engineer for approval. Qualifications of the Contractor's Engineer shall be submitted with the shop drawings and design calculations. Approval of the working drawings does not relieve the Contractor of the responsibility of providing for the safety of the work and its successful completion.

The Contractor designed excavation support system shall meet the following minimum requirements:

1. The Contractor is responsible for selecting, designing, furnishing, installing, maintaining, monitoring, and removing (where applicable) the excavation support systems.
2. The excavation support systems shall be designed to safely resist all anticipated loads they may be subjected to while in place, including, but not limited to: earth pressure, impact and surcharge due to highway loading, and any expected surcharge from construction vehicles (i.e., cranes). The design shall be in accordance with the latest versions published as of the opening bid date of the AASHTO LRFD Bridge Design Specifications, relevant portions of the AASHTO Guide Design Specifications for Bridge Temporary Works.

ITEM 953.1 (Continued)

The Contractor shall submit shop drawings indicating the instrumentation and monitoring point locations, sizes, material types, and installation procedures. Contractor submittals shall be acceptable to the Engineer prior to undertaking the work.

Impact driving of vertical temporary earth support members can be permitted as vibration monitoring is implemented. The Contractor may use an alternative temporary earth support system, which meets all of the relevant requirements and is approved by the Engineer.

All materials used for the support system, whether new or used, shall be sound and free from strength-impairing defects. Steel sheet piling (if used) shall conform to the applicable requirements of Subsection 950. New steel piles (if used) shall conform to the applicable provisions of Subsection 940. Treated timber (if used) shall conform to the applicable provisions of Subsection 955. All materials shall be removed in advance of project completion. Timber elements shall not be used in locations where they protrude into the soil that supports the bridge structure or retaining walls.

For all steel used for excavation support that will remain in place or as part of the permanent part of the work due to either construction sequencing or the Contractor's convenience, all Buy America provisions shall apply. Any steel used for temporary works that does not meet Buy American provisions shall be removed prior to completion of the Contract and is not allowed to remain in place or be incorporated into the permanent work.

The Contractor shall make his own evaluation of existing conditions and facilities, and of the effects of the proposed temporary earth support system and construction methods, and shall provide in his design for all loads and methods necessary to permit construction of the specified stages of the work while maintaining public safety and protecting completed work (and all third party property) from damage caused by his operations. Furnishing such plans and calculations shall not relieve the Contractor of sole responsibility for safety of the public, personnel, equipment, and structures, as well as successful project completion.

The Contractor shall accurately locate all utility lines and structures to ensure that the proposed temporary earth support system will not interfere with any existing or proposed utilities and structures.

The plan submitted shall be sufficiently detailed so that the Contractor's method of dealing with operations and traffic shall be clearly stated within a traffic management plan. Prior to any excavation, the Engineer must approve complete detailed drawings (including traffic control plan) and complete calculations for the temporary earth support system in writing.

ITEM 953.1 (Continued)

During the prosecution of this work, the Engineer may reject use of any method or equipment which causes vibrations that exceed specified values, or levels which may cause damage to portions of the adjacent structures. Any damage done to portions of the adjacent structures and/or utilities identified on the Plans to remain shall be replaced or repaired by the Contractor at his expense to the satisfaction of the Engineer. The provisions and requirements for vibration monitoring shall be followed during the temporary support of excavation work.

BASIS OF PAYMENT

Item 953.1 will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, design, plans, installing, maintenance, dewatering, survey deformation monitoring, surveyor, geotechnical monitoring consultant, subsequent removal of temporary earth support system, obstruction removal, and all incidental costs required to complete the work.

Excavation for construction of proposed substructure elements and demolition of existing substructure units shall be paid for under Items 127.1, and 140, as applicable.

ITEM 964.1 EPOXY BONDING COMPOUND SQUARE FOOT

The work under this Item consists of furnishing and applying epoxy bonding compound to cleaned surfaces of existing concrete at surfaces that are to be bonded to fresh concrete at the locations specified on the Plans or as required by the Engineer.

Epoxy Bonding Compound shall be applied in accordance with the manufacturer's recommendations and with provisions of Subsection 901.37.F of the Standard Specifications.

MATERIAL

Epoxy Bonding Compound Materials shall meet requirements of Materials Specification Subsection M4.10.0 and M4.10.1 of the Standard Specifications for Highways and Bridges and shall be on the MassDOT Qualified Construction Materials List (QCML).

A sample of the epoxy bonding compound proposed for use shall be submitted to the Department's Research and Materials Section for approval. This sample must be submitted at least six weeks prior to scheduled use.

CONSTRUCTION METHODS

Preparation of Concrete Surfaces:

All surfaces to be patched with cement concrete must be clean and sound. Surfaces shall be free of standing water and dry. The entire surface to be bonded shall be blast cleaned to remove any laitance, dirt, grease, oil, or other contaminants.

Mixing Epoxy Compound

Components "A" and "B" of the epoxy-resin system shall be mixed in exact accordance with the manufacturer's instructions.

The area to be overlaid shall be covered with one coat of the epoxy compound, applied with long-nap paint rollers, brooms, or brushes.

The rate of application shall be 80 sq. ft/gallon maximum on smooth concrete (20 mils). As the concrete increases in roughness, the rate of coverage decreases proportionately.

While the epoxy compound is still tacky (4-5 1/2 hrs. at 73 degrees F.), place the concrete. If the bonding compound should harden before the concrete is placed, apply a fresh coat over the hardened coat and proceed.

Weather Limitations

The epoxy bonding compound shall be applied according to manufacturer’s recommendations and as directed.

ITEM 964.1 (Continued)

Epoxy Manufacturer's Field Representative

The Contractor shall arrange with the epoxy manufacturer to have the services of a competent field representative present at the work site. The field representative shall be present at work site prior to any mixing of components to instruct the work crews, explain the inspection procedure and to inspect the condition of the prepared surfaces. He shall remain at the job site after work commences and continue to instruct until the Contractor has mastered the technique of installing the epoxy system successfully. The representative shall make periodic visits to the project as the work progresses and shall confer on each visit with the Inspector and/or Engineer. The manufacturer's field representative must be fully qualified to perform the work and shall be subject to the approval of the Engineer. At the discretion of the Engineer, the services of the manufacture's representative may not be required when in the opinion of the Engineer, the Contractor has demonstrated a thorough understanding and successful execution of the work procedures

METHOD OF MEASUREMENT

Item 964.1 will be measured for payment by the SQUARE FOOT of epoxy bonding compound applied, complete in place.

BASIS OF PAYMENT

Item 964.1 will be paid for at the Contract unit price per SQUARE FOOT, which price shall include all labor, materials, equipment, manufacturer's representative, and all incidental costs required to complete the work.

ITEM 992.33 TEMPORARY UTILITY SUPPORT STRUCTURE LUMP SUM

The work under this Item shall conform to the relevant provisions of Sections 800 and 900 of the Standard Specifications and the following:

The work under this Item includes the construction, maintenance, and satisfactory removal of a temporary utility support structure, as shown on the plans. The contract plans and details pertaining to the temporary utility support structure are shown for schematic purposes only. It is the Contractors responsibility to fully design and detail the utility support system.

This structure is assumed to carry a 12" diameter gas main adjacent to the west fascia of Bridge No. C-01-031 in order to facilitate demolition and construction of the bridge. The work also includes any required excavation, trenching, etc. of the approach roadway and side slopes to accommodate the temporary relocation of the gas line from the east to the west. It shall also include all labor, excavation, backfill, and incidental work and materials required to complete the work. A temporary fence shall be installed around the utility support structure at each abutment as shown on the plans.

The temporary utility support structure shall maintain a minimum of 40'-0" clear span below for pedestrian and bicyclists' access once erection and installation of the structure is complete and shall be a minimum of 15'-0" away from the west fascia of the existing bridge as shown on the plans. The Contractor shall provide a pedestrian detour during the erection and construction of the structure. The Contractor shall notify the City of Cambridge, DCR and the MBTA of the detour 7 days prior to commencing the work.

The design and detailing of the temporary utility support structure shall be completed by the Contractor. The Contractor shall be required to erect and set in place the gas main pipe and other gas main components in their proposed locations on the temporary utility support structure. The gas pipe, hangers and other materials required to install the gas line will be provided by Eversource. Eversource will also fit, make connection to the bridge, weld, and test the gas line. The Contractor shall coordinate all work pertaining to the gas main, temporary utility support structure, and gas main relocation with Eversource and the Engineer.

Upon completion of all work under this Item, the Contractor shall remove the entire temporary utility support system. The support system shall be removed only upon the direction of the Engineer. Upon removal, the Contractor shall own the temporary support system and all materials associated with the structure including the temporary utility gas main, except those that are needed for the final condition, and dispose of legally off site.

The Contractor shall coordinate with all utility owners on the scope and schedule of work and shall verify at the time of construction their requirements for supporting their respective utilities during construction.

ITEM 992.33 (Continued)

The Contractor is responsible for coordinating the support requirements with the utility companies that are to be on the bridge and to adapt their support details if needed to ensure all utility support requirements are met.

The Contractor shall not place heavy equipment or store equipment/materials on the red line tunnel roof, except for MBTA approved equipment and materials essential for the installation of the temporary utility support system. The support system and installation methods shall be submitted to the Engineer for review and approval.

The Contractor's means and methods of construction shall not damage any retained elements of the existing or proposed bridge and the red line tunnel beneath the bridge. Any damage done to the retained portions of the Project by the Contractor's operations shall be repairs to the original condition as required by the Engineer, at the Contractor's expense.

SUBMITTALS

The Contractor shall submit the structural plans, details, erection procedure, and supporting calculations for the temporary utility support system to the Engineer for approval. The Contract plans and details pertaining to the temporary utility support system are shown for schematic purposes only. It is the Contractors responsibility to fully design and detail the utility support system in accordance with latest version published as of the opening bid date of the AASHTO Guide Design Specifications for Bridge Temporary Works.

The Contractor shall submit his/her proposed erection procedures and methods to be used including crane capacity and location, equipment, tools, devices etc. to the Engineer for approval. The requirements for equipment and all procedures utilized shall be in conformance with the intent of Subsection 960.61B, Erection of the Standard Specifications. Prior to commencing the erection, the Contractor shall prepare and submit to the Engineer for review of the complete assembly and erection plans, elevations, details, part lists, erection sequence, installation procedures, and design of the temporary utility support structure.

All submittals shall be stamped by a Professional Structural Engineer registered in the Commonwealth of Massachusetts. Erection may not commence until design, assembly and erection plans have been approved by the Engineer.

The Contractor shall ensure the stability of the structure during erection.

The method and sequence of erection shall be the responsibility of the Contractor and shall be coordinated with the affected utility companies, the MBTA, DCR, and the City of Cambridge.

ITEM 992.33 (Continued)

MATERIALS

All materials used to construct the temporary utility support structure shall be in accordance with the most recent version of the Standard Specifications.

Sawn Lumber and timber shall conform to the AASHTO M 168 Specifications for Structural Timber, Lumber and Piling. Structural lumber and timber shall be treated in conformation to the relevant provisions of Section 955, Treated Lumber.

Steel plates and shapes shall comply with AASHTO M 270 Grade 36 or 50 and ASTM A500, Grade 46 for all HSS shapes. Bolts and lag screws shall comply with ASTM A307.

Materials shall conform to the requirements of the Standard Specifications. Construction materials may include lumber, plywood, structural steel, concrete, reinforcing steel, and any other components.

Dimensional lumber shall be straight and free from defects. Structural steel for the support system shall conform to the requirements of AASHTO M270 Grade 36 or 50. All steel welding shall conform to the relevant provisions of Section 960 of the Standard Specifications and as amended herein. Concrete shall conform to the requirements of Section 901 of the Standard Specifications

CONSTRUCTION METHODS

All workmanship shall be high quality. Joints shall be square, tight and well fastened. All posts shall be set plumb. Bolts shall be tightened to provide a firm connection without crushing the wood or causing excessive deformation (cupping) of the washers. Bolts shall have a maximum of 1” of thread projecting beyond the nut.

All waste from cuts shall be removed from the site and properly disposed of.

Any damage to completed portions of the structure by the Contractor’s operations shall be repaired at no additional compensation.

ITEM 992.33 (Continued)

The method and sequence of erection shall be the responsibility of the Contractor and shall be coordinated with the affected utility companies. The Contractor shall coordinate the relocation of each utility to the temporary structure with each of the utility companies affected. Pedestrian access below the bridge shall be temporarily detoured during erection of the temporary utility support system. The Contractor shall notify the City of Cambridge at least 7 days in advance of the pedestrian detour.

Excavation to the existing grade, on the Alewife Linear Path level located below Bridge No. C-01-031, is not permitted due to the presence of the Red Line Tunnel below.

BASIS OF PAYMENT

Item 992.33 will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, design, submittals, erection and subsequent removal, coordination with utility companies, MBTA, City of Cambridge and DCR, removal or relocation of utilities, temporary chain link fence, and all incidental costs required to complete the work.

ITEM 995. BRIDGE SUPERSTRUCTURE, BRIDGE NO. C-01-031 (4DR) LUMP SUM

SCOPE OF WORK

Work under this Item shall conform to the applicable provisions of Subsection 995 of the Standard Specifications and specific requirements stipulated below for component parts of the subject Item. For those component parts where no specific requirement is stipulated, the Standard Specifications shall apply except for payment.

Work under this Item shall include all materials, equipment and labor needed to construct the following:

- Precast Concrete Bridge Elements (PBE): beam seats, backwalls, approach slabs, and highway guardrail transitions and bases
- Prefabricated Bridge Units (PBU): including concrete deck, concrete end diaphragm, shear connectors, metalized steel girders, steel diaphragms, steel utility supports, and concrete safetywalks
- Cast-in-place concrete: CMP voids, longitudinal closure pours, keeper blocks and sidewalks
- Bearings
- Reinforcing steel and Mechanical Reinforcing Bar splicers
- Structural Steel – Coated Steel
- Laminated Elastomeric Bearings without anchor bolts
- S3-MTL4 bridge railings, CM-MTL3 bridge railing, and Type I protective screen
- Controlled Low-Strength Material
- Damp-proofing
- Membrane waterproofing for bridge decks – spray applied
- Drilled and grouted dowels
- Anti-graffiti coating and elastomeric protective coating
- Sawing & sealing joints in asphaltic pavement at bridges
- Other work not specifically provided or elsewhere in the contract and as required by the Engineer.

The work does not include any items listed separately in the proposal. Payment for materials shown on the Plans as being part of this bridge structure or which may be incidental to its construction and are not specifically included for payment under another Item shall be considered incidental to the work performed under this Item and shall be included in the unit price of the component of which they are a part.

ITEM 995. (Continued)

5000 PSI, 3/4 INCH, HP CEMENT CONCRETE

The work under this heading shall conform to the relevant provisions of the MassDOT Standard Specifications and the requirements specified herein.

5000 PSI,, 3/4 INCH, HP Cement Concrete shall be used for the following cast in place and precast elements on the bridge:

Cast-in-place: keeper blocks and sidewalks
Precast: approach slabs, deck, beam seats, backwalls, safetywalks, concrete end diaphragm, highway guardrail transition, and highway guardrail transition base

This concrete shall conform to all requirements of Subsection ubsM4.06.2 of the Standard Specifications.

STEEL REINFORCEMENT FOR STRUCTURES – EPOXY COATED

Steel Reinforcement for Structures – Epoxy Coated shall conform to the relevant provisions of Sections 901 and M8.01.7 of the Standard Specifications.

CONTROLLED LOW-STRENGTH MATERIAL

Controlled Low-Strength Material shall conform to the relevant provisions of Subsection M4.08.0 of the Standard Specifications.

RAPID HARDENING CONCRETE FOR CLOSURE JOINTS

The work under this heading shall conform to the relevant provisions of the MassDOT Standard Specifications and the requirements specified herein.

Rapid Hardening Concrete for Closure Joints shall be used for the CMP void closure pours and longitudinal deck and end diaphragm closure pours as shown on the plans. It shall attain a minimum compressive strength of 2500 psi prior to reopening the bridge to traffic of construction vehicles.

MATERIALS

Rapid Hardening Concrete for Closure Joints shall meet Subsection M4.03.0: Concrete Produced by Volumetric Mixing, Subsection M4.06.4: Rapid Hardening Concrete, and the requirements specified herein.

ITEM 995. (Continued)

Liquid Membrane-Forming Compounds for Curing.

Liquid membrane-forming compounds for curing shall maintain valid listing on the Department Qualified Construction Materials List (QCML) and meet the requirements specified herein.

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 greater than or equal to seven (7) 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.

Liquid membrane-forming compounds for curing shall meet ASTM C309 Standard Specifications for Liquid Membrane Forming Compounds for Curing Concrete and the requirements specified herein.

Table 1: Types of Liquid Membrane-Forming 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 2: Composition Class of Liquid Membrane-Forming Compounds for Curing

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

ITEM 995. (Continued)

CONSTRUCTION METHODS

Rapid Hardening Concrete for Closure Joints shall meet the relevant provisions of Subsection 901: Cement Concrete of the Standard Specifications and the requirements specified herein.

Surface Preparation.

The new precast concrete surfaces to be in contact with the proposed closure concrete must be free of materials such as paint, oil, curing compound, bond breaker, etc. that will inhibit bonding. Existing concrete surfaces shall be pressure washed with equipment that can remove asphaltic material, oils, dirt, rubber, curing compounds, paint carbonation, laitance, weak surface mortar and other potentially detrimental materials, which may interfere with the bonding or curing of the proposed deck and end diaphragms. Reinforcing steel shall be cleaned as directed, and any damaged epoxy coating of steel reinforcement shall be repaired as directed. The new precast concrete surfaces must be saturated prior to concrete placement using potable water. Standing water shall be removed from surfaces to achieve a Saturated Surface Dry (SSD) condition.

Placement and Finishing.

The closure pour concrete shall be placed immediately after mixing onto substrates that are Saturated Surface Dry (SSD) and shall be worked firmly into sides and bottom of the closure pour to achieve good bond. The manufacturer's limitations on minimum surface and ambient temperatures shall be complied with if different from above. The concrete placement shall start at one edge of the placement and shall continue full depth with temporary vertical bulkheads, if needed, to ensure that horizontal cold joints do not occur between successive concrete placements. It is critical that the concrete be placed and finished as rapidly as possible as the concrete will typically lose all slump within 10 minutes of mixing. Surfaces that are adjacent to the placement shall be protected with drop cloths, waterproof paper, or other means to maintain them free of material splashes, water, and debris.

Application of Liquid Membrane-Forming Compounds for Curing.

At least 30 days prior to the proposed start of placing the concrete, the curing plan shall be developed by the Fabricator and submitted to the Department for review, as specified herein. The curing plan shall identify all required curing materials and methods to be used on the contract, as specified herein. The curing plan shall be included in the Fabricator's Quality Control Plan. All procedures, operations, materials, and equipment required for acceptable curing shall be present and ready for use prior to concrete production. Concrete that is not cured in conformance with the requirements specified herein will be installed at the Contractor's risk and any damage or unsatisfactory concrete shall be removed and replaced at the Contractor's expense.

Immediately after the completion of finishing operations and final set of the concrete is achieved, liquid membrane-forming compounds for curing shall be applied to the concrete surface, to prevent loss of moisture and surface drying, per the Manufacturer's instructions and recommendations as specified herein. The Contractor shall meet the minimum sustained ambient temperature, duration, and strength requirements as specified herein. Controlled, gradual, and uniform termination of the curing method cycle shall begin only after all specified conditions are met.

ITEM 995. (Continued)

Concrete shall be cured with sustained ambient temperatures greater than or equal to 40°F and less than or equal to 85°F. Compressive strength cylinders for termination of curing cycle shall be cast and field cured with the same environmental conditions that the concrete is subjected to throughout the entire duration of the curing cycle. Termination of curing shall occur no earlier than 100% of f'_c.

Prior to use, compounds shall be thoroughly mixed, stirred, and agitated. Compounds shall be applied immediately after final finishing and the disappearance of the surface water sheen, but before the free water on the surface has evaporated, to prevent the formation of cracks and loss of moisture at the surface. 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 shall place a transparent plastic sheet over a test area of the uncured and unfinished concrete surface and shall determine if any bleed water accumulates under the plastic. 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. 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 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 resulting in surface drying, absorption of the compound into the concrete, and forming of a discontinuous membrane shall be prohibited.

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

The Contractor shall verify the application rate and procedures are in accordance with the Manufacturer's instructions and recommendations. At least one uniform coat shall be applied at a rate of 150 to 200 ft^2/gallon. On very deeply textured surfaces, the surface area to be treated shall be at least twice the surface area of the surface. In such cases, two separate applications may be needed, each at 200 ft^2/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.

ITEM 995. (Continued)

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.

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.

CONTRACTOR QUALITY CONTROL

Contractor quality control sampling and testing shall meet Subsection M4.03.2.D: Concrete Produced by Volumetric Mixing and the requirements specified herein. Quality control sampling and testing shall be conducted during production, at a minimum frequency of one (1) per sublot (50 cy) or fraction thereof, minimum one (1) per day. Test results shall be within the specified limits identified in Table 3.

ITEM 995. (Continued)

Table 3: QC Sampling and Testing Requirements During Production

Property	AASHTO or ASTM Method	Quality Characteristic		Limits	
				Min.	Max.
Uniformity	M 157	Batching Quantities of Constituent Materials		M 157	
	T 119	Slump (in.)	< 4 in.	Target - 1.0	Target +1.0
			4 – 8 in.	Target - 1.5	Target +1.5
	T 121	Unit Weight (lb/ft^3)		Informational	
Workability	T 119[1]	Segregation Resistance		Pass	
Thermal	T 309	Concrete Temperature (°F)		50	90
Strength	T 22[2][3]	Compressive Strength (psi)	2 Hours	Informational	
			4 Hours	2500	–
			6 Hours	Informational	
			24 Hours	4000	–
			7 Days	5000	–
			28 Days	Informational	
Durability	T 121 or T 152 or T 196	Freezing, Thawing, and De-Icing Resistance: Air Content (%)		Target - 1.5	Target +1.5

[1] 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.

[2] Three (3) 4 x 8 in. cylinders shall be cast for each specified age for maximum aggregate size less than 1-1/2 inches. Two (2) 6 x 12 in. cylinders shall be cast for each specified age for maximum aggregate size greater than 1 inch.

[3] ASTM C1074 Standard Practice for Estimating Concrete Strength by the Maturity Method may be used as an alternative to AASHTO T 22 Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens for determining early age strength during production for certain concrete applications as determined by the Department. Prior to production, maturity method strength curves shall be developed with validated compressive strength specimens.

ITEM 995. (Continued)

DEPARTMENT ACCEPTANCE

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 the Contractor's Quality Control activities, to determine the corresponding value for a given product, and the acceptability of all material produced and placed through Department acceptance sampling, testing, inspection, evaluation, and documentation.

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. The results and findings of Acceptance sampling and testing will be documented on the Department's Test Report Forms (TRFs). The Department will conduct immediate initiation of non-conformance reporting and corrective action for materials with test results not within allowable limits.

Acceptance sampling and testing will be conducted during production, at a minimum frequency of one (1) per sublot (50 cy) or fraction thereof, minimum one (1) per day. Test results shall be within the specified limits identified in Table 4.

ITEM 995. (Continued)

Table 4: Acceptance Sampling and Testing Requirements During Production

Property	AASHTO or ASTM Method	Quality Characteristic		Limits	
				Min.	Max.
Uniformity	M 157	Batching Quantities of Constituent Materials		M 157	
	T 119	Slump (in.)	< 4 in.	Target - 1.0	Target +1.0
			4 – 8 in.	Target - 1.5	Target +1.5
	T 121	Unit Weight (lb/ft^3)		Informational	
Workability	T 119[1]	Segregation Resistance		Pass	
Thermal	T 309	Concrete Temperature (°F)		50	90
Strength	T 22[2][3]	Compressive Strength (psi)	4 Hours	2500	–
			24 Hours	4000	–
			7 Days	5000	–
			28 Days	Informational	
Durability	T 121 or T 152 or T 196	Freezing, Thawing, and De-Icing Resistance: Air Content (%)		Target - 1.5	Target +1.5

[1] 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.

[2] Three (3) 4 x 8 in. cylinders shall be cast for each specified age for maximum aggregate size less than 1-1/2 inches. Two (2) 6 x 12 in. cylinders shall be cast for each specified age for maximum aggregate size greater than 1 inch.

[3] ASTM C1074 Standard Practice for Estimating Concrete Strength by the Maturity Method may be used as an alternative to AASHTO T 22 Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens for determining early age strength during production for certain concrete applications as determined by the Department. Prior to production, maturity method strength curves shall be developed with validated compressive strength specimens.

ITEM 995. (Continued)

PRECAST CONCRETE APPROACH SLAB
PRECAST CONCRETE BEAM SEAT
PRECAST CONCRETE BACKWALL
PRECAST HIGHWAY GUARDRAIL TRANSITION AND BASE

A. General.

The work under this Heading consists of fabricating, transporting and installing precast concrete approach slabs, precast concrete beam seats, precast concrete backwalls, and precast highway guardrail transitions and bases and includes all necessary labor, materials, and equipment to complete the work as shown on the Plans. The Precast Concrete Bridge Elements shall meet the requirements of Section M4: Cement Concrete and Related Materials.

The Contractor is advised to conduct a field investigation prior to bidding. Contractor shall verify all conditions, dimensions and materials in the field and shall base their bid on their own findings without any additional compensation for variances from the Plans or these Special Provisions regarding actual conditions.

MATERIALS

A. Materials.

Materials shall conform to M4.09.1 and the following:

Non-Shrink Grout Products	M4.04.5
Controlled Low-Strength Material – Structural Non-Excavatable	M4.08.0
Welded Steel Wire Fabric	M8.01.2
Mechanical Reinforcing Bar Splicer	M8.01.9
Lifting Devices	PCI MNL-116
Corrugated Metal Pipe	AASHTO M 36

1. Vertical Adjustment Assembly.

Vertical Adjustment Assembly details and material requirements shall be as shown on the plans. Alternate devices may be used provided that they are adjustable and can support the anticipated loads. The design of the leveling devices, with necessary calculations, shall be submitted to the Engineer of Record for approval.

2. Threaded Inserts.

Threaded inserts are permissible to facilitate forming the keyway pours. Threaded inserts shall be hot dip galvanized or made of stainless steel. The number of threaded inserts shall be minimized, and the inserts shall not come in contact with the reinforcing steel.

3. Corrugated Metal Pipe.

Corrugated Metal Pipe to be used for forming voids as specified on the plans shall be fabricated from steel and shall have a protective metallic coating of zinc (galvanizing).

ITEM 995. (Continued)

CONSTRUCTION METHODS – PLANT FABRICATION

A. Pre-Production Meeting.

The Contractor shall notify the MassDOT Research and Materials Section to determine if a pre-production meeting will be required to review the specification, shop drawings, curing plan, schedule, and discuss any specific requirements. The meeting shall be held prior to scheduling a MassDOT Inspector (refer to M4.09.4 *Department Acceptance*), and at least seven (7) days prior to the scheduled casting of any Precast Concrete Bridge Element or control section. The Contractor shall schedule the meeting, which shall include representatives of the Fabricator and MassDOT.

B. Reinforcement.

The reinforcing bars shall be installed in accordance with Subsection 901.35, including tolerances for cover and horizontal spacing of bars. Components of mechanical reinforcing bar splicers shall be set with the tolerances shown on the plans. The reinforcing bars and mechanical reinforcing bar splicers shall be assembled into a rigid cage that will maintain its shape in the form and which will not allow individual reinforcing bars to move during the placement of concrete. This cage shall be secured in the form so that the clearances to all faces of the concrete, as shown on the plans, shall be maintained.

Where reinforcing bars are to protrude from one Precast Concrete Bridge Element in order to mate with reinforcing bar splicers in a second precast concrete element, the fabricator shall set the reinforcing bars and the reinforcing bar splicers with a template in order to ensure proper fit up within the tolerances specified on the plans.

C. Tolerances.

Fabrication shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement shall be in accordance with Subsection 901.35. In the absence of specifications on the plans, tolerances shall comply with the latest version of the PCI MNL 135, Precast Tolerance Manual.

D. Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the Precast Concrete Bridge Elements within specified tolerances to the shapes, lines and dimensions shown on the approved fabrication drawings. Forms shall be constructed from flat, smooth, non-absorbent material and shall be sufficiently tight to prevent the leakage of the plastic concrete. When wood forms are used, all faces in contact with the concrete shall be laminated or coated with a non-absorbent material. All worn or damaged forms, which cause irregularities on the concrete surface or damage to the concrete during form removal, shall be repaired or replaced before being reused. If threaded inserts are cast into the elements for support of formwork, the inserts shall be recessed a minimum of 1 inch and shall be plugged after use with a grout of the same color as that of the precast cement concrete.

ITEM 995. (Continued)

CONSTRUCTION METHODS – FIELD CONSTRUCTION

A. General.

All of the Contractor's field personnel involved in the erection and assembly of the Precast Concrete Bridge Elements shall have knowledge of and follow the approved Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly.

Prior to installation, the following documentation shall be reviewed and confirmed by the MassDOT Resident Engineer or designee:

(a) QC Compressive Strength Test Report Forms attaining Design Strength, f'c for the Precast Concrete Bridge Element's representative sublot.
(b) Certificate of Compliance generated by the Fabricator as described under the Fabricator Quality Control section.
(c) QC Inspection Reports signed by the Quality Control Manager.

Field construction staff shall verify that the Resident Engineer has accepted all Precast Concrete Bridge Elements prior to installation.

B. Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly.

Prior to the erection, the Contractor shall submit an Erection Procedure and a Quality Control Plan for Precast Concrete Bridge Element Assembly for approval by the Engineer. This submittal shall include computations and drawings for the transport, hoisting, erection and handling of the Precast Concrete Bridge Elements. The Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts with working knowledge of the Contractor's equipment, approved shop drawings, and materials to build the bridge. The Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly shall, at a minimum, include the following:

1. Erection Procedure

The Erection Procedure shall be prepared to conform to the requirements of 960.61, Design, Fabrication and Erection and the applicable sections in Chapter 8 of the PCI Design Handbook (eighth edition) for handling, erection, and bracing requirements. At a minimum, the Erection Procedure shall provide:

(a) Minimum concrete compressive strength for handling the Precast Concrete Bridge Elements.
(b) Concrete stresses during handling, transport, and erection.
(c) Crane capacities, pick radii, sling geometry, and lifting hardware.
(d) Verification that the equipment can handle all pick loads and weights with the required factor of safety.
(e) Evaluation of construction sequence and evaluation of any geometric conflicts in the lifting of the Precast Concrete Bridge Elements and setting them as shown on the plans.
(f) Design of crane supports including verification of subgrade for support.
(g) Location and design of all temporary bracing that will be required during erection.

ITEM 995. (Continued)

Non-shrink grout and concrete materials, approved by the Engineer, shall be placed as shown on the plans. Fill joints, keyways, and voids, in strict accordance with the specifications and manufacturer's recommendations and instructions.

For footings, approach slabs and highway guardrail transitions, once these Precast Concrete Bridge Elements have been set to the correct horizontal and vertical alignment, the void between them and the supporting soil shall be filled with Controlled Low-Strength Material – Structural Non-Excavatable to the limits as shown on the plans. Add additional grout ports in the footings to facilitate the bedding process if required.

Except in approach slabs, joints shall be filled flush to the top with non-shrink grout, and any vertical misalignment between adjacent elements shall be feathered out on a slope of 1 to 12.

Curing of grout or concrete shall be performed in strict accordance with the specifications and manufacturer's recommendations. Filling shall not be completed in cold weather when either the ambient temperature or the precast member's temperature is below the manufacturer's recommendation. No localized heating of either the precast members or of the air surrounding the element will be permitted in an attempt to reach application temperatures.

If the joints or voids are not filled within five days after the Precast Bridge Elements are erected, the Contractor shall cover and protect the openings from weather and debris until they are filled.

2. Quality Control Plan for Precast Concrete Bridge Element Assembly

The Quality Control Plan for Precast Concrete Bridge Element Assembly is a document prepared and submitted by the Contractor prior to the start of work which requires the Contractor to identify and detail the sequence of construction in accordance with the project schedule and which clearly identifies all stages of field construction. The assembly procedures for the Precast Concrete Bridge Elements shall be submitted in PDF format on 24”x36” sheets. This document will be treated as a Construction Procedure and will be reviewed by both the Designer and the District Construction Office. The approval of this document will serve as a guideline for setting interim concrete and grout strengths and curing procedures to allow construction to proceed without waiting for the final in-service strengths to be achieved.

The following list details the minimum criteria that should be included in the Quality Control Plan for Precast Concrete Bridge Element Assembly:

(a) A detailed schedule showing the sequence of operations that the Contractor will follow. The schedule shall include a timeline for installation of all major elements of the bridge accounting for the installation of temporary works and cure times of grouts or closure pour concrete and other selected materials.

ITEM 995. (Continued)

(b) Calculations that support the schedule outlined above should be included verifying that the selected materials have adequate interim strength to proceed from one step to another. Final material strengths are not normally required until the bridge is opened to vehicular traffic. The minimum factor of safety of two (2) will be required for the interim strength of grouts and closure pour concrete before construction is allowed to proceed to subsequent steps. The factor of safety is applied to the service loads that are supported by the elements and materials during various stages of construction. For example, if the Contractor calculates that the grout between the precast pier cap and pier wall requires a strength of 100 psi to support the dead load of the beams in the next step, a cylinder break of 200 psi will be required prior to allowing the pier cap to be loaded with the beams. The required strength of materials for subsequent construction stages shall also be calculated and the material strength verified.

(c) The Contractor is responsible for determining the center of gravity for all elements. Special care shall be used for unusual elements that are not symmetric. These elements may require special lifting hardware to allow for installation in a plumb or flat position.

(d) Plan of the work area, depicting items such as temporary earth support, utilities within the immediate vicinity of the work, drainage structures, etc. The Contractor shall coordinate the various subcontractors that will need to occupy the same area and shall ensure that there are no conflicts. For example, if the Contractor is having different Subcontractors prepare and submit plans for temporary earth support and demolition, and the earth support is required to be installed prior to the demolition, it shall be the Contractor's responsibility to ensure that the Quality Control Plan for Precast Concrete Bridge Element Assembly submission allows both operations to be performed without field modification.

(e) Details of all equipment that shall be employed for the construction of the bridge.

(f) Methods of providing temporary support of the elements. Include methods of adjusting and securing the element after placement.

(g) Vertical Adjustment Assemblies to be used as a means of setting precast concrete footings to the correct elevations.

(h) Procedures for controlling the overall horizontal dimensions and the vertical elevations as each precast concrete bridge element is erected by using the tolerance limits of the joints as detailed on the plans.

(i) Methods for curing grout.

(j) Proposed methods for installing non-shrink grout and the sequence and equipment for the grouting operation.

(k) Methods for sealing the keyways in preparation for filling with non-shrink grout, including the use of backer rods. The Contractor shall not assume that the backer rods will restrain the pressure from the grout in vertical grout joints. Provide additional forming to retain the backer rod.

ITEM 995. (Continued)

C. Survey and Layout.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. MassDOT reserves the right to perform additional independent survey. If discrepancies are found, the Contractor may be required to verify previous survey data.

D. Preparation of Closure Pours and Grouted Keyways.

Immediately prior to erecting the Precast Concrete Bridge Elements, the closure pours and grouted keyways shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete or grout and precast concrete using a high-pressure water blast. Any exposed reinforcing steel in the precast concrete shall be protected from damage during the cleaning of the keyways. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer. The surfaces of the closure pours and grouted keyways shall be wetted so that the surfaces shall have a Saturated Surface Dry (SSD) condition for at least 24 hours prior to the placement of the closure pour concrete.

E. Erection.

The elements shall be placed in the sequence and according to the methods outlined in the Erection Procedure and Quality Control Plan for Precast Concrete Bridge Element Assembly. As the erection proceeds, the Contractor shall constantly monitor the assembly to ensure that the precast concrete bridge element is within proper horizontal and vertical location and tolerances prior to releasing it from the crane and setting the next unit. The Contractor may use shims to maintain proper setting tolerances.

The concrete elements shall be lifted only by the lifting devices, and the utmost care shall be taken to prevent distortion of the elements during handling, transportation or storage.

This approval will be contingent on the Contractor demonstrating by calculations, prepared by a Professional Engineer registered in Massachusetts, that the elements will not be damaged by the non-vertical lifting force and by documentation that the capacity of the lifting devices is adequate for the non-vertical lifting force.

After all Precast Concrete Bridge Elements have been placed, the actual overall dimensions of the structure both horizontal and vertical, as laid out shall not deviate from the nominal dimensions shown on the plans beyond a tolerance of +0 inches and -1 inches. Once the layout of Precast Concrete Bridge Elements has been accepted by the Engineer, the Contractor shall cut all lifting devices off below the surfaces of the elements.

F. Filling of Blockouts for Lifting Devices and Threaded inserts.

If the blockouts in the Precast Concrete Bridge Elements where the lifting devices were located will be exposed and visible after assembly is complete, the Contractor shall fill these blockouts with Mortar (M4.04.5).

After the formwork has been removed, all threaded inserts that have been cast into the precast concrete bridge deck for support of the formwork shall be filled with a grout of the same color as that of the precast concrete.

ITEM 995. (Continued)

SAWING & SEALING JOINTS IN ASPHALT PAVEMENT AT BRIDGES

The work to be done under this Heading consists of making a sealed kerf across the full width of the finished asphalt pavement at bridge abutments where called for on the Plans. The shape, width, and depth of the kerf shall be as shown on the Plans.

Prior to the start of the asphalt pavement operation, the Contractor shall place a mark on each curb or barrier on either side of the paved roadway. These marks shall be aligned with the actual end of the bridge deck and shall be placed so that they will not be covered or otherwise obscured by the asphalt pavement.

After the completion of the paving operation, the Contractor shall snap a straight chalk line on the pavement between these two marks. The Contractor shall then saw cut the pavement along this line to the depth, width and shape as shown on the Plans. The equipment shall be approved by the Engineer prior to commencing work.

After completing the saw cutting, the Contractor shall clean the saw groove of any dust and debris with an oil free air blast. If the groove was wet sawn, the groove shall be cleaned with a water blast to remove any remaining slurry and debris, vacuumed with a Wet-or-Dry vacuum to remove any standing water, and then dried with an air blast from a Hot-Air-Lance.

Once the groove is clean and dry, the Contractor shall fill it completely with a Hot Applied Crack Sealer meeting the requirements of M3.05.2 in accordance with the manufacturer's application instructions and restrictions regarding ambient and material temperatures. The crack sealer shall be thoroughly cured prior to opening the road to traffic. To reduce tackiness, only boiler slag aggregate (black beauty) shall be scattered over the sealer when required by the Engineer. Conventional sand shall not be used for this purpose.

DRILLING AND GROUTING DOWELS

The work under this Heading shall conform to the relevant provisions of Subsection 901 of the Standard Specifications and the following:

The work to be done under this Item shall consist of drilling holes, furnishing, installing, and grouting dowels for the anchorage of new precast beam seats to existing concrete abutments and all other locations as shown on the Contract Plans, or as required by the Engineer.

ITEM 995. (Continued)

Materials

The grout to be used for these dowels shall be on the MassDOT Qualified Construction Materials List (QCML).

Epoxy, vinyl, or polyester resin adhesives shall not be utilized.

The Non-Shrink Grout shall have a minimum compression strength of 8,000 psi after 28 days as determined by testing under ASTM C 109. The grout mix shall exhibit no shrinkage on setting but may exhibit slight expansion of no more than 3% when tested by methods conforming to the requirements of ASTM C 827. All grout materials shall be on the MassDOT's Approved List of Materials.

Reinforcing steel dowels shall meet the requirements of AASHTO M31 Grade 60. All reinforcing steel dowels shall be epoxy coated in accordance with AASHTO M284 or shall be galvanized in accordance with ASTM A767. Reinforcing steel dowels shall be incidental to the work under this item. The Contractor shall follow the Manufacturer's recommendations for mixing, placing and curing the grout and placing the reinforcing dowels.

Submittals

The Contractor shall submit to the Engineer for review and approval, the methods and procedures for drilling and grouting, and dowel testing, including equipment and materials proposed for the work. The embedment length, the method and equipment used to drill the dowel holes and the diameter of the drilled hole shall, at a minimum, conform to the recommendations of the manufacturer and shall also be submitted to the Engineer for approval.

The grouted dowels shall be tested, as a minimum, to the yield capacity of the dowels or per recommendations of the manufacturer, whichever is greater.

Construction Methods

The minimum dowel embedment shall be as shown on the plans or as recommended by the manufacturer, whichever is greater.

ITEM 995. (Continued)

The diameter of the drilled dowel holes shall be as shown on the plans and/or in accordance with the recommendations of the grout manufacturer. The holes shall be blown clear of any debris and shall be approved by the Engineer prior to the placement of any grout materials.

The Contractor shall strictly follow the recommendations of the manufacturer for mixing and placing the grout material prior to the placement of the dowels. The Contractor shall adhere to the recommendations of the manufacturer regarding minimum and maximum temperatures while placing the grout. Any excessive grout around the hole after placement of the dowel shall be struck off smooth while the grout is still fresh.

The drilling operation shall be performed without damage to any existing reinforcing or portion of the structure that is to remain in place. Any damage to any existing portion of the structure that is to remain in place shall be repaired to a condition equal to or better than that existing prior to the beginning of the Contractor's operations, and shall be repaired at the Contractor's expense.

All dowel holes shall be drilled at locations where impact or percussion type drills would be likely to damage adjacent concrete; however, the drill holes shall be intentionally roughened in these instances to ensure proper adhesion of the grout. No impact or percussion type drills will be allowed without prior approval of the Engineer. The drilling operation shall be performed without damage to any existing reinforcing or portion of the structure that is to remain in place. All holes shall be blown clear of any foreign material prior to placement of the grout.

Manufacturer's Representative

The Contractor shall arrange with the materials manufacturer or distributor to have the services of a competent field representative at the work site prior to any drilling of the proposed dowel holes to instruct the work crews in proper dowel installation procedures.

The field representative shall remain at the job site after work commences and continue to instruct until the representative and the Contractor, Inspector and/or Engineer are satisfied that the crew has mastered the technique of installing the dowels successfully. The representative shall make periodic visits to the Project as the work progresses and shall confer on each visit with the Contractor, Inspector, and/or Engineer. The manufacturer's field representative must be fully qualified to perform the work and shall be subject to the approval of the Engineer.

ANTI-GRAFFITI COATING

The following items shall receive a liquid penetrant sealant in accordance with Section M9.15.0 of the MassDOT Standard Specifications and be an approved material on the MassDOT Qualified Construction Materials List (QCML). The surfaces shall also receive a compatible anti-graffiti coating applied in accordance with the manufacturer's recommendations.

1. Existing and proposed abutment stems/beam seats (exposed faces)

ITEM 995. (Continued)

ELASTOMERIC PROTECTIVE COATING

The work to be done under this Heading shall consist of applying a minimum of two (2) coats of an elastomeric acrylic protective coating to the exposed concrete faces of the following:

A. Existing and proposed abutment stems, proposed bridge seats, and proposed backwalls.

A total dry film thickness (DFT) of sixteen (16) mils shall be required.

The acrylic protective coating shall be breathable, durable, flexible, and color retentive. It shall provide protection and be resistant to weathering, carbon dioxide, chlorides, UV light, wind driven rain, dirt pick up and mildew. It shall also bridge hairline cracks up to 1/32". The acrylic protective coating system shall be one of the following, or approved equivalent:

- COLORASTIC by ChemMasters
- FLEXXIDE Elastomer by Carboline
- SIKAGARD 550W Elastocolor by Skia Corp.

The proposed coating product shall be submitted to MassDOT for approval. The Contractor shall submit the proposed application procedures and Manufacturer's Product Data Sheet(s) that completely describe the product. The color of the coating shall be AMS-STD26559 from the AMS Standard 595 Colors.

Preparation and Protection of Surfaces

All vegetation growing adjacent to or within the limits of the concrete surfaces to be coated shall be removed and properly discarded. All debris adjacent to or within the limits of the concrete surfaces to be coated shall be removed and properly discarded. All means & methods for vegetation and debris removal are subject to the approval of MassDOT.

Existing surfaces not to be coated shall be protected to ensure that no elastomeric coating contaminates the surfaces. All means & methods for protection of the existing surfaces are subject to the approval of MassDOT. Any contamination of existing surfaces will be cleaned up at the Contractor's expense.

ITEM 995. (Continued)

All surfaces to be coated must be dry, clean, sound and free of all contaminants that could interfere with adhesion of the coating. All loose material shall be removed. The Contractor shall pressure wash all concrete surfaces to be coated. The pressure washer shall operate at a minimum of 3,000 psi. The protective coating shall not be applied until the surface is dry and the surface preparation has been approved by MassDOT.

Application

Application shall be done by airless sprayer or roller or a combination of both and in accordance with the manufacture's recommendations. The use of a primer shall not be required unless stipulated for that particular coating by the manufacturer. A minimum of two (2) coats shall be applied to achieve a total DFT of sixteen (16) mils. The recommended minimum wet film thickness (WFT) must be maintained during each application. The manufacturer's specified temperature and weather limitations for the application shall be strictly adhered to.

PREFABRICATED BRIDGE UNITS (PBUs)

A. General.

The work under this Heading consists of fabricating, transporting, and erecting Prefabricated Bridge Units (PBUs) and includes all labor, materials, equipment and incidentals necessary to complete the work as shown on the Plans. PBUs consist of shop assembled pairs of structural steel beams and associated diaphragms with shop cast reinforced concrete deck slabs that are fabricated off site and shipped as units. The concrete to be used in the fabrication of the Prefabricated Bridge Units (PBUs) shall meet the requirements of Section M4: Cement Concrete and Related Materials.

The Contractor shall note, the suggested construction sequence shown on the plan is assuming PBU 6 (the east exterior PBU) will include the necessary utility sleeve and carrier pipe for the proposed 12" gas main prior to delivery and erection. The Contractor shall coordinate with Eversource gas for installation of the necessary items at the plant prior to PBU delivery.

QUALITY ASSURANCE FOR STRUCTURAL STEEL

A. General.

Quality Assurance requirements for the fabrication of structural steel shall be as specified in Section 960 and shall be performed at the structural steel plant during fabrication, at the precast concrete plant during PBU assembly, and in the field for final erection and assembly. Quality Assurance requirements for the assembly of the structural steel elements and fabrication of precast concrete deck slabs shall be as specified below.

B. Quality Control for Structural Steel.

The work under this subheading shall conform to the relevant provisions of Section 960 and shall include the supply, fabrication, and assembly of beams and diaphragms into PBUs. Structural steel Fabricators shall be approved by MassDOT in accordance with Standard Specifications, Division I, Section 6.01. The steel Fabricator shall provide qualified work crew(s) and QC inspectors to the precast concrete plant as needed to perform all steel fabrication and assembly work that is required to be performed for the fabrication of the PBUs.

ITEM 995. (Continued)

C. Acceptance for Structural Steel.

Structural steel elements shall conform to the requirements of the specifications and shall be accepted by MassDOT prior to being released from the steel Fabricator for shipment to the precast plant. The structural steel for the PBUs shall be assembled at the precast concrete plant and the assembly shall be accepted by MassDOT at the precast concrete plant prior to casting the deck.

MATERIALS

A. Materials.

Materials shall conform to M4.09.1 and the following:

Mechanical Reinforcing Bar Splicer	M8.01.9
Lifting Devices	PCI MNL-116
Stud Shear Connectors	M8.04.1
High Strength Bolts	M8.04.3
Structural Steel	M8.05.0

1. Cement Concrete Mix Design.

Cement concrete for PBUs shall be 5000 psi, 3/4 inch HP Concrete and meet the requirements of M4.06.2 High Performance Concrete.

2. Stud Shear Connectors.

Stud shear connectors applied to flanges of the beams may be installed at either the steel fabrication shop or the precast plant. If the installation is performed at the precast plans, the work shall be done by steel fabrication shop personnel.

3. Threaded Inserts

Threaded inserts are permissible on the underside of the PBU decks to facilitate the forming of the closure pours. Threaded inserts shall be hot dip galvanized or made of stainless steel. The number of threaded inserts shall be minimized and the inserts shall not come in contact with the reinforcing steel.

CONSTRUCTION METHODS – PLANT FABRICATION OF STRUCTURAL STEEL

A. Shop Drawings.

Shop drawings shall conform to the following requirements:

(a) General Requirements of Section 5.02
(b) Subsection 960.60 and M4.09.2B
(c) The drawings shall account for the geometry of the complete bridge structure and individual PBU components.

ITEM 995. (Continued)

B. Fabrication.

All structural steel components shall be fabricated in accordance with Subsection 960.61.

C. Coatings.

The corrosion protection for the fabricted steel members shall be as specified on the Plans.

D. Tolerances.

Tolerances for the fabrication of the steel beams shall be in accordance with 960.61.

CONSTRUCTION METHODS – PLANT FABRICATION OF PRECAST CONCRETE

A. PBU Assembly Plan Drawings.

PBU Assembly Plan Drawings shall identify the Fabricator's proposed plan for supporting the steel beams of a PBU unit in a manner that will provide for the proper fit and relative elevations of PBUs consistent with the final relative bridge geometry (elevations, horizontal locations and skew) and that will ensure the beams deflect as assumed in the calculation of the beam camber and Top-of-Form elevations. Alternative methods of support during casting of the deck require approval by the engineer and revised Top-of-Form elevations. The PBU Assembly Plan shall also show the design and plan of the foundation that shall support the PBU units during assembly, the method for forming the deck, and the procedure for the placement and finishing of the deck concrete. The PBU Assembly Plan Drawings shall be submitted by the Contractor to the Engineer of Record for approval.

To ensure proper fit in the field and conformance with the roadway profile and deck cross slope, the Fabricator shall cast the deck with the beams set to the relative proposed bridge seat geometry (elevations, horizontal locations, and skew) and the deck forms to the relative blocking distances as defined by the Top-of-Form elevations. The temporary supports shall be installed in accordance with the approved PBU Assembly Plan Drawings. The Contractor shall independently verify the Fabricator's temporary support geometry and the foundation and temporary supports during all operations for settlement. The Contractor shall submit the following documentation to the Engineer of Record for review and approval:

(a) The method the Contractor shall employ to independently verify the Fabricator's temporary support geometry as installed to ensure that it is consistent with the final relative bridge geometry
(b) The method the Contractor shall employ to independently monitor the foundation and temporary support during all assembly and casting operations for settlement
(c) Method of forming deck slabs

B. Pre-Production Meeting.

The Contractor shall notify the MassDOT Research and Materials Section to determine if a pre-production meeting will be required to review the specification, shop drawings, curing plan, schedule, and discuss any specific requirements. The meeting shall be held prior to scheduling a MassDOT Inspector (refer to M4.09.4 *Department Acceptance*), and at least seven (7) days prior to the scheduled casting of any PBU or control section. The Contractor shall schedule the meeting, which shall include representatives of the Fabricator and MassDOT.

ITEM 995. (Continued)

C. Reinforcement.

The reinforcing bars shall be installed in accordance with Subsection 901.35, including tolerances for cover and horizontal spacing of bars. Components of mechanical reinforcing bar splicers shall be set with the tolerances shown on the plans. The reinforcing bars and mechanical reinforcing bar splicers shall be assembled into a rigid cage that will maintain its shape in the form and which will not allow individual reinforcing bars to move during the placement of concrete. This cage shall be secured in the form so that the clearances to all faces of the concrete, as shown on the plans, shall be maintained.

D. Tolerances.

Fabrication shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement shall be in accordance with Subsection 901.35. Tolerances for the deck finish shall be in accordance with Subsection 901.37E.4.

E. Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the PBUs within specified tolerances to the shapes, lines and dimensions shown on the approved fabrication drawings. Forms shall be constructed from flat, smooth, non-absorbent material and shall be sufficiently tight to prevent the leakage of the plastic concrete. When wood forms are used, all faces in contact with the concrete shall be laminated or coated with a non-absorbent material. All worn or damaged forms, which cause irregularities on the concrete surface or damage to the concrete during form removal, shall be repaired or replaced before being reused. If threaded inserts are cast into the elements for support of formwork, the inserts shall be recessed a minimum of 1 inch and shall be plugged after use with a grout of the same color as that of the precast cement concrete.

CONSTRUCTION METHODS – FIELD CONSTRUCTION

A. General.

All of the Contractor's field personnel involved in the erection and assembly of the Prefabricated Bridge Units shall have knowledge of and follow the approved Erection Procedure and Quality Control Plan for Prefabricated Bridge Unit Assembly.

Prior to installation, the following documentation shall be reviewed and confirmed by the MassDOT Resident Engineer or designee:

(a) QC Compressive Strength Test Report Forms attaining Design Strength, f'c for the Prefabricated Bridge Unit's representative sublot.
(b) Certificate of Compliance generated by the Fabricator as described in M4.09.3.
(c) QC Inspection Reports signed by the Quality Control Manager.

Field construction staff shall verify that the Resident Engineer has accepted all Prefabricated Bridge Units prior to installation.

ITEM 995. (Continued)

B. Erection Procedure and Quality Control Plan for Prefabricated Bridge Unit Assembly.

Prior to the erection, the Contractor shall submit an Erection Procedure and a Quality Control Plan for PBU Assembly for approval by the Engineer. This submittal shall include computations and drawings for the transport, hoisting, erection and handling of the PBUs. The Erection Procedure and Quality Control Plan for PBU Assembly shall be prepared and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts with working knowledge of the Contractor's equipment, approved shop drawings, and materials to build the bridge. The Erection Procedure and Quality Control Plan for PBU Assembly shall, at a minimum, include the following:

1. Erection Procedure

The Erection Procedure shall be prepared to conform to the requirements of Subsection 960.61, Design, Fabrication and Erection and the applicable sections in Chapter 8 of the PCI Design Handbook (eighth edition) for handling, erection, and bracing requirements. At a minimum, the Erection Procedure shall provide:

(a) Steel reinforcing details, concrete deck details, location, and details of lifting devices
(b) Minimum concrete compressive strength for handling the PBUs.
(c) Concrete stresses and steel member stresses during handling, transport, and erection.
(d) Crane capacities, pick radii, sling geometry, and lifting hardware.
(e) Verification that the equipment can handle all pick loads and weights with the required factor of safety.
(f) Evaluation of construction sequence and evaluation of any geometric conflicts in the lifting of the PBUs and setting them on the abutments and piers.
(g) Design of crane supports including verification of subgrade for support.
(h) Location and design of all temporary bracing that will be required during erection.

2. Quality Control Plan for PBU Assembly

The Quality Control Plan for PBU Assembly is a document prepared and submitted by the Contractor prior to the start of work which requires the Contractor to identify and detail the sequence of construction in accordance with the project schedule and which clearly identifies all stages of field construction. The assembly procedures for the PBUs shall be submitted in PDF format on 24"x36" sheets. This document will be treated as a Construction Procedure and will be reviewed by both the Designer and the District Construction Office.

At a minimum, the Quality Control Plan for PBU Assembly shall include the following:

(a) Listing of the equipment, materials, and personnel including their assigned responsibilities that will be used to erect and assemble the PBUs on site.
(b) Documentation of all preparatory work necessary for moving personnel, equipment, supplies, and incidentals to the project site before beginning work.
(c) Detailed schedule showing the sequence of operations that the Contractor will follow to complete the field construction from setting working points and working lines to the casting of closure pours and the curing of the closure pour concrete, as described below and as called for on the plans.
(d) Contractor's means for ensuring that the PBU shall align to the roadway profile and cross slope and means for adjusting the final deck slab elevation.

ITEM 995. (Continued)

(e) Timeline and descriptions of Quality Control activities to be followed throughout the field construction operations including methods and procedures for controlling tolerance limits both horizontally and vertically.

C. Survey and Layout.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. MassDOT reserves the right to perform additional independent survey. If discrepancies are found, the Contractor may be required to verify previous survey data.

D. Preparation of Closure Pours.

Immediately prior to erecting the PBUs, the surfaces of the closure pours shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete bridge deck using a high-pressure water blast. The exposed reinforcing steel in the precast concrete bridge deck shall be protected from damage during the cleaning of the closure pours. Damaged epoxy coating of steel reinforcement shall be repaired, and the reinforcing steel shall be cleaned as directed by the Engineer. The surfaces of the closure pours shall be wetted so that the surfaces shall have a Saturated Surface Dry (SSD) condition no more than 24 hours prior to the placement of the closure pour concrete. If UHPC is used as the closure pour concrete, the surfaces of the closure pours shall be prepared as called for in the UHPC Special Provision.

E. Erection.

The PBUs shall be placed in the sequence and according to the methods outlined in the Erection Procedure and Quality Control Plan for Prefabricated Bridge Unit Assembly to the line and grade shown on the plans. The height of each PBU shall be adjusted to within acceptable tolerances by approved means as specified in the Assembly Plan. The Contractor shall ensure that the PBU is in the proper horizontal and vertical location prior to releasing it from the crane and setting the next unit.

As the PBUs are being erected, the Contractor shall monitor the width of the closure pours and the out-to-out width of the precast concrete bridge deck elements so that, after all PBUs are erected, the actual overall width of the bridge deck shall not deviate from the dimension shown on the plans beyond a tolerance of +0 inches and -1 inches. In order to achieve this, the Contractor may vary the width of the closure pours within the tolerances specified on the plans. If required, random oriented fiber shims of different thicknesses may be used to adjust the final elevation of the prefabricated bridge unit to meet the proper roadway grade.

After the layout of PBUs has been accepted by the Engineer, the Contractor shall cut all lifting devices off below the surface of the precast concrete bridge deck.

ITEM 995. (Continued)

F. Filling of Blockouts for Lifting Devices and Closure Pours.

Concrete for closure pours shall be as called for on the plans and shall be placed and cured in accordance with the Assembly Plan. If called for on the plans, the concrete end diaphragms, pier diaphragms, and link slabs shall be filled with the closure pour concrete in accordance with the Assembly Plan.

Blockouts in the precast concrete bridge deck that were provided for the lifting devices shall be filled with same concrete as that used for filling the closure pours or other approved material.

After the formwork has been removed, all threaded inserts that have been cast into the precast concrete bridge deck for support of the formwork shall be plugged with a grout of the same color as that of the precast concrete.

THERMAL SPRAYED COATING (METALIZING) SHOP APPLIED

PURPOSE

This section provides the requirements for shop performed surface preparation; the application of a thermal spray coating (TSC/metalizing); the application of a coating system; and includes field application of coatings and repairs and touch up of all coatings after site erection of the coated structure.

GENERAL INFORMATION

1. All fabrication shall be completed prior to the application of a thermal sprayed coating. (TSC)
2. All surfaces to be coated shall be cleaned in accordance with SSPC SP-5.
3. All TSC shall be sealed with an approved sealer, except for faying surfaces.
4. After site erection of the structure, perform field touch-up of any damaged coating.
5. All fasteners shall be galvanized and coated with the intermediate and topcoat if applicable.
6. The products of only one thermal spray wire manufacturer and one coating manufacturer shall be used on the entire project.
7. All field painting shall be in accordance with applicable sections of Item 961 of the MassDOT Standards and Specifications.

MATERIALS

Abrasives

Provide abrasives that are clean, dry, and sized properly to provide the specified surface profile. The profile shall be dense, uniform and of sufficient angularity to be acceptable for the application of TSC.

Abrasives shall conform to the following as applicable:

- SSPC-AB 1 for mineral slag abrasives
- SSPC-AB 2 for recycles ferrous metal abrasives
- SSPC-AB 3 for new steel abrasives

ITEM 995. (Continued)

Thermal Spray Feedstock

The contractor shall provide material certificates from the supplier that includes the chemical composition and lot number of the wire. MassDOT will perform random sampling of wire from lots provided. Wire shall conform to ASTM A833. See table below for application and selection of wire type, thickness, and coating system.

Environmental Zone 2 shall be used for this project.

ENVIRONMENTAL ZONE*	WIRE TYPE	THICKNESS (mils)**	COATING SYSTEM***
1	Zinc-Aluminum	6-9	Three Coat
	Zinc-Aluminum	6-9	Sealer Only
2	Zinc- Aluminum	8-11	Three Coat
	Zinc-Aluminum	9-12	Sealer Only
3	Zinc Aluminum	9-12	Three Coat
	Zinc Aluminum	12-15	Sealer Only

***Zone 1** – Bridges in rural environments, not over waterways, and not over high speed state or interstate highways with potential for salt spray and heavy salt use and de-icing chemical use.
***Zone 2** – Bridges in urban environments, near industrial and manufacturing plants, power plants, or warehouses, over heavy road traffic, or over waterways.
***Zone 3** – Bridges in marine environments, over or close to saltwater waterways, or over high speed state or interstate highways with potential for salt spray and heavy salt use and de-icing chemical use.
** Mil thickness on faying surfaces shall meet the requirements of the slip certificate.
*** Coating systems shall consist of a three coat paint system applied over the metalized surface or a clear sealer applied over the metalized surface.

SUBMITTALS

Submit the following information to the MassDOT - Highway for approval a minimum of thirty days prior to beginning any coating operations:

A. Manufacturer's recommendation and field history for the coating system proposed. Include data sheets for all selected coatings to be applied.
B. Procedures for shop surface preparation, the application of the TSC and application of coatings.
C. Procedures for coating of field connections.
D. Procedures for field touch-up surface preparation, application of TSC and application of coating.
E. Proposed abrasive for use in the shop.
F. Proposed thermal spray wire to be used and product data sheets. Provide certification of Class B slip coefficient.
G. A copy of SSPC-QP3/AISC (SPE) certification. This certification must be in effect at the time of bid and must remain in effect throughout the duration of the project.
H. Quality Systems Manual
I. Work schedule. Contractor must notify the Engineer a minimum of seven days prior to starting work.

ITEM 995. (Continued)

QUALITY CONTROL

A. The shop performing the application of TSC and coating shall be certified by the American Institute of Steel Construction (AISC) Sophisticated Paint Endorsement (SPE) quality program, or under the Society for Protective Coatings (SSPC) QP3 program, "Standard Procedure for Evaluating Qualification of Shop Painting Applicators" and shall maintain certification throughout the project.
   1. The coating applicator shall have completed a minimum of three structural steel TSC projects that utilized the same coating system as that being specified on this project. Provide project locations, TSC/painting; name, e-mail address, and the telephone number of the owner or owner's representative.

B. Provide an on-site Quality Control Specialist (QCS) who shall function as a TSC inspector with a minimum of five years of each TSC and coating application experience; and possess SSPC BCI Level 1 or NACE Certified Level 3 or other related certification as accepted by the MassDOT - Highway. The QCS shall not be a foreman or a member of the Contractor's production staff. The QCS's sole purpose shall be quality control testing, inspection and reporting.

PRE-APPLICATION MEETING

A pre-application meeting will be held prior to any steel fabrication that includes the application of thermal spray applied coatings. This meeting is separate from the pre-construction meeting for the entire project.

The following parties are required to attend this meeting: TSC/applicator, QCS, and MassDOT – Highway Representatives. Other project personnel should attend as may be needed.

PERSONNEL QUALIFICATION

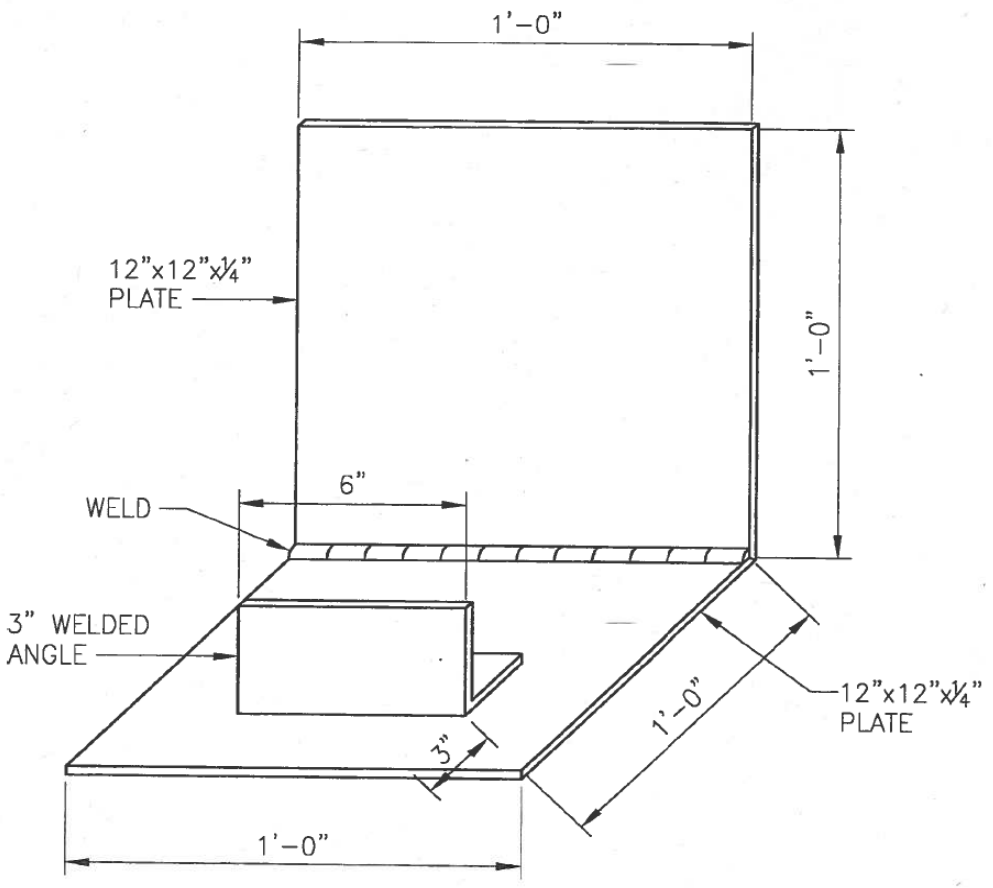
The applicators of the thermally applied material shall be individually qualified to apply the TSC as follows:

1. Each applicator must complete a practical test designed to demonstrate the ability to set up and operate the equipment to apply the material to the specified thicknesses to a minimum of 10 square feet of representative steel surfaces, and to successfully pass the surface preparation, bend, and cut tests specified herein. Administer the qualification testing, document the results in writing, and retain the bend test coupons for the duration of the project.
2. At the discretion of MassDOT - Highway, requalify the applicators at any time during the project to reconfirm the proficiency and the quality of the workmanship being provided. This may be required at any time due to unacceptable or failing results of the bend test, cut test, or poor workmanship.

ITEM 995. (Continued)

SHOP QUALIFICATIONS

Prior to proceeding with the production blast cleaning operations prepare a minimum of five Job Reference Standards (JRS) test plates. Blast clean all surfaces of each test plate using the same equipment and abrasive that will be used for the production work. After acceptance of the surface cleanliness and profile, apply the TSC to all surfaces of each test plate. After acceptance of the TSC apply the sealer to be used with the three coat system to three test plates excluding the bottom surface of all test plates. After curing apply a coat of epoxy to two of the three test plates excluding the bottom surface. After curing apply a coat of the polyurethane topcoat to one test plates on all surfaces excluding the bottom surface. Apply the clear sealer to the last remaining TSC plate. Bottom surfaces of the prepared plates shall be used for cut testing as specified. Surface preparation and application shall be witnessed by a MassDOT representative. *See drawing below for dimensions and construction*



Configuration of JRS Test Plates

ITEM 995. (Continued)

SURFACE PREPARATION

For cleaning that utilizes compressed air, utilize only clean, dry air. Conduct blotter test(s) in accordance with ASTM D4285 a minimum of one time each shift for each compressor system in use to verify that the air supply is free of moisture and oil contamination. Conduct the tests in the presence of the MassDOT – Highway Representative.

Weld Spatter, Sharp Edges, Flame-Cut Steel, Holes, Fins, and Silvers
Remove slag, flux deposits, fins, slivers, burrs, and weld spatter from the steel. Grind any sharp edges around holes. Break all flame-cut and sheared edges. If blast profile is degraded by grinding restore profile by abrasive blasting.

Solvent Cleaning
Where oil and grease are present on the bare steel, remove by solvent cleaning to SSPC-SP 1 prior to blast cleaning. If contamination remains after blast cleaning, reclean with solvent prior to application of the TSC.

Cleaning of galvanized bolts prior to the application of paint to bolted connections in the shop or in the field all galvanized fasteners shall be cleaned of all lubricating wax. Cleaning shall be in accordance with SSPC-SP-1, Solvent Cleaning, method 4.1.1. The contractor is responsible to identify the solvent and method needed to remove all lubricant. Cleanliness will be determined by the use of a white cloth wipe test. The test will be performed by the engineer using a clean white cloth and the same solvent used by the Contractor for cleaning. The cloth shall be wetted and rung to a damp condition, placed on selected fasteners and rubbed with a twisting motion around the entire exposed surface of the previously waxed surfaces of the fastener. A minimum of 3 alternating rotations shall be done. Acceptance of cleanliness is with no color transfer to the cloth. A minimum of 10% of the bolts at each bolted connection shall be tested for cleanliness.

Abrasive Blasting

Blast clean all steel to, SSPC-SP5 “White Metal Surface Cleanliness.” Determine the SP5 condition by use of SSPC-Vis 1. In the event of a conflict between the pictorial standard and the written definition the written definition shall prevail. Abrasive blast cleaned surfaces shall have a dense, uniform pattern of sharp, angular depressions and ridges, between 3.5-5.0 mils.

Surface preparation is defined as complete when all remedial repairs have been performed and the piece is accepted by both QC and MassDOT QA.

Verification of the profile height will be performed in accordance with ASTM D 4417 Method C.

Manual Blasting shall have a minimum of one profile depth measurement every 10 to 20 ft^2, of blasted surface.

ITEM 995. (Continued)

Automated Blasting shall have a minimum of two profile depth measurements every 100 ft². When acceptable results are obtained on three consecutive days in which testing is conducted, the test frequency may be reduced to two spot readings for every 1,000 ft² providing the preparation method remains unchanged. If unacceptable results are encountered during testing or the preparation method has changed in any way, testing will revert back to a frequency of two tests per every 100 ft², until acceptable results are once again achieved over a three day period.

Profile replica tape shall be filed with the project inspection records. The Engineer with the use of a surface profile comparator will randomly inspect angularity of the profile.

The use of steel shot is not permitted.

TSC AND COATING APPLICATION

Storage, Testing and Sampling
The Contractor shall provide protection from the elements and ensure that the paint is not subjected to temperatures outside the manufacturer's recommended extremes.

Before the Contractor will be permitted to use any paint, the material provided for application shall have been sampled, tested and approved in accordance with Section M7. MassDOT's Research and Materials Laboratory needs a minimum of fourteen days after the receipt of samples to test and approve.

Mixing and Thinning
Before the paint is applied, each component shall be mechanically mixed to ensure the pigment is completely dispersed. Mixing of components shall be accomplished by mechanical mixing, boxing or hand mixing of components will not be allowed. Any special precautions or requirements for mixing by the manufacturer shall be followed. Paint shall be kept thoroughly mixed in spray pots or containers during application. The pot life shall not be exceeded or attempts made to extend pot life with the addition of solvent.

If it is necessary for any reason to thin paint it will be done in the presence of the Engineer, in accordance with the manufacturer's recommendations. Thinning must be performed using a measuring cup marked in ounces or milliliters. Other methods, such as eyeballing, are not acceptable. Thinner shall be supplied from and recommended by the same manufacturer as the paint system.

For multi component paints, the mixing of half or partial kits is not allowed. If the need for small quantities of paint is anticipated, the contractor should order materials accordingly.

Application
Prior to the application of any coating material, the Engineer's approval must be obtained. All surfaces painted prior to the Engineer's approval, shall require the complete removal of the coating applied.

ITEM 995. (Continued)

Thermal Sprayed Coating

Apply the TSC within six hours after the final abrasive blast cleaning is performed. If the steel is blast cleaned and remains unmetalized for longer than six hours, or if cleaned steel exhibits evidence of rustback, blast clean it again prior to metalizing. Remove abrasive residue and dust from the surface. Apply the metalizing only after the MassDOT – Highway Representative has accepted the prepared surface.

Bend Testing for Evaluation of the TSC

Conduct bend tests of applied TSC each day prior to production application. Unless otherwise directed by the MassDOT - Highway, each day that TSC will be applied, conduct bend testing before beginning the production work. For each TSC applicator, blast clean five carbon steel coupons measuring 0.05 inches in thickness, 2 inches width, and between 5 and 8 inches in length. Use the same equipment and abrasive used for the production work. Have each applicator apply the TSC to five coupons in accordance with the requirements of this Section to dry film thickness between 8 and 15 mils. Conduct 180^{o} bend testing on all five coupons using the appropriate mandrel in accordance with the requirements and acceptance criteria of SSPC-CS 23. Minor cracks that cannot be lifted from the substrate with a knife blade are acceptable. If lifting on any of the coupons is possible, modify the surface preparation/TSC process until acceptable results are achieved before proceeding with the production work.

Apply the TSC in accordance with the requirements of the material supplier, this specification, approved procedures and SSPC-CS 23.

The completion of TSC is defined as after the spraying of TSC is complete and all remedial repairs have been performed and the piece is accepted by both QC and MassDOT QA.

Touch-up of bare steel and/or TSC damage shall be done with organic zinc rich primer. The total area subject to repair shall be no more than .50 % of the total square foot of the piece requiring repair. The dry film thickness of the applied coating shall be a minimum of 5 mils. Surface preparation for all repair areas shall be as specified in, “Surface Preparation and Abrasives” paragraph 3. The maximum individual repair shall be limited to 1 square foot. Areas larger than 1 square foot shall be re-blasted and the TSC applied in accordance with this document.

Sealer Coat

Apply the seal coat to the TSC after the MassDOT – Highway Representative has accepted the TSC. The seal coat shall be thin enough when applied to penetrate into the body of the TSC and seal the porosity. Added thickness to porous TSC should not be measurable. Typically, the seal coat is applied at a spreading rate resulting in a theoretical 1.5 mils dry film thickness. Apply the seal coat in accordance with the manufacturer’s instructions as soon as possible after the application of the TSC but in no case greater than 6 hours. Verify that the TSC surface is clean and dry prior to the application of the sealer. If grease, oil, or similar contaminants become deposited on the TSC, remove them in accordance with SSPC-SP 1 prior to the application of the seal coat.

ITEM 995. (Continued)

Paint

Applied coatings shall not exhibit, runs, sags, holidays, wrinkling, pinholes, nap hair, topcoat gloss or color variations, or other film discontinuities.

Repair of unacceptable areas that involve removal of the coating system or part of it, shall require surface preparation and coating equal to that specified. Repair procedures used for any unacceptable coating shall be those supplied by the contractor and approved by the Engineer.

Application of full coats of paint shall be accomplished by spray equipment. Spray equipment shall meet the requirements of the coating manufacturer and be in proper working order.

Application by brush and roller will be allowed for limited access areas. Brushes and roller covers recommended by the coating manufacturer shall be used. Areas brushed and rolled will have a uniform thickness and be free of defects and excessive coating thickness.

All coating shall be applied according to the latest manufacturer's data sheet or approved recommendations. The maximum recoat times of the primer, intermediate and finish coats shall not be exceeded.

Application of coatings shall not be done when the relative humidity is above 85% or when the surface temperature of the steel is less than 5°F above the Dew Point. Paint shall not be applied when the surface temperature is below 50°F or when the surface temperature is above 110°F.

If requested by the Engineer the Contractor shall provide written instructions from the coating manufacturer indicating the length of time that each coat must be protected from cold or inclement weather (e.g., exposure to rain) during its curing or drying period.

Paint shall not be applied when, in the Engineer's judgment, conditions are or will become unsatisfactory for application and proper cure. All changes as to the application parameters other than specified must be the manufacturer's and presented in writing and approved by the Engineer. Ambient conditions should be closely monitored so that proper cure/drying is achieved prior to recoat. In no case shall a succeeding coat of paint be applied before the previous coat has cured/dried sufficiently for recoat as per manufactured data sheet.

If required, contaminated surfaces shall be cleaned in accordance with SSPC- SP 1 Solvent Cleaning method 4.1.1.

Measurement of the ambient conditions shall be done in accordance with ASTM, E 337 Test Method for "Measuring Humidity with a Psychrometer" (the Measurement of Wet and Dry bulb Temperatures).

When the primer has cured sufficiently for recoat, all bridge components to be painted shall receive a full intermediate coat.

When the intermediate coat has cured sufficiently for recoat, all bridge components to be painted shall receive the finish coat.

ITEM 995. (Continued)

Coating Thickness

Apply the shop and field coats to the dry film thicknesses as specified.

1. Determine the cumulative dry film thickness of each coat using a magnetic dry film thickness gage in accordance with SSPC-CS 23 and SSPC-PA 2 with the following exceptions:
    a. Take readings on each 100 square-foot increment of the surface.
    b. The minimum specified thickness of the TSC must be achieved at each individual spot measurement location (i.e., the 20 percent under run allowed by SSPC-PA 2 is not permitted for the metalizing).
2. If the thickness of any coat (TSC, seal coat, intermediate coat or top coat) is less than specified, apply additional material in accordance with the manufacturer's instructions and this Section before applying the next coat. Before applying additional TSC, visually confirm that there is no evidence of oxidation or contamination on the surface.

3. Thickness of applied TSC greater than the contract specified shall be reported to the MassDOT-Highway QA inspector in writing prior to the end of the shift. The thickness of the applied TSC shall not be more than 120% of the specified range for the zone specified.

4. Application of TSC to faying surfaces that require a slip rating shall not be more than the maximum thickness specified in the environmental zone chart for each zone included in the materials section of this specification.

5. The minimum adhesion value of the unsealed TSC shall be the average of 3 spot reading resulting in an average of 700psi for each 500 sq/ft.

Access for MassDOT - Highway Inspection

Provide safe access and sufficient time for MassDOT - Highway inspections for any and all phases of the work, including but not limited to surface preparation, the application of each coat (including field coat), and for an inspection of the completed system.

Quality Control Documentation

Copies of Quality Control daily inspection and testing documents will be provided to the MassDOT – Highway Representative within 24 hours.

ITEM 995. (Continued)

METAL BRIDGE RAILING (3 RAIL), STEEL (TYPE S3-MLT4)
METAL BRIDGE RAILING, STEEL (TYPE CM-MTL3)

The metal bridge railings shall conform to Subsection 975 of the Standard Specifications and be installed at the locations designated on the plans and in accordance with the details and specifications provided on the plans.

BASIS OF PAYMENT

Item 995. will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

SCHEDULE OF BASIS FOR PARTIAL PAYMENT

Within 10 days after Notice to Proceed, the Contractor shall submit on his/her proposal form a schedule of unit prices for the major component Sub-Items that make up Item 995. As well as his/her total bridge structure Lump Sum cost for Bridge Structure No. C-01-031 (4DR). The bridge structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual bridge components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 995. And no further compensation will be allowed.

ITEM 995. (Continued)

Sub-Item	Description	Quantity	Unit	Unit Price	Total
160.3	Controlled low-strength material (>300 PSI)	20	CY		
482.31	Sawing and Sealing Joint in Asphalt Pavement at Bridges	100	FT		
904.12	Rapid Hardening Concrete for Closure Joints	30	CY		
904.3	5000 PSI, ¾ IN, 685 HP Cement Concrete	30	CY		
910.1	Steel Reinforcement for Structures – Epoxy Coated	9900	LB		
912.	Drilling and Grouted Dowels	44	EA		
922.3	Laminated Elastomeric Bearing w/o Anchor Bolts (101- 150)	24	EA		
964.11	Anti-Graffiti Coating	220	SY		
964.3	Elastomeric Protective Coating	280	SY		
965.	Membrane Waterproofing for Bridge Decks	510	SF		
970.	Damp-Proofing	2240	SF		
975.1	Metal Bridge Railing (3 Rail), Steel (Type S3-MTL4)	155	FT		
975.11	Metal Bridge Railing, Steel (Type CM-MTL3	110	FT		
975.3	Protective Screen – Type I	140	FT		
962.101	PBU 1	1	EA		
962.102	PBU 2	1	EA		
962.103	PBU 3	1	EA		
962.104	PBU 4	1	EA		
962.105	PBU 5	1	EA		
962.106	PBU 6	1	EA		
916.101	Precast Abutment Cap - North	1	EA		
916.102	Precast Abutment Cap - South	1	EA		
916.103	Precast Approach Slab – North	1	EA		
916.104	Precast Approach Slab - South	1	EA		
629.101	Precast Highway Guardrail Transition – S3-MTL4	4	EA		
629.102	Precast Highway Guardrail Transition – CM-MTL3	2	EA		

Total Cost of Item 995. =

ITEM 995. (Continued)

The schedule on the proposal form applies only to Bridge Superstructure C-01-031 (4DR). Payment for similar materials and construction at locations other than at this bridge structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

END OF DOCUMENT

DOCUMENT A00802

DETAIL SHEETS

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THE COMMONWEALTH OF MASSACHUSETTS
MassDOT HIGHWAY DIVISION
TEN PARK PLAZA - BOSTON, MA

PRELIMINARY ESTIMATE OF QUANTITIES – DETAIL SHEETS

CITY/TOWN: Cambridge

YEAR: 2025
ROAD: Rt 3/Rt 16/Rt 2 (Alewife Brook Parkway)
CLASS: Principal Arterial

TYPE OF PROJECT: Superstructure Replacement On Alewife Brook Parkway

DATE: April 10th, 2024

Unclassified Excavation: 360 CY	Dense Graded Crushed Stone: 105 CY
Pavement Fine Milling: 5250 SY	Crushed Stone: 30 Tons
Gravel Borrow: 325 CY	Bridge Excavation: 200 CY
Gravel Borrow for Backfilling Structures and Pipes: 35 CY	

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT – GREATER THAN 4 FEET **318 SY**

SURFACE COURSE:	2” SUPERPAVE BRIDGE SURFACE COURSE - 12.5 POLYMER (SSC-B-12.5-P) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	2” SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER ASPHALT EMULSION FOR TACK COAT OVER
BASE COURSE:	4 ½”. SUPERPAVE BASE COURSE – 37.5 (SBC – 37.5) OVER
SUBBASE:	4” DENSE GRADED CRUSHED STONE FOR BASE OVER 8” GRAVEL BORROW TYPE b

PROPOSED FULL DEPTH PAVEMENT – LESS THAN 4 FEET **23 SY**

SURFACE COURSE:	2” SUPERPAVE BRIDGE SURFACE COURSE - 12.5 POLYMER (SSC-B-12.5-P) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	2” SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER ASPHALT EMULSION FOR TACK COAT OVER
BASE COURSE:	6" HIGH EARLY STRENGTH CEMENT CONCRETE OVER
SUBBASE:	8" GRAVEL BORROW, TYPE b

PROPOSED FINE MILLING AND RESURFACING OVERLAY **5249 SY**

SURFACE COURSE:	2” SUPERPAVE BRIDGE SURFACE COURSE – 12.5 POLYMER (SSC-B-12.5-P) OVER
MILLING:	2” PAVEMENT FINE MILLING

PROPOSED BRIDGE PAVEMENT **470 SY**

SURFACE COURSE:	1 ½” SUPERPAVE BRIDGE SURFACE COURSE – 12.5 (SSC-B-12.5-P) POLYMER OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	1 ½” SUPERPAVE BRIDGE PROTECTIVE COURSE – 12.5 (SSC-B-12.5-P) POLYMER OVER SPRAY APPLIED WATERPROOFING MEMBRANE

PROPOSED TEMPORARY FULL DEPTH PAVEMENT **493 SY**

SURFACE COURSE:	2” SUPERPAVE BRIDGE SURFACE COURSE – 12.5 POLYMER (SSC-B-12.5-P) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	3” SUPERPAVE INTERMEDIATE COURSE – 19.0 (SIC – 19.0) OVER
SUBBASE:	4” DENSE GRADED CRUSHED STONE FOR SUB-BASE OVER
	8” GRAVEL BORROW, TYPE b

PROPOSED RESURFACING OVERLAY (UNDER BRIDGE) **575 SY**

SURFACE COURSE:	1 ½" TEXTURIZED DECORATIVE PAVEMENT
INTERMEDIATE COURSE:	2 ½" SUPERPAVE INTERMEDIATE COURSE – 19.0 (SIC – 19.0)

PROPOSED HMA SHARED USE PATH MILLING AND RESURFACING OVERLAY **254 SY**

SURFACE COURSE:	1 ½" SUPERPAVE BRIDGE SURFACE COURSE – 12.5 POLYMER (SSC-B-12.5-P) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	2 ½" SUPERPAVE INTERMEDIATE COURSE – 19.0 (SIC – 19.0 – P) OVER
MILLING:	4 IN. PAVEMENT MILLING

PROPOSED CEMENT CONCRETE SIDEWALK **470 SY**

SURFACE COURSE:	4" CEMENT CONCRETE OVER
SUBBASE COURSE:	8" GRAVEL BORROW TYPE b

ITEM 101.1 CLEARING

This item is a contingency item for any shrub clearing needed by the contractor during construction.

ITEM 102.2 TREE TRIMMING

This item is a contingency item for any tree trimming needed by the contractor during construction.

ITEM 102.3 HERBICIDE TREATMENT OF INVASIVE PLANTS

This item is included for herbicide treatment of the invasive plant Japanese Knotweed located in the soil disturbance areas within project limits.

ITEM 102.511 TREE PROTECTION- ARMORING AND PRUNING

For protecting trees within the project limits at the following locations:
102+72, 41' LT (Route 3/Route 16/Route 2)
103+05,42' LT (Route 3/Route 16/Route 2)
103+14, 34' RT (Route 3/Route 16/Route 2)
103+88, 38' RT (Route 3/Route 16/Route 2)
103+95, 36' RT (Route 3/Route 16/Route 2)
104+15, 36' RT (Route 3/Route 16/Route 2)
104+34, 36' RT (Route 3/Route 16/Route 2)
104+40, 39' RT (Route 3/Route 16/Route 2)
104+86, 37' RT (Route 3/Route 16/Route 2)
105+41, 36' RT (Route 3/Route 16/Route 2)
105+96, 50' RT (Route 3/Route 16/Route 2)
106+20, 57' RT (Route 3/Route 16/Route 2)
107+16, 40' RT (Route 3/Route 16/Route 2)
107+22, 33' LT (Route 3/Route 16/Route 2)
107+51, 33' LT (Route 3/Route 16/Route 2)
107+75, 39' RT (Route 3/Route 16/Route 2)
107+86, 34' LT (Route 3/Route 16/Route 2)
108+04, 39' RT (Route 3/Route 16/Route 2)
108+16, 34' RT (Route 3/Route 16/Route 2)
108+31, 32' LT (Route 3/Route 16/Route 2)
108+33, 38' RT (Route 3/Route 16/Route 2)
108+64, 39' RT (Route 3/Route 16/Route 2)
108+93, 40' RT (Route 3/Route 16/Route 2)
109+23, 39' RT (Route 3/Route 16/Route 2)

ITEM 102.521 TREE AND PLANT PROTECTION FENCE

This item is a contingency in the event that Item 102.523 Tree and Plant Protection - Visibility Stakes cannot be used or supplemental fencing/protection is needed.

ITEM 102.523 TREE AND PLANT PROTECTION - VISIBILITY STAKES

This item is included to prevent injury to the trees from construction equipment and activities.

ITEM 103. TREE REMOVED- DIAMETER UNDER 24 INCHES

For removing trees at the following locations:
106+08, 37' RT
106+22, 38' RT
A contingency quantity has been added for 16 additional trees located at the back of sidewalk along the northeast and southeast approaches for the temporary roadway widening and construction of new sidewalk.

ITEM 184.1 DISPOSAL OF TREATED WOOD PRODUCTS

For removal of existing wood fence behind sidewalk at the following locations:
STA 103+64 to STA 106+21
STA 107+02 to STA 109+00

ITEM 227.4 MASONRY PLUG

Contingency item in case drainage pipes connected to existing drainage structures are found.

ITEM 472. TEMPORARY ASPHALT PATCHING

For HMA consisting of placing and removing temporary asphaltic material for use as curbing, berm, sidewalk, roadway patches, temporary transition ramps, or other incidental work performed primarily by hand methods.

ITEM 580. CURB REMOVED AND RESET

To be used for the removed and reset curb on Alewife Brook Parkway.

ITEM 594. CURB REMOVED AND DISCARDED

To be used for the removed and discarded curb on Alewife Brook Parkway.

ITEM 628.21 TRANSITION TO NCHRP 350 GUARDRAIL

To be used at the locations below where proposed guardrail is connecting back into existing. A contingency is also included for the contractor to replace damaged guardrail as determined by the Engineer.
STA 103+64 to STA 103+98
STA 105+53 to STA 105+87
STA 107+86 to STA 108+20
STA 108+66 to STA 109+00

ITEM 628.24 TRANSITION TO BRIDGE RAIL

To be where highway guardrail transitions to bridge rail.
STA 105+73 to STA 106+06 RT
STA 106+00 to STA 106+34 LT
STA 107+14 to STA 107+48 LT
STA 107+20 to STA 107+54 RT
Two(2) Connections for Temp Traffic

ITEM 630.2 HIGHWAY GUARD REMOVED AND DISCARDED

STA 103+64 to STA 106+06 RT
STA 105+53 to STA 106+34 LT
STA 107+14 to STA 108+20 LT
STA 107+20 to STA 109+00 RT

ITEM 655.3 WOOD RAIL FENCE

STA 103+90 to STA 106+21 RT
STA 107+02 to STA 109+00 RT

ITEM 669. FENCE REMOVED AND STACKED

STA 103+90 to STA 106+21 RT
STA 107+02 to STA 109+00 RT

ITEM 706.9 TEXTURIZED DECORATIVE PAVEMENT

To be used as surface pavement for the proposed overlay underneath Bridge No. C-01-031.

ITEM 767.121 SEDIMENT CONTROL BARRIER

STA 100+99
STA 101+68
STA 105+49
STA 106+96
STA 107+11

ITEM 829.06 ROADSIDE GUIDE SIGN AND SUPPORT REMOVED AND DISCARDED

Sign	Location
D1-5 and D1-6	STA 108+21 RT, Offset 35’

ITEM 831. ROADSIDE GUIDE SIGN (D6/D8) – ALUMINUM PANEL (TYPE A)

Sign	Location
D1-5	STA 108+21 RT, Offset 35’
D1-6	STA 108+21 RT, Offset 35’

ITEM 832. WARNING-REGULATORY AND ROUTE MAKER – ALUMINUM PANEL (TYPE A)

Sign	Location
R3-8	STA 104+57 LT, Offset 37'
W12-2a	STA 105+33 RT, Offset 35’
W12-2a	STA 105+48 LT, Offset 26’

ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED

Sign	Location
Weight Limit and “ROUTE 2 WEST”	STA 101+04 LT, Offset 130'
“ROAD NARROWS”	STA 103+08 RT, Offset 27’
W1-4b	STA 105+21 RT, Offset 25’
“RIGHT LANE MUST TURN RIGHT”	STA 105+22 LT, Offset 36’
Weight Limit	STA 105+95 LT, Offset 25’
W1-4b	STA 107+53 LT, Offset 25’
D1-5 and D1-6	STA 108+21 RT, Offset 35’
W1-4b	STA 108+97 LT, Offset 27’
Weight Limit	STA 110+07 LT, Offset 28’
Weight Limit and “ROUTE 2 WEST”	Along Concord Turnpike (Route 2) approach towards the project area
Weight Limit and “ROUTE 2 WEST”	Along Alewife Brook Parkway approach towards the project area

ITEM 903. 3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE

Will be used as a contingency when needed, as required by the Engineer.

DOCUMENT A00806

ACCESS WORK REQUEST FORM

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ACCESS WORK REQUEST FORM

Day(s): S ☐ M ☐ T ☐ W ☐ Th ☐ F ☐ S ☐ Date(s): _____ Time (0-24 HR) _____

Area/Location of work: _____

Description of Work: _____

Contract/Permit #: _____ Contractor/Permitee/Other: _____

Contractor Representative _____ Cell: _____ Tel: _____

MassDOT Representative _____ Cell: _____ Tel: _____

Traffic Control Setup: ☐ None Required ☐ by MassDOT ☐ by Permittee/Contractor/Other

Lanes Requested/Direction: _____

Special Instructions/Conditions

* Contractor responsible to ensure all secured doors be closed and locked at the end of each shift

Approvals

_____ District Representative

_____ Access Work Coordinator

☐ Confined Space entry ☐ Lockout/Tagout ☐ MH / CB Access ☐ See Attached

FAILURE TO NOTIFY THE HOC (617-946-3150) BEFORE THE START OF WORK MAY RESULT IN REVOCATION OF THIS WORK REQUEST.

E-Mail Completed Form at District6AWRequest@dot.state.ma.us

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MBTA SPECIAL INSTRUCTIONS

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MBTA SPECIAL INSTRUCTIONS
April 1, 2003
PAGE 1

APPENDIX M
MBTA SPECIAL INSTRUCTIONS
MARCH 2003

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MBTA SPECIAL INSTRUCTIONS

APRIL 2003

LETTER OF TRANSMITTAL REGARDING SPECIAL INSTRUCTIONS

The Subway Operations, Bus Operations, Safety, Systemwide Maintenance & Improvements, Operations Support, and the Design and Construction Departments of the MBTA have determined that certain limitations regarding Contractor's activities are required while working on a construction project.

These Supplementary Conditions are included herein to augment the MBTA Standard Specifications, Division I - General Requirements, Section 00700 - General Conditions, Article 6 - Prosecution and Progress, Paragraph 6.04 - Limitations of Operations with additional information, which is applicable to construction projects.

However, for non-MBTA construction projects where Division I does not apply, such as in the case of rights to construct on MBTA property granted under a lease or license agreement, the enclosed Special Instructions are still applicable unless otherwise directed.

Contract drawings and specifications for non-MBTA construction projects, relative to all work that will be performed within or directly adjacent to MBTA property, must be submitted to the Authority's Chief Engineer of Design and Construction, Director of Subway Operations, Director of Bus Operations, Director, of Systemwide Maintenance & Improvements, Director of Operations Support, Director of Safety, and the Director of Real Estate. The addresses and phone numbers are listed on. the next page. The, special instructions contain information to be complied with by the owner, contractors, and others associated with the project.

Applicable provisions of the special instructions plus additional requirements from other MBTA departments must be included in the contract specifications as instructions to the contractor when performing work on or adjacent to MBTA property. Permission to perform work on MBTA property will be granted by the Director of Real Estate only when contract plans and specifications are approved by the MBTA.

The enforcement of any of the following conditions shall not be construed as waiving any of the rights of the Authority in any of the other conditions of an MBTA contract.

A meeting to further discuss MBTA requirements may be arranged by contacting the offices of those listed in Article l.a. and/or b. herein.

1. ACCESS TO AUTHORITY PROPERTY

A. For MBTA Contractors Only: An owner or Contractor who wishes permission to enter upon or perform work over, on, under or adjacent to Authority property shall submit to the offices of the Authority's Chief Engineer of Design and Construction, the Director of Bus Operations, the Director of Subway Operations, Director of Systemwide

Maintenance & Improvements, and the Director of Operations Support, a request in writing, a minimum of forty-two (42) days prior to the owner or the Contractor's planned commencement of any of the above stated activities. Addresses of the above are as follows:

MBTA' s Chief Engineer of Design and Construction
6th Floor
10 Park Plaza
Boston, MA 02116
617 222-3116

Director of Systemwide Maintenance & Improvements
500 Arborway
Jamaica Plain, MA 02130
617 222-5454

Director of Subway Operations
10th Floor
45 High Street
Boston, MA 02110
617 222-4554

Director of Bus Operations
10th Floor
45 High Street
Boston, MA 02110
617 222-3368

Director of Operations Support
10th Floor
45 High Street
Boston, MA Q2110
617 222-5460

Director of Safety
2nd Floor
21 Arlington Avenue
Charlestown, MA 02129
617 222-4244

B. Non-MBTA Construction Contractors For Lessees or Licenses of the MBTA Only: An owner or Contractor who wishes permission to enter upon or perform work over, on, under or adjacent to Authority property shall submit to the offices of the MBTA's designated representative for real estate listed below, a request in writing, a minimum of forty-two (42) days prior to the owner or the Contractor's planned commencement of any of the above stated activities. The designated representative will distribute plan sets to the above MBTA departments and will coordinate departmental approvals. Application forms and instructions for obtaining access to MBTA property

can be obtained by visiting the designated representative's website listed below and selecting "MBTA" and "Licensing."

License Administrator
Massachusetts Realty Group
20 Park Plaza, Suite 1120
Boston, MA 02116
617-316-1654
www.mbtarealty.com

The designated representative reports directly to:

MBTA Director of Real Estate
5th Floor
10 Park Plaza
Boston, MA 02116
617 222-3255

C. Requests shall specify the name of the owner or the contractor, the reasons for entering the property, where the property will be entered, each individual location where work of a different nature is to be performed, the nature of such work, and the number of days, including time schedule, the owner or the contractor intends to remain on the property at each location. The Authority will process such requests and meet with the owner or contractor to work out a schedule and phasing .for the work plus other arrangements including financial. The Authority shall request a list of the names of each individual who will enter upon or perform work on Authority property.

D. The owner or contractor shall. notify the representative of the Design and Construction Department and the appropriate Operations Director at least seventy-two (72) hours prior to entering the property as agreed upon earlier with the Authority. The owner or contractor shall notify the Design and Construction, and Operations Departments immediately if the job is to be closed down unexpectedly and shall again notify the Authority as specified above when work will commence.

E. The owner or contractor shall make all necessary arrangements with the Authority before entering upon the property and perform the work in accordance with an MBTA approved work schedule. The owner or contractor shall not enter MBTA property or perform any work on Authority property without the presence of an assigned MBTA representative from the Design and Construction Department or the Operations Department who is responsible for monitoring the work of that owner or contractor for the Authority. Working on Authority property without an assigned MBTA representative present shall be cause for immediate eviction from the property.

F. The owner or contractor must have in place a method of payment for all Authority support services such as flagging, work trains, power shut offs, etc., prior to commencement of any work. This will be processed through a written force account agreement between the Authority and the owner or contractor prior to commencement of work. Direct billing to contractors for Authority support services requires the contractor's authorized representative to agree in writing that the company will reimburse the Authority for those support services, including overhead and fringe benefits. Once the Authority receives the signed statement from the contractor, the General Accounting

Office will open a reimbursable account for specific Authority department(s) to charge costs, and the contractor will be billed directly.

G. The work associated with this project, except as hereinafter expressly provided, will be done without interruption of or change in the regular work or operation of vehicles of the Authority. No work shall be done affecting the operations of vehicles or operations of stations until the contractor has submitted details of his procedures to the Design and Construction and the applicable Operations representatives thirty (30) working days prior to start of work and has secured written permission to proceed.

H. The Authority reserves the right to require work affecting the safety of the operations to be performed at prescheduled non-operating periods from approximately 1:30 a.m. to 5:00 a.m. daily (1:30 a.m. - 4:30 a.m. effective); 1:30 a.m. to 6:00 a.m. Sunday (1:30 a.m.-5:30 a.m. effective). The contractor will not be permitted to remain within the track right-of-way after 5:00 am. (6:00 a.m. Sunday). The Authority may, during emergencies or at times when the Authority work forces are required to work in the area of the contractors work, order the contractor to cease work and remove his work forces and equipment from the property leaving the right-of-way in a safe operating condition. The Authority also reserves the right to stop or postpone any contractor's previously approved work if, in the Authority's opinion, such work is being performed in a manner that will endanger and/or delay the Authority's regular work or operations.

I. The owner or contractor shall make their own provisions for electric power, compressed air, water, ventilation, and disposal of seepage water. No use of existing MBTA utilities will be permitted unless approved in advance by the Authority.

J. The owner or the contractor's attention is directed to other projects that will be ongoing simultaneously in the work area. The Authority will determine priorities for site access between this project and others.

K. The Authority reserves the right to deny the contractor access to the right of way because of operational requirements, adverse weather conditions or emergency track, signal, and power repairs. The contractor shall reasonably expect to be denied access to the site a total of 10 (ten) days per calendar year, this does not include the following holidays; New Year's Day, President's Day, Patriot's Day, Memorial Day, Bunker Hill Day, Independence Day, Labor Day, Columbus Day, Veteran's Day, Thanksgiving Day, and Christmas Day. In addition, right of way access may be denied on days when various Special Events impact service as well as during Red Sox home games on the Green Line.

Furthermore, the contractor shall also expect to have his access to the site delayed a total of 4 (four) times per month. Each delay shall be 60 (sixty) minutes or less. The contractor shall make allowances for these possible events in their bid. Due to increased stopping distances associated with slippery rail conditions, non-emergency access will not be allowed within ten (10) feet of the centerline of the track under adverse weather conditions.

L. The contractor shall perform his work at all times so as to cause no interruption of service during operating hours and shall at all times after performing work during either operating hours or non-operating hours leave the Authority's property in a clean and safe operating condition.

M. On occasion, the Authority will operate work cars, test trains, security trains, and/or hirait Vehicles in, the area of the work. At no time during these occurrences will the contractor be allowed to work on the right-of-way, except with the approval of the Authority or the Authority personnel providing protection services as defined in Protection Services.

2. INSURANCE REOUIREMENTS

A. The owner or Contractor's for MBTA Construction Contracts insurance requirements shall conform to the latest version of MBTA Standard Specifications, Division 1 - General Requirements, Section 00700 - General Conditions, Article *5* - Legal Relations and Responsibility to the Public, Paragraph *5.04* - Insurance Requirements. Owners or Contractors under a lease or license agreement with the MBTA shall provide insurance in accordance with the requirements of said agreement.

3. SUBMITTAL OF SPECIFICATIONS DRAWINGS. DESIGN AND METHODS OF CONSTRUCTION

(Applies to non-MBTA Construction Contracts. MBTA Construction Contracts are covered under Division I)

A. An owner or contractor or others performing a non-MBTA construction contract that requires performing construction over, on, under or adjacent to the Authority's property shall submit to both the Design and Construction Department and to the appropriate Operations Department two (2) sets each of contract drawings and specifications at the 30%, 60%, 90% and 100% phases of design of the project. 100% drawings and specifications must be submitted forty-two (42) days prior to the planned commencement of any work.

B. The contractor's drawings and specifications shall define the work in detail and a Professional Engineer registered in the Commonwealth of Massachusetts shall stamp the final drawings. The contractor or owner shall also submit a crane or heavy equipment location, if used, with dimensions to the face of abutments and structures and calculations of crane equipment loading on Authority structures showing no adverse effect on any structures. All calculations shall be stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The drawings must include any excavation support systems, shoring, underpinning, protective shielding, or any work required for the protection of MBTA property.

C. Unless otherwise agreed to in advance, the owner or contractor's structures shall not attach to, be placed against, pass through, or impose any loads upon any structures or facilities owned by the MBTA.

D. All construction work shall be performed in strict conformity with final plans and specifications that have been reviewed and approved by the MBTA. Any changes requested by the owner or contractor which affect MBTA property or operations must be submitted to the MBTA for review and approval at least 30 days prior to the planned commencement of the work. Approvals or rejections shall be submitted by the MBTA within thirty (30) days following submission to the MBTA for review.

E. The owner or the contractor performing construction work over, on, under, or adjacent to Authority property shall submit to the Director of Design four (4) sets each of the design, drawings and specifications of any earth support system, shoring, underpinning, protective shielding, or any work required for the protection of the Authority's facilities and property, a minimum of forty-two (42) working days prior to the planned commencement of any of the above work. The design, drawings and specifications shall define in detail the methods of construction and materials to be used. The design and drawings shall be stamped and signed by a Professional Engineer registered in the Commonwealth of Massachusetts.

F. Unless otherwise agreed to in advance, earth support structures or shoring systems shall not be attached to any structure owned by the MBTA, nor shall MBTA structures be use to support loadings or be used for excavation support.

G. Engineering drawings of MBTA structures are available for reference or duplication at the MBTA Plan Room, 500 Arborway, Jamaica Plain, MA 02130. For information call the Technical Librarian at 617-222-5285.

4. OPERATIONAL RESTRICTIONS

A. The owner or contractor is made aware that the work will be performed adjacent to or over operating tracks, signal lines, communication lines, power lines, cables and other facilities belonging to the Authority. The owner or contractor is to take all due precautions to protect the Authority's facilities, utilities, and operations during the course of his work. When in the opinion of the Authority's Chief Engineer of Design and Construction, Director of Subway Operations, Director of Systemwide Maintenance & Improvements, Director of Operations Support, or their representatives, the contractor's work would cause hazard to the Authority's facilities, infrastructure, or to the safe operation of the transit system, the Authority will assign qualified personnel deemed necessary to protect the property, facilities and operations, all at the expense of the contractor.

B. The contractor is specifically prohibited from conducting any operations next to or over the right-of-way that have the potential to adversely impact the operations of Authority revenue service during normal operating hours (approximately 5:00 a.m. to 1:30 a.m.). Certain work adjacent to the right-of-way, described below as hazardous work, may take place during restricted revenue hours at the discretion of the Chief of Orange, Red, Green, or Blue Line Operations as applicable and require flagmen present.

C. Access to the MBTA right-of-way, which encompasses all MBTA property (fence to fence, wall to wall, and property line to property line over which Authority vehicles operate, including sidings and yards), is. contingent upon Owner or Contractor compliance with the "MBTA Right-of-Way Safety Rulebook" that outlines Right-of-Way Safe Practices for Access on or Near the Right-Of-Way.

As specified in the Right of Way Safety Rulebook, all persons who access the MBTA right of way must attend a one-day, eight-hour training class conducted by Subway Operations Training and the Safety Department Attendees must successfully complete the Right of Way Safety Training in order to

receive a Right of Way license. The license is valid for a two-year period after which the person must attend the Authority's Right of Way re-certification class. To register for the "Right of Way Safety" class, contact:

Supervisor and Chief Rules Examiner of Training
Cabot RTL Training
275 Dorchester Avenue, 2nd floor
South Boston, MA 02127
Telephone: (617) 222-5377

D. The Authority will consider the property; facilities and operations fouled or subject to hazard when the following occurs:

1. When any object or operation is or can be brought nearer than ten (10) feet to the centerline of operating track.
2. When an object or excavation is brought nearer than four (4) feet to a signal or communication line.
3. When an object or excavation is brought nearer than ten (10) feet to a power line or cable.
4. When explosives are used in the vicinity of the premises. Explosives shall not be used on or adjacent to the Authority's property or facilities without written consent of the Authority's Chief Engineer of Design and Construction and then shall be used only by a licensed blaster, licensed in the Commonwealth of Massachusetts, at times and under conditions acceptable to the Authority.
5. When cranes, trucks, power shovels, pile driver or any other equipment are working in positions that failure with or without load could occur nearer than 10 feet to the centerline of an operating track.

It shall be the responsibility of the contractor to inform the Chief of Orange, Red, Green, or Blue Line Operations as applicable in writing thirty (30) working days prior to all times when they intend to perform hazardous work as described above. Submittal must include a site plan, the reasons for entering the property, where the property will be entered, each individual location where work of a different nature is to be performed, the nature of such work, and number of days, including time schedule, the contractor intends to remain on the property at each location. Failure of the contractor to provide the appropriate Line Chief with the specified advanced notice of hazardous work will result in the stoppage of work by the Authority.

D. The Contractor will be allowed on the right-of-way only after normal revenue service (approximately 1:30 a.m. to 5:00 a.m.). On occasion, the Authority will operate work cars in the area of the project work during non-revenue hours. At no time during these occurrences will the contractor be allowed to work on the right-of-way except with the approval of the Authority. The contractor shall coordinate their schedule at least twenty-four (24) hours in advance with the Authority.

E. No weekday/weekend transit service interruptions will be allowed on this project. The contractor must schedule all work requiring a shutdown of revenue service and/or station and/or platform operations during non-revenue hours.

F. Prior to the contractor leaving any work site, at the completion of each workday, the contractor shall ensure that the site is in proper condition to permit normal transit operations to resume. If, in the opinion of the Authority, the site is not suitable for normal transit operations due to conditions caused by the contractor, the Authority will allocate a suitable number of personnel to rectify the site. The owner or his contractor shall be charged full costs of such personnel and necessary equipment, including the full cost of replacement services during the cleanup period.

G. In the event that the contractor does not adhere to the work period limitations of the special conditions and causes delay in returning the right-of-way to revenue service at the end of any work period, the owner or his contractor shall pay the Authority for substitute bus service a sum not to exceed $120.00 per hour per bus for the entire duration of the delay and including mobilization and demobilization of the bus service. The minimum charge shall be (3) hours per bus per delay... The owner or the 'contractor will reimburse the Authority for the hourly costs of personnel used during such delays (egg., supervisors, officials, gatepersons, flagpersons, and automotive). The required number of buses to adequately accommodate all Authority customers who are inconvenienced by the delay shall be at the sole discretion of the Authority's Bus Operations Department. Whatever sum of money may become due and payable to the Authority by the owner or his contractor under this article may be retained out of money belonging to the contractor in the hand and possession of the Authority. This article shall be construed and treated by the parties to the contract not as imposing a penalty upon the contractor for failing fully to complete the work within the periods as specified herein, but as liquidation damages to compensate the Authority for additional costs incurred by the Authority because of the failure of the contractor to fully complete said work within the work periods specified.

H. The contractor shall assume full responsibility for the safety of all their work. They shall perform the work in a manner that will ensure the safety of both personnel and property. The contractor shall prevent against safety hazards, and the exposure of persons and equipment to hazardous and/or potentially hazardous conditions. All, work in the construction of the project shall comply with the requirements of the Authority, Department of Labor, Occupational Safety and Health Administration (OSHA) provisions, as well as those of state and local regulations. Safe breathing levels must conform to the Massachusetts Department of Environmental Protection (DEP) standards. In the case of conflict of regulations, the most stringent will apply. If the standards are not met, the Authority has the right to stop the work until such time as the contractor is in compliance with standards.

5. PROTECTION SERVICES

A. When the contractor is performing work in the vicinity of Authority rights-of-way or public areas, the Authority will require the contractor to have at the site such authorized and qualified personnel as may be required to adequately protect the Authority's customers, employees, property, facilities and operations from hazardous conditions.

B. The need for protection services is outlined and described in the Authority's Right-of-Way Safety Rulebook. The appropriate Line Chief, or their representative, shall determine what protection services are required and assign flagging personnel, officials, supervisors, coordinators or any other such personnel as may be required to ensure the safety of the Authority's operations. Personnel shall be provided from the Authority's workforce in such numbers as the Line Chief determines.

Costs for all protection services and supplies shall be the responsibility of the owner or contractor. No work will be allowed if flagmen are required, but not on duty.

C. When it is determined that protection services are required, the contractor must notify the Authority twenty-four (24) hours in advance and before 10.00 a.m. on the workday preceding the day that protection services will be required. Requests for protection services for weekends and/or holidays, must be made on the preceding Friday before 10.00 a.m., or before 10.00 a.m. on the workday preceding the holiday.

Requests for protection services for Non-Operating hours 1.30 *a.m.—5.00* a.m. and in order for the work to be included on the Night Orders you must contact the:

Planning and Scheduling Coordinator
Maintenance of Way
617-222-5419.

Requests for protection services for Operating hours 5.00 a.m.-l.30 a.m. and in order for the work to be included on the Day Orders, you must contact:

Orange, Red, Green, or Blue Line Superintendent as applicable.
617-222-5844 (Orange); 617-222-5099(Red);
617-222-5982 (Green); 617-222-5532 (Blue).

It will be at the sole discretion of the Authority whether the contractor will be allowed to perform work on any particular day or night.

D. The contractor will be required to provide each flagperson on duty with properly functioning safety equipment as approved by the Authority's Safety Department. This equipment includes but is not limited to: orange safety cones, red, yellow, and green flags, airhoms, hardhats, safety goggles, and hearing protection. The contractor will not be allowed on or adjacent to the right-of-way if flagging personnel are not equipped with required safety personal protective equipment.

E. The contractor will supply properly functioning Authority-frequency portable radios to each flagperson on duty on a daily basis.. The contractor will be responsible for storing and maintaining radios throughout the life of the contract.

F. All workers employed by the contractor who are to work within the Authority's stations, track area, right-of-way or adjacent to the traction power system or any high voltage electrical cables, shall be required to attend a safety awareness course at the Authority's Subway Operations Training School. The course is to make the contractor's personnel aware of the particular hazards related to the Authority's operations.

G. All personnel working on the project site in the immediate vicinity of, or within the right-of-way, are required to wear orange reflective safety vests, similar to standard Authority equipment as specified in the Right-of-Way safety Rulebook.

H. Work activities necessitating the traction power system (third rail and catenary) deenergization will require the services of an Authority power lineperson on site at all times and the contractor is responsible for any. costs incurred by the Authority as. a result of this action.

I. Prior to the implementation of the contracted work, and throughout the life of the contract, the contractor will be required to supply professionally rendered signs, as directed by the Authority's Marketing Department. These signs will include, but are not limited to, the following:

1. Informational signs for revenue service diversion.
2. Station directional and stairway, platform, exit closing signs.
3. General project informational signs for Authority customers.

J. Upon the direction of the Authority's Chief Engineer of Design and Construction, Director of Safety, and or Director of Subway Operations or their representatives, the contractor will be required to supply and install partitions and wooden barricades to cordon off the work site; such partitions and barricades shall be maintained and remain graffiti free by the contractor for the duration of the project.

K. Upon direction from the Authority's Chief Engineer of Design and Construction and / or Director of Subway Operations or their representatives, the contractor will supply the following when site conditions warrant:

1. Emergency and temporary lighting.
2. Exhaust fans of sufficient size and numbers to adequately ventilate the work site, tunnel and or adjacent stations.
3. Fire and / or garden hose for the purpose of dust control.

L. It shall be the responsibility of the contractor to keep the Authority informed prior to all times when they intend to perform hazardous work. Failure of the contractor to provide the Authority with suitable advance notice of hazardous work will result in the stoppage of the work by the Authority until such time as sufficient numbers of protection personnel are on duty at the site.

6. ANNUAL CERTIFICATION OF HI-RAIL EQUIPMENT

A. All equipment used by the contractor on Authority property shall be inspected by the Maintenance of Way engineer and/or the MBTA Safety Department for clearance and safety standards, and shall not be used if considered unsafe. All contractor/ subcontractor equipment (including hi-rail) operators must be trained, certified, and properly licensed. Documentation of same must be readily available and provided to the Authority upon request. If the contractor equipment is involved in a derailment or near miss incident or an accident, which caused injury or exposed personnel to injury and or caused damage to Authority property, that equipment will be subject to the Impound Policy Procedure.

B. Contractor equipment to be .used on or in the vicinity of the track shall be in first class condition, so as to positively prevent any failure that would cause delay in Authority operations or damage to its property or compromise the health and safety of personnel working on the project. Equipment shall not be placed or operated within the fouling distance of track without first obtaining the permission of the Authority.

C. The contractor shall not, at any time, operate equipment or machinery over Authority's right-of-

way without the use of hi-rail gear. All equipment that the contractor proposes to operate shall 'be modified to operate over the Authority's track and special work (e.g., switches, crossover frogs third rail, and restraining rail). Qualified Authority personnel shall control the movement of all hi-rail equipment at all times while operating on the Authority right-of-way. The contractor shall supply a portable radio for each hi-rail vehicle entering the Authority's right-of-way. No hi-rail equipment will be allowed on Authority's property without a functioning portable radio tuned to an Authority frequency.

D. The contractor shall furnish hi-rail equipment capable of operating within the strict confines of the right-of-way. No Authority owned equipment is available for the contractor's use. In addition to equipment necessary to complete the work on a regular basis, the contractor shall be required to have on site sufficient standby equipment capable of: a) removing disabled equipment from the right-of way, and b) replacing disabled equipment in order to return the right-of-way to normal operating status by the end of the designated work period. As part of the pre-qualification statement, the contractor shall furnish an itemized list of all equipment to be used on the project, including:

1. Type of equipment (e.g., pickup, flatbed or dump trucks, excavator, cranes, etc.).
2. Make, model and date of manufacture.
3. Ownership.
4. Present use and date of availability.
5. Location where equipment may be inspected by Authority personnel during the prequalification period.

E. The contractor shall have proof of competency for hi-rail operators (e.g., documentation, that the operator of hi-rail equipment is certified to operate that specific piece of equipment). The Authority reserves the right to review the lesson plan and audit the training class. The hi-rail operator will be responsible for ensuring and documenting that the vehicle is safe for operation and that all required equipment is present and properly secured. This must be done on a daily basis prior to operating the equipment.

F. The contractor is required to have an Annual Certification of hi-rail equipment (separate form the Registry Inspection) signed by a competent person (e.g. Manufacturer's representative) asserting to the fact that the equipment is Original Equipment Manufacturer (OEM), that it conforms to the latest standards, was installed per the manufacturer's specification, and is functioning properly.

G. The contractor must keep a copy of the Manufacturer's Operating Manual or instructions onboard the hi-rail equipment at all times.

H. The operator shall operate the hi-rail equipment at a reasonable speed for the existing conditions, being alert for another vehicle (or any other obstruction along the right of way). In addition, said operator must maintain a safe spacing of traveling equipment.

I. The contractor's hi-rail vehicles must be equipped with a horn (warning device), and an exhaust gas purifier.

J. All equipment when used in tunnels and or darkness must conform to the Authority's standards for

headlights and marker lights. In addition, when vehicles are operating in tandem such as rail carts; flat cars, etc., such vehicles must be equipped with a flashing/strobe light when the lead vehicle is other than the operating vehicle. Diesel powered equipment only will be allowed in the tunnel and shall be removed from the tunnel each night unless otherwise permitted by the Director of Subway Operations.

K. Contractors must comply with the Authority's Propane Gas policy.

L. Contractor's doing "hot work" must have appropriate permits and follow all applicable rules and procedures for same.

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PROJECT UTILITY COORDINATION FORM

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Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

4/4/2025
Revision Date:

City/Town:	Project File #:	PUC Completed by:	Utility Pole Set:	
Cambridge	610776	PCM	Eversource(NSTAR)/Verizon	
Route/Street:	**Resident Engineer:**	**Mass DOT PM:**	**Scheduled Ad Date:**	**Total Poles Relocated:**
Route 3/ Route 16/ Route 2 Over MBTA Redline	*TBD*	Shahpar Negah	8/16/2025	0

4/4/2025
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Consultant:	Contact:	Office #	Cell #	Email
MassDOT Consultant - HNTB Corporation	Gaby MacNeil	617-532-2279		gmacneil@hntb.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
Eversource Gas	Jeffrey Evans-Mongeon	508-305-6970		jeffrey.evans-Mongeon@eversource.com	x		x		Eversource has a temporary gas relocation onto a contractor installed temporary utility structure. Contractor responsible for erecting and placing temporary pipe onto temporary utility structure. Eversource responsible for fittings, connections to structure, and testing pipe. Eversource has a permanent relocation into eastern bay of proposed bridge. EVS to install roller supports, casing, and carrier pipe onto PBU prior to PBU delivery to site. Eversource will tie in gas main on bridge to existing gas main along easterly side of Alewife Brook Pkwy after Stage 1 bridge construction.		x	x		x	
Eversource Electric "A"	Ned Sadowski	413-537-6594		ned.sadowski@eversource.com		x			Contractor to R&R (2) Eversource owned light poles. EVS will backfeed lighting system once contractor has relocated LPs. EVS will not be seeking reimbursement for backfeeding work. Two flood lights on LP south of the bridge to also be R&R by contractor. EVS transmission line located nearby to the east of the bridge(not being disturbed by this project).		x	x		x	
Cambridge Water Department	Richard Holly Steve Lush Innocent Lugumamu	617-349-4788 617-349-4782 -		rholly@cambridgema.gov slush@cambridgema.gov ilugumamu@cambridgema.gov					Existing 12" water main can be temporarily isolated and removed from the bridge during construction, no temporary bypass needed. A WG will need to be installed adjacent to the Alewife Station prior to removal of the main on the bridge. Contractor to install new main and appurtances onto the PBU prior to delivery to site. Testing per Cambridge Water Department standards to be conducted prior to putting new main into service.		x	x		x	
MBTA Archives & Digital Asset Preservation	Christine Bresnahan Terence McCarthy Sylvia Walsh	617-455-7087 617-222-4166 -		cbresnahan@mbta.com TPMcCarthy@MBTA.com archives@mbta.com					MBTA Access Agreement will need to be obtained by the contractor prior to accesing their property. MBTA Redline tunnel loading restrictions in place. Floodlights and accompanying lighting conduit on both bridge fascia and abutments are owned by MBTA. Fixtures, conduit, and boxes will need to be removed temporarily prior to bridge work and reinstalled by the contractor once bridge work is complete. Contractor to coordinate with MBTA to perform work.		x	x		x	
DCR Lighting	Yvonne Jones	617-626-1489	617-413-6427	yvonne.jones@mass.gov					~ Eversource has care and control of the light pole, arm & fixture plus wire. ~Around the Bridge: DCR has care and control of foundation, base, Handhole(HH) or Manhole(MH) and conduit. ~ On the Bridge: MassDOT has care and control of foundation, base, Handhole(HH)or Manhole(MH) and conduit. ~ Two Eversource owned light poles off bridge need to be relocated due to TTMP. ~ Conduit will need to be removed to facilitate bridge work and permanently reestablished by the contractor upon the completion of necessary construction activities.		x			x	
For Information Only															
Comcast Cable Corporation	Wendy Brown Shane Flewelling	978-848-5163 617-406-9645		wendy_brown@comcast.com shane_flewelling@comcast.com					2023-09-12 - No conflicts. Comcast has UG facilities at the intersection of Rindge Ave, Alewife Brook Pkwy & Cambridge Park Dr.					x	
AT&T/ Siena Engineering Group/ Teleport	Erica Hudson	781-221-8400	x7041	erica.hudson@sienaengineeringgroup.com					2023-07-31 - No conflicts. AT&T cable in Comcast owned conduit.					x	
Cambridge DPW-Engineering/ Sewer	Kathy Watkins	617-349-4800		kwatkins@cambridgema.gov											

No Facilities or No Conflicts															
Raytheon Technologies	Doug Flynn			flynn@rtx.com					2023-07-09 - No Facilities						
Cambridge Electrical Department	Mark Melo	617-349-4925		mamelo@cambridgema.gov					No impacts to facilities						
Eversource Fiber	Bechir Khoury	781-441-3864		bechir.khoury@eversource.com					2023-11-27 - No Facilities						
CSX Transportation	Michael Sliper			michael_sliper@csx.com					No Facilities PCM						
Enbridge	Kathy Aruda	508-938-7728		kathleen.aruda@enbridge.com					2023-07-24 - No facilities within the project limits. Transmission line located north of the project limits.						
Verizon	Karen Mealey Paul Diamantopoulos	774-409-3160 978-323-0282		karen.m.mealey@verizon.com paul.e.diamantopoulos@verizon.com					2023-07-25 - No conflicts. VZ underground present at intersection of Rindge Ave & Alewife Brook Pkwy.						
MCI-Verizon Business	Stephen Parretti	508-248-1305		stephen.parretti@verizon.com					2023-08-21 - No conflicts						
Lumen	Renoy Thomas	516-712-3041		relocations@lumen.com					2023-07-28 - No Facilities						
MWRA Sewer	Kevin McKenna	617-305-5956		kevin.mckenna@mwra.com					2023-08-03 - No Facilities						
MWRA Water	Ralph Francesconi	617-461-3573		ralph.francesconi@mwra.com					2023-08-07 - No Facilities						
Vicinity Energy	Chad Joyce	508-901-0717		chad.joyce@vicinityenergy.us					2023-11-28 - No Facilities						
Crown Castle	Mark Bonanno	508-616-7818		mark.bonanno@crowncastle.com					2023-11-28 - No Conflicts. CC underground present at inersection of Rindge Ave & Alewife Brook Pkwy.						
Extenet Systems	Chad Wagner	617-529-0973		cwagner1@extenetsystems.com					2023-12-06 - No Facilities						
Zayo	Richard Moran	978-844-7525		richard.moran@zayo.com					2024-08-09 - No Facilities						
Verizon Wireless Small Cell	Liz Glidden	-		elizabeth.glidden@verizonwireless.com					2024-08-22 - No Facilities						
Lightpath	Jeff Harrington	617-999-5371		jeff.harrington@lightpathfiber.com					2024-08-07 - No Facilities						
DCR Traffic	Val Soroka Mahendra Ughreja	617-429-6137 -		val.soroka@mass.gov mahendra.ughreja@mass.gov					2024-07-17 - No Conflicts						

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:

MBTA Access permit: loading calcs for redline tunnel, demo/ reconstruction of bridge abutments
DCR Property
City of Cambridge Property
Eversource Elec, DCR, and MassDOT hwy lighting
PBU construction with water main and Eversource gas

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 Cambridge. The information provided is the best available information prior to project advertisement.

PUC FORM - CONTINUED

Is 'enabling' (prep) work, by the Contractor, necessary prior to the start of the first series of utility relocations:	Yes	No
	X	

Has any of the Utility work been identified to work concurrently	Yes	No
	X	

4/4/2025
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Project File #:	610776
City/Town:	Cambridge
Route/Street:	Route 3/ Route 16/ Route 2 Over MBTA Redline

	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 ?	
	C = Contractor	U = Utility Co.			Exclusive Utility on site: Utility working with no other Utilities in vicinity	Concurrent Utilities: Utility working with other Utilities on site	Contractor Off-Site: No Contractor physical construction operations on-site (while Utility is	Contractor Concurrent: Contractor and Utility are working on-site - but NOT in the same vicinity	Potential **Access Restraint** (Yes/No)	Reason/Note (optional)
Pre-Stage 1			Enabling' work by the Contractor - Contractor to submit and obtain MBTA Access Permit that will include loading calculations to comply with loading restrictions for any construction activities above redline tunnel. Prep site (clearing, grubbing, guard rail removal) as required. Contractor will also install project environmental controls (hay bales, silt fence, etc.) as required per the project plans prior to the start of any work. Digsafe Paint and pole markout with proposed curb marked out, pre-walk with All utilities, DE, DURE, RE, and Contractor. Coordinate with DCR and city of Cambridge as needed. Coordinate with Eversource Gas and City of Cambridge before PBU production to ensure gas main and watermain is installed on PBU's during production.							
			UTILITY OPERATIONS - Temporary Gas Bypass							
Task: 1			***Utility Co. Eversource Gas***							
		u	MassDOT Notice to Proceed, Eversource Gas to mobilize to site, complete markout and test hole verifications	30		x		x	No	
	c		Contractor to construct temporary utility support structure			x		x	No	
		u	Install 125-ft. of 8-in. IP plastic and 100-ft. of 8-in. IP Coated Steel (MassDOT contractor responsible for erecting/placing pipe onto temporary utility structure. Eversource resonsible for fitting, connecting to structure, welding, and testing the gas line).	15		x		x	No	
		u	Pig and pressure test temporary bypass	4		x		x	No	
		u	Perform tie-ins for 8-in. temporary bypass on either side of existing bridge	8		x		x	No	
		u	Perform isolations and abandonment of existing 8in gas main on bridge	4		x		x	No	
			Sub-Total	**61**						
			UTILITY OPERATIONS - Light Pole Relocations							
Task: 2			***Utility Co. Eversource Electric***							
	c		Contractor to relocate (2) Eversource owned lightpoles.			x		x	No	
		u	Prepare lighting system to be backfed prior to Stage 1 bridge demolition	1		x		x	No	DUCE Estimate
			Sub-Total	**1**						
			UTILITY OPERATIONS - Gas Installation on the PBU							
Task: 3			***Utility Co. Eversource Gas***							
		u	Pre-fabricate 16-in. casing and 12-in. plastic carrier pipe on pre-fabricated bridge unit (PBU) at MassDOT prefabrication site	6		x		x	No	
		u	Pig and pressure test pre-fabricated carrier pipe	2		x		x	No	
			Sub-Total	**8**						
Stage 3			Enabling' work by the Contractor - Contractor to install Stage 2 PBU's.							
			UTILITY OPERATIONS - Permanent Gas Relocation							
Task: 4			***Utility Co. Eversource Gas***							
		u	Install 175-ft. of 12-in. IP plastic from bridge abutments to tie-in points on either side of bridge	17		x		x	No	
		u	Pig and pressure test new 12-in. plastic main	4		x		x	No	
		u	Perform tie-ins on either side of bridge	8		x		x	No	
		u	Perform isolations and abandonment of 8-in temporary bypass	4		x		x	No	
		u	Clean up and demobilize	3		x		x	No	
	c		Contractor to remove temporary utility structure and gas pipe attached			x		x	No	
			Sub-Total	**36**						

RESPONSIBLE PARTY: C = Contractor / U = Utility Co.	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work — 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 ?	
			Exclusive Utility on site: Utility working with no other Utilities in vicinity	Concurrent Utilities: Utility working with other Utilities on site	Contractor Off-Site: No Contractor physical construction operations on-site (while Utility is	Contractor Concurrent: Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
	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).							
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-April. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-April. 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. Any costs associated with these tasks are deemed to be incidental to the project.							
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								

Proposal No. 610776-132090

DOCUMENT A00811

WATERING LOG
for
MassDOT Plantings

Watering Log for MassDOT Plantings

Project Description:

Contract No:

Project No:

Plant Locations/s: (Attach planting plan/s as necessary)

Notes:

	Separate logs shall be kept to track areas or plants with different watering schedules. Trees shall receive a minimum of 10 gallons with each watering and shrubs a minimum of 5 gallons. Provide note that if watering is not performed as scheduled due to rain. Record date of rainfall and amount.												
Date Watered													
Landscape Contractor Initial													
Prime Contractor Initial													
Date Watered													
Landscape Contractor Initial													
Prime Contractor Initial													

Each week, following watering, Log shall be submitted to the MassDOT Engineer.
6/15/2018

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: CAMBRIDGE Project File Number: 610776

Contract Number: 132090

Project Description: Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline

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 A00855

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

DETERMINATION VERIFICATION LETTER

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To: 02/19/2025 20:41:32 UTC
Project code: 2025-0058679
Project Name: 610776 - CAMBRIDGE- SUPERSTRUCTURE REPLACEMENT, C-01-031, US ROUTE 3/ROUTE 16/ROUTE 2 OVER MBTA REDL

Federal Nexus: yes
Federal Action Agency (if applicable): Federal Highway Administration

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for '610776 - CAMBRIDGE- SUPERSTRUCTURE REPLACEMENT, C-01-031, US ROUTE 3/ROUTE 16/ROUTE 2 OVER MBTA REDL'

Dear Hana Isihara:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on February 19, 2025, for '610776 - CAMBRIDGE- SUPERSTRUCTURE REPLACEMENT, C-01-031, US ROUTE 3/ ROUTE 16/ROUTE 2 OVER MBTA REDL' (here forward, Project). This project has been assigned Project Code 2025-0058679 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your Project, the Project may need to apply***

the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office.

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	NLAA

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete for northern long-eared bat and/or tricolored bat and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat or tricolored bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat or tricolored bat that was not considered when completing the determination key.

15-Day Review Period

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat and/or tricolored bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat and Tricolored Bat DKey.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference Project Code 2025-0058679 associated with this Project.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

610776 - CAMBRIDGE- SUPERSTRUCTURE REPLACEMENT, C-01-031, US ROUTE 3/ ROUTE 16/ROUTE 2 OVER MBTA REDL

2. Description

The following description was provided for the project '610776 - CAMBRIDGE- SUPERSTRUCTURE REPLACEMENT, C-01-031, US ROUTE 3/ROUTE 16/ROUTE 2 OVER MBTA REDL':

> 610776 - CAMBRIDGE- SUPERSTRUCTURE REPLACEMENT, C-01-031, US ROUTE 3/ROUTE 16/ROUTE 2 OVER MBTA REDLINE
> This project includes replacement of the bridge superstructure which carries Alewife Brook Parkway, US Route 3, Route 16, and Route 2 over the MBTA Redline tunnel, increasing its design life and enhancing safety to all roadway users. The work consists of demolition of the existing superstructure in its entirety and its replacement using precast bridge units (PBUs), conducted in two stages to maintain vehicle access during construction. Sidewalks along the parkway (within the project limits) will be closed during construction and pedestrians will be detoured. The existing utilities over/attached to the bridge will be temporary relocated. Two-way traffic will be maintained over the bridge during majority of the construction, except over two inconsecutive long weekends at which time some detours will be needed. Similarly pedestrian and bicyclists access to the path directly below the bridge will be maintained, except during the same two long weekends. The proposed approach roadway work is limited in scope and is primarily to replace what are removed for/impacted by construction (e.g. sidewalk, guardrail). The area below the bridge that is primarily used by pedestrians and bicyclists is in poor conditions, thus will be resurfaced as a part of this work.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.395929699999996,-71.14067689349963,14z

16
3
Alewife Ctr
Access Rd
Alewife Station
Russell/Sen
Field
Jerry's Pit
Comeau
Field

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

   Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   Yes

7. FHWA, FRA, and FTA have completed a range-wide programmatic consultation for transportation- related actions within the range of the Indiana bat, northern long-eared bat and tricolored bat.

   Does your proposed action fall within the scope of this programmatic consultation?

   Note: If you are unsure, but your action is transportation related, please select "Yes" and use the FHWA, FRA, FTA Assisted Determination Key (FHWA DKey) in IPaC to determine if the programmatic consultation is applicable to your action. Return to this key and answer 'no' to this question if it is not.

   No

8. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   Yes

9. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   No

10. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

    No

11. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

12. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

    No

13. Does the action area contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs?

    No

14. Will the action cause effects to a bridge?

    Note: Covered bridges should be considered as bridges in this question.

    Yes

15. Has a site-specific bridge assessment following USFWS guidelines been completed?

    Note: For information on conducting a bridge/structure assessment, please see Appendix K in the USFWS' Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines at:https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines Additional resources can be found at: https://www.fws.gov/media/bats-and-transportation-structures-references-and-additional-resources and a training video is located at: https://www.youtube.com/watch?v=iuFwkT7q8Ws.

    Yes

16. Was evidence of bat use found during the bridge assessment?

    No

    SUBMITTED DOCUMENTS

    - *610776_Cambridge Acoustic Survey VBA Report_610776_final binder_reduced.pdf https://ipac.ecosphere.fws.gov/project/HCAVZ7SI4ZGDDFFUUHO5NP5KDE/projectDocuments/157555683*

17. Did you coordinate with your local Ecological Services Field Office (ESFO) and receive approval of the bridge assessment results? If NO, please contact the appropriate local ESFO before completing this determination key.

    Yes

18. Will the action result in effects to a culvert or tunnel at any time of year?

    No

19. Are trees present within 1000 feet of the action area?

    Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

20. Does the action include the intentional exclusion of bats from a building or structure?

    Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    No

21. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    No

22. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

23. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic permanently or temporarily on one or more existing roads?

    Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    No

24. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

25. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    Note: For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    No

26. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    No

27. Will the action include drilling or blasting?

    Yes

28. Will the drilling or blasting produce noise or vibrations above existing background levels that will affect suitable summer habitat for northern long-eared bats and/or tricolored bats?

    Note: Additional information defining suitable suitable summer habitat for the northern long-eared bat and/or tricolored bat, can be found in Appendix A in the USFWS' Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines

    Yes

29. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    No

30. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    No

31. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

32. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

33. Will the action cause an increase in the extent of suitable forested habitat exposed to artificial lighting?

    No

34. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    Yes

35. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

    No

36. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

    No

37. Does the project intersect with the 0- 9.9% forest density category?

    Automatically answered
    Yes

38. Does the project intersect with the 10.0- 19.9% forest density category map?

    Automatically answered
    No

39. Does the project intersect with the 20.0- 29.9% forest density category map?

    Automatically answered
    No

40. Does the project intersect with the 30.0- 100% forest density category map?

    Automatically answered
    No

41. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 0.5 acre in total extent?

    No

42. Will the proposed action result in the use of prescribed fire?

    Note: If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

    No

43. Does the action area intersect the tricolored bat species list area?

    Automatically answered
    Yes

44. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

45. Has a presence/probable absence bat survey targeting the tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area?

    Yes

46. Was the presence/probable absence survey conducted within the last 5 years?

    Yes

47. Did you coordinate with your Ecological Services Field Office (ESFO) and receive approval of the results? If NO, please contact the appropriate local ESFO before completing this determination key - you may change your answer to 'yes' only after coordinating with the ESFO and uploading survey results.

    Yes

48. Did survey results demonstrate the probable absence of tricolored bats?

    Yes

49. Do you have any documents that you want to include with this submission?

    No

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

.4

IPAC USER CONTACT INFORMATION

Agency: Massachusetts Department of Transportation
Name: Hana Isihara
Address: 10 Park Plaza
City: Boston
State: MA
Zip: 02116
Email hana.l.isihara@dot.state.ma.us
Phone: 6178964454

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

DOCUMENT A00856

Northern Long-Eared Bat Presence/Absence Acoustic Survey and Bridge Assessment

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November 1, 2023

Ref: 14394.10

Mr. Dave Paulson
Wildlife and Endangered Species Program Supervisor
Massachusetts Department of Transportation – Highway Division
Ten Park Plaza, Room 7360
Boston, MA 02116-3973
David.J.Paulson.@dot.state.ma.us, (857) 262-3378

Project	Northern Long-eared Bat (NLEB) Presence/Absence Acoustic Survey and Bridge Assessment
MassDOT Project #	610776
MassDOT Project Title	Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline
Town	Cambridge, Massachusetts
Surveyor Name/Firm	*Kimberley Justham, Casey Bardier, Tim Piacentini, Chelsea Glinka/VHB*
Detector Operation Dates	July 11-13, 2023
Acoustic Survey Results	**NLEB NOT DETECTED**
Acoustic Survey Results	**MYLE NOT DETECTED**
Acoustic Survey Results	**MYLU NOT DETECTED**
Acoustic Survey Results	**PESU NOT DETECTED**
Bridge Assessment Date	July 13, 2023
Bridge Assessment Results	**Signs of Bats Not Detected at Bridge No. C-01-031 during Partial Survey**

Dear Mr. Paulson:

This report contains the results of the Massachusetts Department of Transportation (MassDOT) northern long-eared bat (*Myotis septentrionalis*, hereafter MYSE) summer presence/absence survey performed at the proposed Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline in Cambridge, Massachusetts (MassDOT #610776). Acoustic detectors deployed by VHB did not detect the presence of MYSE. There were no calls classified as the state endangered eastern small footed bat (Myotis leibeii; MYLE), little brown bat (Myotis lucifigus; MYLU) or the state endangered tri-colored bat (Perimyotis subflavus; PESU) and subsequent qualitative analysis did not detect any of these species.

This report also contains the results of the MassDOT bridge assessment performed for the C-01-031 Superstructure Replacement. No bats (dead or alive), staining, bat sounds, or distinct odors were observed for this bridge. This bridge does not appear to provide a cave-like environment. However, as the partial bridge assessment did not include access to all areas of the bridge, this survey cannot definitively conclude that the bridge is not used as a roosting site for bats. The acoustic survey results did not detect federal or state-listed species within the vicinity of the bridge so it may be assumed that these species of concern do not use the bridge as a roost site.

Sincerely,

VHB

Chelsea O. Glinka
Project Manager/Environmental Scientist
cglinka@vhb.com

Attachments: Northern Long-eared Bat Survey Report for Cambridge, 610776

US FISH AND WILDLIFE SERVICE PHASE 2 BAT ACOUSTIC SURVEY REPORT AND VISUAL BRIDGE ASSESSMENT
MASSDOT PROJECT 610776

Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline

Cambridge, Massachusetts

PREPARED FOR

Massachusetts Department of Transportation
10 Park Plaza
Boston, Massachusetts 02116
857.368.4636

PREPARED BY

101 Walnut Street
P.O. Box 9151
Watertown, Massachusetts 02471
617.924.1770

November 2023

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Appendix B Field Data Forms and Site Photos
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1

Introduction

This report summarizes the results of the Phase 2 Presence/Probable Absence Acoustic Monitoring Surveys (acoustic surveys) and Visual Bridge Assessment targeting the northern long-eared bat (*Myotis septentrionalis* or MYSE) performed by VHB on behalf of the Massachusetts Department of Transportation (MassDOT) for superstructure replacement, C-01-031, carrying US Route 3, Route 16, and Route 2 over the MBTA Redline in Cambridge, Massachusetts (see **Figure 1** in **Appendix A**). The MYSE is state-endangered in Massachusetts and has recently been reclassified from federally threatened to federally endangered under the Endangered Species Act (ESA; 16 U.S.C. § 1531 et seq.). The final rule to reclassify MYSE as federally endangered was published in the Federal Register on November 30, 2022, and took effect March 31, 2023 (Federal Register, Vol. 87 No. 229). This survey was performed as a due diligence effort because the Project is within the range of MYSE and contains potentially suitable bat habitat. The survey was conducted in accordance with the MYSE Phase 2 Study Plan for the Project which was approved by USFWS in June 2023.

The acoustic surveys targeted the following Massachusetts state-endangered species in addition to MYSE: tricolored bat (*Perimyotis subflavus*; PESU), little brown bat (*Myotis lucifugus*, MYLU), and eastern small-footed bat (*Myotis leibii*, MYLE). Two of these species are under consideration for federal protections: on September 14, 2022, the USFWS published their proposal to list the PESU as endangered under the ESA (Federal Register, Vol. 87, No. 177) and they are conducting a discretionary review on the status of MYLU (USFWS, 2021) expected to be completed in 2023. In 2013 the USFWS issued a 12-Month Finding on a petition to list the MYLE as endangered or threatened under the ESA and determined that listing MYLE was not warranted (Federal Register, Vol. 78, No. 191).

1.1 Project Overview

The project includes replacement of the superstructure and necessary approach work for the Route 2/Route 3/Route 16 bridge (Bridge C-01-031) over the MBTA Redline in Cambridge, Massachusetts. The sidewalk on the northbound direction (east side) is an existing shared use path and will be replaced in kind within the limits of bridge approach work. Fencing along the back of the sidewalk will be removed and reset (the Project Area, **Figure 1** in **Appendix A**). The total length of the Project is approximately 0.5 kilometer (km), however, the Project limits were extended to reach a Project length of one km in anticipation that additional MassDOT-planned work will occur in the adjacent suitable summer habitat in the

near future. This approach is consistent with the MassDOT MYSE Survey Protocol for Small Projects and Bridges.

1.2 Existing Conditions

Bridge C-01-031 is a parallel box beam structure that carries the convergence of Route 2, Route 3, and Route 16 over the MBTA Redline in Cambridge, Massachusetts. The land use surrounding Bridge C-01-031 includes high-density residential development, public transit facilities, upland deciduous forest, and wetlands. The Boston Transit Alewife Station is located immediately to the east of the Project, the associated parking garage is located immediately to the west. The Alewife Linear Path runs through Alewife Park to the east, passes under the bridge and continues to the north. Jerrys Pond is located to the southeast, Yates Pond is located to the northwest, and Little River and Alewife Brook are located to the north.

2

Methods

VHB biologists with bat acoustic survey and bridge assessment experience conducted the acoustic survey and visual bridge assessment in accordance with the Phase 2 Study Plan approved by the USFWS in June 2023. The Study Plan was developed in accordance with the *USFWS 2023 Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines (Guidelines)*.

2.1 Habitat Assessment and Site Selection

Per the USFWS *2023 Guidelines*, sites were selected through a desktop analysis (i.e., aerial photo interpretation) during the development of the Study Plan by VHB biologists to ensure sufficient coverage of the linear Project. The survey was planned for two detector locations over two calendar nights to target the minimum survey effort of four detector nights. Each detector location was micro-sited in the field to ensure that suitable site conditions were present, and that optimal microphone placement was achieved. Each detector was spaced at least the recommended 200 meters apart.

The detector at Site 1 was deployed on a slope above the retaining wall for the footpath that runs parallel to the east side of the Alewife Brook Parkway. The microphone was oriented north towards an opening in the canopy above the trail. Dominant vegetation included tree-of-heaven (*Ailanthus altissima*), black locust (*Robinia pseudoacacia*), silver maple (*Acer saccharinum*), and Asiatic bittersweet (*Celastrus orbiculatus)*.

The detector at Site 2 was set up on the southern shoulder of the Alewife Brook Parkway and oriented to the east with the flow of traffic. The dominant vegetation included green ash (*Fraxinus pennsylvanica*), yew (*Taxus sp.*), turf grasses, and English-ivy (*Hedera helix*).

2.2 Detector and Microphone Deployment and Placement

Two Pettersson D500x ultrasonic full spectrum detectors (detector) with Pettersson external, directional microphones were deployed within the Project Area (as shown in **Figure 1** in **Appendix A**) for two, consecutive calendar nights from July 11 to July 13, 2023. Photographs of the survey sites and field data forms are included in **Appendix B**. A concise summary of the survey effort for this project is detailed in **Tables 1** and **2** provided in **Appendix C**. A

total of four detector nights were recorded during the survey effort and analysis of the recordings is presented in **Table 3** of **Appendix C**.

Detector locations were micro-sited in the field to meet the USFWS survey protocols for detector and microphone placement, as described in the approved Study Plan. This includes raising the microphone to a height of at least three meters above the ground level vegetation and orienting the microphone toward potential flight corridors such as forest canopy openings, near water sources, parallel to woodland edges, or other suitable survey locations with minimal to no vegetation obstruction in front of the microphone within the detection cone (which is 100 feet in front of highly directional microphones). Due to the nature of the Project Area, it was not always possible to find a location where the cone of detection was absent of vegetation within 100 feet in front of the microphone. However, detectors were placed in vegetative clearings parallel to woodland edges in areas that were either clear of vegetation or contained minimal distant vegetation (i.e., overhanging branches) in the detection cones; these areas were determined suitable for the acoustic survey based on VHB's professional judgement and past survey experience, as applicable. When practical and within reach, any overhanging branches within the 100-foot detection cones were broken and removed to further reduce clutter. The detectors were set up at a minimum of 10 feet away from the mature forest vegetation line to the extent practical based on the site constraints. Site descriptions are included on the field data forms provided in **Appendix B**. Detector equipment function was verified prior to deployment and at retrieval with a clap and/or finger rub test at the microphone, along with verification of the detector settings and review of the event logs. Refer to **Table 1** provided in **Appendix C** for additional equipment details. Specific information for each detector by site is listed in **Table 2**, also provided in **Appendix C**.

2.3 Weather Criteria

The survey included two calendar nights that met the following survey weather criteria per the USFWS 2023 *Guidelines*: temperatures did not fall below 50°F during the first five hours of the survey period; no precipitation (rain and/or fog) that exceeded 30 minutes continuously or continued intermittently during the first five hours of the survey period; and no sustained wind speeds greater than nine miles per hour for 30 minutes continuously during the first five hours of the survey period. Hourly weather conditions were monitored from the nearest active Weather Underground Station: East Arlington (KMAARLIN17). Refer to **Table 1** provided in **Appendix C** for an abbreviated weather summary for each calendar night.

2.4 Call Analysis

VHB biologists trained in conducting acoustic analyses (principally Chelsea Glinka and Kim Justham, resumes provided in **Appendix D**) were responsible for automated call analysis and the qualitative review of call files. Sound files were processed through SonoBat Data Wizard Version 4.4.5 to attribute metadata to each file and then calls were scrubbed with the SonoBat Data Wizard Batch File Scrubber to remove sound files that registered below 20 kilohertz (kHz). This step removes obvious non-bat files to reduce the file processing time.

Full spectrum files were auto classified with Kaleidoscope Pro Version 5.4.7. Total call counts by species and the MLE ("maximum likelihood estimator" or p-values) assigned by Kaleidoscope Pro are included in **Table 3** provided in **Appendix C**. Species that have been qualitatively reviewed are also denoted in **Table 3**. The bat species abbreviations are listed in **Table 4** in **Appendix C.**

Qualitative analysis (manual vetting) was conducted by VHB (principally by Chelsea Glinka) for all calls that were auto-identified as high frequency (i.e., *Myotis* sp., PESU, and eastern red bat (*Lasiurus borealis* or LABO) regardless of MLE value) and any unknown calls which have a characteristic frequency (Fc) of 35 kilohertz (kHz) or greater. The suite of species evaluated in the manual vetting process includes the federally and state endangered MYSE and the state endangered MYLU, MYLE, and PESU. Select calls that were auto classified as low frequency species were also manually reviewed to confirm presence. VHB conducted qualitative analysis in full spectrum format using SonoBat Version 4.4.5.

All qualitatively reviewed calls were provided to Janet Tyburec of Bat Survey Solutions for secondary qualitative review as part of the QA/QC process. Ms. Tyburec provides over 30 years of acoustic surveying experience including field deployment, teaching, and qualitative call analysis using zero cross and full spectrum files. Her resume is provided in **Appendix D**. Secondary qualitative analysis by Ms. Tyburec was performed on all calls that were identified by the Kaleidoscope software as MYSE, UNKN, MYLU, LABO, PESU and select low frequency species calls; refer to **Table 5** provided in **Appendix C** for a summary of these results. Manually confirmed species have been incorporated into the overall call counts in **Table 3** with an asterisk (*) indicating when all or a portion of the call count was qualitatively reviewed.

Decisions on manual identification of calls are made based on a variety of call characteristics, including characteristic slope (Fs), Fc, the length of the sequence, frequency modulation, the type of call (search phase, attack phase, feeding buzz, etc.), the presence of harmonics, among other factors. References consulted during the qualitative analysis process are based on in-person workshops on manual vetting, Echolocation Call Characteristics of Eastern U.S. Bats, and the USGS Guide to Processing Bat Acoustic Data for the North American Bat Program (NA Bat). These sources are included in the References section below.

2.5 Visual Bridge Assessment

A visual bridge assessment was conducted on July 13, 2023, during daytime hours, following Bridge/Structure Bat Assessment Guidance by the Federal Transportation Agency/State Department of Transportation, last updated in 2020. Bridge C-01-031, a parallel box beam bridge, was examined from the sidewalk on top of the bridge deck and from the Alewife Linear Path underneath the deck using a GoPro camera mounted to a telescoping pole. Safety netting prevented full visuals of the spaces between beams and the junctions of the beams and the bridge abutments. The Bridge Inspection Form and Photo Log are provided in **Appendix E** of this report. The findings of the bridge assessment are summarized below.

3

Results

3.0 Acoustic Survey Results

This survey resulted in a probable absence determination for the federally endangered and state endangered MYSE, and the state endangered PESU, MYLE, and MYLU. Automated and qualitative analysis of calls resulted in the detection of the following species: big brown bat (*Eptesicus fuscus* or EPFU), hoary bat (*Lasiurus cinereus* or LACI), and silvered-haired bat (*Lasionycteris noctivagans* or LANO). Additionally, 16 calls were manually confirmed within the EFPU/LANO guild, meaning that the call characteristics could not be distinguished between these two species. The results of the data analysis efforts are detailed in **Tables 3** through **5** provided in **Appendix C.** Spectrograms of select calls are provided in **Appendix E**. The event logs for each detector night are provided in **Appendix F**.

The completed USFWS Northeast 2023 Reporting Form for Acoustic Surveys will be submitted to USFWS as an electronic Excel spreadsheet after this report.

3.1 Bridge Assessment Findings

VHB biologists accessed the deck of Bridge C-01-031 from the sidewalk on Route 2/Route 3/Route 16 and from the Alewife Linear Path. However, safety netting hung from the underside of the bridge prevented full visuals of the spaces between beams and the junctions of the abutment walls with the beams. Although the acoustic survey detected bats within the vicinity of the bridge, there was no evidence of bat roosting observed during the visual assessment (see photos in **Appendix E**). As not all areas of the bridge were accessed there remains potential for roosting bats to be present within portions of the bridge that were not accessed during the survey.

4

References

Corben, Christopher. Bat Sense. July 2020. Examples of calls from Bats of the Midwest and Eastern U.S. Manual ID Workshop.

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Reichert, B., and Lausen, C., Loeb, S., Weller, T., Allen, R., Britzke, E., Hohoff, T., Siemers, J., Burkholder, B., Herzog, C., and Verant, M., 2018, A Guide to processing bat acoustic data for the North American Bat Monitoring Program (NABat): U.S. Geological Survey Open-File Report 2018–1068, 33 p., https://doi.org/10.3133/ofr20181068.

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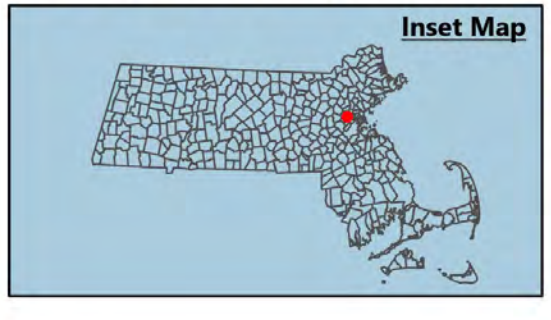
U.S. Fish and Wildlife Service. 2013. Federal Register Vol. 78, No. 191/Wednesday October 2, 2013. 12-Month Finding on a Petition To List the Eastern Small-Footed Bat and the Northern LongEared Bat as Endangered or Threatened Species; Listing the Northern Long-Eared Bat as an Endangered Species; Proposed Rule.

Appendix A: Site Figure



Legend

- Project Limit of Disturbance
- Extended Project Survey Area
- Visual Bridge Assessment
- Town Boundary
- Bat Acoustic Survey Location
- Microphone Orientation
- Alewife Linear Path
- Stream

Note:
Project Length: 1 KM
MassDOT Project: 610776
Detector Nights Surveyed: 4

0 200 400 Feet

Figure 1

Northern Long-eared Bat Acoustic Survey
Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2
Over MBTA Redline
Cambridge, MA

November 2023

Appendix B: Field Data Forms and Site Photos

Bat Acoustic Monitoring Data Form & Photo Log

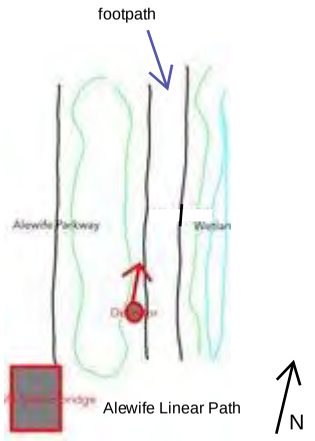
Project:	Superstructure Replacement, C-01-031 (610776)			**Site#:**	1	**Site Name:**	Alewife Station
Municipality:	Cambridge	**County:**	Essex	**State:**	MA	**Survey Contact:**	kjustham@vhb.com
Latitude:	42.39644517	**Longitude:**	-71.14056306	**Datum:**	WGS84		
Surveyed By:	K. Justham, T. Piacentini			**Setup:** 07/11/2023 11:22		**Retrieval:**	07/13/2023 12:49

Land Use:	Transport / Utilities, Other Urban / Built-up, Deciduous, Reservoirs	**Mic Test**	**Setup**	Yes	**Battery Capacity (v)**	**Setup**	5.1	**CF Card Capacity (GB)**	**Setup**	44.72
			Retrieval	Yes		**Retrieval**	4.6		**Retrieval**	44.36

BD #	Trigger Sensitivity	Mic	Mic Orientation	HT [1]	Clutter	Gain	Trigger	Interval	Recording Start Time	Recording End Time
52504	Medium	External / High Frequency / Directional Horned	N	6.1	LOW	45	160	0	19:52	05:48

Site Description / Additional Notes

Detector set on bank above footpath retaining wall east of Alewife Brook Parkway/bridge. Microphone oriented north into opening in canopy above trail. Approx 10ft to nearest veg, set at 20ft high. Dominant vegetation includes tree-of-heaven, black locust, silver maple, Asiatic bittersweet. Wetland adjacent to trail opposite detector.



Site sketch

[1] *Height of microphone above ground level (in meters)*

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Proposal No. 610776-132090

MassDOT Project #610776
Superstructure Replacement, C-01-031
Cambridge, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 1: Site 1 - Alewife Station – Cone of Detection

Date Taken:

July 11, 2023

Orientation:

N

Description:

Detector is positioned east of Alewife Brook Parkway (Route 16) and bridge along the nearby footpath.

Photo 2: Site 1 - Alewife Station

Date Taken:

July 11, 2023

Orientation:

W

Description:

View of detector set up along the greenway east of Alewife Brook Parkway/bridge showing the adjacent tree line.

MassDOT Project #610776
Superstructure Replacement, C-01-031
Cambridge, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 3: Site 1 - Alewife Station

Date Taken:

July 11, 2023

Orientation:

N

Description:

View of detector set up along the greenway east of Alewife Brook Parkway/bridge showing the adjacent slope and footpath.

Photo 4: Site 1 - Alewife Station

Date Taken:

July 11, 2023

Orientation:

S

Description:

View of detector set up along the greenway east of Alewife Brook Parkway/bridge showing the adjacent tree line and footpath.

MassDOT Project #610776
Superstructure Replacement, C-01-031
Cambridge, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 5: Site 1 - Alewife Station

Date Taken:

July 11, 2023

Orientation:

E

Description:

View of detector set up along the greenway east of Alewife Brook Parkway/bridge showing the footpath and a nearby wetland.

Photo 6: Site 1 - Alewife Station

Date Taken:

July 11, 2023

Orientation:

E

Description:

View of detector set up along the greenway east of Alewife Brook Parkway/bridge showing the adjacent tree line.

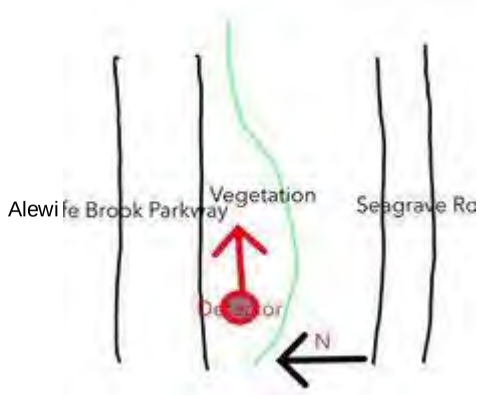
Bat Acoustic Monitoring Data Form & Photo Log

Project:	Superstructure Replacement, C-01-031 (610776)			**Site#:**	2	**Site Name:**	Alewife Brook Parkway					
Municipality:	Cambridge	**County:**	Middlesex	**State:**	MA	**Survey Contact:** kjustham@vhb.com						
Latitude:	42.39975027	**Longitude:**	-71.13920234	**Datum:**	WGS84							
Surveyed By:	K. Justham, T. Piacentini			**Setup:** 07/11/2023 12:17		**Retrieval:** 07/13/2023 13:13						
Land Use:	Residential, Transport / Utilities, Mixed Urban / Built-up, Deciduous	**Mic Test**	**Setup**	Yes	**Battery Capacity (v)**	**Setup**	5	**CF Card Capacity (GB)**	**Setup**	44.72		
			Retrieval	Yes		**Retrieval**	4.5		**Retrieval**	40.04		

BD #	Trigger Sensitivity	Mic	Mic Orientation	HT [1]	Clutter	Gain	Trigger	Interval	Recording Start Time	Recording End Time
52507	Medium	External / High Frequency / Directional Horned	E	4.88	EDGE	45	160	0	19:52	05:48

Site Description / Additional Notes

Detector set up on south side of ABP, with flow of traffic. Approx 16' high and 10ft from vegetation. Dominant vegetation includes green ash, yew, turf grass, English ivy.



Site sketch

1 *Height of microphone above ground level (in meters)*

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Proposal No. 610776-132090

MassDOT Project #610776
Superstructure Replacement, C-01-031
Cambridge, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 1: Site 2 - Alewife Brook Parkway – Cone of Detection

Date Taken:

July 11, 2023

Orientation:

E

Description:

Detector is positioned along the southern shoulder of Alewife Brook Parkway.

Photo 2: Site 2 - Alewife Brook Parkway

Date Taken:

July 11, 2023

Orientation:

E

Description:

View of detector set up along the southern shoulder of Alewife Brook Parkway showing the roadway and adjacent tree line.

MassDOT Project #610776
Superstructure Replacement, C-01-031
Cambridge, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 3: Site 2 - Alewife Brook Parkway

Date Taken:

July 11, 2023

Orientation:
N

Description:

View of detector set up along the southern shoulder of Alewife Brook Parkway showing the roadway and tree line on the opposite side of the road.

Photo 4: Site 2 - Alewife Brook Parkway

Date Taken:

July 11, 2023

Orientation:

W

Description:

View of detector set up along the southern shoulder of Alewife Brook Parkway showing the roadway and adjacent tree line.

MassDOT Project #610776
Superstructure Replacement, C-01-031
Cambridge, MA

Bat Acoustic Monitoring Data Form & Photo Log

Photo 5: Site 2 - Alewife Brook Parkway

Date Taken:

July 11, 2023

Orientation:

S

Description:

View of detector set up along the southern shoulder of Alewife Brook Parkway showing the roadway, adjacent tree line, and nearby houses.

Appendix C: Data Tables

Table 1: Project and Equipment Overview

Project Name	Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline
MassDOT Project #	610776
Project Location	Cambridge, Massachusetts
Weather Summary	7/11/2023-7/12/2023: High Temp: 83.20°F, Low Temp: 69.20°F, Avg Temp: 73.85°F, Avg Wind Speed: 0.0 mph, Precipitation: No 7/12/2023-7/13/2023: High Temp: 85.60°F, Low Temp: 70.30°F, Avg Temp: 76.07°F, Avg Wind Speed: 0.01 mph, Precipitation: No Weather Underground Station: East Arlington (KMAARLIN17)
Principal Equipment	Pettersson D500x; D500x external, high frequency, full spectrum microphone with a directional horn and PVC tube
VHB Personnel	Chelsea Glinka, Kimberley Justham, Casey Bardier, Tim Piacentini. Refer to resumes in **Appendix D**
Bat Survey Solutions Personnel	Janet Tyburec (provided second opinion on qualitative analysis of high frequency calls). Refer to resume in **Appendix D**.
Standard Pettersson D500x Settings	Sampling Frequency = 500 PreTrig = Off Recording Length = 5 seconds HP-Filter = Yes Auto-Record = Yes Input Gain = 45 Trigger Level = 160 Interval = 0
Standard Mic Setup	Height above ground = 6.1 meters (Site 1), 4.88 meters (Site 2) Vertical orientation = 0 degrees; horizontal plane (assuming 0 degrees is parallel with the ground). Clap sound test performed at deployment and retrieval to determine proper functioning, along with review of event log.
Acoustic Analysis Software	**Program:** Kaleidoscope Pro 5.4.6 for automated analysis; SonoBat, V 4.4.5 for qualitative analysis
	Filters or Parameters: Files were scrubbed and attributed using SonoBat Data Wizard V 4.4.5, set to medium: accepts all but poor-quality calls; accepts some noise with tonal content, include signals from 20 kHz and above.
	Program Settings Signal detection parameters (default parameters) Minimum and Maximum Frequency Range: 8-120 kHz Minimum and Maximum Length of Detected Pulses: 2-500 ms Maximum inter-syllable gap: 500 ms Min. # of pulses for species ID = 2 Other relevant settings affecting ID = Kaleidoscope Pro set to Massachusetts species setting Suite of species/groups included in program analysis: EPFU, LANO, LABO, LACI, MYLE, MYLU, MYSE, PESU

Table 2: Detector Details

Site	Detector #	Detector Night Start Dates	Latitude[1]	Longitude[1]	Start Time	End Time	Mic Orientation	Clutter	Distance to Nearest Vegetation or Obstruction	Habitat Type[2]
1	52504	7/11/2023 7/12/2023	42.39644517	-71.14056306	19:52	05:48	N	Edge	10 feet	Detector set on bank above footpath retaining wall west of Alewife Brook Parkway/bridge. Microphone oriented north into opening in the canopy above trail. Approx 10ft to nearest veg, set at 20ft high.
2	52507	7/11/2023 7/12/2023	42.39975027	-71.13920234	19:52	05:48	E	Edge	10 feet	Detector set up on south side of Alewife Brook Parkway, oriented with flow of traffic. Approx 16' high and 10ft from vegetation.

1 Sub-meter accuracy.
2 Refer to the Field Data Forms in Appendix B for more detailed site information.

Proposal No. 610776-132090

Table 3: Recorded Bat Calls

Site # & Detector Night		Species Identification[1]											Total # of Significant[3] Calls	Total # of Calls
		EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLE	MYLU	MYSE	PESU	MYsp	UNKN		
Site 1 7/11/2023 – 7/12/2023	Number of Calls	*15**	0	3	1	*3**	0	0	0	0	0	0	*18*	22
	MLE (p)[2]	*0*	-	0.18	-	-	-	-	-	-	-	-		
Site 1 7/12/2023 – 7/13/2023	Number of Calls	*4**	0	0	0	*3**	0	0	0	0	0	1	*7*	8
	MLE (p)[2]	*0*	-	-	-	-	-	-	-	-	-	-		
Site 2 7/11/2023 – 7/12/2023	Number of Calls	*368**	0	29	31	*4**	0	0	0	0	0	1	*372*	433
	MLE (p)[2]	*0*	-	-	-	-	-	-	-	-	-	-		
Site 2 7/12/2023 – 7/13/2023	Number of Calls	*149**	0	12	14	*6**	0	0	0	0	0	0	*155*	181
	MLE (p)[2]	*0*	-	0.89	-	-	-	-	-	-	-	-		
TOTAL CALLS FOR ALL SITES													-	**644**
TOTAL SIGNIFICANT CALLS FOR ALL SITES[3]													***552***	-

1 Refer to species key in Table 4

2 MLE (p) values ≤0.05 are considered to be significant and suggest presence.

3 Significant calls (italicized) include those with an MLE value ≤0.05 and those calls which have been manually vetted; this does not include any calls classified as UNKN or MYsp.

* All or a portion of the calls were qualitatively reviewed to confirm species presence.

** Note that if an MLE value is missing it's because it was classified via manual vetting and does not include a software generated MLE value

Proposal No. 610776-132090

Table 4: Bat Species Key[1]

Species Abbreviation	Scientific Name	Common Name
EPFU	*Eptesicus fuscus*	Big Brown Bat
LABO	*Lasiurus borealis*	Eastern Red Bat
LACI	*Lasiurus cinereus*	Hoary Bat
LANO	*Lasionycteris noctivagans*	Silver-haired Bat
MYLE	*Myotis leibii*	Eastern Small-footed Bat
MYLU	*Myotis lucifugus*	Little Brown Bat
MYSE	*Myotis septentrionalis*	Northern Long-eared Bat
PESU	*Perimyotis subflavus*	Tri-colored Bat
MYsp	*Myotis sp.*	Unknown Myotis
LAsp	*Lasiurus sp.*	Unknown Lasiurine
UNKN	*Unknown*	Assigned to calls that are too fragmented or poor quality to be classified to species.
EPFU/LANO	*Eptesicus fuscus/ Lasionycteris noctivagans Guild*	Big Brown Bat/Silver-haired Bat Guild

1 The Massachusetts Natural Heritage Program indicates that the Indiana bat (Myotis sodalis) (https://www.mass.gov/doc/indiana-bat/download) is extirpated in Massachusetts. Therefore, this species is not included in the analysis.

Table 5: Qualitative Analysis Summary

Site	Detector Night Start Date	Auto-ID by KPro 5.4.6	QA-QC ID by VHB/BSS	Comments
Site 1	7/11/2023	EPFU	EPFU	Low bandwidth and much diffuse echo after pulses, but consistent with EPFU.
Site 1	7/11/2023	LANO	EPFU/LANO	Very out-of-range, low-bandwidth pulses with much diffuse echo making disambiguation between EPFU/LANO impossible.
Site 1	7/11/2023	LACI	EPFU/LANO	Very out-of-range, low-bandwidth pulses with much diffuse echo making disambiguation between EPFU/LANO impossible.
Site 1	7/12/2023	EPFU	EPFU/LANO	Very out-of-range, low-bandwidth pulses with much diffuse echo making disambiguation between EPFU/LANO impossible.
Site 1	7/12/2023	LACI	EPFU/LANO	Very out-of-range, low-bandwidth pulses with much diffuse echo making disambiguation between EPFU/LANO impossible.
Site 1	7/12/2023	LANO	EPFU/LANO	
Site 2	7/11/2023	EPFU	EPFU	Recording begins with non-bat noise but includes pulses at end consistent with a fragment of EPFU.
Site 2	7/11/2023	PESU	NOTBAT	Non-bat noise.
Site 2	7/11/2023	LABO	NOTBAT	Non-bat noise.
Site 2	7/11/2023	EPFU	EPFU	Despite both reflective and diffuse echo, call types consistent with slightly out-of-range EPFU.
Site 2	7/11/2023	LANO	EPFU/LANO	Much overlapping LoF[1] noise, and too few call pulses, making disambiguation between EPFU/LANO impossible.
Site 2	7/11/2023	NOID	EPFU/LANO	Much overlapping LoF[1] noise, and reflective/diffuse echo, making disambiguation between EPFU/LANO impossible.
Site 2	7/11/2023	LACI	EPFU/LANO	Much overlapping LoF[1] noise, and reflective/diffuse echo, making disambiguation between EPFU/LANO impossible.
Site 2	7/11/2023	EPFU	EPFU	A short sequence but call metrics consistent with EPFU.
Site 2	7/12/2023	EPFU	EPFU	Much reflective echo, but pulse metrics consistent with EPFU.
Site 2	7/12/2023	LANO	NOTBAT	Non-bat noise.
Site 2	7/12/2023	LANO	EPFU/LANO+EPFU/LANO	Two bats in file with ambiguous call characteristics between EPFU and LANO.
Site 2	7/12/2023	LACI	EPFU/LANO	Much LoF[1] noise and reflective echo, and pulse metrics ambiguous with EPFU/LANO; call characteristics too regular to be LACI.
Site 2	7/12/2023	LACI	EPFU/LANO	Too few call pulses of too poor quality to disambiguate between EPFU/LANO.
Site 2	7/12/2023	LANO	EPFU/LANO	Pulses barely rising above background noise floor therefore have too few metrics/characteristics to disambiguate between EPFU/LANO.
Site 2	7/12/2023	LANO	EPFU/LANO	Mostly out-of-range sequence with low-bandwidth and too few call metrics/characteristics to disambiguate between EPFU/LANO.

[1]LoF = low frequency.

Appendix D: Resumes of Qualified Individuals

Chelsea Glinka

Senior Environmental Scientist

Chelsea Glinka is a Senior Environmental Scientist in VHB's Providence, Rhode Island office. Her experience includes assessing permitting needs and developing environmental permit applications for small and large-scale projects within the private and public sectors. She supports project by leading rare, threatened, and endangered species surveys and facilitating Section 7 consultations under the Endangered Species Act through U.S. Fish and Wildlife Service and NOAA Fisheries.

13 years of professional experience

Education

MS, Natural Resources, University of Connecticut, 2013

BS, Environmental Sciences, University of Rhode Island, 2010

Ct, Bat Acoustic Qualitative Analysis Training (Titley Scientific), 2020

Ct, Acoustic Survey Methods (Bat Survey Solutions) 2021

Presentations

Co-Panelist; Meghan Lout (VTrans), Timothy Dexter (MassDOT), David Paulson (MassDOT); "Transportation Panel Discussion about Bat Surveys" Northeast Bat Working Group Conference; Burlington, VT; Jan. 2023

MassDOT Environmental Services Master Services Agreement

Chelsea Glinka is the Project Manager for bat survey efforts conducted on behalf of the Massachusetts Department of Transportation (MassDOT). Since 2015, Chelsea has conducted passive acoustic surveys targeting the northern long-eared bat (*Myotis septentrionalis;* MYSE) for MassDOT. Her responsibilities include assessing survey effort in accordance with the most recently issued survey guidelines by the U.S. Fish and Wildlife Service (USFWS), developing Phase II Acoustic Study Plan for review and approval by USFWS, conducting acoustic surveys and visual bridge assessments and training VHB staff in survey techniques and equipment operation, acoustic analysis using auto-classification software and manual vetting of high frequency calls, report review and finalization and completion of the USFWS Northeastern US Bat Reporting Spreadsheet for Acoustic Surveys. Chelsea also prepares files for submission to the North American Bat Monitoring Project (NABat) on behalf of MassDOT. Chelsea recently worked with MassDOT to provide a Project Review Package under the Section 7 consultation process for a project location where NLEB presence was detected via acoustic surveys. The package included the description of the action area, potential impacts to MYSE, and proposed conservation measures to mitigate and minimize Project impacts to MYSE. The USFWS issued their concurrence for a determination of "may affect, not likely to adversely affect".

RIDOT Master Price Agreement Visual Bridge Assessments for Bat Presence

Chelsea managed the visual bridge assessment effort of 34 bridges throughout Rhode Island for evidence of bat roosting. The inspections were performed during the active bat season in 2022. VHB confirmed probable absence of roosting bats at most bridge locations slated for the 2023 construction season and detected potential presence of roosting bats based on guano and staining. Chelsea coordinated with RIDOT environmental staff, project management, and RIDOT Construction Supervisors for the design and implementation of traffic control set ups for bridge inspections occurring on Interstate 95 and other high-traffic volume roadways; performed work site hazard assessments and safety tailboard meetings; prepared inspection reports using the USFWS reporting form and consulted with USFWS Endangered Species Biologists at the New England Field Office.

CTDOT Environmental Services Task Orders

Chelsea conducted an acoustic bat survey along the proposed linear route of the I-95 Interchange 74 Improvements at Route 161 and Replacement of Bridge No. 250 in East

Lyme Connecticut in 2022. The survey effort included the development of a Phase II Acoustic Study Plan with proposed survey locations for submission to USFWS, conducting the acoustic survey at five survey locations within the Project limits to target a range of potentially suitable summer habitat, training VHB staff in survey techniques, acoustic analysis, and report development.

NHDOT, Exit 4A Interstate 93 Interchange & Keene-Swanzey Floodplain Compensatory Storage

Chelsea led the acoustic bat survey effort for two NHDOT projects targeting the NLEB in 2021 and 2022. Survey tasks included development and review of the Phase II Acoustic Study Plan, conducting the survey in accordance with USFWS survey guidelines, acoustic analysis, and report development. Chelsea trained VHB team members in survey techniques and worked closely with the client to ensure that all reporting requirements were met for these surveys.

Confidential Solar Project, VT

Chelsea assisted in the natural resource assessment in support of a 20 MW solar development in central Vermont by leading the acoustic bat survey effort to detect the probable absence or presence of Indiana bat (*Myotis sodalis*) and MYSE. Chelsea assisted in the development of the Phase II Acoustic Study Plan and coordinated with Vermont Fish and Wildlife Department for plan approval. Chelsea conducted the acoustic survey and trained VHB staff in survey techniques and performed acoustic analysis and determined the presence of six species. The findings of this work will be incorporated into project reporting, permitting, and design to ensure compliance with state and federal regulations.

NJDMAVA, NABat Acoustic Survey Reporting, RI

Chelsea is the Project Manager of an acoustic data management project with the New Jersey Department of Military and Veterans Affairs (NJDMAVA). Chelsea is leading efforts to analyze acoustic bat data collected during surveys at various NJDMAVA facilities from 2009 through 2021 and standardize the metadata and call files for upload to the North American Bat Monitoring Program (NABat). The Project has compiled and formatted the metadata to NABat standards for survey efforts dating back to 2009 and analyzed files via auto-classification software approved by USFWS. VHB has also collaborated with NABat to develop a methodology to manually vet a subset of data from each survey due to the large volume of data. VHB is working with a subconsultant to complete the manual vetting and verify the presence or probable absence of bat species recorded during the survey efforts. VHB has also consolidated NABat protocols and tailored them to the specificities of the NJDAMVA datasets to develop a standard operating procedure that can be used for future data analysis and upload efforts. This project will consolidate several years of bat survey data and make it more readily usable as a reference source by the New Jersey Army National Guard when new activities must consider potential impacts on state and federally-listed bat species.

Kimberley M. Justham

Ecologist

Kimberley is an Ecologist in the Environmental Permitting and Natural Sciences Group in VHB's Worcester, Massachusetts, office. Her background includes environmental compliance monitoring, wetland delineation and restoration oversight, federally and state-listed rare species surveys and monitoring (bats, turtles, birds, plants), invasive species management, and habitat restoration.

16 years of professional experience

Education

MS, Environmental Science, University of Rhode Island, 2016

BS, Conservation Biology, University of Rhode Island, 2005

MassDOT Acoustic Bat Surveys and Visual Bridge Surveys, Massachusetts

Kim has led the VHB field team conducting northern long-eared bat acoustic surveys and visual bridge assessments over multiple locations in a variety of habitat types for the Massachusetts Department of Transportation (MassDOT). Her responsibilities have included assisting with the development of Phase II Acoustic Study Plans for review and approval by USFWS, conducting habitat assessments, acoustic surveys and visual bridge assessments, training VHB staff in these survey techniques and equipment operation, acoustic analysis using auto-classification software, compiling and reviewing year-end reporting, and completion of the USFWS Northeastern US Bat Reporting Spreadsheet for Acoustic Surveys. Kim also prepares files for submission to the North American Bat Monitoring Project (NABat) on behalf of MassDOT.

Interstate 93 Exit 4A Interchange Project Bat Acoustic Monitoring – Londonderry and Derry, NH (2021)

As a consultant for the NHDOT, Kim assisted with the field work for the Phase 2 Presence/Probable Absence Acoustic Monitoring Surveys targeting the northern long-eared bat (*Myotis septentrionalis* or NLEB) and other NH state-listed bat species in accordance with the procedures and standards outlined in the United States Fish and Wildlife Service (USFWS) *Range-Wide Indiana Bat Survey Guidelines* (dated March 2020) and USFWS-approved Study Plan for the project.

New Jersey Department of Military and Veterans Affairs, North American Bat Monitoring Program Acoustic Survey Results Reporting, NJ

VHB provided acoustic call and metadata processing and file upload services to NJDMAVA. Kim assisted in creating a process to extract, organize, process, and post over ten years' of bat monitoring data to the North American Bat Monitoring Program data clearinghouse site. Her responsibilities have included extraction of data from acoustic survey and mistnet survey reports, compilation of metadata for bulk upload processing in NABat, and processing bat call files for AutoID using SonoBat and Kaleidoscope Pro. Kim has compiled the metadata documents into the NABat bulk metadata template and uploaded the processed metadata and ZC (call) files to the NABat website.

CTDOT Environmental Services Task Orders

VHB conducted an acoustic bat survey along the proposed linear route of the the I-95 Interchange 74 Improvements at Route 161 and Replacement of Bridge No. 250 in East Lyme Connecticut in 2022. The survey effort included the development of a Phase II Acoustic Study Plan with proposed survey locations for submission to USFWS, conducting the acoustic survey at five survey locations within the Project limits to target a range of potentially suitable summer habitat, training VHB staff in survey techniques, acoustic analysis, and report development. Kim assisted in the preparation of the final report submitted to USFWS.

MA Division of Fisheries and Wildlife, Westborough, MA

Prior to joining VHB, Kim was a Conservation Biologist for the Natural Heritage and Endangered Species Program. She wrote habitat management plans and secured wetland permits for rare plant species habitat restoration projects and monitored several federally listed plant species annually. Kim designed sampling protocols and conducted and supervised vegetation sampling, data entry and data clean-up for a sandplain grassland restoration monitoring project and led a large-scale, multi-year habitat restoration project on a remote, 75-acre island in Buzzards Bay. Restoration activities included a prescribed burn of the entire island, herbicide applications to control for invasive and woody plants, and site prep and seeding with locally sourced warm season grasses. She interpreted aerial photographs, topographic maps, and site plans to accurately map rare species observations. Kim used ArcGIS Desktop to delineate regulated and non-regulated habitat areas for state and federally listed bats, mammals, and vernal pool invertebrates. She worked with the database team to input, manage, and distribute rare species data. She conducted control of invasive and aggressive vegetation through application of herbicides and mechanical removal. Kim monitored and mapped Natural Communities over 4 years; managed habitat for terns and censused and banded terns over 8 years; conducted avian monitoring, including nightjar, marsh bird, and shorebird surveys over 5 years; and conducted salamander surveys and trapping, mussel surveys, and vernal pool surveys over 4 years. She also conducted active searches by foot, nesting surveys, trapping surveys and radio-telemetry surveys of MESA-listed turtle species, including the federally listed bog turtle over 5 years.

RI Department of Environmental Management, Providence, RI

Prior to joining VHB, Kim was an Environmental Scientist on the Wetlands Enforcement team where she performed DEM Wetland Permit and RIPDES compliance inspections, identified wetland violations, supervised the installation and maintenance of ESC measures, and supervised wetland restorations. ACOE methodology included identification of wetland plant communities, hydric soils, and other hydrologic indicators. Kim interpreted aerial photographs, topographic maps, and site plans to help determine the extent of wetlands violations and areas to be restored. She coordinated with Rhode Island state and town officials, farmers, landowners, contractors, and consultants to resolve wetland violations. She supervised restorations and served as the point of contact for landowners throughout the inspection and restoration process.

Casey Bardier

Environmental Scientist

Education

BS, Fisheries, Wildlife & Conservation Biology, North Carolina State University, 2021

Casey is an Environmental Scientist in the Environmental Permitting and Natural Sciences Group in VHB's Watertown, Massachusetts, office. Her background includes federally and state-listed rare species surveys and monitoring (bats, turtles, birds, plants), environmental compliance monitoring, wetland delineation, and environmental permitting.

2 years of professional experience

MassDOT Acoustic Bat Surveys and Visual Bridge Surveys, MA

Casey has assisted the VHB team conducting northern long-eared bat acoustic surveys and visual bridge assessments over multiple locations in a variety of habitat types for the Massachusetts Department of Transportation (MassDOT). Her responsibilities have included acoustic surveys and visual bridge assessments, data compilation for reporting, and assisting with compilation of year-end reporting.

Confidential Client, Biological Inventories, Southeastern, US

VHB was contracted by a private land holding company to conduct natural resource inventories and prepare detailed reports for a total of 53 properties throughout the southeastern United States. As a Natural Resource Investigator, Casey conducted seasonal amphibian, reptile, and bird surveys on site, processed all collected data, and assisted with the production of the natural resources inventory reports for all of the projects.

NCDOT Endangered Species Surveys, NC

VHB was contracted by the North Carolina Department of Transportation (NCDOT) to conduct a variety of endangered species surveys throughout the state of North Carolina. Casey assisted with multiple plant (Schweinitz's sunflower, dwarf-flower heartleaf, and Michaux's sumac) and visual bat assessments in bridges and culverts. Her responsibilities included conducting surveys in the field, reporting the presence or absence of species of interest, and coordinating with state officials for reporting.

National Development, The District Burlington Modified Master Plan, Burlington, MA

In her role as an Environmental Scientist, Casey helped the environmental permitting for a redevelopment project to create two new life science/laboratory buildings, a new parking garage, and utility and stormwater management improvements for National Development. She contributed to the preparation and submittal of the Notice of Intent (NOI) and an additional amendment for submittal to the Burlington Conservation Commission and the Massachusetts Department of Environmental Protection.

National Grid, Footer Inspection Delineation, Southern NH & Northern MA
In her role as an Environmental Scientist, Casey assisted with the delineation of an extensive study area covering hundreds of acres in contract with Southfield Redevelopment Authority. In addition to her field work duties, she also helped with the field data processing and submittals of Abbreviated Notices of Resource Area Delineations (ANRADs) for the four towns in which the project lies.

Eversource, Kingston Reliability Project, Carver/Plympton/Kingston, MA
In her role as an Environmental Scientist, Casey conducted Stormwater Pollution Prevention Plan (SWPPP) inspections, generated the weekly reports, and coordinated with the client team. Additionally, Casey also assisted with telemetry surveys of a large population of over 40 eastern box turtles located in areas of priority habitat as established by the MassWildlife's Natural Heritage and Endangered Species Program (NHESP) within the limits of the 8-mile long project area.

North Carolina State University, Raleigh, NC
Prior to joining VHB, Casey was an Aquatic Plant Management Technician for the North Carolina State University Extension Office. Within her role, she worked alongside laboratory staff and graduate students to establish and maintain numerous research projects involving the management of invasive aquatic plants in reservoirs, lakes, and rivers across the state of North Carolina. The research projects involved the effects of herbicide treatments in controlled greenhouse and field trials. She also contributed to the revegetation of native aquatic plants in various lakes across the state in partnership with the North Carolina Wildlife Resources Commission.

North Carolina Wildlife Resources Commission, Raleigh, NC
Prior to joining VHB, Casey was an intern with the North Carolian Wildlife Resources Commission working on the Box Turtle Connection Project. As part of her duties, Casey conducted mark-recapture surveys of Eastern Box Turtles over a 105-acre study area. She also operated radio telemetry equipment to track a population of turtles, their movements, and perform weekly health assessments.

JANET DEBELAK TYBUREC

PROFESSIONAL PROFILE

Experienced author, educator, photographer, presenter, and wildlife biologist specializing in environmental and nature studies, especially addressing bat conservation and research. Works in various settings: lecture halls, classrooms, and outdoor field locations. Professional development, coordination, and management of multi-day trainings, workshops, and field surveys. Since 1992 has organized, conducted, and instructed at over 175 workshop venues, personally training over 2,500 students on research skills, including bat capture, handling, identification, and echolocation call recording and analysis. Has been the primary investigator on projects for studying and managing bat populations and conducting field research across North America.

RELEVANT EXPERIENCE

Author, Educator, Photographer, Wildlife Biologist (September 2012 to present)

Bat Survey Solutions, LLC owned by Janet Tyburec Consulting, Tucson AZ

Duties: Provide training and instruction on bat research, inventory, and monitoring, including physical capture techniques, radio-tracking, and acoustic surveys for private, federal and state agencies, including the USDA Forest Service, USDI Bureau of Land Management, National Park Service, Fish and Wildlife Service, and the Department of Defense and Army Corps of Engineers. Perform professional bat surveys for agency directors, staff, wildlife biologists, resource managers, seasonal employees, and volunteers.

Contract Instructor (September 2002 to September 2012)

Bat Conservation International (BCI), Austin TX

Job Duties: Design and teach summer field workshops for BCI and its partner agencies and organizations about bat research and conservation, advanced capture techniques, acoustic monitoring, *Myotis sodalis* survey techniques, and inventory and management techniques; using field study techniques including mist netting, harp trapping, acoustic monitoring equipment and software; radio-tracking, banding, light-tagging, species identification, habitat assessment and management, status determination, and data management tools.

Director of Education Programs (June 1996-September 2002); Assistant Dir. (September 1989-June 1996)

Bat Conservation International (BCI), Austin TX

Administrative Duties: Prepare annual departmental budget for three program activities; contribute to semi-annual departmental reports and provide organizational and donor annual reports.
Job Duties: Organize, schedule, promote, and instruct at BCI's educational workshops. Develop and edit educational materials, posters, books, audio/visual programs.

EDUCATION

Trinity University, San Antonio TX. May 1989

B.A., Biology and English: Undergraduate Science Studies: Botany, Plant Physiology, Vertebrate Zoology, Ecology, Oceanography, Genetics, General Biology, Chemistry, Physics, Statistics
Undergraduate English Studies: Elizabethan Playwrights, Complete Works of Shakespeare, American Novelists, Complete Works of Faulkner, Language Arts, Magazine Writing

University of Colorado, Boulder CO. August 1988

Course work in Comparative Ecology of Alpine and Desert Ecosystems

Pima Community College, Tucson AZ. August 1984 - May 1985

Course work in Creative Writing

Janet Debelak Tyburec, 1832 N. Whispering Bells Dr., Tucson AZ 95745 **T:** 520.404.7406 **E:** *jtyburec@mac.com*

JANET DEBELAK TYBUREC

SELECT PUBLICATIONS

Tyburec, J.D. 1998. Memoirs from bat camp. *BATS* 16(3): 8-9.
Tyburec, J.D. 1998. (Ed.) *Discover Bats*! Bat Conservation International, Austin. 228 pages.
Tyburec, J.D. 1999. Vacation bat watching in the tropics. *BATS* 17(4): 10-13.
Tyburec, J.D 2003. "A Gallery of Workshop Wildlife" (photo essay) *BATS* 21(3): 10.
Tyburec, J.D., C. Weise, A. McIntire, and S. Richardson. 2011. Bat Conservation: Priorities and Initiatives in the Sonoran Desert Region. *Sonorensis* 31 (1): 20-25.
Tyburec, J.D. 2014. "Bats." In: *Cave Creek Canyon: Revealing the Heart of Arizona's Chiricahua Mountains*. ECO Wear & Publishing, Rodeo NM 274 pages.
Tyburec, J.D. 2015 (2nd Ed.). "Bats." In: *A Natural History of the Sonoran Desert*. S.J. Phillips and P.W. Comus (Eds.) University of California Press, Berkeley. Pages 401-410.
Robbins, L.W., J.D. Tyburec, J.C. Timpone, and V. Brack, Jr. 2021. *Bats of Oklahoma*, Center for Bat Research, Outreach, and Conservation, Indiana State University, Terre Haute. 100 pages.

SELECT PRESENTATIONS

Tyburec, J.D. 2012. *Acoustic Monitoring: A Silver-bullet or a Sticky-wicket?* Presentation at the Northeast Bat Working Group Meeting, Carlisle PA, January 2012.
Tyburec, J.D. 2012. *Harp trap effectiveness for the Capture of* Myotis leibii*, small-footed myotis*. Presentation at the Northeast Bat Working Group Meeting, Carlisle PA, January 2012
Tyburec, J.D. and J.D. Chenger. 2013. *Using Auto-classifiers for Acoustic Surveys: Do Results Reflect Reality?* Presentation at the Northeast Bat Working Group Meeting, Albany NY, January 2013.
Tyburec, J.D. and J.D. Chenger. 2013. *Auto-classifiers for Acoustic Surveys: A Bat in the Hand is Worth how Many Detectors in the Bush?* Presentation at the Southeast Bat Diversity Network Meeting, Pikeville TN. February 2013.
Chenger, J.D. and J.D. Tyburec. 2014. Comparing bat detector deployments at different heights, in different orientations, and using different microphone types. Presentation (poster) at the Southeast Bat Diversity Network Meeting, Nacogdoches TX. February 2014.
Tyburec, J.D., J.D Chenger and J.M. Szewczak. 2014. Comparing four acoustic analysis software packages and the accuracies of their auto-classification results for determining bat occupancy in a habitat. Presentation at the Southeast Bat Diversity Network Meeting, Nacogdoches TX. February 2014.
Tyburec, J.D., and J.D. Chenger. 2019. Improving Bat Survey Efficiency and Probable Presence Results by Combining Physical Capture and Acoustic Recording Methods. Oral presentation at the American Fisheries Society and The Wildlife Society's 2019 Join Conference in Reno NV. October 2019.
Tyburec, J.D., and J.D. Chenger. 2021. Stationary Point (Passive) Acoustic Surveys for Bats: Using Auto-classification Software Results to Infer Relative Bat Activity - The Problem of Multiple Bat Passes in a Recording. Oral presentation at the Northeast Bat Working Group 2021 Virtual Meeting, 10-11 March.

SELECT BAT-SURVEY & ACOUSTIC-MONITORING PROJECTS

2009 - Acoustic Identification Summary for 2005-2008 Bat Surveys conducted by the ***USDA-Forest Service, Region 1*** (Idaho/Montana), involving reviewing, vetting and reporting results for over 6,500 full-spectrum echolocation recordings.
2009 - Acoustic Identification Summary for a 2009 Bat Survey conducted by ***Sanders Environmental***, involving reviewing, vetting and reporting results for over 33,000 full-spectrum echolocation call recordings from the Northeastern U.S. to identify federally listed T&E species and state-sensitive species.

Janet Tyburec Consulting, Post Office Box 86493, Tucson AZ 95754 **T:** 520.404.7406 **E:** *jtyburec@mac.com*

2010 - Acoustic Identification Summary for a 2010 Bat Survey conducted by ***Sanders Environmental***, involving reviewing, vetting and reporting results for over 380,000 full-spectrum echolocation call recordings from the Northeastern U.S.

2011 - Acoustic Analysis provided for a 2011 Bat Survey conducted by ***Sanders Environmental***, involving reviewing, vetting and reporting results from over 60,000 full-spectrum echolocation call recordings from the Northeastern U.S. using SonoBat software.

2012 - Capture and Acoustic Field Survey for the ***US Army Corps of Engineers*** (Illinois/Missouri), involving site selection for capture and concurrent acoustic surveys designed to assess management needs for T&E bats, data collection, and reviewing, vetting and reporting results from over 120 bats captured and 12,000 full-spectrum echolocation call recordings collected, with 100% manual vetting of the acoustic files.

2014 - Acoustic Field survey for ***URS Corporation*** to assess *Myotis leibii* habitat along a proposed Pennsylvania Power and Light, right-of-way development in the Pocono Mountains (Wilkes-Barre PA), deploying over 190 bat-detectors, collecting and analyzing over 90,000 recordings from nearly 6,000 hours of full-spectrum monitoring, with 100% of the acoustic files manually vetted.

2016 - Acoustic Analysis of nearly 600 full-spectrum echolocation call recordings from 17 passive monitoring deployments and 2 mobile transects for the ***Environmental Research Group, LLC*** of Bainbridge GA. The analysis included auto-classification outputs from SonoBat4 (NE) and KaliedoscopePRO with manual vetting of both results to document 6 eastern U.S. bat species according to current USF&WS Indiana Bat Summer Survey Guidelines.

2016 - Manual Vetting to provide a second opinion on nearly 1,000 full-spectrum echolocation call recordings, representing nearly 1,200 distinct bat passes, from select locations monitoring from the years of 2011 thru 2016 for the ***U.S. Fish and Wildlife Service, Sheldon-Hart Mountain National Wildlife Refuge Complex***, in Lakeview OR. Analysis included auto-classification outputs from SonoBat4 (NW) with manual vetting to confirm the presence of 13 bat species, including 5 northwestern *Myotis* species.

2016 - Capture and Acoustic Survey, Morphological Identification, Manual Acoustic Vetting, and Acoustic Survey Report Comparing and Summarizing a 2-week Survey Effort in each of 3 locations: in Southeastern Arizona, Northern California and Western Kentucky, which together comprised over 1,000 capture records, 20,000 acoustic recordings, and documented 12 - 20 bat species per location. (100% of the acoustic files were manually vetted with results presented in Tyburec et al. Poster Presentation at the 2016 North American Symposium on Bat Research in San Antonio TX.)

2017 - Capture and Acoustic Field Survey for the ***Sky Island Alliance*** and Appletton-Whitell Audubon Research Ranch to survey bat occurrence at managed wetlands designed for mitigation to aid recovery of the Chiricahua Leopard Frog (Santa Cruz County, Arizona); site selection for capture and acoustic inventories of a 4-site; 7-night period with over 12 capture survey hours and 272 acoustic survey hours, where 12 individual bats of three species were captured and nearly 4,000 individual bat passes were recorded and almost 2,800 were confidently identified to 14 different species.

2017 - Manual Vetting of nearly 400 full-spectrum echolocation call recordings, representing almost 500 individual bat passes, from select monitoring locations during the years of 2014 thru 2016 for the ***Canadian Wildlife Service, Northern Conservation Division, Whitehorse YT***. Analysis included auto-classification outputs from SonoBat4 (WY) with manual vetting to confirm the presence of four (4) bat species including 3 common northwestern *Myotis* species.

2018 - Passive Acoustic Survey, Manual Vetting, and Acoustic Survey Report for a 17-night passive acoustic survey conducted at a southern Arizona grassland community near Elgin, summarizing 5 detector locations, totaling over 19,000 recordings (60GB), from 614 acoustic survey hours, and 66 detector-survey nights, that yielded almost 29,000 bat-passes (that were 100% manually vetted) and confirmed the presence of 19 southwestern bat species: *Antrozous pallidus, Choeronycteris mexicana Eptesicus fuscus, Lasionycteris noctivagans, Lasiurus blossevillii, Lasiurus cinereus, Lasiurus xanthinus, Leptonycteris yerbabuenae, Myotis auriculus, Myotis californicus, Myotis ciliolabrum, Myotis occultus, Myotis thysanodes, Myotis velifer, Myotis volans, Myotis yumanensis, Nyctinomops* spp. *Pipistrellus hesperus*, and *Tadarida brasiliensis*.

2018 - Manual Vetting to provide a second opinion of over 100 full-spectrum echolocation call recordings, representing 130 distinct bat passes, from select monitoring stations deployed in 2017 by the ***Maryland Department of Natural Resources***. Analysis included auto-classification outputs from SonoBat4 (NE, NNE, and PA-VA-NY) with manual vetting to confirm the presence of nearly 50 confidently identified passes from 5 bat species, including *Myotis lucifugus*.

2016-2018 - Passive and Mobile Acoustic Surveys, Manual Vetting, and Acoustic Survey Report summarizing 3 years of acoustic survey work conducted near Punta Gorda FL in association with the Bat Survey Solutions, LLC, Acoustic Survey Methods trainings, summarizing efforts at 35 detector locations, totaling 12,000 recordings (45GB) that were 100% manually vetted, and confirmed the presence of 8 southeastern bat species: *Eptesicus fuscus, Eumops floridanus, Lasiurus borealis/seminolus, Lasiurus intermedius, Nycticeius humeralis, Pipistrellus subflavus*, and *Tadarida brasiliensis*.

2019 - Bat Survey Efforts (including physical captures with single-high mist nets, triple-high mist nets, twin-bank harp traps, and triple-bank harp traps; and full-spectrum active and passive acoustic recording using full-spectrum Wildlife Acoustics SongMeter detectors, Pettersson M500 microphones, and SonoBat LIVE recorders) for ***Merlin Tuttle's Bat Consrvation*** "Experience Texas Bats" Natrual History Tour in Big Bend National Park, TX during April 2019. Presented a bat survey summary presentation at the end of the week analyzing over 4,000 acoustic records and over 200 capture records, documenting 18 of the 24 suspected species found in the park, with breakdown of species only captured physically, only acoustically, and both via capture and acoustic methods, with 100% of the acoustic collection manually vetted to species or species-guild.

2019 - Manual Vetting to provide a second opinion/species identification confirmation of 1,200 zero-cross recordings collected during an ***Office of Surface Mining*** acoustic survey in Pennsylvania. Analysis and manual vetting performed with KaleidoscopePRO software, using USF&WS Indiana Bat Summer Survey Guidelines.

2019 - Manual Vetting to provide a second opinion/species identification confirmation of 50 suspected Myotis species recordings collected in Pennsylvania by ***Bat Conservation and Managment***. Analysis performed with Kaleidoscope PRO software and manual vetting performed with SonoBat software.

2019 - Manual Vetting to provide species occupancy report on 350 zero-cross recordings collected from 10 survey locations in Alaska for the ***Alaska Center for Conservation Science***. Analysis and manual vetting performed using KaleidoscopePRO software.

2020 - Manual Vetting to provide a second opinion and species identification confirmation of 100 recordings suspected to be of *Myotis* species bats collected by the ***Maryland Department of Conservation***.

2020 - Manual Vetting to provide species occupancy report on 7,000 full-spectrum files collected by ***Sanders Environmental*** to identify T&E species (*M. septentrionalis* and *M. sodalis*) in Pennsylvania using current USF&WS Indiana Bat Summer Survey Guidelines. Analysis and vetting performed using MLE results from KaleidoscopePRO software and full-spectrum qualitative analysis using the SonoBat viewer.

2020 - Manual Vetting to provide a second opinion/species identification confirmation on 4,000 full-spectrum recordings collected in Pennsylvania by ***Sanders Environmental*** to provide species occupancy report from fall swarming habitats near mine features, using current USF&WS Indiana Bat Summer Survey Guidelines.

2021 - Manual Vetting to provide second opinions and species identification confirmation on 300 full-spectrum recordings for ***Bat Consrvation and Management*** from a proposed development in Pennsylvania to determine *Myotis sodalis* and/or *M. septentrionalis* presence at the site, using current USF&WS Indiana Bat Summer Survey Guidelines.

2021 - Acoustic survey report to identify true-positive, false-positive, and false-negative auto-classifier decisions to provide a site-level species occupancy report at a four-site, three-night survey in southern Arizona performed by ***Copperhead Consulting***. Analysis and manual vetting of over 8,000 zero-cross recordings using KaleidoscopePRO software.

JANET DEBELAK TYBUREC

BAT SURVEY TRAINING CLASSES DEVELOPED & TAUGHT

From 1992-2012 Janet Debelak Tyburec worked for Bat Conservation International (Austin TX) to develop their "Bat Conservation and Management" workshops, "Educator" workshops and "Decision Makers" workshops which were conducted at venues in Arizona, California, Kentucky, Montana, Pennsylvania, Texas, Virginia and Toronto, Ontario CANADA, working with founder Merlin D. Tuttle and Director of Eduction, Patricia A. Morton to manage and direct all training efforts. In 2001 BCI began offering "Acoustic Monitoring for Bats" workshops at the "flagship" venues in the Chiricahua Mountains of Arizona (May/June), Lava Beds National Monument in California (July), Mammoth Cave National Park in Kentucky (July/August), and at Canoe Creek State Park in Central Pennsylvania (August/September). Beginning in 2008 Janet became a private contractor and federal agency contractor, and worked with Bat Conservation and Management (BCM, Carlisle PA) to offer "Bat Study and Survey Techniques" workshops at venues in Arizona, California, Indiana, Kentucky, Maryland, New Jersey, New York, Pennsylvania, Tennessee, Texas and West Virginia. In 2012 she formed her own company to take over all bat-survey training after BCM and BCI dropped educational outreach from their respective missions. Below is a select list of notable training courses.

2008 "Forest Bat Conservation and Inventory Techniques" workshop for the United States Forest Service, Coronado National Forest in Tucson AZ, 18-19 September.

2009 "Acoustic Monitoring as a Non-contact Bat Survey Method" workshop for Cleveland MetroParks in Akron OH, 25 August.

2009 "Bat Survey Techniques for Caves, Mines, Buildings, and Bridges" workshop for the United States Forest Service, Doublehead Ranger District, in Dillon MT, 14-17 September.

2009 "Forest Bat Conservation and Inventory Techniques" workshop for the United States Forest Service, Coronado National Forest and local partner agencies, in Tucson AZ, 12-13 November.

2010 "Introduction to Bat Conservation, Survey Methods, and Management" workshop for the United States Forest Service, Guadalupe National Forest, Carlsbad Ranger District, in Carlsbad NM, 6-8 July.

2010 "Forest Bat Conservation: Water, Mines, and Man-made Structures" workshop for the United States Forest Service, Lincoln National Forest, Smokey Bear Ranger District in Ruidoso NM, 15-17 July.

2010 "AnaBat Acoustic Survey Training" workshop for the Department of Defense, Nellis Air Force Base in Las Vegas NV, 22-24 October.

2011 "Bat Inventory and Monitoring" workshop for the United States Forest Service, Guadalupe National Forest and the Bureau of Land Management, in Carlsbad NM, 10-13 August.

2011"White-nose Syndrome in Bats, History, Prevention, and Prognosis" class for the Department of Defense, in Sierra Vista AZ, 30 August-1 September.

2012 "Bat Capture and Acoustic Survey Techniques" class for the United States Forest Service, North Central Research Station, in Portal AZ, 19-21 May.

2012 "Bat Inventory and Monitoring" workshop for the Utah Bat Conservation Cooperative, joint agency: Bureau of Land Management, National Park Service and United States Forest Service in Escalante UT, 30 July-2August.

2012 "AnaBat Acoustic Inventory Methods" workshop for the United States Fish and Wildlife Service, in McBee SC, 23-24 April.

2013 "SonoBat Acoustic Analysis Techniques" class for Pima County Parks Department, Tucson AZ, 22 April.

2013 "Acoustic Survey Field Techniques for Bat Studies" workshop for the United States Fish and Wildlife Service, in State College PA, 20-21 October

2014 "Pettersson Detector and SonoBat Software Acoustic Survey Techniques" workshop for Sanders Environmental Clients and Sub-contractors, in Somerset PA, 7-9 April.

2014 "Bat Detectors and Acoustic Survey Protocols" workshop for the United States Fish and Wildlife Service, in Dixon IA, 3-5 June.

2015 "Acoustic Data Management" training workshops in Alton, IL (7-9 March); Hollidaysburg PA (28-29 April); Harrisburg, PA (12-14 October); and Fairfield ME (14-16 June).

Janet Tyburec Consulting, Post Office Box 86493, Tucson AZ 95754 **T:** 520.404.7406 **E:** *jtyburec@mac.com*

JANET DEBELAK TYBUREC

2015 "Combined Field Survey Techniques" training workshops in Portal AZ (20-26 May); Tulelake CA (10-17 July); and Mammoth Cave, KY (19-25 September).
2015 "Field Survey Techniques" training for National Park Service, Mammoth Cave, KY, 14-17 September.
2016 "Acoustic Data Management" training workshops in Duluth MN (7-9 March), Wells ME (7-9 April), and Harrisburg PA (17-19 October).
2016 "Acoustic Survey Methods" training workshop in Punta Gorda FL, 1-5 February.
2016 "Combined Field Survey Techniques for Bats" training workshops in Portal AZ (22-29 May), Tulelake CA (10-17 July), and Mammoth Cave KY (28 August - 4 September).
2016 "Field Survey Techniques for Bats" training workshop for California Department of Fish and Game, Tulelake CA, 18-22 July.
2017 "Acoustic Survey Methods" training course in Punta Gorda FL (23-27 January) and Tucson AZ (3-7 April)
2017 "Combined Field Survey Techniques" training workshops in Portal AZ (13-20 May), Tulelake CA (14-21 July), and Mammoth Cave KY (22-30 August).
2017 "Field Survey Techniques" training workshop for National Park Service staff in Tulelake CA, 24-28 July.
2017 "Acoustic Data Management" training class in Harrisburg PA, 11-13 October.
2018 "Acoustic Survey Methods" training course in Punta Gorda FL, 21-26 January.
2018 "Combined Field Survey Techniques for Bats" training workshop in Portal AZ (8-15 May), Tulelake CA (29 July - 5 August), and Mammoth Cave KY (4-12 September).
2018 "Combined Field Survey Techniques for Bats" training workshop for National Park Service staff at Santa Monica Mountains National Recreation Area, Los Angeles County CA, 18-20 September.
2018 "Acoustic Data Management" training class in Harrisburg PA, 16-18 October.
2019 "Acoustic Survey Methods" training course in Punta Gorda FL, 8-13 January.
2019 "Acoustic Survey Methods" training course for the Seminole Tribe in Big Cypress FL, 11-13 March.
2019 Bat Survey for Merlin Tuttle's Bat Conservation "Discover Texas Bats," Big Bend TX, 27 March - 4 April.
2019 "Acoustic Survey Methods" training course in Tucson AZ, 8-13 April.
2019 "Acoustic Data Management" training class in Tulsa OK, 26-28 April.
2019 "Cave Conservation and Management for Bats" field training workshop in San Marcos TX, 7-9 May
2019 "Combined Field Survey Techniques for Bats" field training workshop in Portal AZ, 20-27 May.
2019 "Acoustic Data Management using KaleidoscopePRO Software" custom training class for Environmental Science Associates consultants in Tampa FL, 24-25 July.
2019 "Bat Survey Techniques for Agency Biologists" training workshop in Great Basin (Baker) NV, 15-19 July.
2019 "Combined Field Survey Techniques for Bats" training workshop in Great Basin (Baker) NV, 21-28 July.
2019 "Combined Field Survey Techniques for Bats" training workshop in Mammoth Cave KY, 4-12 September.
2019 "Acoustic Data Management" training class in Harrisburg PA, 22-24 October.
2020 "Acoustic Survey Methods" training course in Punta Gorda FL, 10-16 January.
2020 "Acoustic Survey Methods for Conducting North American Bat Conservation Program Surveys" for the Southwest Bat HUB, on-line training workshop, 14-18 September.
2020 "Acoustic Survey Methods for Conducting Florida Bonneted Bat Surveys using KaleidoscopePRO" for KCA Environmental Consultants (Tampa FL), on-line training workshop (24-26 August) and follow-up mock-survey consultation (29 September - 1 October).
2021 "Acoustic Survey Methods/NABat Survey Methods" field training course in Tucson AZ, 21-25 June.
2021 "Acoustic Survey Methods/NABat Survey Methods" field training course in Elgin AZ, 5-9 July.

SKILLS

Writing (non-fiction, fiction, and creative), Photography (outdoor and nature; digital and film), Design/Layout (computer assisted), Drawing, drafting, painting, Cycling (recreational road biking; racing), Sea Kayaking, Running Exercise/Health/Nutrition/Fitness, Hiking, Nature Study and Travel

Janet Tyburec Consulting, Post Office Box 86493, Tucson AZ 95754 **T:** 520.404.7406 **E:** *jtyburec@mac.com*

Appendix E: Bridge Assessment Form and Photos

Bridge/Structure Bat Assessment Form

Proposal No. 610776-152099

Date & Time of Assessment: 7/13/2023 12:10	DOT Project Number: 610776	Route/Facility Carried: Alewife Brook Parkway	County: Middlesex
Federal Structure ID: C-01-031	Structure Coordinates (latitude and longitude): 42.39606 -71.14067	Structure Height (approximate): 15'	Structure Length: 100'

Structure Type (check one)

Bridge Construction Style

- ○ Cast-in-place
- ○ Flat Slab/Box
- ○ Truss (Side View)
- ⊗ Parallel Box Beam
- ○ Pre-stressed Girder
- ○ Steel I-beam
- ○ Covered
- ○ Other:

Culvert Type

- ○ Box
- ○ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☑ Concrete
☑ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

- ○ Yes ○ No
- ○ Unknown

Culvert Material

- ☐ Metal
- ☐ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Crossings Traversed (check all that apply)

- ☐ Bare ground
- ☐ Rip-rap
- ☐ Flowing water
- ☐ Standing water
- ☐ Seasonal water
- ☐ Open vegetation
- ☐ Closed vegetation
- ☐ Railroad
- ☑ Road/trail - Type: Alewife Linear Path
- ☐ Other:

Surrounding Habitat (check all that apply)

- ☐ Agricultural
- ☑ Commercial
- ☑ Residential-urban
- ☐ Residential-rural
- ☑ Woodland/forested
- ☐ Grassland
- ☐ Ranching
- ☐ Riparian/wetland
- ☐ Mixed use
- ☐ Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	**Assessment Notes**	**Evidence of Bats** (include photos if present)
☑ All crevices and cracks: **Bridges/culverts:** rough surfaces or imperfections in concrete **Other structures:** soffits, rafters, attic areas	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species: No Bat Evidence
☑ Concrete surfaces (open roosting on concrete)	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☑ Spaces between concrete end walls and the bridge deck	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☑ Vertical surfaces on concrete I-beams	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☑ Spaces between walls, ceiling joists	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☑ Weep holes, scupper drains, and inlets/pipes	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☑ All guiderails	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Kim Justham & Casey Bordier

Signature:

Bridge Assessment Photos

Photo 1: A southerly view of the deck and railings of bridge C-01-031, carrying the convergence of Route 3, Route 16, and Route 2 over the MBTA Redline and Alewife Linear Path.

Photo 2: A westerly, ground-level view of Bridge C-01-031 showing the bridge deck, outer support beams, and southern abutment.

Photo 3: A westerly view of the underside of Bridge C-01-031 over the Alewife Linear Path showing the northern and southern abutments, support beams, and safety netting.

Photo 4: A northeasterly view of the north wall of Bridge C-01-031 from the Alewife Linear Path.

Photo 5: A westerly view of the junction of the southern abutment wall and the support beams of Bridge C-01-031 taken from the Alewife Linear Path using a GoPro camera mounted on a telescoping pole.

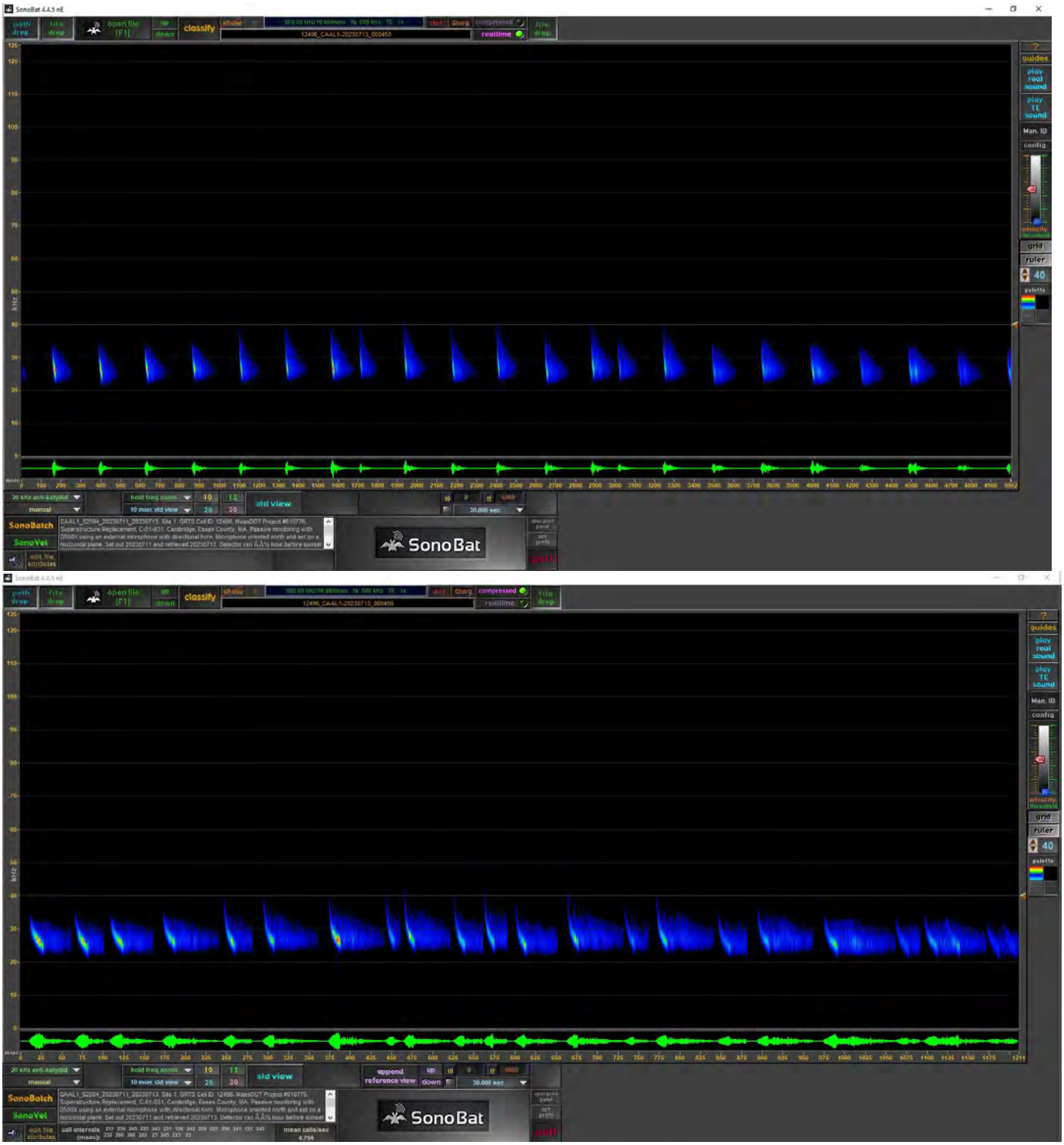
Photo 6: A westerly view of the space between the underside of the bridge deck and the top of the added support structure of Bridge C-01-031 taken from the Alewife Linear Path using a GoPro camera mounted on a telescoping pole.

Photo 7: A northerly view of a gap between beams on the underside of Bridge C-01-031 taken from the Alewife Linear Path using a GoPro camera mounted on a telescoping pole.

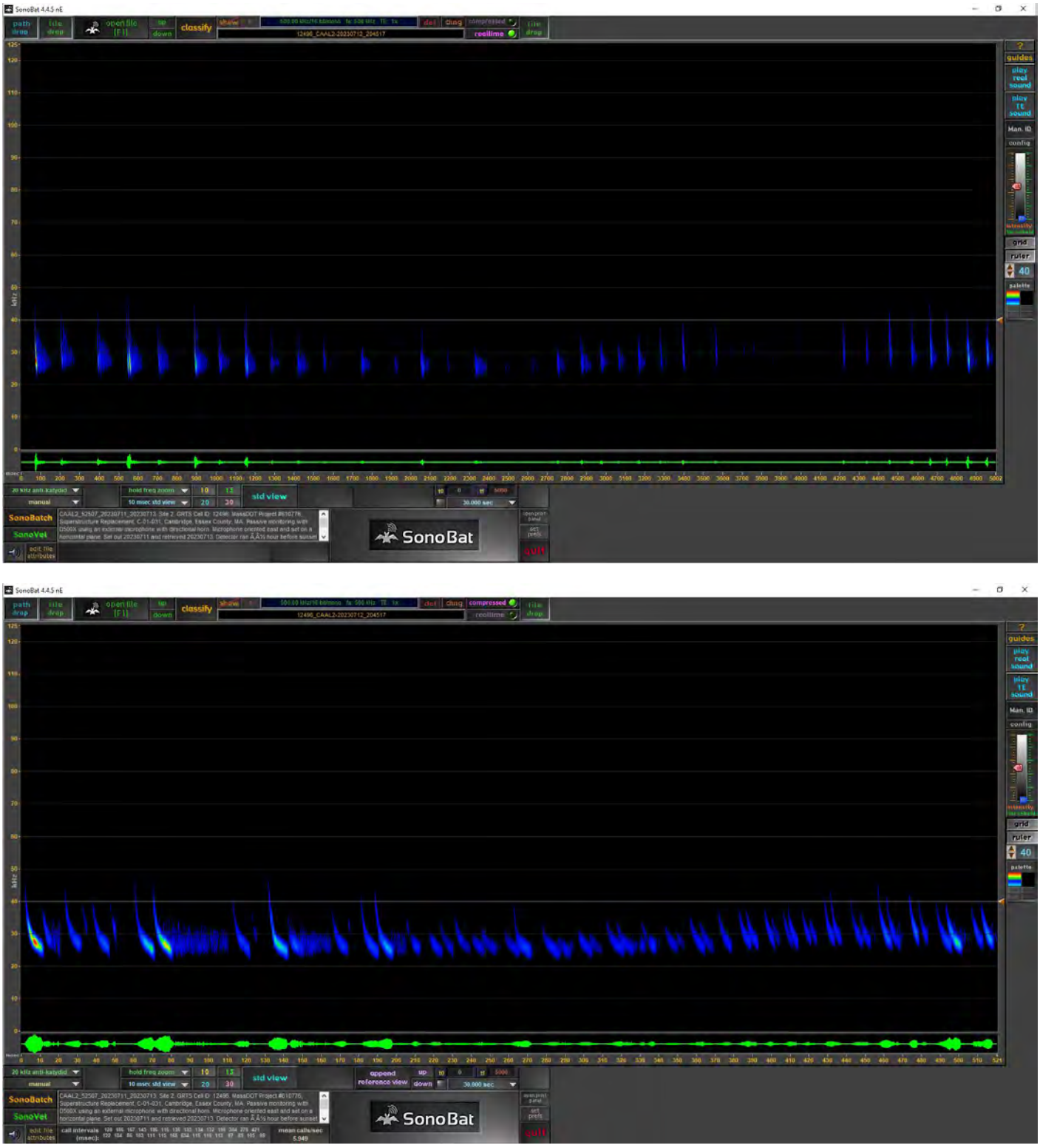
Photo 8: A northerly view of a gap between beams on the underside of Bridge C-01-031 taken from the Alewife Linear Path using a GoPro camera mounted on a telescoping pole.

Photo 9: A southerly view of the junction of the southern abutment wall and the support beams of Bridge C-01-031 taken from the Alewife Linear Path using a GoPro camera mounted on a telescoping pole. Note the safety netting obscuring some views of the underside of the bridge.

Appendix F: Representative Spectrograms



Spectrogram 1: This call was classified in the big brown bat (*Eptesicus fuscus, EPFU*) and silver-haired bat (*Lasionycteris noctivagans*, LANO) guild and was recorded at Site 1 on the night of July 12, 2023, as shown in full-spectrum via SonoBat 4.4.5 in true-time format (top) and compressed format (bottom). This call is very out-of-range, with low-bandwidth pulses and much diffuse echo, making disambiguation between EPFU and LANO impossible.



Spectrogram 2: A confirmed EPFU recorded at Site 2 on the night of July 12, 2023, as shown in full-spectrum via SonoBat 4.4.5 in true-time format (top) and compressed format (bottom). This call's pulse metrics are consistent with EPFU, despite much reflective echo.

Appendix G: Event Logs

Detector 52504_20230711_20230713_Event Log
MODEL NO: TS32GCF133
FW REV: 20171204
SERIAL: 9G17976020351AC60038
LABEL: D500X
2023-07-11 10:56:06 $$SYSTEM START, FW VERSION: D500X V2.4.5 201211, 12:06:56, S/N: 52504, TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 11:13:00 $$TIMER SLEEP ------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 12:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 13:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 14:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 15:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 16:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 17:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 18:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 19:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 19:52:02 $$TIMER WAKEUP ------ TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 20:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 21:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.9V, FILE: M000004.WAV, TOTAL FREE: 44.69G
2023-07-11 22:00:01 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.8V, FILE: M000010.WAV, TOTAL FREE: 44.67G
2023-07-11 23:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000022.WAV, TOTAL FREE: 44.61G
2023-07-12 00:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000034.WAV, TOTAL FREE: 44.55G
2023-07-12 01:00:12 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000043.WAV, TOTAL FREE: 44.51G
2023-07-12 02:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000049.WAV, TOTAL FREE: 44.48G
2023-07-12 03:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000053.WAV, TOTAL FREE: 44.46G
2023-07-12 04:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000058.WAV, TOTAL FREE: 44.44G
2023-07-12 05:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000059.WAV, TOTAL FREE: 44.43G

2023-07-12 05:48:30 $$TIMER SLEEP ------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 06:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 07:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 08:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 09:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.6V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 10:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 11:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 12:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 13:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 14:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 15:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 16:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 17:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 18:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 19:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 19:52:02 $$TIMER WAKEUP ------ TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 20:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.7V, FILE: M000060.WAV, TOTAL FREE: 44.43G
2023-07-12 21:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.5V, FILE: M000063.WAV, TOTAL FREE: 44.41G
2023-07-12 22:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.5V, FILE: M000064.WAV, TOTAL FREE: 44.41G
2023-07-12 23:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:27/05:23, DST=DIS, BATTERY: 4.5V, FILE: M000066.WAV, TOTAL FREE: 44.40G
2023-07-13 00:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000066.WAV, TOTAL FREE: 44.40G
2023-07-13 01:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000067.WAV, TOTAL FREE: 44.39G
2023-07-13 02:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.4V, FILE: M000070.WAV, TOTAL FREE: 44.38G
2023-07-13 03:00:04 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000071.WAV, TOTAL FREE: 44.38G
2023-07-13 04:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.4V, FILE: M000073.WAV, TOTAL FREE: 44.37G

2023-07-13 05:00:04 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.4V, FILE: M000073.WAV, TOTAL FREE: 44.37G
2023-07-13 05:48:30 $$TIMER SLEEP ------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.4V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 06:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.4V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 07:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 08:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 09:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 10:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.5V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 11:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.6V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 12:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.6V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 12:41:04 $$KEYBOARD WAKEUP --- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.6V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 12:43:27 $$KEYBOARD SLEEP ---- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.6V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 12:43:35 $$KEYBOARD WAKEUP --- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.6V, FILE: M000074.WAV, TOTAL FREE: 44.36G
2023-07-13 12:43:47 $$KEYBOARD SLEEP ---- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 20:26/05:25, DST=DIS, BATTERY: 4.6V, FILE: M000074.WAV, TOTAL FREE: 44.36G

Detector 52507_20230711_20230713_Event Log
MODEL NO: TS32GCF133
FW REV: 20170420
SERIAL: 0H277720803877140091
LABEL: D500X
2023-07-11 12:05:06 $$SYSTEM START, FW VERSION: D500X V2.4.5 201211, 12:06:56, S/N: 52507, TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.1V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 12:06:00 $$TIMER SLEEP ------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 13:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 14:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 15:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 16:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 17:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 18:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 19:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 19:52:03 $$TIMER WAKEUP ------ TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 5.0V, FILE: -, TOTAL FREE: 44.71G
2023-07-11 20:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.9V, FILE: M000004.WAV, TOTAL FREE: 44.69G
2023-07-11 21:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.7V, FILE: M000032.WAV, TOTAL FREE: 44.56G
2023-07-11 22:00:04 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.7V, FILE: M000099.WAV, TOTAL FREE: 44.24G
2023-07-11 23:00:05 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000166.WAV, TOTAL FREE: 43.92G
2023-07-12 00:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000251.WAV, TOTAL FREE: 43.52G
2023-07-12 01:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000390.WAV, TOTAL FREE: 42.86G
2023-07-12 02:00:10 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000468.WAV, TOTAL FREE: 42.49G
2023-07-12 03:00:01 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000487.WAV, TOTAL FREE: 42.39G
2023-07-12 04:00:08 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000503.WAV, TOTAL FREE: 42.32G
2023-07-12 05:00:04 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000553.WAV, TOTAL FREE: 42.08G
2023-07-12 05:48:30 $$TIMER SLEEP ------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000590.WAV, TOTAL FREE: 41.90G

2023-07-12 06:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 07:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 08:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 09:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 10:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 11:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 12:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 13:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 14:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 15:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 16:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 17:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 18:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 19:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 19:52:02 $$TIMER WAKEUP ------ TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000590.WAV, TOTAL FREE: 41.90G
2023-07-12 20:00:04 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000596.WAV, TOTAL FREE: 41.88G
2023-07-12 21:00:02 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000649.WAV, TOTAL FREE: 41.62G
2023-07-12 22:00:09 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000711.WAV, TOTAL FREE: 41.33G
2023-07-12 23:00:05 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000768.WAV, TOTAL FREE: 41.06G
2023-07-13 00:00:01 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000796.WAV, TOTAL FREE: 40.92G
2023-07-13 01:00:03 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000822.WAV, TOTAL FREE: 40.80G
2023-07-13 02:00:00 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000876.WAV, TOTAL FREE: 40.54G
2023-07-13 03:00:04 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000885.WAV, TOTAL FREE: 40.50G
2023-07-13 04:00:01 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000903.WAV, TOTAL FREE: 40.41G
2023-07-13 05:00:01 $$HOUR LOG ---------- TIMER ON, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000935.WAV, TOTAL FREE: 40.26G

2023-07-13 05:48:30 $$TIMER SLEEP ------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 06:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 07:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 08:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 09:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.4V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 10:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 11:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 12:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 13:00:00 $$HOUR LOG ---------- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 13:14:06 $$KEYBOARD WAKEUP --- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.6V, FILE: M000982.WAV, TOTAL FREE: 40.04G
2023-07-13 13:14:59 $$KEYBOARD SLEEP ---- TIMER OFF, INPUT GAIN=45, TRIG LEV=160, INTERVAL=0, RTIMER ON/OFF: --:--/--:--, SET/RISE 21:27/06:23, DST=ON, BATTERY: 4.5V, FILE: M000982.WAV, TOTAL FREE: 40.04G

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DOCUMENT A00860

MBTA CONTRACT NO. 091-601 AS-BUILT PLANS

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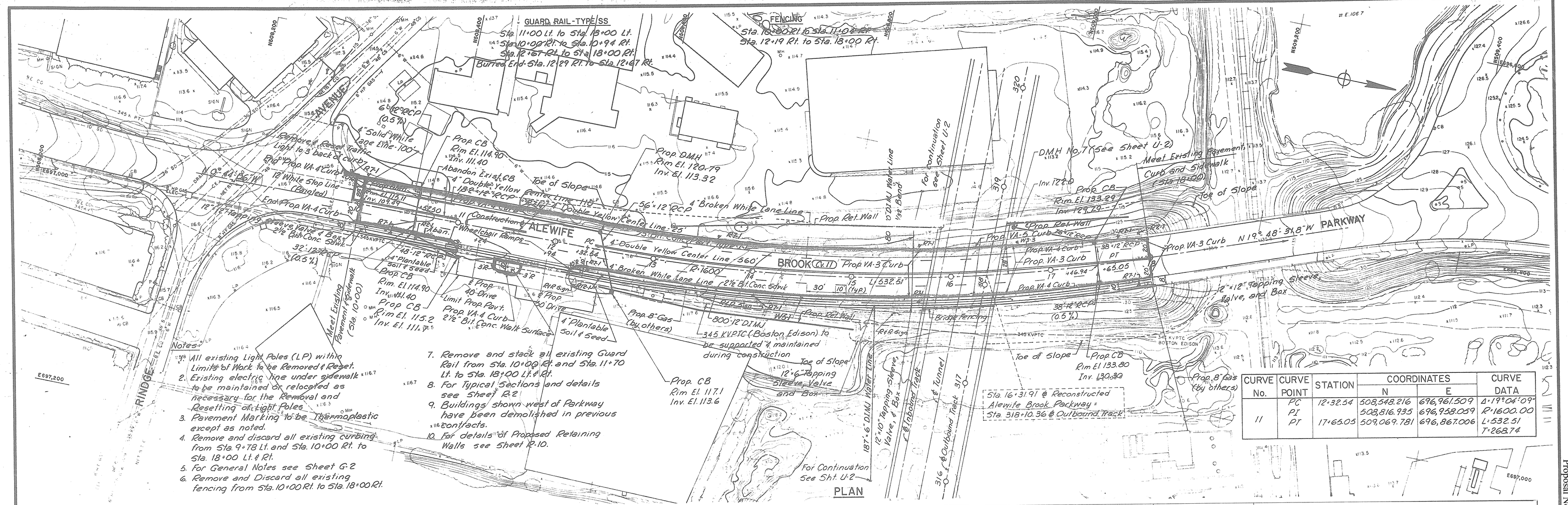
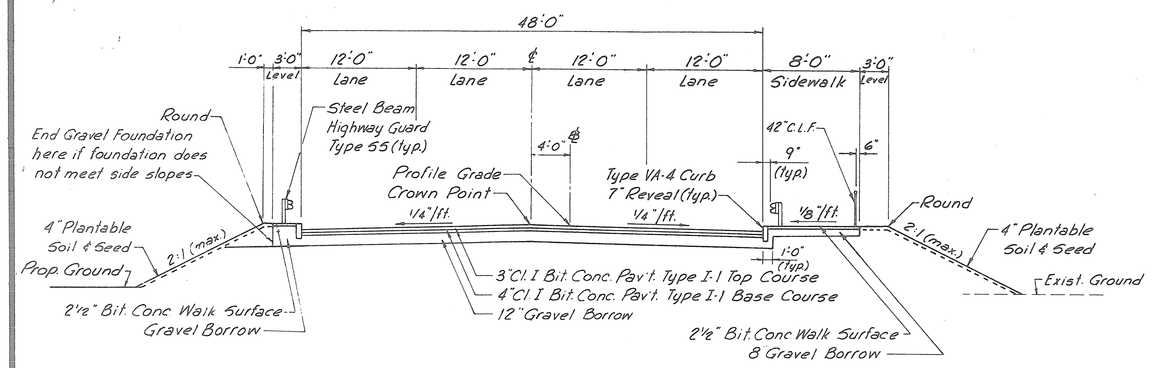
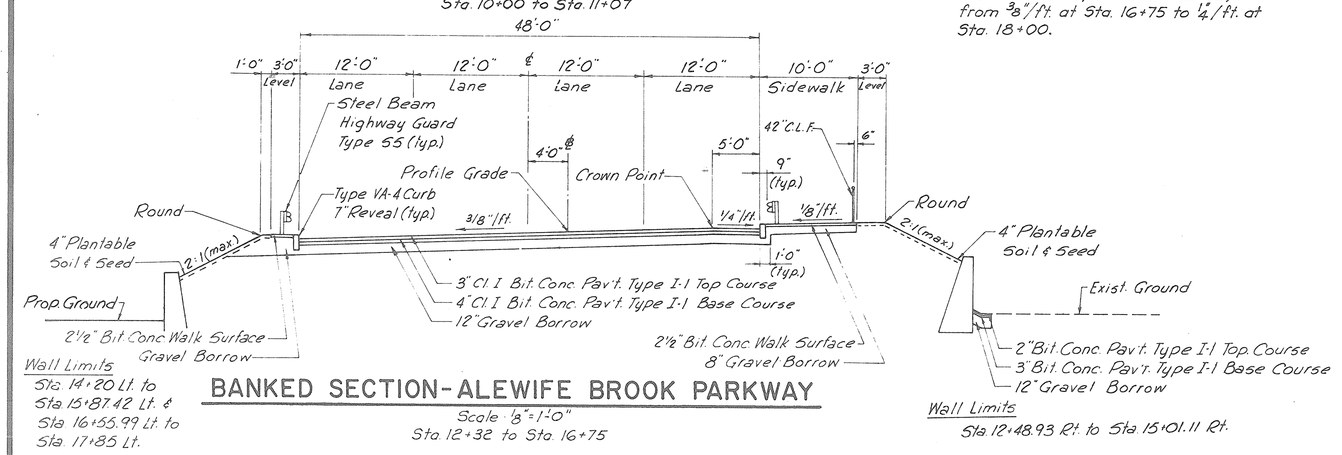

GUARD RAIL - TYPE SS
Sta. 11+00 Lt. to Sta. 13+00 Lt.
Sta. 10+00 Rt. to Sta. 10+94 Rt.
Sta. 12+67 Rt. to Sta. 18+00 Rt.
Buried End Sta. 12+29 Rt. to Sta. 12+47 Rt.
FENCING
Sta. 18+00 Rt. to Sta. 11+04 Rt.
Sta. 12+19 Rt. to Sta. 18+00 Rt.
ALEWIFE BROOK PARKWAY
ALEWIFE BROOK (CV 11)
PARKWAY
Prop. VA-3 Curb
Prop. VA-4 Curb
Prop. VA-5 Curb
Prop. Ret. Wall
Prop. CB
Prop. DMH
Prop. 8" Gas (by others)
Prop. 12"x12" Tapping Sleeve, Valve, and Box
Prop. 12"-6" Tapping Sleeve, Valve and Box
Prop. 18"-6" DIMJ Water Line
Prop. 800-12" DIMJ
Prop. 4" Double Yellow Center Line
Prop. 4" Broken White Lane Line
Prop. 4" Double Yellow Center Line
Prop. 4" Double Yellow Remix Line
Prop. 4" Solid White Lane Line
Prop. 12" White Stop Line (Painted)
Prop. 24" White Crosswalk Line
Prop. 6" White Lane Line
Prop. 4" Plantable Soil & Seed
Prop. 8" Bituminous Concrete Sidewalk
Prop. Wheelchair Ramps
Prop. Retaining Wall
Prop. Bituminous Concrete Wall Surface
Prop. 40' Drive
Limit Prop. Pavt.
Prop. Traffic Island
Prop. Bituminous Concrete Island Surface
Prop. Granite Curb
Prop. Granite Curb Type VA-4
Prop. Granite Curb Type VA-5
Prop. Granite Curb Type VA-3



NORMAL SECTION-ALEWIFE BROOK PARKWAY

Scale: 1/8"=1'-0"
Sta. 10+00 to Sta. 11+07

Note: Transition roadway from 1/4"/ft at Sta. 11+07 to 3/8"/ft. at Sta. 12+32, and from 3/8"/ft. at Sta. 16+75 to 1/4"/ft. at Sta. 18+00.

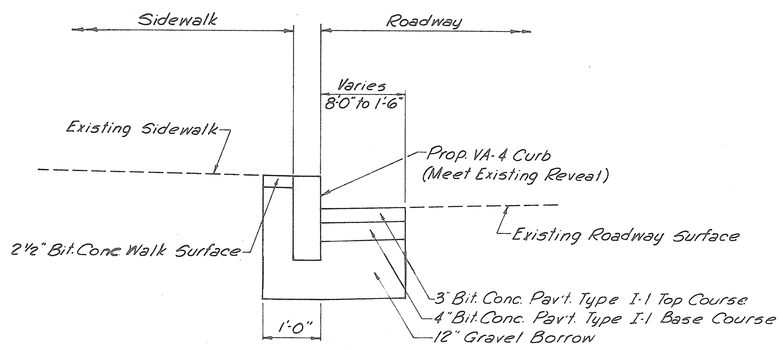


Wall Limits
Sta. 14+20 Lt. to Sta. 15+87.42 Lt. & Sta. 16+55.99 Lt. to Sta. 17+85 Lt.

BANKED SECTION-ALEWIFE BROOK PARKWAY

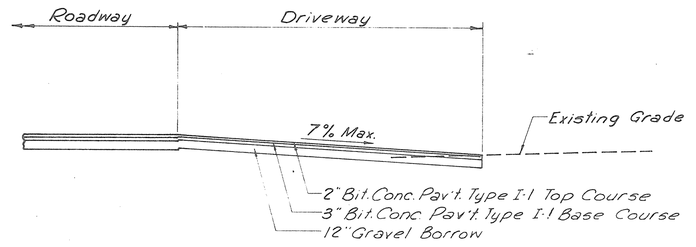
Scale: 1/8"=1'-0"
Sta. 12+32 to Sta. 16+75

Wall Limits
Sta. 12+48.93 Rt. to Sta. 15+01.11 Rt.



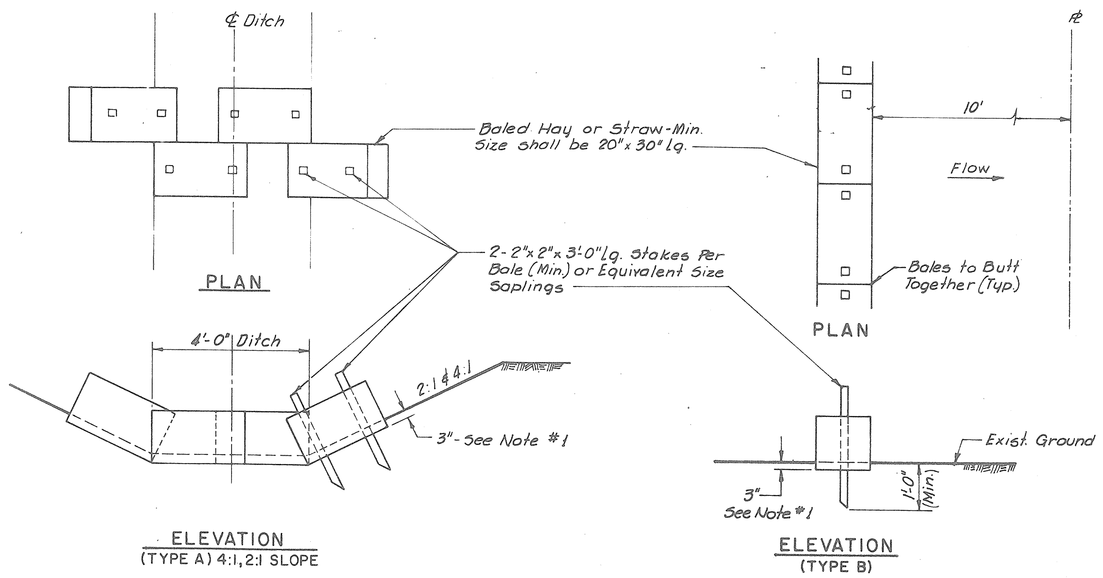
TYPICAL SECTION - CURB INSTALLATION

Scale: 3/4"=1'-0"
Sta. 9+85± Lt. to Sta. 10+00 Lt.



TYPICAL SECTION-DRIVEWAY

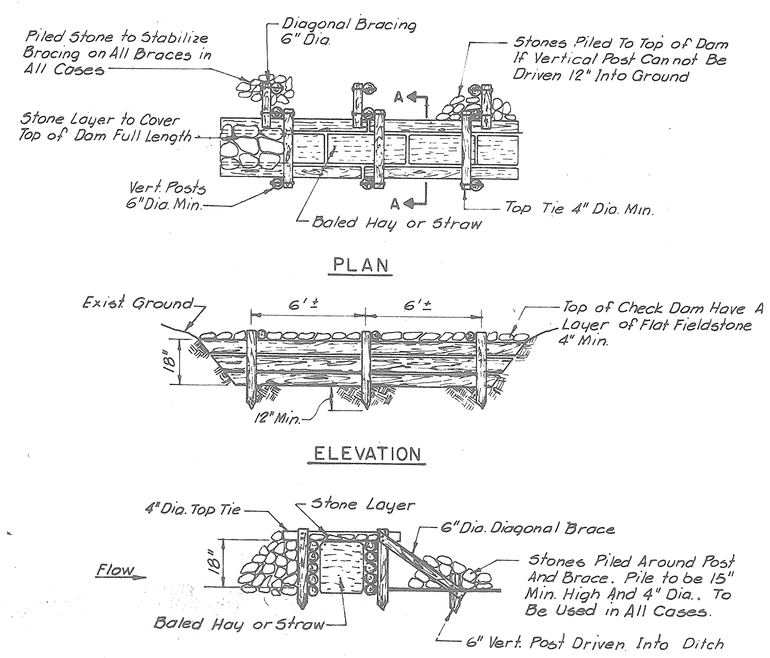
Scale: 1"=8'-0"



NOTES:
1. Baled Hay To Be Placed 3"± Below Exist Ground or Finished Grade As Directed.
2. Type "A" Is To Be Used in Prop. Ditches.
3. Type "B" Is To Be Used Where The Exist. Ground Slopes Away from Proposed Embankment.

BALED HAY

Not to Scale



SECTION A-A

LOG AND HAY EROSION CHECK DAM

Not to Scale

EROSION PROTECTION

DOMENIC D'ERAMO No. 24498 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

AS BUILT

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601
ALEWIFE STATION/GARAGE
RECONSTRUCTED ALEWIFE BROOK PARKWAY
TYPICAL SECTIONS AND DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK	APP

Wallace, Floyd, Ellenzweig, Moore, Inc. Architects/Planners
Sverdrup & Parcel and Associates, Inc. Structural, Civil, Mechanical, & Electrical Engineers
Le Messurier Associates/SCI Structural Engineers

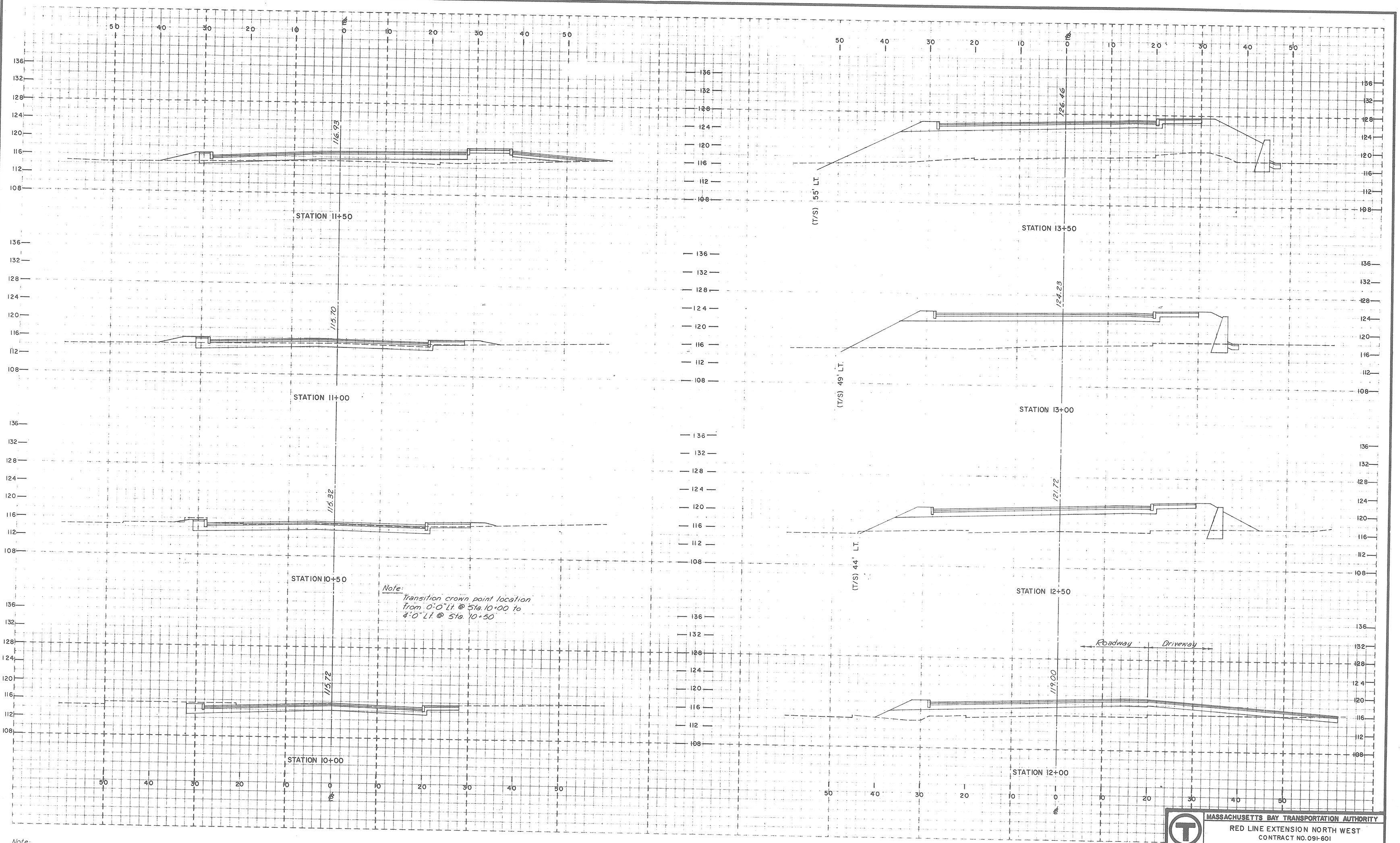
MASS. BAY TRANSPORTATION AUTHORITY APPROVED BY
PROJECT MANAGER

SCALE: As Noted	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. 5946	ISSUE
DATE 7-25-80	FWC	FWC	CJB	SHEET 82 OF	

5163
808119

A00860 - 4

Proposal No. 610776-132090



Note:
Transition crown point location
From 0'-0" Lt. @ Sta. 10+00 to
4'-0" Lt. @ Sta. 10+50

Note:
Limit of Cross-Section equals Toe of Slope (T/S)
For Continuation of Section, See Shts. PG-2 through PG-4

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CHKD	APP

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601

ALEWIFE STATION/GARAGE

RECONSTRUCTED-ALEWIFE BROOK PARKWAY
CROSS SECTIONS STA. 10+00 TO STA. 13+50

Wallace, Floyd Ellenzweig, Moore, Inc.
Architects/Planners/Engineers/Landscape Architects
Sverdrup & Parcel and Associates, Inc.
Structural, Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI
Structural Engineers

MASS. BAY TRANSPORTATION AUTHORITY
APPROVED BY
PROJECT MANAGER

SCALE 1/8"=1'-0"	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. 59462	ISSUE
DATE 7-28-80	FWC	FWC	CJB	SHEET P.3 OF 10	

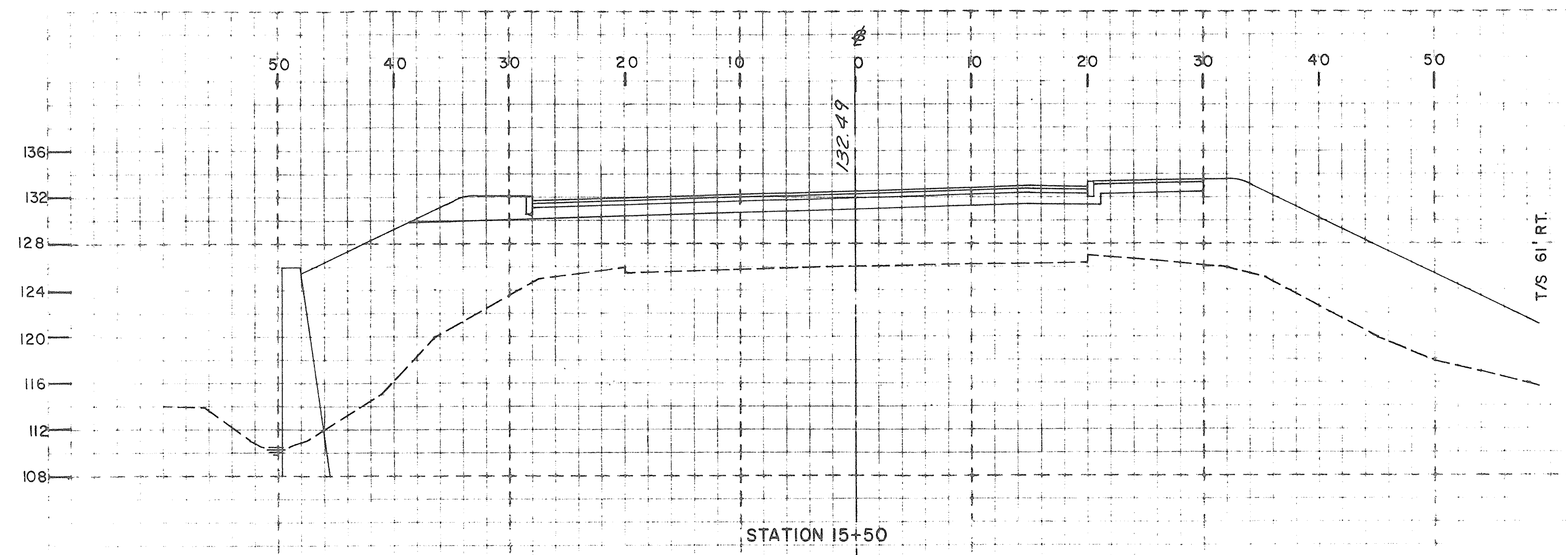
COMMONWEALTH OF MASSACHUSETTS
DOMENIC D'ERAMO
No. 12408
REGISTERED PROFESSIONAL ENGINEER

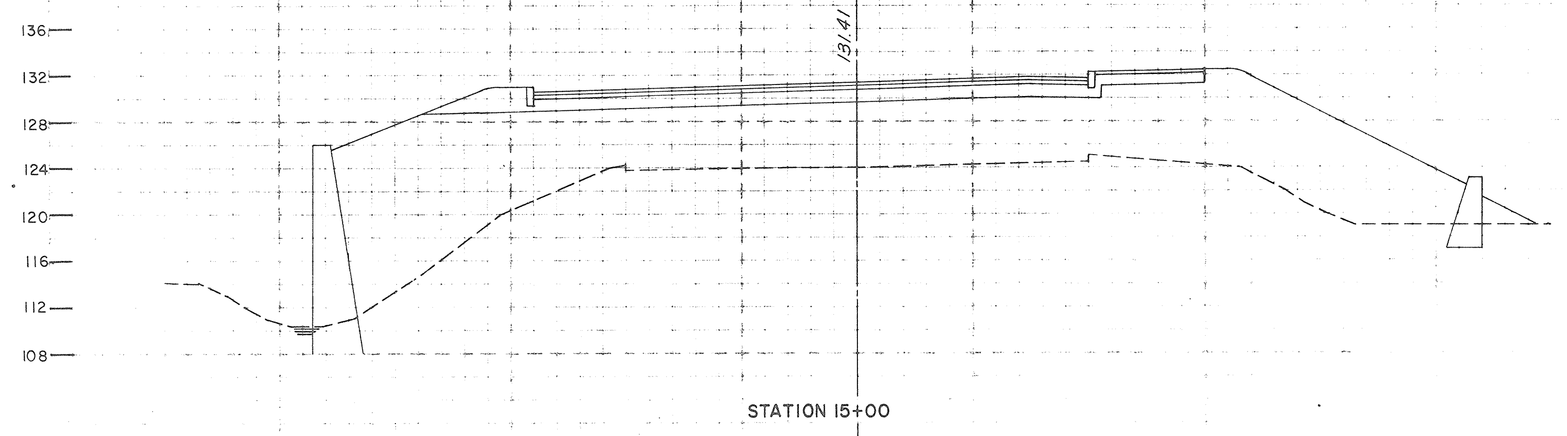
513.3
808/120

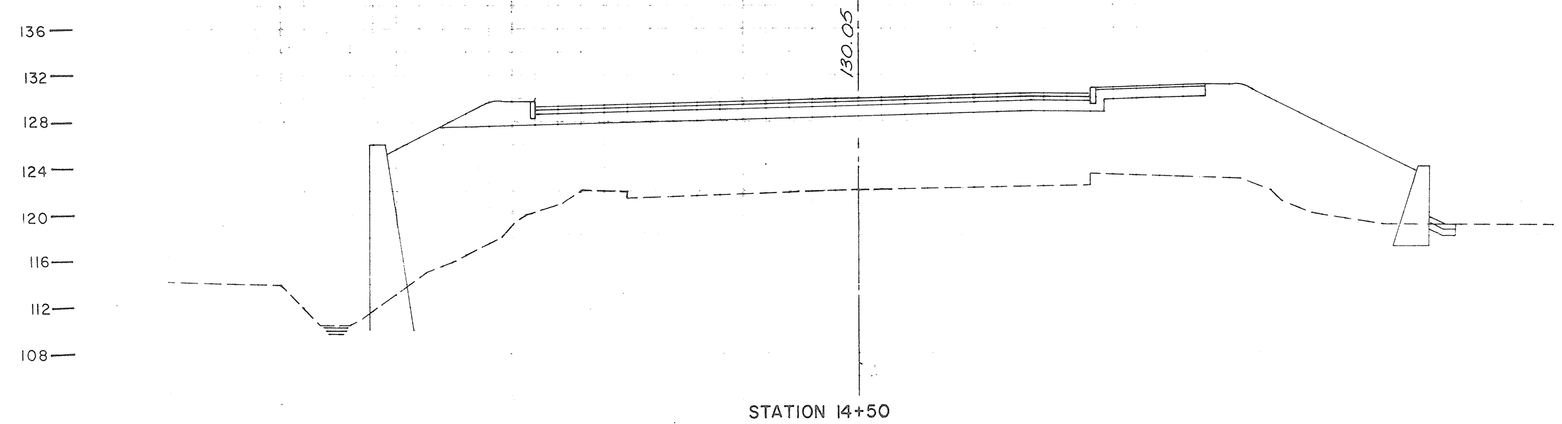
A00860-5

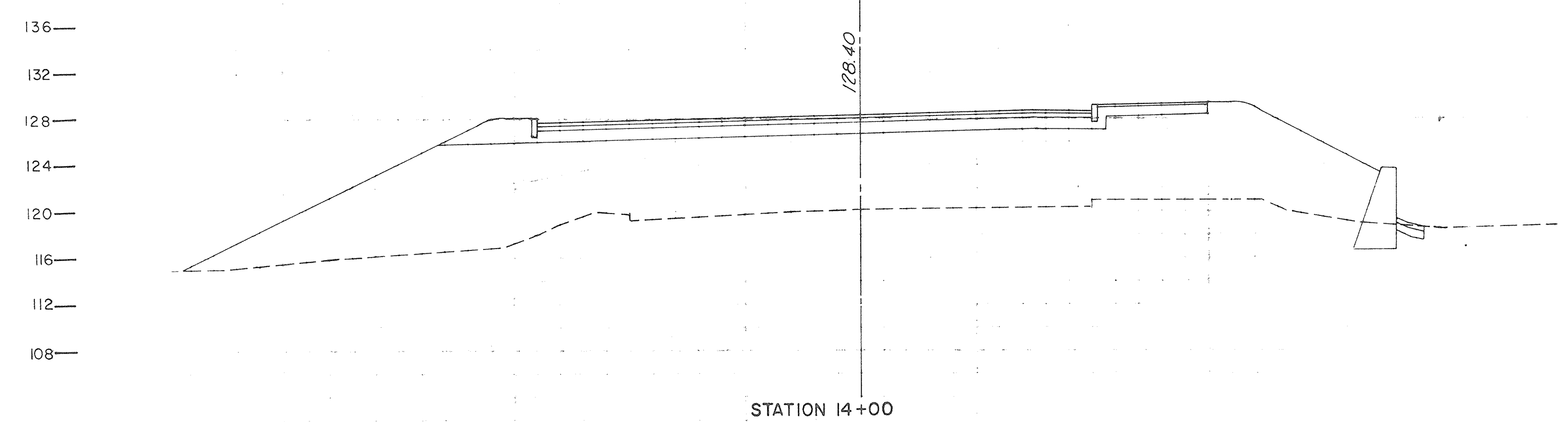
Proposal No. 610776-132090

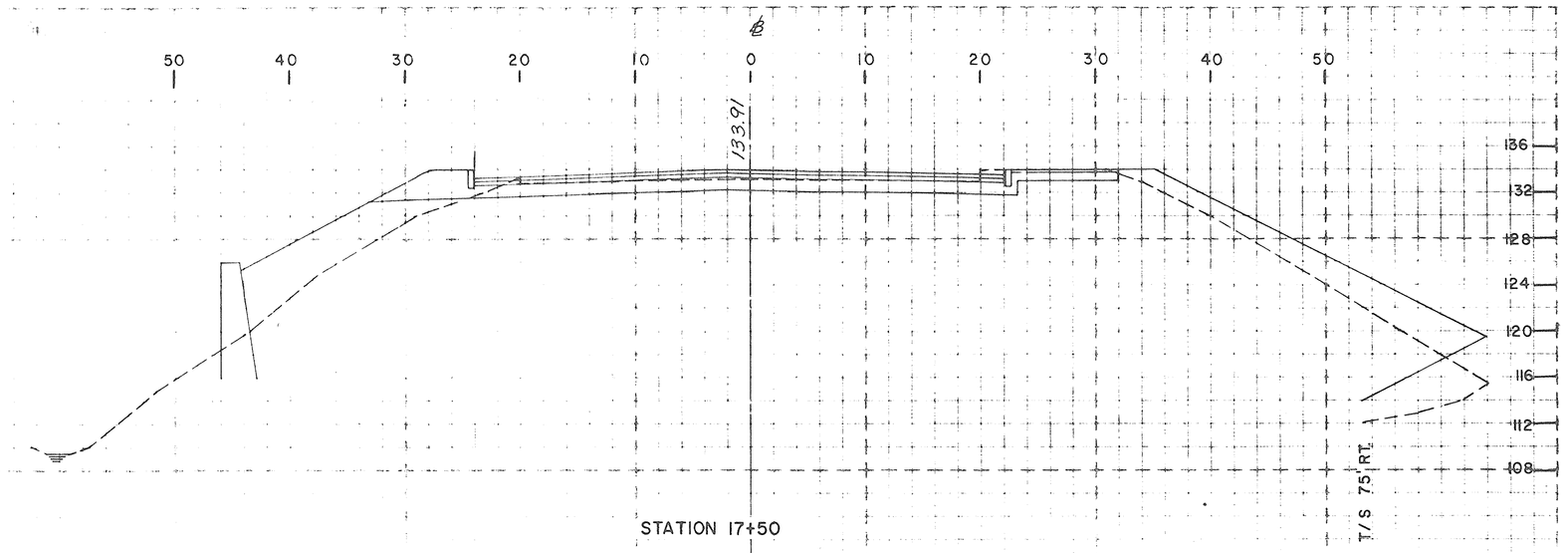
BAREPEACE P-2318

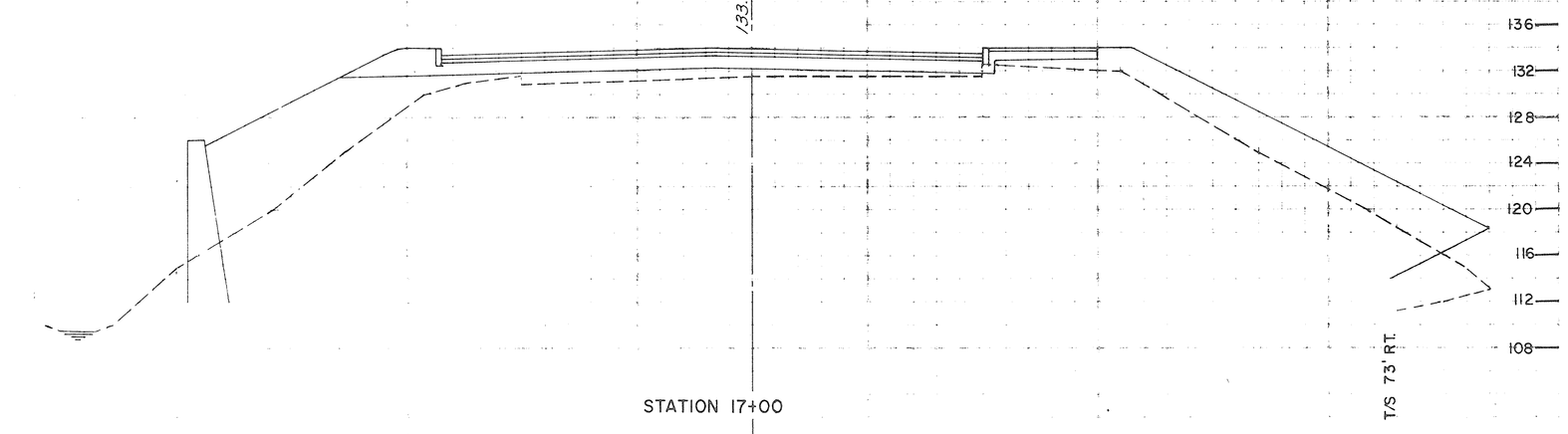


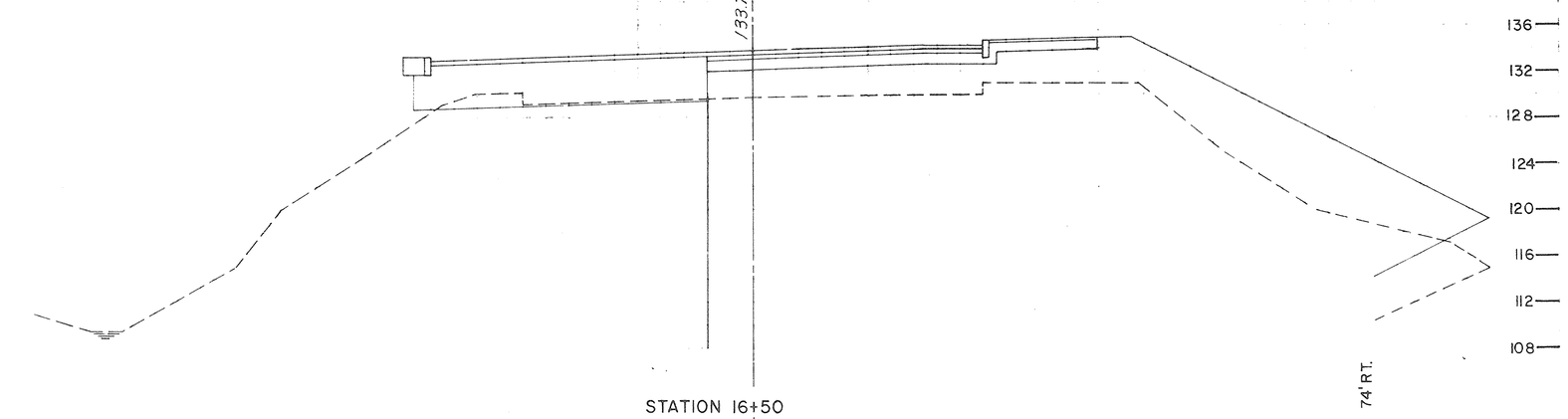


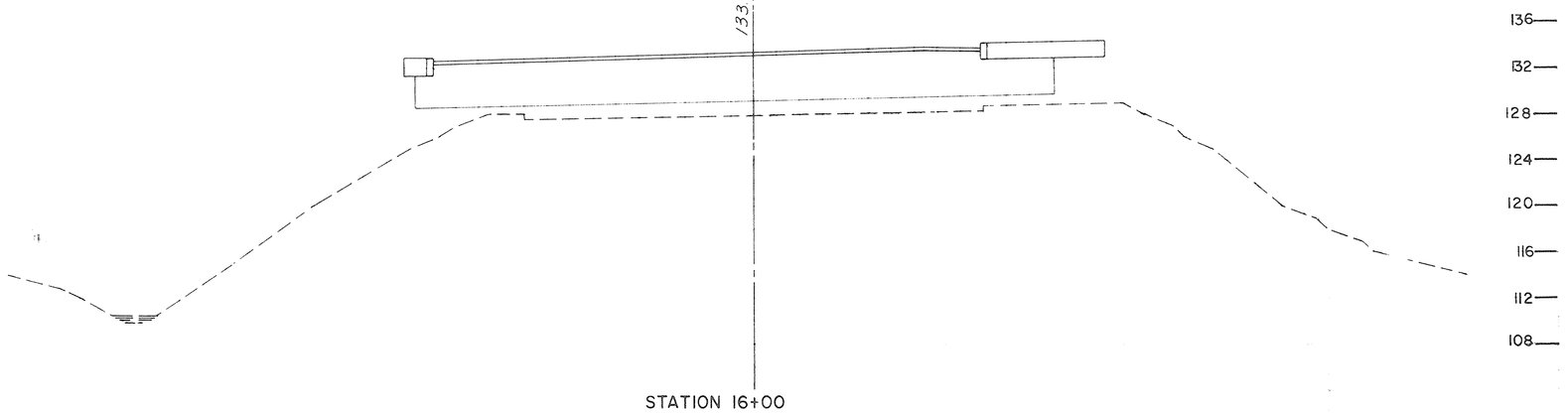


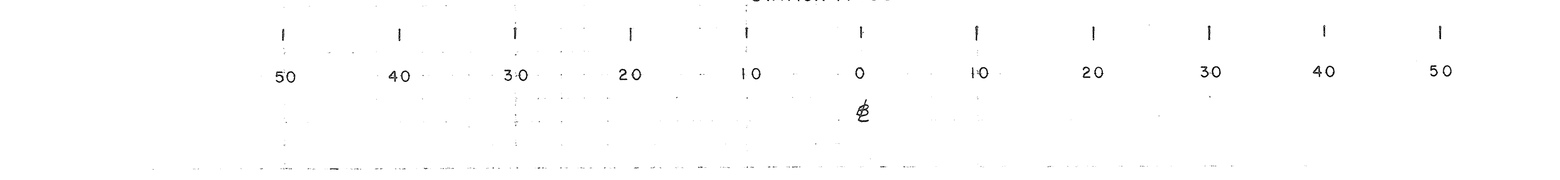


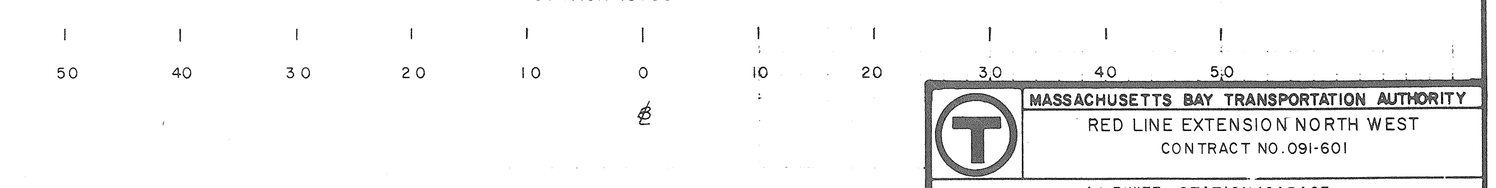












Note:
Limit of Cross Section equals Toe of Slope (T/S) or Face of Wall For Continuation of Section, See Shts. PG-2 through PG-4

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CHKD	APP

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601

ALEWIFE STATION/GARAGE

RECONSTRUCTED ALEWIFE BROOK PARKWAY
CROSS SECTIONS STA. 14+00 TO STA. 17+50

Wallace, Floyd, Ellenzweig, Moore Inc. Architects/Planners
Sverdrup & Parcel and Associates Inc. Structural, Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI Structural Engineers

MASS. BAY TRANSPORTATION AUTHORITY APPROVED BY
PROJECT MANAGER

SCALE 1/8"=1'-0"	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. 59463	ISSUE
DATE / /	FWC	FWC	CJB	SHEET R-4 OF 10	

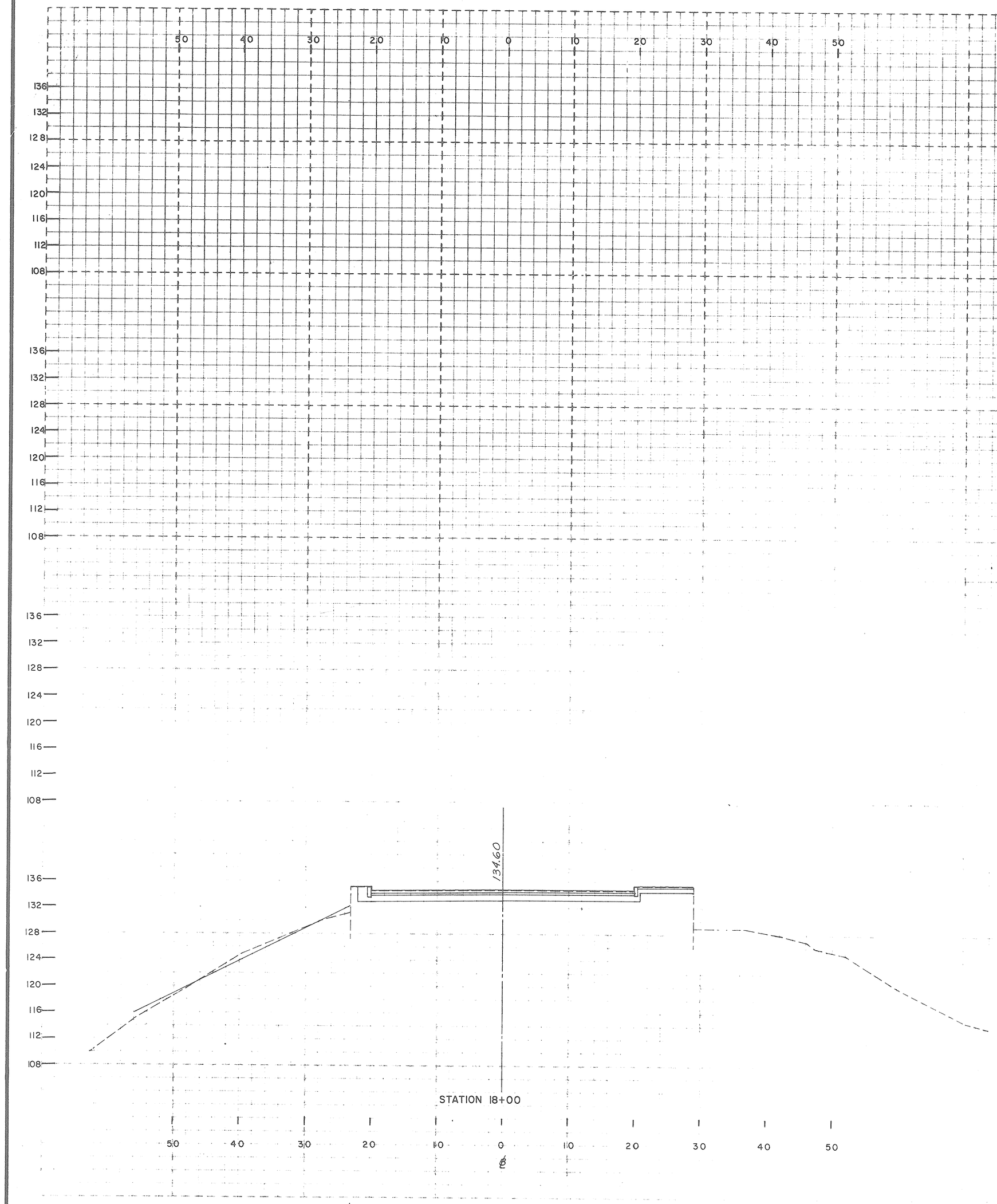
5153
808121

A008860 - 6

Proposal No. 610776-132090

A00860 - 7

Proposal No. 610776-132090



Note:
Limit of Cross-Section equals Toe of Slope (T/S)
For Continuation of Sections, See Shts. PG-2 through PG-4

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808122

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CHK	APP

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601

ALEWIFE STATION/GARAGE
RECONSTRUCTED ALEWIFE BROOK PARKWAY
CROSS SECTION STA. 18+00

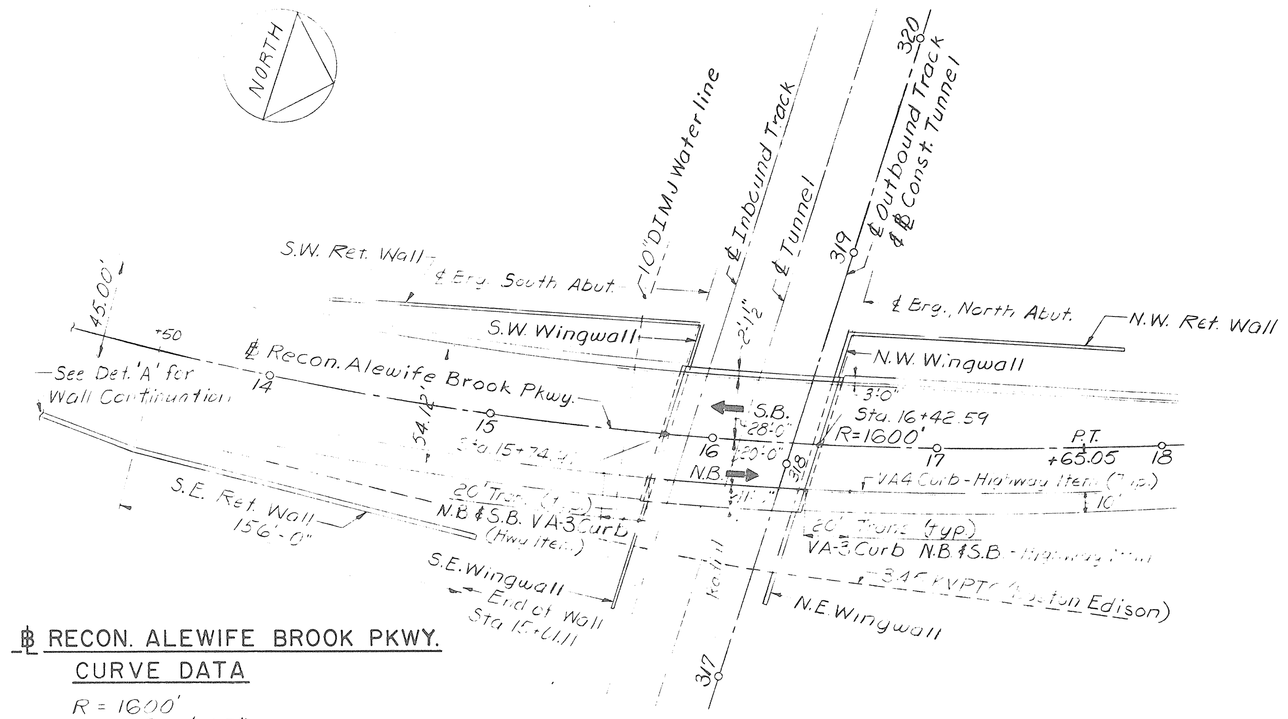
Wallace, Floyd, Ellenzweig, Moore, Inc.
Architects/Planners
Sverdrup & Parcel and Associates, Inc.
Structural, Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI
Structural Engineers

MASS. BAY TRANSPORTATION AUTHORITY
APPROVED BY
PROJECT MANAGER

SCALE	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
1/8"= 1'-0"	FWC	FWC	CJB	59464	
DATE 7-25-80				SHEET R-5 OF 10	

MAREPEACE P-2318

A00860 - 8

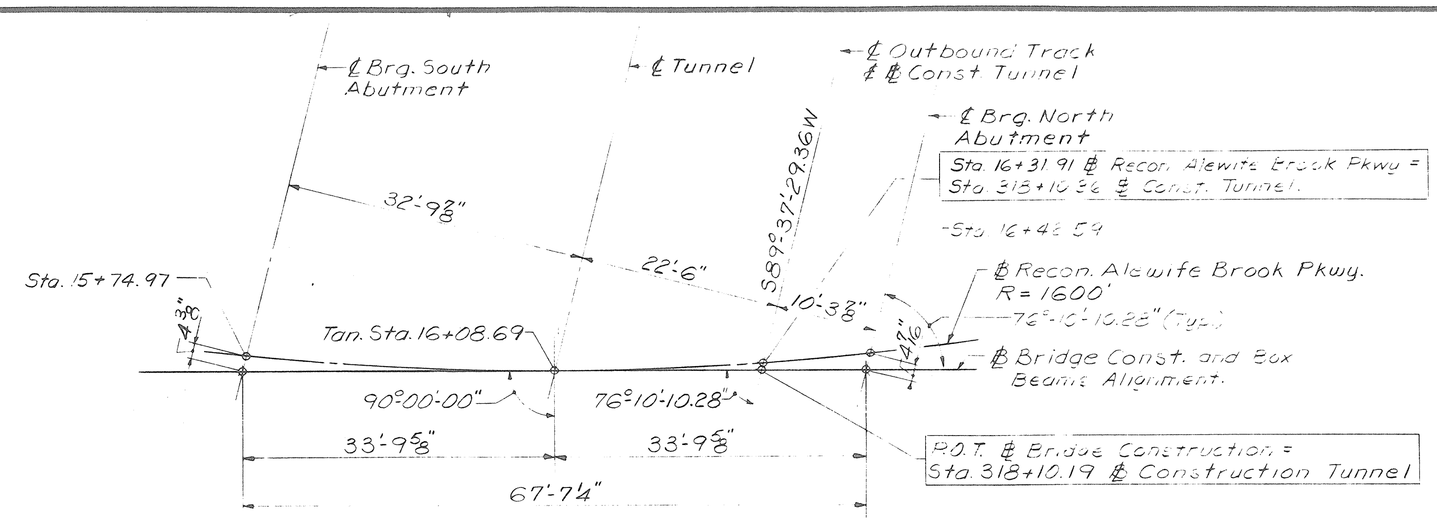


℄ RECON. ALEWIFE BROOK PKWY.

CURVE DATA

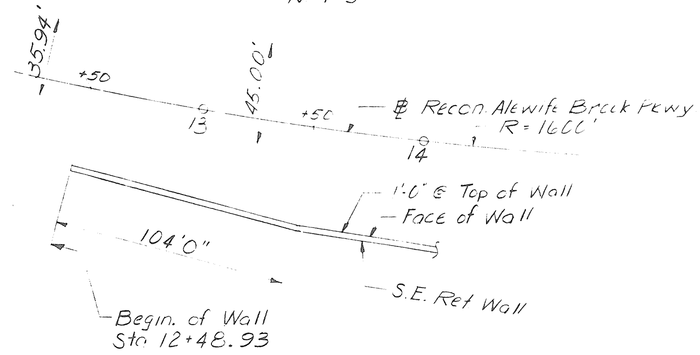
R = 1600'
Δ = 19°04'07"
L = 532.51'
T = 268.74'
PC = Sta. 12+32.54
PT = Sta. 17+65.05

KEY PLAN
Scale: 1"=40'



BASELINE INTERSECTIONS

N T S



DETAIL 'A'
Scale: 1"=40'

GENERAL NOTES

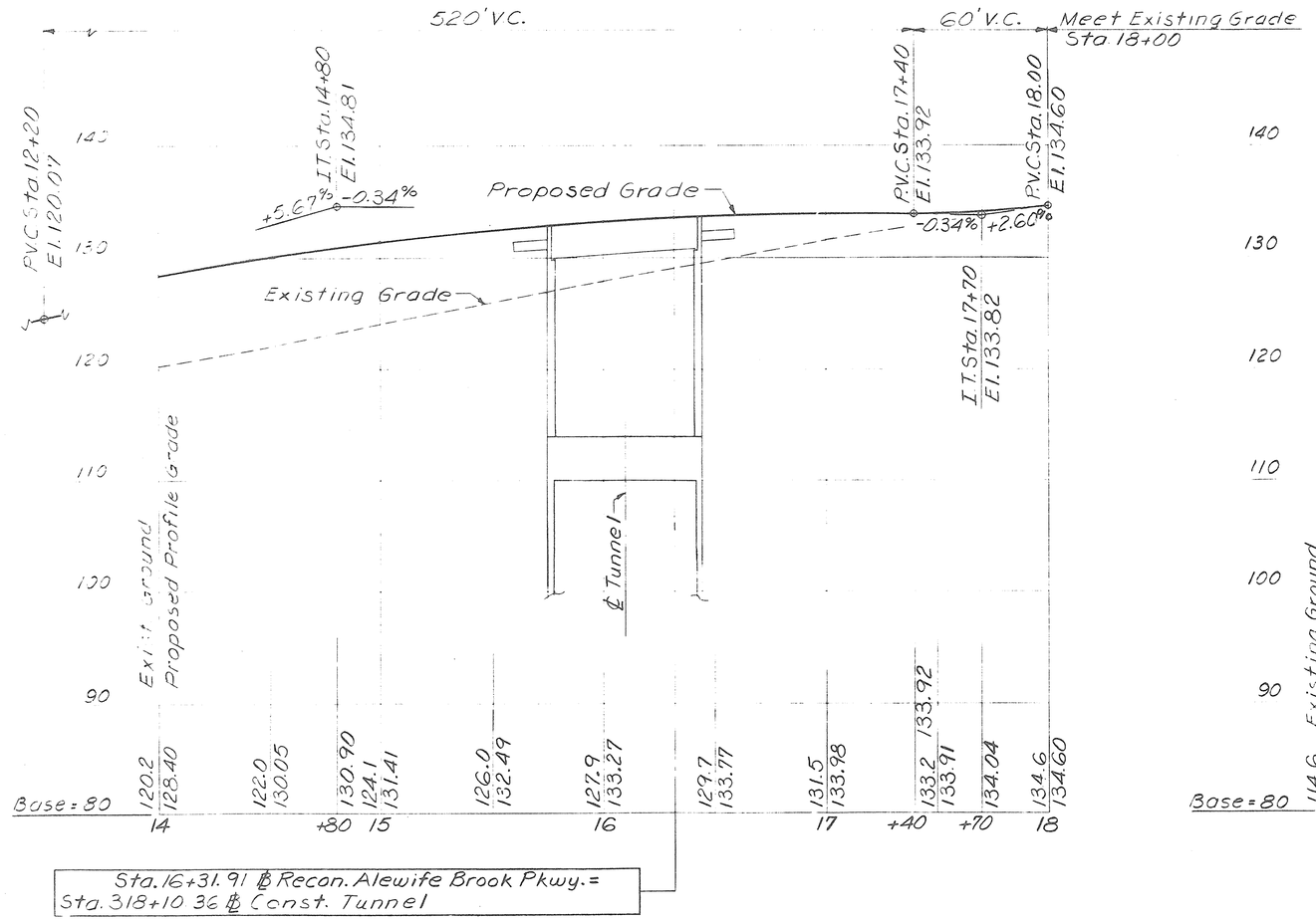
DESIGN:
In accordance with the current AASHTO Specifications for HS-20-44 Loading, modified for Military Loading.

REINFORCEMENT:
All bars shall conform to ASTM A615 Grade 60. Unless otherwise shown on the Plans, all #4 bars shall be lapped 20". and all #5 bars shall be lapped 26". For horizontal bars with 12" or more of concrete below the bar, lap shall be 29" for #4 & 36" for #5 bars. If #4 & #5 bars are spaced 6" or more o/c, the laps shall be 80% of the laps given above. All other bars shall be lapped as shown on Plans.

SCALES:
Scales noted on Plans are not applicable to reduced size prints. Divide scales by 2 for ½ size prints.

BRIDGE RAILING:
For Details, see Sheet R7

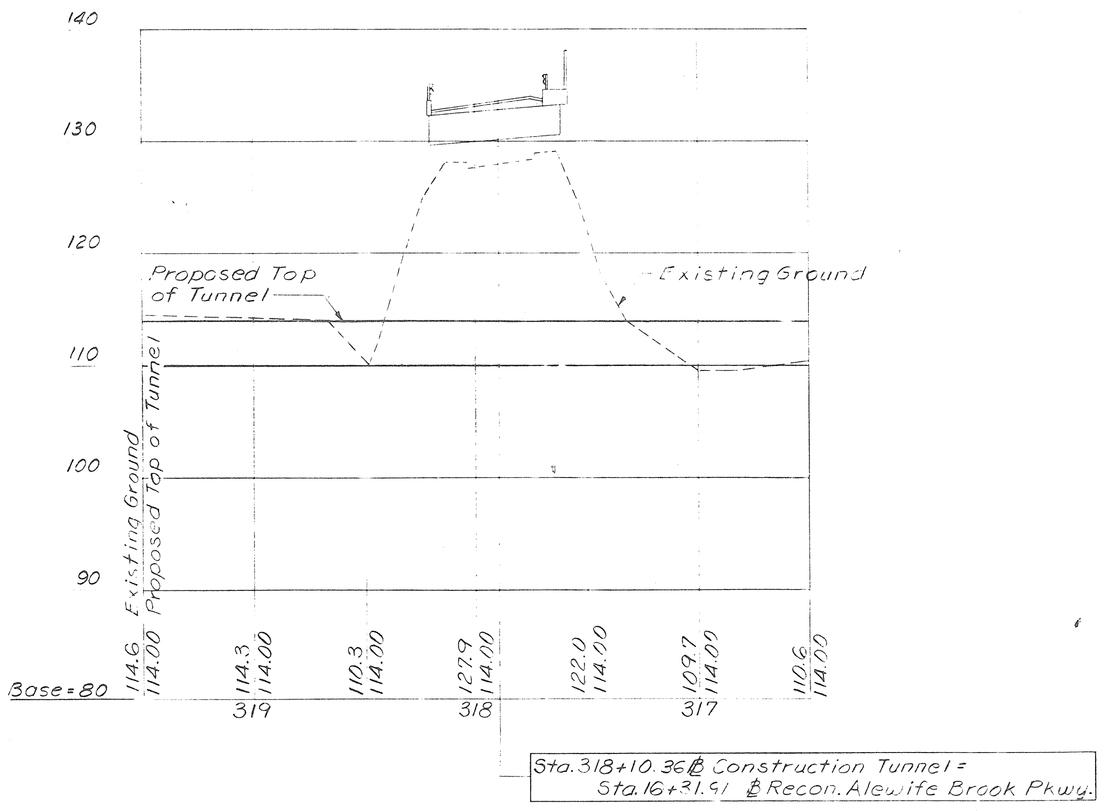
ANCHOR BOLTS:
All Anchor Bolts are to be set by Template and placed before the concrete is poured except at Abutments, where drilling & grouting for Anchor Bolts is allowed at the Contractor's option provided that the method of installation will not cut the Reinforcing Steel. See Sheet R6.



Sta. 16+31.91 ℄ Recon. Alewife Brook Pkwy. = Sta. 318+10.36 ℄ Const. Tunnel

PROFILE RECONSTRUCTED ALEWIFE BROOK PARKWAY

Scale: Horiz. 1"=40'
Vert. 1"=8'



Sta. 318+10.36 ℄ Construction Tunnel = Sta. 16+31.91 ℄ Recon. Alewife Brook Pkwy.

PROFILE ALONG ℄ CONSTRUCTION TUNNEL

Scale: Horiz. 1"=40'
Vert. 1"=8'

AS BUILT

△ 7/14	Addendum No. 1, Item # 143	N.B.	H.K.
NO.	DATE	BY	APP'D

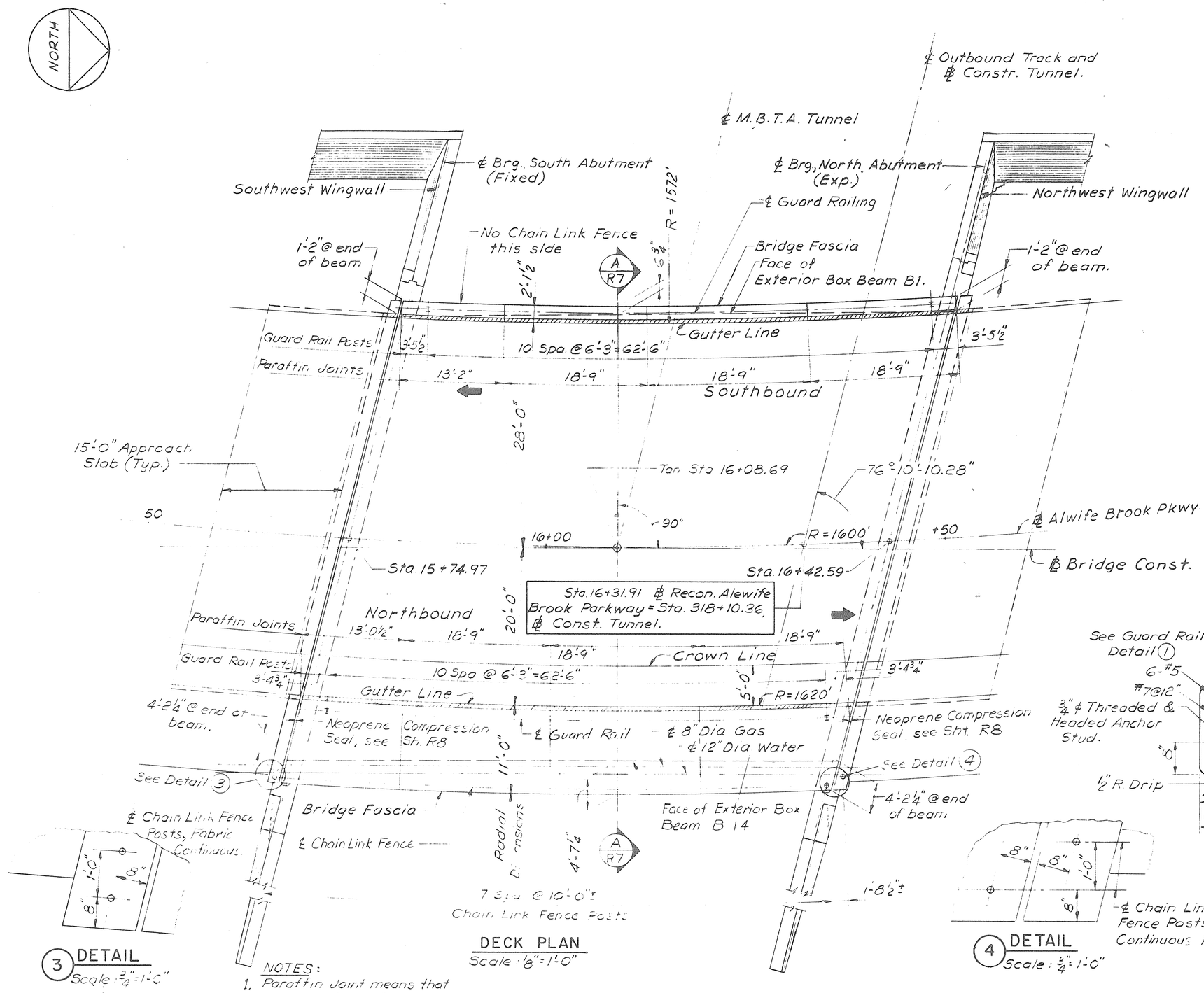
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601
ALEWIFE STATION/GARAGE
BRIDGE KEY PLAN & PROFILES

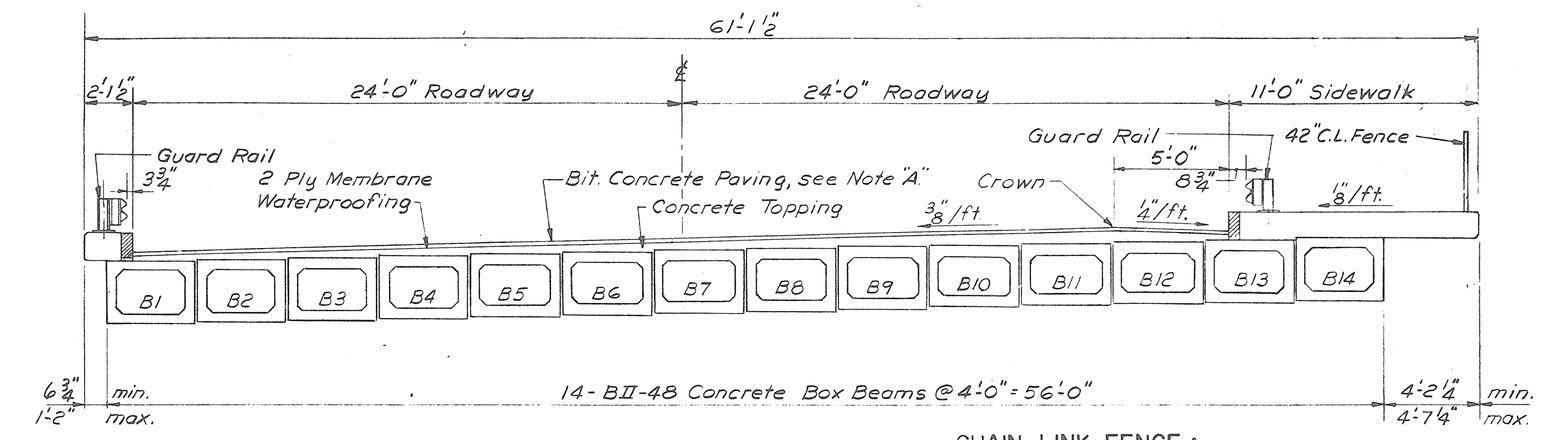
Wallace Floyd Engineering Moore, Inc
Sverdrup & Parcel and Associates, Inc
Structural, Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI
Structural Engineers

MASS BAY TRANSPORTATION AUTHORITY APPROVED BY
PROJECT MANAGER

SCALE AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. 59465	ISSUE
DATE 7-24-90	N.J.B.	R.F.B.	A.E.	SHEET R6	

Proposal No. 610776-132090



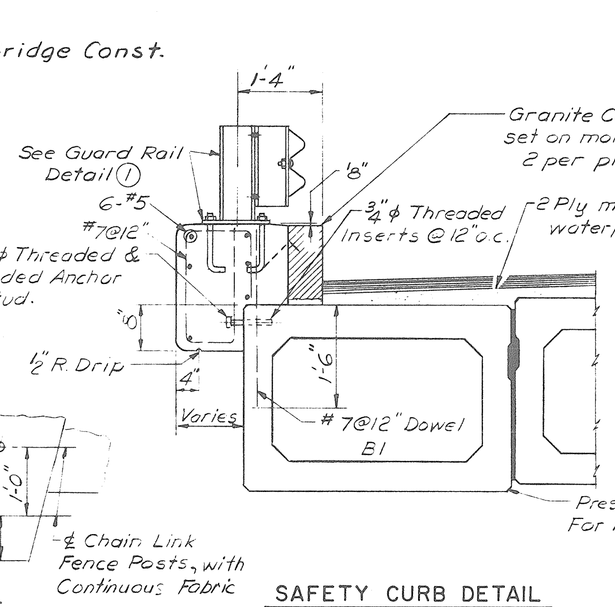


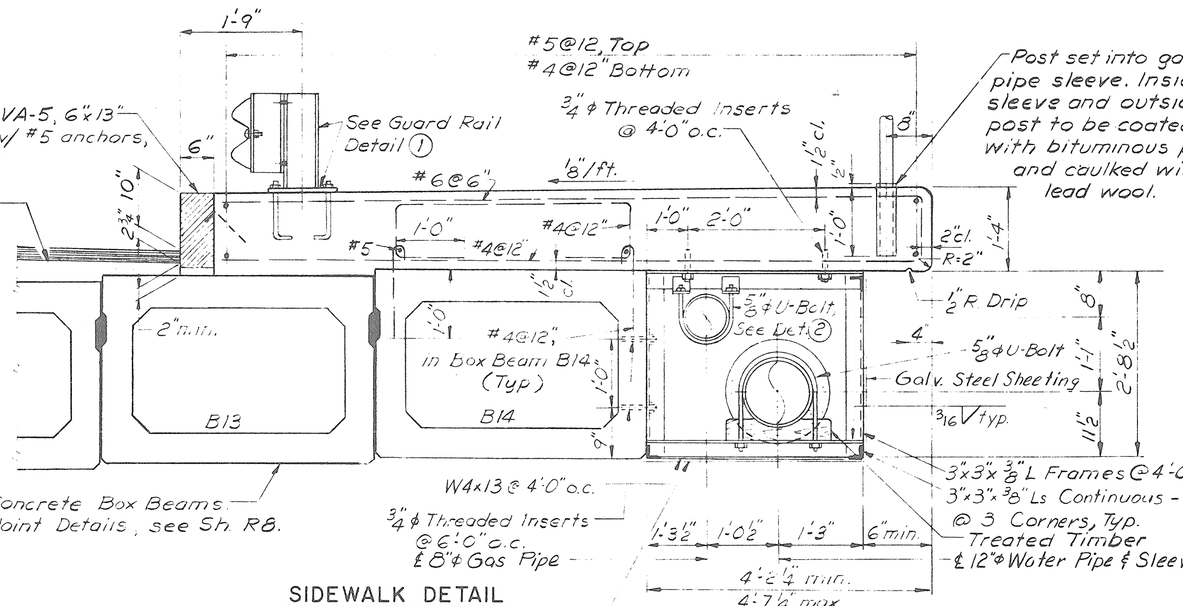
NOTE "A":
1¼" Class I Top Course Bit Concrete Pavement Type I-1 over 1¼" Class I Dense Protective Course for Bridges.

A SECTION
Scale: ¼" = 1'-0"

CHAIN LINK FENCE:

All Components Shall be A-36 Steel, Galvanized after fabrication. Posts Shall be 1.90" O.D. Pipe and top & bottom Rails 1.66" O.D. Pipe. Fabric bands Shall be ⅛" x ¾" & Stretcher bar ¼" x ¾". Fabric Shall be of 0.148" Wire woven into 2" diamond mesh. Provide ½" Exp. Joints in C.L.F. at every 20'± intervals.

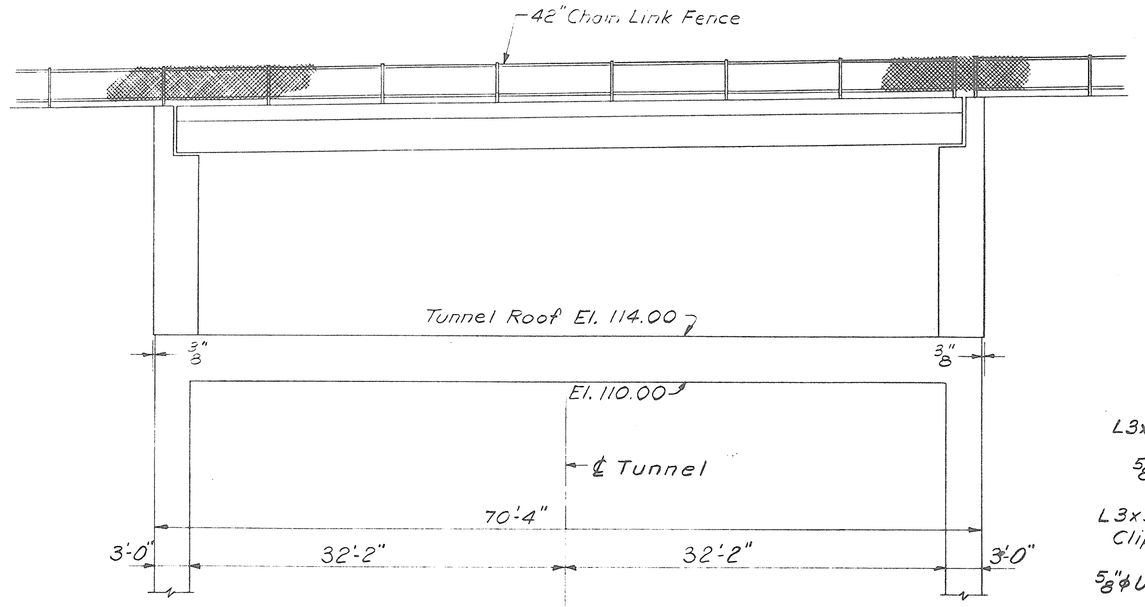




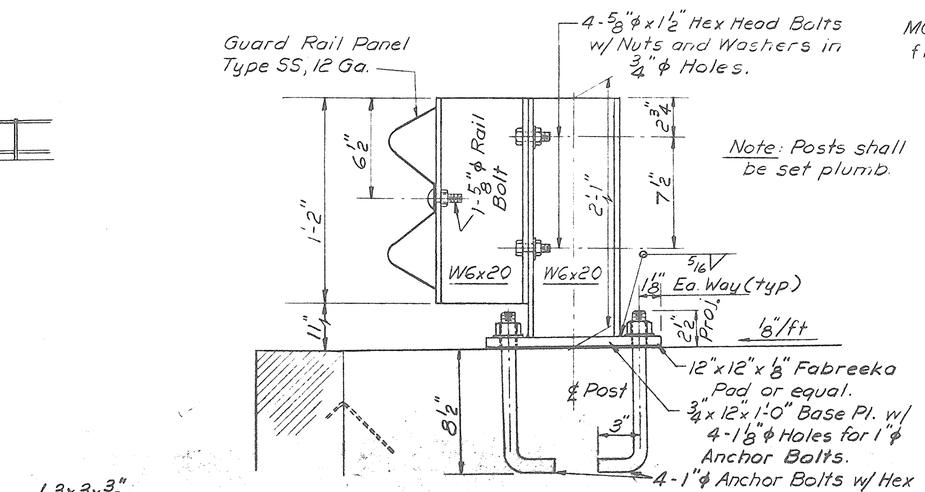
Prestressed Concrete Box Beams For Beam & Joint Details, see Sh. R8.

SAFETY CURB DETAIL
Scale: ¾" = 1'-0"

SIDEWALK DETAIL
Scale: ¾" = 1'-0"

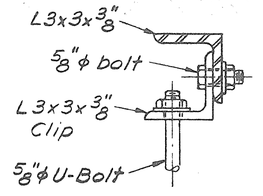


ELEVATION ALONG EAST FASCIA
Scale: ⅛" = 1'-0"



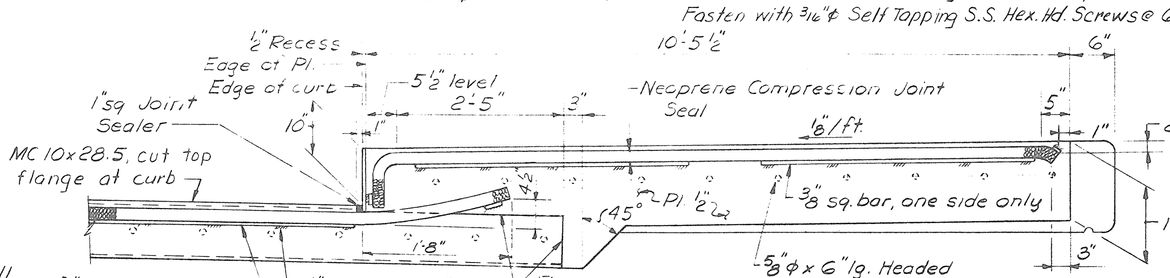
Note: Posts shall be set plumb.

1 DETAIL
N.T.S.

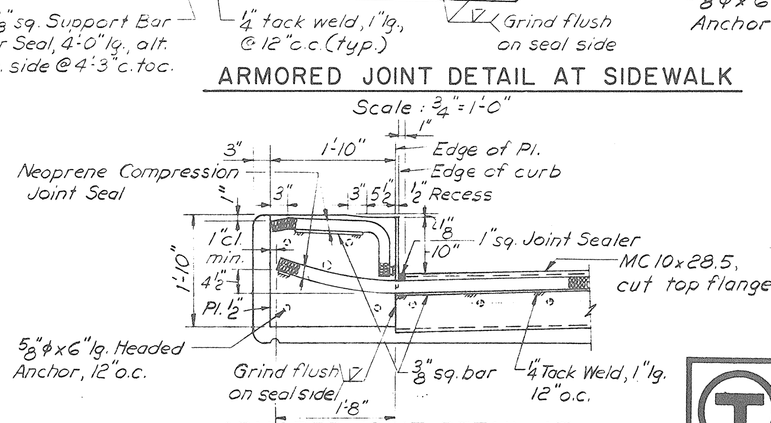


2 DETAIL
Scale: 3" = 1'-0"

NOTE:
All railing components shall be of A36 steel, galvanized after fabrication, unless otherwise noted.
Railing panels shall be 12 ga. galv. steel, lapped in direction of Traffic.



ARMORED JOINT DETAIL AT SIDEWALK
Scale: ¾" = 1'-0"



ARMORED JOINT DETAIL AT SAFETY CURB
Scale: ¾" = 1'-0"

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CH.	APP
1	7/8	Addendum No. 1, Item # 144	WB	HR	

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601

ALEWIFE STATION/GARAGE
BRIDGE DECK PLAN AND ELEVATION

Wallace, Floyd, Ellenzweig, Moore, Inc. Consulting Engineers
Sverdrup & Parcel and Associates, Inc. Structural: Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI Structural Engineers

MASS. BAY TRANSPORTATION AUTHORITY APPROVED BY
PROJECT MANAGER

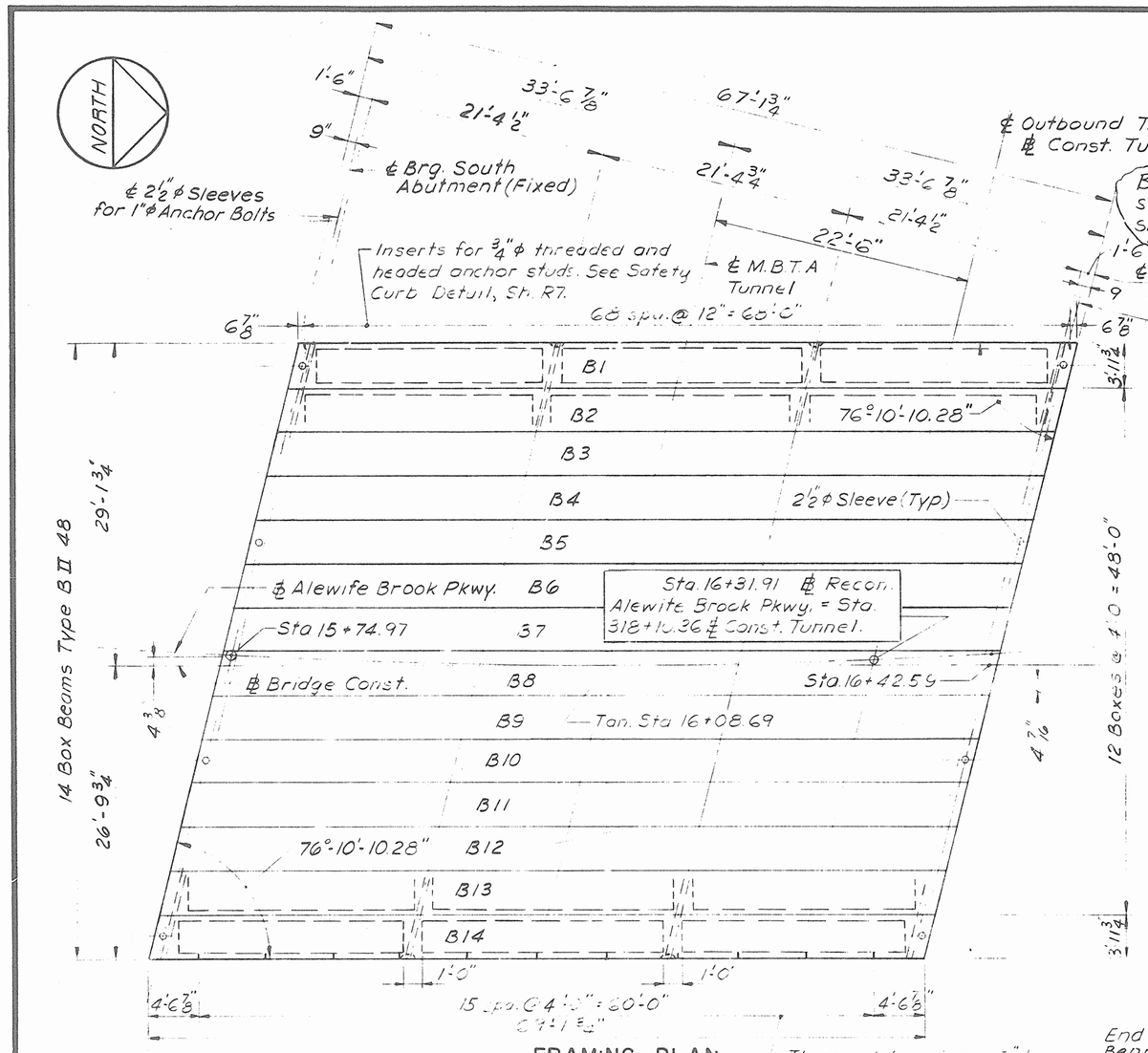
SCALE	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO	ISSUE
AS NOTED	CER	RMP	M.E.	59466	
DATE 7-28-80				SHEET R7 OF	

DOMENIC E. D'ERAMO No. 24498 REGISTERED PROFESSIONAL ENGINEER

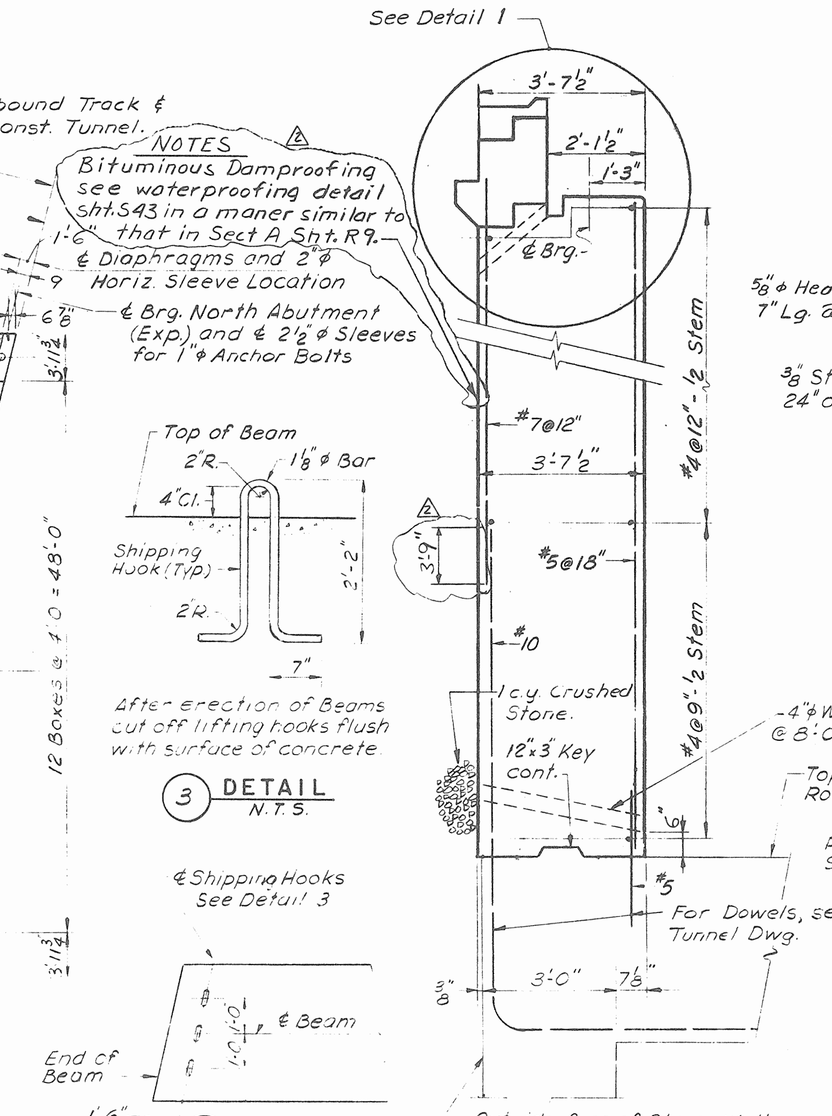
5153
808133

A008060-6

Proposal No. 610776-132090



FRAMING PLAN
N.T.S.

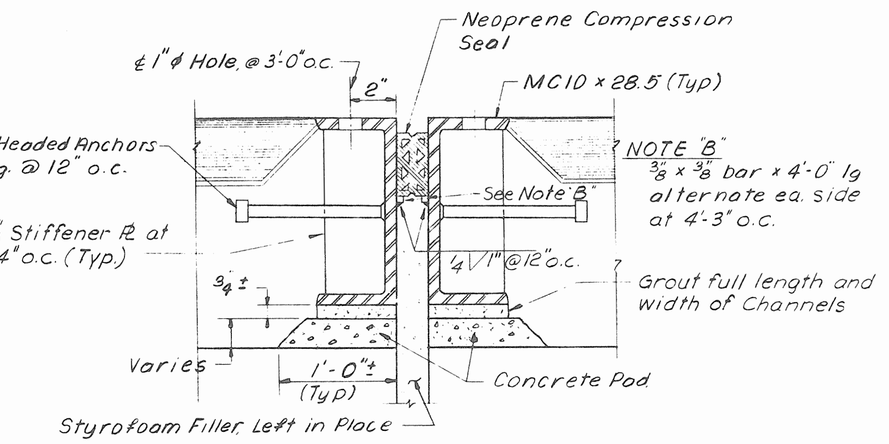


ABUTMENT SECTION
Scale: ½"=1'-0"

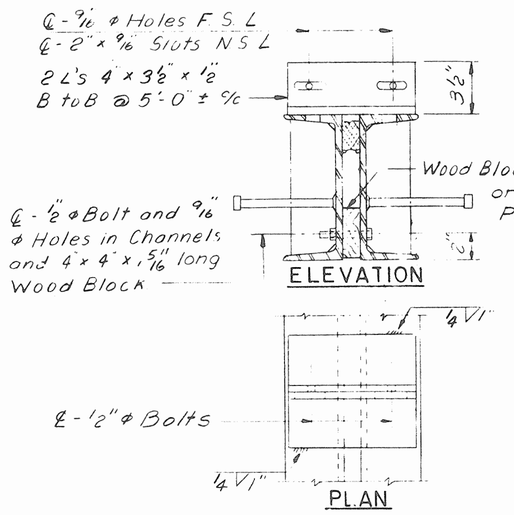
After erection of Beams cut off lifting hooks flush with surface of concrete.

3 DETAIL
N.T.S.

2 DETAIL
N.T.S.



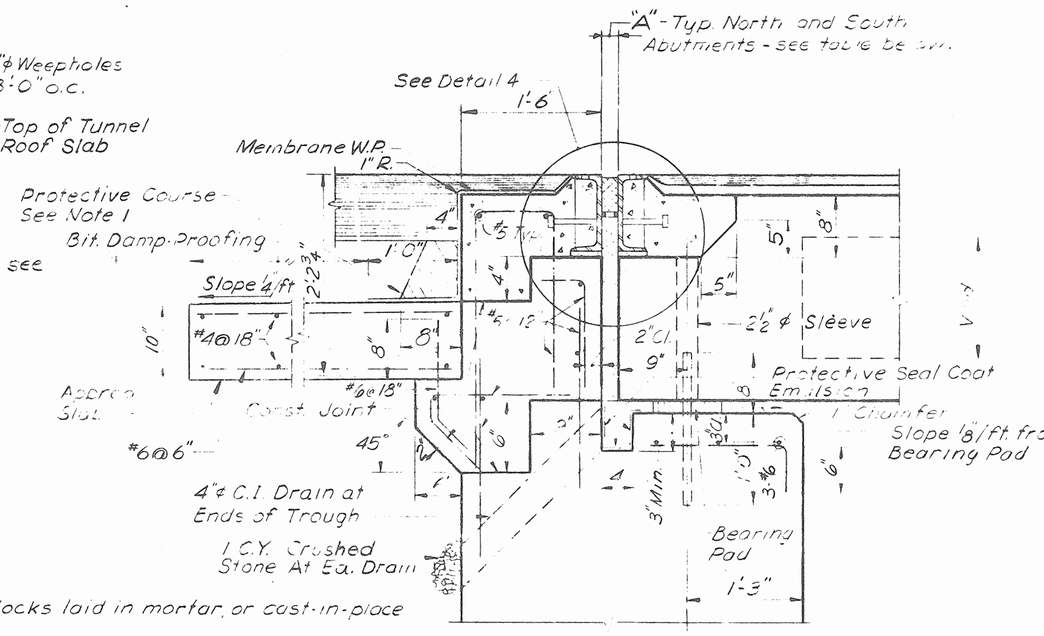
4 DETAIL
Scale: 3"=1'-0"



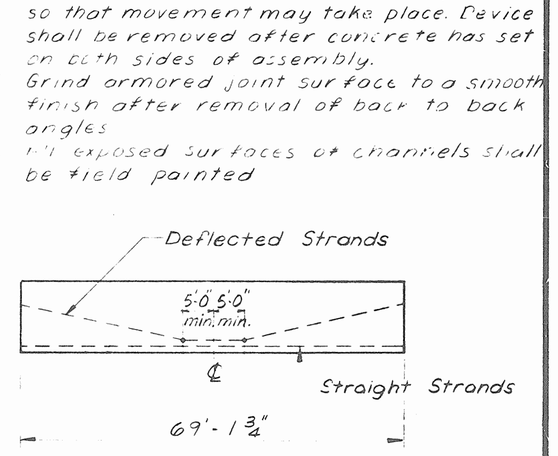
SHIPPING DEVICE FOR ROADWAY ARMORED JOINT
N.T.S.

NOTES FOR SHIPPING DEVICE:

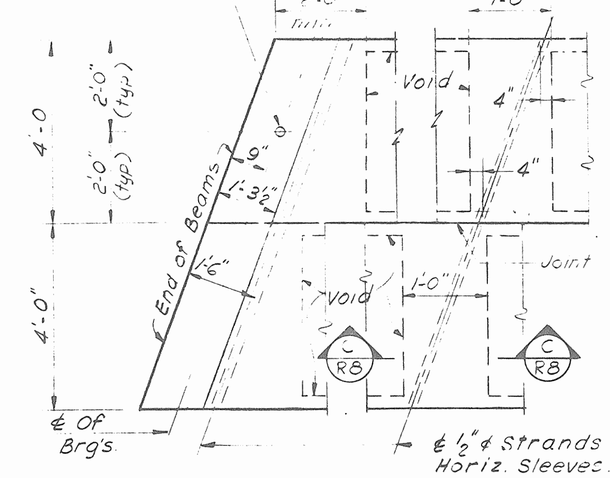
1. Shop drawings shall be submitted for this device.
2. All armored joint assemblies must be properly fitted in the shop and shipped with the device for maintaining proper spacing and fit (See Temp. Table)
3. With armored joint in place, remove ½"φ bolt and wood block and insert styrofoam filler.
4. Bolts on shipping device must be loosened within one hour after concrete is placed so that movement may take place. Device shall be removed after concrete has set on both sides of assembly.
5. Grind armored joint surface to a smooth finish after removal of back to back angles.
6. All exposed surfaces of channels shall be field painted.



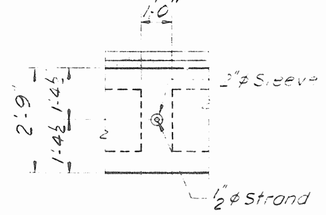
1 DETAIL
Scale: 1"=1'-0"



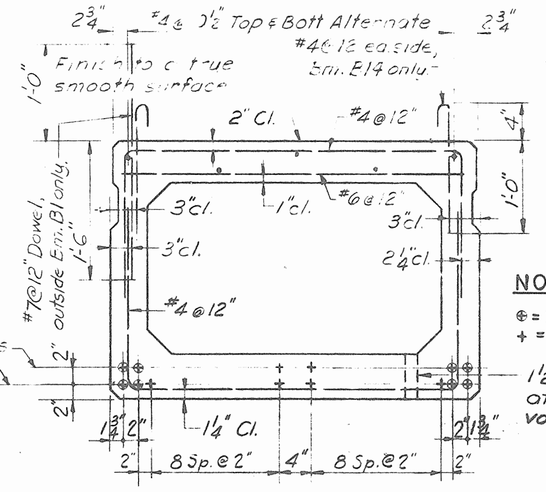
DEFLECTED STRAND LAYOUT
N.T.S.



PLAN - TYPICAL DIAPHRAGM LAYOUT
Scale: ½"=1'-0"

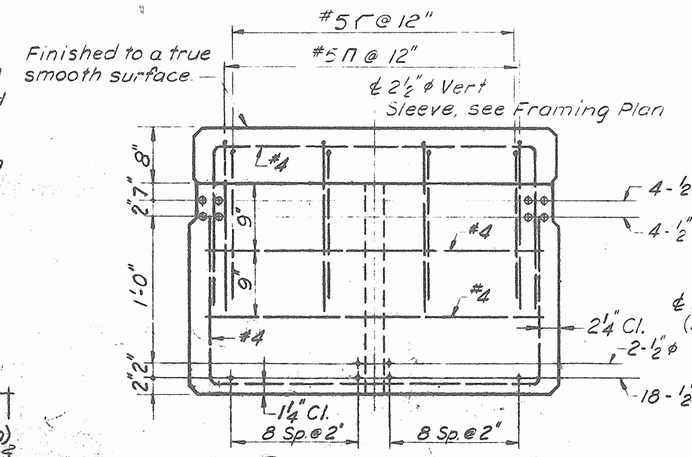


C SECTION
This Sheet
Scale ½"=1'-0"

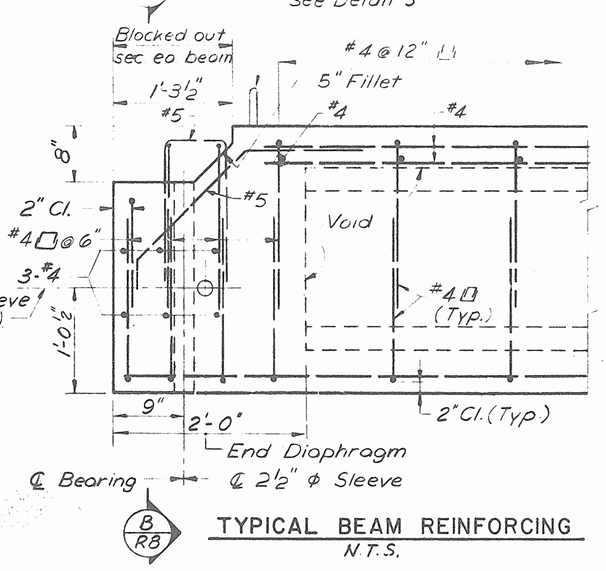


REINFORCING DETAIL MID-SPAN
N.T.S.

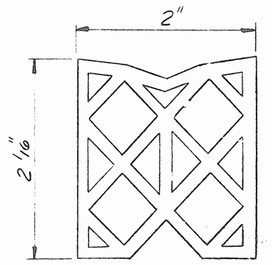
NOTE
℄ = ½"φ deflected strand
+ = ½"φ straight strand
1½"φ PVC. drain pipe at low point of each void of beam.



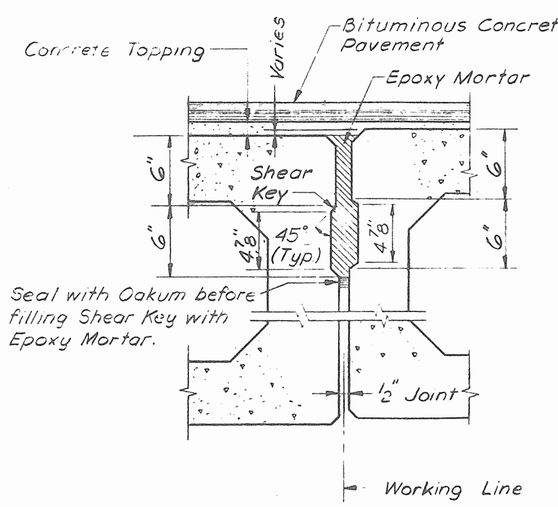
B SECTION
N.T.S.



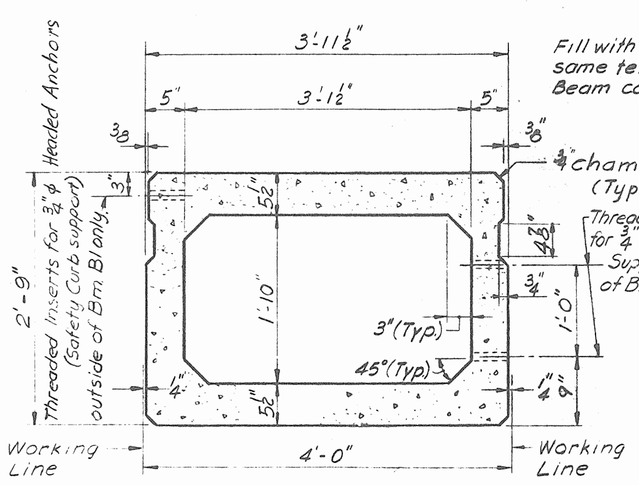
TYPICAL BEAM REINFORCING
N.T.S.



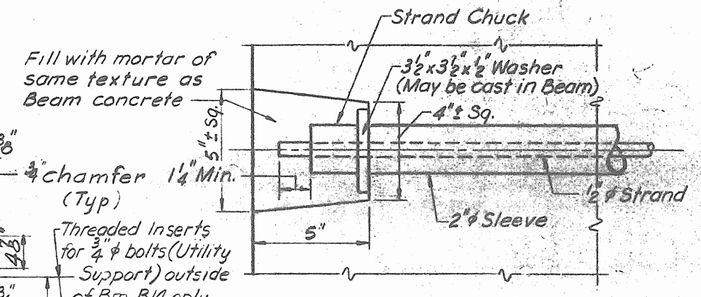
NEOPRENE COMPRESSION SEAL
N.T.S.



TYPICAL JOINT DETAIL
N.T.S.



BOX BEAM TYPE BII-48"
N.T.S.



PLAN

DETAILS OF LATERAL ANCHORAGE
Scale: 3"=1'-0"

NOTES

1. ½"φ Strand, Chuck and Washer each end.
2. Strand shall be painted with Bituminous Paint, except at the Chuck location.
3. The Strand shall be Tensioned to 10,000 pounds before grouting of the Longitudinal joints.
4. Do not burn off the Strand less than 1¼" from end of Chuck.
5. Sidewalks and Topping shall be poured after the Longitudinal joints are grouted.
6. Omit Shear Key on outside of Beams B1 & B14.

EXP. JOINT GROOVE SIZE (DIM. "A")						
30°F	40°F	50°F	60°F	70°F	80°F	90°F
1 9/16	1'2"	1 7/16	1 3/8"	1 5/16	1 1/4"	1 3/16

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CH KD	APP
1	10/81	Add'l Item 65966	V.K.	R.P.	VS
2	11/81	Addendum No. 1, Item # 145	NB	HR	

DOMENIC F. D'ERAMO No. 24698 REGISTERED PROFESSIONAL ENGINEER

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601

ALEWIFE STATION/GARAGE
FRAMING PLAN & BRIDGE DETAILS

Wallace Floyd, Ellenzweig, Moore, Inc.
Sverdrup & Parcel and Associates, Inc. Structural, Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI Structural Engineers

MASS BAY TRANSPORTATION AUTHORITY APPROVED BY
PROJECT MANAGER

SCALE	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
As noted	HBC	RFB	H.E.	59467	
DATE 7-28-80				SHEET R8	

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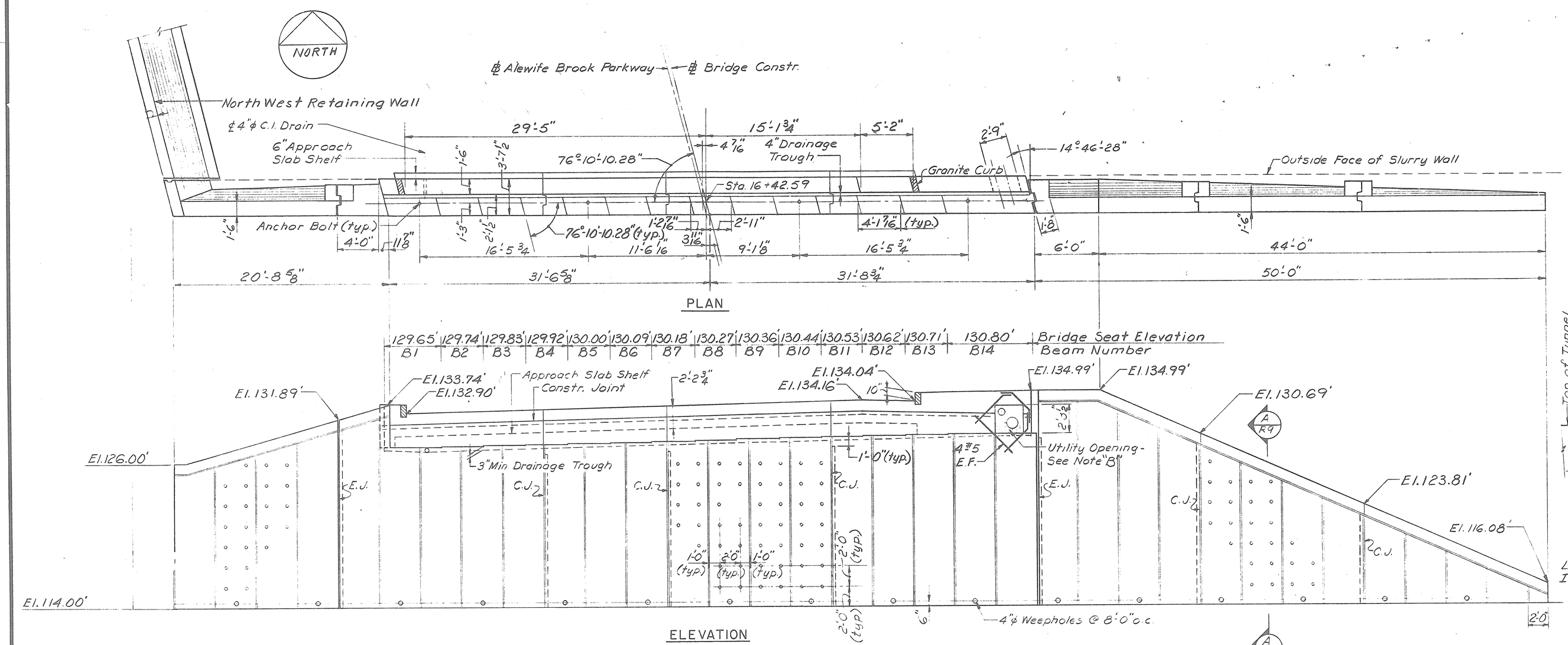
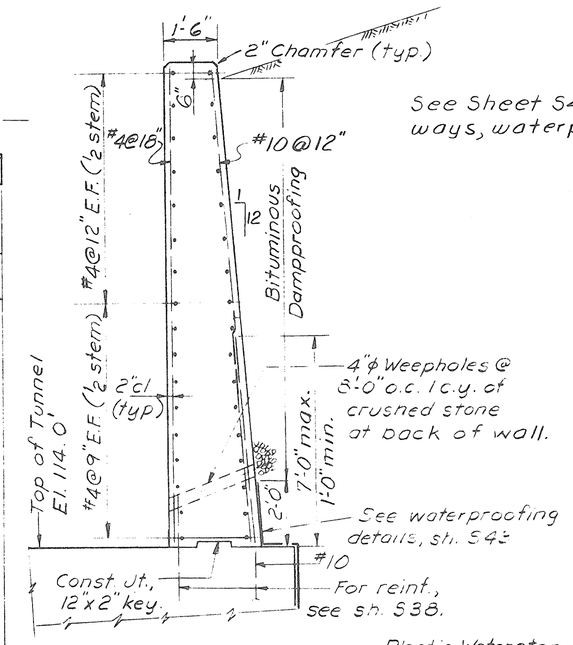
Proposal No. 610776-132090



NOTE"B"

Opening in Abutment Backwall shall be bricked up after utilities are installed. Use additional #5 bars at each face of Backwall at opening.

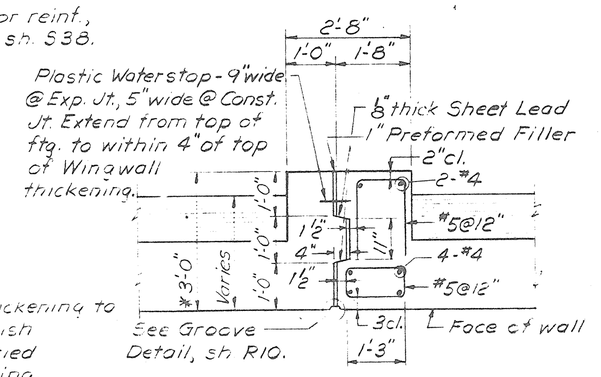


See Sheet S43, Vent Shaft and Passagways, waterproofing Details are similar.

A SECTION
Scale: 3/8"=1'-0"

Limit of Bridge Payment Item 0212.425
El. 114.00'

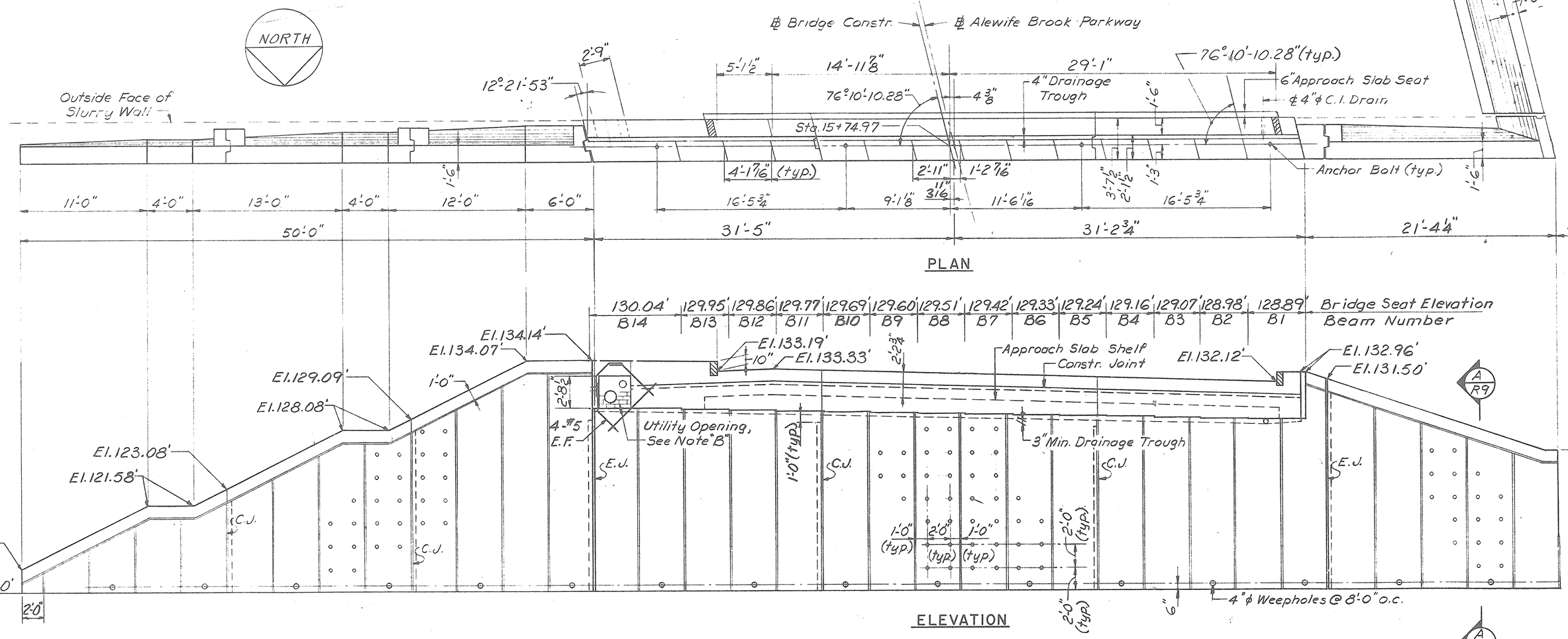
* Top of wall thickening to be 1'-0" below finish grade, and carried to top of footing.

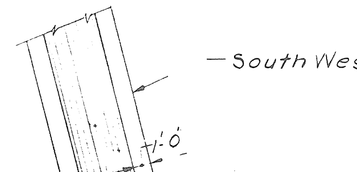


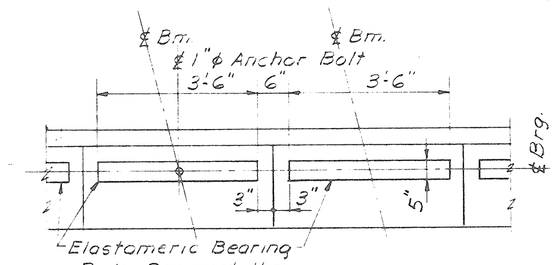
WINGWALL EXPANSION JOINT DETAIL

Scale: 1½"=1'-0"

Note: Construction Joint similar, except as noted. Omit Sheet Lead, Preformed Filler, and additional Reinforcing.







Note: Elastomeric Bearing Pads shall be set level on a bed of neat cement grout. The grout shall be allowed to harden before the Beams are erected.

ELASTOMERIC BEARING PAD DETAIL

Note:
See Sheet E48 for location and details of abutment lighting.

COMMONWEALTH OF MASSACHUSETTS
DOMENIC D'ERAMO
No. 24488
REGISTERED PROFESSIONAL ENGINEER

Limit of Bridge Payment Item 0212.425
El. 114.00'

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CH'KD	APP'D
3	7/28/80	Add #2 Item #179	V.K.	R.P.	
2	7/14/80	Addendum No. 1, Item #146	W.B.	V.K.	R.P.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601
ALEWIFE STATION/GARAGE
ABUTMENTS AND DETAILS

Wallace Floyd Associates, Inc. / Alan M. Voorhees
Sverdrup & Parcel and Associates, Inc.
Structural Civil Mechanical & Electrical Engineers
Le Messurier Associates/SCI
Structural Engineers

MASS. BAY TRANSPORTATION AUTHORITY APPROVED BY
John A. Carey
PROJECT MANAGER

SCALE	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
				59468	
DATE 7-28-80	C.R.	R.M.P.	M.E.	SHEET R9 OF	

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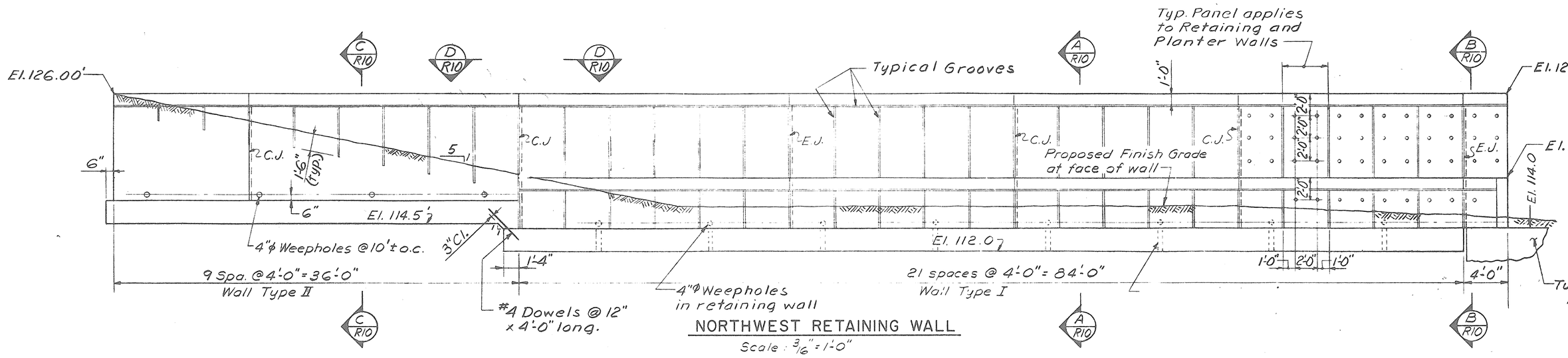
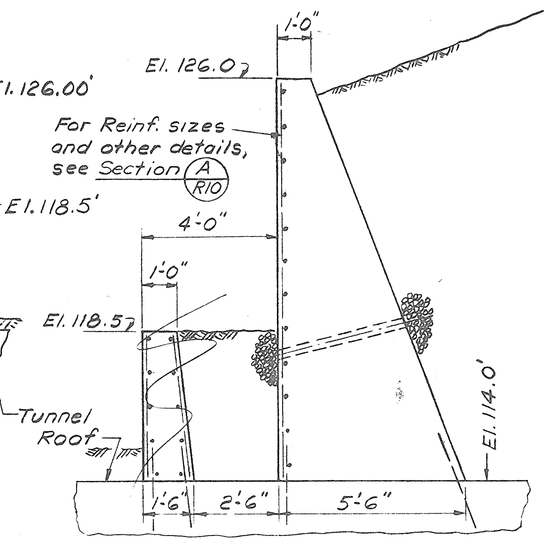
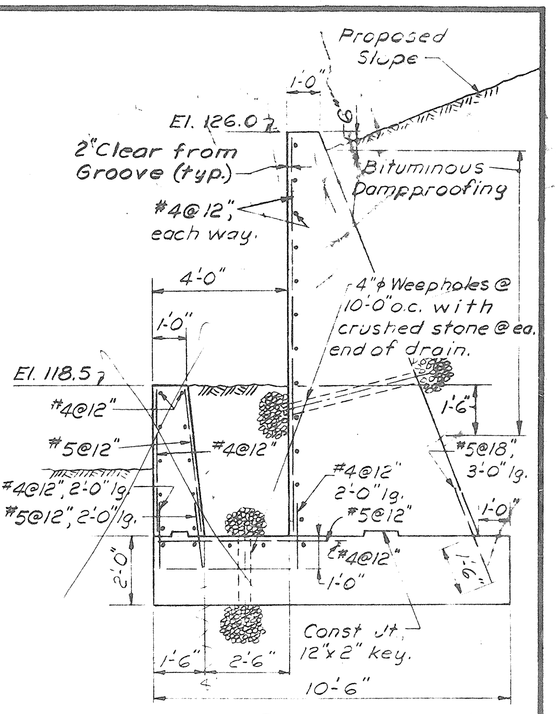
Proposal No. 610776-132090



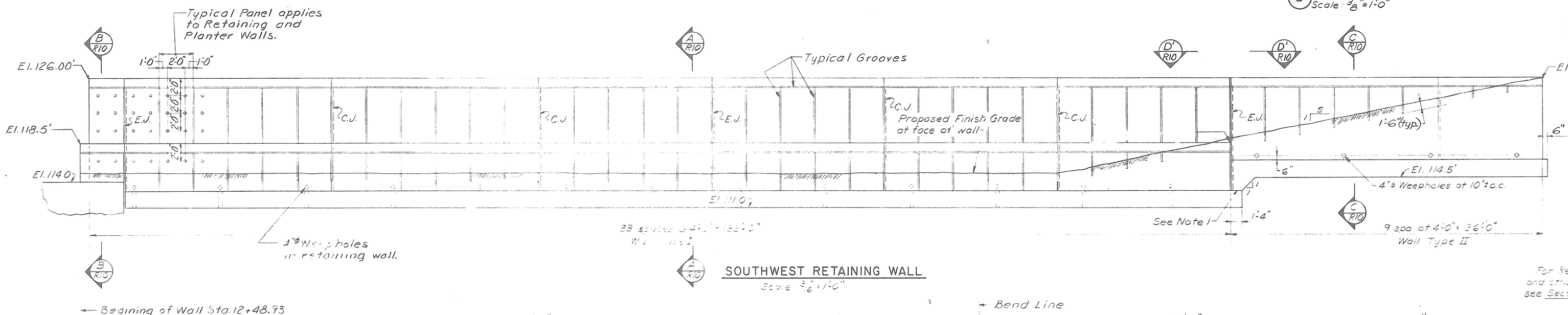
NORTHWEST RETAINING WALL
Scale: 3/16" = 1'-0"



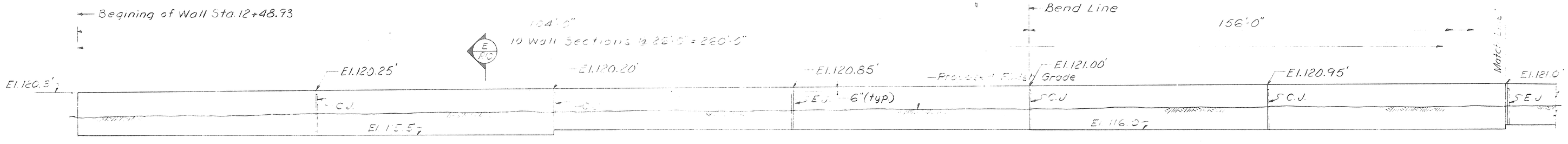
B SECTION
Scale: 3/8" = 1'-0"



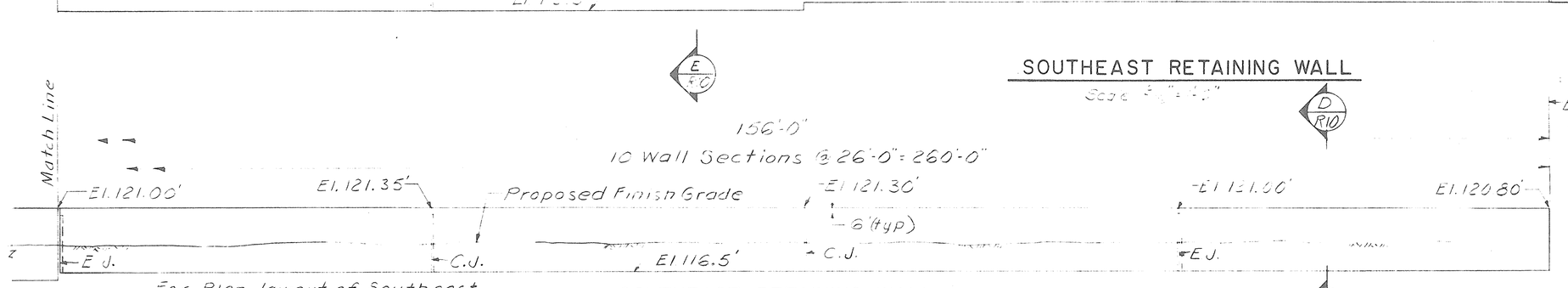
A SECTION TYPE I
Scale 3/8" = 1'-0"



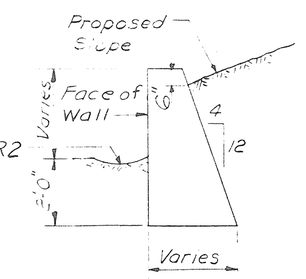
SOUTHWEST RETAINING WALL
Scale 3/16" = 1'-0"



SOUTHEAST RETAINING WALL
Scale 3/16" = 1'-0"



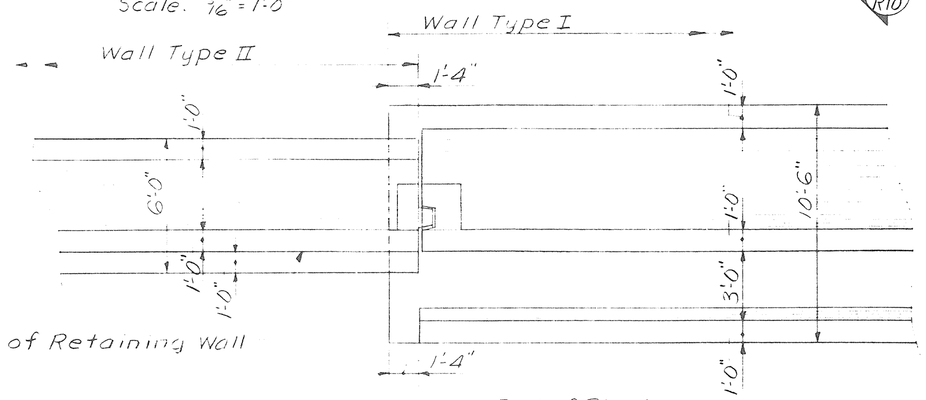
SOUTHEAST RETAINING WALL
Scale: 3/16" = 1'-0"



E SECTION
Scale: 3/8" = 1'-0"

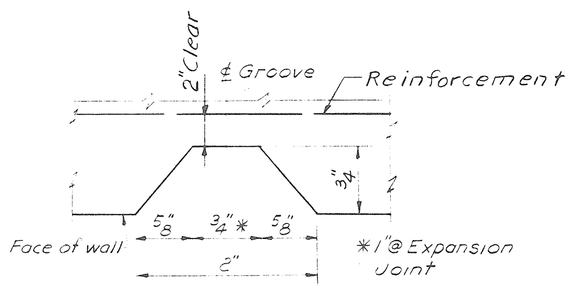
NOTE 1

Trowel to smooth finish. Apply two layers of heavy weight tar paper. (Expansion Joint only).



SECTION D-D (as shown)

SECTION D'-D' (opposite hand)
Scale: 4 = 1'-0"



HORIZONTAL AND VERTICAL GROOVE DETAIL
Full Size

AS BUILT

ISSUE	DATE	DESCRIPTION	BY	CH'D	APP'D
1	9/18/80	Addendum No. 1, Item #147	NB	HR	MS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NORTH WEST
CONTRACT NO. 091-601
ALEWIFE STATION/GARAGE
WALL ELEVATIONS AND DETAILS

Wallace Floyd Ellenzweig Moore Inc. Landscape Architects
Severdrup & Parcel and Associates, Inc. Structural, Civil, Mechanical & Electrical Engineers
Le Messurier Associates/SCI Structural Engineers

MASS BAY TRANSPORTATION AUTHORITY APPROVED BY
PROJECT MANAGER

SCALE	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.
AS NOTED				59468A
DATE 7-28-80	CER	RMP		SHEET R10 OF

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808130

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Proposal No. 91077-132090

DOCUMENT A00865

BEAMS 1 AND 2 SHORING SYSTEM DETAILS

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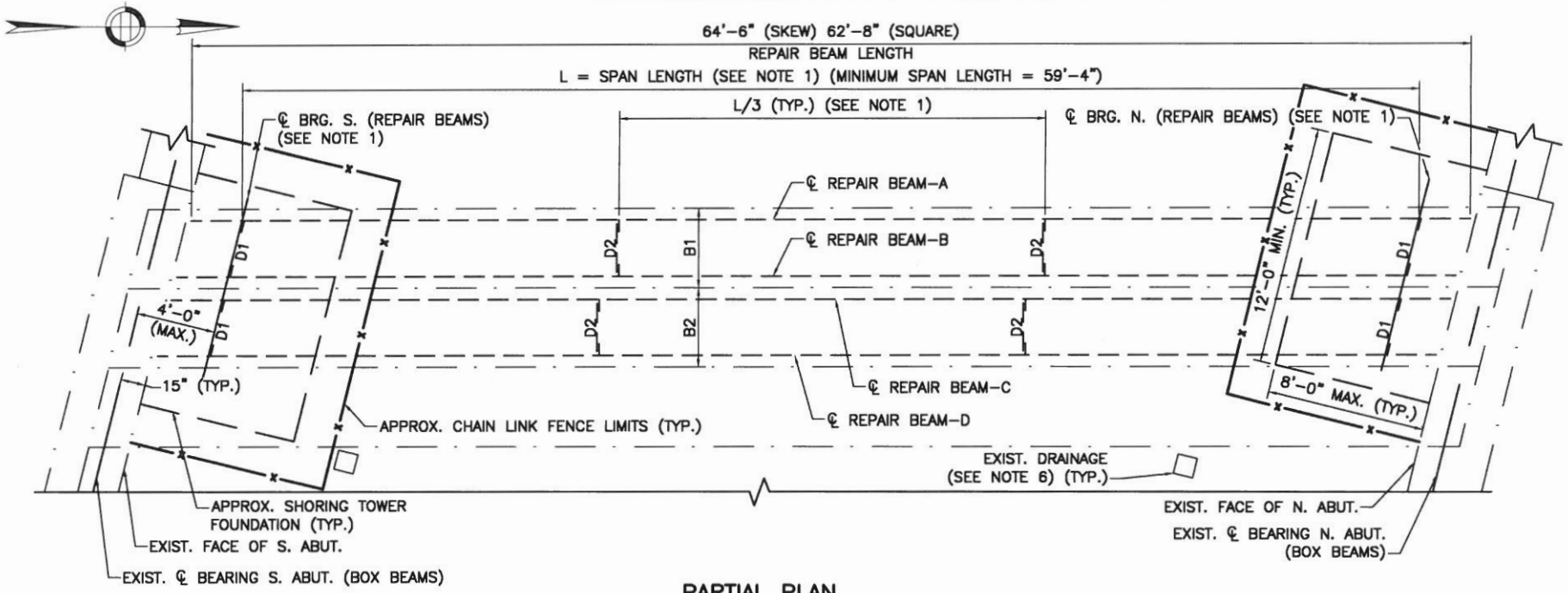


PARTIAL PLAN
SCALE: $\frac{1}{8}$" = 1'-0"

GENERAL NOTES:

EXISTING FEATURES
NO SURVEY DATA IS AVAILABLE FOR THIS PROJECT. LOCATIONS AND DIMENSIONS OF THE EXISTING SITE FEATURES SHOWN ON THESE PLANS ARE FOR GENERAL REFERENCE ONLY AND ARE NOT GUARANTEED TO BE ACCURATE. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND DETAILS NECESSARY FOR COMPLETION OF ALL WORK, PRIOR TO ORDERING MATERIALS OR COMMENCING FABRICATION. THE CONTRACTOR SHALL VISIT THE SITE TO INSPECT THE WORK AREAS PRIOR TO BIDDING.

THE CONTRACTOR SHALL SUBMIT A WORK PLAN TO SHOW IMPACT TO MBTA GARAGE AND FACILITY.

DESIGN
IN ACCORDANCE WITH THE 2019 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS.

REFER TO THE MASSDOT BRIDGE RATING REPORT PERFORMED BY TRANSYSTEMS IN SEPTEMBER 2021 FOR DESIGN OPERATING LIVE LOAD.

NETTING
CONTRACTOR SHALL REMOVE THE EXISTING NETTING UNDER BEAMS AS NEEDED TO INSTALL SHORING SYSTEM.

AFTER THE COMPLETION OF THE REPAIR, THE NETTING SHALL BE RESTORED TO ITS ORIGINAL INTENT, AS DIRECTED BY MASSDOT.

LIGHTING
CONTRACTOR SHALL RELOCATE ANY EXISTING UNDERBRIDGE LIGHTING FIXTURES THAT WILL BE IMPACTED BY THE PROPOSED SHORING SYSTEM, AS NECESSARY.

STRUCTURAL STEEL
1. ALL BOLTS SHALL BE $\frac{7}{8}$" DIAMETER, ASTM F3125 GRADE A326 TYPE 3 HIGH STRENGTH BOLTS IN $\frac{15}{16}$" DIAMETER HOLES, UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED.
2. ALL BOLT HOLES SHALL BE DRILLED FULL SIZE OR SUBPUNCHED AND REAMED TO SIZE UNLESS NOTED OTHERWISE.
3. ALL BOLTS SHALL BE FURNISHED SUCH THAT THREADS ARE EXCLUDED FROM THE SHEAR PLANE.
4. ALL BOLTED CONNECTIONS ARE CONSIDERED SLIP CRITICAL CONNECTIONS WITH CLASS B FAYING SURFACES.

PARTIAL PLAN NOTES:

1. CENTERLINE OF BEARING OF REPAIR BEAMS IS APPROXIMATELY SHOWN. THE REPAIR BEAM SPAN LENGTHS WILL DEPEND ON THE MODULAR SHORING SYSTEM.
2. D1 = C12x20.7 (TYP. END DIAPHRAGM)
   D2 = C12x20.7 (TYP. INTERMEDIATE DIAPHRAGM)
3. SEE SHEET 4 FOR DIAPHRAGM SUPPORT DETAILS.
4. ALL STEEL SHALL CONFORM TO AASHTO M 270 GRADE 50, UNLESS NOTED OTHERWISE, AND SHALL BE UNCOATED.
5. BEAM ENDS SHALL BE CUT SQUARE AND PROVIDE A MINIMUM 3" FROM BEAM END TO FACE OF ABUTMENT
6. CONTRACTOR TO CONFIRM LOCATION OF EXISTING DRAINAGE IN FRONT OF EACH ABUTMENT. IF SHORING SYSTEM FOUNDATION IMPACTS DRAINAGE, CONTRACTOR SHALL PROVIDE SILT SACK.

COMMONWEALTH OF MASSACHUSETTS
GABRIELLE J. PIPP
CIVIL
No. 54501
REGISTERED PROFESSIONAL ENGINEER
12-23-2021

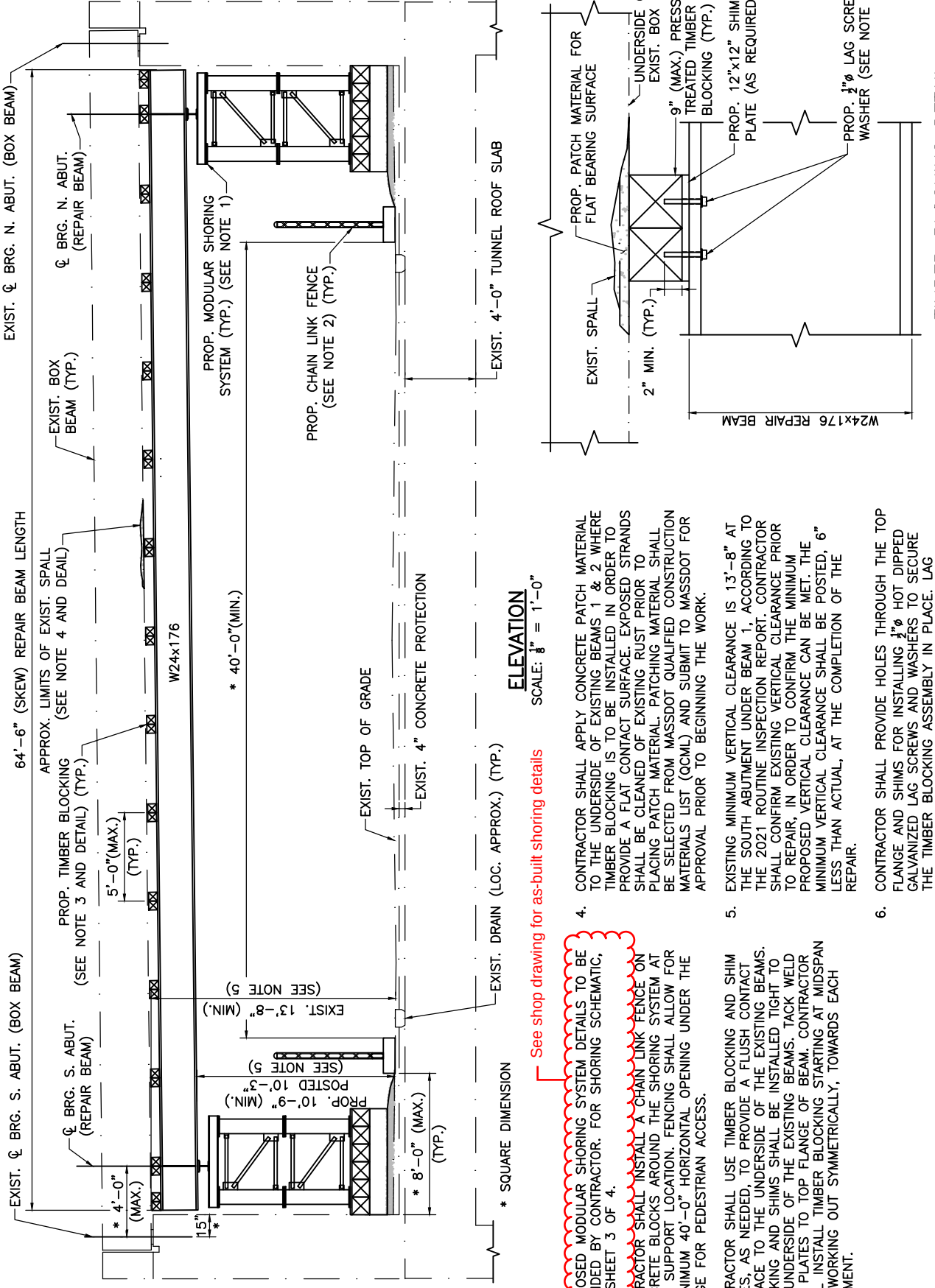
HNTB
31 ST JAMES ST, STE. 300
BOSTON, MA 02116
(617) 542-6900

PROJECT: BRIDGE NO. C-01-031 (4DR)
BEAMS B1 & B2 REPAIR

SUBJECT: PARTIAL PLAN & GENERAL NOTES

SHEET:	1 OF 4
DRAWN BY:	GJP
DATE:	11/22/2021
CHECKED BY:	MTB
DATE:	11/23/2021

Proposal No. 610766-132090



See shop drawing for as-built shoring details

NOTES:

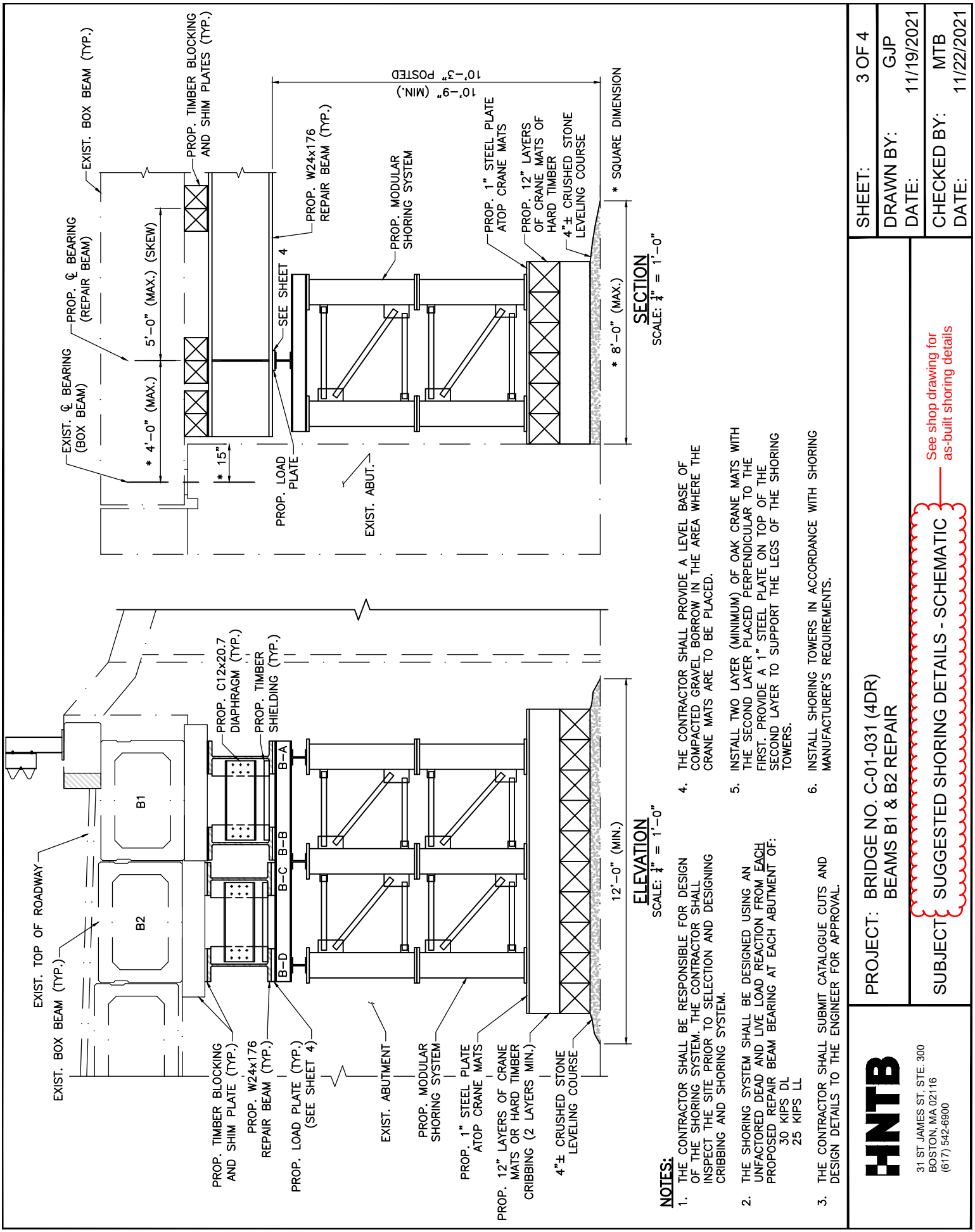
1. PROPOSED MODULAR SHORING SYSTEM DETAILS TO BE PROVIDED BY CONTRACTOR. FOR SHORING SCHEMATIC, SEE SHEET 3 OF 4.
2. CONTRACTOR SHALL INSTALL A CHAIN LINK FENCE ON CONCRETE BLOCKS AROUND THE SHORING SYSTEM AT EACH SUPPORT LOCATION. FENCING SHALL ALLOW FOR A MINIMUM 40'-0" HORIZONTAL OPENING UNDER THE BRIDGE FOR PEDESTRIAN ACCESS.
3. CONTRACTOR SHALL USE TIMBER BLOCKING AND SHIM PLATES, AS NEEDED, TO PROVIDE A FLUSH CONTACT SURFACE TO THE UNDERSIDE OF THE EXISTING BEAMS. BLOCKING AND SHIMS SHALL BE INSTALLED TIGHT TO THE UNDERSIDE OF THE EXISTING BEAMS. TACK WELD SHIM PLATES TO TOP FLANGE OF BEAM. CONTRACTOR SHALL INSTALL TIMBER BLOCKING STARTING AT MIDSPAN AND WORKING OUT SYMMETRICALLY, TOWARDS EACH ABUTMENT.
4. CONTRACTOR SHALL APPLY CONCRETE PATCH MATERIAL TO THE UNDERSIDE OF EXISTING BEAMS 1 & 2 WHERE TIMBER BLOCKING IS TO BE INSTALLED IN ORDER TO PROVIDE A FLAT CONTACT SURFACE. EXPOSED STRANDS SHALL BE CLEANED OF EXISTING RUST PRIOR TO PLACING PATCH MATERIAL. PATCHING MATERIAL SHALL BE SELECTED FROM MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST (QCML) AND SUBMIT TO MASSDOT FOR APPROVAL PRIOR TO BEGINNING THE WORK.
5. EXISTING MINIMUM VERTICAL CLEARANCE IS 13'-8" AT THE SOUTH ABUTMENT UNDER BEAM 1, ACCORDING TO THE 2021 ROUTINE INSPECTION REPORT. CONTRACTOR SHALL CONFIRM EXISTING VERTICAL CLEARANCE PRIOR TO REPAIR, IN ORDER TO CONFIRM THE MINIMUM PROPOSED VERTICAL CLEARANCE CAN BE MET. THE MINIMUM VERTICAL CLEARANCE SHALL BE POSTED, 6" LESS THAN ACTUAL, AT THE COMPLETION OF THE REPAIR.
6. CONTRACTOR SHALL PROVIDE HOLES THROUGH THE TOP FLANGE AND SHIMS FOR INSTALLING 1"ø HOT DIPPED GALVANIZED LAG SCREWS AND WASHERS TO SECURE THE TIMBER BLOCKING ASSEMBLY IN PLACE. LAG SCREWS SHALL HAVE A MINIMUM 2" EMBEDMENT DEPTH INTO THE TIMBER BLOCKING.

HNTB
31 ST JAMES ST, STE. 300
BOSTON, MA 02116
(617) 542-6900

PROJECT: BRIDGE NO. C-01-031 (4DR)
BEAMS B1 & B2 REPAIR

SUBJECT: ELEVATION

SHEET: 2 OF 4
DRAWN BY: GJP
DATE: 11/22/2021
CHECKED BY: MTB
DATE: 11/23/2021



NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN OF THE SHORING SYSTEM. THE CONTRACTOR SHALL INSPECT THE SITE PRIOR TO SELECTION AND DESIGNING CRIBBING AND SHORING SYSTEM.
2. THE SHORING SYSTEM SHALL BE DESIGNED USING AN UNFACTORED DEAD AND LIVE LOAD REACTION FROM EACH PROPOSED REPAIR BEAM BEARING AT EACH ABUTMENT OF:
   30 KIPS DL
   25 KIPS LL
3. THE CONTRACTOR SHALL SUBMIT CATALOGUE CUTS AND DESIGN DETAILS TO THE ENGINEER FOR APPROVAL.
4. THE CONTRACTOR SHALL PROVIDE A LEVEL BASE OF COMPACTED GRAVEL BORROW IN THE AREA WHERE THE CRANE MATS ARE TO BE PLACED.
5. INSTALL TWO LAYER (MINIMUM) OF OAK CRANE MATS WITH THE SECOND LAYER PLACED PERPENDICULAR TO THE FIRST. PROVIDE A 1" STEEL PLATE ON TOP OF THE SECOND LAYER TO SUPPORT THE LEGS OF THE SHORING TOWERS.
6. INSTALL SHORING TOWERS IN ACCORDANCE WITH SHORING MANUFACTURER'S REQUIREMENTS.

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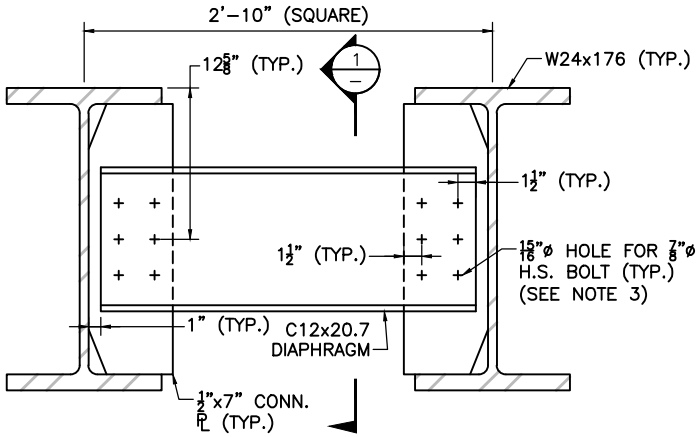
31 ST JAMES ST, STE. 300
BOSTON, MA 02116
(617) 542-6900

PROJECT: BRIDGE NO. C-01-031 (4DR)
BEAMS B1 & B2 REPAIR

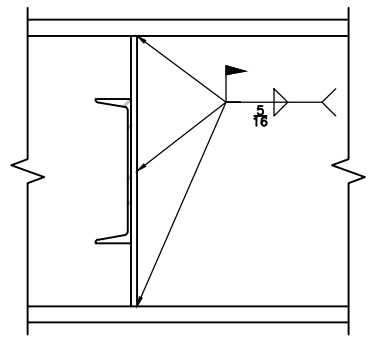
SUBJECT: SUGGESTED SHORING DETAILS - SCHEMATIC

See shop drawing for as-built shoring details

SHEET:	3 OF 4
DRAWN BY:	GJP
DATE:	11/19/2021
CHECKED BY:	MTB
DATE:	11/22/2021



ELEVATION VIEW

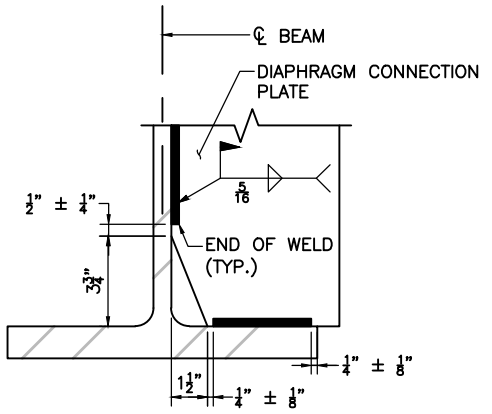


NOTE: INTERMEDIATE DIAPHRAGM SHOWN, END DIAPHRAGM SIMILAR.

SECTION 1

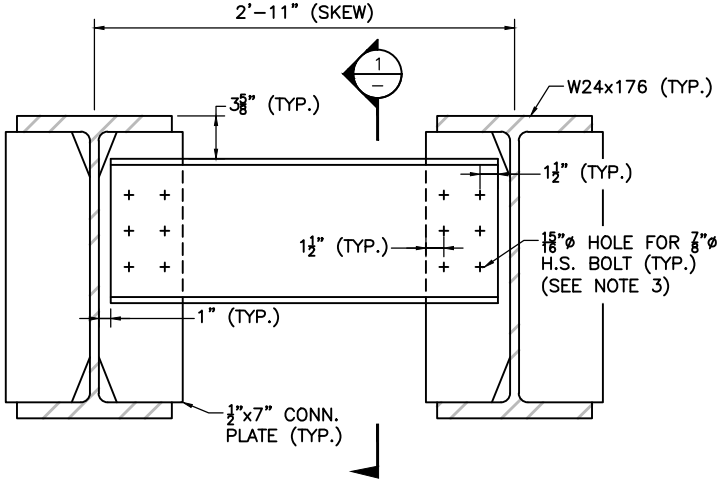
INTERMEDIATE DIAPHRAGM DETAILS

SCALE: 3/4" = 1'-0"

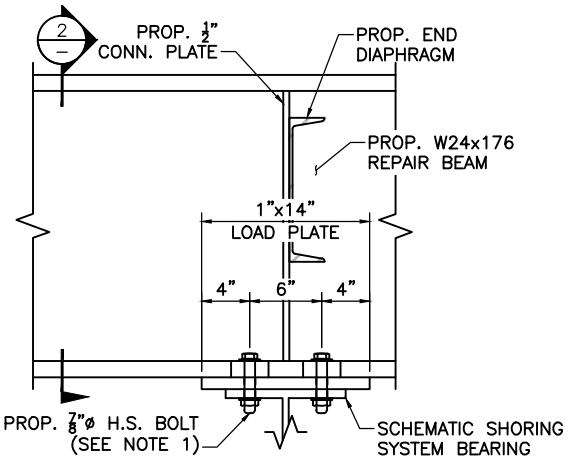


CLIP DETAIL

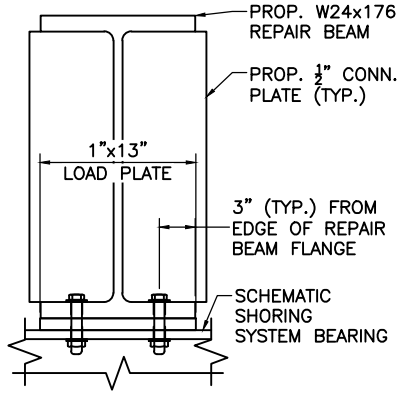
NOT TO SCALE



ELEVATION VIEW



ELEVATION VIEW



SECTION 2

END DIAPHRAGM DETAILS

SCALE: 3/4" = 1'-0"

LOAD PLATE DETAILS

SCALE: 3/4" = 1'-0"

NOTES:

1. STANDARD 15/16"ø HOLES FOR 7/8"ø BOLTS AT SOUTH ABUTMENT (FIXED) IN BOTTOM FLANGE REPAIR BEAM, LOAD PLATE AND SHORING SYSTEM BEARING MEMBER. LONG SLOT 15/16"ø HOLES FOR 7/8"ø BOLTS AT NORTH ABUTMENT (EXPANSION) IN BOTTOM FLANGE REPAIR BEAM. LOAD PLATE AND SHORING SYSTEM BEARING MEMBER AT NORTH ABUTMENT SHALL HAVE STANDARD 15/16"ø HOLES FOR 7/8"ø BOLTS.
2. THE CONTRACTOR SHALL SUBMIT A WELDING PROCEDURE FOR ALL FIELD WELDING TO MASSDOT FOR REVIEW, PRIOR TO BEGINNING WORK.
3. THE CONTRACTOR MAY CHOOSE TO FIELD DRILL THE 15/16"ø HOLES ON ONE (1) OF THE TWO (2) CONNECTION PLATES FOR EACH DIAPHRAGM, FOR FIELD FIT UP.

HNTB
31 ST JAMES ST, STE. 300
BOSTON, MA 02116
(617) 542-6900

PROJECT: BRIDGE NO. C-01-031 (4DR)
BEAMS B1 & B2 REPAIR

SUBJECT: STEEL DETAILS

SHEET:	4 OF 4
DRAWN BY:	GJP
DATE:	11/22/2021
CHECKED BY:	MTB
DATE:	11/23/2021

Proposal No. 610766-132090

GENERAL NOTES

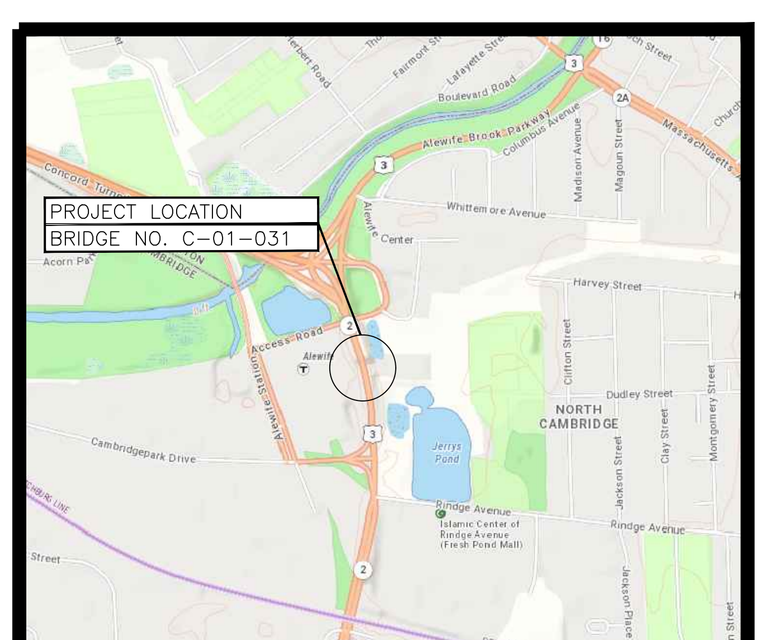
1. PROPOSED SHORING DESIGN DEVELOPED IN ACCORDANCE WITH THE 2002 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 17TH EDITION WITH INTERIM SPECIFICATIONS THROUGH 2007 USING ALLOWABLE STRESS DESIGN.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE RELEVANT PROVISIONS OF THE 2021 MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES WITH THE SUPPLEMENTAL SPECIFICATIONS DATED MARCH 31,2021.
3. THESE DRAWINGS WERE FORMATTED FOR 24"x36" PLAN SHEETS. SCALES NOTED ON THE DRAWINGS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS.
4. EXISTING STRUCTURE DIMENSIONS AND DETAILS ARE ACCORDING TO ORIGINAL CONSTRUCTION DRAWINGS, OBSERVATION, AND FIELD MEASUREMENTS AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENT (I.E. BEARING LOCATIONS, EXISTING REPAIRS, ETC.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY AND ACCURACY THEREOF, AND SHALL NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION UNTIL THEY HAVE MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE AND THE EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY NOT TO DAMAGE UTILITIES, EQUIPMENT, STRUCTURES, OR THOSE PORTIONS OF THE SUPERSTRUCTURE THAT ARE TO REMAIN IN PLACE, THAT ARE TO BE REUSED, OR THAT ARE TO REMAIN THE PROPERTY OF OTHERS. ANY PORTION OF THE SUPERSTRUCTURE TO REMAIN WHICH BECOMES DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.
6. WELDING AND FABRICATION OF STEEL SHALL CONFORM TO THE RELEVANT PROVISIONS OF THE AASHTO ASD STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, THE ANSI/AWS D1.1 STRUCTURAL WELDING CODE, THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE, AND THE MASSACHUSETTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES. WELDING ELECTRODES SHALL CONFORM TO AWS E70XX.
7. ALL TIMBER DIMENSIONS ARE NOMINAL UNLESS OTHERWISE NOTED.
8. SHORING LOADS AND LAYOUT FROM HNTB PLANS DATED 12/20/2021.

MATERIALS

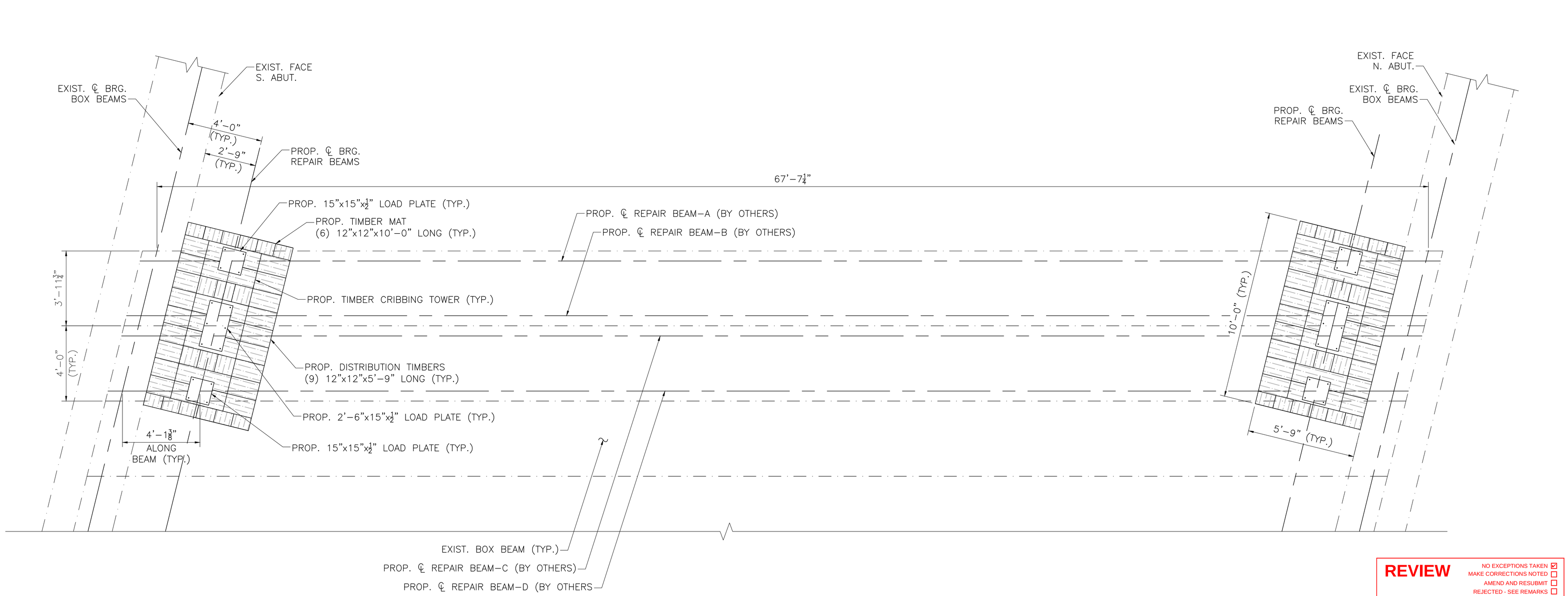
1. ALL STRUCTURAL TIMBER SHALL BE PRESSURE TREATED HEM FIR NO. 2 OR BETTER, UNLESS OTHERWISE NOTED.
2. TIMBER LAG SCREWS SHALL BE IN ACCORDANCE WITH ANSI/ASME STANDARD B18.2.1 AND SHALL BE $\frac{5}{8}$"ø. LENGTHS OF LAG SCREWS WILL BE AS SHOWN ON THE PLANS.
3. ALL BOLTS SHALL BE $\frac{1}{4}$"ø HIGH STRENGTH BOLTS (H.S.). THE BOLTS SHALL CONFORM TO ASTM F3125, GRADE 325, TYPE 3 AND NUTS AND WASHERS SHALL CONFORM TO AASHTO M292 AND M293 RESPECTIVELY. NUTS SHALL BE LUBRICATED WITH A LUBRICANT CONTAINING A VISIBLE DYE.
4. THREADED RODS SHALL BE $\frac{1}{2}$"ø CONFORMING TO ASTM A307 GRADE A. NUTS SHALL CONFORM TO AASHTO M291. PLATE WASHERS SHALL CONFORM TO ASTM A36. ALL RODS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M298 (ASTM B695) CLASS 50. NUTS AND WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE SAME PROCESS.
5. ALL PROPOSED STEEL PLATES SHALL BE AASHTO M270 GRADE 36 (ASTM A709). CHARPY V-NOTCH TESTING NOT REQUIRED.
6. SHIM PLATES IF REQUIRED MAY BE ANY GRADE OF STEEL.
7. JACKS SHALL BE ELLIS BRIDGE JACK MODEL BJ-3 WITH A SAFE LOAD CAPACITY OF 80 KIPS WITH A FACTOR OF SAFETY OF 2.5 OR APPROVED EQUAL.
8. CRUSHED STONE SHALL CONFORM TO THE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATION M2.01.7.

SHORING INSTALLATION NOTES:

1. CONTRACTOR SHALL ESTABLISH LEVEL BASE AS SHOWN ON THE DRAWINGS AND FIELD MEASURE VERTICAL HEIGHT OF SHORING REQUIRED.
2. ERECT SHORING AS SHOWN ON THE DRAWINGS.



LOCUS PLAN
NOT TO SCALE



PROPOSED REPAIR BEAM SHORING PLAN
SCALE: $\frac{3}{8}$" = 1'-0"

REVIEW
NO EXCEPTIONS TAKEN ☑
MAKE CORRECTIONS NOTED ☐
AMEND AND RESUBMIT ☐
REJECTED - SEE REMARKS ☐
NOT REVIEWED - SEE REMARKS ☐
Reviewed only for general conformance with the project requirements indicated in Contract Documents and for consistency with the project design concept. This review does not relieve the Contractor from responsibility for errors or omissions in designs for which the Contractor is responsible. Contractor is responsible for compliance with all requirements of the Contract Documents and for the safe and successful construction of the work. This review does not consider the means, methods, techniques, sequences, fabrication processes, and operations of construction, or safety precautions or programs incidental thereto, which are the sole responsibility of the Contractor.
HNTB
BY GJP
DATE 1/19/2022

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)
GILL ENGINEERING

C01031 Shoring Plans.dwg Plotted on 15-Jan-2022 8:24 PM

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
1/03/2022	ASD	JAV	GRK	FOR APPROVAL
1/14/2022	ASD	JAV	GRK	REVISED PER MASSDOT COMMENTS

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS — GEORGE R. KOBER — STRUCTURAL — NO. 41483 — REGISTERED PROFESSIONAL ENGINEER

TEMPORARY SHORING

SPS NEW ENGLAND INC.

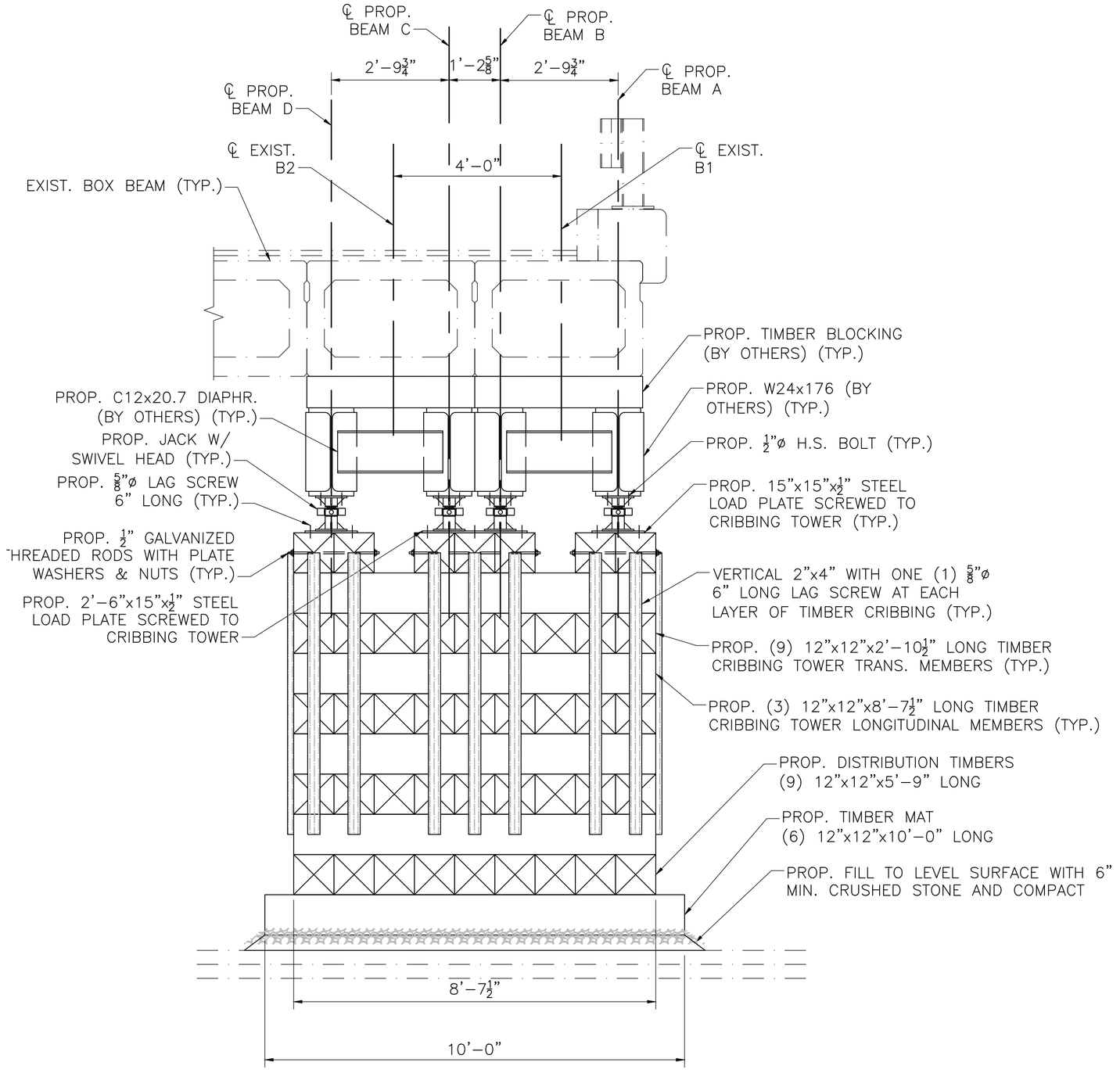
TEMPORARY SHORING FOR CAMBRIDGE C-01-031(4DR) ST 16 OVER RED LINE

NOTES & PLAN

SHEET 01 OF 02

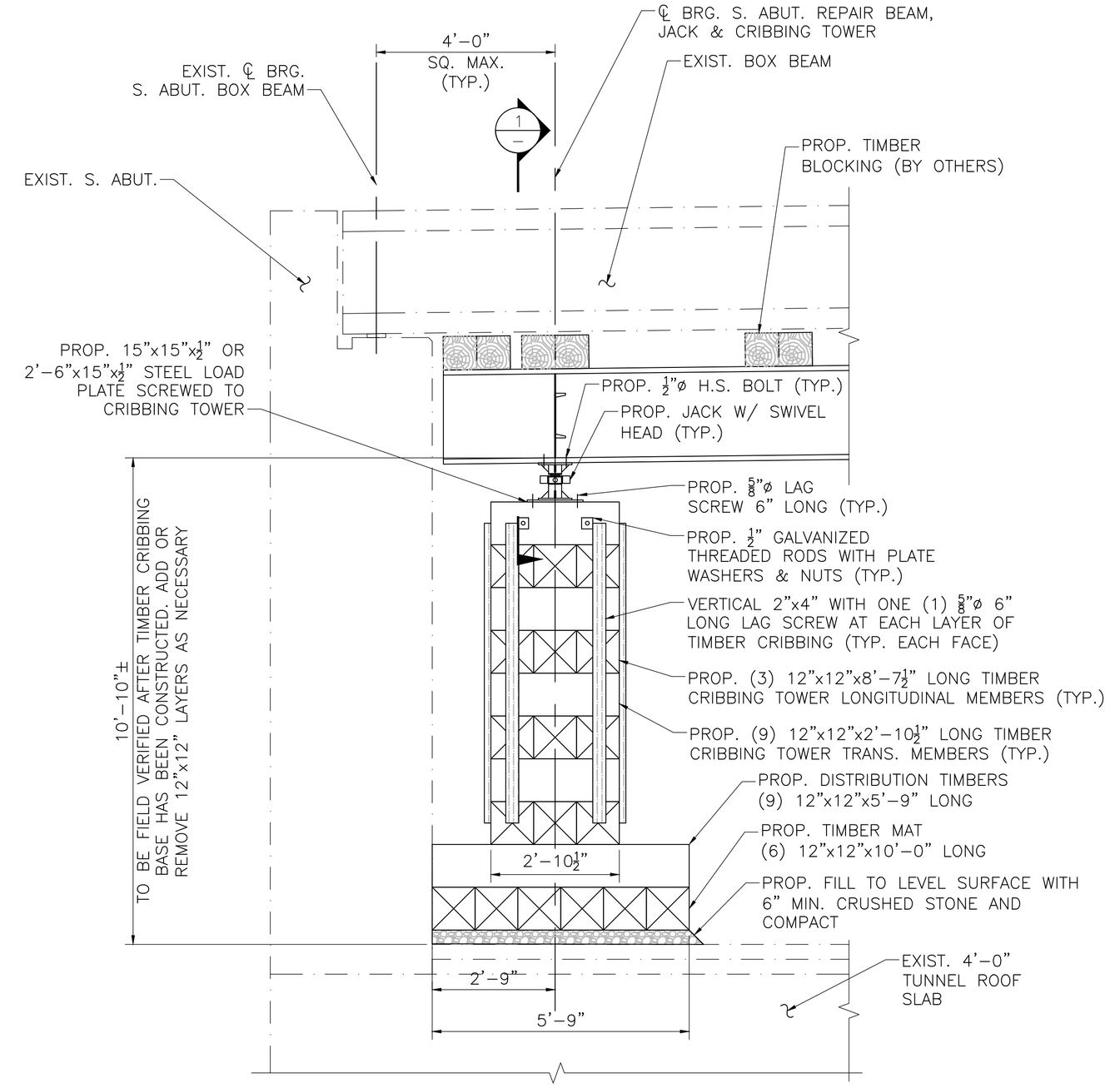
Proposal No. 61077-132090

A00865 - 7



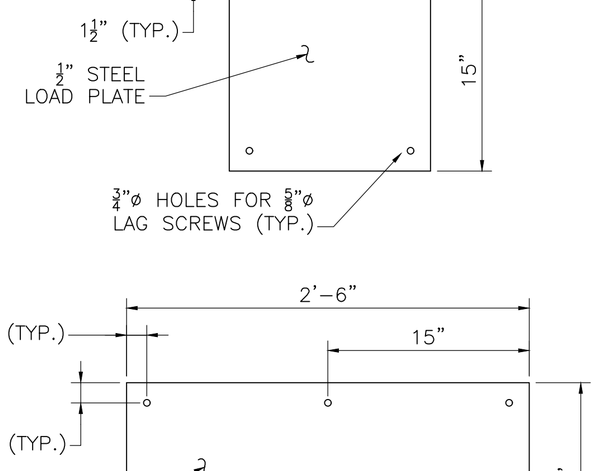
PROPOSED LONGITUDINAL CRIBBING TOWER ELEVATION

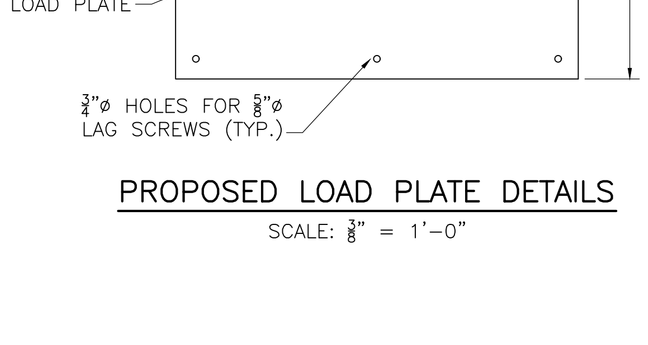
SCALE: ½" = 1'-0"



PROPOSED TRANSVERSE CRIBBING TOWER ELEVATION

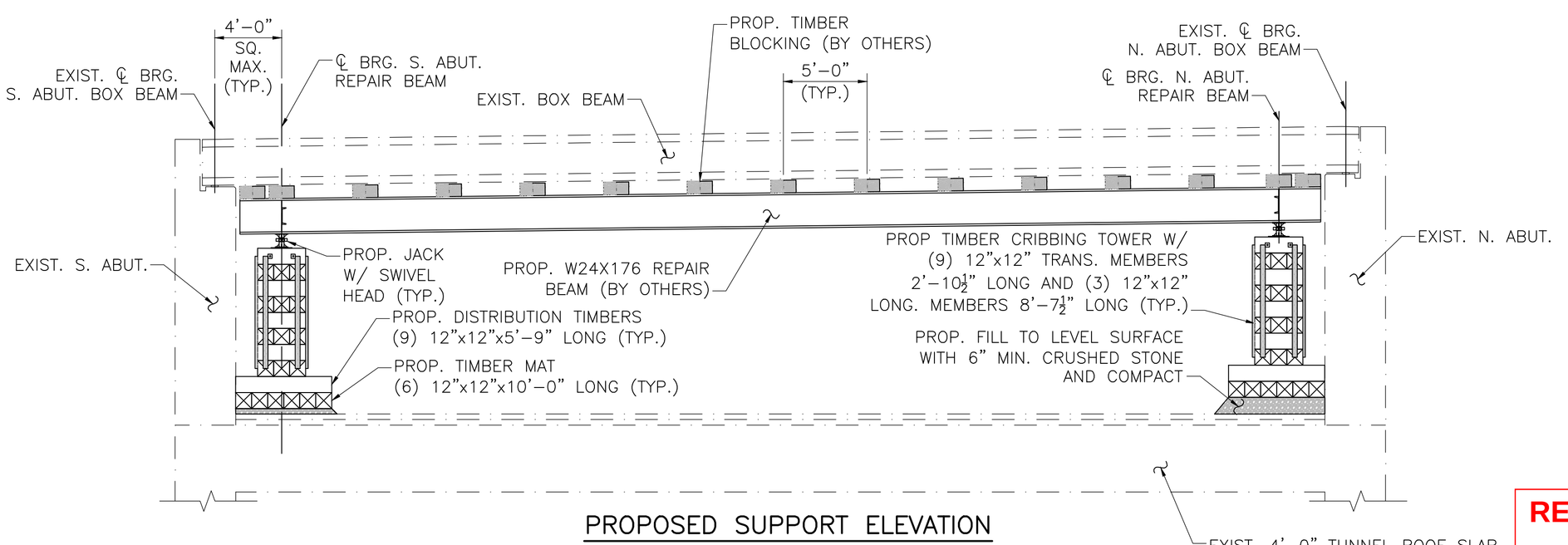
SCALE: ½" = 1'-0"





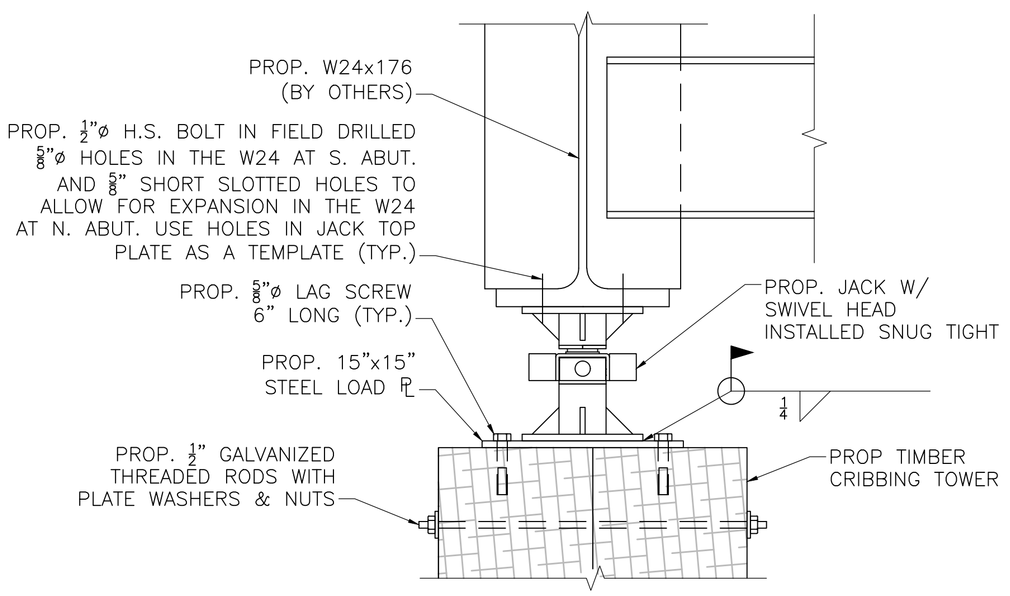
PROPOSED LOAD PLATE DETAILS

SCALE: ⅜" = 1'-0"



PROPOSED SUPPORT ELEVATION

SCALE: 3/16" = 1'-0"



NOTE:

LOAD PLATE SECTION BELOW BEAMS A & D SHOWN, LOAD PLATE SECTION BELOW BEAMS B & C SIMILAR

SECTION 1/—

SCALE: 1½" = 1'-0"

REVIEW

NO EXCEPTIONS TAKEN ☑
MAKE CORRECTIONS NOTED ☐
AMEND AND RESUBMIT ☐
REJECTED - SEE REMARKS ☐
NOT REVIEWED - SEE REMARKS ☐

Reviewed only for general conformance with the project requirements indicated in Contract Documents and for consistency with the project design concept. This review does not relieve the Contractor from responsibility for errors or omissions in designs for which the Contractor is responsible. Contractor is responsible for compliance with all requirements of the Contract Documents and for the safe and successful construction of the work. This review does not consider the means, methods, techniques, sequences, fabrication processes, and operations of construction, or safety precautions or programs incidental thereto, which are the sole responsibility of the Contractor.

HNTB

BY GJP

DATE 1/19/2022

63 KENDRICK STREET
NEEDHAM, MA 02494
781-355-7100
781-355-7101 (FAX)

GILL ENGINEERING

C01031 Shoring Plans.dwg Plotted on 15-Jan-2022 8:23 PM

DATE	DRW. BY	CALC. BY	APPRV. BY	DESCRIPTION
1/03/2022	ADD	JAV	GRK	FOR APPROVAL
1/14/2022	ADD	JAV	GRK	REVISED PER MASSDOT COMMENTS

REGISTERED PROFESSIONAL ENGINEER — DATE

COMMONWEALTH OF MASSACHUSETTS — GEORGE R. KRIEG — STRUCTURAL — NO. 41443 — REGISTERED PROFESSIONAL ENGINEER

TEMPORARY SHORING

SPS NEW ENGLAND INC.

TEMPORARY SHORING FOR CAMBRIDGE C-01-031(4DR) ST 16 OVER RED LINE

SHORING ELEVATIONS & DETAILS

SHEET 02 OF 02

Proposal No. 61077-1320900

Y00865 - 8

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

CAMBRIDGE

For: **Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the City of CAMBRIDGE in Middlesex County, in the Commonwealth of Massachusetts, and is shown by the locus map (Document 00331) in the Proposal Pamphlet, the work locations extend as follows:

Route 3/Route 16/Route 2

Beginning – Station 101+05.00 +/-
Ending –Station 110+85.00 +/-

The contract prices shall include the furnishing of all materials (except as otherwise herein specified), the performing of all the labor requisite or proper, the providing of all necessary machinery, tools, apparatus and other means of construction, the doing of all the abovementioned work in the manner set forth, described and shown in the specifications and on the drawings for the work, and in the form of contract, and the completion thereof within **735 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 # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
100.95	1	GEOTECHNICAL MONITORING AND INSTRUMENTATION AT _____ LUMP SUM		
100.951	1	PRE-CONSTRUCTION AND POST-CONSTRUCTION SURVEYS AT _____ LUMP SUM		
101.1	0.25	CLEARING AT _____ PER ACRE		
102.2	1	TREE TRIMMING AT _____ LUMP SUM		
102.3	20	HERBICIDE TREATMENT OF INVASIVE PLANTS AT _____ PER HOUR		
102.511	24	TREE PROTECTION - ARMORING AND PRUNING AT _____ EACH		
102.521	950	TREE AND PLANT PROTECTION FENCE AT _____ PER FOOT		
102.523	1,900	TREE AND PLANT PROTECTION - VISIBILITY STAKES AT _____ PER FOOT		
102.55	70	ARBORIST AT _____ PER HOUR		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
103.	18	TREE REMOVED - DIAMETER UNDER 24 INCHES AT _____ EACH		
114.1	1	DEMOLITION OF SUPERSTRUCTURE OF BRIDGE NO. C-01-031 (4DR) AT _____ LUMP SUM		
119.	1	RODENT CONTROL AT _____ LUMP SUM		
119.5	1	CONSTRUCTION NOISE CONTROL AT _____ LUMP SUM		
120.1	360	UNCLASSIFIED EXCAVATION AT _____ PER CUBIC YARD		
127.1	130	REINFORCED CONCRETE EXCAVATION AT _____ PER CUBIC YARD		
127.12	5	REINFORCED CONCRETE EXCAVATION FOR SUBSTRUCTURE REPAIRS AT _____ PER CUBIC YARD		
140.	200	BRIDGE EXCAVATION AT _____ PER CUBIC YARD		
141.1	10	TEST PIT FOR EXPLORATION AT _____ PER CUBIC YARD		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
146.	2	DRAINAGE STRUCTURE REMOVED AT _____ EACH		
151.	325	GRAVEL BORROW AT _____ PER CUBIC YARD		
151.2	35	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES AT _____ PER CUBIC YARD		
156.	30	CRUSHED STONE AT _____ PER TON		
170.	1,400	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ PER SQUARE YARD		
180.01	1	ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AT _____ LUMP SUM		
180.02	80	PERSONAL PROTECTION LEVEL C UPGRADE AT _____ PER HOUR		
180.03	80	LICENSED SITE PROFESSIONAL SERVICES AT _____ PER HOUR		
181.11	500	DISPOSAL OF UNREGULATED SOIL AT _____ PER TON		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
181.12	60	DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY AT _____ PER TON		
181.13	30	DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY AT _____ PER TON		
181.14	35	DISPOSAL OF HAZARDOUS WASTE AT _____ PER TON		
182.1	1	INSPECTION AND TESTING FOR ASBESTOS AT _____ LUMP SUM		
182.2	100	REMOVAL OF ASBESTOS AT _____ PER FOOT		
184.1	2	DISPOSAL OF TREATED WOOD PRODUCTS AT _____ PER TON		
220.	7	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH		
221.	5	FRAME AND COVER AT _____ EACH		
222.1	2	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
222.5	4	BICYCLE-SAFE SCUPPER GRATE AT _____ EACH		
227.3	21	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT AT _____ PER CUBIC YARD		
227.31	430	REMOVAL OF DRAINAGE PIPE SEDIMENT AT _____ PER FOOT		
227.4	25	MASONRY PLUG AT _____ PER SQUARE FOOT		
303.10	20	10 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
303.12	140	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
309.	1,180	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
316.12	50	12 INCH WATER MAIN REMOVED AND DISPOSED AT _____ PER LINEAR FOOT		
350.10	2	10 INCH GATE AND GATE BOX AT _____ EACH		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
350.12	2	12 INCH GATE AND GATE BOX AT _____ EACH		
358.	3	GATE BOX ADJUSTED AT _____ EACH		
358.3	1	GATE AND GATE BOX REMOVED AND DISCARDED AT _____ EACH		
371.10	1	10 INCH COUPLING AT _____ EACH		
371.12	2	12 INCH COUPLING AT _____ EACH		
373.12	65	12 INCH WATER PIPE INSULATION AT _____ PER FOOT		
402.	105	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER CUBIC YARD		
415.2	5,250	PAVEMENT FINE MILLING AT _____ PER SQUARE YARD		
431.	20	HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE AT _____ PER SQUARE YARD		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
440.01	1	CONSTRUCTION DUST CONTROL AT _____ LUMP SUM		
450.32	250	SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) AT _____ PER TON		
450.42	105	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		
450.611	770	SUPERPAVE BRIDGE SURFACE COURSE - 12.5 POLYMER (SSC-B - 12.5 - P) AT _____ PER TON		
450.711	45	SUPERPAVE BRIDGE PROTECTIVE COURSE - 12.5POLYMER (SPC-B - 12.5 - P) AT _____ PER TON		
451.	65	HMA FOR PATCHING AT _____ PER TON		
452.	550	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
453.	3,105	HMA JOINT ADHESIVE AT _____ PER FOOT		
472.	115	TEMPORARY ASPHALT PATCHING AT _____ PER TON		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
482.4	20	SAWCUTTING PORTLAND CEMENT CONCRETE AT _____ PER FOOT		
482.5	525	SAWCUTTING ASPHALT PAVEMENT FOR BOX WIDENING AT _____ PER FOOT		
506.	305	GRANITE CURB TYPE VB - STRAIGHT AT _____ PER FOOT		
580.	305	CURB REMOVED AND RESET AT _____ PER FOOT		
594.	305	CURB REMOVED AND DISCARDED AT _____ PER FOOT		
620.12	800	GUARDRAIL, TL-2 (SINGLE FACED) AT _____ PER FOOT		
627.82	1	GUARDRAIL TANGENT END TREATMENT, TL-2 AT _____ EACH		
628.21	6	TRANSITION TO NCHRP 350 GUARDRAIL AT _____ EACH		
628.24	6	TRANSITION TO BRIDGE RAIL AT _____ EACH		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
628.305	4	TEMPORARY IMPACT ATTENUATOR, NON-REDIRECTIVE, TL-3 AT _____ EACH		
628.4	10	TEMPORARY IMPACT ATTENUATOR, REMOVED AND RESET AT _____ EACH		
630.2	1,020	HIGHWAY GUARD REMOVED AND DISCARDED AT _____ PER FOOT		
655.3	470	WOOD RAIL FENCE AT _____ PER FOOT		
669.	470	FENCE REMOVED AND STACKED AT _____ PER FOOT		
697.1	12	SILT SACK AT _____ EACH		
701.	470	CEMENT CONCRETE SIDEWALK AT _____ PER SQUARE YARD		
701.2	40	CEMENT CONCRETE PEDESTRIAN CURB RAMP AT _____ PER SQUARE YARD		
706.15	580	BRICK PAVERS REMOVED AND STACKED AT _____ PER SQUARE YARD		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
706.9	580	TEXTURIZED DECORATIVE PAVEMENT AT _____ PER SQUARE YARD		
722.3	1	SCHEDULE OF OPERATIONS (TYPE C) - FIXED PRICE $61,500 AT Sixty One Thousand Five Hundred Dollars LUMP SUM	$61,500.00	$61,500.00
741.	25	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE B) AT _____ PER MONTH		
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.	100	LOAM FOR ROADSIDES AT _____ PER CUBIC YARD		
765.	480	SEEDING AT _____ PER SQUARE YARD		
767.121	1,000	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
769.	375	PAVEMENT MILLING MULCH UNDER GUARD RAIL AT _____ PER FOOT		
804.2	350	2 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC (UL) AT _____ PER FOOT		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
811.36	1	ELECTRIC MANHOLE ADJUSTED AT _____ EACH		
811.38	2	ELECTRIC HANDHOLE REMOVED AND RESET AT _____ EACH		
812.09	2	LIGHT STANDARD FOUNDATION PRECAST AT _____ EACH		
812.102	2	LIGHT STANDARD FOUNDATION REMOVAL AT _____ EACH		
813.31	700	WIRE TYPE 7 NO. 8 GENERAL PURPOSE AT _____ PER FOOT		
813.52	350	WIRE TYPE 10 - #8 GROUNDING AND BONDING AT _____ PER FOOT		
813.72	2	GROUND ROD 10 FEET LONG AT _____ EACH		
820.111	1	HIGHWAY LIGHTING - UNDERPASS LIGHTING SYSTEM AT _____ LUMP SUM		
823.70	2	HIGHWAY LIGHTING POLE AND LUMINAIRE REMOVED AND RESET AT _____ EACH		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
829.06	1	ROADSIDE GUIDE SIGN AND SUPPORT REMOVED AND DISCARDED AT _____ EACH		
831.	50	ROADSIDE GUIDE SIGN (D6/D8) - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
832.	50	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
841.1	1	SUPPORTS FOR GUIDE SIGN (D6 W/ D8-5 INCH TUBULAR POST) STEEL AT _____ EACH		
847.1	10	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		
851.1	10	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	1,800	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
852.11	500	TEMPORARY PEDESTRIAN BARRICADE AT _____ PER FOOT		
852.12	10	TEMPORARY PEDESTRIAN CURB RAMP AT _____ EACH		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
853.1	16	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		
853.21	4,300	TEMPORARY BARRIER REMOVED AND RESET AT _____ PER FOOT		
853.23	1,100	TEMPORARY BARRIER (TL-3) AT _____ PER FOOT		
853.33	800	TEMPORARY BARRIER - LIMITED DEFLECTION (TL-3) AT _____ PER FOOT		
853.403	10	TRUCK MOUNTED ATTENUATOR AT _____ PER DAY		
853.8	10	TEMPORARY ILLUMINATION FOR WORK ZONE AT _____ PER DAY		
853.81	1	TEMPORARY ILLUMINATION FOR PEDESTRIAN DETOUR AT _____ LUMP SUM		
853.82	1	TEMPORARY ILLUMINATION FOR WALKWAY UNDER BRIDGE AT _____ LUMP SUM		
854.016	21,300	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ PER FOOT		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
854.036	2,100	TEMPORARY PAVING MARKINGS - 6 INCH (TAPE) AT _____ PER FOOT		
854.1	3,000	PAVEMENT MARKING REMOVAL AT _____ PER SQUARE FOOT		
856.	110	ARROW BOARD AT _____ PER DAY		
856.12	120	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ PER DAY		
859.	1,510	REFLECTORIZED DRUM AT _____ PER DAY		
859.1	110	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AT _____ PER DAY		
864.04	400	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) AT _____ PER SQUARE FOOT		
866.106	4,500	6 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
866.112	100	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
867.106	2,500	6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.112	100	12 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
874.41	15	TRAFFIC SIGN REMOVED AND DISCARDED AT _____ EACH		
903.	5	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE AT _____ PER CUBIC YARD		
905.2	20	5000 PSI, 3/8 INCH, 710 HP CEMENT CONCRETE AT _____ PER CUBIC YARD		
909.3	20	CRACK REPAIR AT _____ PER FOOT		
950.1	1	TEMPORARY SHORING AT _____ LUMP SUM		
953.1	1	EXCAVATION SUPPORT SYSTEM BRIDGE NO. C-01-031 (4DR) AT _____ LUMP SUM		
964.1	20	EPOXY BONDING COMPOUND AT _____ PER SQUARE FOOT		

Project # 610776	Contract # 132090			
Location : CAMBRIDGE				
Description : Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
992.33	1	TEMPORARY UTILITY SUPPORT STRUCTURE AT _____ LUMP SUM		
995.	1	BRIDGE SUPERSTRUCTURE, BRIDGE NO.C-01-031 (4DR) AT _____ LUMP SUM		
Total Qty:	72,642.25			

DOCUMENT B00853

SCHEDULE OF PARTICIPATION
BY DISADVANTAGED BUSINESS ENTERPRISES (DBEs)

APPENDIX F – FORM F3: DBE SCHEDULE OF PARTICIPATION

PRIME BIDDER: _____

DATE OF BID OPENING: _____ MassDOT PROJECT NO.: 610776

FEDERAL AID PROJECT NUMBER: NHP(BRR-ON)/HIP(BR)-0036(020)X

PROJECT LOCATION: CAMBRIDGE

Name Address and Phone Number of DBE	Name of Activity	NAICS Code(s)	(a) DBE Contractor Activity Amount *Construction Work*	(b) DBE Other Business Amount *Services, Supplies, Material*	(c) Total amount eligible for credit
Total Bid Amount	TOTALS:		$		$
$ 204,889	DBE Percentage of Total bid:		%		%

A copy of the DBE's most recent certification and an original affidavit must be attached to this document.

Is a Joint Check Approval being submitted for any of the above? ☐ Yes X No
Will any of the contractors listed above be using a third party to deliver materials or perform any portion of work?
☐ Yes X No
(i.e. manufacturing)

SIGNATURE:_____ DATE_____

NAME AND TITLE (*PRINT*):_____

EMAIL ADDRESS: _____TEL NO.:_____

Rev'd 5/8/13

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DOCUMENT B00854

DBE Letter of Intent

(To be completed by the DBE – Page 1 of 2)

The DBE firm will also include the latest MassUCP letter with this Letter of Intent.

To: _____ (Prime Bidder)

From: _____ (DBE Firm)

Federal Aid Project No.: NHP(BRR-ON)/HIP(BR)-0036(020)X

Bid Opening or Due Date: _____

Project Name: _____

Project Location: CAMBRIDGE

I, _____, authorized signatory of the above-reference DBE firm hereby declare:

(Print Name)

(a) My company is currently certified as a Disadvantaged Business Enterprise (DBE) by the Massachusetts Supplier Diversity Office (SDO), as a (check all that apply):

☐ CONTRACTOR ☐ REGULAR DEALER ☐ OTHER
☐ MANUFACTURER ☐ TRUCKING OPERATIONS ☐ PROFESSIONAL SERVICES

[Additional guidance is available at Title 49, Code of Federal Regulations, Part 26.55 (49 CFR Part 26.55)]

(b) My firm has the ability to manage, supervise and perform the activity described on page 3 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.

(c) There have been no changes affecting the ownership, control or independence of my company since my last certification review on _____. 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 Office of Diversity and Civil Rights (ODCR)(MBTA/MassDOT) and SDO.

(d) I have read the MassDOT proposal for the Project, and acknowledge that my company will comply with that document and the requirements of 49 CFR Part 26.

(e) For the purpose of obtaining subcontractor approval from the MassDOT, my firm will provide to you:

a. ***The following construction work:***
   i. a complete list of contact information for proposed Superintendent, i.e., address, phone number and e-mail address, and;
   ii. a list of projects completed in the last 10 years. I shall also include, for each project: the name and telephone number of a contact person for the contracting authority, person, or organization; project title / location (City/State), dollar value of the work; a description of the work; and the date project completed .

b. The following professional services work:
   i. resume, stating the qualifications and experience of person responsible for project oversight and contact information, i.e., address, phone number and e-mail address.
   ii. proposed team and organization,
   iii. resumes of key personnel;
   iv. example projects

c. 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 to be sent to the Office of Diversity and Civil Rights Government Compliance Unit designee;
   ii. information concerning brokers fees and commissions for providing services or materials.

DBE Firm Authorized Signature _____ Date _____

DBE Letter of Intent (Continued)

(To be completed by the DBE – Page 2 of 2)

Prime Bidder: _____

DBE Firm: _____

Federal Aid Project No.: NHP(BRR-ON)/HIP(BR)-0036(020)X

Bid Opening or Due Date: _____

Project Name: _____

Project Location: CAMBRIDGE

Item number if applicable	NAICS Code	Description of Activity with notations such as Services, or Brokerage, Labor Only, Material Only, or Complete	Quantity	Unit Price	Amount
			TOTAL AMOUNT:		

Please give full explanations, attach additional sheets if necessary.

I HEREBY VERIFY THAT _____

(DBE Firm)

WILL SOLELY PERFORM THE WORK, OR PROVIDE THE SERVICES OR MATERIALS, AS DESCRIBED ABOVE.

DBE Authorized Signature: _____

_____

Name (Print): _____

Title: _____

Email Address: _____

Phone Number: _____ Fax Number: _____

END OF DOCUMENT

DOCUMENT B00855

DBE JOINT CHECK ARRANGEMENT APPROVAL FORM

(to be submitted by Prime Contractor)

Contract No: 132090 **Project No.** 610776 **Federal Aid No.:** NHP(BRR-ON)/HIP(BR)-0036(020)X

Location: CAMBRIDGE **Bid Opening Date:** _____

Project Description: Superstructure Replacement, C-01-031, US Route 3/Route 16/Route 2 over MBTA Redline

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 ***