RM

COMMONWEALTH OF MASSACHUSETTS

CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	606082-129855
P.V. =	$31,535,000.00
PLANS	YES

FOR

Federal Aid Project No. NHP(NHS)/CMQ-003S(824)X
Median Installation on Route 6 (Scenic Highway)

in the Town of

BOURNE

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

This Proposal to be opened and read: **WEDNESDAY, MAY 28, 2025 at 2:00 P.M.**

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DOCUMENT 00010

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DOCUMENT 00104

NOTICE TO CONTRACTORS

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

WEDNESDAY, MAY 28, 2025 at 2:00 P.M. **
BOURNE
Federal Aid Project No. NHP(NHS)/CMQ-003S(824)X
Median Installation on Route 6 (Scenic Highway)
****Date Subject to Change**

PROJECT VALUE = $31,535,000.00

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

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

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

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

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

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

NOTICE TO CONTRACTORS (Continued)

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

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

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

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 $622.50 per ton, Portland cement $425.53 per ton, diesel fuel $2.759 per gallon, and gasoline $2.346 per gallon, and Steel Base Price Index 356.2. 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, MARCH 29, 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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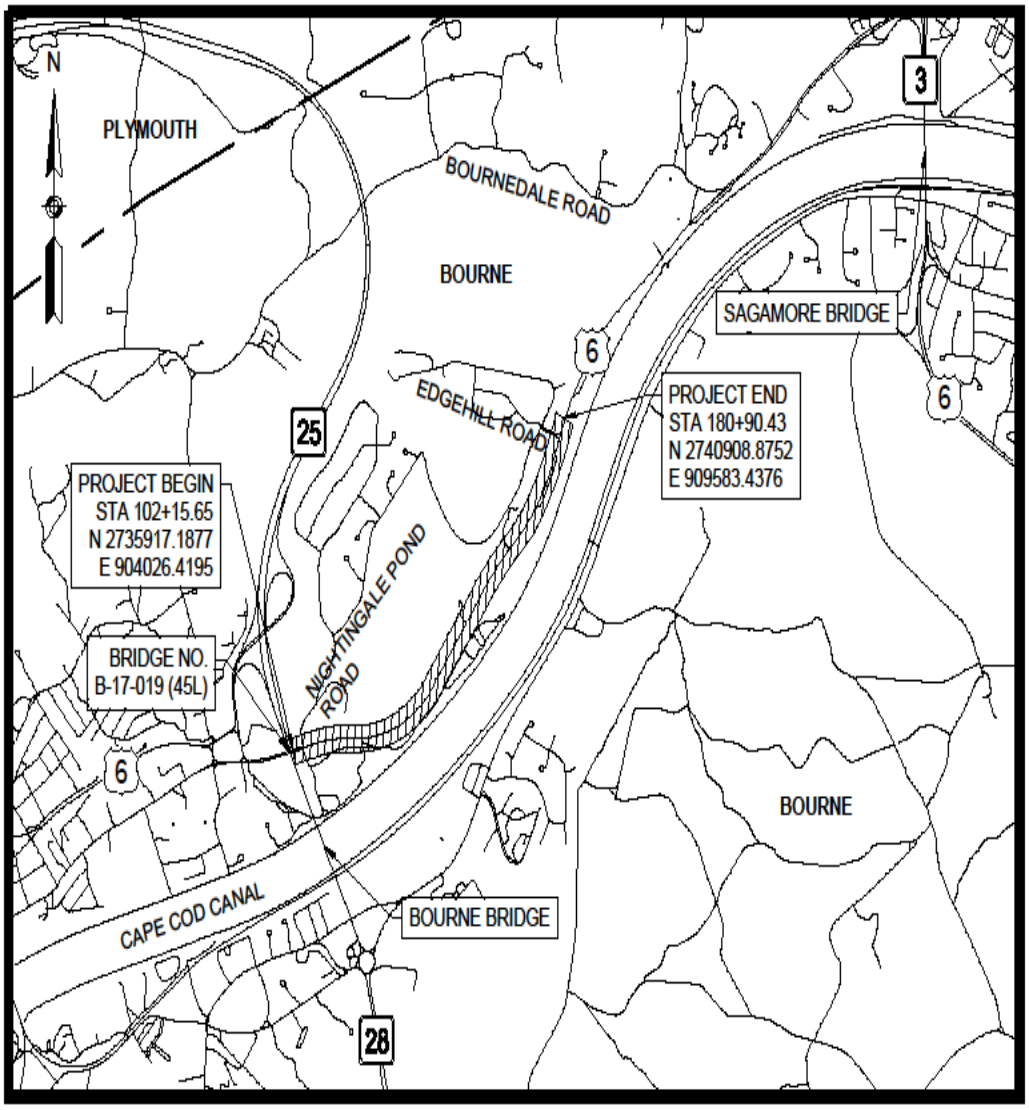
DOCUMENT 00331

LOCUS MAP

BOURNE
Federal Aid Project No. NHP(NHS)/CMQ-003S(824)X
Median Installation on Route 6 (Scenic Highway)



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DOCUMENT 00439

Final Report ☐

Interim Report ☐

CONTRACTOR PROJECT EVALUATION FORM

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

Date: _____

City/Town: _____ Contractor: _____

Project: _____ Address: _____

F.A. No. _____ Contract Number: _____

Bid Price: _____ Notice to Proceed: _____

Funds: State: _____ Fed Aid: _____ Current Contract Completion Date: _____

Date Work Started: _____ Date Work Completed*: _____

Contractor's Superintendent: _____

Division: (indicates class of work) Highway: _____ Bridge: _____ Maintenance: _____

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

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

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

_____ _____

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

_____

Contractor's Signature Acknowledging Report/Date

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

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

_____

_____

CONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number: _____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

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

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

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

I recommend a deduction for project completed late: _____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 9: _____

WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

Revised: 04/28/17

*** END OF DOCUMENT ***

DOCUMENT 00440

Final Report ☐

Interim Report ☐

SUBCONTRACTOR PROJECT EVALUATION FORM

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

Date: _____

City/Town: _____ Subcontractor: _____

Project: _____ Address: _____

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

Prime Contractor _____ Current Contract Completion Date: _____

Date Work Started: _____ Date Work Completed*: _____

Subcontractor's Superintendent: _____

Type of Work Performed by Subcontractor: _____

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

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

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

_____ _____

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

_____ _____

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

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

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

_____

_____

Contractor's Comments: _____

_____

SUBCONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number:_____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

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

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

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

I recommend a deduction for project completed late:_____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 8: _____

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WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

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Revised: 04/28/17

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DOCUMENT 00710
GENERAL CONTRACT PROVISIONS
Revised: 03-21-25

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2025, 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 00719

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

SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES

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

Section: Page 00719-

POLICY

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

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

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

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

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

1. DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2. DBE PARTICIPATION

a. Goal

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

☒ Design-Bid-Build Projects: DBE Participation Goal ____**%**
(*One half of this goal shall be met in the form of Subcontractor construction activity*)

☐ Design-Build Projects: DBE Design Participation Goal ____**%** and DBE Construction Participation Goal **%**
(One half of the Construction Goal shall be met in the form of Subcontractor construction activity)

b. Bidders List

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

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

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

3. CONTRACTOR ASSURANCES

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

4. REQUIRED SUBCONTRACT PROVISIONS

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

5. ELIGIBILITY OF DBES

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

a. Massachusetts DBE Directory

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

Contractors are encouraged to make use of the DBE Directory maintained by SDO on the Internet. This listing is updated daily and may be accessed at the SDO's website at:
https://www.diversitycertification.mass.gov/BusinessDirectory/BusinessDirectorySearch.aspx

b. DBE Certification

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

c. Joint Venture Approval

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

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

6. COUNTING DBE PARTICIPATION TOWARDS DBE PARTICIPATION GOALS

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

a. Commercially Useful Function

(1) In general, a DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. With respect to materials and supplies used on the Contract, the DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing (where applicable) and paying for the material itself.

(2) To determine whether a DBE is performing a commercially useful function, MassDOT will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors.

(3) A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, MassDOT will examine similar transactions, particularly those in which DBEs do not participate.

b. Counting Participation Toward The Contract Participation Goal

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

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

(2) MassDOT will count the entire amount of fees or commissions charged by a DBE firm for providing bona fide services, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a U.S. DOT assisted Contract, toward DBE participation goals, provided it is determined that the fee is reasonable and not excessive as compared with fees customarily allowed for similar services.

(3) When a DBE performs as a participant in a joint venture, MassDOT will count toward DBE participation goals a portion of the total dollar value of the contract that is equal to the distinct, clearly defined portion of the work of the Contract that the DBE performs with its own forces.

(4) MassDOT will use the following factors in determining whether a DBE trucking company is performing a commercially useful function:

(i) the DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract; there cannot be a contrived arrangement for the purpose of meeting DBE participation goals.

(ii) the DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the Contract.

(iii) the Contractor will receive DBE credit for the total value of the transportation services the DBE provides on the Contract using trucks owned, insured, and operated by the DBE itself and using drivers the DBE employs alone.

(iv) the DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The Contractor who has a contract with a DBE who leases trucks from another DBE will receive credit for the total value of the transportation services of the lease.

(v) the DBE may also lease trucks from a non-DBE firm, including an owner-operator. The Contractor who has a Contract with a DBE who leases trucks from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees not to the exceed the value of transportation services provided by DBE-owned trucks on the Contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement, fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.

(vi) the lease must indicate that the DBE has exclusive use of, and control over, the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

(5) MassDOT will count the Prime Contractor's expenditures with DBEs for materials or supplies toward DBE participation goals as follows:

(i) if the materials or supplies are obtained from a DBE manufacturer, as defined in Section 1 above, MassDOT will count one hundred (100%) percent of the cost of the materials or supplies toward DBE participation goals, provided the DBE meets the other requirements of the regulations.

(ii) if the materials or supplies are purchased from a DBE regular dealer, as defined in Section 1 above, MassDOT will count sixty (60%) percent of the cost of the materials or supplies toward the Contract participation goal, provided the DBE meets the other requirements of the regulations.

(iii) for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, MassDOT will count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site toward the Contract participation goal, provided that MassDOT determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services; the cost of the materials and supplies themselves will not be counted; and provided the DBE meets the other requirements of the regulations.

c. Joint Check Policy

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

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

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

Other factors MassDOT may consider:

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

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

d. Joint Check Procedure(s)

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

7. AWARD DOCUMENTATION AND PROCEDURES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

8. COMPLIANCE

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

m. Termination of DBE by Prime Contractor

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

n. Prompt Payment.

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

9. SANCTIONS

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

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

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

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

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

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

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

10. FURTHER INFORMATION; ENFORCEMENT, COOPERATION AND CONFIDENTIALITY.

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

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

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

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

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

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

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

(1) Availability of records.

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

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

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

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

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

11. LIST OF ADDITIONAL DOCUMENTS.

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

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

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

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

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

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

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

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

*** END OF DOCUMENT ***

DOCUMENT 00760

FHWA-1273 – Revised October 23, 2023

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

10. Assurances Required:

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

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

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages (29 CFR 5.5)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2. Withholding (29 CFR 5.5)

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

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

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

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

(2) A contracting agency for its reprocurement costs;

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

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

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

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

3. Records and certified payrolls (29 CFR 5.5)

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

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

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

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

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

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

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

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

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

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

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

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

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

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

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

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

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

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

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

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

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

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

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

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

the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

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

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

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

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

3. Withholding for unpaid wages and liquidated damages

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

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

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

(2) A contracting agency for its reprocurement costs;

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

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

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

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

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

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

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

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

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

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

VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

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

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

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

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

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

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

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

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

VII. SAFETY: ACCIDENT PREVENTION

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

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

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

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

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B) This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

DOCUMENT 00811

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
Revised: 02/03/2023

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

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

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

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

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

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

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

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

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

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

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DOCUMENT 00812

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

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

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

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

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

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

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

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

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

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

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DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

March 19, 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.)	$0.77
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	$0.77
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	$0.79
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Plate	$0.83
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 36 or 250 Structural Steel Shapes	$0.78
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Plate	$0.83
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 50 or 345 Structural Steel Shapes	$0.78
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Plate	$0.86
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 50WT or 345WT Structural Steel Shapes	$0.79
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W 345W Structural Steel Plate	$0.86
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 50W or 345W Structural Steel Shapes	$0.79
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 50W or 345W Structural Steel Plate	$0.90
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 70W or 485W Structural Steel Plate	$0.97
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 100W or 690W Structural Steel Plate	$1.48
16	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Plate	$0.86
17	ASTM A992/A992M Grade 50S / AASHTO M270M/M270 Grade 50S or 345S Structural Steel Shapes	$0.79
18	ASTM A276 Type 316 Stainless Steel	$4.44
19	ASTM A240 Type 316 Stainless Steel	$4.44
20	ASTM A148 Grade 80/50 Steel Castings (See Note below.)	$1.52
21	ASTM A53 Grade B Structural Steel Pipe	$0.97
22	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	$0.97
23	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	$0.77
24	ASTM 252, Grade 2 Permanent Steel Casing	$0.77
25	ASTM A36 (AASHTO M183) for H-piles, steel supports and sign supports	$0.81
26	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	$1.46
27	ASTM A572 / A572M, Grade 50 Sheetpiling	$1.46
28	ASTM A36/36M, Grade 50	$0.83
29	ASTM A570, Grade 50	$0.81
30	ASTM A572 (AASHTO M223), Grade 50 H-Piles	$0.83
31	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	$0.97
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

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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 ǂ

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

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

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

Contract No: 129855 **Project No.** 606082 **Federal Aid No.:** NHP(NHS)/CMQ-003S(834)X

Location: BOURNE

Project Description: Median Installation on Route 6 (Scenic Highway)

PART 1 CONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that to the best of my knowledge, information and belief, the company is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices, that the company will not discriminate in their employment practices, that the company will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained in Contract Document 00820 The Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, and that the company will comply with the special provisions and documentation indicated below (as checked).

I further hereby certify, as an authorized official of this company, that the special provisions and documentation indicated below (as checked) have been or are included in, and made part of, the Subcontractor Agreement entered into with the firm named above.

☐ **This is not a Federally-aided construction project**

Document #

☐ 00718 –Participation By Minority Or Women's Business Enterprises and SDVOBE†
☐ 00761 –Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program
☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs, and Certified Payroll
☐ 00859 – Contractor/Subcontractor Certification Form (this document)
☐ 00860 – MA Employment Laws
☐ 00861 – Applicable State Wage Rates in the Contract Proposal**
☐ B00842 – MA Schedule of Participation By Minority or Women Business Enterprises (M/WBEs)†
☐ B00843 – MA Letter of Intent – M/WBEs†

** Does not apply to Material Suppliers, unless performing work on-site
† Applies only if Subcontractor is a M/WBE; only include these forms for the particular M/WBE Entity

☐ B00844 - Schedule of Participation By SDVOBE
☐ B00845 - Letter of Intent – SDVOBE
☐ B00846 – M/WBE or SDVOBE Joint Check Arrangement Approval Form
☐ B00847 – Joint Venture Affidavit

☐ **This is a Federally-aided construction project (Federal Aid Number is present)**

Document #

☐ 00719 – Special Provisions for Participation by Disadvantaged Business Enterprises†
☐ 00760 - Form FHWA 1273 - Required Contract Provisions for Federal-Aid Construction Contracts
☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program
☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs and Certified Payroll
☐ 00859 – Contractor/Subcontractor Certification Form (this document)
☐ 00860 – MA Employment Laws
☐ 00870 – Standard Federal Equal Employment Opportunity Construction Contract Specifications Executive Order 11246, (41 CFR Parts 60-4.2 and 60-4.3 (Solicitations and Equal Opportunity Clauses)*
☐ 00875 – Federal Trainee Special Provisions

☐ B00853 – Schedule of Participation by Disadvantaged Business Enterprise†
☐ B00854 – Letter of Intent – DBEs†
☐ B00855 – DBE Joint Check Arrangement Approval Form
☐ B00856 – Joint Venture Affidavit
☐ 00861/00880 - Applicable state and federal wage rates from Contract Proposal**

*Applicable only to Contracts or Subcontracts in excess of $10,000
**Does not apply to Material Suppliers, unless performing work on-site
† Applies only if Subcontractor is a DBE; only include these forms for the particular DBE Entity

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

_____ _____
(Print Name and Title) (Authorized Signature)

PART 2

PART 2 SUBCONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that the required documents in Part 1 above were physically incorporated in our Agreement/Subcontract with the Contractor and give assurance that this company will fully comply or make every good faith effort to comply with the same. I further certify that:

1. This company recognizes that if this is a Federal-Aid Project, then this Contract is covered by the equal employment opportunity laws administered and enforced by the United States Department of Labor ("USDOL"), Office of Federal Contract Compliance Programs ('OFCCP"). By signing below, we acknowledge that this company has certain reporting obligations to the OFCCP, as specified by 41 CFR Part 60-4.2.
2. This company further acknowledges that any contractor with fifty (50) or more employees on a Federal-aid Contract with a value of fifty-thousand ($50,000) dollars or more must annually file an EEO-1 Report (SF 100) to the EEOC, Joint Reporting Committee, on or before September 30th, each year, as specified by 41 CFR Part 60-1.7a.
3. For more information regarding the federal reporting requirements, please contact the USDOL, OFCCP Regional Office, at 1-646-264-3170 or EEO-1, Joint Reporting Committee at 1-866-286-6440. You may also find guidance at: http://www.dol.gov/ofccp/TAguides/consttag.pdf or http://www.wdol.gov/dba.aspx#0.
4. This company ☐ has, ☐ has not, participated in a previous contract or subcontract subject to the Equal Opportunity clauses set forth in 41 CFR Part 60-4 and Executive Order 11246, and where required, has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs or the EEO Commission all reports due under the applicable filing requirements.
5. This company is in full compliance with applicable Federal and Commonwealth of Massachusetts laws, rules, and regulations and is not currently debarred or disqualified from bidding on or participating in construction contracts in any jurisdiction of the United States. See : https://www.mass.gov/service-details/contractors-and-vendors-suspended-or-debarred-by-massdot
6. This company is properly registered and in good standing with the Office of the Secretary of the Commonwealth.

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

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

_____
(Print Name and Title)

_____
(Authorized Signature)

_____
(Date)

Rev'd 09/02/22

*** END OF DOCUMENT ***

DOCUMENT 00860

COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS

Revised February 20, 2019

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

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

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

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

The Prevailing Wage Rate generally includes the following:

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

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

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

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

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

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

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

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

STATEMENT OF COMPLIANCE

Date: _____

I , _____do hereby state:
(Name of signatory party) (Title)

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

_____
(Contractor or Subcontractor)

on the _____
(MassDOT Project Location and Contract Number)

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

Signature _____

Title _____

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

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

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

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

*** END OF DOCUMENT ***

DOCUMENT 00861

STATE PREVAILING WAGE RATES

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Proposal No. 606082-129855

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

Prevailing Wage Rates

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

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: MassDOT Highway

Contract Number: 129855 **City/Town:** BOURNE

Description of Work: BOURNE: Federal Aid Project No. NHP(NHS)/CMQ-003S(824)X Median Installation on Route 6 (Scenic Highway)

Job Location: Along Route 6

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F "rental of equipment" contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27.The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Issue Date: 03/28/2025 **Wage Request Number:** 20250328-003

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.95	$15.57	$20.17	$0.00	$75.69
	06/01/2025	$40.95	$15.57	$20.17	$0.00	$76.69
	12/01/2025	$40.95	$15.57	$21.78	$0.00	$78.30
	01/01/2026	$40.95	$16.17	$21.78	$0.00	$78.90
	06/01/2026	$41.95	$16.17	$21.78	$0.00	$79.90
	12/01/2026	$41.95	$16.17	$23.52	$0.00	$81.64
	01/01/2027	$41.95	$16.77	$23.52	$0.00	$82.24
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.02	$15.57	$20.17	$0.00	$75.76
	06/01/2025	$41.02	$15.57	$20.17	$0.00	$76.76
	12/01/2025	$41.02	$15.57	$21.78	$0.00	$78.37
	01/01/2026	$41.02	$16.17	$21.78	$0.00	$78.97
	06/01/2026	$42.02	$16.17	$21.78	$0.00	$79.97
	12/01/2026	$42.02	$16.17	$23.52	$0.00	$81.71
	01/01/2027	$42.02	$16.77	$23.52	$0.00	$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.14	$15.57	$20.17	$0.00	$75.88
	06/01/2025	$41.14	$15.57	$20.17	$0.00	$76.88
	12/01/2025	$41.14	$15.57	$21.78	$0.00	$78.49
	01/01/2026	$41.14	$16.17	$21.78	$0.00	$79.09
	06/01/2026	$42.14	$16.17	$21.78	$0.00	$80.09
	12/01/2026	$42.14	$16.17	$23.52	$0.00	$81.83
	01/01/2027	$42.14	$16.77	$23.52	$0.00	$82.43
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	12/01/2024	$42.80	$14.50	$11.05	$0.00	$68.35
	06/01/2025	$43.80	$14.50	$11.05	$0.00	$69.35
	12/01/2025	$44.80	$14.50	$11.05	$0.00	$70.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2024	$48.12	$7.07	$20.60	$0.00	$75.79

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2024

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

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	02/01/2025	$65.80	$11.49	$23.59	$0.00	$100.88
	08/01/2025	$67.95	$11.49	$23.59	$0.00	$103.03
	02/01/2026	$69.30	$11.49	$23.59	$0.00	$104.38
	08/01/2026	$71.50	$11.49	$23.59	$0.00	$106.58
	02/01/2027	$72.90	$11.49	$23.59	$0.00	$107.98

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 New Bedford*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.90	$11.49	$23.59	$0.00	$67.98
2	60	$39.48	$11.49	$23.59	$0.00	$74.56
3	70	$46.06	$11.49	$23.59	$0.00	$81.14
4	80	$52.64	$11.49	$23.59	$0.00	$87.72
5	90	$59.22	$11.49	$23.59	$0.00	$94.30

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$33.98	$11.49	$23.59	$0.00	$69.06
2	60	$40.77	$11.49	$23.59	$0.00	$75.85
3	70	$47.57	$11.49	$23.59	$0.00	$82.65
4	80	$54.36	$11.49	$23.59	$0.00	$89.44
5	90	$61.16	$11.49	$23.59	$0.00	$96.24

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$47.35	$9.90	$19.05	$0.00	$76.30
	06/01/2025	$48.85	$9.90	$19.05	$0.00	$77.80
	12/01/2025	$50.35	$9.90	$19.05	$0.00	$79.30
	06/01/2026	$51.90	$9.90	$19.05	$0.00	$80.85
	12/01/2026	$53.40	$9.90	$19.05	$0.00	$82.35
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.20	$9.90	$19.05	$0.00	$75.15
	06/01/2025	$47.70	$9.90	$19.05	$0.00	$76.65
	12/01/2025	$49.20	$9.90	$19.05	$0.00	$78.15
	06/01/2026	$50.75	$9.90	$19.05	$0.00	$79.70
	12/01/2026	$52.25	$9.90	$19.05	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.53	$9.90	$19.05	$0.00	$75.48
	06/01/2025	$48.03	$9.90	$19.05	$0.00	$76.98
	12/01/2025	$49.53	$9.90	$19.05	$0.00	$78.48
	06/01/2026	$51.08	$9.90	$19.05	$0.00	$80.03
	12/01/2026	$52.58	$9.90	$19.05	$0.00	$81.53
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2025	$49.62	$9.83	$19.97	$0.00	$79.42
	09/01/2025	$50.87	$9.83	$19.97	$0.00	$80.67
	03/01/2026	$52.12	$9.83	$19.97	$0.00	$81.92
	09/01/2026	$53.37	$9.83	$19.97	$0.00	$83.17
	03/01/2027	$54.62	$9.83	$19.97	$0.00	$84.42

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2025

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

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.89	$9.83	$1.73	$0.00	$34.45
2	45	$22.89	$9.83	$1.73	$0.00	$34.45
3	55	$27.98	$9.83	$3.40	$0.00	$41.21
4	55	$27.98	$9.83	$3.40	$0.00	$41.21
5	70	$35.61	$9.83	$16.51	$0.00	$61.95
6	70	$35.61	$9.83	$16.51	$0.00	$61.95
7	80	$40.70	$9.83	$18.24	$0.00	$68.77
8	80	$40.70	$9.83	$18.24	$0.00	$68.77

Notes:

Apprentice to Journeyworker Ratio:1:5

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
All Aspects of New Wood Frame Work						

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

Effective Date - 10/01/2024

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

Effective Date - 10/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.65	$7.02	$0.00	$0.00	$23.67
2	60	$16.65	$7.02	$0.00	$0.00	$23.67
3	65	$18.04	$7.02	$1.00	$0.00	$26.06
4	70	$19.43	$7.02	$1.00	$0.00	$27.45
5	75	$20.81	$7.02	$4.80	$0.00	$32.63
6	80	$22.20	$7.02	$4.80	$0.00	$34.02
7	85	$23.59	$7.02	$4.80	$0.00	$35.41
8	90	$24.98	$7.02	$4.80	$0.00	$36.80

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	07/01/2024	$49.19	$13.35	$24.21	$1.80	$88.55

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (New Bedford)*

Effective Date - 07/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.60	$13.35	$16.43	$0.00	$54.38
2	60	$29.51	$13.35	$19.21	$1.80	$63.87
3	65	$31.97	$13.35	$20.21	$1.80	$67.33
4	70	$34.43	$13.35	$21.21	$1.80	$70.79
5	75	$36.89	$13.35	$22.21	$1.80	$74.25
6	80	$39.35	$13.35	$23.21	$1.80	$77.71
7	90	$44.27	$13.35	$24.21	$1.80	$83.63

Notes:

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

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$58.18	$15.55	$16.50	$0.00	$90.23
	06/01/2025	$59.51	$15.55	$16.50	$0.00	$91.56
	12/01/2025	$60.98	$15.55	$16.50	$0.00	$93.03
	06/01/2026	$62.31	$15.55	$16.50	$0.00	$94.36
	12/01/2026	$63.79	$15.55	$16.50	$0.00	$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2025

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

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	12/02/2024	$46.25	$9.90	$18.90	$0.00	$75.05
	06/02/2025	$47.75	$9.90	$18.90	$0.00	$76.55
	12/01/2025	$49.25	$9.90	$18.90	$0.00	$78.05
	06/01/2026	$50.80	$9.90	$18.90	$0.00	$79.60
	12/07/2026	$52.30	$9.90	$18.90	$0.00	$81.10
	06/07/2027	$53.90	$9.90	$18.90	$0.00	$82.70
	12/06/2027	$55.50	$9.90	$18.90	$0.00	$84.30
	06/05/2028	$57.18	$9.90	$18.90	$0.00	$85.98
	12/04/2028	$58.85	$9.90	$18.90	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	12/02/2024	$47.25	$9.90	$18.90	$0.00	$76.05
	06/02/2025	$48.75	$9.90	$18.90	$0.00	$77.55
	12/01/2025	$50.25	$9.90	$18.90	$0.00	$79.05
	06/01/2026	$51.80	$9.90	$18.90	$0.00	$80.60
	12/07/2026	$53.30	$9.90	$18.90	$0.00	$82.10
	06/07/2027	$54.90	$9.90	$18.90	$0.00	$83.70
	12/06/2027	$56.50	$9.90	$18.90	$0.00	$85.30
	06/05/2028	$58.18	$9.90	$18.90	$0.00	$86.98
	12/04/2028	$59.85	$9.90	$18.90	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.90	$18.90	$0.00	$75.80
	06/02/2025	$48.50	$9.90	$18.90	$0.00	$77.30
	12/01/2025	$50.00	$9.90	$18.90	$0.00	$78.80
	06/01/2026	$51.55	$9.90	$18.90	$0.00	$80.35
	12/07/2026	$53.05	$9.90	$18.90	$0.00	$81.85
	06/07/2027	$54.65	$9.90	$18.90	$0.00	$83.45
	12/06/2027	$56.25	$9.90	$18.90	$0.00	$85.05
	06/05/2028	$57.93	$9.90	$18.90	$0.00	$86.73
	12/04/2028	$59.60	$9.90	$18.90	$0.00	$88.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	12/02/2024	$47.25	$9.90	$18.90	$0.00	$76.05
	06/02/2025	$48.75	$9.90	$18.90	$0.00	$77.55
	12/01/2025	$50.25	$9.90	$18.90	$0.00	$79.05
	06/01/2026	$51.80	$9.90	$18.90	$0.00	$80.60
	12/07/2026	$53.30	$9.90	$18.90	$0.00	$82.10
	06/07/2027	$54.90	$9.90	$18.90	$0.00	$83.70
	12/06/2027	$56.50	$9.90	$18.90	$0.00	$85.30
	06/05/2028	$58.18	$9.90	$18.90	$0.00	$86.98
	12/04/2028	$59.85	$9.90	$18.90	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.90	$18.90	$0.00	$75.80
	06/02/2025	$48.50	$9.90	$18.90	$0.00	$77.30
	12/01/2025	$50.00	$9.90	$18.90	$0.00	$78.80
	06/01/2026	$51.55	$9.90	$18.90	$0.00	$80.35
	12/07/2026	$53.05	$9.90	$18.90	$0.00	$81.85
	06/07/2027	$54.65	$9.90	$18.90	$0.00	$83.45
	12/06/2027	$56.25	$9.90	$18.90	$0.00	$85.05
	06/05/2028	$57.93	$9.90	$18.90	$0.00	$86.73
	12/04/2028	$59.60	$9.90	$18.90	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	12/02/2024	$46.25	$9.90	$18.90	$0.00	$75.05
	06/02/2025	$47.75	$9.90	$18.90	$0.00	$76.55
	12/01/2025	$49.25	$9.90	$18.90	$0.00	$78.05
	06/01/2026	$50.80	$9.90	$18.90	$0.00	$79.60
	12/07/2026	$52.30	$9.90	$18.90	$0.00	$81.10
	06/07/2027	$53.90	$9.90	$18.90	$0.00	$82.70
	12/06/2027	$55.50	$9.90	$18.90	$0.00	$84.30
	06/05/2028	$57.18	$9.90	$18.90	$0.00	$85.98
	12/04/2028	$58.85	$9.90	$18.90	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$78.11	$10.08	$24.29	$0.00	$112.48
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 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
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 (ZONE 2)*	08/01/2024	$83.69	$10.08	$24.29	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.01	$12.00	$0.60	$0.00	$32.61
2	45	$22.51	$12.00	$0.68	$0.00	$35.19
3	50	$25.01	$12.00	$0.75	$0.00	$37.76
4	55	$27.51	$12.00	$8.59	$0.00	$48.10
5	60	$30.01	$12.00	$9.15	$0.00	$51.16
6	65	$32.51	$12.00	$9.74	$0.00	$54.25
7	70	$35.01	$12.00	$10.30	$0.00	$57.31
8	75	$37.52	$12.00	$10.89	$0.00	$60.41

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.90	$12.25	$0.63	$0.00	$33.78
2	45	$23.51	$12.25	$0.71	$0.00	$36.47
3	50	$26.13	$12.25	$0.78	$0.00	$39.16
4	55	$28.74	$12.25	$9.11	$0.00	$50.10
5	60	$31.35	$12.25	$9.71	$0.00	$53.31
6	65	$33.96	$12.25	$10.32	$0.00	$56.53
7	70	$36.58	$12.25	$10.91	$0.00	$59.74
8	75	$39.19	$12.25	$11.52	$0.00	$62.96

Notes:

Apprentice to Journeyworker Ratio:2:3***

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2022

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

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$51.78	$15.30	$16.40	$0.00	$83.48
	05/01/2025	$53.22	$15.30	$16.40	$0.00	$84.92
	11/01/2025	$54.51	$15.30	$16.40	$0.00	$86.21
	05/01/2026	$55.95	$15.30	$16.40	$0.00	$87.65
	11/01/2026	$57.24	$15.30	$16.40	$0.00	$88.94
	05/01/2027	$58.67	$15.30	$16.40	$0.00	$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$53.37	$15.30	$16.40	$0.00	$85.07
	05/01/2025	$54.82	$15.30	$16.40	$0.00	$86.52
	11/01/2025	$56.12	$15.30	$16.40	$0.00	$87.82
	05/01/2026	$57.57	$15.30	$16.40	$0.00	$89.27
	11/01/2026	$58.87	$15.30	$16.40	$0.00	$90.57
	05/01/2027	$60.32	$15.30	$16.40	$0.00	$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	05/01/2025	$26.22	$15.30	$16.40	$0.00	$57.92
	11/01/2025	$26.98	$15.30	$16.40	$0.00	$58.68
	05/01/2026	$27.83	$15.30	$16.40	$0.00	$59.53
	11/01/2026	$28.59	$15.30	$16.40	$0.00	$60.29
	05/01/2027	$29.44	$15.30	$16.40	$0.00	$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$45.96	$15.55	$16.50	$0.00	$78.01
	06/01/2025	$47.02	$15.55	$16.50	$0.00	$79.07
	12/01/2025	$48.19	$15.55	$16.50	$0.00	$80.24
	06/01/2026	$49.25	$15.55	$16.50	$0.00	$81.30
	12/01/2026	$50.43	$15.55	$16.50	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$27.01	$9.90	$18.46	$0.00	$55.37
	06/01/2025	$28.09	$9.90	$18.46	$0.00	$56.45
	12/01/2025	$28.09	$9.90	$18.46	$0.00	$56.45
	06/01/2026	$29.21	$9.90	$18.46	$0.00	$57.57
	12/01/2026	$29.21	$9.90	$18.46	$0.00	$57.57
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE II*	03/01/2024	$49.47	$8.83	$20.27	$0.00	$78.57

Apprentice - *FLOORCOVERER - Local 2168 Zone II*

Effective Date - 03/01/2024

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

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

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

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

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$31.37	$0.00	$0.00	$0.00	$31.37
2	60	$34.22	$15.55	$16.50	$0.00	$66.27
3	65	$37.07	$15.55	$16.50	$0.00	$69.12
4	70	$39.92	$15.55	$16.50	$0.00	$71.97
5	75	$42.77	$15.55	$16.50	$0.00	$74.82
6	80	$45.62	$15.55	$16.50	$0.00	$77.67
7	85	$48.48	$15.55	$16.50	$0.00	$80.53
8	90	$51.33	$15.55	$16.50	$0.00	$83.38

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$32.08	$0.00	$0.00	$0.00	$32.08
2	60	$35.00	$15.55	$16.50	$0.00	$67.05
3	65	$37.91	$15.55	$16.50	$0.00	$69.96
4	70	$40.83	$15.55	$16.50	$0.00	$72.88
5	75	$43.75	$15.55	$16.50	$0.00	$75.80
6	80	$46.66	$15.55	$16.50	$0.00	$78.71
7	85	$49.58	$15.55	$16.50	$0.00	$81.63
8	90	$52.50	$15.55	$16.50	$0.00	$84.55

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2024	$42.33	$14.59	$19.04	$2.24	$78.20
	04/01/2025	$43.83	$14.59	$19.04	$2.24	$79.70
	10/01/2025	$45.08	$14.59	$19.04	$2.24	$80.95
	04/01/2026	$46.58	$14.59	$19.04	$2.24	$82.45
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2024	$42.33	$30.43	$19.04	$2.24	$94.04
	04/01/2025	$43.83	$30.43	$19.04	$2.24	$95.54
	10/01/2025	$45.08	$30.43	$19.04	$2.24	$96.79
	04/01/2026	$46.58	$30.43	$19.04	$2.24	$98.29
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$18.36	$0.00	$67.96
	06/01/2025	$41.09	$9.90	$18.36	$0.00	$69.35
	12/01/2025	$42.47	$9.90	$18.36	$0.00	$70.73
	06/01/2026	$43.91	$9.90	$18.36	$0.00	$72.17
	12/01/2026	$45.35	$9.90	$18.36	$0.00	$73.61
	06/01/2027	$46.80	$9.90	$18.36	$0.00	$75.06
	12/01/2027	$48.25	$9.90	$18.36	$0.00	$76.51
	06/01/2028	$49.75	$9.90	$18.36	$0.00	$78.01
	12/01/2028	$51.25	$9.90	$18.36	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.70	$9.90	$18.46	$0.00	$68.06
	06/01/2025	$41.09	$9.90	$18.46	$0.00	$69.45
	12/01/2025	$42.47	$9.90	$18.46	$0.00	$70.83
	06/01/2026	$43.91	$9.90	$18.46	$0.00	$72.27
	12/01/2026	$45.35	$9.90	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	09/01/2024	$51.23	$14.75	$19.61	$0.00	$85.59
	09/01/2025	$54.31	$14.75	$19.61	$0.00	$88.67
	09/01/2026	$57.38	$14.75	$19.61	$0.00	$91.74

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Southern MA*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.62	$14.75	$14.32	$0.00	$54.69
2	60	$30.74	$14.75	$15.37	$0.00	$60.86
3	70	$35.86	$14.75	$16.43	$0.00	$67.04
4	80	$40.98	$14.75	$17.49	$0.00	$73.22

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.16	$14.75	$14.32	$0.00	$56.23
2	60	$32.59	$14.75	$15.37	$0.00	$62.71
3	70	$38.02	$14.75	$16.43	$0.00	$69.20
4	80	$43.45	$14.75	$17.49	$0.00	$75.69

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

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

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.37	$9.90	$18.36	$0.00	$51.63
2	70	$27.27	$9.90	$18.36	$0.00	$55.53
3	80	$31.16	$9.90	$18.36	$0.00	$59.42
4	90	$35.06	$9.90	$18.36	$0.00	$63.32

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.20	$9.90	$18.36	$0.00	$52.46
2	70	$28.24	$9.90	$18.36	$0.00	$56.50
3	80	$32.27	$9.90	$18.36	$0.00	$60.53
4	90	$36.31	$9.90	$18.36	$0.00	$64.57

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$38.95	$9.90	$18.46	$0.00	$67.31
	06/01/2025	$40.34	$9.90	$18.46	$0.00	$68.70
	12/01/2025	$41.72	$9.90	$18.46	$0.00	$70.08
	06/01/2026	$43.16	$9.90	$18.46	$0.00	$71.52
	12/01/2026	$44.60	$9.90	$18.46	$0.00	$72.96

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

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.37	$9.90	$18.46	$0.00	$51.73
2	70	$27.27	$9.90	$18.46	$0.00	$55.63
3	80	$31.16	$9.90	$18.46	$0.00	$59.52
4	90	$35.06	$9.90	$18.46	$0.00	$63.42

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.20	$9.90	$18.46	$0.00	$52.56
2	70	$28.24	$9.90	$18.46	$0.00	$56.60
3	80	$32.27	$9.90	$18.46	$0.00	$60.63
4	90	$36.31	$9.90	$18.46	$0.00	$64.67

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	12/02/2024	$39.04	$9.90	$18.42	$0.00	$67.36
	06/02/2025	$40.43	$9.90	$18.42	$0.00	$68.75
	12/01/2025	$41.81	$9.90	$18.42	$0.00	$70.13
	06/01/2026	$43.25	$9.90	$18.42	$0.00	$71.57
	12/07/2026	$44.69	$9.90	$18.42	$0.00	$73.01
	06/07/2027	$46.14	$9.90	$18.42	$0.00	$74.46
	12/06/2027	$47.59	$9.90	$18.42	$0.00	$75.91
	06/05/2028	$49.09	$9.90	$18.42	$0.00	$77.41
	12/04/2028	$50.59	$9.90	$18.42	$0.00	$78.91
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	12/01/2024	$38.95	$9.90	$18.36	$0.00	$67.21
	06/01/2025	$40.34	$9.90	$18.36	$0.00	$68.60
	12/01/2025	$41.72	$9.90	$18.36	$0.00	$69.98
	06/01/2026	$43.16	$9.90	$18.36	$0.00	$71.42
	12/01/2026	$44.60	$9.90	$18.36	$0.00	$72.86
	06/01/2027	$46.05	$9.90	$18.36	$0.00	$74.31
	12/01/2027	$47.50	$9.90	$18.36	$0.00	$75.76
	06/01/2028	$49.00	$9.90	$18.36	$0.00	$77.26
	12/01/2028	$50.50	$9.90	$18.36	$0.00	$78.76
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2025	$50.36	$11.49	$21.62	$0.00	$83.47
	08/01/2025	$52.08	$11.49	$21.62	$0.00	$85.19
	02/01/2026	$53.16	$11.49	$21.62	$0.00	$86.27
	08/01/2026	$54.92	$11.49	$21.62	$0.00	$88.03
	02/01/2027	$56.04	$11.49	$21.62	$0.00	$89.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.18	$11.49	$21.62	$0.00	$58.29
2	60	$30.22	$11.49	$21.62	$0.00	$63.33
3	70	$35.25	$11.49	$21.62	$0.00	$68.36
4	80	$40.29	$11.49	$21.62	$0.00	$73.40
5	90	$45.32	$11.49	$21.62	$0.00	$78.43

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.04	$11.49	$21.62	$0.00	$59.15
2	60	$31.25	$11.49	$21.62	$0.00	$64.36
3	70	$36.46	$11.49	$21.62	$0.00	$69.57
4	80	$41.66	$11.49	$21.62	$0.00	$74.77
5	90	$46.87	$11.49	$21.62	$0.00	$79.98

Notes:

Apprentice to Journeyworker Ratio:1:3

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.91	$11.49	$23.56	$0.00	$67.96
2	60	$39.49	$11.49	$23.56	$0.00	$74.54
3	70	$46.07	$11.49	$23.56	$0.00	$81.12
4	80	$52.66	$11.49	$23.56	$0.00	$87.71
5	90	$59.24	$11.49	$23.56	$0.00	$94.29

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$33.99	$11.49	$23.56	$0.00	$69.04
2	60	$40.78	$11.49	$23.56	$0.00	$75.83
3	70	$47.58	$11.49	$23.56	$0.00	$82.63
4	80	$54.38	$11.49	$23.56	$0.00	$89.43
5	90	$61.17	$11.49	$23.56	$0.00	$96.22

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	01/06/2025	$45.09	$10.08	$21.47	$0.00	$76.64
	01/05/2026	$47.42	$10.08	$21.47	$0.00	$78.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 01/06/2025

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

Effective Date - 01/05/2026

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$26.08	$10.08	$5.50	$0.00	$41.66
2	65	$30.82	$10.08	$6.50	$0.00	$47.40
3	75	$35.57	$10.08	$18.97	$0.00	$64.62
4	85	$40.31	$10.08	$19.97	$0.00	$70.36

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

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	06/01/2025	$25.97	$15.30	$16.40	$0.00	$57.67
	12/01/2025	$26.63	$15.30	$16.40	$0.00	$58.33
	06/01/2026	$27.22	$15.30	$16.40	$0.00	$58.92
	12/01/2026	$27.89	$15.30	$16.40	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$31.08	$15.30	$16.40	$0.00	$62.78
	06/01/2025	$31.80	$15.30	$16.40	$0.00	$63.50
	12/01/2025	$32.60	$15.30	$16.40	$0.00	$64.30
	06/01/2026	$33.32	$15.30	$16.40	$0.00	$65.02
	12/01/2026	$34.12	$15.30	$16.40	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2025

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.68	$9.95	$0.00	$0.00	$34.63
2	55	$27.15	$9.95	$6.66	$0.00	$43.76
3	60	$29.62	$9.95	$7.26	$0.00	$46.83
4	65	$32.08	$9.95	$7.87	$0.00	$49.90
5	70	$34.55	$9.95	$20.32	$0.00	$64.82
6	75	$37.02	$9.95	$20.93	$0.00	$67.90
7	80	$39.49	$9.95	$21.53	$0.00	$70.97
8	90	$44.42	$9.95	$22.74	$0.00	$77.11

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.42	$9.95	$23.95	$0.00	$81.32

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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.71	$9.95	$0.00	$0.00	$33.66
2	55	$26.08	$9.95	$6.66	$0.00	$42.69
3	60	$28.45	$9.95	$7.26	$0.00	$45.66
4	65	$30.82	$9.95	$7.87	$0.00	$48.64
5	70	$33.19	$9.95	$20.32	$0.00	$63.46
6	75	$35.57	$9.95	$20.93	$0.00	$66.45
7	80	$37.94	$9.95	$21.53	$0.00	$69.42
8	90	$42.68	$9.95	$22.74	$0.00	$75.37

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

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

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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.98	$9.95	$0.00	$0.00	$33.93
2	55	$26.38	$9.95	$6.66	$0.00	$42.99
3	60	$28.78	$9.95	$7.26	$0.00	$45.99
4	65	$31.17	$9.95	$7.87	$0.00	$48.99
5	70	$33.57	$9.95	$20.32	$0.00	$63.84
6	75	$35.97	$9.95	$20.93	$0.00	$66.85
7	80	$38.37	$9.95	$21.53	$0.00	$69.85
8	90	$43.16	$9.95	$22.74	$0.00	$75.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$46.02	$9.95	$23.95	$0.00	$79.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.01	$9.95	$0.00	$0.00	$32.96
2	55	$25.31	$9.95	$6.66	$0.00	$41.92
3	60	$27.61	$9.95	$7.26	$0.00	$44.82
4	65	$29.91	$9.95	$7.87	$0.00	$47.73
5	70	$32.21	$9.95	$20.32	$0.00	$62.48
6	75	$34.52	$9.95	$20.93	$0.00	$65.40
7	80	$36.82	$9.95	$21.53	$0.00	$68.30
8	90	$41.42	$9.95	$22.74	$0.00	$74.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$38.95	$9.90	$18.46	$0.00	$67.31
	06/01/2025	$40.34	$9.90	$18.46	$0.00	$68.70
	12/01/2025	$41.72	$9.90	$18.46	$0.00	$70.08
	06/01/2026	$43.16	$9.90	$18.46	$0.00	$71.52
	12/01/2026	$44.60	$9.90	$18.46	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.78	$15.57	$20.17	$0.00	$75.52
	06/01/2025	$40.78	$15.57	$20.17	$0.00	$76.52
	12/01/2025	$40.78	$15.57	$21.78	$0.00	$78.13
	01/01/2026	$40.78	$16.17	$21.78	$0.00	$78.73
	06/01/2026	$41.78	$16.17	$21.78	$0.00	$79.73
	12/01/2026	$41.78	$16.17	$23.52	$0.00	$81.47
	01/01/2027	$41.78	$16.77	$23.52	$0.00	$82.07
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 2*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$23.39	$10.08	$2.53	$0.00	$36.00
2	55	$28.58	$10.08	$5.07	$0.00	$43.73
3	70	$36.38	$10.08	$19.22	$0.00	$65.68
4	80	$41.58	$10.08	$21.76	$0.00	$73.42

Notes:

% Indentured BEFORE 8/1/2020, 50/60/70/75/80/80/90/90

Step 1 $60.36/2 $65.75/3 $70.75/4 $73.35/5&6 $75.95/7&8 81.14

Apprentice to Journeyworker Ratio:1:5

PIPELAYER *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/26/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.00	$10.15	$2.50	$0.00	$33.65
2	50	$26.25	$10.15	$2.50	$0.00	$38.90
3	60	$31.49	$10.15	$8.90	$0.00	$50.54
4	70	$36.74	$10.15	$14.24	$0.00	$61.13
5	80	$41.99	$10.15	$17.80	$0.00	$69.94

Effective Date - 08/25/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$22.10	$10.15	$2.50	$0.00	$34.75
2	50	$27.62	$10.15	$2.50	$0.00	$40.27
3	60	$33.14	$10.15	$8.90	$0.00	$52.19
4	70	$38.67	$10.15	$14.24	$0.00	$63.06
5	80	$44.19	$10.15	$17.80	$0.00	$72.14

Notes:

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

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.70	$9.90	$17.54	$0.00	$67.14
	06/01/2025	$41.09	$9.90	$17.54	$0.00	$68.53
	12/01/2025	$42.47	$9.90	$17.54	$0.00	$69.91
	06/01/2026	$43.91	$9.90	$17.54	$0.00	$71.35
	12/01/2026	$45.35	$9.90	$17.54	$0.00	$72.79
	06/01/2027	$46.80	$9.90	$17.54	$0.00	$74.24
	12/01/2027	$48.25	$9.90	$17.54	$0.00	$75.69
	06/01/2028	$49.75	$9.90	$17.54	$0.00	$77.19
	12/01/2028	$51.25	$9.90	$17.54	$0.00	$78.69
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER *LABORERS - ZONE 2*	12/01/2024	$39.95	$9.90	$18.36	$0.00	$68.21
	06/01/2025	$41.34	$9.90	$18.36	$0.00	$69.60
	12/01/2025	$42.72	$9.90	$18.36	$0.00	$70.98
	06/01/2026	$44.16	$9.90	$18.36	$0.00	$72.42
	12/01/2026	$45.60	$9.90	$18.36	$0.00	$73.86
	06/01/2027	$47.05	$9.90	$18.36	$0.00	$75.31
	12/01/2027	$48.50	$9.90	$18.36	$0.00	$76.76
	06/01/2028	$50.00	$9.90	$18.36	$0.00	$78.26
	12/01/2028	$51.50	$9.90	$18.36	$0.00	$79.76
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.95	$9.65	$18.46	$0.00	$68.06
	06/01/2025	$41.34	$9.65	$18.46	$0.00	$69.45
	12/01/2025	$42.72	$9.65	$18.46	$0.00	$70.83
	06/01/2026	$44.16	$9.65	$18.46	$0.00	$72.27
	12/01/2026	$45.60	$9.65	$18.46	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 653 - Southeastern Concrete (Weymouth)*	08/01/2023	$25.00	$13.91	$6.90	$0.00	$45.81
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	12/01/2024	$39.20	$9.90	$18.36	$0.00	$67.46
	06/01/2025	$40.59	$9.90	$18.36	$0.00	$68.85
	12/01/2025	$41.97	$9.90	$18.36	$0.00	$70.23
	06/01/2026	$43.41	$9.90	$18.36	$0.00	$71.67
	12/01/2026	$44.85	$9.90	$18.36	$0.00	$73.11
	06/01/2027	$46.30	$9.90	$18.36	$0.00	$74.56
	12/01/2027	$47.75	$9.90	$18.36	$0.00	$76.01
	06/01/2028	$49.25	$9.90	$18.36	$0.00	$77.51
	12/01/2028	$50.75	$9.90	$18.36	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	02/01/2025	$52.03	$13.28	$21.70	$0.00	$87.01
	08/01/2025	$53.53	$13.28	$21.70	$0.00	$88.51
	02/01/2026	$54.78	$13.28	$21.70	$0.00	$89.76

Apprentice - *ROOFER - Local 33*

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.02	$13.28	$15.55	$0.00	$54.85
2	60	$31.22	$13.28	$21.70	$0.00	$66.20
3	65	$33.82	$13.28	$21.70	$0.00	$68.80
4	75	$39.02	$13.28	$21.70	$0.00	$74.00
5	85	$44.23	$13.28	$21.70	$0.00	$79.21

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.77	$13.28	$15.55	$0.00	$55.60
2	60	$32.12	$13.28	$21.70	$0.00	$67.10
3	65	$34.79	$13.28	$21.70	$0.00	$69.77
4	75	$40.15	$13.28	$21.70	$0.00	$75.13
5	85	$45.50	$13.28	$21.70	$0.00	$80.48

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	02/01/2025	$52.28	$13.28	$21.70	$0.00	$87.26
	08/01/2025	$53.78	$13.28	$21.70	$0.00	$88.76
	02/01/2026	$55.03	$13.28	$21.70	$0.00	$90.01
For apprentice rates see "Apprentice- ROOFER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2024	$42.33	$14.59	$19.04	$2.24	$78.20
	04/01/2025	$43.83	$14.59	$19.04	$2.24	$79.70
	10/01/2025	$45.08	$14.59	$19.04	$2.24	$80.95
	04/01/2026	$46.58	$14.59	$19.04	$2.24	$82.45

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

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$16.93	$14.59	$4.18	$1.09	$36.79
2	45	$19.05	$14.59	$4.71	$1.17	$39.52
3	50	$21.17	$14.59	$11.84	$1.45	$49.05
4	55	$23.28	$14.59	$11.84	$1.52	$51.23
5	60	$25.40	$14.59	$15.53	$1.64	$57.16
6	65	$27.51	$14.59	$15.84	$1.71	$59.65
7	70	$29.63	$14.59	$16.15	$1.78	$62.15
8	75	$31.75	$14.59	$16.45	$1.86	$64.65
9	80	$33.86	$14.59	$16.76	$1.93	$67.14
10	85	$35.98	$14.59	$17.07	$2.00	$69.64

Effective Date - 04/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.53	$14.59	$4.18	$1.09	$37.39
2	45	$19.72	$14.59	$4.71	$1.17	$40.19
3	50	$21.92	$14.59	$11.84	$1.45	$49.80
4	55	$24.11	$14.59	$11.84	$1.52	$52.06
5	60	$26.30	$14.59	$15.53	$1.64	$58.06
6	65	$28.49	$14.59	$15.84	$1.71	$60.63
7	70	$30.68	$14.59	$16.15	$1.78	$63.20
8	75	$32.87	$14.59	$16.45	$1.86	$65.77
9	80	$35.06	$14.59	$16.76	$1.93	$68.34
10	85	$37.26	$14.59	$17.07	$2.00	$70.92

Notes:

Apprentice to Journeyworker Ratio:1:3

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.53	$15.57	$20.17	$0.00	$76.27
	06/01/2025	$41.53	$15.57	$20.17	$0.00	$77.27
	12/01/2025	$41.53	$15.57	$21.78	$0.00	$78.88
	01/01/2026	$41.53	$16.17	$21.78	$0.00	$79.48
	06/01/2026	$42.53	$16.17	$21.78	$0.00	$80.48
	12/01/2026	$42.53	$16.17	$23.52	$0.00	$82.22
	01/01/2027	$42.53	$16.77	$23.52	$0.00	$82.82
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	03/01/2025	$64.93	$11.51	$23.80	$0.00	$100.24

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$22.73	$11.51	$13.07	$0.00	$47.31
2	40	$25.97	$11.51	$13.90	$0.00	$51.38
3	45	$29.22	$11.51	$14.72	$0.00	$55.45
4	50	$32.47	$11.51	$15.55	$0.00	$59.53
5	55	$35.71	$11.51	$16.38	$0.00	$63.60
6	60	$38.96	$11.51	$17.20	$0.00	$67.67
7	65	$42.20	$11.51	$18.03	$0.00	$71.74
8	70	$45.45	$11.51	$18.85	$0.00	$75.81
9	75	$48.70	$11.51	$19.68	$0.00	$79.89
10	80	$51.94	$11.51	$20.50	$0.00	$83.95

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

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$40.69	$11.75	$14.53	$0.00	$66.97
	09/01/2025	$42.52	$12.00	$15.30	$0.00	$69.82
	09/01/2026	$44.41	$12.25	$16.09	$0.00	$72.75
	09/01/2027	$46.51	$12.50	$16.93	$0.00	$75.94

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2024

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

Notes: See Electrician Apprentice Wages

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

Apprentice to Journeyworker Ratio:2:3***

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

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

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.37	$11.49	$23.59	$0.00	$67.45
2	60	$38.84	$11.49	$23.59	$0.00	$73.92
3	70	$45.32	$11.49	$23.59	$0.00	$80.40
4	80	$51.79	$11.49	$23.59	$0.00	$86.87
5	90	$58.27	$11.49	$23.59	$0.00	$93.35

Effective Date - 08/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$33.45	$11.49	$23.59	$0.00	$68.53
2	60	$40.13	$11.49	$23.59	$0.00	$75.21
3	70	$46.82	$11.49	$23.59	$0.00	$81.90
4	80	$53.51	$11.49	$23.59	$0.00	$88.59
5	90	$60.20	$11.49	$23.59	$0.00	$95.28

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$50.20	$9.90	$19.05	$0.00	$79.15
	06/01/2025	$51.70	$9.90	$19.05	$0.00	$80.65
	12/01/2025	$53.20	$9.90	$19.05	$0.00	$82.15
	06/01/2026	$54.75	$9.90	$19.05	$0.00	$83.70
	12/01/2026	$56.25	$9.90	$19.05	$0.00	$85.20

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.32	$9.90	$19.05	$0.00	$75.27
	06/01/2025	$47.82	$9.90	$19.05	$0.00	$76.77
	12/01/2025	$49.32	$9.90	$19.05	$0.00	$78.27
	06/01/2026	$50.87	$9.90	$19.05	$0.00	$79.82
	12/01/2026	$52.37	$9.90	$19.05	$0.00	$81.32
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.20	$9.90	$19.05	$0.00	$75.15
	06/01/2025	$47.70	$9.90	$19.05	$0.00	$76.65
	12/01/2025	$49.20	$9.90	$19.05	$0.00	$78.15
	06/01/2026	$50.75	$9.90	$19.05	$0.00	$79.70
	12/01/2026	$52.25	$9.90	$19.05	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.82	$15.57	$20.17	$0.00	$76.56
	06/01/2025	$41.82	$15.57	$20.17	$0.00	$77.56
	12/01/2025	$41.82	$15.57	$21.78	$0.00	$79.17
	01/01/2026	$41.82	$16.17	$21.78	$0.00	$79.77
	06/01/2026	$42.82	$16.17	$21.78	$0.00	$80.77
	12/01/2026	$42.82	$16.17	$23.52	$0.00	$82.51
	01/01/2027	$42.82	$16.77	$23.52	$0.00	$83.11
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	12/01/2024	$58.43	$9.90	$19.50	$0.00	$87.83
	06/01/2025	$59.93	$9.90	$19.50	$0.00	$89.33
	12/01/2025	$61.43	$9.90	$19.50	$0.00	$90.83
	06/01/2026	$62.98	$9.90	$19.50	$0.00	$92.38
	12/01/2026	$64.48	$9.90	$19.50	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	12/01/2024	$60.43	$9.90	$19.50	$0.00	$89.83
	06/01/2025	$61.93	$9.90	$19.50	$0.00	$91.33
	12/01/2025	$63.43	$9.90	$19.50	$0.00	$92.83
	06/01/2026	$64.98	$9.90	$19.50	$0.00	$94.38
	12/01/2026	$66.48	$9.90	$19.50	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	12/01/2024	$50.50	$9.90	$19.50	$0.00	$79.90
	06/01/2025	$52.00	$9.90	$19.50	$0.00	$81.40
	12/01/2025	$53.50	$9.90	$19.50	$0.00	$82.90
	06/01/2026	$55.05	$9.90	$19.50	$0.00	$84.45
	12/01/2026	$56.55	$9.90	$19.50	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	12/01/2024	$52.50	$9.90	$19.50	$0.00	$81.90
	06/01/2025	$54.00	$9.90	$19.50	$0.00	$83.40
	12/01/2025	$55.50	$9.90	$19.50	$0.00	$84.90
	06/01/2026	$57.05	$9.90	$19.50	$0.00	$86.45
	12/01/2026	$58.55	$9.90	$19.50	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.20	$9.90	$18.46	$0.00	$67.56
	06/01/2025	$40.59	$9.90	$18.46	$0.00	$68.95
	12/01/2025	$41.97	$9.90	$18.46	$0.00	$70.33
	06/01/2026	$43.41	$9.90	$18.46	$0.00	$71.77
	12/01/2026	$44.85	$9.90	$18.46	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$52.49	$10.80	$21.40	$0.00	$84.69
	08/25/2025	$55.24	$10.80	$21.40	$0.00	$87.44
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
For apprentice rates see "Apprentice- LINEMAN"						

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

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 08/30/2020

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

Notes:

Apprentice to Journeyworker Ratio:1:2

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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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DOCUMENT 00870

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

1. As used in these specifications:

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

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

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

   d. "Minority" includes:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX A

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

Area covered: Goal for Women apply nationwide

Goals and Timetables

Timetable	Goals (percent)
From Apr. 1, 1980 until further notice	6.9

APPENDIX B-80

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

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

Economic Areas

STATE:	Goals (percent)
MASSACHUSETTS	
004 Boston MA: SMSA Counties: 1123 Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	4.0
MA Essex, MA Middlesex, MA Norfolk, MA Plymouth, MA Suffolk, NH Rockingham.	
5403 Fall River- New Bedford MA, Bristol	1.6
9243 Worcester-Fitchburg-Leominster, MA	1.6
6323 Springfield-Chicopee-Holyoke MA-CT MA Hampden, MA Hampshire	4.8
Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket	3.6
Non-SMSA Counties: MA Franklin	5.9

APPENDIX C

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

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontractors, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Massachusetts Department of Transportation (MassDOT) or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to MassDOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, MassDOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a control, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as MassDOT or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request MassDOT to enter into any litigation to protect the interests of MassDOT. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX D

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

PERTINENT NON-DISCRIMINATION AUTHORITIES:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-Aid programs and projects)

- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 *et seq.*) (prohibits discrimination on the basis of sex)

- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability) and 49 CFR Part 27

- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 *et seq.*) (prohibits discrimination on the basis of age)

- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex)

- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of Federal-Aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not)

- Titles II and III of the Americans with Disabilities Act (42 U.S.C. §§ 12131-12189), as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38 (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities)

- The Federal Aviation Administration's Non-Discrimination Statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex)

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations)

- Executive Order 13166, Improving Access to Services for People with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100)

- Title IX of the Education Amendments Act of 1972, as amended (20 U.S.C. 1681 *et seq*.) (prohibits discrimination on the basis of sex in education programs or activities)

*** END OF DOCUMENT ***

DOCUMENT 00875
TRAINEE SPECIAL PROVISIONS
Revised October, 2016

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

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

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

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

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

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

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

Reimbursement

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

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

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

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

Payment

Trainees will be paid:

1. Percentage (%) of the journeyworker's rate as provided in the existing programs approved by the Department of Labor or Transportation as of September 15, 1970.

2. For journeyworker programs submitted by the Contractor and approved by Massachusetts Department Of Transportation and the Federal Highway Administration at least 60 percent of the appropriate minimum journeyworker's rate specified in the contract for the first half of the training period, 75 percent for the third quarter if the training period, and 90 percent for the last quarter of the training period.

3. For skilled laborer programs, the minimum starting wage rate of unskilled laborer. At the conclusion of training, he or she will be paid the minimum wage rate of the Classification for programs submitted by the Contractor and approved by the Massachusetts Department Of Transportation and the Federal Highway Administration.

4. For the purposes of meeting the legal requirements of State Prevailing Wage Law, please be advised that no person may be paid the Apprentice wage rate as listed on a MA Prevailing Wage Rates schedule, unless that person and program is registered with the Department of Labor Standards/Division of Apprentice Standards (DLS/DAS). Any person or program not registered with DLS/DAS, regardless of whether or not they are registered with any other federal, state, local, or private entity must be paid the journeyworker’s rate for the trade.

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

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

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

*** END OF DOCUMENT ***

DOCUMENT 00880

Revised January 12, 2022

DEPARTMENT OF LABOR

Employment Standards Administration

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONTRACTS

"General Decision Number: MA20250015 03/14/2025

Superseded General Decision Number: MA20240015

State: Massachusetts

Construction Type: Highway

County: Barnstable 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	03/14/2025

ELEC0223-001 09/01/2024

	Rates	Fringes
ELECTRICIAN (Includes Traffic Signalization)	$ 50.02	31.09%+15.50

ENGI0004-032 12/01/2024

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 57.03	33.20
Group 2	$ 56.40	33.20

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

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

IRON0007-026 03/16/2024

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND		

STRUCTURAL).....$ 54.68 36.48

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* LABO0133-001 12/01/2024

Rates Fringes

LABORER (Concrete Surfacer).....$ 46.20 29.85

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* LABO0385-001 12/01/2024

Rates Fringes

LABORER
Common or General.....$ 38.95 29.41
Fence Erection.....$ 38.95 29.41

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* LABO0385-005 12/01/2024

Rates Fringes

LABORER (Landscape).....$ 38.95 29.41

LABO0596-009 12/01/2021

Rates Fringes

LABORER
Guardrail Installation.....$ 32.75 23.96

PAIN0035-023 07/01/2024

Rates Fringes

PAINTER (Steel).....$ 56.76 36.00

TEAM0059-001 06/01/2024

Rates Fringes

TRUCK DRIVER (Dump Truck).....$ 39.78 35.24+a+b

FOOTNOTES:

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

B. PAID VACATION: Employees with 4 months to 1 year of

service receive 1/2 day's pay per month; 1 week vacation for 1 - 5 years of service; 2 weeks vacation for 5 - 10 years of service; and 3 weeks vacation for more than 10 years of service

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SUMA2014-005 01/11/2017

	Rates	Fringes
CARPENTER, Includes Form Work	$ 43.64	22.09
CEMENT MASON/CONCRETE FINISHER	$ 56.70	21.08
IRONWORKER, REINFORCING	$ 44.52	19.36
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 33.65	17.32
LABORER: Concrete Saw (Hand Held/Walk Behind)	$ 44.43	14.18
LABORER: Jack Hammer	$ 38.69	17.33
OPERATOR: Forklift	$ 64.67	0.00
OPERATOR: Mechanic	$ 48.74	11.79
OPERATOR: Piledriver	$ 42.56	17.34
PAINTER: Spray (Linestriping)	$ 47.30	6.42
TRAFFIC CONTROL: Flagger	$ 23.00	20.44
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper	$ 53.35	12.78
TRUCK DRIVER: Concrete Truck	$ 33.69	15.79
TRUCK DRIVER: 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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SPECIAL PROVISIONS

BOURNE
Federal Aid Project Number: NHP(NHS)/CMQ-003S(824)X
Median Installation on Route 6 (Scenic Highway)

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 Construction Standard Details in effect as of March 12, 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 project consists of approximately a mile and a half of roadway reconstruction on Route 6 (Scenic Highway). The project begins one hundred feet west of the Nightingale Pond Road / Andy Olivia Drive intersection and extends seventy feet east of the Edgehill Road intersection. The project addresses safety and geometric deficiencies along the corridor, including the installation of a raised cement concrete median down the center of Route 6, the widening of narrow travel lanes and shoulders, and correcting inadequate cross slopes. An HMA shared-use path will be constructed along the south side of Route 6 to provide pedestrian and bicycle accommodations from points west of the Nightingale Pond Road intersection to the Scenic Overlook, as well as to destinations near the Edgehill Road intersection.

The work under this Contract includes, but is not limited to, clearing and grubbing, full depth construction, milling and pavement overlay, reconstructing driveways, installing new sloped granite edging and curbing, an HMA shared-use path and sidewalks, cement concrete pedestrian curb ramps, installing highway guard, constructing retaining walls, roadside water quality swales and stormwater control measures, new stormwater structures and pipes, underground utility relocations by others, utility pole and overhead wire relocations by others, tree trimming, traffic signal installation, pavement markings and signage, traffic control management, and other incidental items required to complete the work as shown on the Plans, as specified herein, and as required by the Engineer.

Contractor shall be aware the property at 431-461 Scenic Highway is currently under construction (by others) and existing conditions near this property will change throughout the duration of this Contract. Contractor shall field verify tie-in locations for utilities, driveways and curb returns and provide to the Resident Engineer for approval prior to constructing.

SUBSECTION 7.05 INSURANCE REQUIREMENTS
B. Public Liability Insurance

The insurance requirements set forth in this subsection are in addition to the requirements of the Standard Specifications and supersede all other requirements.

Paragraphs 1 and 2

The Massachusetts Department of Transportation and applicable railroads shall be named as additional insureds.

CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS

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

Contractors should email questions and addendum acknowledgements to the following email address massdotspecifications@dot.state.ma.us The MassDOT project file number and municipality is to be placed in the subject line.

CONTAMINATED SOIL

Soil to be removed from the project area shall not be assumed to be uncontaminated and must be evaluated prior to off-site management for potential contamination with hazardous materials. No soil may be disposed of off-site without proper assessment by the contractor and approval from the Resident Engineer (RE), District Environmental Engineer (DEE), or the project designee.

SOIL STOCKPILING DIRECTIVE P-22-001

Any stockpiling of soil must be performed in compliance with Policy Directive P-22-001, Off-Site Stockpiling of Soil from MassDOT Construction Projects. This directive limits the allowable locations for off-site stockpiling of soil generated during MassDOT projects and includes various requirements that must be satisfied by the contractor prior to off-site stockpiling. The Contractor is responsible for identifying a suitable stockpile location.

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.

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.

LANE CLOSURES AND TRAFFIC MANAGEMENT

For all changes to the traffic patterns within the entirety of the project limits, the Contractor to provide notice of traffic setup to the Town of Bourne's Department of Public Works at least 72 hours prior to the traffic pattern change. Contact is below:

Matt Sawicki
Director of Public Works
Town of Bourne
35 Ernest Valeri Road
Buzzards Bay, MA 02532
(508) 759-0600 ext. 3225
msawicki@townofbourne.com

Work on this Project is to be performed during an 8-hour day, 5-day week with additional recommended night shift for proposed Stage 1 work. Typical daytime work hours are 7:00am to 3:30pm. The duration of start/end times of the daytime workday may be adjusted with written approval from the Engineer and the Town of Bourne.

A nightshift will be allowed for the Project between 8:00pm and 6:00am, Sunday night through Thursday night. It is anticipated that night work will primarily be needed during Stage 1 for a Route 6 westbound lane closure to construct temporary pavement and barrier installation, but other work may be permitted during a night shift with written approval from the Engineer and the Town of Bourne.

No work shall be done on this Contract during Saturdays or Sundays without prior written approval of the Engineer and the Town of Bourne. No work shall be performed the day before a long weekend, which involves a Holiday without prior approval.

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.

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.

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.

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.

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.

BUILD AMERICA BUY AMERICA PREFERENCE (Continued)

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.

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.

NATIONAL GRID EMERGENCY TELEPHONE NUMBERS

GAS:
Emergency: 1-800-233-5325
New Service: 1- 877-696-4743
Customer Support: 1-800-732-3400
Damage Prevention: 1-781-399-1326
I&R: 1-617-910-8034

EVERSOURCE EMERGENCY TELEPHONE NUMBERS

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

UTILITIES

TOWN OF BOURNE

Mr. Matt Sawicki
Bourne Director of Public Works
35 Ernest Valeri Road
Buzzards Bay, MA 02532
508-759-0600 x3

Mr. Steven Souza
Bourne Water District Superintendent
P.O. Box 1447
Pocasset, MA 02559
ssouza@bbwd.us
508-759-4631

UTILITIES (Continued)

District Utility/Constructability Engineer
Mr. Christopher Lockett
MassDOT District 5
1000 County St.
Taunton, MA 02780
christopher.lockett@state.ma.us
857-368-5073

Electric
Mr. Ned Sadowski
Eversource Electric "B"
50 Duchaine Blvd.
New Bedford, MA 01745
ned.sadowski@eversource.com

Gas
Ms. Melissa Owens
National Grid Gas
170 Data Drive
Waltham, MA 02451
melissa.owens@nationalgrid.com
781-907-2845

Ms. Kathy M. Arruda
Enbridge
8 Wilson Way
Westwood, MA 02090
kathleen.aruda@enbridge.com
508-938-7728

Telephone
Ms. Karen Mealey
Verizon
385 Myles Standish Blvd.
Taunton, MA 02780
karen.m.mealey@verizon.com
774-409-3160

Cable
Ms. Wendy Brown
Comcast Cable Corporation
5 Omni Way, P.O. Box 6505
Chelmsford, MA 01824
wendy_brown@comcast.com
978-848-5163

UTILITIES (Continued)

Mr. Mark Bonanno
Crown Castle
80 Central St.
Boxborough, MA 01719
mark.bonanno@crowncastle.com
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NORTHERN LONG-EARED BAT AND TRICOLORED BAT PROTECTION

The U.S. Fish and Wildlife Service (USFWS) has listed the northern long-eared bat (*Myotis septentrionalis*; NLEB) and tricolored bat (*Perimyotis subflavus*; TCB) as federally endangered or proposed endangered, respectfully, under the Endangered Species Act (ESA). USFWS has developed this guidance to address ESA compliance and promote conservation of NLEB and TCB. This project has been consulted with the USFWS through the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA) Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat revised February 5, 2018 and amended March 31, 2023.

On behalf of FHWA, the lead federal agency for Section 7 consultation, MassDOT submitted a FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat to the USFWS through the Information for Planning and Consultation (IPaC) webpage. Therefore, the project has completed Section 7 consultation through 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 (David Paulson, david.j.paulson@dot.state.ma.us, 857-262-3378) for questions about project limits, restrictions, or conservation measures.

General AMM

- The Contractor shall ensure all personnel working in on the project site are aware of all environmental commitments related to NLEB 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.

Lighting AMMs

- Direct temporary lighting away from suitable habitat during the active season: **April 1 to October 31.**

- When installing new or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting); or for those transportation agencies using the BUG system developed by the Illuminating Engineering Society, be as close to 0 for all three ratings with a priority of "uplight" of 0 and "backlight" as low as practicable.

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)

- No tree cutting shall be conducted during the active season: **April 1 to October 31.**

- No tree cutting shall be conducted during the active season: **April 1 to October 31**, or if cutting inside of this timeframe is required, tree removal is limited to 10 or fewer trees per project at any time of year within 100 feet of existing road/rail surface and outside of documented roosting/foraging habitat or travel corridors; and a visual emergence survey must be conducted by *MassDOT Highway Division's Environmental Services Section or appointed representative* with no bats observed.

- Do not remove **documented** or NLEB and/or TCB roosts that are still suitable for roosting, or trees within 0.25 miles of roosts, or **documented** foraging habitat any time of year.

- The Contractor shall ensure all personnel working in on the project site are aware of all environmental commitments related to NLEB and/or TCB, including the **TOY** restriction. If this restriction needs to be waived at any location(s) the Resident Engineer shall send a locus map of the proposed work to MassDOT Highway Division's Environmental Services Section for review and a determination if the restriction can be waived.

Bridge AMM

- An inspection of the bridge for the presence of, or evidence of use by, bats shall be completed by the MassDOT Wildlife Unit prior to commencing bridge work. The Contractor shall notify the MassDOT Wildlife Unit no later than thirty (30) days prior to the start of work or reinitiating work on the bridge 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 the MassDOT Wildlife Unit has completed coordination with the U.S. Fish and Wildlife Service to determine the appropriate follow up or mitigative actions. If bridge work is not complete within 2 years of the initial bridge inspection, another inspection of the bridge for the presence of, or evidence of use by, bats shall be completed.

Structure AMMs

- This category includes manmade structures that may provide bat roosting or hibernation habitat that are not bridges (i.e., buildings, sheds, culverts). An inspection of the structure for the presence of, or evidence of use by, bats shall be completed by a Qualified Bat Consultant or MassDOT Biologist prior to commencing structure work. The Contractor shall notify the MassDOT Wildlife Unit no later than thirty (30) days prior to the start of work or reinitiating work 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 the MassDOT Wildlife and Endangered Species Unit has completed coordination with the USFWS to determine the appropriate follow up or mitigative actions.

Hibernacula AMMs

- For projects located within karst areas, on-site personnel will use best management practices, secondary containment measures, or other standard spill prevention and countermeasures to avoid impacts to possible hibernacula. Where practicable, a 300 foot buffer will be employed to separate fueling areas and other major containment risk activities from caves, sinkholes, losing streams, and springs in karst topography.

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.

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.

ENVIRONMENTAL PERMITTING

Environmental permits have not been obtained, as no work (either temporary or permanent) is proposed to occur in water or wetland resource areas. If Contractor erection, demolition, storage, or other procedures require work to occur in or otherwise impact water, wetland resource areas, buffer zones, etc., the Contractor is advised that no associated work can occur until all required environmental permits have been obtained. The Contractor must notify the District 5 Highway Director and Resident Engineer in writing at least 60 days prior to desired commencement of the proposed activity. All environmental submittals, including any contact with Local, State, or Federal environmental agencies, must be coordinated through the District 5 Environmental Engineer. The Contractor is expected to fully cooperate with requests for information and provide same in a timely manner. The Contractor is further advised that the Department will not entertain a delay claim due to the time required to obtain the environmental permits. As a supplement to Section 7.00 of the Standard Specifications, the Contractor is reminded that no debris of any type shall be allowed to enter water or wetland resource areas, either temporarily or permanently.

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

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 102.2 TREE TRIMMING LUMP SUM

Work to be done under this Item shall conform to the relevant provisions of Subsections 8.08 and 101 of the Standard Specifications and the following.

The work consists of removing all living, dead, dying, broken and certain other limbs and branches in areas adjacent to proposed overhead wire relocations, highway lighting, traffic signals, traffic signage, other areas as described on the plans, and as required by the Engineer from trees located within the limits of the Project and the satisfactory disposal of all such removed debris.

Tree trimming shall be done as directed by the Engineer. Any tree trimming for overhead wire relocations shall meet the current requirements of each Utility. Prior to commencing work the Contractor shall verify each location with the Utility Companies.

All pruning and tree work shall be in conformance with the most current version of the American National Standards Institute (ANSI) Standard Z-133.1 and A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance.

All tree trimming work within 10 feet of energized power lines and equipment shall be in conformance with the most current version of the United States Department of Labor (DOL) OSHA Standard 1910.269(r) along with subsections (1) through (8).

All work under this Item will be performed or supervised by the Massachusetts Certified Arborist.

Contractor shall be required to provide a crew, consisting of a bucket truck with operator and grounds man for pruning and removal. The minimum crew shall consist of the following: a supervisor and three tree-trimmers/laborers. The crew shall be equipped with all necessary equipment needed to complete the work including, but not limited to, pickup trucks, chippers, gas powered chain saws, hand saws, loppers, shears, pruners, branch trimmers, ladders, tree-climbing equipment, etc. Fuel for equipment shall also be considered incidental to this Item. The crew shall be OSHA certified as line-clearance tree trimmers in order to work within 10 feet of energized power lines and equipment.

SUBMITTALS

Prior to start of work, the Contractor shall submit to the Engineer the name, certification number and resume of the Massachusetts Certified Arborist referenced herein. Cost for Certified Arborist for all activities pertaining to this Item shall be incidental to this Item.

Incidental to this Item, the Contractor shall provide to the Engineer one (1) copy of the most current version of the American National Standards Institute (ANSI) Standard Z-133.1 and A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance, Part 1: Pruning. These references shall be kept by the Engineer at his/her office for the length of the Contract.

Prior to start of work, the Contractor shall coordinate with the MassDOT Landscape Design Section, the Electric Utility Company, and the Utility Company with pole set in the field to confirm number, location, and extent of selective tree trimming.

ITEM 102.2 (Continued)

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.

BASIS OF PAYMENT

Item 102.2 will be paid for at the Contract unit price per LUMP SUM, which price shall include all labor, certifications, materials, equipment, apparatus, tools, 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. Treatment and monitoring of invasive plant species shall be at the direction of the Resident Engineer with oversight from MassDOT Landscape Section.

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

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

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

Herbicide shall be applied during daytime hours only.

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

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

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

Control of invasive plants shall begin immediately with the initiation of construction activities and prior to any clearing or site disturbance. Treatment areas shall include stockpile locations and may, upon approval of the Engineer, extend outside the project limit. Treatment shall be done each consecutive year for the duration of the contract unless specified otherwise in the 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.

ITEM 102.3 (Continued)

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: Tara.Mitchell@dot.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 a completed and signed MassDOT Herbicide Use Report.

Photo Documentation

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

MATERIALS

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

METHODS

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

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

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

ITEM 102.3 (Continued)

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

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

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

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

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

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

Disposal Of Invasive Plant Material

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

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

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

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

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

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

ITEM 102.3 (Continued)

Follow-Up Treatment

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

MEASURE OF SUCCESS

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

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

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

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

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

ITEM 129.2 OLD PAVEMENT EXCAVATION SQUARE YARD

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

The work to be done under this Item consists of the excavation of existing pavement outside of the new roadway alignment, excluding driveways, to be removed and as required by the Engineer. Excavation methods are subject to the pre-approval of the Engineer.

The old pavement excavation shall be removed and become the property of the Contractor and shall be disposed of by the Contractor.

METHOD OF MEASUREMENT

Item 129.2 will be measured for payment by the SQUARE YARD of existing pavement that is removed.

BASIS OF PAYMENT

Item 129.2 will be paid for at the Contract unit price per SQUARE YARD, which price shall include all labor, materials, equipment, tools, and all other incidentals required to complete the work.

ITEM 160.1. CONTROLLED LOW-STRENGTH MATERIAL - MANUAL EXCAVATABLE (<= 100 PSI) CUBIC YARD

ITEM 160.2 CONTROLLED LOW-STRENGTH MATERIAL MECHANICAL EXCAVATABLE (101-300 PSI) CUBIC YARD

ITEM 160.3 CONTROLLED LOW-STRENGTH MATERIAL(>300 PSI) CUBIC YARD

Work under these Items shall conform to the relevant provisions of Subsection 160 of the Standard Specifications and the following:

Material shall meet the applicable requirements specified in Subsection M4.08.0 of the Standard Specifications. The slump test shall be the "pancake" diameter type.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Items 160.1, 160.2, and 160.3 will be measured and paid per Subsections 160.80 and 160.81, respectively.

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 202.5 MANHOLE (5 FOOT DIAMETER) EACH
ITEM 202.6 MANHOLE (6 FOOT DIAMETER) EACH

The work under these Items shall Conform to the relevant provisions of Subsection 201 of the Standard Specifications and the following.

The work under these Items shall consist of furnishing and installing drain manholes.

Drain manholes shall be precast concrete. The precast manholes shall conform to the latest ASTM Specifications for precast reinforced concrete sections (ASTM C478). Concrete shall have a minimum compressive strength of 4000 psi. Reinforcing steel shall conform to the latest ASTM A185 Specifications. The manhole shall have a capability of supporting HS 20-44 live load.

Joints of precast manhole sections shall be sealed with either a round rubber "O"-ring gasket or a flexible joint sealant. The "O"-ring shall conform to ASTM C443.

Manhole rungs shall be steel reinforced copolymer polypropylene plastic conforming to ASTM C478. Rungs shall be 14 inches wide. Copolymer polypropylene shall meet ASTM Specification D4101. Steel reinforcing shall be 3/8-inch diameter, Grade 60 conforming to ASTM Specification A615 and shall be continuous throughout the rung. The portion of the legs to be embedded in the precast section shall have fins and be tapered to insure a secure bond.

The manhole base section shall be monolithic to a point six (6) inches above the crown of the highest pipe.

The manhole shall be placed on a bedding of 12 inches of crushed stone.

The manhole casting shall be a standard frame and cover. Cover to be marked "Drain."

Adjustment to grade for frame and cover shall be made using courses of brick conforming to M4.05.2, Grade 55.

Concrete collar to be 3000 psi cement concrete masonry.

METHOD OF MEASUREMENT

Items 202.5 and 202.6 will be respectively measured for payment by the EACH manhole installed, complete in place.

BASIS OF PAYMENT

Items 202.5 and 202.6 will be paid for at the respective Contract unit price per EACH, which prices shall include all labor, materials, tools, equipment, concrete masonry, excavation, disposal of surplus materials, bedding, backfilling, and all incidental costs required to complete the work.

Castings shall be excluded in the cost of these Items, and will be paid for under Item 221.1, Frame and Cover - Secured. For structures shown on plans with eccentric openings, payment for eccentric cones or top slabs shall be included in the Contract unit price. Crushed stone for bedding is considered incidental to these Items.

ITEM 221.1 FRAME AND COVER - SECURED EACH

The work under this Item shall conform to the relevant provisions of Subsections 201, 220 and the following:

The work to be done under this Item consists of the furnishing and delivering Frame and Cover – Secured to the site as shown on the Plans, and as required by the Engineer.

Frame and Cover - Secured assemblies shall consist of covers and frames that conform to the nominal size, weight, material and load-carrying requirements in MassDOT Construction Standard Details E 202.6.0, E 202.7.0 and E 202.8.0, and are on the relevant MassDOT Qualified Construction Materials list. Some dimensions of secured manhole covers and frames may vary slightly from those shown on the standard details to account for necessary fastening components. The Contractor shall submit shop drawings of all drainage castings for approval prior to ordering.

Covers and frames shall be held securely together by bolting to threaded holes in the frame or to nuts or tumbler devices secured by the frame, by use of hooks attached to the cover or by any other means approved by MassDOT, to prevent being dislodged under traffic loading. Gaskets and other sealing devices will not be allowed.

METHOD OF MEASUREMENT

Item 221.1 will be measured per EACH Frame and Cover – Secured furnished and delivered to the site.

BASIS OF PAYMENT

Item 221.1 will be paid for at the Contract unit price EACH Frame and Cover – Secured furnished and delivered.

ITEM 299.1 INFILTRATION STORMWATER CONTROL MEASURE LUMP SUM

The work under this Item shall conform to the relevant provisions of SectionS 200 and 700 of the Standard Specifications and the following:

The work to be done under this Item shall include installation of the stormwater infiltration basin, as shown on the plans. The various specific installation items that are included in Item 299.1, such as earthwork, placed granite edging, and modified rock fill, shall not be counted again under their respective other bid items.

BASIS OF PAYMENT

Item 299.1 will be paid for at the Contract unit price per LUMP SUM, which price shall include all labor, materials, equipment, earthwork, granite edging, modified rock fill, and all incidental costs required to complete the work. Unless noted otherwise above, installation of all aspects of the infiltration basin shall be considered incidental to this item, with no separate payment. The work under this Item includes, but is not limited to, approximately 300 LF of straight granite curb and approximately 150 SY modified rock fill.

Seeding within the area of the stormwater infiltration basin will be paid for separately, as detailed in the landscape plans. The proposed drainage structures that discharge runoff to the basin and collect treated runoff from the basin are paid for separately, as detailed in the drainage plans.

ITEM 316.12 12 INCH WATER MAIN REMOVED AND DISPOSED 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 of the Standard Specifications.

METHOD OF MEASUREMENT

Item 316.12 will be measured for payment by the FOOT of 12 inch water main removed and disposed.

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,excavation, removal, disposal, backfill, and all incidental costs required to complete the work.

ITEM 369.12 12 X 12 INCH TAPPING SLEEVE, VALVE AND BOX EACH
ITEM 370.4 12 X 6 INCH TAPPING SLEEVE, VALVE AND BOX EACH

The work under these Items shall conform to the relevant provisions of Subsection 301 of the Standard Specifications and the following.

MATERIALS

Prior to the installation of a tapping sleeve and valve the Contractor shall obtain written approval from the Buzzards Bay Water District.

Tapping sleeves and valves shall consist of a split ductile iron sleeve tee with mechanical joint ends on the main and a flange on the branch. Tapping-type gate valves shall have one flange and one mechanical joint end. The valves shall conform to the requirements hereinbefore specified for gate valves and shall be furnished with a 2-inch square operating nut. The Contractor shall be responsible for verifying the outside diameter of the pipe to be tapped.

Oversized valves shall be provided as required to permit the use of full size cutters. Before backfilling, all exposed portions of bolts used to hold the two halves of the sleeve together shall be heavily coated with two coats of bituminous paint comparable to Inertol No. 66, Special Heavy. Sleeves shall be of cast iron furnished with rubber gaskets. Gaskets shall cover the entire area of flange surfaces.

Tapping sleeves and valves shall be as manufactured by Clow Valve Co., Oskaloosa, IA; Meuller Co., Decatur, IL; American Valve and Hydrant, Birmingham, AL; or approved equal.

CONSTRUCTION METHODS

The Contractor shall make all connections to the existing mains as indicated on the drawings and as herein specified.

The Contractor shall develop a program for the construction and putting into service of the new work subject to the approval of the Engineer. All work involving cutting into and connecting to the existing system shall be planned so as not to interfere with operation of the existing facilities, even to the extent of working outside of normal working hours to meet demand requirements.

The Contractor shall have all possible preparatory work done prior to making the connection and shall provide all labor, tools, material, and equipment required to do the work in one continuous operation.

The Contractor shall have no claim for additional compensation, by reason of delay or inconvenience, for adapting his operations to the needs of the Owner's water supply. No damages shall be claimed by the Contractor for delays in dewatering pipelines nor shall any damages be claimed because of water leaking through closed valves after dewatering is completed.

ITEMS 369.12 and 370.4 (Continued)

Under no circumstances shall water supply to the existing system and facilities be interrupted for a period of more than 4 hours without prior approval of the Owner.

Existing pipeline that is not to be abandoned but is damaged by the Contractor during the work shall be replaced by him at his own expense in a manner approved by the Engineer.

Tapping connections to the existing mains, where indicated on the drawings, shall be made with service pressure in the main, using tapping sleeves, saddles and valves and a suitable tapping machine.

Other connections to existing mains shall be made with the main out of service, unless otherwise required by the Engineer. Such connections will not require tapping sleeves and valves but connections as indicated on the drawings.

METHOD OF MEASUREMENT

Items 369.12 and 370.4 will be respectively measured for payment by the EACH tapping sleeve furnished and installed, complete in place.

BASIS OF PAYMENT

Items 369.12 and 370.4 will be paid for at the respective Contract unit price per EACH, which prices shall include all labor, material, equipment, and all incidental costs required to complete the work.

ITEM 371.06 6 INCH COUPLING EACH

The work under this Item shall conform to the relevant provisions of Subsection 301of the Standard Specifications and the following.

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 Buzzards Bay Water District and the Engineer.

MATERIALS

MECHANICAL COUPLINGS
Bolted, Sleeve-Type Couplings for Plain-End Pipe, ANSI/AWWA C-219.

Manufacturer:
1. Dresser "Style 38"
2. Smith-Blair “Style 441”
3. Ford "FC3" and "FC3"
4. Or equal without pipe stop for coupling pipes of equal diameters.

Gaskets: Styrene Butadiene (SBR). In contaminated areas, gaskets shall be nitrile.

MECHANICAL TRANSITION COUPLINGS
Manufacturer:
1. Dresser "Style 62 Type 1"
2. Rockwell "413"
3. Ford "FC5" with pipe stops
4. Or equal with pipe stops.

Minimum length of center sleeve to meet or exceed ANSI/AWWA C-219.

Gaskets: Styrene Butadiene (SBR). In contaminated areas, gaskets shall be nitrile.

CONSTRUCTION METHODS

Pipe ends shall be cleaned thoroughly prior to installation. After the bolts have been inserted and all nuts have been made up fingertight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferable by use of a torque wrench of the appropriate size and torque for the bolts. The correct torque as indicated by a torque wrench shall not exceed 90 foot-lb.

METHOD OF MEASUREMENT

Item 371.06 will be measured for payment by the EACH 6 inch coupling furnished and installed, complete in place.

BASIS OF PAYMENT

Item 371.06 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 402.13 PAVEMENT MILLING MULCH FOR SHOULDERS FOOT

Work to be done shall conform to the relevant provisions of Subsection 769 of the Standard Specifications and the following:

The work consists of earthworks to install pavement millings mulch for shoulders at the edge of pavement. The existing shoulder shall be prepared for pavement milling mulch as necessary and directed by the Engineer. The work shall consist of excavation and leveling shoulder area to be mulched. The excavation and leveling of shoulder shall be pushed back down slope on embankment and/or excavated and disposed of on-site level and compacted as directed by the Engineer. Milling mulch shall be graded and compacted to a width of 3 feet and a depth of 4 inches level with the edge of the pavement, top of edging or curb or as directed by the Engineer. No geotextile fabric under the pavement millings shall be installed.

Materials

Pavement milling mulch shall be smaller than the Standard 1-1/2 inch sieve.

The on-site recycling of pavement millings sourced from the project is encouraged. All pavement milling mulch for shoulders will be accepted based on visual inspection by the Engineer. Mulch material greater than 1 ½ inch shall be removed off-site by the Contractor.

METHOD OF MEASUREMENT

Item 402.13 will be measured per FOOT in the longitudinal direction parallel to the edge of road, complete in place.

BASIS OF PAYMENT

Item 402.13 will be paid per FOOT of material installed which price includes materials, excavation, grading and leveling and disposing on site, compacting and all incidental costs required to complete the work to the satisfaction of the Engineer.

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.

CONSTUCTION METHODS

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.

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.

ITEM 655.3 (Continued)

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.

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 along the top rail from center to center of end posts, 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 labor, materials, transportation, equipment, cutting, installing the timber, excavation and backfill, and all incidental costs required to complete the work.

ITEM 697.1 SILT SACK EACH

Work under this Item shall conform to the relevant provisions of Subsections 227 and 670 of the Standard Specifications and the following:

The work under this Item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

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 Subsection 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 740. ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) MONTH

The work under this Item shall conform to the relevant provisions of Subsection 740 of the Standard Specifications and the following:

Three computer systems and 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 740. (Continued)

The Multifunction Printer System shall meet the following minimum criteria or better:

Color laser printer, fax, scanner, email and copier all in one with the following minimum capabilities:

- Estimated volume 8,000 pages per month
- LCD touch panel display
- 50 page reversing automatic document feeder (RADF)
- Reduction/enlargement capability
- Ability to copy and print 11” x 17” paper size
- email and network pc connectivity
- Microsoft and Apple compatibility
- ability to overwrite latent images on hard drive
- 600 x 600 dpi capability
- 30 pages per minute print speed (color),
- 4 Paper Trays Standard (not including the bypass tray)
- Automatic duplexing
- Finisher with staple functions
- Standard Ethernet. Print Controller
- Scan documents to PDF, PC and USB
- ability to print with authenticated access protection

The Contractor shall supply a maintenance contract for next day service, and all supplies (toner, staples, paper) necessary to meet estimated monthly usage.

The Engineer's Field Office and the equipment included herein including the computer system, and printer shall remain the property of the Contractor at the completion of the project. Disks, flash drives, and card readers with cards shall become the property of the Department.

Compensation for this work will be made at the Contract unit price per month which price includes full compensation for all services and equipment, and incidentals necessary to provide equipment, maintenance, insurance as specified and as directed by the Engineer.

ITEM 751.7 COMPOST BLANKET CUBIC YARD

The work under this Item shall conform to the relevant provisions of Subsection 751 and M1.06.0 Compost of the Standard Specifications and the following:

Work shall consist of furnishing and pneumatically applying compost as a thin mulch blanket (1/2- 1 inch depth) over prepared soil to provide temporary soil stabilization and organic matter for plant growth.

SUBMITTALS AND MATERIALS

No materials shall be delivered until the required submittals have been approved by the Engineer. Delivered materials shall match the approved samples. Approval of test results does not constitute final acceptance.

Contractor shall submit to the Engineer samples and certified test results no sooner than 60 days prior to application of compost. Vender certification that material delivered meets the test results shall be submitted if requested.

Compost shall meet the requirements for M1.06.0: Compost, Type 2, as referenced in the MassDOT– Highway Division Standard Specifications for Highways and Bridges, Division III: Materials Specifications, latest edition.

The Engineer shall approve the Contractor's equipment for application.

CONSTRUCTION METHODS

Application of compost material shall not begin until the Engineer has approved the site and soil conditions. Soil preparation shall be as specified under the applicable item for soil placement or for seeding. The Contractor shall notify the Engineer when areas are ready for inspection and application of compost.

Compost blanket shall be pneumatically applied (blown on) to a minimum depth of one half to one inch. Where shown on the plans or when directed by the Engineer depth may be increased to provide berms for sediment control or to otherwise prevent slope erosion.

When compost blanket is proposed with seeding, seed shall be broadcast and shall occur in conjunction with compost blanket, as specified under the relevant item for seeding.

When compost blanket is proposed for areas with planting, compost (and seed if applicable) shall be applied after planting. If compost and seed occur prior to planting, areas shall be regraded and compost and seed reapplied to the satisfaction of the Engineer and at the Contractor’s expense.

ITEM 751.7 (Continued)

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 751.7 will be measured and paid for at the Contract unit price per Cubic Yard which price shall include all labor, materials, equipment, and all incidental costs required to complete the work of pneumatically applying compost.

Surface preparation of substrate receiving compost blanket shall be compensated under the applicable item for placement of loam, sand, ordinary borrow, wetland soil, topsoil rehandled and spread, tilled existing soil, or other specified substrate.

Seeding, if utilized, will be compensated for under the appropriate seeding items.

ITEM 756. NPDES STORM WATER POLLUTION PREVENTION PLAN LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the EPA for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. The Contractor shall be fully responsible for compliance with the most recently issued CGP and any subsequent revisions. Should a fine or damages be assessed against it, or MassDOT, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a fourteen (14) day review period commencing from the date on which EPA enters the Notice into their database. Based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

The CGP also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The Plan will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. The contractor shall prepare the SWPPP and update it as necessary. The Contractor shall submit the Plan to the Engineer for approval at least four (4) weeks prior to any site activities. It is the responsibility of the Contractor to comply with the CGP conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to the project and to include in the SWPPP the methods and means necessary to comply with applicable conditions of said permits.

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, regulations, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

ITEM 756. (Continued)

In addition to the CGP requirements for inspections, MassDOT requires inspection of all erosion controls and site conditions on a weekly basis. Inspections are also required at portions of sites that discharge to sediment or nutrient impaired or high quality waters per the CGP when each incidence of rainfall exceeding 0.25 inches in twenty-four hours or after snowmelt discharge from a storm event that produces 3.25 inches or more of snow within twenty-four hours occurs. The CGP requires that inspections be performed by a qualified individual as outlined in the CGP. MassDOT requires proof of completion of a 4 hour minimum sedimentation and erosion control training class current to the latest CGP. This individual can be, but not limited to, someone that is either a certified inspector, certified professional, or certified storm water inspector. The documentation shall be included as an appendix in the SWPPP. The inspector's qualifications shall be submitted to the Engineer for approval prior to beginning any work. This individual shall be on-site during construction to perform these inspections. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. The Standard Specifications require adequate erosion control for the duration of the Contract. All control measures must be properly selected, installed, and maintained in accordance with manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or is no longer adequate, it is the responsibility of the Contractor to replace or modify the control for site conditions at no additional cost to the Department. Contractor must maintain all control measures and other protective measures in effective operating conditions and shall consider replacement of erosion controls for each construction season.

The work under this item shall also include the preparation, submission and implementation of a Flood Contingency Plan. The plan shall address the potential need for the temporary relocation of construction and auxiliary equipment situated within the 1% annual chance of flooding zone to designated upland locations above the Base Flood Elevation during flood events. The Flood Contingency Plan shall address any additional MassDEP-required information requirements, as applicable. The Flood Contingency Plan shall be submitted to the Engineer for review and approval at the same time as the SWPPP.

This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, preparation of monthly reports and Flood Contingency Plan. In addition, any erosion controls beyond those specified in bid items which are selected by the Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this Item.

ITEM 756. (Continued)

The CGP provides specific requirements for temporary and final stabilization. This shall be incorporated into the project schedule. The permit defines specific deadline requirements for Initial Stabilization ("immediately", i.e., no later than the end of the next work day following the day when earth-disturbing activities have temporarily or permanently ceased) and for Complete Stabilization Activities (no later than 14 calendar days after the initiation of stabilization). Stabilization criteria for vegetative and non-vegetative measures are provided in the CGP.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etc. Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer's Final Estimate. The permittee shall use EPA's website to prepare and submit the NOT.

BASIS OF PAYMENT

Item 756 will be paid for at the Contract unit price Lump Sum, which price shall include all labor, materials, equipment, SWPPP & Flood Contingency Plan preparation, revisions/addenda during construction, monthly reports, filing fees, and all incidental costs required to complete the work.

Payment of 50% of the Lump Sum price of this item will be made upon acceptance of the NPDES Stormwater Pollution Prevention Plan & Flood Contingency Plan.

Payment of 40% of the Lump Sum price of this item will be will be paid in equal monthly installments distributed across the time remaining in the accepted baseline schedule until substantial completion.

The remaining 10% of the Lump Sum price of this Item will be paid following accepted submission of a Notice of Termination (NOT) when final stabilization has been achieved.

ITEM 765.21 ANNUAL COVER CROP FOR NATIVE SEEDING POUND

Work under this Item shall be in accordance with Subsection 765 of the Standard Specifications and the following.

DESCRIPTION

Work consists of furnishing and applying the appropriate annual grass to be seeded as a cover crop in conjunction with upland native seeding and at the rate specified herein.

A cover crop shall be used for following conditions:

- when specified under Application Rate for the permanent native upland seed mix
- for slopes 2:1 or steeper and an annual is not already specified as part of the permanent mix
- when seeding out of season and the native seed mix does not already specify an annual
- as required to prevent erosion until the permanent seed establishes.

A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Annual rye (*Lolium multiflorum*) will not be accepted as an annual cover crop.

Using annual rye or exceeding the application rate such that a dense stand of annual grasses prevents germination of the native grasses will require mowing of annual grasses. In this instance, mowing of cover crop will be incidental to this Item.

Seed and Application Rate

Add 30 pounds/acre of the following seed based on seeding season:

Avena sativa (Grain Oats):	1 January to 31 July
Cecale cereale (Grain Rye):	1 August to 31 December

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Annual Cover Crop will be measured for payment per pound of seed per pound of seed, complete in place.

Annual Cover Crop will be paid at the Contract unit price per pound upon approval of seed bag tags or other documentation of correct application rate and species, and upon acceptance of a satisfactory stand of annual grasses three weeks following seeding.

Application and care of cover crop will be paid for separately under Item 765.635 Native Seeding and Establishment

ITEM 765.412	**SHORT GRASSLAND MIX-SANDY SOIL**	**POUND**
ITEM 765.415	**NATIVE SHORT GRASSLAND MIX**	**POUND**
ITEM 765.472	**STEEP SLOPE MID-HEIGHT MIX**	**POUND**
ITEM 765.553	**SEED - WETLAND RIPARIAN MIX**	**POUND**

Work under these Items shall consist of furnishing the mix(es) specified below in the required quantity.

SUBMITTALS

1) Pre-Verification of Seed Availability. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species in the required quantities and for the anticipated date of seeding. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. Species not expected to be available should be noted and substitutions recommended.

2) Final Verification of Seed Availability. No earlier than 21 days prior to ordering, the Contractor shall submit to the Engineer the supplier's verification of availability of seed species and in the required quantities. Verification shall be on the supplier's letterhead and notarized by the supplier's notary. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section. Substitutions or changes in the mix at this time must be approved by MassDOT Landscape Design Section.

3) Seed Worksheet provided herein shall be submitted to the Engineer prior to ordering seed to determine the number of pounds of Pure Live Seed required.

4) Seed Tags. The contractor shall submit original seed tags from each bag of seed used on the project or ensure that each tag is photo documented by the Engineer while on the unopened bag.

   Number of tags submitted must correspond to number of bags delivered.

Species listed on the seed tag shall match the Final Verification of Seed Availability (Submittal #2) unless approved otherwise. Tag must include: variety and species name; lot number; purity; percentage of inert matter; percentage of weeds, noxious seeds, and other crop seeds; germination, dormant or hard seed; total viability; origin of seed; germination test date, net weight, and name and address of seller. The origin of seed must be listed on the seed tag for all species in the mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section.

ITEMS 765.412 through 765.553 (Continued)

5) Verification of Seed Delivery. Prior to payment, contractor shall submit the Seed Delivery Verification form contained within the contract or the Supplier's Verification on company letterhead or a bill of lading. Supplier verification must include all information requested on the Verification form within this contract. The bill of lading must include variety and species name, lot number, net weight shipped, date of sale, invoice, project or seeding location, and name and address of Supplier. All information must be filled in and complete for acceptance. Information must match the seed tags and quantity of seed used on the job. A copy of this submittal shall be forwarded to the MassDOT Landscape Design Section

6) Seed Sample. If requested or if seed is from a previously opened bag, the contractor may be asked to submit to the Engineer a sample of seed from the seed bag (1-2 cups) at the time of seeding.

SEEDING SEASON

The appropriate seeding seasons are:
Spring: April 1 - May 15
Fall: October 1 - December 1 for dormant seeding

PERMANENT SEED MIX(ES)

Calculating Pure Live Seed (PLS)

Quantities specified are PURE LIVE SEED. Greater quantities of ordered seed may be required to achieve actual specified seeding rates.

Pure Live Seed (PLS) is defined as a percentage calculated by multiplying the percent of pure seed by the percent of viable seed (total germination, hard seed, and dormant seed). For example:

If a seed label indicates 90% purity, 78% germination, 10% hard seed, and 2% dormancy, it is calculated to be 90% x [78 + 10 + 2]% = 81% PLS.

Therefore, each pound of PLS would need 1 pound / 0.81 = 1.2 pounds of seed with a 90% purity and 90% total germination

Seed Mix(es) shall be as specified below. Ecotypes and cultivars shall be as close to Massachusetts as possible and appropriate to the site conditions.

Native Upland Seed Mix to be used on flat or areas will shallow slopes on the North side of Route 6 shall be Short Grassland Mix – Sandy Soil.

ITEMS 765.412 through 765.553 (Continued)

765.412 Short Grassland Mix-Sandy Soil

Botanical Name	Common Name	% Mix By Weight (PLS)
Grass		
Festuca ovina	Sheep Fescue	44.0%
Schizachyrium scoparium	Little Blue Stem	34.5%
Elymus canadensis	Canada Wild Rye	13.0%
Eragrostis spectabilis 'RI Ecotype'	Purple Lovegrass 'RI Ecotype'	2.0%
Agrostis perennans	Upland Bentgrass	1.0%
		94.5%
Herb/Forb		
Chamaecrista fasciculata	Partridge Pea	2.0%
Rudbeckia hirta-VT ecotype	Black-eyed Susan-VT ecotype	0.8%
Pycnanthemum tenuifolium	Slender Mountain Mint	0.4%
Achillea millefolium	Common Yarrow	0.4%
Asclepias tuberosa	Butterfly Milkweed	0.4%
Aster laevis NY Ecotype	Smooth Aster NY Ecotype	0.3%
Aster pilosus	Heath Aster	0.3%
Eurybia spectabilis	Eastern Showy Aster	0.3%
Lespedeza capitata	Roundhead Bush Clover	0.2%
Solidago odora	Licorice Scented Goldenrod	0.2%
Solidago nemoralis	Grey Goldenrod	0.2%
		5.5%
Seeding Rate: 30.0 lbs PLS/Acre		**100.0%**

ITEMS 765.412 through 765.553 (Continued)

Native Upland Seed Mix to be used in flat or areas will shallow slopes on the South side of Route 6 shall be Native Short Grassland Mix.

765.415 Native Short Grassland Mix

Botanical Name	Common Name	% Mix By Weight (PLS)
Grass		
Schizachyrium scoparium	Little Blue Stem	54.5%
Elymus virginicus	Virginia Wild Rye	27.2%
Dichanthelium clandestinum 'Tioga'	Deertongue grass 'Tioga'	4.0%
Eragrostis spectabilis 'RI Ecotype'	Purple Lovegrass 'RI Ecotype'	3.0%
Agrostis perennans	Upland Bentgrass	1.5%
Juncus tenuis	Path Rush	1.0%
		91.2%
Herb/Forb		
Chamaecrista fasciculata	Partridge Pea	4.0%
Zizia aurea	Golden Alexanders	2.0%
Penstemon digitalis	Beard-tongue	1.0%
Achillea millefolium	Common Yarrow	0.5%
Solidago nemoralis	Grey Goldenrod	0.3%
Pycnanthemum tenuifolium	Slender Mountain Mint	0.2%
Aster laevis NY Ecotype	Smooth Aster NY Ecotype	0.2%
Solidago bicolor	White Goldenrod	0.2%
Aster lateriflorus	Calico Aster	0.2%
Euthamia graminifolia	Grass-leaved Goldenrod	0.1%
Aster pilosus	Heath Aster	0.1%
		8.8%
Seeding Rate: 15.0 lbs PLS/Acre		**100.0%**

ITEMS 765.412 through 765.553 (Continued)

765.472 Steep Slope Mid-Height Mix

Botanical Name	Common Name	% Mix By Weight (PLS)
Grass		
Cover Crop - Secale cereale/Avena	Cover Crop - Grain Oats/Rye	40.0%
Schizachyrium scoparium 'Albany Pine'	Little Bluestem 'Albany Pine'	30.0%
Elymus virginicus	Virginia Wild Rye	8.0%
Elymus canadensis	Canada Wild Rye	5.0%
Panicum virgatum	Switch Grass	4.5%
Agrostis perennans	Upland Bentgrass	3.0%
Dichanthelium clandestinum 'Tioga'	Deertongue grass 'Tioga'	2.3%
		92.8%
Herb/Forb		
Echinacea purpurea	Purple Coneflower	3.0%
Chamaecrista fasciculata	Partridge Pea	2.0%
Penstemon digitalis	Beard-tongue	0.7%
Monarda fistulosa	Wild Bergamot	0.3%
Asclepias syriaca	Common Milkweed	0.2%
Lespedeza capitata	Roundhead Bush Clover	0.2%
Rudbeckia hirta-VT ecotype	Black-eyed Susan-VT ecotype	0.1%
Aster prenanthoides	Zig Zag Aster	0.1%
Solidago nemoralis	Grey Goldenrod	0.1%
Aster pilosus	Heath Aster	0.1%
Aster laevis NY Ecotype	Smooth Aster NY Ecotype	0.1%
Pycnanthemum tenuifolium	Slender Mountain Mint	0.1%
Solidago juncea	Early Goldenrod	0.1%
Asclepias incarnata	Swamp Milkweed	0.1%
		7.2%
Seeding Rate: 75.0 lbs PLS/Acre		**100.0%**

ITEMS 765.412 through 765.553 (Continued)

Seed - Wetland Riparian Seed Mix to be used at the bottom of stormwater basins.

765.553 Seed - Wetland – Riparian Mix

	Botanical Name	Common Name	% PLS by Weight
Grass			
	Sorghastrum nutans NY Eco	Indiangrass NY Ecotype	14.00%
	Schizachyrium scoparium	Little Blue Stem	14.00%
	Elymus riparius	Riverbank Wild Rye	10.00%
	Elymus virginicus	Virginia Wild Rye	10.00%
	Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	9.00%
	Andropogon gerardii NY Eco	Big Bluestem NY Eco	8.00%
	Carex vulpinoidea	Fox Sedge	7.00%
	Panicum virgatum	Switchgrass	3.00%
	Juncus effusus	Soft Rush	2.00%
	Agrostis perennans	Upland Bentgrass	2.00%
	Scirpus atrovirens	Green Bulrush	1.00%
			80.00%
Herb/ Forb	Chamaecrista fasciculata	Partridge Pea	3.00%
	Verbena hastata	Blue Vervain	3.00%
	Asclepias incarnata	Swamp Milkweed	3.00%
	Heliopsis helianthoides	Ox-Eye Sunflower	2.00%
	Eupatorium perfoliatum	Boneset	2.00%
	Aster umbellatus	Flat Topped White Aster	1.00%
	Aster prenanthoides	Zig Zag Aster	1.00%
	Aster puniceus	Aster – Swamp	1.00%
	Aster novae-angliae	New England Aster	1.00%
	Eupatorium maculatum	Joe-pye Weed	1.00%
	Monarda fistulosa	Wild Bergamot	1.00%
	Vernonia noveboracensis	New York Ironweed	1.00%
			20.00%
			100.00%

Seeding Rate: 20.0 lbs PLS/Acre

ITEMS 765.412 through 765.553 (Continued)

Any species substitutions shall be with a species having similar characteristics and function. Substitutions must be approved by MassDOT Landscape Design Section per the documentation submittal process.

50% Increase Adjustment for Field Conditions

Seeding under the following conditions requires a 50% increase in the permanent mix at the time of construction:

- Seeding out of season
  OR
- Seeding after Compost Blanket has been applied (unless already increased for out of season).

ITEMS 765.412 through 765.553 (Continued)

NATIVE SEED WORKSHEET

Project Description: _____ Project No: _____

Contractor: _____ Contract No: _____

Seed Mix Number & Description: _____

Contractor: Complete Prior To Ordering

Pounds of Seed Required Per Contract:

_____lbs./acre for _____Acre(s) OR _____ SY

Additional 50% increase if required (out of season or seeding over compost blanket):

_____**lbs. Total Seed Required**

Calculated Quantity for **P**ure **L**ive **S**eed (PLS[1]):

_____ **Total Pounds PLS**

Engineer: Verification at Time of Application

Number pounds delivered to site[2]: _____ Date(s): _____

Actual Seed Bag Tag/s Received or photo documented by Engineer: _____

[1] PLS=% pure seed x % viable seed (total germination, hard seed, and dormant seed).
*[2]Quantity delivered should match pounds **Total Pounds PLS** and **Verification of Seed Delivery**. Pounds should be shown on each Seed Tag.*

ITEMS 765.412 through 765.553 (Continued)

SUPPLIER VERIFICATION OF SEED DELIVERY FOR MASSDOT PROJECTS

Date_____

We hereby certify that (*Seed Supplier*):_____

Furnished to (*Contractor*): _____

For use on: (*Project Description*) _____

Project #: _____ Contract #: _____

Pounds of Pure Live Seed: _____

Of Mix (*Description*): _____

Lot Number _____

The material was delivered on (*Date*)_____.

The labels and contents meet all State and Federal regulations. The mixture consists of the following species, including cultivars (as applicable) and ecotype region, and at the following percentages (may be attached separately):

Name (print): _____ Title: _____

Supplier: _____

Signature and Seal: _____

ITEMS 765.412 through 765.553 (Continued)

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

765.412 Short Grassland Mix– Sandy Soil, 765.415 Native Short Grassland Mix, 765.472 Steep Slope Mid-Height Mix and 765.553 Wetland -Riparian Mix will be measured for payment by the pound of Pure Live Seed delivered and complete in place.

765.412 Short Grassland Mix – Sandy Soil, 765.415 Native Short Grassland Mix, 765.472 Steep Slope Mid-Height Mix and 765.553 Wetland -Riparian Mix will be paid at the Contract unit price per pound of Pure Live Seed delivered upon approval of all Seed Submittal Documentation. Overseeding required to correct poor germination or establishment shall be incidental to the item.

Cover crop not included as part of the permanent mix composition will be paid for under Item 765.21, Annual Cover Crop.

Application and care of native seed mix will be paid for separately under Item 765.635 Native Seeding and Establishment.

ITEM 765.635 NATIVE SEEDING AND ESTABLISHMENT SQUARE YARD

Work shall conform to the relevant provisions of Subsections 765 and 767 of the Standard Specifications and the following:

The work under this Item shall consist of seeding, mowing, and other care to establish a stand of grass in the areas shown on the plans or as required by the Engineer. For the purposes of these specifications, the term "grass" shall apply to all the forbs, grasses, sedges, and rushes included in the materials.

QUALIFICATIONS

Seeding shall be done by a company having a minimum of five years of experience with native seed establishment. Prior to beginning work, the seeding Contractor shall furnish proof of qualifications to the Engineer for approval. Proof of qualifications shall include providing documentation (photos and contacts) to demonstrate knowledge and expertise with native seeding and establishment and proof of having completed successful native seeding projects.

SEEDING SEASON

Seeding seasons for native mixes is April 1 - May 15 and October 1 - December 1 for dormant seeding. Written approval must be obtained for seeding outside the seeding season and, if approved, the permanent seed rate shall be increased by 50%.

Seeding season for cover crops shall be grain oats January 1 – July 31 and grain rye August 1 – December 1.

MATERIAL AND SUBMITTALS

Seed Mixes and Submittals shall be per the item(s) for permanent and annual (cover crop) seed mixes.

Compost Blanket, if used, shall meet the material and submittal requirements for that item.

Hydromulch shall be wood fiber or straw applied per the Standard Specifications and at the rates specified below and per the manufacturer.

A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of hydromulch, tackifier, and seed, per 100 gallons of water and as applicable to products used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above.

Fertilizer

No fertilizers shall be applied.

ITEM 765.635 (Continued)

Water

Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

SEEDING

Hand broadcast method shall be used for all areas smaller than half an acre and when specified on the plans for areas over half an acre.

Seeding shall occur within 72 hours of placement of loam and final grading or the Contractor shall propose a reasonable, alternative schedule that shall be approved by the Engineer.

Surface Preparation

No seeding or soil preparation shall be done if soils are muddy or dry and compacted. Bare soils shall be raked to remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Ruts and depressions shall be filled with additional loam or compost and the soil shall be re-graded to a relatively smooth finish corresponding to the required grades.

When seeding over existing or compacted soil or soil that has sat bare for more than 30 days, surface will be prepared by tilling or raking to a minimum depth of 2 inches prior to seeding and prior to Compost Blanket application (when applied).

Surface preparation shall be compensated for under for loam placement or topsoil rehandled and spread as appropriate to the project.

Jute or coir mesh, when specified in the Contract, shall be placed after seeding and per the Standard Specifications and the manufacturer’s instruction.

Surface preparation shall be approved by the Engineer prior to seeding.

Seeding over Various Substrates

Loam: Seeding shall occur within 72 hours of loam placement to prevent loss of topsoil. Seed shall be manually broadcast for areas less than half an acre (each area, not cumulative area) and when specified on the plans. Broadcasting shall be immediately followed by hydromulching as specified below. When not specified on the plans, larger areas may be hydroseeded as specified below.

Compost Blanket: Compost Blanket shall be applied as specified under that item. Seed should be hand broadcast at the same time as compost application to ensure a thin cover of compost over seed.

When seeding is done after application of Compost Blanket the rate shall be increased by 50%. If the Compost Blanket is applied after December 1, seed shall be broadcast or hydroseeding over the compost in the Spring and the rate increased by 50% specified under Seed Application.

ITEM 765.635 (Continued)

Compost Mulch over Modified Rock: Compost Mulch and seed shall be applied as specified under that item. No hydromulch is required.

Cover Crop

Cover crop shall be used when seeding out of season, when specified with the permanent native seed mix under that item, and as required to prevent erosion until the permanent seed establishes.

A cover crop should not be used with a steep slope mix or other permanent mix which already contains either cereal rye or oats in the composition of the mix. A cover crop is not necessary for wetland seeding and is not typically necessary for soil stabilization when seeding in conjunction with a compost blanket application.

Seed Application

All seed shall be mulched as specified herein.

Seed application shall be by broadcast seeding or by hydroseeding as described below.

Broadcast Seeding

Seed shall be broadcast spread using a cyclone or whirlwind seeder or hand broadcast. Small or light-seeded species such as bluestem may be mixed with approved filler to achieve an even distribution. Seed shall not be broadcast when wind velocities are greater than 15 mph.

Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction (horizontally and vertically). To ensure seed to soil contact with broadcasting of seed, seeding shall be followed by rolling or tracking with equipment approved by the Engineer.

Broadcast seed shall be mulched with weed-free straw mulch unless seeding is done as part of Compost Blanket in which case it shall be as specified above under seeding with Compost Blanket application. Hydromulching shall be as specified under Hydromulching.

Hydroseeding and Hydromulching

Hydroseed and mulching shall be per the manufacturer's directions and as follows.

Hydroseeding shall only be used for sites over half an acre in size or with permission of the Engineer.

Tank and hoses shall be cleaned from all previous hydroseeding and hydromulching projects. Seed shall be mixed into the slurry immediately before application and slurry applied within 30 minutes after seeds have been placed in the tank. Once seed has been placed in the tank, tank shall be agitated only enough to mix the seeds and keep slurry from separating.

ITEM 765.635 (Continued)

A 2-step process shall be used for seeding in conjunction with hydromulch. Seed shall be applied with 500 lbs/acre of hydromulch in the first pass. A second pass with 1,000 lbs/ acre of hydromulch shall be applied in a second pass. Each pass shall be applied in a different direction. Once the seed has been added to the tank mixture a one-hour time limit is set for spreading the mixture on the soil. Once the one hour has passed the excess mixture must be discarded.

For broadcast seeding, hydromulch shall be applied immediately following seeding at a rate of 1,000 lbs/acre. Tank shall be cleaned from any previous hydroseeding.

CARE DURING GERMINATION AND ESTABLISHMENT

Contractor shall care for seeded areas as necessary for successful germination. Care will include watering and weed control as necessary to achieve establishment of the specified seeded species after one growing season as specified below.

The contractor shall maintain the stand of grasses to ensure healthy growth of the seeded species. Work shall include mowing or weed-whacking for weed control, watering if necessary, and removal of invasive plants.

Watering shall be sufficient to achieve soil moisture to a depth of 2 inches or more and such moisture is uniform. Method of watering shall not erode or damage soil or grassed surfaces.

General Weed Control: Unless otherwise directed, mowing shall be as specified under Mowing for Weed Control for seed establishment. Weeds shall be mowed prior to weeds setting seed (by the end of July unless otherwise approved).

Control of Invasive and Aggressive Weeds: Invasive and aggressive weeds, including but not limited to mugwort, ragweed, knapweed, foxtail, crabgrass, and chicory must be cut or treated prior to going to seed. Herbicide treatment must be coordinated with MassDOT. Undesired species (such as chicory) introduced due to use of incorrect seed mix shall be removed at the Contractor's expense.

MOWING FOR WEED CONTROL

Mowing for weed control shall be completed after weeds have sprouted and show leaf and bud growth, but prior to setting seed, generally between July 7th and August 1st, unless directed otherwise by the MassDOT Landscape Architect and the Engineer.

Mowing height shall be as needed for weed control, generally to a height of 8 inches and not below 4 inches, unless directed otherwise. Mowing shall be with a brush hog mower or string trimmer other approved equipment. Conventional lawn mowers which cannot achieve the appropriate cut shall not be used.

Contractor shall give 48-hour notice prior to mowing work. Mowing shall only occur in dry sunny weather. Litter pickup should occur prior to mowing in all areas. If required, cut grass shall be raked and removed. Litter pickup and raking and removal of grass shall be incidental to the work.

ITEM 765.635 (Continued)

Mowing equipment shall be approved by the Engineer prior to work.

OVER-SEEDING

Areas of bare ground greater than 2-3 feet in diameter shall be over-seeded with the specified mix during the appropriate season for seeding. Where required for overseeding mowing shall be as close to the soil as possible. Soil that is compacted shall be raked or otherwise roughened prior to over-seeding.

Over-seeding rates and methods shall those specified above under Materials and Methods. Following over-seeding, soil shall be lightly tamped to ensure seed to soil contact and areas shall be mulched with straw mulch and watered with a fine mist to moisten soil to a depth of at least 2 inches.

Over-seeding, mulch, watering, and all work for over-seeding shall be incidental.

DETERMINING SATISFACTORY GRASS ESTABLISHMENT

A well-established stand of the specified seeded species as determined by the Engineer and the MassDOT Landscape Architect will be required for Final Acceptance. The expectation is that an acceptable number and variety of the desired permanent seeded species (not the cover crop) will be visible. Generally:

- A minimum of 75% coverage by the specified permanent seeded species after one growing season. Of that percentage, generally, depending on the mix species:
    - At least 3 types of the permanent seeded grass species shall be visible.
    - At least 3 species of wildflowers shall be visible.
- There will be no significant gaps or bare soil (generally 2-3 feet in diameter or greater).
- There will be no more than 25% coverage by weed species.
- All soil shall be stabilized and there shall be no channeling or erosion.
- There will be no invasive or aggressive species within the stand at the time of acceptance.
- There shall be no evidence of seed from non-native mixes (i.e., clover) due to failure to clean the hydroseeding tank or using incorrect mix.

Invasive and aggressive weeds (such as mugwort, ragweed, knapweed, and chicory) must be cut or treated prior to going to seed for Interim Acceptance. Herbicide treatment must be coordinated with MassDOT.

A warm-season grass mix with perennials will not have uniform growth. A uniform stand of grass may indicate use of an incorrect mix.

ACCEPTANCE OF SEEDING AND ESTABLISHMENT WORK

Conditional Acceptance shall be based on proper application of seed as specified herein.

ITEM 765.635 (Continued)

Interim Acceptance of Care. Seeding will be inspected by mid-July to assess germination and Establishment conditions as described above. When necessary for Interim Acceptance, areas shall be mowed prior to weed species producing seed and as specified above under Weed Control. ***Areas requiring weed control that are not mowed prior to weed seed dispersal will not be approved for Interim Acceptance.*** Seeding that shows good germination and is determined by the Engineer and Landscape Architect to not require weed control at time of inspection shall be accepted for Interim Acceptance payment.

Final Acceptance of Establishment shall be given upon satisfactory Establishment as described above.

If the seeded area fails to meet the requirements of Establishment by the end of the growing season, contractor shall propose and implement remediations and site shall be inspected during the following growing season after July 1st. All remediation shall be at the contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Native Seeding and Establishment will be measured for payment by the square yard, complete in place.

Native Seeding and Establishment will be paid at the Contract unit price by the square yard upon Conditional, Interim, and Final Acceptances as described above. This price shall include all submittals, seeding, rolling to ensure seed-to-soil contact, weed control other than mowing, water, over-seeding, labor, materials, equipment, and all incidental costs required to complete the work of establishing a satisfactory stand of grass.

Native seed and cover crop mixes shall be compensated under the respective items.

Site preparation, including raking, tilling, removal of debris and stones, and other work to the prepare site for seeding shall be compensated under loam placement or topsoil rehandled and spread as relevant to the project. If used, Compost Blanket shall be compensated under the respective item.

Schedule of payment shall be as follows:

30% upon Conditional Acceptance

20% upon Interim Acceptance of Care, except this amount will be reduced to zero and final payment will be reduced accordingly when areas requiring weed control are not mowed as specified in the Interim Acceptance criteria.

50% upon Final Acceptance of Establishment

ITEM 765.664 MOWING FOR NATIVE SEED ESTABLISHMENT SQUARE YARD

DESCRIPTION

Item 765.664 Mowing for Native Seed Establishment shall be used solely for the purpose of weed management for upland native seed establishment, only when required by the Landscape Architect and the Engineer, and only during the period prior to weed seed dispersal as specified herein unless otherwise directed.

METHODS

Mowing shall be completed after weeds have sprouted and show leaf and bud growth, but prior to setting seed, generally between July 7th and August 1st, unless directed otherwise by the MassDOT Landscape Architect and the Engineer.

Mowing height shall be as needed for weed control, generally to a height of 8 inches and not below 4 inches, unless directed otherwise. Mowing shall be with a brush hog mower or string trimmer other approved equipment. Conventional lawn mowers which cannot achieve the appropriate cut shall not be used.

Contractor shall give 48-hour notice prior to mowing work. Mowing shall not occur when ground or grasses are wet. Litter pickup should occur prior to mowing in all areas. If required, cut grass shall be raked and removed. Litter pickup and raking and removal of grass shall be incidental to the work.

Mowing equipment shall be approved by the Engineer prior to work.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Mowing for Native Seed Establishment will be measured for payment per Square Yard of area mowed complete in place.

Mowing for Native Seed Establishment will be paid at the Contract unit price per Square Yard of area mowed and upon completion during the approved period for mowing as described under Methods. Payment shall include all labor, materials, equipment, traffic controls, and all incidental work required for satisfactory completion of mowing.

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.

ITEM 767.121 (Continued)

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer's instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

Compost Filter Tube

Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

Straw Bales

Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

ITEM 767.121 (Continued)

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

Sedimentation Fence

Materials and Installation shall be per Subsection 670.40 and 670.60 of the Standard Specifications and the following:

Sedimentation fence shall only be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

MAINTENANCE

Maintenance of the sediment control barrier shall be per Subsection 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact (despite fabric decay) and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

DISMANTLING & REMOVING

Barriers shall be dismantled and/or removed, as required, when construction work is complete and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

ITEM 767.121 (Continued)

Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and sedimentation fence, shall be removed and disposed off-site by the Contractor.

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grass mix).
- Sedimentation fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 767.121 will be measured and paid for at the Contract unit price per foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Additional barrier, such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damage by construction activities shall be repaired or replaced as directed by the Engineer at the Contractors expense.

ITEM 767.9 JUTE MESH SQUARE YARD

The work under this Item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following.

The work under this Item shall consist of furnishing and installing jute mesh fabric to prevent soil erosion. Jute mesh shall be placed over all areas of exposed soil in locations shown on the plans or as required by the Engineer.

MATERIALS

Jute netting or similar material shall be new, unused, undyed, and unbleached 100% biodegradable yarn (no polypropylene) and of uniform plain weave. The materials should weigh approximately 1.0 (+/- 5%) pounds per linear yard (assuming a 4-foot width).

Shall meet the following minimum requirements:

Open Area:	70-75%
Mesh Size:	approximately 1/2 inch with an open area of 60-65%.
Roll Weight:	approximately 1.0 (+/- 5%) pounds per linear yard
Warp Ends:	78 per linear yard
Weft Ends:	41 per linear yard
Recommended flow:	6 fps (1.8 m/s)
Functional Longevity:	6-9 months

Anchoring devices shall be 11-gauge steel staples 6-inch minimum length. In loose soils the length of the staples shall be 9-inches.

For areas that will be routinely mowed anchoring devices shall consist of minimum 8” wooden stakes. Longer stakes shall be used where loose soils or other conditions obligate, as required by the Engineer.

CONSTRUCTION METHODS

Area shall be seeded prior to installation of jute netting.

Installation shall be such as to ensure continuous contact with soil without folds or wrinkles. Jute netting shall be laid such that upslope fabric is placed over lower slope fabric by a minimum of 3 feet. Adjoining rolls shall be overlapped a minimum 6 inches. The netting shall extend beyond at least 1 foot beyond the edge of the seeded area.

The Contractor shall bury the ends of the jute netting 6-8 inches in anchor trenches at top and bottom of slopes.

ITEM 767.9 (Continued)

Jute netting shall be anchored in place with vertically driven metal staples. The staples shall be driven in until their tops are flush with the soil. Staples shall be placed at 12-inch intervals along the top of a slope and in staggered courses along the face of the slope to achieve a minimum of 3 staples per square yard, or at manufacturer's recommendations for the given site conditions.

Contractor shall reseed all trenched and otherwise disturbed areas with specified seed mix. The Contractor shall maintain the jute netting and make satisfactory repairs of any areas damaged until acceptance of seed establishment.

METHOD OF MEASUREMENT

Jute Mesh will be measured by the number of SQUARE YARDS complete in place, including anchoring, as measured across the surface of grade and does not include buried or overlapped portions. The quantity measured for payment shall not exceed that shown on the plans or as directed by the Engineer.

Mesh that becomes loose or that is not otherwise functioning to stabilize soil shall be repaired and new or additional jute matting installed as required at the Contractor's expense. Soil erosion shall be repaired, and area shall be raked and reseeded with the original specified mix as required by the Engineer at the Contractors expense.

BASIS OF PAYMENT

Item 767.9 will be paid for at the Contract unit price per SQUARE YARD which price shall include all labor, materials, equipment, trenching, placing, and stapling of jute fabric, reseeding of trenched and disturbed areas, and all incidental costs required to complete the work.

ITEM 772.043	**ARBORVITAE – GREEN GIANT 4-5 FEET**	**EACH**
ITEM 773.224	**PINE - PITCH 4-5 FEET**	**EACH**
ITEM 773.435	**PINE - WHITE 4-5 FEET**	**EACH**
ITEM 773.461	**TUPELO 4-5 FEET #5**	**EACH**
ITEM 776.519	**MAPLE - RED 4-5 FEET #5**	**EACH**
ITEM 777.238	**OAK - SCARLET 4-5 FEET #5**	**EACH**
ITEM 777.324	**OAK - WHITE 4-5 FEET #5**	**EACH**
ITEM 778.167	**BIRCH - GRAY 4-5 FEET #5**	**EACH**
ITEM 783.021	**SASSAFRAS 4-5 FEET #5**	**EACH**
ITEM 789.333	**BAYBERRY SHRUB - NORTHERN 2-3 FEET / #3**	**EACH**
ITEM 789.433	**BEACH PLUM SHRUB 2-3 FEET / #3**	**EACH**
ITEM 789.669	**BLUEBERRY - LOWBUSH #1**	**EACH**
ITEM 792.121	**SHEEP LAUREL #1**	**EACH**
ITEM 793.521	**SAND CHERRY #1**	**EACH**
ITEM 794.731	**SUMMERSWEET SHRUB 18-24 INCH / #2**	**EACH**
ITEM 794.803	**SWEETFERN #1**	**EACH**
ITEM 796.009	**BEARBERRY #1**	**EACH**
ITEM 796.010	**CHOKEBERRY – BLACK / #1**	**EACH**

The work under these Items shall conform to the applicable requirements of Subsection 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Specifications.

Plant locations shown on the plans are schematic. Plants shall be located as directed by the MassDOT Landscape Architect or the Landscape Architect for the Designer of Record.

Tree trunk guards shall be supplied and installed at all deciduous trees. Tree trunk guards shall be expandable, made of corrugated plastic, 2 feet in length and a diameter that is a minimum of one-half inch larger than the caliper of the tree. Tree trunk guards shall not be tied or otherwise secured in a manner that does not allow for expanded tree trunk growth.

Planting

As shown in the Details, soil shall be carefully removed to expose the root flare of all B&B and container plants. Container plants shall be scored and girdled roots shall be teased out and pruned as necessary.

Plants planted incorrectly (too deep, girdled roots, root balls not scored) shall be deemed unacceptable for payment. The problem shall be remediated, and the plants re-planted to the satisfaction of the Landscape Architect. Plants with root systems that cannot be untangled or that require such severe pruning that the plant is compromised shall be rejected on site and replaced at the Contractor's expense.

Plants shall be watered prior to backfilling of planting pits and again after backfilling.

ITEM 772.043 through 796.010 (Continued)

Compost blanket shall be applied as mulch to smaller restoration size plantings. Compost shall be per Item 751.7. Evergreen trees shall have aged pine bark mulch.

Watering

Watering shall meet the requirements for the MassDOT Standard Specifications. In addition, a Watering Log (available online: Watering Log for MassDOT Plantings) shall be submitted to the Engineer at the end of each week or as requested by the Engineer. Watering and submitting of the weekly Watering Log shall commence immediately following planting and shall continue until the end of the plant warranty. The Engineer shall be notified prior to watering.

Failure to submit the watering log and/or notify the Engineer will result in deductions or non-payment for plants at the Interim and Final Acceptance inspections. This may include rejection of plants that have healthy foliage at the time of inspection but have been compromised (root system loss) due to lack of water during establishment.

Acceptance of Planting and Plant Establishment

Inspections and acceptance of planting and plant establishment shall be as follows:

Conditional Acceptance

Following planting, the Contractor shall request an inspection for Conditional Acceptance of the plants and planting beds. The Engineer, the MassDOT Landscape Architect, and the Contractor shall inspect the plants, planting methods, and planting beds. Approval of plants and planting shall mark the beginning of the Plant Establishment Period and the one-year warranty period. Plants shall be watered and cared for as specified in the MassDOT Standard Specifications.

Interim Acceptance

Following Conditional Acceptance, plants and planting beds shall be cared for as specified in the standard specifications. Plants shall show healthy growth per the Standard Specifications. All weeds shall be removed (including roots) or, if approved by the Landscape Architect, weed-whacked. Watering log submissions shall be submitted and reviewed.

Plants that are dead or that fail to show healthy growth will not be approved for Interim Acceptance. As determined by the Engineer, those plants shall be immediately replaced, or shall be deducted from the contract and there shall be no further payments made.

Inspections for Interim Acceptance shall be conducted by the Contractor, the Engineer, and the MassDOT Landscape Architect and shall be according to the following schedule:

Spring Planting: Plants and planting beds shall be inspected following the first full growing season (June – August) after planting.

ITEM 772.043 through 796.010 (Continued)

Fall Planting: Plants and planting beds shall be inspected the following spring (April– June) for Spring Interim Acceptance. Plants and planting beds shall be inspected again at the end of the growing season for Fall Interim Acceptance. This inspection shall take place between August 15 - September 10 or as otherwise determined by the Engineer, in order to allow for place replacements.

Final Acceptance: One year following Conditional Acceptance (end of the plant warranty period), plants shall be inspected by the Contractor, MassDOT Landscape Architect and the Engineer. Plants shall show healthy growth meeting the MassDOT Standard Specifications and planting beds shall be free of weeds. Formal planting beds shall be weed-free (no roots) and have a neat appearance.

No payment will be made for plants that are dead or that fail to show healthy growth.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The quantity of trees, shrubs, vines, grasses and ground cover plants measured will be paid for at the Contract unit prices per each for planting of the types, species and sizes called for in the bid schedule. The unit price per planting item shall include furnishing and delivering all plants, furnishing and delivering prepared backfill soil, mulch, fertilizer, excavation for plant pits, backfilling, planting, pruning, guying and staking, tree trunk guards, mulching, weeding, watering, cleanup, plant establishment work and care including replacements, and for all labor, equipment, tools and incidentals necessary to complete the work prescribed in this section.

Payment Schedule

Upon approval of plants at each inspection, payment shall be as follows:

Spring Planting:

- 40% upon Conditional Acceptance
- 40% upon Interim Acceptance which will include submission and approval of watering logs
- 20% upon Final Acceptance

Fall Planting:

- 35% upon Conditional Acceptance
- 10% upon Spring Interim Acceptance
- 35% upon Fall Interim Acceptance which will include submission and approval of watering logs
- 20% upon Final Acceptance

Compost Blanket will be paid under Item 751.7.

Mulching will be incidental to these Items.

ITEM 801.402	**4 INCH ELECTRICAL CONDUIT – TYPE NM (DOUBLE)**	**FOOT**
ITEM 801.404	**4 INCH ELECTRICAL CONDUIT – TYPE NM (4 BANK)**	**FOOT**
ITEM 801.406	**4 INCH ELECTRICAL CONDUIT – TYPE NM (6 BANK)**	**FOOT**
ITEM 801.602	**6 INCH ELECTRICAL CONDUIT – TYPE NM (DOUBLE)**	**FOOT**
ITEM 801.604	**6 INCH ELECTRICAL CONDUIT – TYPE NM (4 BANK)**	**FOOT**
ITEM 801.606	**6 INCH ELECTRICAL CONDUIT – TYPE NM (6 BANK)**	**FOOT**
ITEM 801.609	**6 INCH ELECTRICAL CONDUIT – TYPE NM (9 BANK)**	**FOOT**

The work under these Items shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The trench shall be excavated to the width and depth shown on the plans. All construction of duct banks including trench, excavation, and backfill shall conform to Eversource details and specifications (see Document A00822 included herein). All work shall be performed by an Eversouce approved Contractor. A representative from Eversource shall be present for all Electric conduit installed.

For all conduits encased in concrete, use plastic spacers to maintain conduit spacing. Spacers shall meet Eversource specifications for design and spacing.

All trench excavation activities shall comply with all appropriate OSHA standards.

Duct bank shall have 6-inch red warning tape installed above the concrete encasement (6 to 9 inches below surface grade, centered above the buried ductbank) as shown on the plans.

Conduits shall be blown clean using compressed air. Run mandrel through each conduit to confirm viable pathway.

Woven polyester mule tape with minimum strength of 2500 lb. tensile strength to be installed within each conduit.

PVC conduits shall be Schedule 40, Type EB.

Concrete encasement shall be 2,500 psi, pea stone mix using Type 2 Portland cement.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Items 801.402, 801.404, 801.406, 801.602, 801.604, 801.606, 801.609 will be measured and paid per Subsections 801.80 and 801.81, respectively.

ITEM 802.401 4 INCH TELEPHONE CONDUIT – TYPE NM (SINGLE) FOOT
ITEM 802.4012 4 INCH TELEPHONE CONDUIT – TYPE NM (12 BANK) FOOT
ITEM 802.402 4 INCH TELEPHONE CONDUIT – TYPE NM (DOUBLE) FOOT

The work under these Items shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The trench shall be excavated to the width and depth shown on the plans. All construction of duct banks including trench, excavation, and backfill shall conform to Verizon details and specifications (see Document A00823 included herein). All work shall be performed by a Verizon approved Contractor. A representative from Verizon shall be present for all Telephone conduit installed.

For all conduits encased in concrete, use plastic spacers to maintain conduit spacing. Spacers shall meet Verizon specifications for design and spacing.

All trench excavation activities shall comply with all appropriate OSHA standards.

Duct bank shall have 6-inch orange warning tape installed above the concrete encasement as shown on the plans.

Conduits shall be blown clean using compressed air. Run mandrel through each conduit to confirm viable pathway.

Woven polyester mule tape with minimum strength of 2500 lb. tensile strength to be installed within each conduit.

PVC conduits shall be Schedule 40.

Concrete encasement and cap (where required) shall be 2,500 psi, 3/8 inch, 520 cement concrete.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Items 802.401, 802.4012, 802.402 will be measured and paid per Subsections 801.80 and 801.81, respectively.

ITEM 803.402 4 INCH CATV CONDUIT – TYPE NM (DOUBLE) FOOT
ITEM 803.403 4 INCH CATV CONDUIT – TYPE NM (TRIPLE) FOOT

The work under these Items shall conform to the relevant provisions of Subsection 801 of the Standard Specifications and the following:

The trench shall be excavated to the width and depth shown on the plans. All construction of duct banks including trench, excavation, and backfill shall conform to Comcast and Open Cape details and specifications (see Document A00824 included herein). All work shall be performed by a Comcast and Open Cape approved Contractor. A representative from Comcast and Open Cape shall be present for all CATV conduit installed.

For all conduits encased in concrete, use plastic spacers to maintain conduit spacing. Spacers shall meet Comcast and Open Cape specifications for design and spacing.

All trench excavation activities shall comply with all appropriate OSHA standards.

Duct bank shall have 6-inch orange warning tape installed above the concrete encasement as shown on the plans.

Conduits shall be blown clean using compressed air. Run mandrel through each conduit to confirm viable pathway.

Woven polyester mule tape with minimum strength of 2500 lb. tensile strength to be installed within each conduit.

PVC conduits shall be Schedule 40.

Concrete encasement shall be 2,500 psi, 3/8 inch, 520 cement concrete.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Items 803.402, 803.403 will be measured and paid per Subsections 801.80 and 801.81, respectively.

ITEM 811.111	**ELECTRIC MANHOLE**	**EACH**
ITEM 811.113	**ELECTRICAL SWITCHING ENCLOSURE**	**EACH**
ITEM 811.115	**5 FOOT X 5 FOOT X 5 FOOT ELECTRIC PULLBOX**	**EACH**
ITEM 811.116	**TRANSFORMER FOUNDATION**	**EACH**

Work under these Items shall conform to the relevant provisions of Section 800 of the Standard Specifications, and the following:

Foundations are to be constructed at the locations shown on the plans. Rigid galvanized steel bollards filled with concrete and painted safety yellow with catalyzed epoxy paint are to be installed protecting the transformer if required by Eversource. Bollard dimensions will be approximately 42" height and 6" minimum diameter. Install a grounding ring and 10' ground rods providing equipment grounding for the transformer foundation per codes and Eversource requirements.

Electric manholes, handholes, transformer foundations, and switching enclosure bases shall be in conformance with Eversource Standard Specifications(see Document aaaaaa ncluded herein). An Eversource approved polymer concrete electric handhole shall be provided on all proposed underground electric services.

The switching enclosure shall be placed on a 12" layer of ¾" crushed stone in conformance with Section M2.01.4 of the Standard Specifications.

Handholes and manholes shall be placed on a 6" layer of ¾" crushed stone in conformance with Section M2.01.4 of the Standard Specifications.

Install bollards plumb in accordance with Eversource requirements.

A representative from Eversource shall be present for all electric handhole, electric manhole, transformer foundation, and switching enclosure installations.. Utility work shall be performed by a Eversource approved Contractor.

METHOD OF MEASUREMENT

Items 811.111, 811.113, 811.115, and 811.116 will be respectively measured for payment by the EACH for each item installed, complete in place.

BASIS OF PAYMENT

Items 811.111, 811.113, 811.115, and 811.116 will be paid for at the respective Constract unit price per EACH, which prices shall include all labor, material, equipment, including ground ring and rods for equipment grounding, cable racks, access ladder, frame and cover, and all incidental costs required to complete the work.

ITEM 811.121 TELEPHONE MANHOLE EACH

Work under this Item shall conform to the relevant provisions of Section 800 of the Standard Specifications, and the following:

Telephone manholes shall be in conformance with Verizon Standard Specifications (see Document A00823 included herein).

Manholes shall be placed on a 6" layer of ¾" crushed stone in conformance with Material Specification M2.01.4 of the Standard Specifications.

A representative from Verizon shall be present for all telephone manhole installations. Utility work shall be performed by a Verizon approved Contractor.

METHOD OF MEASUREMENT

Item 811.121 will be measured for payment by the EACH telephone manhole installed, complete in place.

BASIS OF PAYMENT

Item 811.121 will be paid for at the Contract unit price per EACH, which price shall include all for all labor, material, equipment, including ground ring and rods for equipment grounding, cable racks, access ladder, frame and cover, and all incidental costs required to complete the work.

ITEM 811.131	**4 FOOT X 4 FOOT CATV MANHOLE**	**EACH**
ITEM 811.132	**6 FOOT X 4 FOOT CATV MANHOLE**	**EACH**

Work under these Items shall conform to the relevant provisions of Section 800 of the Standard Specifications, and the following:

CATV manholes shall be in conformance with Comcast and Open Cape Standard Specifications (see Document A00824 included herein).

Manholes shall be placed on a 6" layer of ¾" crushed stone in conformance with Material Specification M2.01.4 of the Standard Specifications.

A representative from Comcast and Open Cape shall be present for all CATV manhole installations. Utility work shall be performed by a Comcast and Open Cape approved Contractor.

METHOD OF MEASUREMENT

Items 811.131 and 811.132 will be respectively measured for payment by the EACH CATV manhole installed, complete in place.

BASIS OF PAYMENT

Items 811.131 and 811.132 will be paid for at the respective Contract unit price per EACH, which prices shall include all labor, material, equipment, including ground ring and rods for equipment grounding, cable racks, access ladder, frame and cover, and all incidental costs required to complete the work.

ITEM 816.01	**TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1**	**LUMP SUM**
ITEM 816.02	**TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2**	**LUMP SUM**

Work under these Items shall conform to the relevant provisions of Section 800 of the Standard Specifications, the 2009 Manual on Uniform Traffic Control Devices (MUTCD), and the following:

The above Items refer to work during construction and final restoration. The work shall include furnishing and installing part or all of the following items:

- Traffic signal cabinet, including controller, backpanel, Malfunction Management Unit, Bus Interface Unit, load packs, relay flashers, loop amplifiers, grounding rod, police panel, and all wiring and appurternances to complete the installation;
- Modification to existing controller cabinet assemblies;
- Signal posts and foundations and mast arm foundations with anchor bolts;
- Signal heads, backplates, and tunnel visors;
- Pedestrian signals with countdown timers;
- Audible vibro-tactile pedestrian pushbuttons, signs and saddles;
- Radar/Video detection cameras;
- Equipment grounding and bonding;
- Emergency vehicle pre-emption system;
- All cable and wiring;
- All other equipment, materials and incidental costs required to provide a complete, fully operational traffic signal system as specified herein and as shown on the plans.

The work shall also include project restoration. The locations correspond to the following intersections:

- Location 1 – Route 6 (Scenic Highway) at Nightingale Road/Andy Olivia Drive
- Location 2 – Route 6 (Scenic Highway) at Edgehill Road

A list of major traffic signal items required at these intersections are included on the plans.

SHOP DRAWINGS

Within 30 days following execution of the Contract, the Contractor shall submit shop drawings for signal supports, a list of equipment, and manufacturer's equipment specifications to the Engineer in accordance with the relevant provisions of Section 815.20.

No work shall be commenced by the Contractor until approval of the shop drawings and manufacturer's data has been received in writing from the Engineer. Approval of these drawings will be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

ITEM 816.01 and 816.02 (Continued)

The Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

EXISTING INSTALLATIONS

Under these Items, the existing signal equipment, service connection and conduit shall be retained unless otherwise indicated on the plans and in accordance with the relevant provisions of Subsection 815.65 of the Standard Specifications.

All existing signal installations to be modified under these Items shall be maintained in operation throughout the construction period and until the modified signals are ready for operation. The Contractor may use temporary supports for signal heads as necessary to allow construction activities.

Any temporary installations shall be in conformance with the MUTCD at all times. If the existing signal is to be turned off temporarily to allow controllers switchovers or rewiring, police detail shall be used to control traffic at the intersection.

Once construction is completed and the new signals are in operation, unused items of the old signals shall be completely removed and stacked in accordance with Section 815.65 of the Standard Specifications. Old cable and unusable materials shall be disposed of by the Contractor.

EXISTING TRAFFIC SIGNAL EQUIPMENT REMOVED AND STACKED OR REMOVED AND RESET

All existing traffic signal equipment noted on the plans to be removed and stacked shall be removed and stacked by the Contractor and transported by the Contractor to a location designated by MassDOT.

The individual items of work shall include but not necessarily be limited to: removing, transporting and stacking or disposing existing traffic signal equipment including the removal and disposal of their foundations and electrical system; removing and disposing or abandoning existing hand holes and signal conduit. Old cable, all unusable material, existing mast arms/supports and any item rejected by the Engineer for stacking, shall be disposed of legally by the Contractor.

All existing traffic signal equipment noted on the plans to be remove and reset shall be removed and reset by the Contractor as shown on the plans.

The individual items of work shall include but not necessarily be limited to: removing, and resetting existing traffic signal equipment including the removal and disposal of their foundations; and the restoration to original condition of any natural features disturbed in any way or manner by the operation, and all materials including new hardware, and labor and equipment necessary to reset the item at the new location.

The work shall also include the excavation and backfilling with compacted gravel of the holes resulting from the excavation of the foundations and the replacement, in kind, of any surface material disturbed.

ITEM 816.01 and 816.02 (Continued)

MODIFYING EXISTING TRAFFIC SIGNAL CONTROLLER CABINET ASSEMBLIES

Under Item 816.02 the Contractor shall modify the existing traffic signal controller cabinet assemblies to accommodate the proposed phasing/timings as shown on the plans.

The lead-in conductors shall be connected to the appropriate terminals in the controller cabinet, by using crimped or soldered terminal ends. The heat source for soldering shall be electrical not exceeding 30W capacity.

INTERSECTION WIRING TO BE RETAINED

Contractor may need to install all new wiring of the intersection if existing wiring is deemed unfit for reuse.

FIELD VERIFICATION

Prior to any work being done under Items 816.01 and 816.02, the Contractor shall confirm, and document existing traffic signal operations (i.e. vehicle detection assignment, signal timing and phasing, coordination data, signal heads). This information will supplement data provided in the plans to facilitate modifications and maintenance required during construction and to facilitate restoration to final conditions. Any discrepancies from the plans found by the Contractor shall be submitted to MassDOT and the Engineer for resolution.

FLASHING OPERATION

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in the MUTCD.

TRAFFIC SIGNAL EQUIPMENT

ATC Cabinet (ATCC)

Proposed cabinets shall be either an ATC 4 door “P” size (44” W x 26” D x 67” H), ATC two door “P” size (44” W x 26” D x 67” H), or an ATC type 352 two door size (“24”W x 30”D x 67”H) as shown on the plans. The cabinets shall conform to requirements defined in the Advanced Transportation Controller Cabinet (ATCC) 5301 v02 Standard. The cabinets shall conform to the functional requirements of NEMA TS2 -2016 Standard, Section 7; cabinet sizes shall be as defined above. The cabinets shall have a natural brushed aluminum finish; either brushed or non-brushed.

The traffic signal control equipment shall be enclosed within a dust and moisture-proof aluminum housing with an auxiliary door in door feature. The door hinge pins shall be made of stainless steel.

All cabinets shall be configured to eliminate arc flash. All electrical equipment shall be dead front, no open terminals, busbars, breakers, or exposed terminal strips. All cabinet switches and circuit breakers shall be permanently labeled as to function. All cabinets shall be designed, constructed, and installed with all necessary provisions to comply with the latest NFPA 70E requirements. All electrically live parts over 50 volts shall be covered with Lexan or a suitable physical barrier to eliminate the possibility of arc flash.

ITEM 816.01 and 816.02 (Continued)

The lock for the police door switch compartments shall unlock with a skeleton style (#1) key. The lock for the main door(s) of the cabinet shall unlock with a Corbin #2 key. Two sets of two keys (main door/police door) shall be furnished with each cabinet.

All cabinets shall be supplied with a permanent label mounted on the upper portion of the inside front main door which shall contain the name of the cabinet manufacturer, controller manufacturer, model/part number and year/month of assembly.

All cabinets shall be supplied with a GFCI duplex outlet, as well as a multi-outlet strip. All AC+ line cords shall contain a white flexible label with black lettering permanently affixed to the plug end of the cord depicting the device/ assembly that it is connected to, i.e., ATC, FMU, video detection etc.

All ATC 4 door "P" size cabinets, ATC 2 door "P" size cabinets and ATC type 352 two door cabinets shall be provided with two removable lifting eyes for placing the cabinet on its foundation. Each eye opening shall have a minimum diameter of 0.75 inches. Each lifting eye shall be able to support a weight limit of 1,000 pounds.

All ATC 4 door "P" size cabinets, ATC 2 door "P" size cabinets and an ATC type 352 two door size (24" W x 30"D x 67"H) shall be equipped by the with an internal cable management system. The cable management system shall be comprised of nonconductive channels designed to facilitate wire and cable routing within an electrical enclosure.

For the ATC4 door "P" size cabinets, the shelving used on the power side of the cabinet shall be designed with sufficient strength to support two batteries per shelf for back-up power elements. The shelves shall be designed and constructed to fully support the weight of two 12V batteries on each shelf without deflection.

Cabinet Configuration - All ATC four door "P" size cabinets and ATC 2 door "P" size cabinets shall be supplied with two side-by-side, 19" rack cages which shall extend from the bottom to the top of the cabinets.

The ATC four door "P" size cabinets front left side shall provide for user interface to the in-cabinet equipment including the front panel of the controller, the cabinet status displays and detection system control interfaces. The cabinet rear shall provide access for termination of field cables and shall only be accessed for installation and for cabinet troubleshooting. The left-side rack of the cabinet relative to facing the cabinet from the front, to be referred to as the " Control" side, shall house the control devices such as the Controller, Cabinet Monitor Unit (CMU) and Auxiliary Display Unit (ADU), switch packs and the power distribution panel. As such, this rack shall be referred to as the "Control" side of the cabinet. The right-side rack of the cabinet relative to facing the cabinet from the front, to be referred to as the " Power and Auxiliary" side, shall house the spare card cage assembly, battery back-up devices (if required), communications elements and future ancillary devices.

ITEM 816.01 and 816.02 (Continued)

Cabinet Doors – The ATC four door "P" cabinets shall be supplied with four main doors: two on the front face and two on the back face. Each door shall open independently with an independent center post latching for each of the four doors. The front control side door shall be defined as the "primary" door; the remaining three (3) main doors shall be defined as "secondary" doors. The ATC two door "P" size cabinets shall be supplied with two front facing doors. The left side door shall be defined as the "primary" door; the left side door shall be defined as the "secondary" door.

All main doors for each of the three cabinet types shall be provided with a stop to limit door opening to both 90° and 180° ±10°. The door stop bars shall be a captive type mechanism that serves to keep the bars in contact with the cabinet at both stop bar ends and provided with a catch that can be operated when the doors reach these 2 positions and shall hold the doors open securely until released. The cabinets shall be supplied with a three-point draw roller latching system consisting of the following latching points:

a. Center of the cabinet (lock)
b. Top of the cabinet – controlled by door handle
c. Bottom of the cabinet – controlled by door handle

The latching points on the top and bottom of the main cabinet doors shall remain in the locked position until the door locks are disengaged. The locking mechanisms shall be equipped with nylon rollers to secure the top and bottom of the doors. The door locking mechanism shall be contructed such that it closes freely without obstruction with any internal cabinet device, shelf, rack system or internal metal support element.

All cabinets shall be supplied with a ¾" diameter shank, stainless steel latching handle for each door. The latching handle shall have a provision for padlocking the door in a closed position. The cabinets shall have a pliable seal composed of caulking compound or mastic installed between the cabinet bases and the concrete foundations and in between the riser base and the cabinet to prevent dust and dirt from entering the cabinets.

Extension Bases – All cabinet types shall be supplied with a 6" high riser aluminum base that elevates the cabinet above the cabinet foundations. The color and finish of the base shall match the color and finish of the main cabinet is supports.

Internal Cabinet Lighting – All three cabinet types shall be supplied with white LED light panels which shall automatically illuminate via a door open switch whenever any of the main cabinet doors are opened.

ITEM 816.01 and 816.02 (Continued)

For ATC four door "P" size cabinets and ATC two door "P" size cabinets , the LED panels shall produce a minimum of 1,000 lumens on the Control side of the cabinet and 1,000 lumens on the Power/Auxiliary side of the cabinet and be protected by a clear shatterproof shield. The cabinets shall contain four light panels: two at the top of each rack assembly and two at the underside of the bottom shelf of each rack assembly. LED light panel mounting brackets shall be installed such that they do not interfere with the unused rack mounting holes which could potentially conflict with the installation of future rack mounted devices. There shall be two switches on each of the four main doors. The first door switch shall activate the LED panels. The second door switch shall be used to monitor when the door has been opened. The front control side door monitoring switch shall be connected to one of the door status inputs of the controller. The door monitoring switches for the remaining door(s) shall be connected to the second door status input to the controller. The door status inputs shall log a report event every time any one of main doors were opened.

Cabinet Fans - Each of the three cabinet types shall be provided with thermostatically controlled ventilating fans and throwaway glass fiber air filters. The electric fans shall have ball or roller bearings and shall have a capacity of 100 ft^3 per minute. The fans shall be rated for continuous duty with a minimum service life of 3 years. The fan blades shall be supplied with a safety screen to prevent accident contact with the blades. The ventilating system shall be designed to prevent the entrance of rain, snow, dust, and insects. The fans and vents shall be arranged in such a manner that the air intake is at the cabinet bottoms and the exhaust is at the cabinet tops. The air intake shall be rain tight and covered with a removable glass fiber air filter. The removable air filter shall be firmly held in place with aluminum louvered backing plate such that cracks, and openings are eliminated to ensure that all air is filtered.

Each of the cabinet types shall contain two fans. For the ATC four door "P" size cabinet, the thermostat panel shall be mounted to the top, rear of the cabinet's 19" equipment rack and oriented to be clearly visible allowing user adjustable temperature settings from a minimum of 70°F to 140°F and capable of activating the fans within plus or minus five degrees of the set temperature; the thermostat shall be initially set to 100°F. Any exposed terminals shall be covered to protect a technician's hand.

For ATC four door "P" size cabinets and ATC 2 door "P" size cabinets there shall be two intake vents provided with the cabinet, one in each front door. For the ATC type 352 two door cabinets, one intake vent shall be provided on the main door.

Cabinet Switches/Manual Control – All cabinets shall be supplied with a single police door panel. For ATC four door "P" size and ATC 2 door "P" size cabinets it shall be located in the middle area of the front door on the Power and Auxiliary side. For the an ATC type 352 two door size cabinets it shall be located on the upper side of the cabinet as shown on the cabinet layout diagram. . The switches shall be mounted in the police panel and labelled as to function. The three switches shall be supplied as follows:

a. Signal On/Off
b. Signal/Flash
c. Manual/Auto with cord

ITEM 816.01 and 816.02 (Continued)

The manual control cord shall be a coiled type, sealed weatherproof covered hand switch extending to six feet when fully stretched. The cord shall be fastened to the cabinet via a compression type connector to provide strain relief for the cord's electrical connections. The police door panel shall be of sufficient size so as to store the manual control cord when panel door is closed.

Each cabinet shall be supplied with a technician's panel switch assembly. For ATC four door "P" size cabinets,ATC 2 door "P" size cabinets and the ATC type 352 two door cabinets it shall integrated into the lower output file rack assembly. This assembly shall be supplied with the following switches:

a. Flash/Auto (Allows the controller to cycle while flashing)
b. Signals On/Off (Allows the controller to cycle with signal displays being dark)
c. Stop Time Normal/On (Provides the ability to manually activate a controller stop time input)

Cabinet Power - The main cabinet circuit breaker shall be rated at 30 amps. Circuit breakers shall be approved and listed by the UL. All circuit breakers shall be quick-make, quick-break on either automatic or manual operation. Contacts shall be silver alloy enclosed in an arc quenching chamber. Overload tripping of breakers shall not be influenced by an ambient temperature range of from 0 to +158°F. The electrical current rating shall be stenciled on the support panel adjacent to each fuse and circuit breaker installed within the cabinet.

Pull-Out Drawers - Each cabinet shall contain a pull-out drawer, 19" wide with sufficient strength to hold a laptop computer. The standard drawings for each cabinet type shows the location of the sldie out drawer.

Spare Lateral Rack (SLR) – The ATC four door "P" size cabinets and ATC 2 door "P" size cabinets shall be supplied with a Spare Lateral Rack (SLR) (empty cage) assembly. This rack assembly shall not be wired to any cabinet device, but rather used to store spare rack mounted cabinet devices such as switch packs, Serial Interface Units (SIUs), CMUs and phase selectors. This spare rack assembly shall be located at the top of the Power and Auxiliary rack. The rear of the assembly shall contain unterminated edge connectors which shall serve to hold the spare plug-in devices in place during storage.

Electric Meter Trim - The cabinets shall be supplied and installed with an electric service meter socket trim and electrical service disconnect switch mounted on the exterior of the cabinet. The meter and disconnect switch shall be installed centered on the side of the cabinet without doors such that it is not less than 48 inches nor more than 60 inches above final grade. The Contractor shall coordinate with the local electric utility company to determine the appropriate type of electric service meter socket trim and electrical conductors to be used. The line side cable shall be routed external to the cabinet from the ground to a 50 amp disconnect switch, then continuing to the bottom of the electric service meter socket trim, all through rigid steel conduit furnished and installed by the Contractor. The load side cable shall be routed through the cabinet and terminated on the line side of the main cabinet circuit breaker.

ITEM 816.01 and 816.02 (Continued)

The cable shall be routed through the interior of the cabinet such that it does not block or enter into available rack space in a ATC/NEMA four door "P" size cabinet preventing that space from being used either by equipment supplied as part of the project, or future equipment that would be installed in the rack system. The cable shall be routed between the edge of the rack system and the cabinet side wall, along the bottom of the cabinet and below the bottom opening of the doors. Care shall be taken by the Contractor when installing the electric service meter socket trim and electrical service disconnect switch so that there is no damage inflicted on installed devices or the rack system during the installation. All metal shavings produced during the drilling of the access hole for the electric service shall be removed from the cabinet interior by the Contractor. The Contractor shall install appropriate bushings to all cabinet penetrations. All wiring shall comply with all applicable local electrical codes as well as the National Electric Code.

Back of Door Documentation - Each cabinet shall be supplied with a laminated door sticker. This sticker shall be permanently affixed to the inside front control side of the cabinet door. At a minimum, the sticker shall contain the following information:

a. Vehicle / Pedestrian detection information including all detector channel assignments, phases assigned, approaches and cabinet termination points.
b. Per approach preemption information including channel, approach/direction and termination points.
c. Field termination chart showing per approach/per phase numbering of all signal circuits.
d. Signal phasing and signal plan with intersection geometry and signal head designations.

The back of the main front door shall contain a resealable, heavy-duty opaque plastic envelope with two grommets that provide mounting to two integrated hooks installed on the back side of the front cabinet door. The heavy-duty plastic envelope will be used to store cabinet wiring diagrams and operations manuals that cannot be accommodated in the pull-out draw storage tray.

Input and Output Channels - The ATC four door "P" size cabinets and ATCtwo door "P" size cabinet shall be supplied with 32 output channels and 48 input channels. The input channel rack assemblies shall consist of two (2) 24 channel units. The output channel rask assembly shall consit of two (2) 16 channel units. The ATC type 352 two door cabinets
shall be supplied with 16 output channels and 24 input channels.

Input Channel Assignments - The first detector rack in a NEMA cabinet and the first and second detector rack in the ATC cabinet shall be used for inductive loop detectors or other non-invasive applications (preemption, isolators, confirmation strobes). The remaining detector channels (NEMA #17- #64; ATC Cabinet #49- #120) shall be used for non-invasive detectors (video/radar).

Output Channel Assignments - Each cabinet shall be configured, per type, to provide the following output channel assignments:

ITEM 816.01 and 816.02 (Continued)

Channel	Outputs (32 Channel)	Outputs (16 Channel)
Channels 1 – 8	Phases 1 -8	Phases 1 -8
Channels 9 – 12	Flashing Yellow Arrow	Flashing Yellow Arrow/Overlaps/ Confirmation Strobe / As needed
Channels 13- 16	Pedestrians	Pedestrians
Channels 17 – 20	Overlaps	N/A
Channels 21 +	As needed	N/A
Channel 32	Confirmation strobe if required	N/A

The Contractor shall assess the per output channel electrical load requirements for ATC cabinets. If required, the cabinet shall be configured to distribute the electrical load for a single phase circuit between separate output channels. For example, at locations with an exclusive pedestrian phase with 8 or more pedestrian heads, the current draw for this many signal heads may exceed the maximum limit of the output current for an individual channel (switch pack circuit).

Detector Test Switch Panels - Each cabinet type shall be supplied with a detector test switch panel. There shall be a total of 48 switches to allow for the manual placement of detector calls into the controller. Each switch shall be clearly labelled as to input channel. Each switch position shall correspond to the same controller input; switch one is for controller input channel one, switch two is for controller input channel 2, etc. The detector switch panel shall be comprised of switches that are wired directly to the corresponding input channels on the rack assemblies. Each switch shall be supplied with a red LED indicator to be illuminated whenever a channel input is active via the three-position detector switch. The use of an SIU internal to the detector test switch panel, or the use of input rack isolator cards to provide this capability is not allowed. The switches shall be three position type and function as follows:

a. Up Position = Provides a constant call
b. Center Position = Normal operation (Phase receives call from detectors)
c. Down Position = Provides a momentary call

Standard ATC Cabinet Devices - A Cabinet Monitor Unit (CMUs) and Auxiliary Display Unit (ADUs) shall be supplied and installed in each cabinet. The CMUs and ADUs shall conform to requirements defined in the Advanced Transportation Controller Cabinet (ATCC) 5301 v02 standard. The CMU/ADU units supplied and installed as part of this project shall support 32 channels. All configuration programming shall be resident in a non-volatile Datakey device. Each CMU shall be supplied with a Datakey programmer and associated software. The Datakey programming software shall include a set-up wizard which shall assist the user with the initial set up of the device. The Contractor shall program the Datakey with data entries appropriate for each intersection. The CMU shall be programmed to activate load current monitoring on all active vehicle and pedestrian circuits. The CMU shall be programmed using the set-up wizard supplied with the CMU. The Contractor shall supply documentation stating that the set-up wizard was used for the CMU programming. Any deviations made by the Contractor to the CMU

ITEM 816.01 and 816.02 (Continued)

programming data generated by the set-up wizard shall be documented with reason(s) why the deviations were required; these deviations shall be documented and included with the cabinet. All programing resident on the Datakey shall be included in the hardcopy. A cabinet power supply shall be supplied and installed in each cabinet. The cabinet power supply shall comply with ATCC 5301 v02.

The Contractor shall reconfigure the default username and passwords on all communications / control equipment within the ATC Controller and Cabinet. This includes but is not limited to the ATC traffic controller, ATC ancillary equipment, video detection equipment, Ethernet switches, and routers. The new username and passwords shall be created in coordination with the agency IT staff and or as required by the Engineer; no manufacture default level passwords shall be allowed.

All SDLC cables used to interconnect devices within the cabinet shall be supplied with factory installed protective wire covers to protect the connector side of the cables. The use of Contractor supplied/installed cable protector covers shall not be allowed.

The Contractor shall utilize network communications encryption settings on all forms of wired Ethernet data paths. No "in the clear" communications shall be allowed. At a minimum all wired Ethernet connections shall meet 802.1AE standards. The Contractor shall supply and configure a Cyber Intrusion and Prevention Device (CIPD) in each ATC cabinet. The CIPD shall prevent any unauthorized access / connections to the traffic control system. Upon detection of unauthorized attempts, the CIPD shall notify the agency via SMS message and or email and log the event. The CIPD shall be installed prior to any remote access device.

The Contractor shall coordinate with the agencies Information Technology and Operational Technology (IT/OT) staff and or the Engineer for finale configuration of the CIPD. No direct access to the traffic system shall be allowed without the installation of a CIPD and or Router/Firewall.

Advanced Traffic Controller (ATC)
The traffic controllers supplied shall conform to Section 3 "Controller Units" of the NEMA TS 2 Standard. The traffic controllers shall be supplied in a TS 2 Type 1 Configuration as required in the list of major traffic signal items included on the plans. Specifically, the controller units (CU) shall be supplied as an actuated controller with NTCIP capabilities; defined as Type A1N in Subsection 3.2 of the NEMA TS 2 Standard.

The controller units shall utilize an interface conforming to Subsection 3.3 of the NEMA TS 2 Standard. The controller unit shall utilize an input/output interface conforming to the requirements of Paragraph 3.3.1 for all input/output functions with the Terminals and Facilities (TF), Malfunction Management Unit (MMU), detector rack assemblies and auxiliary devices.

ITEM 816.01 and 816.02 (Continued)

The controller units shall also meet the requirements of Paragraph 3.3.6 of the NEMA TS 2 Standard.

The controller units shall be supplied with Port 1, Port 2, and Port 3 as defined by the requirements of Subsections 3.3.1, 3.3.2, and 3.3.3, respectively. It shall include a temperature compensated, 8 lines by 40 characters display with LED backlight. The controller operating system (OS) shall be Linux and contain a Flash File System to allow for controller software upgrades.

The controller units shall be keyboard-entry menu-driven units with internal time base coordination, emergency preemption, and programmatic capability.

The controllers shall support 1/10th second high-resolution data logging which provides detailed operational information allowing for the generation of enhanced performance metrics. This would include construction of Purdue Coordination Diagrams, time space diagrams and measures of effectiveness.

The controller units shall meet the approval of MassDOT District 5 Office. As part of the shop drawing submission the Contractor shall provide written approval of the controller units from MassDOT.

Malfunction Management Unit (MMU)
The malfunction management units (MMU) shall comply with Section 4 of the NEMA TS 2 standard. The MMU shall be capable of operating as either a Type 16 with 16 channels (8 vehicle, 4 pedestrian and 4 overlap) or a Type 12 with 12 channels (8 vehicle, 4 overlap). The MMU supplied shall be configured to operate as a Type 16 unit.

The MMU in either the Type 16 or Type 12 configuration shall be capable of operating in a NEMA TS 2 Type 1 cabinet, a NEMA TS 2 Type 2 cabinet, or a NEMA TS 1 cabinet without loss of functionality.

Spare Equipment
The Contractor shall provide the following spare signal equipment in each of the traffic signal controller cabinets:

1. A full complement of load switches to accommodate each available position of the back panel.
2. A full complement of flash transfer relays to accommodate each available position of the back panel.
3. A 25-foot RS-232 cable for communication function with a laptop computer.
4. Two (2) BUI (one at each location).

Surge Suppression
The Contractor shall supply and install surge suppression on all outputs and inputs in each of the traffic signal controller cabinets per the manufacturer's recommendations.

ITEM 816.01 and 816.02 (Continued)

Bus Interface Units
The Bus Interface Units (BIU) shall comply with Section 8 of the NEMA TS 2 Standard. The BIU shall be fully interchangeable with any other manufacturer's unit and interchangeable in a NEMA TS 2 Type 2 cabinet assembly.

At a minimum the BIU shall perform the interface function between port 1 at the controller unit, the malfunction management unit (MMU), the loop detector rack assembly, and the terminal facilities. The cabinets shall be supplied with the appropriate number of BIUs required to provide an operating traffic control signal according to the plans and these specifications.

As a minimum, two LED indicators shall be provided on the BIU front panel. One indicator shall serve a dual use: as a power on indication and as a diagnostic indicator for proper operation of the device. The second indicator shall serve as a transmit indicator illuminating each time data is transmitted.

Testing of Grounding System
The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer in accordance with MassDOT Standard Specifications.

VEHICLE DETECTION

The Contractor shall furnish and install a vehicle detection system that detects vehicles on a roadway by processing images sent from a sensor to an interface board with detector outputs that can be received by the traffic signal controller. The location and configuration of the equipment on the plans is subject to change depending on the system implemented. The Contractor shall ensure proper detection placement and mounting to provide the required detection zones and operations. All cable, mounting hardware and peripheral equipment to provide a working detection system satisfying the requirements of this special provision shall be included in the item price. The detection system shall be non-intrusive (i.e. above ground) and shall consist of:

- Mounting brackets
- Traffic sensor and detection module
- Communications cable

The Contractor shall provide and install a management system designed to allow for remote monitoring, data collection and control. The management system shall be compatible with the detection system supplied as part of this project.

The detection system also, at a minimum, shall be able to:

- Collect and store volume, speed, and classification of vehicles and bicycles;
- Collect Actual Turning Movement Counts
- Provide Stop bar presence detection and high speed dilemma zone detection and;
- Be NEMA TS 2 compatible

All data collected, processed and stored by the vehicle detection system shall be the property of MassDOT and may not be repurposed or reused without consent from MassDOT.

ITEM 816.01 and 816.02 (Continued)

The detection zones and camera locations shown on the plans are not final. The detection zones and camera locations shown may be adjusted as needed. The Contractor shall install additional detection zones and cameras as required to properly implement the signal control. The Contractor shall be responsible to ensure that no false calls are places as result of camera placement.

The detection system shall be connected, via Ethernet, to the server to allow for remote monitoring and control.

As part of the shop drawing submission the Contractor shall provide written approval of the video detection system from MassDOT.

Components of the detection system shall all be the same as to make and model.

Mounting Bracket
The mounting brackets associated with the detection system shall be per the manufacturer's recommendations.

Vehicle Detection Zones
The Contractor shall be responsible for setting the vehicle detection zones to accommodate the intended signal operation. The Contractor may be required to adjust and readjust the location of existing and proposed vehicle detection zones in the presence of the Engineer, at no additional cost, to properly set the detection areas.

Installation and Training
The manufacturer of the vehicle detection system, or their representative, shall design sensor layout, placement and lens size, and supervise the installation and testing of the equipment. A factory certified representative from the supplier shall be on-site for a minimum of one day.

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2 circuit flasher is as balanced as possible within the limitations of the signal phasing.

RADAR/VIDEO VEHICLE DETECTORS

The Contractor shall provide and install Radar/Video Vehicle Detectors (RVVD) for dilemma zone detection as shown on the plans and these special provisions. The RVVD system shall include all cameras, communication cables, interface boards, detection module, connections, software, mounting bracket with hardware, surge protection devices and all other accessories required by the manufacturer for proper operation of the system. The RVVD shall monitor/detect the traffic flow continuously and shall generate vehicle presence events, and dilemma zone events. Via physical outputs, via a serial connection and/or via TCP/IP on an interface board in the traffic controller cabinet. The RVVD supplied shall be on the MassDOT Approved Traffic Signal Equipment List. The RVVD shall meet the following minimum requirements:

ITEM 816.01 and 816.02 (Continued)

a.	Camera	Integrated color CMOS and Doppler radar
b.	Housing module:	Compact, esthetical, UV-resistant, and waterproof to IP67
c.	Rain/Sun Shield	Aluminum
d.	Camera Resolution:	5 megapixels minimum
e.	Weight (excl. bracket):	approx. 4.5 lbs
f.	Power Supply:	24 VDC
g.	Power Consumption:	10 Watts maximum during regular operation
h.	Radar:	Doppler, 24 GHz (K-band)
i.	Measured Quantities:	Per lane and per vehicle (Presence, Speed, Count)
j.	Maximum Mounting Height:	20 to 33’ above roadway surface
k.	Detection Range:	up to 600 feet
l.	Viewing Angle:	50-degree minimum horizontally
m.	Communications:	RS-232 and RS-485 Connection
n.	Operating Temperature:	-40 degrees Celsius to 74 degrees Celsius
o.	Environmental:	FCC Part 15 Class B
p.	Humidity	0 to 95%, non-condensing
q.	Shock & Vibration:	ATC/NEMA TS-2 standards

The RVVD shall have a red detection LED, clearly visible from the ground, that allows both the vehicle drivers and maintenance personnel to see the status of the detection module (i.e. detection, boot mode, safe status).

The RVVD shall allow digital zooming to obtain a VGA resolution (640x480 pixels) image. The detection system shall support streaming video in MJPEG, MPEG-4 and H.264 format.

The RVVD shall able to detect vehicles in 1 to 6 traffic lanes. It shall work on 1 of at least 3 available, user selectable subchannels. The radar shall be capable of tracking at least 32 independent objects at a sample time of 50 milliseconds, and at least 64 independent objects at a sample time of 100 milliseconds. It shall detect objects at speeds of 0 to 150 miles per hour with an accuracy of ±0.6 miles per hour.

The RVVD shall only track vehicles traveling in the appropriate direction of travel.

The Contractor shall supply any necessary cables, interface devices and software for monitoring video detection via laptop computers and FMU.

Cabinet Interface

The interface board shall be used for system configuration, detection verification, detection output generation and error output generation. The interface board shall allow connection to up to 8 sensors and has an Ethernet connection to communicate with a PC, and a USB port. The interface board provides 4 contact closures (detection outputs).

ITEM 816.01 and 816.02 (Continued)

The interface board shall be capable of SDLC communications via an optional SDLC board. The interface board shall communicate to the optional SDLC board via a RS485 serial communication path. The optional SDLC board shall be capable of up to 64 detection outputs when connected to the SDLC port of the traffic controller.

Functionalities

- Vehicle presence detection at the stop bar; In one or more predefined virtual detection zones, the detection software shall detect both moving and stopped vehicles on multiple lanes, taking into account optical occlusion constraints. In total, it shall be required to provide up to 24 virtual detection zones in the image. Logical functions (AND, OR) shall be used to link multiple virtual detection zones to a single output. Detection shall be in any direction through the image and in more than 1 direction. Detection zone outputs shall be configurable to allow the selection of presence, entry pulse, exit pulse, extend, and delay outputs.

- Vehicle presence detection at a distance from the stop bar (i.e. advance detection) ; In up to 8 predefined radar zones, the detection software shall detect approaching and/or receding vehicles on multiple lanes, taking into account optical occlusion constraints. Per radar zone, it shall be required to configure up to 8 detection zones using parameters per lane, phase, vehicle class (small or large) and/or in a preconfigured speed range (with minimum and maximum detection speed thresholds), at a user-configured distance from the stop bar, and with a user-configured zone length.

- Dilemma zone protection - Static dilemma zone protection shall be required utilizing vehicle presence detection zones with a certain user configured fixed length at a user-configured fixed distance from the stop bar.

- Dynamic dilemma zone protection shall be realized by following user-configured thresholds:
  - Lane or Phase
  - Per Vehicle Class (small or large):
    - Allowed speed of approach (in mph or kph) Dilemma Zone In (in seconds)
    - Dilemma Zone Out (in seconds)
    - Minimum Speed (in seconds)
    - Maximum Speed (in seconds)

Per radar zone, it shall be possible to configure 1 static dilemma zone and 1 dynamic dilemma zone.

Software & Installation

The Contractor shall provide software that enables a technician to test all features and functions of the RVVD, and to perform all set-up procedures on a PC. This software shall be delivered to MassDOT on a CD so that it can be installed on other laptops.

ITEM 816.01 and 816.02 (Continued)

The RVVD shall be installed in accordance with the manufacturer's recommendations. Each RVVD shall be installed with surge protection device at the controller cabinet ends of the cable run. Surge protection devices shall be of the same manufacturer as the RVD.

The RVVD system shall be installed by factory certified installers and as recommended by the manufacturer and documented in installation materials provided by the manufacturer. Proof of the factory certification shall be provided. Installation includes connecting the RVVD to the traffic signal controller and power supply in the associated controller cabinet assembly. This setup shall include speed calibration using measured (not estimated) reference speeds. When the setup is complete and the RVVD is ready for operation, the values of all parameters that were set during the process shall be delivered to the Design Engineer in printed and computer-readable form. All equipment, such as radar gun, software, laptop computer, tools and cables, needed for setup work shall be provided by the Contractor.

The Contractor shall be responsible for the proper programming of the RVVD, orientation of the RVVD, and all other work required to provide a complete and radar vehicle detection system.

The Contractor shall be required to field adjust the location of the RVVD in the presence of the Design Engineer to properly detect approaching vehicles at no additional cost.

Cables

Communication cables associated with the RVVD system shall be per the manufacturer's recommendations.

Warranty

The supplier shall provide a minimum two-year warranty on the RVVD system. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.

FIELD MONITORING UNIT (FMU)

In each of the cabinets the Contractor shall furnish and install a Field Monitoring Unit (FMU) and software, as well as all needed accessories required for a full and complete installation, including but not limited to power adapters, Ethernet cables, and interface cables, as described herein.

The Contractor shall submit a test unit to the agency for evaluation along with conducting a live demonstration of the FMU functionality and shall submit test plans demonstrating the proposed device meets or exceeds all items in this specification prior to acceptance by MassDOT.

The Contractor shall request from MassDOT and or the Engineer the IP addresses for each device connected to the FMU. All devices with Ethernet ports within the controller cabinet shall be connected to the FMU.

ITEM 816.01 and 816.02 (Continued)

The FMU shall be integrated into MassDOT existing MassDOT Critical Operations Multi-jurisdictional Modular System (MCOMMS) cloud-based management system.

The FMU shall be configured to connect to MassDOT existing traffic signal network as required by the Engineer. This work shall consist of furnishing, installing, configuring, and testing an FMU that meets the following requirements:

A. The FMU shall operate independent of the brand/type of intersection controller, video or thermal detection system and battery backup system (if applicable) and any in cabinet web accessed device deployed in the traffic cabinet.

B. The FMU shall function correctly between -34 degrees C and +74 degrees C.

C. The FMU shall have at least five (5) other FMU installations within the New England area.

D. The FMU shall be provided with appropriately rated connectors that allows the FMU to be exchanged by unplugging connectors, without tools.

E. The Contractor shall develop a test plan that fully demonstrates that all requirements as defined in these specifications have been met. The test plan shall define in detail each test, and the expected result of each test. The test plan shall be submitted as part of the shop drawings and shall be subject to revisions based on review and comment by the agency and the design consultant. Where applicable, the Contractor shall provide manufacturer certificates of compliances to verify that the unit supplied meets a specific requirement.

F. The FMU shall monitor and log all Controller and cabinet faults and/or alarms.

G. The FMU shall be wired directly to the cabinet.

H. The FMU shall have an internal cellular modem running at 4G LTE.

- The Cellular modem shall be designed to be replaced / upgraded to 5G service when available.

I. The FMU shall incorporate an integrated GPS and cell modem.

J. The configuration of the FMU shall be accomplished by accessing the internal web server with a browser. It shall be possible to configure the FMU without any special software.

K. The FMU shall be powered via a standard 120 VAC input power.

ITEM 816.01 and 816.02 (Continued)

L. The FMU shall allow for the routing of the controller configuration packets to and from the controller by Ethernet for any type of controller utilized by the agency. In this way, it shall be possible to configure the controller and utilize the controller specific software to interrogate the controller, and the FMU shall provide the redundant communications pipeline (where applicable) which allows this to be accomplished.

M. The FMU shall be connected via a RJ-45 Ethernet cable to the Ethernet Switch (if applicable).

N. The FMU shall be configured to allow for the remote display and control of the connected traffic signal controller via the FMU manufacturer cloud hosted web-based software. This feature shall not require the end user to create a separate VPN connection to the FMU.

O. The FMU shall be configured to provide access to view the detection system, including the video image of each approach, via the FMU web-based software. This feature shall not require the end user to create a separate VPN connection to the FMU.

- The remote streaming of the video detection camera shall be done via the FMU manufacturer's website. The streaming shall be able to stream at 10 frames per second or greater.

P. The FMU shall be configured to provide SPaT message broadcast from the ATC controller using the FMU manufacturer mobile app.

Q. The FMU shall be configured to provide remote access to all devices within the traffic control cabinet that have a web interface via the FMU web-based software. This feature shall not require the end user to create a separate VPN connection to the FMU.

R. The FMU shall perform a load test of the connected Battery Backup System (BBS) batteries on a scheduled or on demand basis (if applicable).

S. The FMU shall, within the size limitations above, include a battery and battery charging/monitoring circuit to allow the FMU to function correctly even when all power to the intersection has failed. The battery shall continue to power the FMU for a minimum of 5 hours after all power has failed to the intersection.

T. The FMU shall incorporate an integrated GPS which will allow the FMU to geo-locate itself on the FMU management software map, without configuration.

U. The FMU shall be connected to the traffic signal controller to provide for GPS time sync pulse for the traffic signal internal clock.

ITEM 816.01 and 816.02 (Continued)

V. The FMU shall operate without requiring a static IP address. The only configuration required at the FMU is to enter the URL of where the FMU management software is hosted.

W. In the event that the cell service is interrupted or is not available, the FMU shall store any events that occur in its internal memory and forward these events automatically

to the FMU management software when the cell service is restored. In this way, a complete record of events at the device can be maintained even if cell service is interrupted for a period of time. The system shall store 5,000 events.

X. The FMU shall utilize HTTP and HTTPS protocols, and XML data structures, for communication with the FMU management software. In this way the data shall be scalable for future expansion and competition. The use of custom proprietary protocols is not permitted.

Y. The FMU shall include Ethernet communications via an Ethernet Port with RJ45 connector.

Z. The FMU shall include an integrated four port Ethernet switch.

AA. The FMU shall be supplied and installed to include weatherproof antennas to support operations.

BB. The FMU shall be supplied, installed, and configured by the Contractor with map display management software that has the following features:

- The FMU shall include a scrollable, zoomable map display, with the intersections and other monitored devices shown as representative icons on the map. The map shall include the ability to see the intersections using Google Streetview or similar.
- The alarm status of the intersection shall be clearly indicated on the icon on the map so that the user can see at a glance which intersections are in an alarm condition.
- The map display shall also include a list of intersections, with the number and priority of alarms indicated on the list. Intersections in high priority alarm shall be moved to the top of the list, followed by medium priority, low priority and then finally by intersections not in an alarm state.
- The icons shall dynamically change to be able to clearly indicate if an intersection is offline.

ITEM 816.01 and 816.02 (Continued)

- Clicking on the icon on the map shall expose a display window with the current parameters of the intersection shown.
- The default map display position and zoom shall be configurable by user so that the user's view will default to show the intersections that the user is responsible for managing.
- The map view shall have the ability to show Google traffic overlays on the map.

CC. The FMU shall be supplied, installed, and configured by the Contractor with intersection detail display management software that has the following features:

- It shall be possible to drill down, either from the map icon or from the list, to a device level detail for the intersection. The cabinet shall be fully wired to support the following parameters that shall be monitored and displayed:
  - The alarm status, with priority indicated, and a text description of the alarm (if an alarm is present for this device).
    - The time since the last communication with the device.
    - The following parameters (real time values, minimum for the day values, maximum for the day values, and average for the day values).
      - The AC mains voltage (value)
      - The battery back-up voltage (value)
      - The cabinet temperature (value)
      - The cabinet humidity (value)
      - The presence of AC power (OK or Fail)
      - The flashing status of the intersection (OK or Flashing)
      - Stop Time status (OK or Stop Time Active)
      - The cabinet door status (Open or Closed)
      - The intersection fan status (Fan on or Fan off)
- It shall be possible to view graphs of each of the value parameters in graphical form over the most recent two-week period. This includes real time graphs of:
  - The AC mains voltage
  - The battery back-up voltage
  - The cabinet temperature
  - The cabinet humidity

ITEM 816.01 and 816.02 (Continued)

DD. The FMU shall be supplied, installed, and configured by the Contractor with a diagnostics and log display management software that meets or exceeds the following:

- From the device level detail within the FMU management software, it shall be possible to drill down to get the raw data; the error logs; and the communications logs to allow a technician to fault-find problems.
- It shall be able to filter the logs by Device; by Device Type and/or by Group as well as between dates.
- It shall be able to print these selected logs to a local printer or a PDF file.
- It shall be able to export these logs to Excel on the local computer for further analysis.

EE. The FMU shall be supplied, installed, and configured by the Contractor with an alarm management
software that meets or exceeds the following:

- The FMU management software shall have a comprehensive alarm generation capability.
- It shall be able to configure alarms to be generated on any parameter that indicates a value that is out of tolerance, including analog values, digital values, and enumerated values.
- Alarms shall be configurable to be of Low, High or Critical Priority.
- The alarm priority shall be displayed throughout the FMU management software, on all displays using color codes such as red-critical; yellow–high; and amber-low to indicate the priority of the alarm.
- The current active alarms shall be accessible for viewing via an expandable window, to observe which alarms are active and when the alarm occurred. The highest priority alarms shall rise to the top of the list.

FF. The FMU shall be supplied, installed, and configured by the Contractor with alerts management software that meets or exceeds the following:

- The FMU management software shall have a comprehensive alerting function to enable the response personnel to be notified when an abnormal situation has occurred.
- It shall be able to configure alerts to one or more personnel for each alarm. This will cause, as selected, an SMS and/or an email to be sent to the person when an alarm occurs.
- The alert notification system shall be configurable by the system user to optionally send via email and/or via SMS message when an alarm clears.

ITEM 816.01 and 816.02 (Continued)

- The SMS and email alerts shall be issued within 30 seconds of the occurrence of an event which results in an alert being issued.

GG. The FMU shall be supplied, installed, and configured by the Contractor with connectivity and server management software that meets or exceeds the following:

- The Contractor shall supply the FMU with the FMU manufacturers 10-year options for Connectivity and Service, as part of the purchase price. The Connectivity and Service agreement shall include at a minimum:
  - Cellular Connectivity
  - No cellular overage charges
  - Video Streaming via the manufacturer's web based interface
  - Extended warranty on the hardware for the period of the Connectivity and Service Agreement
  - Over-the-air software updates
  - Over-the-air security updates
  - Remote Front Panel of the connected traffic signal controller
  - SPaT message broadcast to mobile device application
  - Future Connected Vehicles Service

HH. The FMU shall be configured for SPaT data.

II. The FMU shall be supplied with the unlimited video/data streaming service.

JJ. The FMU shall be configured with Traffic Signal Controller remote front panel access.

KK. The FMU shall be configured to supply streaming video from the detection system.

LL. At the time of the shop drawing submittal, Contractor shall supply a detailed list of available FMU functions for the agency consideration.

4G LTE DIRECTIONAL HIGH GAIN ANTENNAS

The Contractor shall furnish and install a 4G LTE Directional High Gain Cellular Antenna (DHGCA) which shall be used for communication between the FMU and MCOMMS for all access to the traffic signal equipment, as shown in the Plans.

All active components shall be UL listed and the network installation shall conform to the NEC/EIA/TIA, and any other applicable standards and codes.

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Antenna Requirements

- The Contractor shall provide and install an external high gain directional antenna at all locations as shown on the plans.
- The antenna shall have a gain of at least 15 dB.
- The external antenna shall be on a protected mount, weatherproof and of the type that is specifically designed for outdoor applications. It shall include a weatherproof covering that protects the antenna elements from snow and ice buildup.
- The antenna shall be mounted to the traffic signal pole or strain pole.
- The mounting method and hardware shall be as recommended and approved by the antenna manufacturer.

The Contractor shall position the antennas in a manner that yields the maximum achievable signal strength at each location.

The Contractor shall rotate the antenna through a full 360 degrees of rotation while monitoring the received signal strength. The antenna shall be permanently secured at the rotational position that yields the maximum signal strength.

The lead-in cable between the external antenna and the cabinet shall be an ultra-low-loss coaxial cable as specified by the antenna manufacturer. The antenna cable shall be suitable for installation in an outdoor conduit environment. The cable loss shall not exceed 4 dB per one hundred (100) feet of length. The Contractor shall use two (2) antenna cables between the DHGCA and the FMU. The Contractor shall provide and install a coaxial surge protector in the antenna lead-in cables.

The surge protector shall be properly grounded as recommended by its manufacturer. The surge protector shall be ground to a ground bus bar in the traffic control cabinet. Grounding to the 19" rack rails shall not be allowed.

Any adapters needed to interconnect the FMU, surge protector, and antenna shall be supplied by the Contractor.

EMERGENCY VEHICLE PREEMPTION

The emergency vehicle preemption system shall be installed in the same cabinet as the controllers. The emergency vehicle preemption control system shall consist of a data-encoded phase selector to be installed within the traffic control cabinet. This unit will serve to validate, identify, classify and record the signal from the optical detectors located on support structures at the intersection. Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans.

The optical detectors shall be single input, single output units used to control one approach. All traffic signal installations shall be supplied with a minimum of two optical detectors unless otherwise noted on the traffic signal plans. The preemption cable shall be run on a separate cable, not on the spare signal cable.

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The phase selector shall be a rack-mounted plug-in two or four channel, dual priority device. The phase selector shall plug into a shelf-mounted single card slot chassis. Programming the phase selector shall be via a PC-based computer utilizing unit specific software. One copy of software, on CD shall be supplied and licensed to the Town of Bourne. A hard copy of final programming data shall be left in the control cabinet. The Contractor shall supply a complete set of interface cables for phase selector to laptop connection.

The Contractor shall install confirmation strobe(s) at the traffic signal location as shown on the traffic signal plans. The confirmation strobe shall serve to validate to the driver of the emergency vehicle that the traffic signal has recognized the preemption call and will initiate the proper preemption sequence. The confirmation strobe shall have a clear/white lens. The confirmation strobe shall run on a separate signal cable.

The Contractor shall be responsible for the proper programming of the phase selector, orientation of the optical detectors, and all other work required to provide a complete and operating emergency vehicle preemption system. The Contractor may be required to field adjust the location of the optical detectors in the presence of the Engineer, a representative from the City and MassDOT to properly detect preemption calls from approaching vehicles.

The emergency vehicle preemption systems shall be maintained by the City at the completion of construction and acceptance of the traffic signals. Emergency Preemption shop drawings shall be approved by the affected Cities prior to ordering materials.

POLES AND FOUNDATIONS

Poles and foundations shall be fabricated and constructed in conformance with the MassDOT Standard Drawings. Foundation shall not obstruct a sidewalk or crosswalk so that passage by physically-challenged persons is not impaired.

SIGNAL HEADS

Signal heads mounted overhead shall be ridged mounted. All signal heads shall be equipped with ball and/or arrow light emitting diode (LED) modules. ¾ Tunnel visors shall be provided on all proposed signal heads.

REMOVE AND RESET TRAFFIC SIGNAL HEAD

All existing traffic signal heads noted on the plans to be remove and reset shall be removed and reset by the Contractor as shown on the plans. The existing signal is to be turned off temporarily to allow for placement and rewiring. Police detail shall be used to control traffic at the intersection. Unused items of the old signals shall be completely removed and stacked in accordance with Subsection 815.65 of the Standard Specifications. Old cable and unusable materials shall be disposed of by the Contractor.

ITEM 816.01 and 816.02 (Continued)

RED, YELLOW, AND GREEN LED VEHICLE SIGNAL MODULE

All signal and pedestrian displays shall be equipped with LED signal modules. All red, amber, green, and pedestrian signal housings with the exception of optically programmed and fiber optic housings and shall conform to the following where applicable:

- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated April 3, 2006.
- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement, Dated June 27, 2005.
- ITE's Pedestrian and Countdown Signal Modules Compliant to PTCSI - Part 2 Light Emitting Diode (LED), Dated, August, 2007.
- Energy Star / EPACT Program Requirements for Traffic Signals
- On the MassDOT Traffic Signal Approved Equipment List

An independent lab shall certify that the LED signal module complies with the applicable ITE specification. The independent report should be submitted to MassDOT for review unless the module is already on the approved list.

To prevent the LED module warranty from being voided, the connecting leads on the module shall not be cut. The original LED module leads shall be connected to the signal head terminal block as continuous wire without splices.

The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

- A failure due to workmanship or material defects within the first 60 months of field operation
- A greater than 40 percent light output degradation or a fall below the minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation)

PEDESTRIAN HEADS WITH COUNTDOWN TIMERS

All pedestrian heads shall be 16 inch, single units, with countdown timers, Pedestrian head indications shall be illuminated L.E.D. type displaying graphical symbols of a walking person and/or upraised hand. The countdown module shall display the number of seconds remaining throughout the pedestrian flashing "DON'T WALK" interval, and blank out during the steady "DON'T WALK" interval. The countdown module shall be automatically set by the intersection controller based upon the "WALK" and "DON'T WALK" signal intervals only. The countdown module shall continuously monitor the intersection controller for any changes to the pedestrian phase timing, and reprogram itself automatically. All LED indications on the pedestrian signal shall have an automatic dimming circuit for night illumination to reduce long-term degradation to the LEDs

ITEM 816.01 and 816.02 (Continued)

APS PUSH BUTTONS

Pedestrian push button controls shall be raised from or flush with their housings and shall be a minimum of 2 inches in the smallest dimension. The force required to activate the controls shall be no greater than 5 pounds.

Each push button shall be complemented with an audible and vibro-tactile indication with LED confirmation light. Each separately phased pedestrian movement shall have its own distinctive audible emanation in order for visually impaired pedestrians to discriminate which phase is appropriate given his or her destination and/or direction of travel.

The audible emanation shall be a percussion type sound. No buzzer or ringing type sounds will be acceptable. The output level of the audible pedestrian signal shall vary in intensity with significant fluctuations in ambient noise conditions. At a minimum, the output level shall vary in intensity from daytime to nighttime operations. Pedestrian push buttons shall be located as close as practicable to the sidewalk curb ramp serving the controlled crossing and shall permit operation from a clear ground space.

If two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian pushbuttons and/or legends on the pedestrian push button signs should clearly indicate which crosswalk signal is actuated by each pedestrian push button.

A maximum mounting height of 42 inches above the finish sidewalk grade shall be used for pedestrian push buttons.

Where a parallel approach is provided, push buttons shall be within 10 inches horizontally and centered on the clear ground space. Push button extenders shall be used where necessary to meet the reach requirements set forth in the Massachusetts AAB and ADA rules and regulations.

POSTS AND BASES

Signal posts and bases shall be steel shafts with octagonal bases. See Section 815.44 of the Standard Specifications for additional requirements.

MAST ARM, POLES AND FOUNDATIONS

Mast arm foundations shall not obstruct a sidewalk so that passage by physically challenged persons is not impaired. Mast arm, poles and foundations shall be fabricated and constructed in conformance with MassDOT's Overhead Signal Structure & Foundation Standard Drawings dated December 2015 and Engineering Directive E-16-001 dated 01/29/2016.

All mast arm poles shall be galvanized steel monolevers with shoe bases, unless otherwise directed. Acceptance of Type II mast arm poles shall be contingent upon review and approval of the shop drawings stamped (by MA licensed engineer) and submitted by the Contractor. Design Engineer and MassDOT approvals will be required. Longhand design calculations shall be submitted for all Type II Mast Arms.

ITEM 816.01 and 816.02 (Continued)

The pole and arm shafts shall be fabricated from commercial quality hot rolled steel. For mast arms that are 40' and shorter in length, the shafts shall have only one (1) longitudinal, automatically, electrically welded joint, and shall have no intermediate horizontal joints or welds. Only one (1) length of steel sheet shall be used, which shall be formed into a continuously tapered shaft, having a taper length of 0.14" per foot. For mast arms that are 45' and greater in length, the arm shaft shall have telescopic field splice and the minimum splice length shall be at least 1.5 times the inside diameter of the exposed end of the female section.

Based on the soil boring logs and the blow counts, the foundations shall be to the depths noted below. The Contractor shall coordinate with the Design Engineer for the day of drilling and shall have the Design Engineer on site during drilling to assess subsoil condition. During construction of the cored pier foundation (drilled shaft), a temporary casing, that will be removed when concrete is placed, will be required to prevent collapse of the fill and sand. Drilling for the pier foundation is anticipated to encounter cobbles and possibly boulders. When the drilling operations are complete, concrete should be placed inside the casing as soon as possible. The concrete should be placed using a tremie pipe. It is recommended pouring the pier foundation concrete on the same day that the pier is drilled. See Appendix for soil boring logs.

Loc. No	Location	Boring/Description	Mast Arm	Foundation Depth	Diameter	Vertical Bars	Tie Bars
1	STA 178+25 51.5' LT	MAB-1 Dry Sand Loose	40'	17'-6"	3'-6"	18 - #8	#5@ 8"

Foundations for Signal Posts, and Mast Arm Poles shall be constructed using 4000 psi 565 Cement Concrete Masonry conforming to the relevant provisions of Section M4 of the Standard Specifications and the following:

1. Reinforcing steel shall be ASTM A-615, Grade 60.
2. The top forming of cast-in-place units shall extend downward for a minimum of 24" on the side of any foundation. The lower portions of all foundations shall be placed directly against undisturbed earth. No forms or reinforcing for foundations for mast arm poles, and control cabinets shall be set nor shall concrete be placed until the excavation has been inspected by the Engineer and his approval to proceed has been given.

BREAK INTO EXISTING PULL BOX

Contractor shall expose the existing pull box by excavating the adjacent earth/material and break into an unused side of the pull box to connect new conduit and wiring. Once conduit and wiring are installed, Contractor shall replace the disturbed material in kind.

PAINTING
See Section 815.61 of the Standard Specifications

ITEM 816.01 and 816.02 (Continued)

DATA BASE PROGRAMMING

Each programmable local hardware component (traffic signal controller, detector amplifier) shall be initially programmed by the Contractor based on information contained on the plans. Three sets of hard copy programming per device shall be supplied.

HIGHWAY LUMINAIRE *(ITEM 816.02)*

The work for installing the Highway Luminaires, support arms, mounting hardware and wiring shall conform to the relevant provisions of Subsection 820 of the Standard Specifications and the following:

One (1) highway luminaire shall be installed on the mast arm at Location 2 as shown on the plans. The furnishing and installing the luminaire is included in Item 816.02. Highway luminaires mounted on mast arms shall be installed in conformance with MassDOT's Overhead Signal Structure & Foundation Standard Drawings dated December 2015 and Engineering Directive E-16-001 dated 01/29/2016. Contractor shall angle the luminaire in a manner to light the crosswalk. Mast arm mounted luminaires shall be powered through a dedicated circuit in the traffic signal controller cabinet.

Description

The work shall consist of providing and powering a cobrahead style luminaire. The work also includes but is not limited to the photoelectric switch, splicing, furnishing luminaire,

Materials

Luminaire shall be:
-Cree Traveyo Series catalog number TRVLG-A-HT-3ME-13L-30K7-UL-GY-N-FAO-Q9-H with Backlight Control Shield (TRV-BLSL).
-GE Current Evolve Luminaire catalog number ERL2-0-16-C5-30-E-GRAY-F-L-R-V1-Y-ELSHS
-Cooper Lighting Streetworks ARCH-M-PA2-110-730-U- T3-AP-10K-HSS-LLPC-FADC-CC-PR7
-Signify Road Focus Medium Luminaire catalog number RPM-90W80LED-730-G1-R3M-UNV-DMG-HHS-TLRD7-PHXL-FAWS-GY3
-Or equivalent.

All materials and construction procedures shall conform to the specifications contained herein, and as shown on the Contract drawings or as required by the Engineer.

The complete luminaire shall conform to and meet all the current requirements of the National Electrical Manufacturers Association; American Standards Association; The Illuminating Engineering Society of North America; and the National Electric Code, wherever such standards shall apply, and in addition, the following specification shall apply.

ITEM 816.01 and 816.02 (Continued)

Each luminaire shall be supplied with a 7-pin photocell receptacle. Photocell receptacles shall be fully pre-wired and shall incorporate an ANSI C136.41 compliant receptacle. The 0-10V shall be connected from the dimmable LED driver to the receptacle pads as specified in ANSI C136.41. Each photocell receptacle shall be supplied with a twist lock photocell installed in the receptacle.

Luminaire manufacturer must have been manufacturing luminaires for a minimum of 5 years. Luminaire shall include field adjustable dimming module factory set to full power.

The luminaire shall be UL listed for wet locations, Ingress protection rating of IP66 conforming to ANSI C136.25. The fixture shall consist of an internal LED driver with heatsinks specifically designed for LED applications, a rugged aluminum housing, and a leaf/debris guard.

General Description

Fixture housing is all aluminum construction. Standard fixture utilizes terminal block for power input suitable for #2–#14 AWG wire. Fixture is designed to mount on 2" IP (2.375" O.D.) horizontal tenon and is adjustable +/- 5º to allow for fixture leveling (includes leveling bubble to aid in this process).

Luminaire shall have 40 LEDs +/-20.

Electrical

Modular design accommodates varied lighting output from high power, cool white, 3000K CCT (+/- 500K per full fixture), minimum 70 CRI, long life LED sources. 120-277V 60 Hz, Class 1, 0-10 volt dimming LED driver. LED drivers have power factor >90% and THD <20% at full load. Units shall be provided with integral 10kV surge suppression protection. Surge protection tested in accordance with ANSI standard C136.2-2015. Quick disconnect harness suitable for mate and break under load provided on power feed to driver for ease of maintenance.

Finish

Finish features a finish with a silver powder topcoat, providing resistance to corrosion, ultraviolet degradation and abrasion. The finish is covered by a 10-year limited warranty. Finish shall be endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117.

Testing & Compliance

UL listed for wet locations. RoHS compliant. Meets CALTrans 611 Vibration Testing and 3G vibration rating conforming to ANSI C136.31. International Dark-Sky Association listed.

Luminaire shall be labeled to ANSI 136.15.

Optical assembly shall produce an asymmetric forward – Type 3 distribution.

ITEM 816.01 and 816.02 (Continued)

Output: 13,000-Lumens +/- 7% (including house-side shield)
Minimum Luminaire Efficacy: 127 Lumens per Watt (including house-side shield) Average rated Life: >60,000 to 90% of initial output at 25° C (77°F) per IES TM-21.

DLC Listed - Luminaire shall be listed on the qualified product list of the Design Lights Consortium to the latest DLC technical requirements version for outdoor luminaires (with limited exceptions for shielded luminaires).

Warranty
Provide a minimum five-year warranty covering maintained integrity and functionality of Luminaire housing, LED driver(s), wiring, and connections and LED light source(s). Negligible light output from more than 10 percent of the LED packages constitutes luminaire failure. Warranty period shall begin 90 days after date of invoice, or as negotiated by owner such as in the case of an auditable asset management system.

Construction Methods

Contractor shall install luminaire level and per manufactures instruction. Contractor shall provide circuit breaker in traffic cabinet and wire as indicated on the Contract drawings for powering luminaire.

Upon completion of the installation, an operating test shall be conducted, in the presence of the Engineer, to demonstrate that the roadway lighting systems and associated equipment operate in accordance with the requirements of this Section.

AS BUILT PLANS

See Subsection 815.67 of the Standard Specifications

BASIS OF PAYMENT

Items 816.01 and 816.02 will be paid for at the respective Contract unit price LUMP SUM, which prices shall include all labor, material, equipment, and all incidental costs required to complete the work.

The maintenance of the existing installation, the removal and stacking of existing traffic signal equipment, and project restoration shall be incidental to the pertinent pay item.

ITEM 824.11 FLASHING WARNING BEACON SIGN SYSTEM LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsection 824 of the Standard Specifications and the MUTCD and the following.

GENERAL

The work of this Item shall include furnishing and installing the following items:

- (1) Flashing Beacon System
  - Mounted on Traffic Signal Post
  - Solar Powered
  - Radio Antenna
- (1) Radar/Video Vehicle Detector (RVVD)
  - Mounted on Traffic Signal Post
  - Solar Powered
  - Radio Antenna
- (1) Communication Repeater
  - Mounted on Traffic Signal Post
  - Solar Powered
  - (2) Radio antenna

SHOP DRAWINGS

Within 30 days following execution of the Contract, the Contractor shall submit shop drawings for a list of equipment and manufacturer's equipment specifications to the Engineer.

No work shall be commenced by the Contractor until approval of the shop drawings and manufacturer's data has been received in writing from the Engineer. Approval of these drawings will be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

The Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

FLASHING WARNING BEACON SYSTEMS

One (1) flashing warning beacon system shall be installed on Route 6 east of the Route 6 (Scenic Highway) at Nightingale Road/Andy Olivia Drive intersection as shown on the plans. The System shall consist of 12” yellow LED signal module above and below a W3-7SP sign mounted on a signal post with base, as shown in Detail “C” on the plans. The yellow LED signals shall flash at a rate of 50 to 60 times per minute and shall alternate evenly. The systems shall be solar powered.

The flashing beacons shall be on the MassDOT Approved Traffic Control Equipment list.

The flashing beacon system components shall conform to all other sections of Item 816.01, including but not limited to RED, YELLOW, AND GREEN LED VEHICLE SIGNAL MODULE, POSTS AND BASES, and PAINTING.

ITEM 824.11 (Continued)

RADAR/VIDEO VEHICLE DETECTORS

The Contractor shall provide and install Radar/Video Vehicle Detectors (RVVD) for queue detection as shown on the plans and these special provisions. The RVVD system shall include all cameras, wireless communication, interface boards, detection module, connections, software, mounting bracket with hardware, surge protection devices and all other accessories required by the manufacturer for proper operation of the system. The RVVD shall monitor/detect the traffic flow continuously and shall generate vehicle presence events. Via physical outputs, via a serial connection and/or via TCP/IP on an interface board in the controller cabinet. The RVVD supplied shall be on the MassDOT Approved Traffic Signal Equipment List. The RVVD shall meet the following minimum requirements:

a. Camera	Integrated color CMOS and Doppler radar
b. Housing module:	Compact, esthetical, UV-resistant, and waterproof to IP67
c. Rain/Sun Shield	Aluminum
d. Camera Resolution:	5 megapixels minimum
e. Weight (excl. bracket):	approx. 4.5 lbs
f. Power Supply:	24 VDC
g. Power Consumption:	10 Watts maximum during regular operation
h. Radar:	Doppler, 24 GHz (K-band)
i. Measured Quantities:	Per lane and per vehicle (Presence, Speed, Count)
j. Mounting Height:	20 to 33’ above roadway surface
k. Detection Range:	up to 600 feet
l. Viewing Angle:	50-degree minimum horizontally
m. Communications:	RS-232 and RS-485 Connection
n. Operating Temperature:	-40 degrees Celsius to 74 degrees Celsius
o. Environmental:	FCC Part 15 Class B
p. Humidity	0 to 95%, non-condensing
q. Shock & Vibration:	ATC/NEMA TS-2 standards

The RVVD shall have a red detection LED, clearly visible from the ground, that allows both the vehicle drivers and maintenance personnel to see the status of the detection module (i.e. detection, boot mode, safe status).

The RVVD shall allow digital zooming to obtain a VGA resolution (640x480 pixels) image. The detection system shall support streaming video in MJPEG, MPEG-4 and H.264 format.

The RVVD shall be able to detect vehicles in 1 to 6 traffic lanes. It shall work on 1 of at least 3 available, user selectable subchannels. The radar shall be capable of tracking at least 32 independent objects at a sample time of 50 milliseconds, and at least 64 independent objects at a sample time of 100 milliseconds. It shall detect objects at speeds of 0 to 150 miles per hour with an accuracy of ±0.6 miles per hour.

The RVVD shall only track vehicles traveling in the appropriate direction of travel.

The Contractor shall supply any necessary cables, interface devices and software for monitoring video detection via laptop computers and FMU.

ITEM 824.11 (Continued)

The RVVD shall be post mounted and SOLAR powered and shall be connected to the Flashing Beacon System via radio connection.

Software & Installation

The Contractor shall provide software that enables a technician to test all features and functions of the RVVD, and to perform all set-up procedures on a PC. This software shall be delivered to MassDOT on a CD so that it can be installed on other laptops.

The RVVD shall be installed in accordance with the manufacturer's recommendations. Each RVVD shall be installed with surge protection device at the controller cabinet ends of the cable run. Surge protection devices shall be of the same manufacturer as the RVD.

The RVVD system shall be installed by factory certified installers and as recommended by the manufacturer and documented in installation materials provided by the manufacturer. Proof of the factory certification shall be provided. Installation includes connecting the RVVD to the traffic signal controller and power supply in the associated controller cabinet assembly. This setup shall include speed calibration using measured (not estimated) reference speeds. When the setup is complete and the RVVD is ready for operation, the values of all parameters that were set during the process shall be delivered to the Design Engineer in printed and computer-readable form. All equipment, such as radar gun, software, laptop computer, tools and cables, needed for setup work shall be provided by the Contractor.

The Contractor shall be responsible for the proper programming of the RVVD, orientation of the RVVD, and all other work necessary to provide a complete and radar vehicle detection system.

The Contractor shall be required to field adjust the location of the RVVD in the presence of the Design Engineer to properly detect approaching vehicles at no additional cost.

Cables

Communication cables associated with the RVVD system shall be per the manufacturer's recommendations.

Warranty

The supplier shall provide a minimum two-year warranty on the RVVD system. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.

RED, YELLOW, AND GREEN LED VEHICLE SIGNAL MODULE

All signal displays shall be equipped with LED signal modules. All LEDs red, amber, shall conform to the following where applicable:

ITEM 824.11 (Continued)

- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated April 3, 2006.
- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement, Dated June 27, 2005.
- ITE's Pedestrian and Countdown Signal Modules Compliant to PTCSI - Part 2 Light Emitting Diode (LED), Dated, August, 2007.
- Energy Star / EPACT Program Requirements for Traffic Signals
- On the MassDOT Traffic Signal Approved Equipment List

An independent lab shall certify that the LED signal module complies with the applicable ITE specification. The independent report should be submitted to MassDOT for review unless the module is already on the approved list.

The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

- A failure due to workmanship or material defects within the first 60 months of field operation
- A greater than 40 percent light output degradation or a fall below the minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation)

POSTS AND BASES

Signal posts and bases shall be steel shafts with octagonal bases. See Subsection 815.44 of the Standard Specifications for additional requirements.

PAINTING

See Subsection 815.61 of the Standard Specifications

BASIS OF PAYMENT

Item 824.11 will be paid for at the Contract unit price LUMP SUM, which price shall include all labor, material, equipment, and all incidental costs required to complete the work.

ITEM 826.7 ELECTRIC SERVICE RISER RELOCATION EACH

The work under this Item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

The work under this Item shall consist of the removal and relocation of existing underground secondary electrical services from utility poles.

New utility poles will be installed "By Others". The Contractor shall supply and install a rigid galvanized riser pipe and sweep assembly, hand-hole, conduit, wiring and appurtenances as required per Massachusetts electric code and electric company specifications to complete the service relocation.

The work shall include all excavation and backfill, compaction, and materials or any other requirements in accordance with the latest edition of the National Electrical Code, the respective utility company, local codes and guidelines.

The work associated with disconnecting power and reconnecting power to the utilities secondary power lines shall be performed at a time convenient to the property owners or tenants occupying the building. The actual time of day or evening for the disconnecting and reconnecting will be agreed upon between the Engineer, Power Company, and the property owner/tenant during construction. No additional compensation shall be given for this work outside of normal work hours if required.

METHOD OF MEASUREMENT

Item 826.7 will be measured for payment by the EACH electric service riser relocated, complete in place.

BASIS OF PAYMENT

Item 826.7 will be paid for at the Contract unit price per EACH, which price shall include all labor, equipment, excavation, backfill, risers, sweeps, conduit, hand holes, wiring, and miscellaneous materials, tools and equipment required to complete the work.

The work associated with the relocation of the utility poles and the transfer of the utilities overhead primary and secondary wiring shall be the responsibility of the respective utility companies and shall not be paid for under this Item.

ITEM 826.71 ELECTRIC SERVICE RELOCATION EACH

The work under this Item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

The work under this Item shall consist of the removal and relocation of existing secondary electrical services, which originated from overhead utility poles and will now be originating from the underground system. This Item includes the installation of proposed underground secondary electrical system services and any associated structure restoration.

The Contractor shall supply and install a new rigid galvanized riser pipe and sweep assembly, SCH 80 PVC conduit with sand bedding, handhole (Eversource approved polymer concrete or M1207 per plan) with 3/4" crushed stone (M2.01.4) bedding 6" minimum below base of handhole, wiring, meter, and appurtenances as required per the latest edition of the National Electrical Code, Massachusetts Electrical Code, Utility Company Specifications and Local Codes/Guidelines to complete the service relocation.

The work shall include all excavation, sand bedding, backfill, compaction, and materials or any other requirements in accordance with the latest edition of the National Electrical Code, Massachusetts Electrical Code, Utility Company Specifications and Local Codes/Guidelines.

This Item consists of converting the meter on each respective address from overhead to underground and restoring associated structures. Each service connection is defined by each respective connection to the property as shown on the plans.

The work associated with disconnecting power and reconnecting power to the utilities secondary power lines should be performed at a time convenient to the property owners or tenants occupying the building. The actual time of day or evening for the disconnecting and reconnecting will be agreed upon between the Engineer, Power Company and the property owner/tenant during construction. No additional compensation shall be given for this work outside of normal work hours if needed.

METHOD OF MEASUREMENT

Item 826.71 will be measured for payment by the EACH electric service removed and relocated, complete in place.

BASIS OF PAYMENT

Item 826.71 will be paid for at the Contract unit price per EACH, which price shall include all labor, conduit, sand bedding, hand-holes with crushed stone bedding, wiring, meters, restoration of associated structures, and materials, tools and equipment, plus any related Utility charges and/or permit fees associated with the work, and all incidental costs required to complete the work.

The conduit for the services (electric, telephone, and CATV services) are paid for under separate items, based on the type of service, number, and size of conduit.

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.

ITEMS 852.11 and 852.12 (Continued)

Lateral joints between any surfaces shall not exceed 0.5 inches. Lateral edges may be vertical up to 0.25 inches high and shall be beveled at 1V:2H between 0.25 inches and 0.5 inches.

The TPAR shall be kept clear of debris, snow, and ice and the Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall not obstruct drainage.

Removal and/or resetting of Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall be considered incidental.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Payment for Temporary Pedestrian Barricades will be made at the Contract price per linear 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 853.21 TEMPORARY BARRIER REMOVED AND RESET FOOT

Work under this Item shall conform to the relevant provisions of Section 850 and shall consist of removing, transporting and resetting temporary barrier systems and limited deflection temporary barrier systems from alignments established along the roadway to new alignments in accordance with the details shown on the plans, as required by the construction and staged construction operations and as required by the Engineer for the channelization of traffic and/or work zone protection.

The work shall also include furnishing and installing all hardware and associated materials per the details and/or manufacturer's specifications. The work shall also include necessary patches and repairs caused by the temporary barrier system to damaged pavement surfaces or any adjacent longitudinal barrier once the system has been removed.

Temporary barrier systems and limited deflection temporary barrier systems shall be removed from existing locations and reset in accordance to the construction methods stated in the respective barrier items.

Damage to the pavement surface or adjacent permanent barriers caused by removing or resetting temporary barrier shall be repaired as directed by the Engineer at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 853.21 will be measured and paid by the FOOT, in place which shall provide full compensation for removing, relocating, resetting, realigning, and transporting maintaining the temporary barrier system and/or limited deflection temporary barrier system. The Contractor will be paid for this Item each time the barrier is relocated either to a new work zone, to off-season storage, or back to the project from storage. The Contractor will not be separately compensated for any work required to maintain or re-align units or replace damaged units. No payment will be made for removing and resetting barriers for the purpose of gaining access to the construction work zone. No payment will be made for removing, relocating and resetting any barriers moved for the convenience of the Contractor.

For temporary barrier systems that require anchorage systems, the cost of furnishing, installing and removing the anchorage and hardware and the restoration of pavement surfaces or adjacent permanent barrier systems to facilitate anchorage shall be considered incidental to the cost of this Item.

ITEM 853.33 TEMPORARY BARRIER – LIMITED DEFLECTION (TL-3) FOOT

Work under this Item will conform to the relevant provisions of Section 850 and will consist of furnishing, installing, maintaining and final removal of limited deflection TL-3 temporary barrier systems for channelization of traffic and/or work zone protection. Limited deflection TL-3 temporary barrier systems shall have a maximum dynamic deflection of 18 inches when anchored on asphalt and 6 inches when anchored on concrete and in all cases the clear area available behind the barrier will be greater than the dynamic deflection of the limited deflection barrier system.

MATERIALS

The Contractor will use a temporary limited deflection barrier system that is listed on the Qualified Traffic Control Equipment List.

The Contractor may submit alternate materials to the Engineer for approval if the temporary limited deflection barrier system meets the following criteria:

1. The system has been tested by an independent laboratory that is accredited by FHWA to crash test roadside hardware;
2. The system meets the minimum requirements of the AASHTO *Manual on Assessing Safety Hardware* (MASH) at Test Level (TL) 3 or higher; and
3. The system has a federal-aid eligibility letter from FHWA.

Copies of the testing results and the federal-aid eligibility letter will be submitted and approved by the Engineer prior to procurement of an alternate temporary limited deflection barrier system.

The Contractor will supply shop drawings to confirm the available clear area behind the limited deflection barrier equals or exceeds the maximum dynamic deflection of MASH Test 3-11 during testing procedures taken at an independent laboratory that is accredited by FHWA to crash test roadside hardware.

Delineators will be installed on all temporary limited deflection barrier systems in conformance with the relevant provisions of Subsection 850.69 of the Standard Specifications and will be incidental to the temporary limited deflection barrier systems.

Temporary impact attenuators that are listed on the Qualified Traffic Control Equipment List will be used whenever a blunt end of the temporary limited deflection barrier system is facing traffic within the clear zone unless it is protected by a second barrier system or secured to a separate barrier system or bridge railing by a method approved by the manufacturer. For any single continuous run of barrier, all contiguous barrier segments shall be of the type and the same product.

ITEM 853.33 (Continued)

CONSTRUCTION METHODS

Temporary limited deflection barrier systems will be placed in line with the drawings. Installation will be per the manufacturer's specifications, details, and the approved shop drawings.

The Contractor shall not place any breaks in the temporary limited deflection barrier system that will result in sections that are shorter than the stated minimum length-of-need (LON) under MASH Test 3-11. Exceptions will be allowed for gate systems or changeable length segments placed over expansion joints if those barrier segment types have been tested and meet the minimum requirements of MASH Test 3-11 with the adjoining limited deflection barrier system.

Within the LON section, temporary limited deflection barrier systems will only be placed on paved surfaces unless otherwise tested and certified under MASH TL-3 for those conditions.

Damage to the pavement surface caused by the temporary limited deflection barrier during installation, while in service, and/or during removal will be repaired as directed by the Engineer at the Contractor's expense.

Temporary limited deflection barrier systems that require anchorage systems will conform with the relevant provisions of Subsection 850.70 of the Standard Specifications.

METHOD OF MEASUREMENT

Item 853.33 will be measured by the FOOT, in place.

BASIS OF PAYMENT

Payment for work under this Item will be made at the Contract unit price per foot for limited deflection temporary barrier installed in place, including all incidental items. This price shall include the cost of furnishing, installing, maintaining and final removal of all limited deflection temporary barrier systems.

For limited deflection temporary barrier systems that require anchorage systems, the cost of furnishing and installing the anchorage and hardware and the restoration of pavement surfaces or adjacent permanent barrier systems to facilitate anchorage shall be considered incidental to the cost of the item.

Payment for limited deflection temporary barrier removed and reset will be made under Item 853.21.

ITEM 853.8 TEMPORARY ILLUMINATION FOR WORK ZONE DAY

The work under this Item shall conform to the relevant provisions of Section 850 of the Standard Specification and the following:

The work under this Item shall include furnishing, deploying and maintaining in proper operating condition a LED balloon diffuser lighting system. These portable light towers shall be used throughout the project area for temporary work zone lighting. The use of unshielded high wattage flood lights shall not be permitted.

These towers shall be used, relocated and adjusted to meet the criteria in Section 850 of the Standard Specifications and the following:

The Contractor shall illuminate the following work zone areas:

- Change in direction (i.e., work zone entrances and exits, crossovers, etc.)
- Tapered areas
- Actual area where the construction is being performed

Light measurement shall be based on the illuminance method and the lighting levels shall be based on the classification of construction activity that is taking place. At no time shall the light level be below 5 fc and the uniformity shall not exceed 6:1. Task Classifications and recommended illumination levels is shown in Table 1.

Task Classifications	Illumination Level	Average Minimum Maintained Illuminance
All work operations areas, setup of lane or road closures, lane closure tapers, and flagging stations, such as: Excavation (all types), Embankment Fill and Compaction, Reworking Shoulders, Asphalt Pavement Rolling, Subgrade, Stabilization and Construction, Base Course Rolling, Sweeping, Cleaning and Landscaping.	Level I	5 foot-candles
Areas on or around construction equipment; asphalt paving, milling, and concrete placement and/or removal, such as, Milling, Removal of Pavement, Asphalt Paving and Resurfacing, Concrete Pavement, Waterproofing and Sealing, Sidewalk Construction, Base Course Grading and Shaping, Surface Treatment, Drainage Structures and Drainage Piping, Other Concrete Structures, Barrier Wall and Traffic Separators, Guardrails and Fencing, Striping and Pavement Markings, Repair of Concrete Pavement, Highway Signs, Hole Filling and Repair of Guardrails and Fencing.	Level II	10 foot-candles
Pavement or structural crack/ pothole filling; joint repair, pavement patching and/or repairs, installation of signal/electrical/mechanical equipment, such as, Traffic Signals, Highway Lighting Systems and Crack Filling	Level III	20 foot-candles

TABLE 1
TASK CLASSIFICATIONS AND ILLUMINATION LEVELS

ITEM 853.8 (Continued)

Prior to commencement of work the Contractor shall submit to MassDOT for approval a description of illumination equipment that is proposed to be used on this project, and shall include photometrics that detail the light levels that are to be provided for the particular operation for the type of equipment, level of luminance and height to be installed.

Any potential glare from the lighting system should be considered from each direction and on all approaching roadways and opposing lanes of traffic. Glare from the illumination system should be minimized as much as possible for both workers and motorists in adjacent active travel lanes. If necessary, the Contractor shall provide supplemental hardware, such as, visors, louvers, shields, glare screen and barrier to reduce glare in adjacent active travel lanes.

Equipment mounted lighting may be used to supplement light towers to achieve the required lighting levels for the activity involved per Table 1.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 853.8 will be measured and paid for at the Contract unit price per DAY. The cost shall include all labor, materials, equipment, tools and all incidentals required for the design and installation of the work zone lighting system. This shall include, but not be limited to lighting submission preparation, wiring connections, equipment relocations, and include all material and labor incidental for a complete, functional and operational work zone illumination system.

The price of this Item shall include the material and labor required to install any supplemental hardware required to reduce glare on all adjacent active travel lanes.

The per DAY price shall be full compensation for all “Temporary Illumination for Work Zone” regardless of the number of concurrent work areas, amount of equipment concurrently in use or the durations of or changes of the work shifts per day.

Furnishing, Installing, resetting, modifying and removing equipment for work zone illumination shall be incidental to Item 853.8.

ITEM 861.104 4 INCH REFLECTORIZED YELLOW LINE (PAINTED) FOOT

The work under this Item shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

The work under this Item shall consist of furnishing materials and installing reflectorized pavement markings on the proposed shared use path only.

METHOD OF MEASUREMENT

Item 861.104 will be measured for payment by the FOOT, complete in place.

BASIS OF PAYMENT

Item 861.104 will be paid for at the Contract unit price per FOOT, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

ITEM 864.31	**SLOTTED PAVEMENT MARKER ONE-WAY WHITE**	**EACH**
ITEM 864.32	**SLOTTED PAVEMENT MARKER ONE-WAY YELLOW**	**EACH**
ITEM 864.35	**SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW**	**EACH**

The work under these Items shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

The work to be done under these Items will consist of furnishing and installing one-way white, one-way yellow and two-way yellow/yellow slotted pavement markers in accordance with the construction plans and the relevant provisions of Traffic Standard TR.6.3 "Typical Pavement Markings for Freeways".

MATERIALS

Reflectorized pavement markers shall be 3M Series 290, Ennis-Flint Stimsonite C80, Ray-O-Lite Model 200 or an approved equal.

CONSTRUCTION METHODS

Only motorized vehicles with specialized grinding equipment intended for these purposes will be used to grind out the slots for the recessed pavement markers. No manually-propelled or walk behind carts will be allowed. Equipment that does not produce slots that remain in true alignment with the striping centerline will be replaced with satisfactory equipment as required by the Engineer.

The work will include cutting the tapered pavement slot to the dimensions shown on the typical detail for the one-way or two-way markers issued with Engineering Directive E-05-003, application of the manufacturer's recommended epoxy adhesive, and placing the reflectorized pavement marker in the proper position within the slot so that the reflective face is visible and perpendicular to oncoming traffic and so that the top of the marker is set 1/8± inch below the top of the adjacent pavement.

Surface preparation and installation will be strictly in accordance with the manufacturer's instructions.

Pavement markers will not be placed on pavement surfaces that show evidence of cracking, checking, spalling or failure of underlying base material.

If during the laying out process, it is determined that the marker would be installed at a point with one of the aforementioned surface defects or at a pavement construction joint, then the marker will be relocated a distance not to exceed 10% of the typical marker spacing. If the marker cannot be located within this 10% margin then this marker will be deleted.

The minimum pavement surface temperature at the time of application will be that recommended by the epoxy manufacturer. No markers will be installed if the pavement surface or precut slots are wet.

The marker will be protected against traffic until the adhesive has hardened. The following table may be used as a guideline.

ITEMS 864.31, 864.32, and 864.35 (Continued)

Ambient Air Temp °F	Minimum Period Protected from Traffic (Minutes)
100	15
90	20
80	25
70	30
60	35
50*	45

*No installation will be made at a lower temperature than 50°F unless the epoxy manufacturer can guarantee his produce will harden sufficiently at this lower temperature to withstand traffic in 45 minutes.

METHOD OF MEASUREMENT

Items 864.31, 864.32 and 864.35 will be respectively measured for payment by the EACH slotted pavement marker installed, complete in place.

BASIS OF PAYMENT

Items 864.31, 864.32 and 864.35 will be paid for at the respective Contract unit price per EACH, which prices shall include all labor, materials, equipment, pavement grinding, and all incidental costs required to complete the work.

ITEM 866.104 4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) EACH

The work under this Item shall conform to the relevant provisions of Subsection 860 of the Standard Specifications and the following:

The work under this Item shall consist of furnishing materials and installing reflectorized pavement markings on the proposed parking spaces.

METHOD OF MEASUREMENT

Item 866.104 will be measured for payment by the FOOT, complete in place.

BASIS OF PAYMENT

Item 866.104 will be paid for at the Contract unit price perFOOT, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

ITEM 874.2 TRAFFIC SIGN REMOVED AND RESET EACH

Work under this Item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following:

The work under this Item shall consist of removing existing traffic sign panels and supports, discarding the existing supports, and resetting the existing sign panels to new locations on new supports of a type that shall match the existing supports, as indicated on the plans.

The work shall also include excavation (including Class "B" rock) of the existing foundations to a depth of at least 1 foot below grade outside roadways, and to a depth of 3 feet within proposed roadways, the supplying and placing of compacted gravel, the restoration to original condition of any natural features disturbed in any way or manner by the operation, and all materials including new support posts and foundations, and labor and equipment required to reset the sign panel at the new location.

METHOD OF MEASUREMENT

Item 874.2 will be measured for payment by the EACH sign removed and reset a, complete in place.

BASIS OF PAYMENT

Item 874.2 will be paid for at the Contract unit price per EACH, which price shall include removal, loading, transporting and resetting all signs and all other incidental work, complete in place. Signs and attachment hardware lost, damaged, or otherwise made unsuitable for reuse while being removed, transported, stored or reset shall be replaced at no additional cost.

Sign supports will be paid for under Item 847.1 and 848.1 as applicable.

Loam Borrow and Seeding required as part of the restoration work shall be paid under Item 751 and Item 765, respectively.

ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED EACH

Work under this Item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following:

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 required by the Engineer.

The work shall also include excavation (including Class "B" rock) of the existing foundations to a depth of at least 1 foot below grade outside roadways, and to a depth of 3 feet within proposed roadways, the supplying and placing of compacted gravel, the restoration to original condition of any natural features disturbed in any way or manner by the operation, and all materials including new support posts and foundations, and labor and equipment required to reset the sign panel at the new location.

The existing signs shall not be removed until the new signs and structures replacing them are ready for traffic unless otherwise required 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 disposed.

BASIS OF PAYMENT

Item 874.41 will be paid for at the Contract unit price per EACH, which price shall include all labor, material, equipment, 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 874.71 MISCELLANEOUS SIGN REMOVED AND RESET EACH

Work under this Items shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following:

The work under this Item shall consist of removing the existing Bourne Public Works sign at the Edgehill Rd and Route 6 intersection and resetting the sign to a new location on existing supports as indicated on the plans.

The work shall also include excavation (including Class "B" rock) of the existing foundations to a depth of at least 1 foot below grade outside roadways, and to a depth of 3 feet within proposed roadways, the supplying and placing of compacted gravel, the restoration to original condition of any natural features disturbed in any way or manner by the operation, and all materials including new support posts and foundations, and labor and equipment required to reset the sign panel at the new location.

METHOD OF MEASUREMENT

Item 874.71 will be measured for payment by the EACH sign removed and reset as shown on the plans, complete in place.

BASIS OF PAYMENT

Item 874.71 will be paid for at the Contract unit price per EACH, which price shall include all labor, material, equipment, removal, loading, transporting and resetting all signs and all other incidental work, complete in place. Signs and attachment hardware lost, damaged, or otherwise made unsuitable for reuse while being removed, transported, stored or reset shall be replaced at no additional cost.

Sign supports will be paid for under Item 847.1 and 848.1 as applicable.

Loam Borrow and Seeding required as part of the restoration work shall be paid under Item 751 and Item 765, respectively.

ITEM 876.1 ITS POLE REMOVED AND RESET LUMP SUM

Work under this Item shall conform to the relevant provisions of Subsection 828 of the Standard Specifications and the following:

The work under this Item shall consist of removing the existing Travel Time Reader, solar panel, post and base near STA 166+00 RT and resetting to the location specified on the plans on new foundation.

Notification and coordination with MassDOT ITS- Programs section must be made before commencing any work for resetting the pole.

The work shall also include excavation (including Class "B" rock) of the existing foundations to a depth of at least 1 foot below grade outside roadways, and to a depth of 3 feet within proposed roadways, the supplying and placing of compacted gravel, the restoration to original condition of any natural features disturbed in any way or manner by the operation, and all materials and labor and equipment required to reset the post at the new location.

BASIS OF PAYMENT

Item 876.1 will be paid for at the Contract unit price per LUMP SUM, which price shall include all labor, material, equipment, and all incidental costs required to complete the work.

ITEM 950.01	**TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO.02**	**LUMP SUM**
ITEM 950.02	**TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO. 03**	**LUMP SUM**
ITEM 950.03	**TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO. 04**	**LUMP SUM**
ITEM 950.04	**TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO.05**	**LUMP SUM**

The work under these Items shall conform to the relevant provisions of Subsections 140, 940, 950, 955 of the Standard Specifications and the following:

GENERAL

Under these Items, the Contractor shall design, furnish and install, maintain and cut-off or remove (where approved) temporary earth support systems to maintain the existing roadway grades and structures during staged construction and for retaining the embankments adjacent to excavation for the construction. The limits of the excavation support systems shall be determined by the Contractor and submitted for approval by the Engineer.

Additionally, the Contractor is responsible for providing the necessary temporary support and protection for existing drainage structures and buried utility structures that will remain in service during the bridge excavation operations and staged construction. This work is incidental to the item and will not be considered for additional compensation.

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 temporary earth support systems are expected to consist of either soldier pile and lagging or steel sheeting with walers and tieback or deadman anchors, but alternate forms of temporary support system may be submitted for review and approval by the Engineer. Any necessary tieback anchors, deadman anchors, soil nails and/or temporary bracing are considered incidental to these Items. The temporary earth support systems provided shall be independent and not cause damage to the permanent structures when removed (where specified).

The temporary earth support systems shall extend longitudinally such that the maximum slope of the excavated surface does not exceed 1 (vertical) to 1 1/2 (horizontal).

Do not remove temporary earth support system members installed within the zone of influence of new or existing structures, tracks or utilities. The zone of influence is defined as a line extending down and away from the outer edge of the structure or pipe springline at a slope of 1 horizontal to 1 vertical. The zone of influence of railroad tracks is defined by Drawing 2.1.10 in Part II of the MassDOT LRFD Bridge Manual.

ITEMS 950.01, 950.02, 950.03, and 950.04 (Continued)

Support members that are not removed shall be cut off at least 4 feet below finished grade or at a depth accepted by the Engineer and abandoned in place. No wood shall remain as part of the abandoned portion of the Work. 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 these 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.

The Contractor is responsible for installation of survey deformation monitoring points (DMPs) to monitor movements that may be detrimental to performance of roadway, railroad tracks and/or structures. This work is incidental to these Items and will not be considered for additional compensation.

GEOTECHNICAL INSTRUMENTATION AND MONITORING

Geotechnical instrumentation and monitoring is required at the following locations.

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 structures, railroad tracks 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
Track DMP (Hor. and Vert.)	0.25 inch	0.5 inch
Utility DMP (Vert.)	0.25 inch	0.5 inch
Excavation Support DMP		
Hor.	1.0 inch	2.0 inch
Vert.	0.5 inch	1.0 inch

ITEMS 950.01, 950.02, 950.03, and 950.04 (Continued)

These 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 excavation 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 required by the Engineer, install and monitor additional instruments as required 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 structures or railroad tracks, the Contractor shall provide all labor and equipment to monitor and report vibrations during the Work.

Contractor shall conduct vibration monitoring using a portable seismograph 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 pile 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 required to reduce vibration levels, at no additional cost to the Owner. The Engineer may require the Contractor to perform additional vibration monitoring if, in the opinion of the Engineer, conditions warrant such action.

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 buildings, structures, 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.

ITEMS 950.01, 950.02, 950.03, and 950.04 (Continued)

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 a temporary earth support system design that is designed to carry all of the applicable AASHTO loads. The temporary 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 drawing does not relieve the Contractor of the responsibility of providing for the safety of the work and its successful completion.

The Contractor designed temporary earth support systems shall meet the following minimum requirements:

1. The Contractor is responsible for selecting, designing, furnishing, installing, maintaining, monitoring, and removing (where applicable) the temporary earth support systems.
2. The temporary earth 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 HL-93 loading, temporary barriers and temporary grade beam, 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 and relevant portions of the AASHTO Guide Design Specifications for Bridge Temporary Works.
3. Where the temporary earth support system is located within 3 feet of temporary barriers, the temporary earth support systems shall be designed for an additional load per requirements of Section 3.3.2 of Part I of the MassDOT LRFD Bridge Manual.

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.

ITEMS 950.01, 950.02, 950.03, and 950.04 (Continued)

All materials used for the support system, whether new or used, shall be sound and free from strength-impairing defects. New steel piles (if used) shall conform to the applicable provisions of Subsection 940 of the Standard Specifications. Steel sheet piling (if used) shall conform to the applicable requirements of Subsection 950 of the Standard Specifications. Treated timber if used shall conform to the applicable provisions of Subsection 955 of the Standard Specifications. Steel materials used for the temporary earth support systems are permitted to remain in place at the completion of construction. All other 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, retaining walls, or railroad tracks.

For all steel used for temporary 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 required 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 take into account subsurface conditions such as soil types, water surface elevations, existing foundations to be demolished and proposed new foundations. 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.

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.

Excavation and/or earth support systems are required where shown on the plans

ITEMS 950.01, 950.02, 950.03, and 950.04 (Continued)

BASIS OF PAYMENT

Items 950.01, 950.02, 950.03, and 950.04 will be paid for at the respective Contract unit price LUMP SUM, which prices shall include all labor, tools, equipment, material and all associated work required to design, provide and revise submittals, install, maintain and remove the excavation support system.

No separate payment for dewatering or deformation monitoring shall be made.

ITEM 986.1 MODIFIED ROCKFILL SQUARE YARD

The work under this Item shall conform to the relevant provisions of Subsections 230, 258, 983 of the Standard Specifications and the following:

The work to be done under this Item consists of the furnishing and delivering Modified Rock Fill to the site as shown on the Plans and specified in Subsection 983.66 of the Standard Specifications.

METHOD OF MEASUREMENT

Item 986.1 will be measured for payment by the SQUARE YARD, complete in place.

BASIS OF PAYMENT

Item 986.1 will be paid for at the Contract unit price per SQUARE YARD, which price shall include all labor, materials, equipment, and all incidental costs required to complete the work.

ITEM 996.301	**MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO.01**	**SQUARE FOOT**
ITEM 996.302	**MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO.02**	**SQUARE FOOT**
ITEM 996.303	**MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO.03**	**SQUARE FOOT**
ITEM 996.304	**MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO.05**	**SQUARE FOOT**

These Items shall conform to the requirements of all relevant Sections of the Standard Specifications and Supplemental Specifications and the following.

The work under these Items shall consist of design, fabrication, furnishing, transportation, and erection of a Mechanically Stabilized Earth (MSE) retaining wall system of the required type, including foundation excavation, leveling pad, drainage, backfill, and miscellaneous items required for a complete installation.

The MSE retaining walls shall consist of reinforcing strips or reinforcing mesh earth wall systems utilizing architectural precast concrete facing panels supported on cast-in-place concrete leveling pads, or equivalent system as accepted by MassDOT. All reinforcing strips or mesh material shall consist of galvanized steel. The wall structures shall be dimensioned to achieve the design criteria shown on the Plans and specified herein.

MSE retaining walls shall be designed and constructed as specified herein. The design shall be subject to review and acceptance by the Engineer. The acceptability of a MSE retaining wall design shall be at the sole discretion of the Engineer. Any additional design, construction or other costs arising as a result of rejection of a retaining wall design by the Engineer shall be borne by the Contractor.

Also included are the final detailing, fabrication, furnishing, transportation, and construction of precast concrete copings including all associated components, as shown on the plans.

ACCEPTANCE

Acceptable MSE retaining wall systems:

- “Reinforced Earth” by the Reinforced Earth Company and 133 Park Street, North Reading, Massachusetts 01864 - Ph: (978) 664-2830.
- “Retained Earth” by the Reinforced Earth Company (Formerly VSL Retained Earth by Foster Geotechnical/VSL Corporation) 133 Park Street, North Reading, Massachusetts 01864 – Ph: (978) 664-2830.
- Vist-A-Wall Systems LLC (Formerly T&B Structural Systems) 304-6800 Manhattan Blvd Fort Worth, TX 76120 – Ph: 1-888-280-9858.
- “Tricon Retained Soil Wall System” by the Tricon Precast, Ltd. Company.
- “RSE – Smooth Face’ by Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, California 95503 – Ph: 1-800-762-8962.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

Alternate MSE retaining wall systems shall be an accepted equal upon the approval of the Engineer.

An anti-graffiti coating shall be applied to all exposed concrete surfaces of the retaining walls that are abutting traffic.

Value engineering is not applicable to the work of this Item.

QUALITY ASSURANCE

Quality Assurance shall conform to the requirements of all relevant Sections of the Standard Specifications and Supplemental Specifications and the following.

Fabricator Quality Control

Precast concrete requirements regarding the precast concrete Fabricator's Quality Control (QC), the fabrication plant, personnel, laboratory, testing equipment, inspection, temperature monitoring of the concrete, sampling and testing of concrete, certificate of compliance, and QC documentation shall conform to Subsection M4.02.14, Precast Concrete Highway Units of the Standard Specifications.

Contractor Quality Control

The Contractor installing the PM retaining wall shall have a minimum of 5 years' experience constructing the chosen prefabricated wall system and shall use personnel having demonstrated experience in the installation procedures recommended by the manufacturer and as specified herein.

A qualified representative (minimum 2 years demonstrated experience) from the wall design-supplier shall be present during construction of the PM walls. The services of the qualified representative shall be at no additional cost to the project. The Contractor shall make the necessary arrangements with the wall supplier to have the technical representative on the project. The qualified experienced technical representative will advise the Contractor and Engineer concerning proper installation procedures. The services of a qualified technical representative shall be incidental to these Items.

Quality control and testing shall comply with Subsection M4.02.14 of the Standard Specifications. The sublot size for MSE wall units shall comply with Subsection M4.02.14 of the Standard Specifications.

Acceptance

Final Acceptance for the prefabricated modular wall system shall be determined by MassDOT.

MassDOT will perform Acceptance inspection and sampling and testing in accordance with Subsection M4.02.14 of the Standard Specifications.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

MATERIALS

All materials used in the construction of the MSE retaining walls shall meet the requirements specified in the MassDOT Standard and Supplemental Specifications and as specified herein.

Materials not conforming to this section of the specifications or from sources not listed in the Contract documents shall not be used without written consent from the Engineer.

Reinforced Concrete Facing Panels

The panels shall be fabricated in accordance with Section M4, Subsection M4.02.14 Precast Concrete Highway Units and Subsection 901 of the Standard Specifications, with the following exceptions and additions:

The architectural facing panels shall be manufactured of 5,000 pounds per square inch (psi), ¾ inch, 705, air-entrained cement concrete, from a MassDOT approved precaster.

Finishing, Protection, and Curing of Precast Concrete

Unless otherwise indicated on the Plans, the concrete surfaces shall be finished in accordance with relevant requirements of Subsection M4.02.14 Precast Concrete Highway Units and Section 901 of the Standard and Supplemental Specification and as modified herein.

The panels shall be cast on a flat area. The coil embeds, tie strip guide, and other galvanized devices shall not contact or be attached to the face panel reinforcement steel. Each panel shall be cast as a unit. No horizontal joints are permitted in a panel.

Steel Reinforcement

Steel reinforcement for precast panels shall be epoxy coated reinforcing bars in accordance with Section M8 of the Standard and Supplemental Specifications.

Soil Reinforcing and Attachment Devices

All reinforcing and attachment devices, to be installed as shown on the Shop Drawings, shall be carefully inspected to insure they are true to size and free from defects that may impair their strength and durability.

A. Ribbed Reinforcing Strips - Ribbed reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either AASHTO M183 (ASTM A36) or AASHTO M223 Grade 65 (ASTM A572). Galvanization shall conform to the minimum requirements of AASHTO M111 (ASTM A123).

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

B. Reinforcing Mesh - shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO M32 (ASTM A82) and shall be welded into the finished mesh fabric in accordance with AASHTO M55 (ASTM A185). Galvanization shall be applied after the mesh is fabricated and conform to the minimum requirements of AASHTO M111 (ASTM A123).

C. Tie Strips - The tie strips shall be shop fabricated of hot rolled steel conforming to the minimum requirements of ASTM A570, Grade 50 or equivalent. Galvanization shall conform to AASHTO M111 (ASTM A123).

D. Coil Embeds/Loop Embeds-Shall be fabricated of cold drawn steel wire conforming to ASTM 510, UNS G 10350 or AASHTO M32 (ASTM A82). Loop imbeds shall be welded in accordance with AASHTO M55 (ASTM A185). Both shall be galvanized in accordance with ASTM B633.

E. Coil Embed Grease - The cavity of each coil embed shall be completely filled with no-oxide type grease.

F. Coil Bolt - The coil bolts shall have two inches of thread. They shall be cast of 80-55-06 ductile iron conforming to ASTM A536. Galvanization shall conform to ASTM B633.

G. Fasteners - Fasteners shall consist of hexagonal cap screw bolts and nuts, which are galvanized and conform to the requirements of AASHTO M164 (ASTM A325) or equivalent.

H. Connector Pins-Connector pins and mat bars shall be fabricated from AASHTO M183 (ASTM A36) steel and welded to the soil reinforcement mats as shown on the Plans. Galvanization shall conform to AASHTO M111 (ASTM A123).

Joint Materials

Joint materials shall be either preformed EPDM rubber pads conforming to ASTM D2000 for 4AA, 812 rubbers or neoprene elastomeric pads having a Durometer Hardness of 55 ±5.

Backfill Material

All backfill materials used in the MSE Walls reinforced mass shall conform to Subsection 150 of the Standard Specifications. Backfill material used in MSE walls shall also meet the quality of materials and gradation requirements of the MSE wall manufacturer. Additional backfill requirements:

Backfill below water - Crushed Stone M2.01.5
Backfill above water - Gravel Borrow M1.03.0(b)

A. Soundness - The material shall be substantially free of shale or other soft, poor durability particles. The materials shall have a magnesium sulfate soundness loss, as determined by AASHTO T104 (ASTM C88), of less than 30 percent after four cycles.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

B. Electrochemical Requirements - The backfill materials shall meet the following criteria:

Requirements		Test Methods
Resistivity	> 3,000 ohm centimeters	AASHTO T288 (ASTM G57)
pH	between: 5 and 10, inclusive	AASHTO T289 (ASTM G51)
Chlorides	< 100 parts per million	AASHTO T291 (ASTM D512)
Sulfates	< 200 parts per million	AASHTO T290 (ASTM D516)
Organic Content	< 1%	AASHTO T267-86

Subdrain

Walls shall be constructed with subsurface drainage measures as shown on the project plans and as specified herein. A subdrain system, at the back of the wall, shall be provided to collect and remove surface and subsurface water away from the embankment and backfill toward the outside limits of the wall. Open-graded gravel drains with a geotextile, geocomposite drains, and blanket drains can be used, in conformance with MassDOT requirements.

Leveling Pad

The leveling pad shall be constructed of 3,000 psi, ¾ inch, 425-pound cement concrete approved mix as specified in Section M4, or other foundation material as approved by the Engineer. Leveling pad shall have minimum dimensions of 6 inches thickness and 12 inches width and be placed at the design elevation shown on the plans within a 1/8 inch tolerance.

Impervious Membrane

The impervious membrane shall be a polymer sheet suitable for retaining water with dissolved deicing salts. The membrane shall be composed of polyvinyl chloride or polyethylene and have a minimum thickness of 30 mil. Joints between sheets of membrane shall either be heat welded or glued in accordance with manufacturer's recommendations. The impervious membrane shall be placed such that it is above all soil reinforcement and completely covers all soil reinforcement below it.

Crushed Stone for Drainage Layer

Crushed stone for use in the drainage layer above the Impervious Membrane shall be 1/2 inch crushed stone conforming to the requirements of Subsection M2.01.5 of the Standard Specifications.

Wall Coping

Cast-in-place or precast cement concrete moment slabs, wall coping, traffic barriers, and light pole pedestals shall be furnished and constructed in accordance with Standard Specification Section 901. Moment slabs, coping, traffic barriers, curbs, and light pole pedestals shall be constructed of the following standard MassDOT cement concrete mixes:

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

Structural Component	Cement Concrete Mix
Coping	4000, ¾ IN, 610

All steel reinforcing shall be epoxy coated and shall conform to the requirements of AASHTO M31 Grade 60.

Anti-Graffiti Coating

For retaining walls that are abutting traffic, two coats of anti-graffiti coating shall be applied by airless spray, brush, or roller to all exposed concrete surfaces of the prefabricated retaining walls. The Contractor may not proceed with any production coating operations until the samples and mock- ups are approved. All manufacturer's recommendations and procedures shall be strictly adhered to. Approved manufacturer's authorized representatives shall provide additional job site training in the proper mixing and application procedures of the anti-graffiti coating. The cost for sufficient involvement of the authorized representatives shall be considered incidental to these Items. All State, Federal and local safety and environmental protection requirements shall be strictly adhered to.

The anti-graffiti coating shall be a clear, non-yellowing, chemical and scratch resistant, fast curing, water-based, one-component silicone elastomer specifically formulated to protect surfaces subject to repeated graffiti attacks. It shall have no effect on the color of the concrete.

ACCEPTANCE OF MATERIALS

The Contractor shall furnish to the Engineer a Certificate of Compliance certifying that the above materials comply with the applicable Contract specifications. A copy of all test results performed by the Contractor necessary to assure Contract compliance shall also be furnished to the Engineer. Acceptance will be based on the Certificate of Compliance, accompanying test reports, and visual inspection by the Engineer.

DESIGN REQUIREMENTS

Design Specifications

The MSE retaining walls shall be designed to provide the grade separation shown on the Plans with a service life of not less than 75 years.

All calculations and Shop Drawings shall be signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts and specializing in MSE wall design and construction.

The MSE wall system shall be designed in accordance with:

1. The manufacturer's requirements.
2. The Contract Plans.
3. The requirements as specified herein.
4. AASHTO LRFD Bridge Design Specification, current edition.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

5. AASHTO LRFD Bridge Construction Specifications, current edition.
6. FHWA-NHI-10-024, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume I, November 2009, or the latest FHWA Publication.
7. FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Volume II, November 2009, or the latest FHWA Publication.
8. FHWA-NHI-09-087, Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, November 2009, or the latest FHWA Publication.

Where conflicting requirements occur, the more stringent shall govern. Design shall consider Service, Strength, and Extreme Limit States, and external and internal stability.

The MSE wall shall be dimensioned so that the maximum bearing pressure does not exceed the factored bearing resistance of the foundation soils, as noted in the Plans.

The MSE walls shall be designed to account for drainage required for walls below established groundwater levels and seasonal levels.

The MSE wall design shall follow the general dimensions of the wall envelope shown on the Plans. Base of footing elevation shall be as shown on the Plans or may be lower. All wall elements shall be within the right-of-way limits shown on the Plans. The panels shall be placed so as not to interfere with drainage or other utilities, or other potential obstructions.

MSE Facing panels shall have tongue and groove, ship lap or similar approved connections along all joints, both vertical and horizontal.

MSE facing panels shall be installed on cast-in-place concrete leveling pads or other foundation material as approved by the Engineer. The top of the leveling pad shall be located at or below the theoretical leveling pad elevation. The minimum wall embedment shall be 4.0 feet as measured to the top of the leveling pad, or as shown on the Plans, whichever is greater. The leveling pads are incidental to these Items.

All appurtenances behind, in front of, under, mounted upon, or passing through the wall such as drainage structures, utilities, fences, concrete parapet wall or other appurtenances shown on the Plans shall be accounted for in the stability design of the wall.

Walls or wall sections which intersect at an angle of one hundred thirty (130) degrees or less shall include a special corner element to cover the joint formed by the abutting walls or wall sections and to permit relative movement. Corner elements shall not consist of connected standard facing panels.

Required geometry and reinforcing of coping has been provided on the Plans. Final design of copings and detailing of all components shall be completed by the Manufacturer, in accordance with the following standards:

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

1) MassDOT LRFD Bridge Manual, 2013 or current edition.
2) AASHTO LRFD Bridge Design Specification, current edition.

Final design and detailing of wall coping shall be consistent with the final selected wall type.

SUBMITTALS

Design computations demonstrating compliance with the criteria specified herein and shown on the Plans, prepared and signed and stamped by a registered professional engineer licensed in the Commonwealth of Massachusetts and specializing in MSE wall design and construction with a minimum of 5 years of design experience.

A. The design calculations shall include:

1. Statement of all assumptions made and copies of all references used in the calculations.

2. The MSE wall design calculations shall include a complete and thorough set of hand calculations that are specific to this project to support any computer generated calculations. The calculations shall include all applicable references to the LRFD code, tables, graphs, sources of equations used and material properties. A detailed explanation of any symbols and computer programs used in the design shall be provided. The design calculations shall be provided for external stability (sliding, overturning, maximum bearing pressure, and global stability) of the final wall configuration, and internal stability within each layer of reinforcement (tensile stress, pullout resistance and tensile stress at the connection with the facing) for the applicable strength and extreme event limit states. Calculations shall be performed in English units, with the final calculation results shown in English units.

3. The design calculations and associated design parameters, including the pullout resistance of the tensile reinforcement shall account for the frictional, gradation and strength characteristics of the specific reinforced backfill materials that are provided by the Contractor for the project.

4. Analyses demonstrating compliance with all applicable earth, water, surcharges, seismic, or other loads, as specified herein and on the Plans, and as required by AASHTO and the latest Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Reference Manual published by FHWA.

5. Analyses or studies demonstrating durability and corrosion resistance of retaining wall systems for the proposed location and environment. The designers shall provide all corrosion protection devices necessary for the retaining wall to have a minimum service life of 75 years in the proposed location and environment.

6. Structural design of coping, and final detailing of coping in coordination with geometry and detailing required on Plans.

ITEM 996.301, 996.302, 996.303, 996.304 (Continued)

7. Analyses of reinforcement pull-out resistance.

B. A detailed resume of the wall designer listing similar projects and demonstrating necessary experience to perform the MSE retaining wall design, including a brief description of each project that is similar in scope. A reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, address and current phone number.

C. A detailed listing of MSE walls that the Contractor has constructed including a brief description of each project and a listing of personnel who will construct the walls demonstrating their experience in construction of MSE retaining walls. A reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, address and current phone number.

D. Manufacturer's product data for the MSE wall system, including material, manufacture and erection specifications, all specified erection equipment necessary, details of buried MSE wall elements, special details required of reinforcing layout around drainage structures and sign foundations, structures design properties, type of backfill and details for connections between facing panels.

E. Concrete mix design in accordance with Section M4 of the Standard Specifications.

F. Shop Drawing showing the configuration and all details, dimensions, quantities and cross-sections necessary to construct the MSE wall, including but not limited to the following:

1. A plan view of the wall which shall include Contract limits, stations and offsets, and the face of wall line shown on the Plans
2. An elevation view of the wall which shall include the elevation at the top of the wall at all horizontal and vertical break points and at least every 50 feet along the face of the wall, all steps in the leveling pads, the designation as to the type of retaining wall system(s), and an indication of the final ground line and maximum calculated bearing pressures. The face of wall shown on the Plans shall be indicated.
3. A typical cross section or cross sections showing the elevation relationship between existing ground conditions and proposed grades, and the proposed wall configuration, including details for the proposed methods for connecting to existing conditions. The sections shall also indicate the location of the face of wall shown on the Plans.
4. General notes pertaining to design criteria and wall construction.
5. A listing of the summary of material quantities for each wall.
6. Details of sleeves and pipes and other embedded items to be installed through the walls.
7. Clearly indicated details for construction of walls or reinforcing elements around drainage, foundations, utilities or any other potential obstructions.
8. Details of the architectural treatment of facing panels.
9. Drainage design detail.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

10. Location of utilities.
11. Sequence and schedule of construction, including overall construction schedule.
12. Methods of excavation and backfill.
13. Method of maintaining stability of excavated trenches.
14. Method of monitoring plumbness and deviation of wall.
15. Any acceptance testing and frequency.
16. Details and location of all necessary construction and expansion joints.
17. Connection details at the interface of the wall and any adjacent proposed cast in place retaining wall or abutment structure.
18. Details of impermeable membrane connection to facing panels and to runoff collection system.
19. Details of impermeable membrane connection to facing panels and to runoff collection system.
20. Details of maintaining the stability, rigidity and alignment of the wall during construction, prior to wall construction completion, and prior to backfilling behind the top of the wall and roadway/moment slab construction at the top of the wall.
21. Groundwater elevation.
22. Layout and detail drawings for wall coping.

CONSTRUCTION METHODS – PLANT FABRICATION

All provided walls shall be from one single manufacturer. The same MSE wall system shall be used for all MSE retaining walls on this project.

MSE Wall Panel Fabrication

Reinforced Concrete Facing Panels shall nominally measure 5' high by 5' wide on the exterior exposed face without additional tabs or interlocking extensions adding to the overall dimension of the panel face. Panel dimensions and layout shall include a minimum design joint width of 3/4" in order to accommodate differential settlement without impairing the appearance of the facing or compromising the structural integrity of individual panels. Architecturally, panel joints should be maintained at 3/4" throughout the wall.

The date of manufacture, production lot number, and the piece mark shall be clearly scribed on an unexposed face of each panel.

MSE Wall Panel Fabrication Tolerances

Dimensions shall conform to the following tolerances:

1. Position of panel connection devices within 1", except for coil and loop imbeds which shall be 3/16", with all other dimensions within 3/16".

2. Panel squareness as determined by the difference between the two diagonals shall not exceed 1/2".

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3. Surface defects on smooth-formed surfaces measured over a length of five feet shall not exceed 1/8". Surface defects on textured-finished surfaces measured over a length of 5' shall not exceed 5/16".

If requirements for the precast facing panels are different from the standard panels from the above systems, alternate details shall be prepared by the Contractor.

Architectural Form Liners

The panels shall be cast using custom architectural form liners. The panel face rustication shall be Ashlar Stone surface.

All Reinforced Concrete Facing Panels shall receive a custom architectural finish treatment to be part of the pre-casting process using form liners manufactured by one of the following form liner manufacturers, or other manufacturers as approved by MassDOT:

1. Greenstreak Form Liners, by Greenstreak, St. Louis, Missouri.
2. Symons Form Liner, by Symons Corp., Des Plaines, Illinois.
3. Lithotex Formliner, by L.M. Scofield Co., Los Angeles, California.
4. Custom Rock Form Liners, by Custom Rock, St. Paul, Minnesota.

The same custom form liner must be used exclusively for all textured architectural finish surfaces on the job. Using form liners from different manufacturers together on the same job will not be permitted.

Lifting Devices and Threaded Inserts

Lifting sleeves and inserts shall be provided for the purpose of handling and placing. Care shall be taken during storage, transporting, hoisting, and handling to prevent cracking or damaging the precast units.

Repairs and replacement of PM wall units shall be in accordance with Subsection M4.02.14, *Repairs and Replacement for Proprietary Retaining Wall Systems* of the Standard Specifications. Variations in the exposed face that substantially deviate from the approved architectural model unit as to color, texture, and reveal will be considered a Category 3 Rejectable Defect.

Storage and Shipping

The precast units shall be supported as specified in Subsection M4.02.14 Precast Concrete Highway Units of the Standard Specifications.

The precast units shall be shipped and installed as specified in Subsection M4.02.14 Precast Concrete Highway Units of the Standard Specifications.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

CONSTRUCTION METHODS

All MSE walls shall be built in accordance with the Plans and accepted Shop Drawings for the proposed wall systems.

The MSE retaining walls shall be constructed in accordance with these specifications and in conformity with the lines, grades, design criteria, and dimensions shown on the Plans or established by the Engineer.

Wall Penetrations

Utility penetrations through the MSE wall system shall be considered incidental to these Items. See Plans for details of pipe sleeves and stipulated requirements for coordination with the utility owner.

Delivery, Storage and Handling

The Contractor shall check the material upon delivery to assure that the proper material has been received. A product certification shall be provided with each shipment.

All wall materials and facing panels shall be stored elevated from the ground and protected to prevent all mud, wet cement, and epoxy and like substances which may affix themselves to the panels or materials. The panels shall be supported during storage to prevent excessive bending stress.

Wall Excavation

Earth excavations for walls shall be in accordance with the requirements of Subsection 120 of the Standard Specifications and in close conformity to the limits and construction stages shown on the Plans. Subsections 120.80, 120.81, and 120.82 of the Standard Specifications do not apply to the work covered in this section. Payment for excavation and incidentals to complete the excavation are included in the MSE Wall Item.

Temporary Earth Support Systems

Design, installation, and removal of any temporary earth supports required for the construction of the wall shall be in accordance with the requirements of Subsection 950 of the Standard Specifications.

Foundation Preparation

The foundation for the structure shall be graded level for a width equal to the length of reinforcement elements plus 1 foot, or as shown on the Plans. Where applicable, dewatering of the foundation area shall be in accordance with applicable MassDOT Standard Specifications. Prior to wall construction the foundation shall be compacted with at least 10 passes of a smooth wheel vibratory roller weighing at least 10,000 lbs. Any foundation soils found to be unsuitable shall be removed and replaced with Special Borrow Material as per Subsection 140 and Subsection 170 of the Standard Specifications.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

In areas below the existing groundwater level, backfill shall consist of crushed stone for bridge foundations as per Subsection 150 of the Standard Specifications.

The foundation for the structure shall be approved by the Engineer before erection is started.

Wall Erection

Precast concrete panels shall be placed so that their final position is vertical or battered as shown on the Plans. For erection, panels are handled by means of lifting devices connected to the upper edge of the panel. Panels should be placed in successive horizontal lifts in the sequence shown on the approved Shop Drawings as backfill placement proceeds. As backfill material is placed behind the panels, the panels shall be maintained in position by means of temporary wedges or bracing according to the wall supplier's recommendations. Concrete facing vertical tolerances and horizontal alignment tolerances shall not exceed 3/4 inch when measured with a ten-foot straight edge. During construction, the maximum allowable offset in any panel joint shall be 3/4 inch. The overall vertical tolerance of the wall (top to bottom) shall not exceed 1/2 inch per ten feet of wall height.

Joints

Installed to the dimensions and thickness in accordance with the Plans or approved shop drawings.

Cover all joints between panels on the back side of the wall with a geotextile fabric. The geotextile fabric shall conform to the requirements of AASHTO M288 for the intended application. Slit film and multifilament woven geotextile fabrics are not allowed for this application. The minimum width of the fabric shall be 12 inches. Lap fabric at least 4 inches where splices are required.

Backfill Placement

Prior to backfilling, the Contractor shall install a subdrain as shown on the project plans and as specified in this special provision.

Backfilling will not take place until concrete design strength of the panels is reached. Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance of the wall materials or misalignment of the facing panels or reinforcing elements. Any wall materials which become damaged during backfill placement shall be removed and replaced. Any misalignment or distortion of the wall facing panels due to placement of backfill outside the limits of this specification shall be corrected. At each reinforcement level, the backfill elevation after compaction shall be 2 inches above the connection device from a point approximately 12 inches behind the back face of the panel to the free end of the reinforcement, unless otherwise shown on the plans. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize corrections as outlined in Note 7 of that test). For backfills containing more than 30 percent retained on the 3/4 inch sieve, a method of compaction consisting of at least 4 passes by a heavy roller shall be used.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift.

The maximum lift thickness after compaction shall not exceed 12 inches, regardless of the vertical spacing between layers of tensile reinforcement. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density.

Compaction within three feet of the back face of the wall shall be achieved by at least three passes of lightweight mechanical tamper, roller, or vibratory system.

At the end of each day's operation, the Contractor shall slope the last lift of the backfill away from the wall facing to rapidly direct runoff away from the wall face. In addition, the Contractor shall not allow surface runoff from other areas to enter the wall construction site.

Construction sampling and testing procedures and frequency for backfill material shall conform to the project requirements.

Roadway Runoff Collection System

The Contractor shall place an impervious membrane and drainage layer to the lines and grades shown on the Plans. The impervious membrane shall be placed just below the drainage layer at the top lift of the MSE wall. The impervious membrane shall slope away from the wall panels towards the collection system located beyond the end of the soil reinforcement elements. If angular fill material is to be placed above or below the impervious membrane, a suitable thickness of sand shall be used to protect the membrane from puncture. The membrane shall be continuous throughout the limits shown on the Plans with watertight seams at any splices. Repair any holes created during installation according to the membrane manufacturer's recommendation before covering.

METHOD OF MEASUREMENT

Items 996.301, 996.302, 996.303, and 996.304 will be respectively measured for payment by the SQUARE FOOT of mechanically stabilzed earth (MSE) wall installed, complete in place. Mechanically Stabilized Earth Walls will be measured by the vertical square foot of retaining structure installed according to the lines, grades, and dimensions shown on the Plans. The vertical area of retaining structure is defined as the area measured at the wall face, bounded by the top of the leveling pad, ends of wall, and top of coping.

ITEMS 996.301, 996.302, 996.303, and 996.304 (Continued)

BASIS OF PAYMENT

Items 996.301, 996.302, 996.303, and 996.304 will be paid for at the respective Contract unit price per SQUARE FOOT, which prices shall include the following:

A. All design work, preparation of written submittals and plans, revision of submittals, sample submittals and any other required preliminary work prior to and after acceptance of the retaining wall by the Engineer.

B. All materials, including transportation, for the MSE walls, including facing panels, MSE reinforcing elements, attachment devices, fasteners, bearing blocks and shims, joint materials, copings, impervious membrane, wall drainage, compacted select granular backfill, reinforced stone backfill, and crushed stone for bridge foundations when working below the groundwater table, geotextile fabric, concrete masonry and leveling pads, reinforcing steel, and incidentals.

C. All labor and equipment required to excavate and prepare the wall foundation, form and cast the leveling pad, erect the MSE wall to the lines and grades shown on the Plans, place and connect attachment devices, install the joint materials, install wall drainage, place and compact backfill, and construct any other items required to complete the MSE wall.

D. All temporary shoring.

E. Anti- Graffiti Coating shall be incidental to these Items.

F. MSE Wall Representative shall be incidental to these Items.

Excavation and replacement of any unsuitable materials below the proposed bottom of the MSE wall earth volume limits as shown on the Plans, or as required by the Engineer, will be measured and paid for as defined in Subsections 120, 140, and 150 of the Standard Specifications.

Design, installation, and removal of temporary earth supports are paid for separately under Items 950.01, 950.02, and 950.04, Temporary Earth Support System, Retaining Walls.

ITEM 996.41 PREFABRICATED MODULAR BLOCK GRAVITY RETAINING WALL, WALL NO. 04 SQUARE FOOT

The work under this Item shall conform to the requirements of all relevant Sections of the Standard Specifications and Supplemental Specifications and the following.

The work under this Item shall consist of design, fabrication, furnishing, transportation, and erection of prefabricated modular (PM) block gravity retaining wall system of the required type, including foundation excavation, leveling pad, drainage, backfill, vehicular barrier system, and miscellaneous items required for a complete installation.

The PM block wall system shall be a gravity wall system consisting of architectural precast concrete block units supported on cast-in place unreinforced concrete leveling pads, or other foundation materials as approved by the Engineer and select backfill. The wall structures shall be dimensioned to achieve the design criteria shown on the Plans and specified herein. The PM block wall design shall follow the general dimensions of the wall envelope shown in the Contract plans.

Prefabricated modular (PM) block gravity retaining wall system shall be designed and constructed as specified herein. The design shall be subject to review and acceptance by the Engineer. Acceptability of the PM block gravity wall design shall be at the sole discretion of the Engineer. Any additional design, construction, or other costs arising as a result of rejection of a retaining wall design shall be borne by the Contractor.

Retaining Wall No.04 is included under this Item, Item 996.41.

Also included are the final detailing, fabrication, furnishing, transportation, and construction of precast or cast-in place concrete copings, including all associated components, as shown on the Plans.

Acceptable PM block gravity retaining wall systems are:

Redi Rock Retaining Wall™ by Michie Corporation/Capital Concrete Products
Stone Strong Retaining Wall by MBO Precast
Versa-Lok Standard Retaining Wall by VERSA-LOK of New England

Wall system requires Engineer's approval for use on the project. Alternative PM block gravity wall systems shall be an accepted equal upon approval of the Engineer.

An anti-graffiti coating shall be applied to all exposed concrete surfaces of the retaining walls that are abutting traffic.

Value engineering is not applicable to the work of this Item.

ITEM 996.41 (Continued)

QUALITY ASSURANCE

Quality Assurance shall conform to the requirements of all relevant Sections of the Standard Specifications and Supplemental Specifications and the following.

Fabricator Quality Control

Precast concrete requirements regarding the precast concrete Fabricator's Quality Control (QC), the fabrication plant, personnel, laboratory, testing equipment, inspection, temperature monitoring of the concrete, sampling and testing of concrete, certificate of compliance, and QC documentation shall conform to Subsection M4.02.14, Precast Concrete Highway Units of the Standard Specifications.

Contractor Quality Control

The Contractor installing the PM block retaining wall shall have a minimum of 5 years' experience constructing the chosen prefabricated block wall system and shall use personnel having demonstrated experience in the installation procedures recommended by the manufacturer and as specified herein.

A qualified representative (minimum 2 years demonstrated experience) from the wall design supplier shall be present during construction of the PM block walls. The services of the qualified representative shall be at no additional cost to the project. The Contractor shall make the necessary arrangements with the wall supplier to have the technical representative on the project. The qualified experienced technical representative will advise the Contractor and Engineer concerning proper installation procedures. The services of a qualified technical representative shall be incidental to this Item.

Quality control and testing shall comply with Subsection M4.02.14 of the Standard Specifications. Acceptance of a production lot will be as specified in Subsection M4.02.14 Precast Concrete Highway Units of the Standard Specifications.

Acceptance

Final Acceptance for the prefabricated modular wall system shall be determined by MassDOT.

MassDOT will perform Acceptance inspection and sampling and testing in accordance with Subsection M4.02.14 of the Standard Specifications.

Precast modular block wall units for PM block walls shall be manufactured in a concrete products plant with MassDOT approved facilities.

ITEM 996.41 (Continued)

MATERIALS

All materials used in the construction of the prefabricated block retaining walls shall meet the relevant requirements as specified in Division III, Materials Specifications of the MassDOT Standard and Supplemental Specifications, and as specified herein.

Materials not conforming to requirements of the referenced specifications or from sources not listed in the Contract Documents shall not be used without written consent from the Engineer.

The PM block wall units shall be fabricated in accordance with Subsection M4.02.01 Precast Concrete Highway Units and Subsection 901 of the Standard Specifications with the following exceptions and additions:

All PM block wall units shall be wet-cast units conforming to ASTM C1776.

The PM wall units shall be manufactured of 5,000 psi, ¾ inch, 705, air-entrained cement concrete, from a MassDOT approved precaster.

Finishing, Protection, and Curing of Precast Concrete

Unless otherwise indicated on the plans, the concrete surfaces shall be finished in accordance to relevant requirements of Subsection 901 of the Standard and Supplemental Specification and as modified herein.

The blocks shall be cast on a flat area. Each block shall be cast as a unit. No horizontal joints are permitted in a block.

Steel Reinforcement

Steel Reinforcement for PM wall units shall be furnished in accordance with the relevant requirements of Section M8 of the Standard and Supplemental Specifications.

Shear Keys

Precast shear keys shall be made of the same concrete mix as the prefabricated modular units and cured in the same manner. The shear keys are to be designed and detailed by the prefabricated wall manufacturer.

Backfill

All backfill materials used for PM block walls shall be gravel borrow and shall conform to Subsection 150 of the Standard Specifications. Backfill material used in PM block walls shall also meet the quality of material and gradation requirements of the PM block manufacturer.

ITEM 996.41 (Continued)

Additional backfill requirements:

A. Soundness: The material shall be substantially free of shale or other soft, poor durability particles. The materials shall have a magnesium sulfate soundness loss, as determined by AASHTO T104 (ASTM C88), of less than 30 percent after four cycles.

Limits of backfill included under this Item shall be from the back face of the blocks to a vertical plane 12 inches beyond the rear most edge of the PM block walls. See Plans for diagrammatic details of the payment limits.

Anti-Graffiti Coating

For retaining walls that are abutting traffic, two coats of anti-graffiti coating shall be applied by airless spray, brush, or roller to all exposed concrete surfaces of the prefabricated retaining walls. The Contractor may not proceed with any production coating operations until the samples and mock- ups are approved. All manufacturer's recommendations and procedures shall be strictly adhered to. Approved manufacturer's authorized representatives shall provide additional job site training in the proper mixing and application procedures of the anti-graffiti coating. The cost for sufficient involvement of the authorized representatives shall be considered incidental to this Item. All State, Federal and local safety and environmental protection requirements shall be strictly adhered to.

The anti-graffiti coating shall be a clear, non-yellowing, chemical and scratch resistant, fast curing, water-based, one-component silicone elastomer specifically formulated to protect surfaces subject to repeated graffiti attacks. It shall have no effect on the color of the concrete.

Subdrain

Walls shall be constructed with subsurface drainage measures as shown on the project plans and as specified herein. A subdrain system, at the back of the wall, shall be provided to collect and remove surface and subsurface water away from the embankment and backfill toward the outside limits of the wall. Open-graded gravel drains with a geotextile, geocomposite drains, and blanket drains can be used, in conformance with MassDOT requirements.

Leveling Pad

The leveling pad shall be constructed of 3,000 psi, ¾-inch, 425-pound cement concrete approved mix as specified in Section M4 of the standard Specifications, or other foundation material as approved by the Engineer.

The Contractor may substitute crushed stone, the crushed stone shall meet the gradation requirements in Section M2 of the Standard Specifications for crushed stone for bridge foundations.

Leveling pad shall have minimum dimensions and limits as shown on the Plans and be placed at the design elevation shown on the Plans within a 1/8-inch tolerance.

ITEM 996.41 (Continued)

Crushed Stone for Drainage Layer

Crushed stone for use in the drainage layer above the Impervious Membrane shall be 1/2 inch crushed stone conforming to the requirements of Subsection M2.01.5 of the Standard Specifications.

Wall Coping

Precast cement concrete wall copings shall be furnished and constructed in accordance with Standard Specification Section 901. Copings shall be constructed of the following standard MassDOT cement concrete mixes:

Structural Component	Cement Concrete Mix
Precast Coping	4000, ¾ IN, 610

All steel reinforcing shall be epoxy coated and shall conform to the requirements of AASHTO M31 Grade 60.

ACCEPTANCE OF MATERIALS

The Contractor shall furnish to the Engineer a Certificate of Compliance certifying that the above materials comply with the applicable Contract specifications. A copy of all test results performed by the Contractor necessary to assure Contract compliance shall also be furnished to the Engineer. Acceptance will be based on the Certificate of Compliance, accompanying test reports, and visual inspection by the Engineer.

DESIGN REQUIREMENTS

The PM block gravity wall system shall be designed to provide a prefabricated modular block retaining wall system that acts as a gravity wall without the need for external reinforcing straps, grids, mesh, tiebacks, deadmen, etc. behind the wall system to provide external stability that would conflict with existing and proposed utilities and drainage structures, including future maintenance and repair of utilities. Prefabricated modular block gravity wall systems that provide stability within the wall envelope limits as shown on the Plans are permitted.

Design Specifications

The PM block retaining walls shall be designed to provide the grade separation shown on the Plans with a service life of not less than 75 years.

ITEM 996.41 (Continued)

All calculations and Shop Drawings shall be signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts and experienced in prefabricated modular block retaining wall design and construction.

The PM block gravity wall system shall be designed in accordance with:

1. The manufacturer's requirements.
2. The Contract Plans.
3. The requirements as specified herein.
4. AASHTO LRFD Bridge Design Specification, current edition. Herein referenced as AASHTO LRFD.
5. AASHTO LRFD Bridge Construction Specifications, current edition.

Where conflicting requirements occur, the more stringent shall govern. Design shall consider Service, Strength, and Extreme Limit- States, and external and internal stability.

The PM block wall shall be dimensioned so that the maximum bearing pressure does not exceed the factored bearing resistance of the foundation soils, as noted on the Plans. The factored bearing pressure stated assumes a uniform pressure distribution.

The PM block walls shall be designed to account for drainage required for walls below established groundwater levels and seasonal levels.

The prefabricated block retaining wall design shall follow the general dimensions of the wall envelopes shown on the Plans. Top of leveling pad or footing elevations shall be as shown on the Plans, or may be lower. All wall elements shall be within the right-of-way limits shown on the Plans. The PM block wall units shall be placed so as not to interfere with guardrail posts, drainage or other utilities, or other potential obstructions.

All appurtenances behind, in front of, over (such as coping), under, mounted upon or passing through the wall (such as drainage structures), or other appurtenances shown on the Plans shall be accounted for in the stability design of the prefabricated block retaining wall system.

The PM block retaining wall system shall be supported on cast-in-place unreinforced concrete leveling pad, or other foundation materials as approved by the Engineer. The top of the leveling pad shall be located at or below the theoretical leveling pad elevation. The minimum wall embedment shall be 4.0 feet as measured to the top of the leveling pad, or as shown on the Plans, whichever is greater. The leveling pads are incidental to this Item.

If steps at the bottom of the wall are required, they shall be kept at or below the footing elevation shown on the Contract Drawings. Steps in addition to those shown on the Contract Drawings will be permitted at no additional cost to the Department.

ITEM 996.41 (Continued)

If additional soils information is required by the Contractor's wall designer, it must be obtained by the Contractor and will not be reimbursed by the Department.

Required geometry and reinforcing of coping has been provided on the Plans. Final design of copings and detailing of all components shall be completed by the Manufacturer, in accordance with the following standards:

1) 2013 Massachusetts Department of Transportation Bridge Manual
2) 2014 American Association of State Highway and Transportation Officials LRFD Bridge Design Specifications, current edition.

PRE-CONSTRUCTION SUBMITTALS

Design computations demonstrating compliance with the criteria specified herein and shown on the Plans shall be prepared, signed, and stamped by a registered professional engineer licensed in the Commonwealth of Massachusetts and with a minimum of 5 years of experience in the design and construction of prefabricated retaining walls.

A. The design calculations shall include:

1. Statement of all assumptions made, and copies of all references used in the calculations. Calculations shall be performed in English units.

2. Analyses demonstrating compliance with all applicable earth, water, surcharges, seismic, or other applicable loads, as specified herein and required by the reference AASHTO LRFD. The design calculations shall include all applicable references to the LRFD code.

3. Analyses or studies demonstrating durability and corrosion resistance of the prefabricated retaining wall system for the proposed location and environment. The Contractor/Designers shall provide all corrosion protection devices necessary for the retaining wall to have a minimum service life of 75 years in the proposed location and environment.

4. Analyses demonstrating adequacy of design for external stability of the PM block wall system. Sliding, overturning, and bearing pressures shall be evaluated for conformance with stipulated design requirements.

5. Structural design of coping, and final detailing of coping in coordination with geometry and detailing required on Plans.

B. A detailed resume of the wall designer shall be provided, listing similar projects and demonstrating necessary experience to perform the retaining wall designs, including a brief description of each project that is similar in scope shall be provided for acceptance.

ITEM 996.41 (Continued)

A reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, address, and current phone number.

C. A detailed listing of the relevant type of PM block retaining walls that the Contractor has constructed shall be provided, including a brief description of each project and a listing of personnel who will construct the walls demonstrating their experience in construction of PM retaining walls. A reference shall be included for each project listed. As a minimum, the reference shall include an individual's name, address, and current phone number.

D. Manufacturer's product data for the PM block retaining wall system shall be provided, including material, manufacture and erection specifications, all specified erection equipment, details of buried wall elements, structures design properties, type of backfill, and details for connections between wall units.

E. Concrete mix design shall be in accordance with Section M4 of the Standard Specifications.

F. Provide Shop Drawings showing the configuration and all details, dimensions, quantities, and cross-sections necessary to construct the prefabricated block retaining walls, including but not limited to the following:

1. A plan view of the wall, which shall include contract limits, stations and offsets, and the face of wall line as shown on the Plans.

2. An elevation view of the wall, which shall include the elevation at the top of the wall at all horizontal and vertical break points and at least every 25-feet along the face of the wall, all steps in the wall footings, the designation as to the type of retaining wall system, and an indication of the final ground line and maximum calculated bearing pressures. The theoretical face of wall as shown on the Plans shall be indicated.

3. A typical cross section or cross sections showing the elevation relationship between existing ground conditions and proposed grades, and the proposed wall configuration. The sections shall also indicate the location of the theoretical face of wall as shown on the Plans.

4. General notes pertaining to design criteria and wall construction.

5. A listing of the summary of material quantities for each wall.

6. Details of sleeves and pipes and other embedded items to be installed through the walls, if applicable. Annular space around the pipe shall be filled and sealed with closed cell foam.

7. Clearly indicate details for construction of walls or reinforcing elements around drainage, foundations, utilities or any other potential obstructions, where applicable.

ITEM 996.41 (Continued)

8. Details of the finished surface treatment for the face of PM block wall units.

9. Drainage design detail and design scheme, where applicable.

10. Location of utilities, where applicable.

11. Sequence and schedule of construction, including overall construction schedule.

12. Methods of excavation and backfill.

13. Method of maintaining stability of excavated trenches, where applicable.

14. Method of monitoring plumbness and deviation of wall.

15. Any acceptance testing and frequency.

16. Details and location of all necessary construction and expansion joints.

17. Details of impermeable membrane connection to PM wall units and to runoff collection system.

18. Details of maintaining the stability, rigidity and alignment of the wall during construction, prior to wall construction completion, and prior to backfilling behind the top of the wall and roadway/moment slab construction at the top of the wall.

19. Groundwater elevation.

20. Layout and detail drawings for wall copings.

CONSTRUCTION METHODS – PLANT FABRICATION

Fabrication of the precast concrete wall elements shall conform to Subsection M4.02.14 of the Standard Specifications with the following additions.

All provided walls shall be from one single manufacturer. The same PM block wall system shall be used for all prefabricated modular block retaining walls on this project.

The date of manufacture, production lot number, and the piece mark shall be clearly scribed on an unexposed face of each PM wall unit.

ITEM 996.41 (Continued)

PM Block Wall Unit Fabrication Tolerances

Dimension tolerances for precast modular block units shall be ½ inch or the manufacturer's published tolerances, whichever is less. Units not meeting the specified tolerances will be rejected.

Architectural Form Liners

Exposed PM wall unit face shall be cast using custom architectural form liners. The unit face rustication shall be Ashlar Stone surface.

Form liners shall be manufactured by one of the following form liner manufacturers, or other manufacturers as approved by MassDOT:

1. Greenstreak Form Liners, by Greenstreak, St. Louis, Missouri.
2. Symons Form Liner, by Symons Corp., Des Plaines, Illinois.
3. Lithotex Formliner, by L.M. Scofield Co., Los Angeles, California.
4. Custom Rock Form Liners, by Custom Rock, St. Paul, Minnesota.

The same custom form liner must be used exclusively for all textured architectural finish surfaces on the job. Using form liners from different manufacturers together on the same job will not be permitted.

Lifting Devices and Threaded Inserts

Lifting sleeves and inserts shall be provided for the purpose of handling and placing. Care shall be taken during storage, transporting, hoisting, and handling to prevent cracking or damaging the precast units.

Repairs and replacement of PM wall units shall be in accordance with Section M4.02.14, Repairs and Replacement for Proprietary Retaining Wall Systems. Variations in the exposed face that substantially deviate from the approved architectural model unit as to color, texture, and reveal will be considered a Category 3 Rejectable Defect.

Storage and Shipping

The precast units shall be stored, shipped, and installed as specified in Section M4.02.14 Precast Concrete Highway Units of the Standard Specifications.

CONSTRUCTION METHODS

Prefabricated modular block gravity retaining walls shall be built in accordance with the Plans and accepted Shop Drawings for the proposed wall system.

ITEM 996.41 (Continued)

The PM block retaining walls shall be constructed in accordance with these specifications and in reasonably close conformance with the lines, grades, design criteria, and dimensions shown on the Plans or as established by the Engineer. The Contractor is responsible for coordination with installation of guardrail and sidewalks.

The Contractor shall be responsible for the purchase or manufacture of the concrete modular block wall units of the PM block walls, plus all other necessary components, aggregate backfills, joint fillers, geotextile fabric, bearing pads, and membranes for a complete installation.

Wall Penetrations

Utility penetrations through the PM block wall system shall be considered incidental to this Item. See Plans for details of pipe sleeves and stipulated requirements for coordination with the utility owner.

Delivery, Storage, and Handing

The Contractor shall check the material upon delivery to assure that the proper material has been received. A product certification should be provided with each shipment.

All wall materials and PM block wall units shall be stored elevated from the ground and protected to prevent all mud, wet cement, epoxy and like substances, which may affix themselves to the PM block wall units. For storage exceeding 30 days in duration, all materials shall be stored in or beneath a trailer or covered with a colored tarpaulin to prevent long-term exposure.

Wall Excavation

Earth excavations shall be in accordance with the requirements of Subsection 120 of the Standard Specifications and in close conformity to the limits shown on the Plans. Sections 120.80, 120.81, and 120.82 of the Standard Specifications do not apply to the work covered in this section. Excavation and incidentals to complete the excavation for prefabricated retaining walls shall be included in the Prefabricated Modular Block Gravity Retaining Wall Item.

Temporary Earth Support Systems

Design, installation, and removal of any temporary earth supports required for the construction of the wall shall be in accordance with the requirements of Subsection 950 of the Standard Specifications.

ITEM 996.41 (Continued)

Foundation Preparation

The foundation for prefabricated block retaining walls shall be graded level for a width equal to the width/depth of each course of wall unit plus 1-foot. Prior to wall construction, the foundation shall be compacted with at least 10 passes of an appropriate roller, weighing a minimum of 10,000 lbs. Compact the foundation area to provide a hard and level surface to support wall units. Any foundation soils found to be unsuitable shall be removed and replaced with Gravel Borrow for Bridge Foundation per Subsections 120, 140, and 170 of the Standard Specifications. The foundation for the structure shall be approved by the Engineer before erection is started.

In areas below the existing groundwater level, backfill shall consist of Crushed Stone for Bridge Foundations as per Subsection 150 of the Standard Specifications.

Wall Erection

The precast modular block wall units shall be installed in accordance with approved manufacturer's recommendations. Special care shall be taken in setting the bottom course of units to true line and grade. While erecting each subsequent course, line and grade shall be examined and deviations shall be corrected to prevent accumulative inaccuracies in alignment. Joint filler and rubber pads shall be installed. Joints at corners or angle points shall be closed.

All wall units above the first course shall interlock with the lower courses. Vertical joints shall be staggered with each successive course or as approved on the Shop Drawings. The maximum offset in any unit horizontal joint shall be ¼ inch.

The overall tolerance of the wall (top to bottom) shall not exceed ¾ inch per 10 feet in vertical alignment and horizontal alignment.

Backfill Placement

Backfill placement for PM block walls shall follow erection of each course of modular wall units. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the modular wall units. Any wall materials, which become damaged or disturbed during backfill placement, shall be removed and replaced at the Contractor's expense. Any misalignment or distortion of the modular units due to placement of backfill outside specified limits shall be corrected.

ITEM 996.41 (Continued)

Compaction of backfill material shall adhere to the following criteria unless approved otherwise on the Shop Drawings:

A. Backfill material conforming to the requirements specified herein shall be placed and compacted simultaneously with the placement of the modular units.

B. Backfill lift shall be a maximum of 12 inches, uniform in thickness and compacted within the limits shown on the Plans. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density.

C. Placement and compaction shall be accomplished without distortion or displacement of the modular units.

D. Backfill placement shall closely follow the erection of each row of PM block units.

E. The compaction shall take place in a direction that is parallel to the wall.

F. The specified compaction of the backfill material shall be accomplished by use of large, smooth drum, vibratory rollers with the exception of the 5-foot zone directly behind the wall face of the modular units.

G. Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T 99, Method C or D (with oversize corrections as outlined in Note 7 of that test).

H. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift.

I. Within 5 feet of the wall face, small, single or double drum, hand operated, walk-behind vibratory rollers, or walk-behind vibrating plate compactors shall be used, and at least three passes shall be made.

J. When there is evidence of wall displacement or disturbance, compaction shall be accomplished by use of a smooth drum static roller.

K. At the end of each day's operation, the Contractor shall slope the last placed level of backfill away from the wall face to rapidly direct runoff of rainwater from the wall face.

The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

ITEM 996.41 (Continued)

METHOD OF MEASUREMENT

Item 996.41 will be measured for payment by the SQUARE FOOT of Prefabricated Modular Block Gravity Retaining Walls installed, complete in place. Item 996.41 will be measured by the vertical unit of square foot of retaining wall structure, according to the dimensions shown on the Plans. The vertical area of retaining wall structure is defined as the area, measured at the wall face, bounded by the top of leveling pad or footing directly under the wall, ends of wall, and top of wall.

BASIS OF PAYMENT

Item 996.41 will be paid for at the Contract unit price per SQUARE FOOT, which price shall include all design, fabrication, transportation, erection, and installation of prefabricated retaining wall, including backfill and miscellaneous items required for a complete installation, all labor, tools, equipment, materials and incidental expense required to complete this Item and accepted by the Engineer.

The unit price for Prefabricated Modular Block Gravity Retaining Wall shall include costs for:

A. All design work, preparation of written submittals and detailed construction drawings, revision of submittals, sample submittals and any other required preliminary work prior to and after acceptance of the retaining wall system by the Engineer.

B. All materials, including transportation, for the PM block retaining walls. For PM block walls this, includes concrete modular units, bearing blocks and shims, joint materials, copings, cement concrete, reinforcing steel, aggregate backfill, anti-graffiti coating, and incidentals.

C. All labor and equipment required to prepare the wall foundation; erect the retaining walls to the lines and grades shown on the Plans; install the joint materials; install wall drainage; provide and install steel pipe sleeves for utility penetrations; provide, place, and compact backfill within wall units or backfill behind the wall units; and design, detail and construct any other items required to complete the prefabricated retaining walls.

D. As required and approved by the Engineer, excavation and replacement of any unsuitable materials beyond the retaining wall payment limits shown on the Plans will be measured and paid for as defined in Subsections 120 and 150 of the Standard Specification and Items 120. and 151.

E. PM Wall Representative shall be incidental to this Item.

F. Anti- Graffiti Coating shall be incidental to this Item.

Design, installation, and removal of temporary earth supports are paid for separately under Item 950.03.

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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: Bourne

YEAR: 2025
ROAD: Route 6 (Scenic Highway)
CLASS: Urban Principal Arterial

TYPE OF PROJECT: Pavement Rehabilitation and Intersection Improvements

DATE: January 30th, 2025

Earth Excavation: 145,900 CY	Dense Graded Crushed Stone: 5,065 CY
Pavement Milling: 23,000 SY	Crushed Stone: 105 tons
Gravel Borrow: 15,100 CY	
Test Pit for Exploration: 120 CY	

PAVEMENT NOTES

PROPOSED FINE MILLING AND OVERLAY **21,835 SY**

SURFACE COURSE: 2” SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC – 12.5-P) OVER
ASPHALT EMULSION FOR TACK COAT OVER
0” (MIN) TO 8” (MAX) SUPERPAVE LEVELING COURSE - 12.5 (SLC-12.5) AS REQUIRED AND WHERE INDICATED ON TYPICAL SECTIONS OVER
ASPHALT EMULSION FOR TACK COAT OVER

FINE MILLING: 2” PAVEMENT FINE MILLING

PROPOSED FULL DEPTH HMA PAVEMENT **38,206 SY**

SURFACE COURSE: 2” SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P) OVER
ASPHALT EMULSION FOR TACK COAT OVER

INTERMEDIATE COURSE: 2” SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
ASPHALT EMULSION FOR TACK COAT OVER

BASE COURSE: 4 1/2” SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) OVER

SUBBASE: 4" DENSE GRADED CRUSHED STONE BASE FOR SUBBASE OVER 8"
GRAVEL BORROW, TYPE b

PAVEMENT NOTES (Continued)

PROPOSED HMA PAVEMENT WIDENING – LESS THAN 4 FEET	**258 SY**
SURFACE COURSE:	2” SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC -12.5-P) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	2” SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5) OVER ASPHALT EMULSION FOR TACK COAT OVER
BASE COURSE:	8" HIGH EARLY STRENGTH CEMENT CONCRETE OVER
SUBBASE:	12" GRAVEL BORROW, TYPE b

PROPOSED HMA SUP (SHARED USE PATH)	**11,047 SY**
SURFACE COURSE:	1 1/2” SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	2 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
SUBBASE COURSE:	8" GRAVEL BORROW TYPE b

PROPOSED HMA DRIVEWAY	**161 TON**
SURFACE COURSE:	1 1/2” SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER 2 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
SUBBASE COURSE:	8" GRAVEL BORROW TYPE b

PROPOSED HMA SIDEWALK	**29 TON**
SURFACE COURSE:	3” SUPERPAVE SURFACE PLACED IN TWO LAYERS: 1 1/4” SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER 1 3/4” SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER
SUBBASE COURSE:	8" GRAVEL BORROW TYPE b

PAVEMENT NOTES (Continued)

PROPOSED CEMENT CONCRETE CURB RAMPS, SIDEWALK, & MEDIAN **750 SY**

SURFACE COURSE:	4” CEMENT CONCRETE (AIR ENT. 4000 PSI, 3/4"-610 LB) OVER
FOUNDATION:	8" GRAVEL BORROW TYPE b

TEMPORARY PAVEMENT **7,259 SY**

SURFACE COURSE:	2" SUPERPAVE SURFACE COURSE 9.5 (SSC - 9.5) OVER ASPHALT EMULSION FOR TACK COAT OVER
INTERMEDIATE COURSE:	3" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0) OVER
SUBBBASE COURSE:	4” DENSE GRADED CRUSHED STONE FOR SUB-BASE OVER 8" GRAVEL BORROW TYPE b

ITEM 103. TREE REMOVED – DIAMETER UNDER 24 INCHES

For removing trees within the project limits at the following locations.
STA 108+33 LT, Offset 30'
STA 113+19 LT, Offset 40'
STA 113+24 LT, Offset 38'
STA 113+91 LT, Offset 49'
STA 114+71 LT, Offset 28' (multiple trees)
STA 115+93 LT, Offset 26'
STA 116+10 LT, Offset 27'
STA 116+22 LT, Offset 25'
STA 116+32 LT, Offset 23'
STA 116+33 LT, Offset 26'
STA 116+39 LT, Offset 19'
STA 116+44 LT, Offset 41'
STA 116+52 LT, Offset 41'

ITEM 120. EARTH EXCAVATION

This Item includes areas of cuts from cross sections. In areas of fill, existing pavement and loam must be removed prior to filling and this quantity is included here. Excavation is also included for the removed and discarded mulch.

ITEM 121. CLASS A ROCK EXCAVATION

Large boulders were observed during the subsurface exploration program and may be encountered during construction.

ITEM 160.1. CONTROLLED LOW-STRENGTH MATERIAL - MANUAL EXCAVATABLE (<= 100 PSI)

ITEM 160.2 CONTROLLED LOW-STRENGTH MATERIAL MECHANICAL EXCAVATABLE (101-300 PSI)

ITEM 160.3 CONTROLLED LOW-STRENGTH MATERIAL(>300 PSI)

Items included as contingency.

ITEM 482.5 SAWCUT ASPHALT PAVEMENT FOR BOX WIDENING

For saw cutting at limits of full depth pavement widening construction adjacent to existing HMA pavement.
STA 103+73 LT to STA 114+00 LT (Route 6)
STA 106+50 RT to STA 114+00 RT (Route 6)

ITEM 482.5 SAWCUT ASPHALT PAVEMENT FOR BOX WIDENING

For saw cutting at limits of full depth pavement widening construction adjacent to existing HMA pavement.
STA 103+73 LT to STA 114+00 LT (Route 6)
STA 106+50 RT to STA 114+00 RT (Route 6)

ITEM 580. CURB REMOVED AND RESET

To be used for the removed and reset curb along Route 6 and at intersections.
STA 200+50 to STA 200+92 LT (Nightingale Pond Rd)
STA 200+81 to STA 200+94 RT (Nightingale Pond Rd)
STA 104+11 to STA 104+27 LT (Route 6)
STA 168+02 to STA 176+47 RT (Route 6)
STA 173+97 to STA 178+47 LT (Route 6 Median)
STA 173+97 to STA 178+47 RT (Route 6 Median)

ITEM 583. EDGING REMOVED AND RESET

STA 166+13 to STA 167+97 LT (Route 6)
STA 166+13 to STA 167+97 RT (Route 6)

ITEM 630.2 HIGHWAY GUARD REMOVED AND DISCARDED

STA 108+43 to STA 111+00 LT (Route 6)
STA 112+89 to STA 135+10 RT (Route 6)
STA 115+19 to STA 115+52 LT (Route 6)
STA 115+59 to STA 118+88 LT (Route 6)
STA 128+47 to STA 130+66 LT (Route 6)
STA 135+13 to STA 174+38 LT (Route 6)
STA 145+03 to STA 146+79 LT (Route 6)
STA 162+56 to STA 178+18 LT (Route 6)
STA 174+45 to STA 180+36 RT (Route 6)

ITEM 655.3 WOOD RAIL FENCE

STA 116+26 to STA 123+31 RT (Route 6)
STA 126+54 to STA 130+15 RT (Route 6)
STA 135+18 to STA 140+50 RT (Route 6)
STA 154+68 to STA 160+00 RT (Route 6)
STA 162+50 to STA 170+52 RT (Route 6)
STA 170+79 to STA 171+78 RT (Route 6)
STA 171+88 to STA 172+05 RT (Route 6)
STA 172+32 to STA 174+27 RT (Route 6)
STA 174+56 to STA 178+07 RT (Route 6)

ITEM 665. CHAIN LINK FENCE REMOVED AND STACKED

STA 109+95 to STA 110+46 RT (Route 6)
STA 111+69 to STA 113+60 LT (Route 6)

ITEM 767.121 SEDIMENT CONTROL BARRIER

For sediment control barrier proposed at the toe of slope as shown on the plans.
STA 102+16 to STA 113+13 RT (Route 6)
STA 103+65 to STA 108+06 LT (Route 6)
STA 103+66 to STA 110+77 RT (Route 6)
STA 108+38 to STA 111+51 LT (Route 6)
STA 114+23 to STA 168+18 RT (Route 6)
STA 121+72 to STA 122+25 LT (Route 6)
STA 122+31 to STA 123+09 LT (Route 6)
STA 128+87 to STA 132+99 LT (Route 6)
STA 144+92 to STA 146+24 RT (Route 6)

For mid-slope sediment control barrier:
STA 108+28 to STA 110+40 LT (Route 6)
STA 108+88 to STA 109+86 LT (Route 6)
STA 134+18 to STA 136+23 LT (Route 6)
STA 136+16 to STA 144+53 LT (Route 6)
STA 140+27 to STA 143+66 LT (Route 6)
STA 146+16 to STA 151+06 LT (Route 6)
STA 147+56 to STA 155+04 LT (Route 6)
STA 149+51 to STA 158+87 LT (Route 6)
STA 153+65 to STA 157+24 LT (Route 6)
STA 159+02 to STA 160+90 LT (Route 6)

ITEM 769. PAVEMENT MILLING MULCH UNDER GUARDRAIL

Contingency for installation under proposed guardrail tangent ends/trailing ends.

ITEM 901. 4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE

Item included as contingency.

DOCUMENT A00808

PROJECT UTILITY COORDINATION FORM

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Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

1/2/2025
Revision Date:

City/Town:	Project File #:	PUC Completed by:	Utility Pole Set:	
Bourne	606082	MD/CJL	Verizon	
Route/Street:	**Resident Engineer:**	**Mass DOT PM:**	**Scheduled Ad Date:**	**Total Poles Relocated:**
Route 6 (Scenic Highway)		Muazzez Reardon	3/29/2025	16

1/2/2025
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Consultant:	Contact:	Office #	Cell #	Email
HNTB	Brett Fiocchi	(774) 454-9566		bfiocchi@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 Electric	Ned Sadowski	(508) 441-5832		ned.sadowski@eversource.com	x		x				x		x	x	x
Verizon	Karen Mealey	(774) 409-3160		karen.m.mealey@verizon.com	x		x				x		x	x	x
Comcast	Wendy Brown	(978) 848-5163		Wendy_Brown@comcast.com	x		x				x		x	x	x
Open Cape	Gary Farrenkopf		(508) 525-5903	gary@opencape.org	x		x				x		x	x	x
Town of Bourne DPW	Matt Sawicki	(508) 759-0600		msawicki@townofbourne.com	x		x		Town of Bourne owns and maintains existing utility pole mounted street lights.		x		x		x
National Grid Gas	Melissa Owens	(781) 907-2845		Melissa.Owens@nationalgrid.com		x	x		Per email received 09/26/2024, NGrid Gas will not be submitting a force account.		x		x	x	
Enbridge Gas	Kathleen Aruda	(508) 938-7728		kathleen.aruda@enbridge.com		x	x		No conflicts per email received 12/05/2024. However, Enbridge will require advance notification prior to start of work to schedule standby staff.		x		x	x	

Utility Relocation Notes for MassDOT Contractor

Unless otherwise noted by Contract, the MassDOT Contractor is to provide the District Construction Office with 7 Calendar Days advance notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (for DBB Contracts) and/or Section 9 (of DB Contracts). Note: The durations included below do not include these lead-times. See Additional 'Important Basis notes for Contractor' - on last PUC Form page.

Additional notes:

Suggested Sequence of Relocation (Based on Consultant proposed construction staging)

The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the utilities listed below along with the designer and the Town of Bourne. 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

1/2/2025
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massDOT Massachusetts Department of Transportation Highway Division

	RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
	C = Contractor	U = Utility Co.			Exclusive Utility on site: 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	Contractor Concurrent: Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
	C		>Contractor to notify Utilities 30 days prior to starting work. >Contractor to perform clearing & grubbing, tree trimming, required slope work, and individual tree removal as necessary. >Contractor to construct retaining walls on the south side of Scenic Highway as necessary to enable the installation of the proposed telephone duct bank system. >Contractor to place new ducts and structures for Eversource Electric, Verizon, Comcast, and Open Cape.							
			UTILITY OPERATIONS - Aerial & Underground							
Task: 1			***Verizon***							
		U	Verizon - Verizon CWI to intercept existing duct banks, place (4) split bottom mhs, rebuild 8 mhs, and stub out to MassDOT GC placed ducts	67	x			x		
		U	Verizon - Verizon CWI to inspect MassDOT GC placed ducts & manholes	10	x			x		
		U	Verizon - Verizon Line to place new copper cables in ducts	24	x			x		
		U	Verizon - Verizon Line to place new fiber cable in ducts	75	x			x		
		U	Verizon - Verizon Line to place new poles & anchors	17	x			x		
		U	Verizon - Verizon Splice to join all new copper cable placed and trim off old	55	x			x		
		U	Verizon - Verizon Splice to join all new fiber cable placed and trim off old	38	x			x		
		U	Verizon - Verizon Line old copper & fiber cabling	48	x			x		
			Sub-Total	**334**						
Task: 2			***Eversource Electric***							
		U	Eversource Electric - Eversource to install ten sections of 3-477 AL, 15/25 kW and reconductor secondary main / neutral with 3x4/0 AL Triplex, one set of 3-4/0 AL single phase secondary cables, one set of 3-4/0 AL single phase secondary cables from pole to handhole, 19 sections of 3-750 FS, 25 kV rated primary cables via several pull-boxes, four sections of 1-1/0 AL, single phase, 25 kV rated primary cables and several sections of 3-1/0 AL, 25 kV rated, primary cables and fuses.	73	x			x		
		U	Eversource Electric - Eversource to install two 25 kV, 50 kVA, Code 140 single phase transformer and reconnect to existing secondaries, and two 25 kVA, Code 223, 25 kV, single phase padmount transformers.	3	x			x		
		U	Eversource Electric - Eversource to install two 25 kV G&W Viper Reclosers 923-15 and 923-30.	3	x			x		
		U	Eversource Electric - Eversource to provide and Customer to install four 25 kV, three phase 4 way Multi-Tap and two 25 kV single phase fiberglass padmount and make elbows normally open in Multi-Tap 10095/105.	2	x			x		
		U	Eversource Electric - Eversource to install 33 sections of 3-1/0 AL, 25 kV rated, primary cables from P35/32 to P35/62.25 via several manholes and Multi-Taps.	55	x			x		
		U	Eversource Electric - Eversource to install two sets of 3-1/0 AL, 25 kV rated three phase primary cables from manholes to Multi-Taps 10095/020, 10095/087, 10095/105, 10095/183 and install two sections of 1-1/0 AL, 25 kV rated single phase primary cables from Multi-Tap to padmount.	16	x			x		
		U	Eversource Electric - Eversource to remove: single phase OH Transformers on poles 35/28, 35/33, 35/47 and 35/64; sections of single-phase primary and neutral as shown once the OH has been refed from the new UG; manual loadbreak 923-5 line switch; 923-6 ASU on pole 35/68 Scenic Highway once new Siphon Section and Reclosers are installed; 36 sections of 3-477 AL three phase wire along with existing secondary main / neutral; and cut service over to feeds / services.	3	x			x		
			Sub-Total	**155**						
Task: 3			***Town of Bourne - DPW***							
		U	Bourne DPW - Arden Engineering Constructors to disconnect and remove streetlight fixture and arm from pole 35/25.	1	x			x		
			Sub-Total	**1**						

	RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
	C = Contractor	U = Utility Co.			Exclusive Utility on site: 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	Contractor Concurrent: Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
Task: 4			***Open Cape***							
		U	Open Cape - Frame 14 Poles with new hardware.	1	x			x		
		U	Open Cape - Pull-in Aerial Fiber Cable. 1,438' Build Slack Locations.	1	x			x		
		U	Open Cape - Pull-in UP Cable. 6,570' Build Slack Locations.	2	x			x		
		U	Open Cape - Trim-out working fiber cable. Migrate slack, Set-up Splice Locations.	1	x			x		
		U	Open Cape - Splice New Fiber Cable 4 Locations +-.	1	x			x		
		U	Open Cape - Wreck-out 7,322' of decommissioned Fiber Cable (junk).	1	x			x		
		U	Open Cape - Strip Hardware from 39 poles (junk).	1	x			x		
			Sub-Total	**8**						
Task: 5			***Comcast***							
		U	Comcast - Pull New Fibers along new Aerial / Underground path way.	5	x			x		
		U	Comcast - Lash any aerial fiber.	3	x			x		
		U	Comcast - Final clean up.	2	x			x		
		U	Comcast - Set up Splice locations on either side of the work Zone.	4	x			x		
		U	Comcast - Night Cutovers (2) to swap over to the new cables.	2	x			x		
		U	Comcast - Wreck out Aerial Fiber.	5	x			x		
			Sub-Total	**21**						
Task: 6			***Verizon***							
		U	Verizon - Verizon Line to remove 55 poles, anchors & guys,	23	x			x		
			Sub-Total	**23**						
			UTILITY OPERATIONS - Underground							
Task: 7			***National Grid Gas***							
		U	**NGrid Gas - ADJ gas gates.	2	x			x		
			Sub-Total	**2**						

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-March. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-March. The Contractor shall (and the CTD plan) reflect this calendar restriction within the schedule (unless otherwise note).
5	Access - Unless otherwise noted in the Contract, and in addition to the 'enabling' notes above, the Contractor must provide safe and unimpeded access (for trucks, lifts, cranes, etc.) to the Utilities, to allow for the proposed relocation(s) - including but not limited to snow removal, clearing and grubbing, guard rail removal, barrier removal, tree removal, and grading.
6	For all MassDOT construction contracts issued after January 2014, the new Utility Coordination/documentation specification is required. This is Section 8.14 in Design-Bid-Build Contracts (see Design-Build index reference for applicable section #).
7	Prior to starting any and all enabling work for Utilities, the Contractor is to plan in advance with submittals and approved durations.
8	* Potential District Initiated Early Utility Relocation - if noted herein, the District reserves the right to initiate early utility relocation in advance of the Contract NTP. In submitting a bid price and in the development/basis of the Baseline Schedule, the Contractor shall not plan the Work with the potential benefit of any form of 'early utility relocation.' As a requirement of the Baseline submission, unless otherwise noted in this Specification, the earliest that the first Utility company is to receive the 30 days advance notification to mobilize to the site, will be 7 calendar days after the pre-construction meeting and never sooner than 7 days after the Contract NTP.
9	** Assumed Duration, Not Provided By Utility Company.

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DOCUMENT A00810

MassDOT Herbicide Use Report

Proposal No. 606082-129855

MassDOT Herbicide Use Report

Date Submitted:

Use multiple sheets for multiple application techniques or sites as needed.

Contractor Performing Work:

Project or Contract No:

Town/s:

Associated Route:

Project Description:

MDAR ALERT*:

Treatment Description:

Area Treated (as applicable)

Acres: **Sq Yds:** **Miles:**

Weeds Targeted:

Gallons Formula Used:

Application Method:

Date/Time Began:

Date/Time End:

Product Used:

Name: _____	Name: _____	Name: _____
EPA Reg. No: _____	EPA Reg. No: _____	EPA Reg. No: _____
% Active Ingredient	% Active Ingredient	% Active Ingredient
Dry: _____	Dry: _____	Dry: _____
Liquid: _____	Liquid: _____	Liquid: _____
Formulation (dilution rate): _____	Formulation (dilution rate): _____	Formulation (dilution rate): _____

Additional products used (surfactants, etc.) or other information:

Applicators: **License Numbers:**

* Please note:
EDRR Species (MAM, Hogweed, Pepperweed, Kudzu, etc.)
Tree of Heaven 1) stands of >20 trees; 2) >5 trees near nursery, landscape company, or highway rest area where trucks stop

Upon completion, please submit form to MassDOT District Engineer and Landscape Design Section in Boston office.

07/18/2018

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)

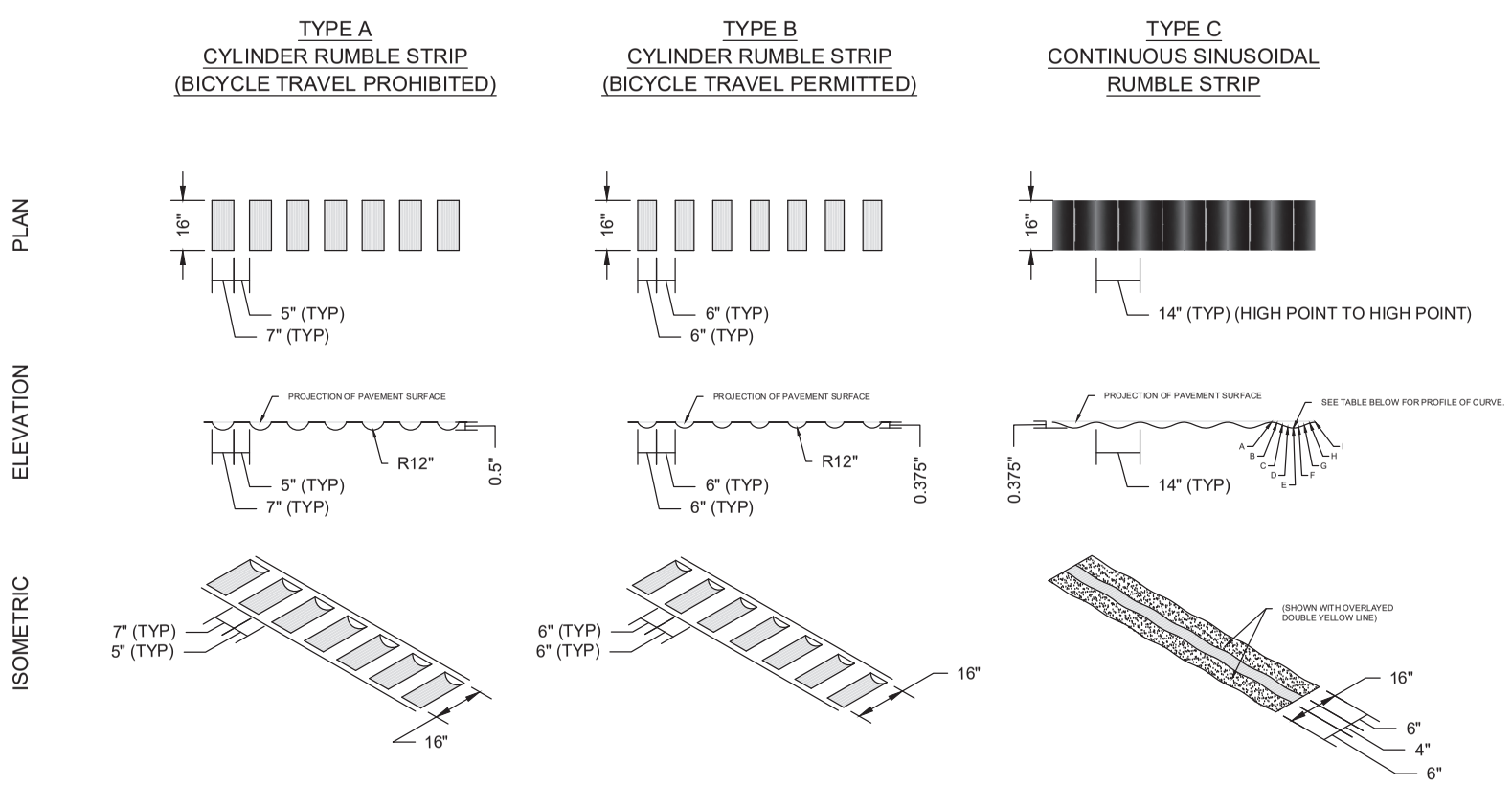
Notes:

	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 A00816

RUMBLE STRIP DETAILS



NOTES:

1. NOT TO SCALE. SOME LINE WORK EXAGGERATED FOR CLARITY.
2. SEE PLANS FOR LOCATION(S) AND START AND END STATIONS FOR ALL RUMBLE STRIP INSTALLATIONS.
3. HIGH POINT OF SINUSOIDAL RUMBLE STRIP LOCATED $\frac{1}{16}$" BELOW PAVEMENT SURFACE.

DESIGN OF CURVE PROFILE FOR SINUSOIDAL RUMBLE STRIP									
POINT	A	B	C	D	E	F	G	H	I
DEPTH FROM PAVEMENT SURFACE (IN.)	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{7}{32}$	$\frac{11}{32}$	$\frac{3}{8}$	$\frac{11}{32}$	$\frac{7}{32}$	$\frac{1}{8}$	$\frac{1}{16}$
DISTANCE FROM HIGH POINT "A" (IN.)	0	1.75	3.5	5.25	7	8.75	10.5	12.25	14

massDOT Massachusetts Department of Transportation Highway Division

TRAFFIC & SAFETY STANDARDS
SECTION 860

RUMBLE STRIP DETAILS

DATE OF ISSUE: 2020

DRAWING NUMBER: XXX.X.X

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: BOURNE Project File Number: 606082

Contract Number: 129855

Project Description: Median Installation on Route 6 (Scenic Highway)

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 A00821

NATIONALGRID GENERAL GUIDELINES

FOR WORKING AROUND GAS UTILITIES

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General Guidelines for Working Around Gas Utilities

Notice: National Grid requests the opportunity to review design plans and construction projects prior initiation. This document intends to provide minimum guidelines to consider when planning construction, and does not remove the need to coordinate with National Grid. Additional measures may be required to maintain the integrity of all gas pipeline and ancillary items to ensure the safety of the general public and personnel on site. National Grid should be contacted and involved as early as possible to prevent delays or undue costs during construction.

NGRID Contacts:
Gas Leaks & Emergencies - 800-233-5325
Damage Prevention – Arnold Larson – (781) 399-1326
NGRID I&R – Paul Whelan – (617) 910-8034

Dig Safe and General construction
Contractor must call Dig Safe to have the gas mains and services marked out before construction.

Contractor shall dig test pits to ascertain the exact locations, cover and invert elevations, clearances, and alignment of existing gas facilities as needed. Contractor shall exercise extreme caution when excavating in the vicinity of any gas facility. Hand excavation shall be performed to locate all gas facilities and whenever digging within 24" of gas facilities. If cover over gas piping is removed the required cover must be replaced.

Notification of Construction
National Grid requires a minimum 4-month's advanced notification prior to the start of construction to allow for the review of 3rd party design plans, the design of required gas distribution main replacement and/or upgrades in coordination with 3rd party construction, and time to line up the required resources to start standard gas projects. Depending on the classification and complexity of the gas infrastructure in question, lead times for the design of gas facilities in conflict may increase. Where non-stock material is required, National Grid cannot guarantee the procurement within a given duration. National Grid's ability to start construction will be contingent on obtaining the required permit approval from municipalities, state, and federal agencies alike.

Please also note that the safety and reliability of our gas system takes precedence. National Grid will review projects on a case-by-case basis, however standard practice is to restrict live gas work during the normal heating season of November 15th through April 15th.

Types of Gas Facilities
Gas mains and services are made of several different materials and contain a wide range of pressures. Typical materials used for buried gas pipe includes bare steel, coated steel, plastic, cast iron, wrought iron, ductile iron, and copper. Never assume that a pipe is not gas. At times gas lines are inserted into older lines to save excavation cost. Contact National Grid damage prevention if there are questions around any pipe being a live gas facility.

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Exposure of Gas Facilities

If any gas mains or services become exposed, National Grid must be notified to inspect the line before backfilling. Also any damage that may have been made to the pipe or pipe coating will need to be repaired by National Grid before backfilling. See Language for Backfill and Compaction around Gas Pipes, below.

Support In Place

Care must be exercised when saw cutting over any gas infrastructure, the exact depth of gas mains and services vary. Undermined gas pipe must be adequately supported and protected from damage. Steel and plastic gas facilities may be supported in accordance with standard CNST-6045. Please contact National Grid prior to exposing and supporting any natural gas pipe or facility. **See appendix 1**

Cast Iron gas main requires special attention, plans should be reviewed by National Grid prior to excavation and supporting in place. Refer to Encroachments section below for additional information.

Encroachments

Massachusetts state law requires the replacement of encroached gas pipe per DPU ruling: 220 CMR 113, National Grid treats encroachments as an emergency. Cast iron gas pipe 8" in diameter and smaller may need to be replaced with steel or plastic pipe prior to construction to prevent encroachments from occurring. Where crossing existing cast iron facilities, the use of smaller buckets and hand tools is recommended to limit trench openings to 36" in width. This will greatly reduce the number of encroachments requiring replacement and repair.

Cast iron gas pipe larger than 8" in diameter are not covered under the encroachment guidelines and cannot be encroached by law. However, National Grid does not allow more than 10 linear feet of large diameter cast iron gas main or more than (1) bell and spigot joint to be exposed and supported at a time, whichever is more restrictive.

Protection of Exposed Pipe

Hand excavation or vacuum excavation shall be used when exposing gas pipe or in the close vicinity of gas pipe. If a gas facility becomes exposed, contact National Grid for review and analyses prior to backfilling.

Where gas facilities are exposed, the pipe must be protected from damage. The use of tools or equipment directly on or near our pipe, as well as any construction activity that could move or damage our pipeline or pipe coating, will not be permitted by National Grid. If a gas facility becomes exposed, the use of construction blankets, plywood, rock shielding, fiberglass reinforcement protection wraps, or other means must be used to protect the gas pipe coating from debris and damage. Small nicks, holes, and discontinuation in the pipe wall/pipe coating can become a weak spot that hastens corrosion and could lead to premature failure.

Vibration

Low levels of vibration must be maintained when working around gas facilities. If activities may impose increased levels of vibrations on our gas pipe, contact National Grid for review. Construction activities may include, but are not

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limited to pile driving, ledge removal and blasting, certain methods of soil compaction, micro-tunneling, jacking, directional drilling, etc.

Blasting

National Grid must be notified of any blasting that will take place within 200 feet of a gas utility. National Grid must be supplied with a detailed blast plan for blasting in the vicinity of gas facilities. The evaluation of the blast plan by a National Grid engineer may take some time, therefore, blast plan data should be submitted at least two weeks prior to the planned blasting. As a general rule, blasting will not be permitted within 10 feet of a gas line and PPV at the nearest gas pipe shall not exceed 2 in/sec without approval from National Grid. PPV at the nearest gas main shall be monitored.

Clearances

Except under special applications which may require greater clearances (steam lines, high voltage cables, etc.), underground structures and utilities installed parallel to National Grid's gas facilities must maintain a minimum of three (3) feet separation.

Except under special applications which may require greater clearances (steam lines, high voltage cables, etc.), underground structures and utilities must be installed with a minimum separation of twelve (12) inches from National Grid's gas facilities.

Contact National Grid engineer for guidance if the above separations cannot be maintained.

Regulator Station – [Rt 6 @ Nightingale Pond Rd] **– contact NGRID I&R and Damage Prevention prior to construction**
Gas regulator stations are **critical** facilities and National Grid must be contacted prior to the commencement of work within 200 feet of a station. Regulator stations are typically in buried vaults accessed through either manhole covers or aluminum doors. Only authorized National Grid employees shall open a regulator station vault. Be aware that a complex nest of piping and valves often exists in the vicinity outside the vaults.

Valves - NEVER OPERATE A GAS VALVE. ONLY NATIONAL GRID SHALL OPERATE GAS VALVES.
Access to gas valves must be maintained throughout construction and left at grade at the end of construction. Contact Gate Valve Adjustment/Damage Prevention prior to restoration to coordinate the adjustment of road boxes. Grade adjustments overtop transmission pipeline should be coordinated with National Grid engineering prior to construction. The adjustment of road boxes, manholes, or vaults that house valves/purges/blowoffs/etc. on transmission pipeline may require design work and the procurement of non-stock items with long lead times.

Valve boxes and covers associated with retired main may be removed or abandoned by removing their covers and filling with compacted soil after confirming with a national grid representative.

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Pipeline Markers:

Pipeline markers and above ground signage indicating the presence of high pressure transmission pipeline **must remain in place at all times**. If the location of existing markers need to be relocated for any reason, contact National Grid Damage Prevention prior to removal.

Excavations Involving Transmission Pipelines

If the proposed construction is within close proximity of high pressure transmission gas main, contact National Grid's Damage Prevention Department for specific requirements. It is recommended that:

- A National Grid representative is on site continuously during any excavation/subsurface work within 15 feet of a transmission facility.
- When working within 15' of the outside perimeter of any transmission pipeline, hand tools and vacuum excavation must be used until the exact alignment has been verified
- When working within 15' of the outside perimeter of any transmission pipeline, verification holes should be dug using hand tools/vacuum excavation at 50 ft intervals over transmission main that runs adjacent to a proposed individual construction excavation.
- Where crossing transmission gas pipe with utilities and underground structures, test holes must be dug at the crossing to confirm the depth, invert elevation, and separation.
- Once the exact alignment of transmission piping has been verified using hand tools and vacuum excavation, powered excavation may be used within 15' of the pipeline, **but no closer than the transmission pipeline Safety Zone (18" + ½ the diameter of the pipeline).**

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Guidelines for Backfill and Compaction Around Gas Pipes
Permanent Backfill and Compaction

This work shall consist of backfilling and compacting all disturbed material at and around existing gas pipes and facilities. Size of pipe, material, length of exposed pipe, location of pipe, etc. will all follow the same set of Standards and Specifications stipulated by Nationalgrid Company. If design plans call for gas pipes to be exposed and supported (sheeting methods not used), then at the time of backfill, all disturbed material below the invert of the gas pipe shall be removed and replaced with suitable roadway or trench excavation material or bedding material. The contractor will not be allowed to replace this disturbed material with the same existing material if it has now been mixed with adjacent silty subsoil (clays) and fines. Well-graded gravel and sands will be used to replace the unsuitable material when no excess suitable material is available on site. Soils with high humus or mineral content should not be used to for backfill because they can promote electrolytic or bacterial attack.

Backfilling the gas pipe should begin immediately after the work in that location is complete. The region within 6" alongside and on top of the gas pipe shall be backfilled with padding sand (free of cinders, ash, and rock). In no case shall the material used for backfilling in this region contain any stones. Backfill shall consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of not more than 8" to 12" after compaction.

Trench spoil material shall be suitable for backfilling above the padding material as long as rocks with a diameter larger than 3" are removed. The layers shall be mechanically compacted to the industry standard of 95% or until a density comparable to the unexcavated material is achieved. In some instances, flooding with water is an acceptable method of compaction but only if the back-fill material is clean, coarse, and adequate drainage is existent. The above specified backfill material is essential in order to attain the degree of compaction necessary to avoid future settlement.

Tracing Wire, if necessary, shall be installed 2” to 6” above Plastic gas pipes. Tracer wire must be installed and repaired by qualified personnel only, contact National Grid if tracer wire has been damaged during excavation.

Warning Tape shall be installed approximately 12” above the gas pipe. If warning tape is exposed during excavation, immediately stop excavation and contact National Grid for further review

A minimum of 2" temporary pavement shall be applied over the trench as soon as possible.

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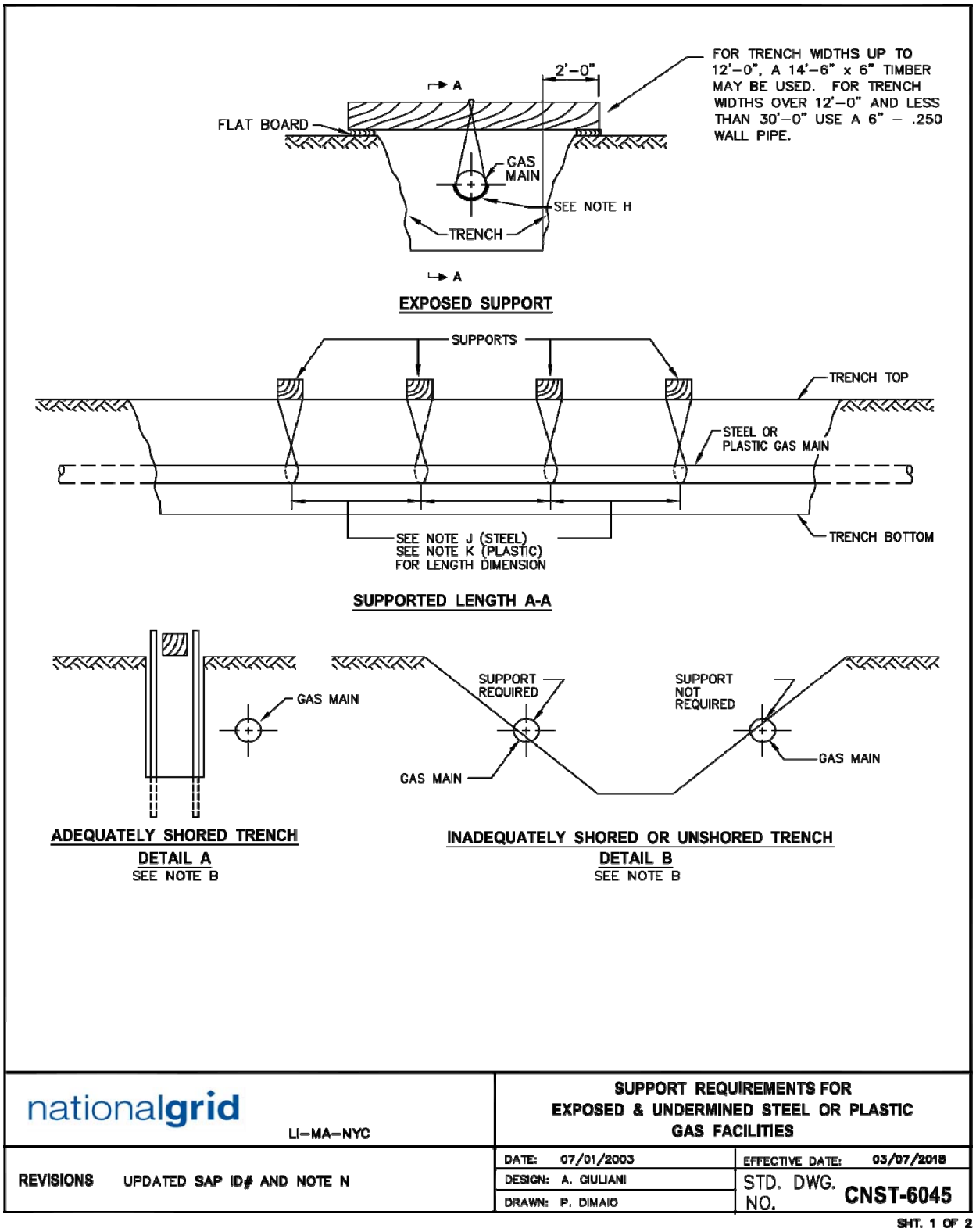
02451-1120

Appendix 1



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NOTES:

A. THIS CONSTRUCTION STANDARD SHALL BE USED TO SUPPORT PLASTIC OR STEEL GAS FACILITIES WHICH ARE UNDERMINED AND EXPOSED BY CONSTRUCTION ACTIVITY.

B. IF AN EXCAVATION IS MADE AT ANY DISTANCE PARALLEL TO THE GAS FACILITY WITH ADEQUATE OSHA STRUCTURAL SHORING,
AS SHOWN IN DETAIL "A", OR IF A STABLE SOIL CONDITION WITH SUFFICIENT COVER ABOVE THE PIPE'S CENTERLINE EXISTS,
AS SHOWN IN DETAIL "B", THEN SUPPORTS ARE NOT REQUIRED. UNSTABLE SOIL IS DEFINED AS A SOIL WHICH CAN CAUSE "SOIL RUN OUT" FROM BENEATH THE PIPE (e.g., WASHOUT, SOFT CLAY, etc.,) OR CAN SHIFT DUE TO CONSTRUCTION ACTIVITY, VIBRATIONS, etc.; AND CAUSE A SOIL SCENARIO TO OCCUR AS SHOWN IN DETAIL "B" TO REQUIRE PIPE SUPPORT.

C. IF AN EXCAVATION CROSSES OR RUNS PARALLEL TO A GAS FACILITY, SUPPORTS MAY NOT BE REQUIRED IF THE EXPOSED SECTION OF PLASTIC PIPES IS 3' OR LESS AND STEEL PIPES 7' OR LESS.

D. ALL EXCAVATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONE CALL DIG SAFE PROGRAM USING THE APPROPRIATE MARK OUT, TEST HOLES AND EXCAVATION TO AVOID DAMAGE TO PIPE OR PIPE COATINGS:
- NEW YORK STATE CODE RULE 753
- MA CHAPTER 82 - SECTION 40, GENERAL LAWS, REGULATING NOTICE REQUIREMENTS FOR EXCAVATION IN PUBLIC WAYS

E. USE OF THIS CONSTRUCTION STANDARD DOES NOT RELIEVE THE CONSTRUCTION AGENCY OR AUTHORITY OR THEIR RESPECTIVE CONTRACTORS OF RESPONSIBILITY FOR DAMAGES. ALL DAMAGES WILL BE REPAIRED IN ACCORDANCE WITH EXISTING STANDARDS AND THE APPROPRIATE PARTY SHALL BE BILLED FOR ALL EXPENSES.

F. GAS FACILITIES SHOULD NOT BE UNDERMINED WITHOUT ADEQUATE SUPPORT (DETAIL A). ALL SUPPORT LINES SHALL BE TENSIONED SO THAT NO DEFLECTION WILL OCCUR WHEN THE FACILITY IS UNDERMINED. THIS TENSION SHALL BE CHECKED AT THE START AND END OF EACH DAY AND ADJUSTED AS NECESSARY.

G. WHERE A COUPLING, GAS SERVICE, CLAMP, VALVE, DRIP LINE OR OTHER APPURTENANCE EXISTS ON THE EXPOSED SECTION OF MAIN, AN ADDITIONAL SUPPORT SHALL BE INSTALLED AT THE LOCATION.

H. WHEN SUPPORTING AN EXPOSED FACILITY, THE PIPE COATING SHALL BE PROTECTED WITH ROCK SHIELD (ITEM ID 9340226),
OR OTHER LIKE MATERIAL CUT TO A MINIMUM WIDTH OF ½ THE SUPPORTED PIPE DIAMETER. SUPPORT LINES SHALL BE A MINIMUM OF ¾" POLYPROPYLENE OR BETTER. FRP SHEILDS MAY ALSO BE USED FOR THIS PURPOSE PROVIDED THEY EXTEND A MINIMUM OF ½ WAY UP THE PIPE TO PROTECT FROM SIDE LOADING.

I. SUPPORTS FOR GAS TRANSMISSION FACILITIES SHALL BE REVIEWED WITH GAS ENGINEERING PRIOR TO INSTALLATION.

J. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR STEEL FACILITIES SHALL BE AS FOLLOWS: 7' SPACING FOR ¾" AND 1 ¼" STEEL

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10’ SPACING FOR 2” STEEL
15’ SPACING FOR 3” AND 4” STEEL
20’ SPACING FOR 6” AND LARGER STEEL

K. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR PLASTIC FACILITIES SHALL BE AS FOLLOWS :
3 ‘ SPACING FOR 2” AND SMALLER PLASTIC
6’ SPACING FOR 4” AND LARGER PLASTIC

L. VIBRATING MACHINES ARE ALLOWED OVER STEEL OR PLASTIC FACILITIES WITH 24” OR GREATER COVER. HAND HELD MECHANICAL TAMPER IS ACCEPTABLE OVER ANY FACILITY WITH 12” OR GREATER COVER.

M. WHEN CONSTRUCTION ACTIVITY IS COMPLETED, CLEAN FILL SHALL BE COMPACTED AROUND AND UNDER THE GAS FACILITY BEFORE REMOVING SUPPORTS.

N. CONTACT NATIONAL GRID FOR **REPLACEMENT** REQUIREMENTS OF CAST IRON PIPE.

DOCUMENT A00822

NSTAR ELECTRIC CONSTRUCTION STANDARD

ELECTRIC OPERATIONS ORGANIZATION

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ISSUED 24-Apr-08	CONSTRUCTION STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	C1100 Revision 0 Page 1 of 25

******This Standard Supersedes BECo 2.10-2.1, COM/Elec NEFA******

DISTRIBUTION DUCTBANK CONSTRUCTION AND MATERIALS

Table of Contents

1.0 Scope

The purpose of this standard is to provide ductbank construction details, installation requirements and material lists for concrete-encased and direct buried conduit systems.

2.0 General

2.1 All excavation, backfill and paving shall be done In accordance with this standard and all applicable local and state regulations. When conflicts exist between local/state regulations and this standard the more stringent requirement shall be adhered to unless otherwise directed by NSTAR.

2.2 Before placing concrete within ductbank forms and backfilling an NSTAR inspection is required to ensure compliance with all referenced specifications.

2.3 DIG Safe marking and notification regulations are to be understood and adhered to during all construction.

2.4 All NSTAR safety standards as well as all applicable OSHA and DOT worker safety requirements shall be adhered to at all in times. Refer to NSTAR Work Method Standard, "W1000, Entering and Working in Underground Locations including Subsurface Vaults" specific requirements.

3.0 Conduit & Fittings Specifications

All encased conduit shall be PVC conduit (Type EB) and fittings shall be schedule 40 unless otherwise specified by NSTAR. Direct buried conduit and fittings shall be schedule 40 minimum. Refer to NSTAR Material Standard "M1000, PVC Conduit & Fittings" for details.

4.0 Conduit Plan and Records/Data Requirements

4.1 All proposed electric utility pans shall be approved by NSTAR local engineering dept. before construction begins. New subdivision or commercial development plans to be submitted for local authority petitions (town approval) shall also be provided to NSTAR as AutoCAD data files. These shall show all proposed and existing utility plan view layers including electric, gas, water, sewer, drain, cable/data, telephone, and fire alarm.

4.2 The proposed electric utility plans shall include profile views that show relative elevation and clearances where proposed electric duct banks or lines intersect with non-electric utilities. Separation in any direction from electric to other utilities of 12" or less shall be detailed on the drawings.

4.3 GPS land based x-y-z coordinates shall be in NAD83 state plane feet format, with a minimum one foot accuracy. These plans shall show the road layout, curb lines, property lines (parcel boundaries), utility easements and utilities. Center coordinate positions shall be provided for all new manholes/pull boxes, equipment pads, and riser poles. Conduit location coordinates shall be provided at every 50 ft on straight sections or curves with less than 5 degree radii, and at every 20 ft for curves/sweeps over 5 degrees. GPS data for new conduit and infrastructure shall have accuracy of 6 inches or better.

4.4 Contractor shall provide NSTAR Survey and Records department (or local engineering) with as-built new facility location data in electronic file format within 20 business days of completing the project (CD or EFT). All files shall be labeled with the project title, town, NSTAR work order number and date of completion.

5.0 Application

5.1 Typically all primary and secondary distribution duct banks shall be unreinforced concrete encased using Type EB conduit. Stocked fittings are generally Schedule 40 unless otherwise specified.

5.2 If the interval between concrete pours for a continuous duct bank is expected to be more than 4 hours apart, industry standard construction joints shall be formed to ensure that the continuation of the ductbank pour shall create an interlocking joint between different pours. Refer to Figure “E” for detail.

5.3 The concrete specified for ductbanks shall be an approved 2500 psi pea stone mix using Type 2 Portland cement.

5.4 Reinforced distribution ductbanks maybe required per NSTAR for locations where ductbanks cross over other utilities and/or a future excavation could expose NSTAR ductbank without support. Reinforced ductbanks may also be required when installation is in soils that do not meet NSTAR specified backfill. For reinforced concrete ductbank standards refer to NSTAR Construction Standard, “C1101, Distribution Duct bank Construction, and (Steel Reinforced Concrete)”.

5.5 Exceptions to concrete encased ductbanks, i.e. direct buried conduit, may be allowed by NSTAR for secondary conduits installed off roadways and areas not subject to vehicle loads such as greenbelts and yards. Also when approved by NSTAR, single or double primary conduit runs in URD residential subdivisions may be direct buried as long as minimum schedule 40 conduit is used and local regulations allow it.

6.0 Excavation, Backfill and Street Restoration

6.1 Excavation

The roadway surface shall be cut in reasonably straight and parallel lines using a jackhammer, saw or other accepted method to insure the least amount of damage to the roadway surface.

Sheeting and bracing shall be required for excavations in excess of 5 feet deep in accordance with the latest OSHA Standards.

6.2 Backfill Material

A. Backfill material shall conform to "MHD M1.03.1 Process Gravel for Subbase". Backfill shall be mechanically compacted in eight inch (8") loose layers to 95% of the maximum density per ASTM D1557 unless otherwise approved by NSTAR.
B. Excavated material that has been evaluated as unsuitable for backfill shall be removed from the site and disposed of properly.
C. If directed by NSTAR only "Type IE", (Controlled Density Fill ,"CDF", or excavatable flowable fill), shall be used as backfill in certain instances, such as filling hard to reach areas where maneuvering compaction equipment would be difficult or when directed by the governing municipality.
D. Note, NSTAR approved red caution tape, marked "CAUTION ELECTRIC LINES BURIED BELOW", shall be installed 6-9 inches below surface grade, centered above the buried line or ductbank.
E. Backfilling shall not commence less than two hours after the duct bank concrete has been placed.

6.3 Street Restoration

All street paving of open excavations shall be restored using temporary or Interim pavement with two – 1-1/2 inch lifts of compacted hot mix asphalt binder (unless otherwise noted by NSTAR). Cold patch repairs when approved by NSTAR shall be cold patch NSTAR Cat ID 1628. Permanent street paving shall be by the governing municipality.

7.0 Installation

7.1 Duct Bank Forms – In general duct banks shall be constructed using forms for the sidewalls. Where suitable stable soil conditions exist the trench walls may be used to form the sidewalls. Duct bank standards shall be maintained.
7.2 Common Trench – Other utilities sharing a common trench with NSTAR ductbank shall not be enveloped within the same concrete formed encasement, but shall be separate from our encasement and a minimum clearance of 12 inches away.
7.3 Cutting Duct – Use a fine tooth wood saw to cut conduit. All ruff or abrasive edges shall be sanded smooth.
7.4 Duct Plugs – NSTAR approved duct plugs shall be installed in all open conduit. The plugs shall be installed during construction when a conduit installation is

partially complete to manhole or equipment as well as at all terminations in manholes.

7.5 Joining Duct – All conduit ends shall be cleaned by wiping off all dust, dirt and moisture from the surfaces to be cemented and brushed gently with a fine abrasive paper or cloth. Apply the approved PVC solvent cement with a non-synthetic bristle brush evenly coating the full length PVC socket of the fitting. Refer to manufacturers' instructions for additional detail.

7.6 Depth of Cover – The minimum depth of cover over a single conduit or multiple duct bank shall be 36 inches unless otherwise directed by NSTAR. In limited situations NSTAR may allow shallow depth ductbank installations less than 36 inches. Prior approval from NSTAR is required for shallow depth construction as well as the requirement to use ¼ inch thick steel plates above and adjacent to the side wall of the ductbank.

7.7 Clearance– The minimum clearance between an NSTAR conduit or ductbank and any other subsurface structure or utility (EXCEPT Steam Lines) shall be 12 inches unless otherwise approved by NSTAR. Steam lines shall maintain a 10 ft. minimum from NSTAR ductbank or lines.

7.8 Conduit Spacers – Conduit Spacers shall be of the approved type per NSTAR Material Standard, "M1000, PVC Conduit and Fittings". Spacers shall be installed at typically 5 ft. spacing (7 ft. maximum) along the ductbank. Refer to Figure "B" for conduit construction plastic spacers details.

7.9 Conduit Sweeps and Bends – Conduit heat bending is not allowed. All sweeps and bends shall be constructed using pre-fabricated approved fittings. Refer to "Table 3 – Conduit Sweeps and Angle Fittings".

7.10 Mandrel – Upon completion of the duct bank installation or direct buried ducts, a standard flexible mandrel, (not less than 12 inches long with a diameter not less than ½ inch less than the inside diameter of the duct) shall be pulled through each duct to loosen particles of earth, sand and other foreign material left in the line. A brush with stiff bristles shall then be pulled through each duct to remove the loosened particles. The diameter of the brush shall be the same as, or slightly larger than the diameter of the duct.

7.11 Building Wall Construction – When conduit or ductbank enters a structure and differential settlement is expected, construction details shall be per Figure "C".

7.12 Riser Construction – When conduit transitions from underground to above ground a galvanized steel conduit with a 36 inch radius sweep shall be used. For typical riser construction details refer to Figure "D".

7.13 All conduit shall have "mule tape" or equal, i.e. pulling tape made of woven polyester with a strength of 2500 lbs. installed within.

7.14 Transposition of Ducts – When ducts leaving one manhole/pad/equipment foundation require altering the duct bank cross section along the run, the revised configuration (and corresponding duct numbering) shall be as shown on Figure "G" unless otherwise approved by NSTAR.

8.0 Breaking into existing Manholes

8.1 Manhole breaks for new ductbank penetrations shall receive prior approval from NSTAR inspector. Contractors must be pre-qualified by NSTAR to work in or break into live manholes. Sidewall breaks are generally not allowed unless prior approval from NSTAR inspector.

8.2 All newly formed bell mouths shall be installed per Figure "F".

9.0 Compatible Unit Format for Conduit & Fittings

The Compatible Unit format for Conduit & Fittings, which are considered Non-electric Facilities, is described below:

9.1 Conduit, Banks and Riser CU Formats -unit lengths are noted in CU title:

NC (Application/Material) (Size) - (Quantity {row x height})

(Application/Material) -

D – Direct Buried (schedule 40 PVC)
E – Concrete Encased PVC (Type EB with spacers needed)
RP – Riser PVC (pipe and sweep- schedule. 40)
RS – Riser steel (pipe and sweep – galv. steel)
S – Steel Conduit
FLEX – flexible PVC, schedule 40

(Size) – Conduit inside diameter (inches)
(Quantity) – Cross section, rows x height (greater than one only, if one leave blank)

Examples: NCE4-3x3: 3x3 duct bank, 4", PVC type EB
NCRS4: 4", galvanized steel, riser pipe and sweep
NCD2: single 2" schedule 40 PVC duct, direct buried

9.2 Conduit Fitting CU Formats:

NF (Material) (Size) - (Type) – {detail below}

(Material) – P – PVC schedule 40 or DB/EB, **S** – Steel, **I** - Iron
(Size) – Conduit inside diameter in inches
(Type) - SW – Sweeps & angle fittings in degrees
(Angle)-(Radius) - For 36 in. radius bends leave blank, show all others.
R - Reducers **(A side – B side)** – in inches
CAP - Riser Caps, **PLUG** – Duct Plugs, **CPL** – Straight Couplings
RADP - Riser Adapter, **FA** – Fairleader, **BEL40** – Endbell – Sch 40,
BELEB - Endbell – EB, **SLIP** – Slip Coupling, **SPLIT** – Split Repair
PS - PVC to Steel Coupling, **GNDBUSH** – Grounding Bushing,
GNDUCONN – pipe ground connector

Examples: NFP4-SW90-24: 4", PVC, 90 degree angle sweep with 24 in radius
NFP5-SW22: 5" PVC duct, 22.5 degree sweep, 36 in radius
NFP6-CAP: 6" PVC riser cap (for spare)
NFP5-CPL: 5" PVC straight coupling
NFS4-GNDBUSH: 4" Grounding Bushing:

9.3 Conduit Accessory CU Formats:

NA (Material) - (Size option if any**)**

Material – CM - PVC cement, **MT** - marker tape, **FL**- fish line, **DX** - duxseal, **DF** - duct foam, **CP** - cold patch, **FA** – fairleader

10.0 Ductbank Compatible Units

10.1 Ductbanks shall be designed using Compatible Units (CUs). The table below references the CUs for the most commonly used ductbanks for distribution construction. Refer to NSTAR Material Standard, "M1000, PVC Conduit & Fittings" for additional information.
10.2 Refer to Figure "E" for typical ductbank construction details.
10.3 Figures 1 thru 21 noted below refer to standard cross sections on pages 19-24.

DUCTBANK COMPATIBLE UNIT REFERENCE TABLE

Note: Each single duct bank CU includes 20 ft of trenching, needed lengths of conduit, spacers, concrete, backfill & resurfacing.

FIG	4" Ducts	5" Ducts	6" Ducts
1	NCE4-2x1	NCE5-2x1	NCE6-2x1
2	NCE4-3x1	NCE5-3x1	NCE6-3x1
4	NCE4-2x2	NCE5-2x2	NCE6-2x2
5	NCE4-3x2	NCE5-3x2	NCE6-3x2
8	NCE4-4x2	NCE5-4x2	NCE6-4x2
9	NCE4-3x3	NCE5-3x3	NCE6-4x2
13	NCE4-4x3	NCE5-4x3	NCE6-4x3
21	NCE4-4x4	NCE5-4x4	NCE6-4x4

11.0 Bill of Materials and Compatible Units – Conduit, Fittings & Accessories – Tables 1- 6

Table 1 - PVC & Steel Conduit Only (not banks)					
Material	**Size (ID)**	**Wall Thickness (Type/ Sch)**	**Unit Length (Ft)**	**Catalog ID**	**Compatible Unit**
PVC – rigid	2	40	10	1197	NCD2
"	3	40	10	1198	NCD3
"	4	40	10	1195	NCD4
"	4	EB	20	1362	NCE4
"	5	40	10	1196	NCD5
"	5	EB	20	1363	NCE5
"	6	40	10	15174	NCD6
"	6	EB	20	16047	NCE6
PVC – flexible	1-1/2	40 flex	1	15968	NCFLEX1.5
"	2	40 flex	1	9480	NCFLEX2
"	2-1/2	40 flex	1	15969	NCFLEX2.5
"	3	40 flex	1	9481	NCFLEX3
"	4	40 flex	1	9482	NCFLEX4
Steel, Galv	2	40	10	9474	NCS2
"	3	40	10	1246	NCS3
Steel, Galv	4	40	10	1248	NCS4
"	5	40	10	1249	NCS5
"	6	40	10	15177	NCS6

Table 2 – Straight Couplings, Split Duct and Reducers (PVC to PVC Only)					
Material	**Type**	**Size(s)**	**Application**	**Catalog ID**	**Compatible Unit**
PVC	Straight Coupling	2	Joining	1208	NFP2-CPL
"	"	3	Joining	1209	NFP3-CPL
"	"	4	Joining	1210	NFP4-CPL
"	"	5	Joining	16375	NFP5-CPL
"	"	6	Joining	16355	NFP6-CPL
PVC	Split Duct	2	Repair	16873	NFP2-SPLIT
"	"	3	Repair	16874	NFP3-SPLIT
"	"	4	Repair	16875	NFP4-SPLIT
"	"	5	Repair	16876	NFP5-SPLIT
"	"	6	Repair	16831	NFP6-SPLIT

PVC	Reducer	3 to 2-1/2	change dia.	13661	NFPR3-2.5
"	"	3 to2	change dia	13639	NFPR-3-2
"	"	4 to 3	change dia.	16043	NFPR-4-3
"	"	5 to 4	change dia.	16044	NFPR-5-4
"	"	6 to 5	change dia.	16045	NFPR-6-5

Table 3 – Conduit Sweeps and Angle Fittings

Material	Angle (deg)	Size (ID)	Radius	Catalog ID	Compatible Unit
PVC	5	4	N/A	1357	NFP4-SW5
"	"	5	N/A	1358	NFP5-SW5
"	"	6	N/A	16354	NFP6-SW5
"	22.5	3	13	15319	NFP3-SW22-13
"	"	4	36	1168	NFP4-SW22
"	"	5	36	1169	NFP5-SW22
"	"	6	48	16359	NFP6-SW22-48
PVC	45	3	13	15320	NFP3-SW45-13
"	"	4	36	1166	NFP4-SW45
"	"	5	36	1170	NFP5-SW45
"	"	6	48	16358	NFP6-SW45-48
"	90	2	18	1158	NFP2-SW90-18
"	"	3	24	1159	NFP3-SW90-24
"	"	4	36	1167	NFP4-SW90
"	"	4	24	16374	NFP4-SW90-24
"	"	4	16	7746	NFP4-SW90-16
PVC	90	4	48	16385	NFP4-SW90-48
"	"	5	36	1171	NFP5-SW90
"	"	5	60	16361	NFP5-SW90-60
"	"	6	36	16363	NFP6-SW90
"	"	6	60	16364	NFP6-SW90-60
Galv. Steel	90	2	30	16854	NFS2-SW90-30
"	"	3	30	1173	NFS3-SW90-30
"	"	4	36	9898	NFS4-SW90
"	"	5	36	9899	NFS5-SW90
"	"	6	36	15176	NFS6-SW90

Table 4 – Underground Conduit Plugs and End Bells					
Material	**Description**	**Size (ID)**	**Ends**	**Catalog ID**	**Compatible Unit**
PVC/rubber	Duct Plug	2	n/a	1634	NFP2-PLUG
"	"	3	n/a	1635	NFP3-PLUG
PVC/rubber	Duct Plug	4	n/a	1636	NFP4-PLUG
"	"	5	n/a	1637	NFP5-PLUG
"	"	6	n/a	16869	NFP6-PLUG
PVC	Sched 40 End Bell	2		9423	NFP2-BEL40
"	"	3		9424	NFP3-BEL40
"	"	4		9425	NFP4-BEL40
"	"	5		16428	NFP5-BEL40
"	"	6		16367	NFP6-BEL40
PVC	Type EB End Bell	2		16365	NFP2-BELEB
"	"	3		16366	NFP3-BELEB
"	"	4		1156	NFP4-BELEB
"	"	5		1157	NFP5-BELEB
"	"	6		16429	NFP6-BELEB

Table 5 – Pole Riser Sections including Fittings (Steel to PVC, Steel to Steel)					
Material	**Description**	**Size (ID)**	**Ends**	**Catalog ID**	**Compatible Unit**
PVC	External Cap	2		16918	NFP2-CAP
"	"	3		16917	NFP3-CAP
"	"	4		9460	NFP4-CAP
"	"	5		16393	NFP5-CAP
"	"	6		16394	NFP6-CAP
Galv. Steel	Riser Pipe Section (steel sweep, 10 ft Rigid steel conduit, iron slip coupling & PVC-steel coupling)	2	sweep RS cond slip cplg thrd cplg	16854 9474 16351 9513	NCRS2
"	"	3	sweep RS cond slip cplg thrd cplg	1173 1246 1343 9514	NCRS3
"	"	4	sweep RS cond slip cplg thrd cplg	9898 1248 1345 1099	NCRS4

Galv. Steel	Riser Pipe Section (steel sweep, 10 ft Rigid steel conduit, iron slip coupling & PVC-steel coupling)	5	Sweep RS cond slip cplg thrd cplg	9899 1249 1346 1100	NCRS5
"	"	6	sweep RS cond slip cplg thrd cplg	15176 15177 n/a 16368	NCRS6
Steel	Grounding Bushing	2	threads	15971	NFS2-GNDBUSH
"	"	3	"	1190	NFS3-GNDBUSH
"	"	4	"	1188	NFS4-GNDBUSH
"	"	5	"	1189	NFS5-GNDBUSH
"	"	6	"	16934	NFS6-GNDBUSH
Copper	Pipe Ground Conn.	2"	U bolt	9011	NFS2-GNDUCONN
"	Pipe Ground Conn.	4"	"	15363	NFS4-GNDUCONN
"	Pipe Ground Conn.	5"	"	15363	NFS5-GNDUCONN

Table 6 – Conduit Installation Accessories

Material	Description	Size	Catalog ID	Compatible Unit
PVC Cement	All season, quick setting cement	Quart	1213	NA-CM
Marker Tape	Caution Tape to install over buried electric lines	1000 ft roll	9913	NA-MT
Fish Line	Pull line, 2500lb strength	3000 ft	16860	NA-FL
Duct Foam	Expands and seals around cables at duct mouths	13 oz can	1380	NA-DF
Dux Seal	Plug compound, nonhardening	Large, 5lb	1239	NA-DX5
"	"	Small, 1lb	9469	NA-DX1
Cold patch	Temporary Pavement	60 lb	1628	NA-CP
Fairleader	For Duct Mouths	3-5	1371	NA-FA

12.0 **Typical Construction Plans** - Figures A thru F

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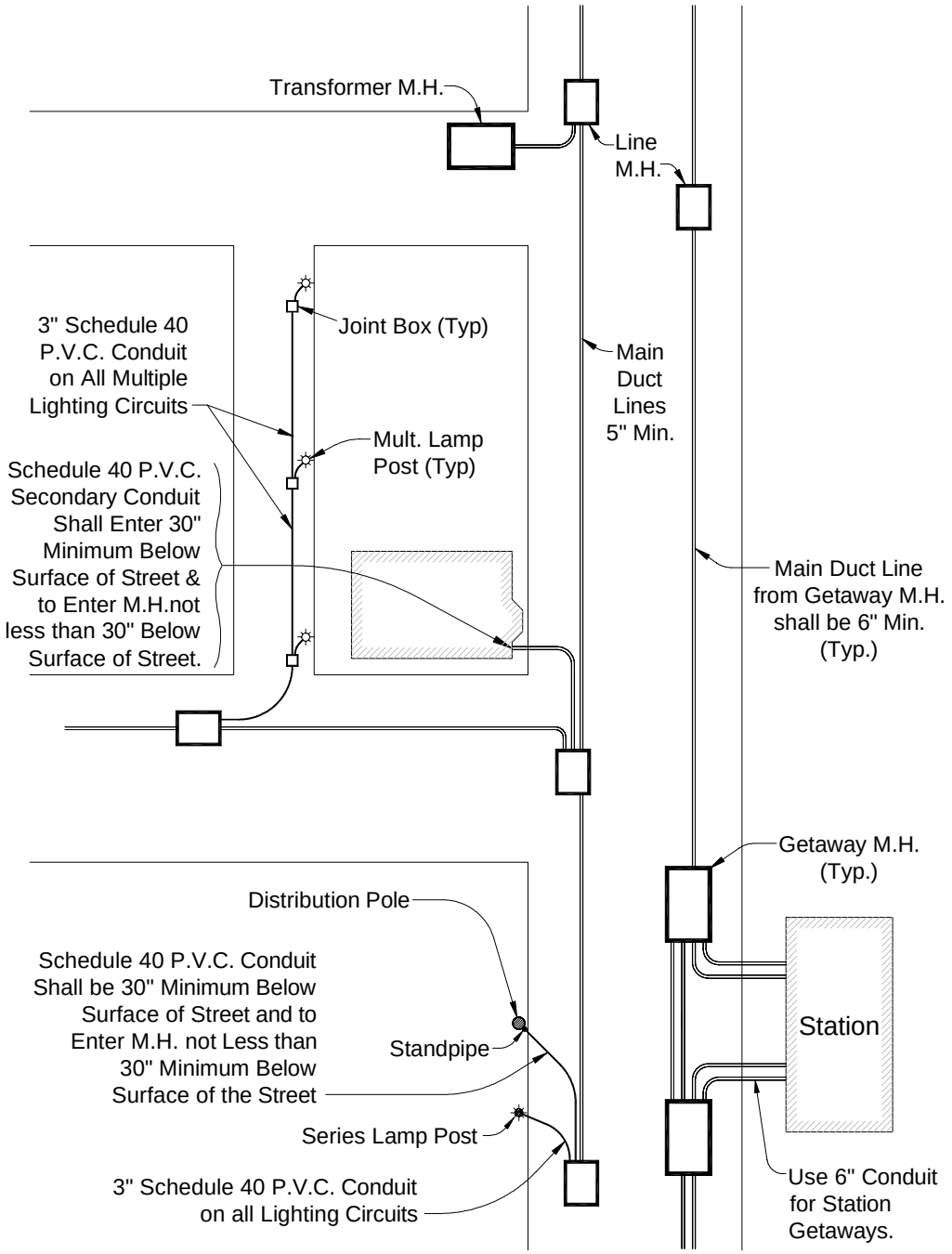

FIGURE A - PLAN VIEW
TYPICAL DISTRIBUTION CONDUIT CONSTRUCTION DETAILS

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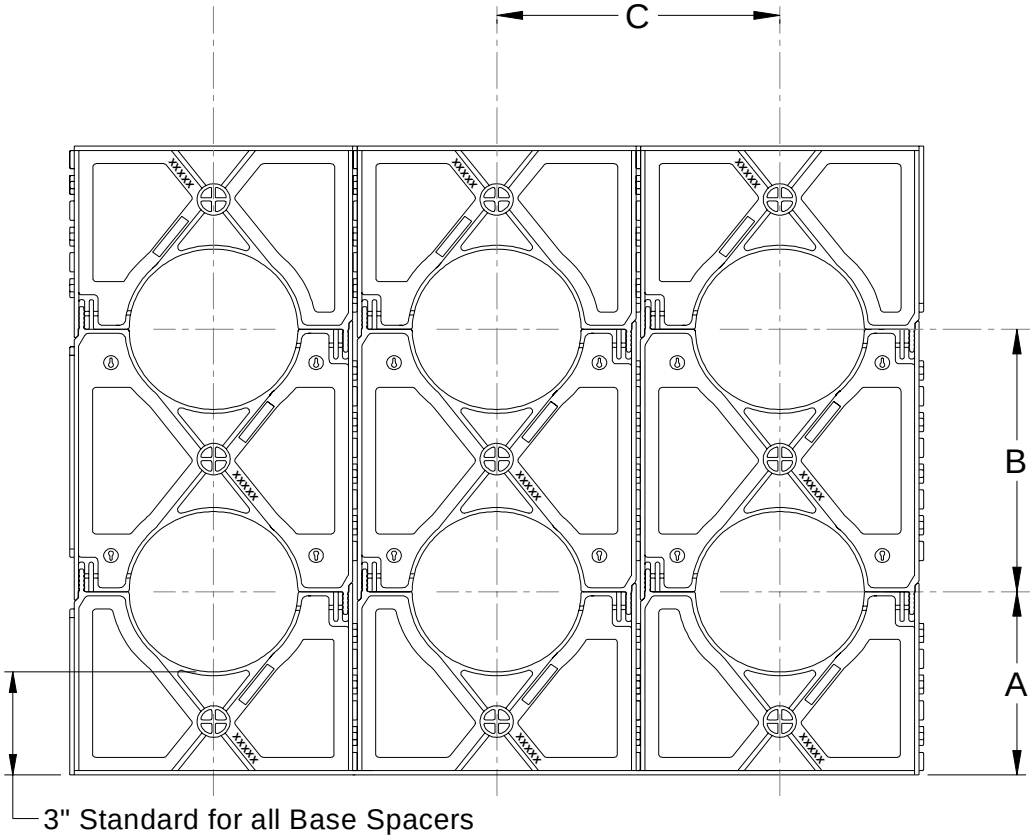
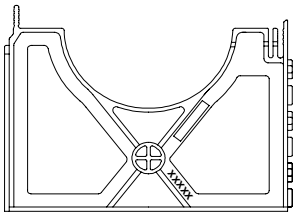
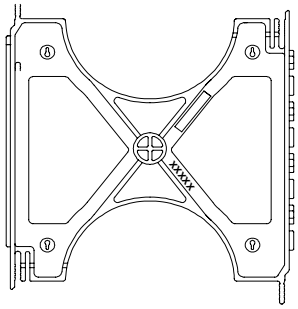




BASE SPACERS

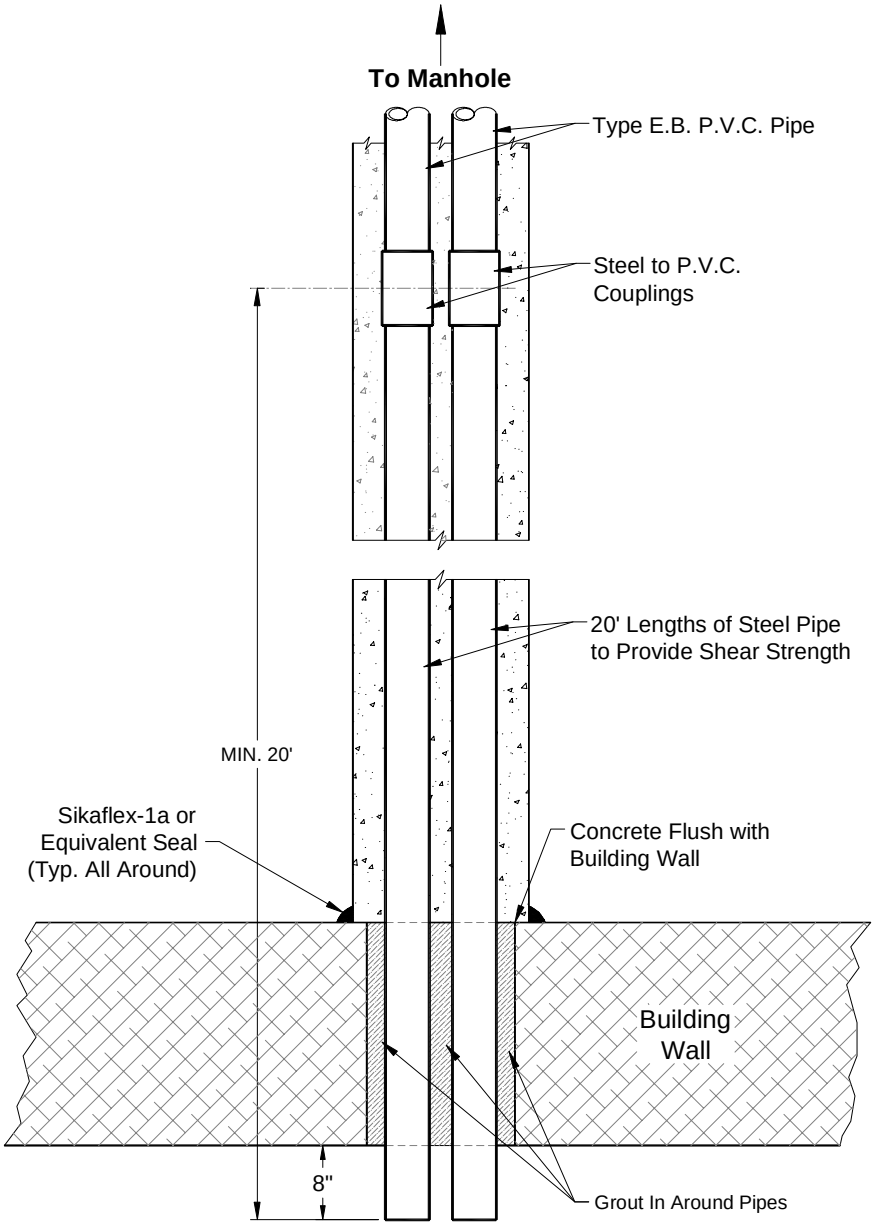


INTERMEDIATE SPACERS

Size	Spacing	A	B	C	Base Spacer; Cat. ID	Intermediate Spacer; Cat. ID
4"	1 1/2"	5.310	6.010	6.250	9462	9464
5"	1 1/2"	5.840	7.070	7.310	9465	9463
6"	1 1/2"	6.380	8.140	8.380	16378	16379

Note: Conduit spacers shall be installed every 5 ft. (7 feet maximum).

FIGURE B
CONDUIT CONSTRUCTION PLASTIC SPACER
(TYPICAL)



Note:

Building wall construction to be used wherever settlement of building or conduit is anticipated.

FIGURE C – PLAN VIEW
BUILDING WALL CONSTRUCTION

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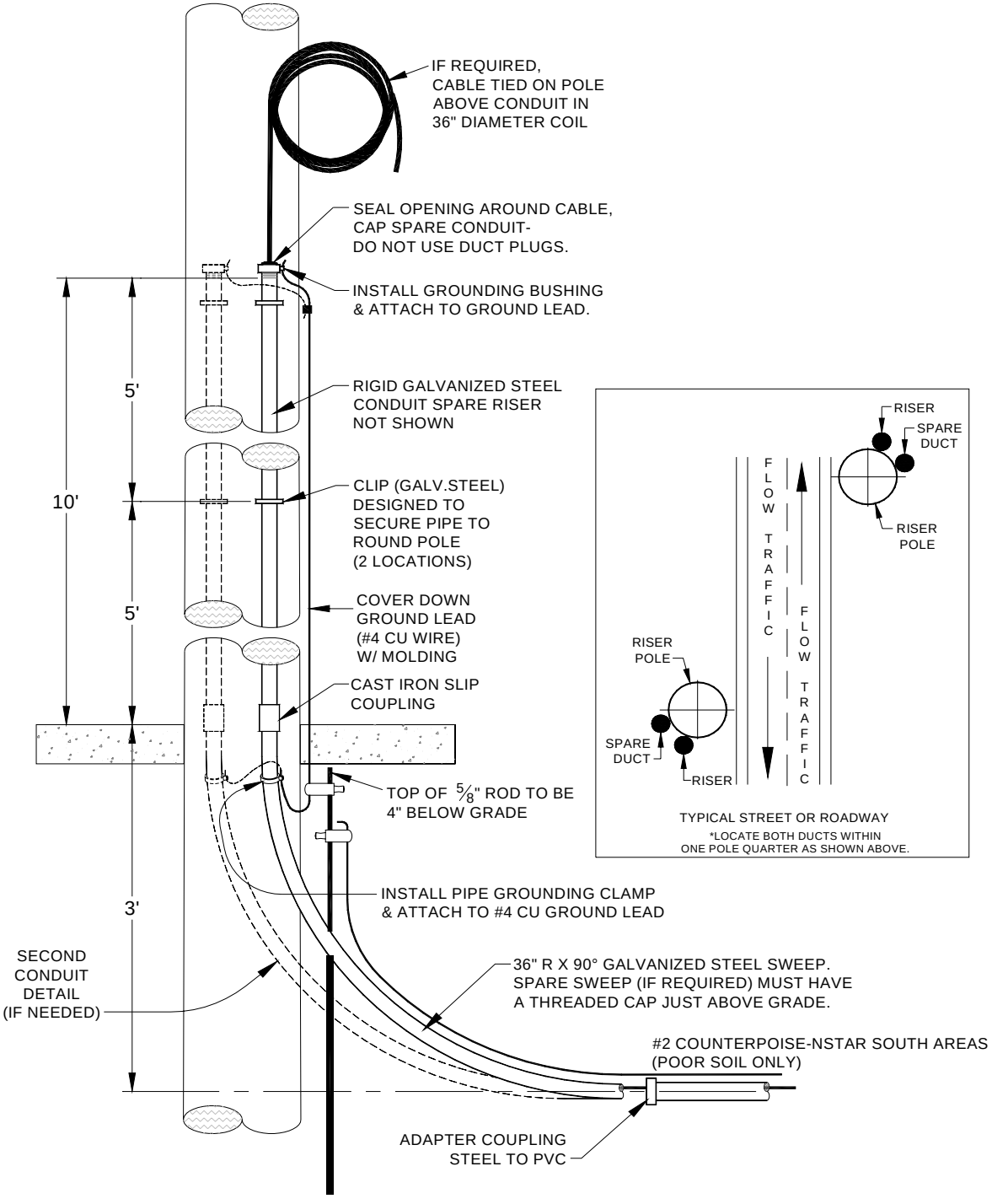
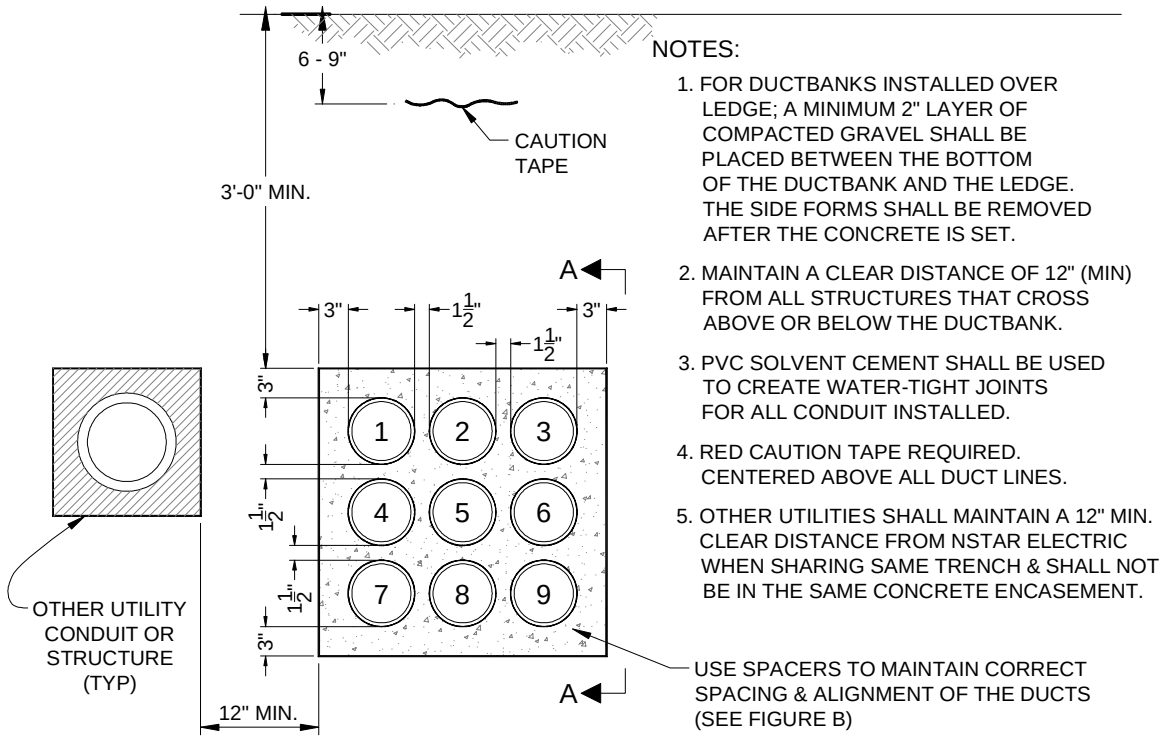


FIGURE D – PROFILE
TYPICAL RISER CONSTRUCTION DETAIL

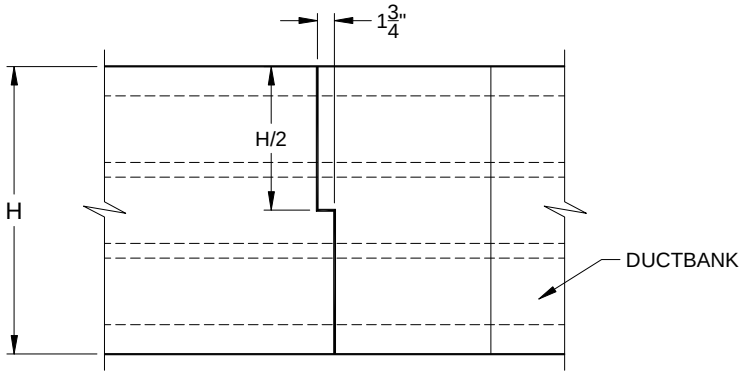
ISSUED 24-Apr-08	CONSTRUCTION STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	C1100 Revision 0 Page 16 of 25



NOTES:

1. FOR DUCTBANKS INSTALLED OVER LEDGE; A MINIMUM 2" LAYER OF COMPACTED GRAVEL SHALL BE PLACED BETWEEN THE BOTTOM OF THE DUCTBANK AND THE LEDGE. THE SIDE FORMS SHALL BE REMOVED AFTER THE CONCRETE IS SET.
2. MAINTAIN A CLEAR DISTANCE OF 12" (MIN) FROM ALL STRUCTURES THAT CROSS ABOVE OR BELOW THE DUCTBANK.
3. PVC SOLVENT CEMENT SHALL BE USED TO CREATE WATER-TIGHT JOINTS FOR ALL CONDUIT INSTALLED.
4. RED CAUTION TAPE REQUIRED. CENTERED ABOVE ALL DUCT LINES.
5. OTHER UTILITIES SHALL MAINTAIN A 12" MIN. CLEAR DISTANCE FROM NSTAR ELECTRIC WHEN SHARING SAME TRENCH & SHALL NOT BE IN THE SAME CONCRETE ENCASEMENT.

PROFILE



H = HEIGHT OF DUCTBANK

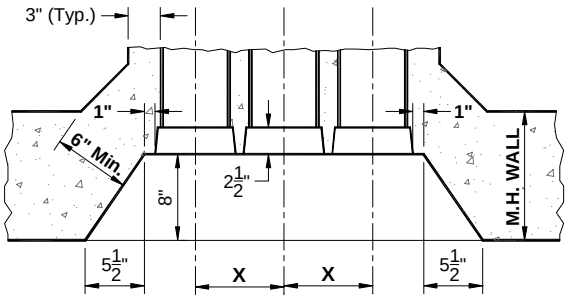
SECTION A-A

CONCRETE SPECIFICATION:

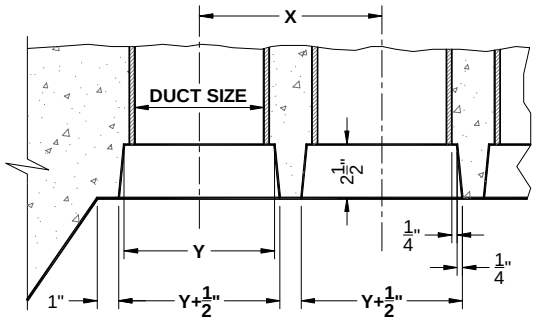
CONCRETE SHALL BE NORMAL WEIGHT WITH PEASTONE MIX,
2500 PSI @ 28 DAY COMPRESSIVE STRENGTH.
UNLESS OTHERWISE SPECIFIED, CONSTRUCTION SHALL CONFORM
TO ACI-318 (LATEST EDITION) WHERE REINFORCEMENT IS SPECIFIED.

FIGURE E – PROFILE & SECTION VIEWS
STANDARD UNREINFORCED CONCRETE DUCTBANK CONSTRUCTION DETAILS

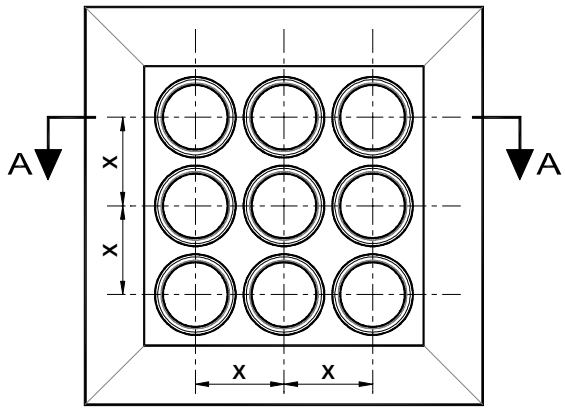
ISSUED 24-Apr-08	CONSTRUCTION STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	C1100 Revision 0 Page 17 of 25



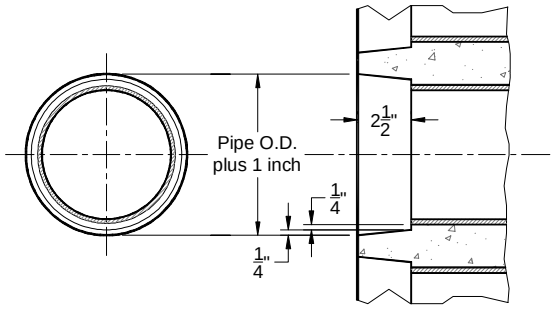
SECTION "A-A"



DETAIL OF DUCT MOUTH



DUCT FACE



DUCT MOUTH FOR SERVICE PIPES, ETC.

Duct Size	X	Y
4"	6 ½"	5"
5"	7 ½"	6"
6"	8 ½"	7"

Notes:

1. Ducts shall be 5" size unless otherwise specified.
2. Ducts shall be terminated with a matching schedule PVC end bell, which shall then be sealed around with mortar mix.

FIGURE F
MANHOLE BELLMOUTH CONSTRUCTION

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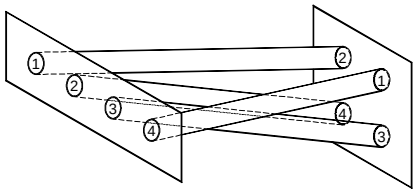
This Standard Specifies the Typical Arrangement of Transposed Duct Numbering as the Configuration changes from Horizontal to Vertical or vice versa.

Connect Left to Right as Follows:

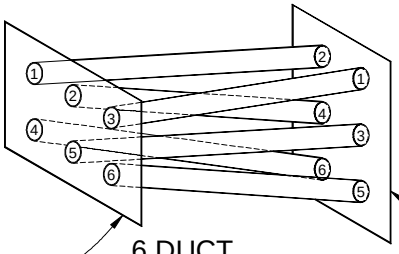
1 to 2
2 to 4
3 to 3
4 to 1



4 DUCT

Connect Left to Right as Follows:

1 to 2
2 to 4
3 to 1
4 to 6
5 to 3
6 to 5



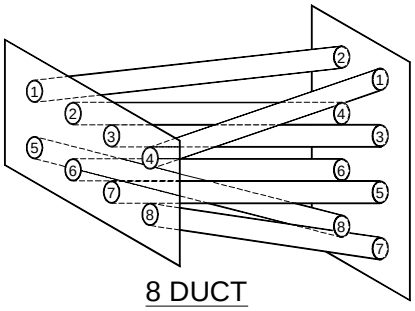
Configuration Entering or Approaching Manhole/Pad/ Equipment Fdn. (Typ)

Configuration Leaving Manhole/Pad/ Equipment Fdn. (Typ)

6 DUCT

Connect Left to Right as Follows:

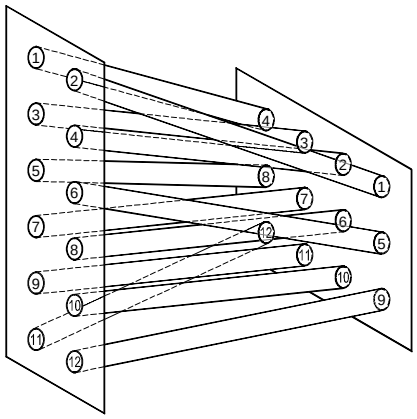
1 to 2
2 to 4
3 to 3
4 to 1
5 to 8
6 to 6
7 to 5
8 to 7



8 DUCT

Connect Left to Right as Follows:

1 to 4
2 to 1
3 to 3
4 to 2
5 to 8
6 to 5
7 to 7
8 to 6
9 to 11
10 to 10
11 to 12
12 to 9



12 DUCT

Notes:

1. The open duct ends, as viewed from the center of the Manhole/Pad/Equipment Foundation, shall be numbered as shown on Figures No. 1 - 23.
2. If other duct transpositions are required prior approval from NSTAR is required.

FIGURE G
TRANSPOSITION OF DUCTS – (WHEN NECESSARY)

13.0 Duct Bank Cross Sections – Figures 1 thru 23
Standard and Nonstandard (Alternate) Designs shown to support old construction.

DUCT BANK LAYOUT FOR 4", 5", & 6" CONDUIT
(NON-REINFORCED CONCRETE)

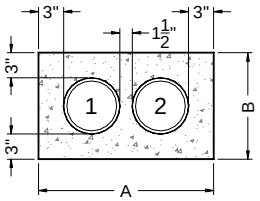


FIG. 1 2-DUCTS

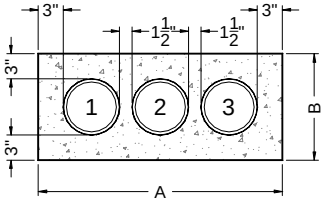


FIG. 2 3-DUCTS

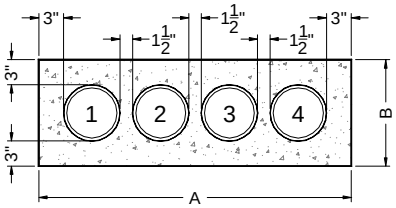


FIG. 3 4-DUCTS (Alternate)

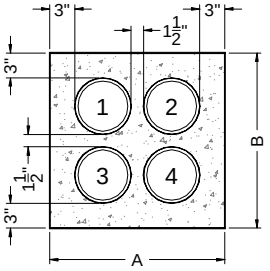


FIG. 4 4-DUCTS

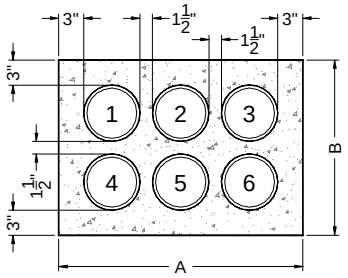


FIG. 5 6-DUCTS

Numbers in Duct Indicate Numbering System when Viewed from the Open End of a Ductbank.

DIMENSIONS						
FIG	4" Ducts		5" Ducts		6" Ducts	
	A Inches	B Inches	A Inches	B Inches	A Inches	B Inches
1	16 ½"	10 ½"	18 ½"	11 ½"	21"	12 ½"
2	22 ½"	10 ½"	25 ½"	11 ½"	29"	12 ½"
3	28 ½"	10 ½"	32 ½"	11 ½"	37"	12 ½"
4	16 ½"	16 ½"	18 ½"	18 ½"	21"	21"
5	22 ½"	16 ½"	25 ½"	18 ½"	29"	21"

NOTE: See pages 25 for duct bank weights and concrete quantities.

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DUCT BANK LAYOUT FOR 4", 5", & 6" CONDUIT
(NON-REINFORCED CONCRETE)

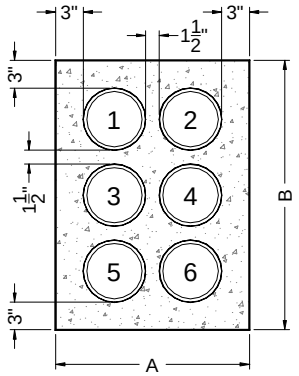

FIG. 6 6-DUCTS (Alternate)

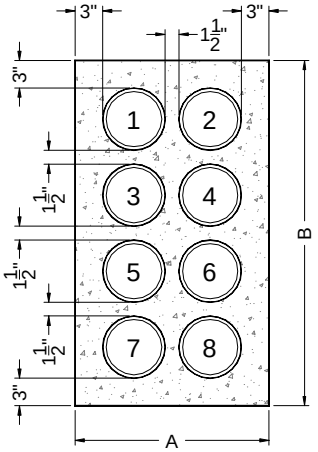

FIG. 7 8-DUCTS (Alternate)

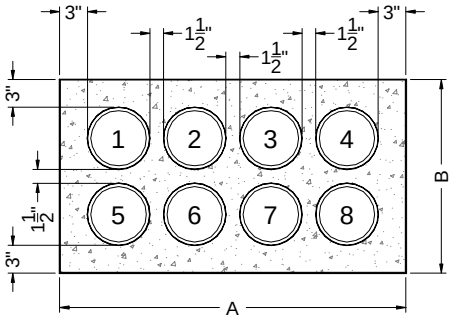

FIG. 8 8-DUCTS

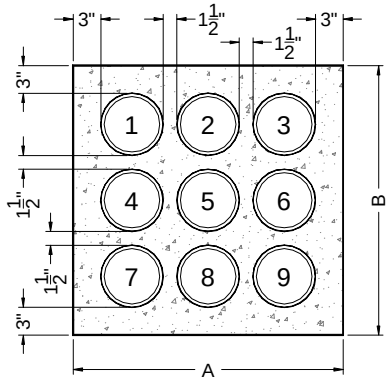

FIG. 9 9-DUCTS

Numbers in Duct Indicate Numbering System when Viewed from the Open End of a Ductbank.

DIMENSIONS						
FIG	4" Ducts		5" Ducts		6" Ducts	
	A Inches	B Inches	A Inches	B Inches	A Inches	B Inches
6	16 ½"	22 ½"	18 ½"	25 ½"	21"	29"
7	16 ½"	28 ½"	18 ½"	32 ½"	21"	37"
8	28 ½"	16 ½"	32 ½"	18 ½"	37"	21"
9	22 ½"	22 ½"	25 ½"	25 ½"	29"	29"

NOTE: See pages 25 for duct bank weights and concrete quantities.

ISSUED 24-Apr-08	CONSTRUCTION STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	C1100 Revision 0 Page 21 of 25

DUCT BANK LAYOUT FOR 4", 5", & 6" CONDUIT
(NON-REINFORCED CONCRETE)

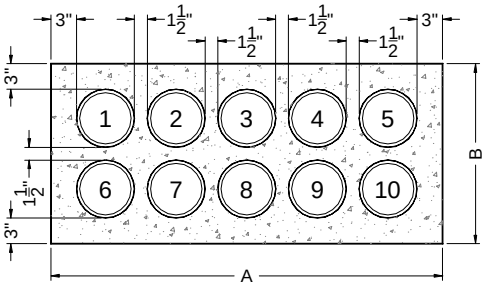

FIG. 10 10-DUCTS

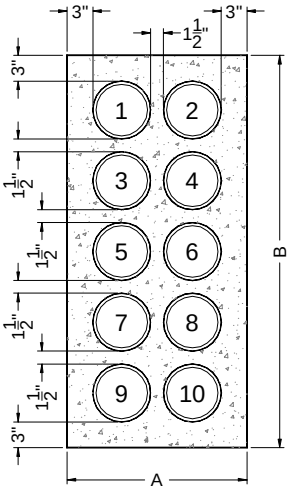

FIG. 11 10-DUCTS (Alternate)

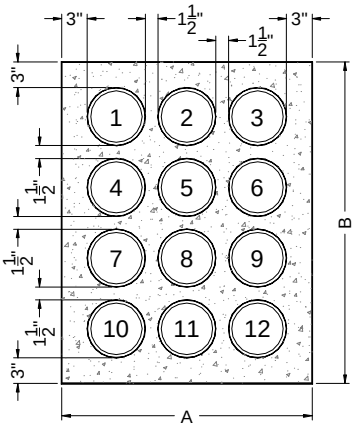

FIG. 12 12-DUCTS (Alternate)

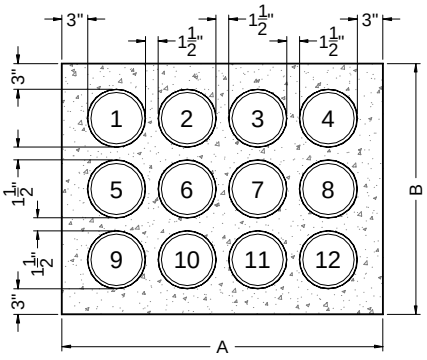

FIG. 13 12-DUCTS

Numbers in Duct Indicate Numbering System when Viewed from the Open End of a Ductbank.

FIG	DIMENSIONS					
	4" Ducts		5" Ducts		6" Ducts	
	A Inches	B Inches	A Inches	B Inches	A Inches	B Inches
10	34 ½"	16 ½"	39 ½"	18 ½"	45"	21"
11	16 ½"	34 ½"	18 ½"	39 ½"	21"	45"
12	22 ½"	26 ½"	25 ½"	32 ½"	29"	37"
13	28 ½"	22 ½"	32 ½"	25 ½"	37"	29"

NOTE: See pages 25 for duct bank weights and concrete quantities.

DUCT BANK LAYOUT FOR 4", 5", & 6" CONDUIT
(NON-REINFORCED CONCRETE)

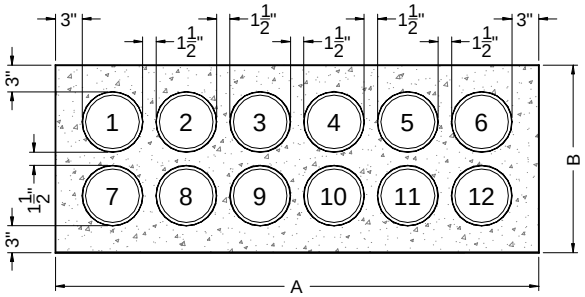

FIG. 14 12-DUCTS

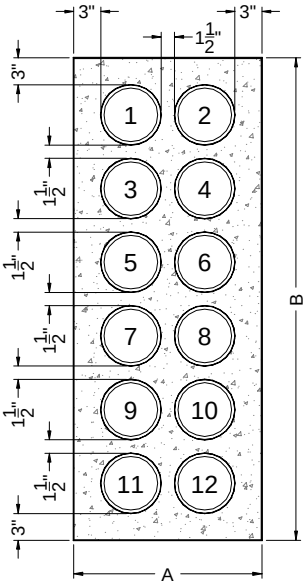

FIG. 15 12-DUCTS (Alternate)

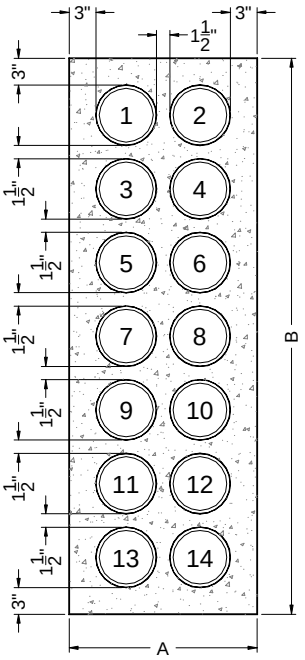

FIG. 16 14-DUCTS (Alternate)

Numbers in Duct Indicate Numbering System when Viewed from the Open End of a Ductbank.

FIG	DIMENSIONS					
	4" Ducts		5" Ducts		6" Ducts	
	A Inches	B Inches	A Inches	B Inches	A Inches	B Inches
14	40 ½"	16 ½"	46 ½"	18 ½"	53 ½"	21"
15	16 ½"	40 ½"	18 ½"	46 ½"	21"	53 ½"
16	16 ½"	46 ½"	18 ½"	53 ½"	21"	61"

NOTE: See pages 25 for duct bank weights and concrete quantities.

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DUCT BANK LAYOUT FOR 4", 5", & 6" CONDUIT
(NON-REINFORCED CONCRETE)

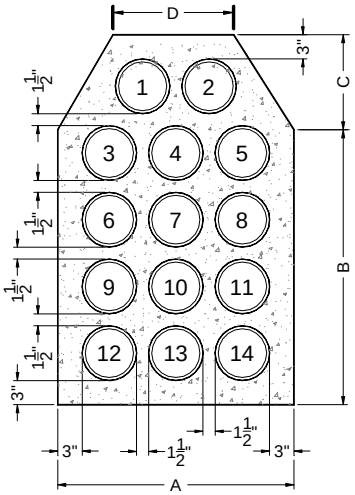


FIG. 17 14-DUCTS (Alternate)

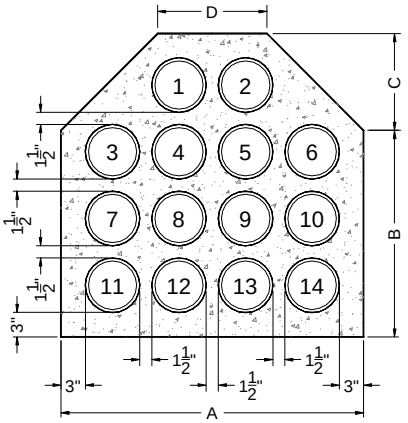


FIG. 18 14-DUCTS

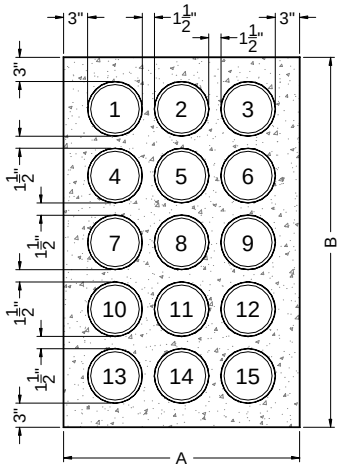


FIG. 19 15-DUCTS (Alternate)

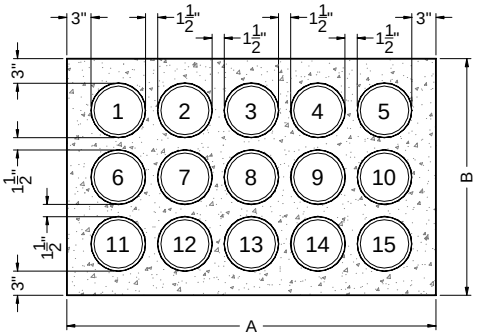


FIG. 20 15-DUCTS

Numbers in Duct Indicate Numbering System when Viewed from the Open End of a Ductbank.

FIG	DIMENSIONS											
	4" Ducts				5" Ducts				6" Ducts			
	A Inches	B Inches	C Inches	D Inches	A Inches	B Inches	C Inches	D Inches	A Inches	B Inches	C Inches	D Inches
17	22 ½"	25 ½"	9"	12"	25 ½"	29 ½"	10"	14"	29"	33 ½"	11"	16"
18	28 ½"	19 ½"	9"	10"	32 ½"	22 ½"	10"	12"	37"	25 ½"	11"	14"
19	22 ½"	34 ½"	N/A	N/A	25 ½"	39 ½"	N/A	N/A	29"	45"	N/A	N/A
20	34 ½"	22 ½"	N/A	N/A	39 ½"	25 ½"	N/A	N/A	45"	29"	N/A	N/A

NOTE: See pages 25 for duct bank weights and concrete quantities.

DUCT BANK LAYOUT FOR 4", 5", & 6" CONDUIT
(NON-REINFORCED CONCRETE)

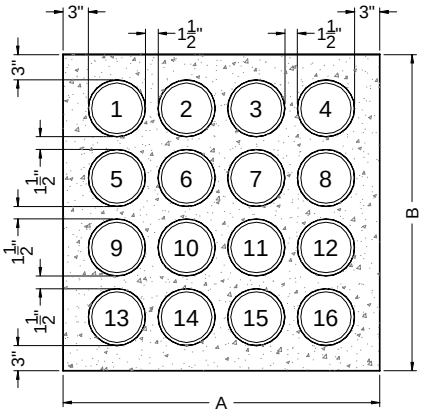


FIG. 21 16-DUCTS

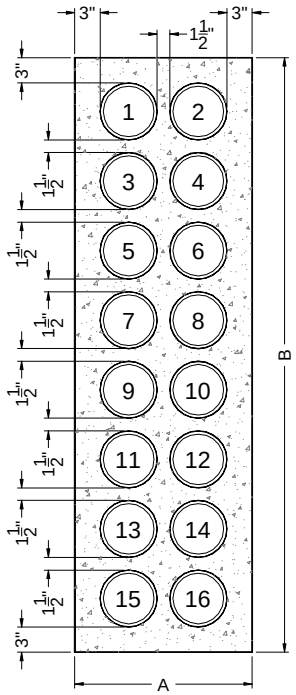


FIG. 22 16-DUCTS (Alternate)

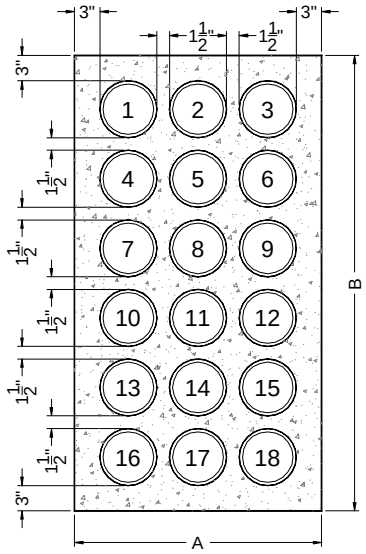


FIG. 23 18-DUCTS

Numbers in Duct Indicate Numbering System when Viewed from the Open End of a Ductbank.

FIG	DIMENSIONS											
	4" Ducts				5" Ducts				6" Ducts			
	A Inches	B Inches	C Inches	D Inches	A Inches	B Inches	C Inches	D Inches	A Inches	B Inches	C Inches	D Inches
21	28 ½"	28 ½"	N/A	N/A	32 ½"	32 ½"	N/A	N/A	37"	37"	N/A	N/A
22	16 ½"	52 ½"	N/A	N/A	18 ½"	60 ½"	N/A	N/A	21"	69"	N/A	N/A
23	22 ½"	40 ½"	N/A	N/A	25 ½"	46 ½"	N/A	N/A	29"	53 ½"	N/A	N/A

NOTE: See pages 25 for duct bank weights and concrete quantities.

14.0 Conduit Bank Concrete Requirements and Weights per linear foot.

CONDUIT CONSTRUCTION
DUCT SIZES, WEIGHTS & CONCRETE QUANTITIES

No. of Ducts	4 Inch Dia.		5 Inch Dia.		6 Inch Dia.	
	Unreinforced Concrete PVC Duct & Cable		Unreinforced Concrete PVC Duct & Cable		Unreinforced Concrete PVC Duct & Cable	
	lbs/lin. ft.	cu.yds/lin. ft	lbs/lin. ft.	cu.yds/lin. ft	lbs/line. ft. ft.	cu.yds/lin. ft.
2	180	0.0363	200	200	228	0.05
3	245	0.0483	274	274	312	0.067
4(2wx2D)	285	0.0536	316	316	373	0.078
4 (4W)	315	0.0606	347	347	394	0.083
6	385	0.0709	432	432	508	0.1037
8	490	0.0882	548	548	641	0.129
9	530	0.0931	590	590	687	0.1367
10	600	0.106	663	663	774	0.154
12 (4Wx3D)	675	0.116	748	748	867	0.17
12 (6Wx2D)	700	0.123	778	778	918	0.183
14	810	0.141	858	858	984	0.191
15	815	0.138	904	904	1048	0.203
16 (4Wx4D)	840	0.141	948	948	1095	0.211
16 (2Wx8D)	865	0.155	961	961	1186	0.231
18 (3Wx6D)	946	0.161	1063	1063	1261	0.24

15.0 Reference Standards

13.1 W1000, "Entering and Working in Underground Locations including Subsurface Vaults"
13.2 C1101, "Distribution Duct bank Construction, and (Steel Reinforced Concrete)"

16.0 Signature Approval

Approved by: Amin Jessa
Director, Distribution Engineering

EVERSOURCE	CONSTRUCTION STANDARD ELECTRIC OPERATIONS ORGANIZATION

Clearances for Pad-mount Foundations Near Buildings, Roadways, & Landscaping

Document Number:	Issued Date:	Revised Date:	Revision:	Applicability:
DTR 42.100	01-Jun-20	---	0	EMA

***** This Document Supersedes Eversource-EMA C3802 *****

Scope:

This document outlines the minimum clearances when locating a pad-mounted distribution transformer near buildings, a traveled-way, landscaping, and other obstructions.

Safety:

Providing a work environment, free of recognized hazards is a value at Eversource. Therefore, prior to the start of any work, ensure that you are familiar and knowledgeable with all Eversource Safety Rules, Policies and Procedures that are applicable to the work and tasks at hand and perform a job brief at the job site, prior to commencing work. PPE requirements to protect the worker shall be followed as required in the Eversource Employee Safety Manual.

Approved by: *Signature on File* Date: June 1, 2020
Jennifer Hebsch
Director, Distribution Technical Engineering

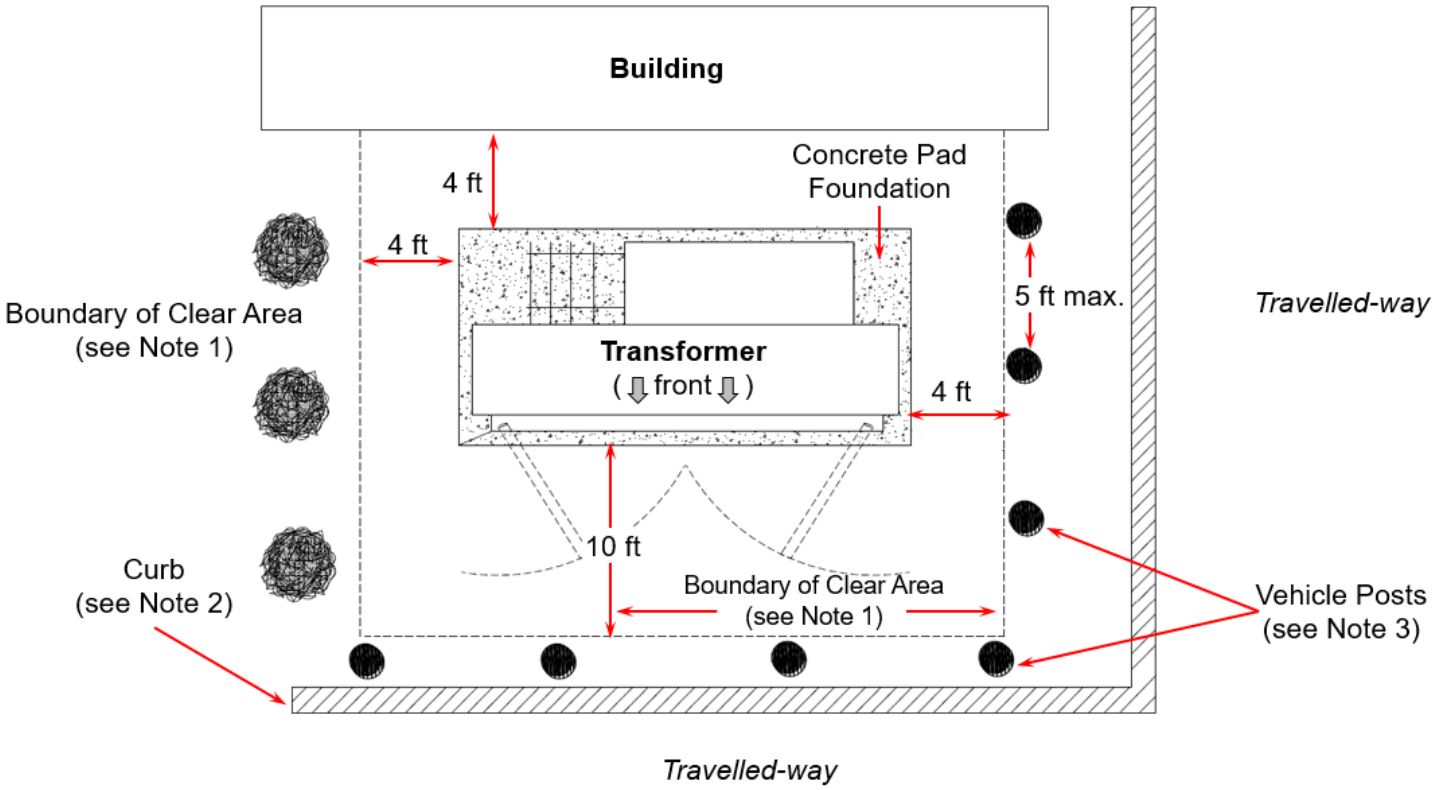
Rev No.	Description	Date
0	Issued as approved. Supersedes Eversource-EMA C3802.	June 1, 2020

Table of Contents

1.0 General Clearances

1.1 Maintain minimum clearances when locating the pad-mounted transformer, or other piece of equipment, near a building, travelled-way, landscaping, and other structures. Refer to Figure 1.

1.1.1 Clearances, less than the recommended minimums, shall be approved by the Eversource Construction Supervisor.



Notes:

(1) The specified distances "Boundary of Clear Area" in Figure 1 shall be maintained to provide access, inspect, perform switching, and ventilate the transformer or other piece of equipment sitting on the foundation.

(2) If no curb exists, or the pad-mount transformer is located closer than 10 feet to the travelled way, then protective vehicle posts shall be installed on the exposed sides as specified.

(3) Vehicle posts shall be a minimum of a 4 inch galvanized steel pipe, filled with concrete and extend 42 inches above and below grade. Larger diameter posts may be required for some installations.

Figure 1 – Minimum Clearances

1.2 The clearance distance from emergency generators (not shown) shall be a minimum of 20 feet.

1.2.1 If this cannot be maintained, then the emergency generator and the pad should be separated by an 8 foot high block wall.

.1.1. The block wall shall be positioned at least 4 feet from the pad.

.1.2. The length of the block wall shall be determined by Eversource, depending upon the transformer dimensions.

2.0 Non-combustible Walls

2.1 Pad-mounted type transformers may be located as close as 4 feet to any non-combustible wall, if the following clearances are maintained from doors, windows and other building openings. See previous Figure 1.

2.2 Pad-mounted type transformers shall NOT be located within a zone extending 20 feet outward and 10 feet to either side of a building door, as shown in Figure 2.

2.3 Pad-mounted type transformers shall NOT be located within a zone extending 10 feet outward and 10 feet to either side of an air intake opening, as shown in Figure 3.

2.3.1 If the air intake opening is above the transformer, there must be a 25 foot vertical distance from the air intake opening to the transformer.

2.4 Pad-mounted type transformers shall NOT be located within a zone extending 10 feet outward and 3 feet to either side of a building window, as shown in Figure 4.

2.5 Pad-mounted type transformers shall NOT be located less than 5 feet from any part of a second story window, as shown in Figure 5.

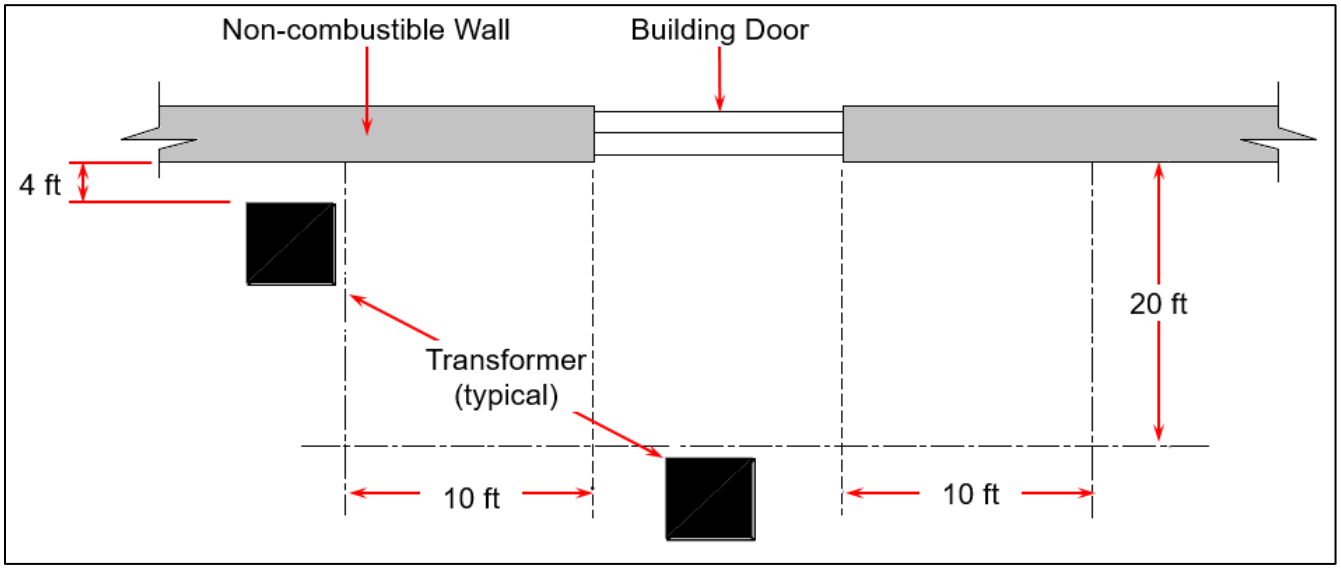


Figure 2 – Building Door Clearance

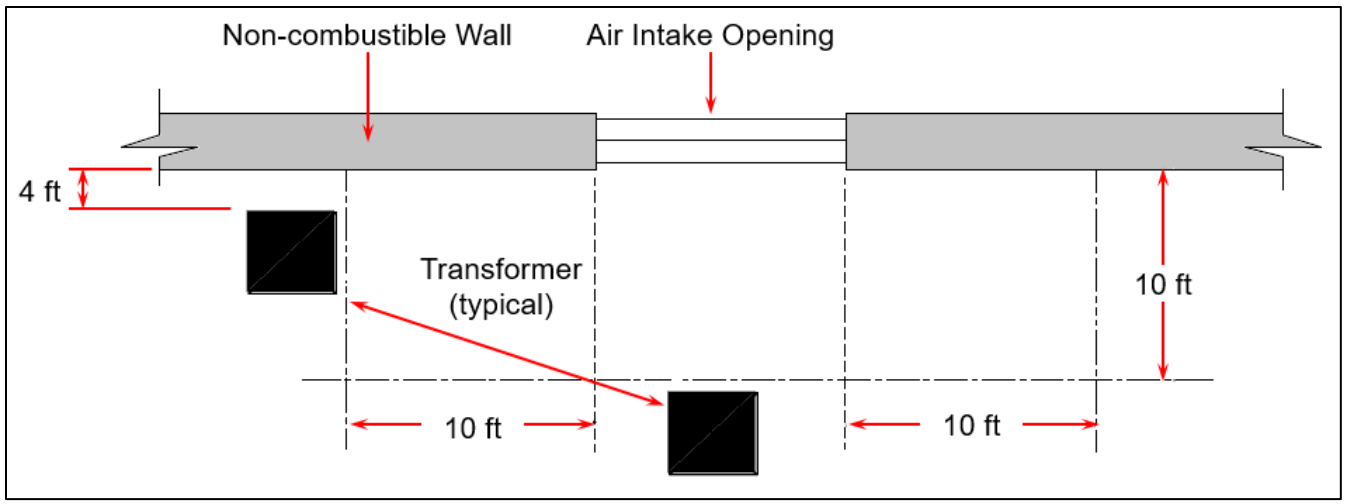


Figure 3 – Air Intake Clearance

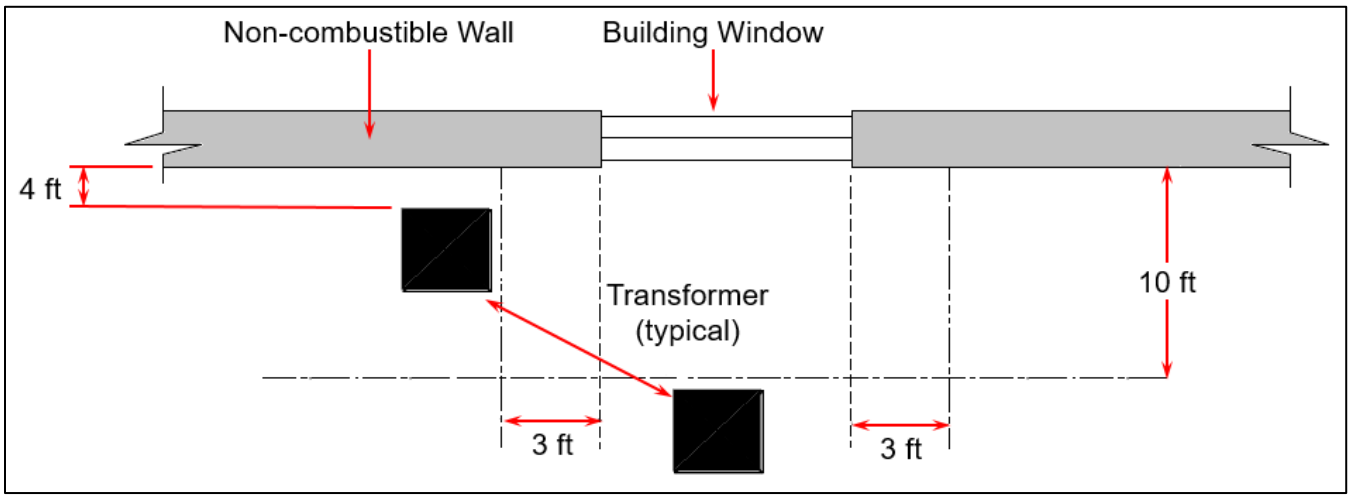


Figure 4 – Building Window Clearance

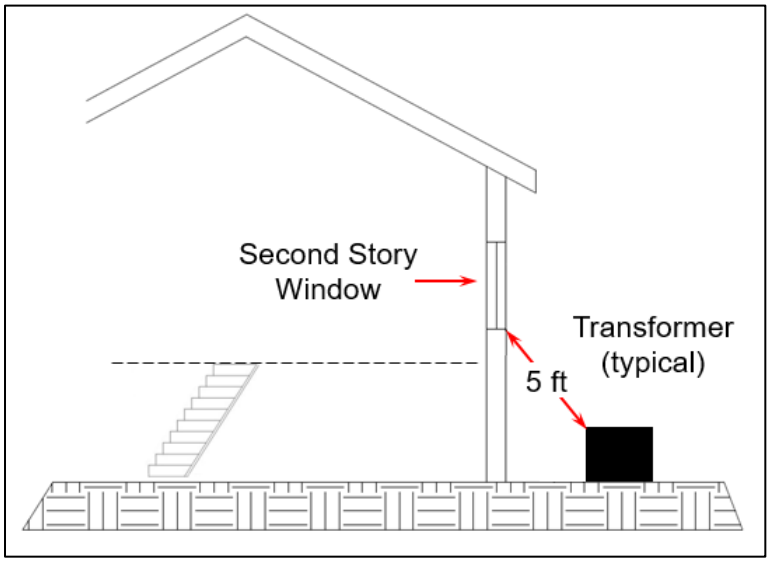


Figure 5 – Second Story Window Clearance

3.0 Combustible Walls

3.1 Pad-mounted type transformer sizes up to and below 100 kVA shall be located according to the provisions set forth for non-combustible walls.

3.2 Pad-mounted type transformer sizes above 100 kVA shall be located a minimum of 10 feet from the building wall.

3.2.1 In addition, the clearances from building doors, windows and other openings set forth for non-combustible walls shall be maintained.

3.2.2 If the immediate terrain is pitched toward the building, a sump shall be installed for transformer sizes exceeding 400 kVA.

.2.1. Consult with the local Eversource Engineer for sump specifications and additional requirements.

4.0 Fire Spaces

4.1 Pad-mounted type transformers shall be located such that a minimum clearance of 20 feet is maintained from fire escapes always.

EVERSOURCE	CONSTRUCTION STANDARD ELECTRIC OPERATIONS ORGANIZATION

Installation of Handholes & Box Pads

Document Number:	**Issued Date**:	**Revised Date**:	**Revision**:	**Applicability**:
DTR 63.102	01-Jun-20	---	0	EMA

***** This Document Supersedes Eversource-EMA C3814 *****

Scope:

This document details construction methods and materials required for the installation of fiberglass, HDPE, or polymer concrete handholes and fiberglass box pads.

The installation of cable switching station (CSS) junction enclosures are also incorporated.

Safety:

Providing a work environment, free of recognized hazards is a value at Eversource. Therefore, prior to the start of any work, ensure that you are familiar and knowledgeable with all Eversource Safety Rules, Policies and Procedures that are applicable to the work and tasks at hand and perform a job brief at the job site, prior to commencing work. PPE requirements to protect the worker shall be followed as required in the Eversource Employee Safety Manual.

Approved by: *Signature on File* Date: June 1, 2020
Jennifer Hebsch
Director, Distribution Technical Engineering

Rev No.	Description	Date
0	Issued as approved. Supersedes Eversource-EMA C3814.	June 1, 2020

Table of Contents

1.0 Introduction

1.1 The handholes and box pads may be used for service connections, primary splices, transformer foundations, switching stations, or miscellaneous equipment foundations.

1.2 This standard references Eversource item numbers for handholes and box pads required for typical applications. Examples include: various handholes and box pads which are used for splicing, pulling, equipment foundation, and enclosure.

1.2.1 If a specific application or equipment requires unique installation details, they should be referenced in that specific installation standard or the Eversource plans (Work Order).

1.3 The term “box pads” should be understood as fiberglass box pads for the remainder of this standard.

2.0 Reference Documents

DTR 42.100 Clearances of Pad-mounted Equipment for Location to Buildings and Roadways

DTR 60.850 G&W PNI-9 Pad-mounted Switch 15 kV, Unfused

DTR 60.856 S&C 600 Amp 15 kV & 25 kV PME-9 with Visible Break, Fused

D3820 Specs for New 15 & 25 kV Primary UG Distribution Systems up to 200 Amps

M2301 Secondary Cable, 600 V, Termination & Buswork Pad-mounted Enclosures

3.0 Bill of Materials

Table 1 – Handholes

Equipment (top surface dimensions = inch)		**Item #**
Fiberglass Handhole:		
(street lighting only)	15 L x 10 W x 12 D	574316
	23 L x 14 W x 15 D	577332
(standard use)	30 L x 17 W x 18 D	574317
Polymer Concrete Handhole:		
	30 L x 17 W x 18 D	521914

Table 2 – Box Pads

Application	Equipment (top surface dimensions = inch)	Item #
PME-9 Switch, 15 kV Manufactured before Jan. 2001	Pad: 68 L x 64 W x 36 D (top opening = 59 x 50)	574476
	Base Cover to use with pad	574634
PME-9 Switch, 15 kV Manufactured after Jan. 2001	Pad: 75 L x 72 W x 36 D (top opening = 65 x 62)	579185
	Base Cover to use with pad	577332
	Adapter Plate to fit new switch on old base covers	579186
PME-9 Switch, 25 kV	Pad: 86 L x 84 W x 36 D (two pieces)	579493
	Base Cover to use with pad	579494
PVI-9 Switch, 15 kV	Pad: 102 L x 60 W x 36 D (two top openings)	580329
EMA-North Single-Phase Transformers & Base for Old Compact Style CSS Enclosures	Pad: 43 L x 37.5 W x 32 D (top opening = 26 x 32)	574477
	Base Cover to use with pad	574633
(shallow depth) EMA-North Single-Phase Transformers	Pad: 43 L x 37.5 W x **15 D** (top opening = 26 x 32)	575743
	Base Cover to use with pad	574633
EMA-South Single-Phase Transformers	Pad: 43 L x 37 W x 32 D (top opening = 26 x 26)	581386
Single & Three-Phase Primary Splices with 3 - #1 AWG Aluminum ONLY	Pad: 43 L x 37.5 W x 32 D (top opening = 26 x 32)	574477
Three-Phase Primary Splice	Pad: 75 L x 72 W x 36 D (top opening = 65 x 62)	579185
Single-Phase Primary CSS Junction Enclosure	4-Position Multi-tap:	
	15 kV	577181
	25 kV	577182
Three-Phase Primary CSS Junction Enclosure	3 x 4-Position Multi-tap:	
	15 kV	574926
	25 kV	577183

Table 3 – Grounding Accessories

Equipment	Item #
Rod, Copperweld Ground Rod:	
(preferred) 5/8 inch wide by 8 feet long	528988
(acceptable) 3/4 inch wide by 8 feet long	591508
Wire, Bare Copper	
1/0 AWG	574260
Mechanical Connector, Wire to Wire:	
Run: 1/0 - 4/0 AWG Cu to Tap: #6 - 4/0 AWG Cu	573849
Mechanical Connector, Wire to Rod:	
1/0 AWG Cu to Ground Rod	575975

4.0 General

4.1 Only Eversource approved handholes and box pads shall be installed. Refer to the Bill of Materials.

4.2 The location of proposed handholes and box pads shall be approved by Eversource before installation begins and in accordance with:

4.2.1 Eversource Design Standard **D3820**.

4.2.2 Eversource document for “Information and Requirements for Electric Service”.

4.3 All excavation, backfill, and paving shall be done in accordance with this standard and all applicable local and state regulations.

4.3.1 When conflicts exist between this standard and all applicable local and state regulations, the more stringent requirement shall be adhered to, unless otherwise directed by Eversource.

4.4 Prior and during work, the employee(s) shall understand and adhere to “DIG-SAFE” notifications and marking regulations.

4.5 The employee(s) performing the work shall adhere to all Eversource safety standards and all applicable OSHA and DOT worker safety requirements.

4.6 Do NOT locate handholes, box pads, or splice boxes if there is possibility of it being undermined or covered over.

4.6.1 Avoid locations at low points in final grade or on abrupt slopes.

4.6.2 Avoid locations likely to be covered by plowed snow or made inaccessible.

4.6.3 Avoid locations in a paved way.

4.6.4 Avoid locations in the line to driveways or close to them.

4.7 All handholes and box pads that house splices or supporting equipment shall be located to allow unobstructed and safe access to all sides of it for operation.

4.8 Before the installation, final approval of the location is required by Eversource.

5.0 Excavation & Installation

5.1 A test pit is required at the proposed location of handholes and box pads, prior to installation, when either requirement is met:

5.1.1 The depth of excavation required for installation is greater than 24 inches.

5.1.2 The ledge/large rock outcrops are in the immediate vicinity.

5.2 Test pits shall extend 12 inches beyond the extreme length, width, and depth of the approved handhole or box pad.

5.3 The excavation shall be made to fully accommodate the approved handhole or box pad, along with the following requirements:

5.3.1 A minimum of 12 inches of clearance shall be allowed around the perimeter of the handhole or box pad.

5.3.2 The depth of the excavation shall be a minimum of 6 inches (3 inches for handholes) deeper than the installed underside of the handhole or box pad, to allow for a minimum of 6 inches (3 inches for handholes) of bedding.

5.4 Excavated materials shall be kept at least 2 feet back from edge of the excavation cut.

5.4.1 It shall be piled to not endanger the work or restrict, hamper, or inconvenience owners or tenants of property, or interfere with the normal flow of traffic.

5.4.2 All excess materials not suitable for backfill shall be removed from the job site and disposed of as directed by Eversource.

5.5 The handhole or box pad shall be installed using properly rated lifting equipment, which adheres to OSHA work method requirements.

5.5.1 The handhole or box pad shall be set level on firm well-compacted bedding.

5.6 For recommended minimum clearances from the pad foundation to buildings, building openings, landscaping, or traveled ways refer to Construction Standard **DTR 42.100**.

6.0 Concrete Thrust Block

6.1 A concrete thrust block shall be cast-in-place and formed around the conduit sweeps, due to the occasional shifting and movement of the conduit sweeps as cable is pulled through the conduit.

6.1.1 The top of the concrete thrust block shall be a minimum of 2 inches below the bottom flange of the handhole or box pad.

6.2 A ready-mix batch of 2500 psi concrete shall be used to form the concrete thrust block.

6.3 The forms shall be prepared to the dimensions shown in the applicable construction drawings, see section “Drawings.

6.3.1 Make sure all the ducts are temporarily capped.

6.4 Carefully place the mixed concrete into the forms to a depth, not less than 2 inches, below the installed bottom elevation of the handhole or box pad.

NOTE: This is to allow for the installation of the grounding pig tails which shall be installed over the concrete thrust block and under the handhole or box pad.

6.5 Allow the concrete to set for a minimum of 15 minutes before backfilling.

7.0 Backfill Material

7.1 Do NOT backfill without Eversource approval. Once Eversource approval is obtained, backfilling shall start promptly.

7.2 The handhole or box pad shall be set on mechanically compacted crushed stone (diameter various per drawing), over virgin or mechanically compacted soil. The depth of stone required is noted in the appropriate drawing in the back of this standard.

7.2.1 All deleterious soils including organics, ashes, cinders, shells, or frozen materials shall be removed and replaced with suitable backfill before installing the foundation.

7.3 Backfill material around the sidewalls of the handhole or box pad shall be placed in uniform layers and mechanically compacted to a minimum 6 inch thickness or maximum 12 inch thickness, see the appropriate drawing.

8.0 Pavement Cuts

8.1 The pavement cut shall be straight and uniform.

8.2 All cuts in bituminous or concrete pavement shall be vertical and made with the proper tools to ensure minimum repaving.

8.3 Excavated pavement and street base, if any, shall be kept at least 2 feet back from the edge of the excavation cut.

8.3.1 It shall be piled to not endanger the work or restrict, hamper, or inconvenience owners or tenants of property, or interfere with the normal flow of traffic.

8.3.2 All excess materials not suitable for backfill shall be removed from the job site and disposed of as directed by Eversource.

9.0 Sod Removal

9.1 Sod shall be removed carefully, when possible, in regular and uniform blocks with sharp edged tools.

9.2 Sod shall be placed in uniform piles along the excavation and kept moist until time for relaying.

9.3 The Contractor shall be responsible for reseeding, if necessary, and shall maintain the grass until it has grown.

10.0 Restoration

10.1 Street

10.1.1 Sidewalks and paved areas shall be restored to its original or better condition.

10.1.2 Permanent street paving shall be done by the governing municipality.

10.2 Landscape

10.2.1 Provide sod for the grass areas disturbed by construction activity.

10.2.2 Replace shrubbery and trees damaged by construction activity.

10.2.3 Restore existing grades where disturbed.

11.0 Handholes

11.1 Be sure to read and follow the previous sections of this standard before continuing.

11.2 For approved Eversource handholes see Table 1 in the Bill of Materials.

11.2.1 The handholes could be manufactured with three varied materials:

.1.1. Fiberglass made with re-enforced fibers.

.1.2. HPDE made with plastic.

.1.3. Polymer concrete made of composite fire-retardant materials.

11.3 All handholes with installed splices on secondary cables are NOT required to be grounded.

11.4 Each handhole cover shall be made of material compatible with its use.

11.4.1 Covers shall be fastened with a minimum of two pentahead bolts.

11.5 Fiberglass and HDPE handholes must be installed in unpaved areas, traveled ways or sidewalks, and areas not subject to any incidental traffic.

11.5.1 They shall be installed 2 inches above final grade. See Figure 1.

11.6 Polymer concrete handholes are rated for H20 vehicle load, and are to be used in paved areas or incidental traffic only (i.e. driveway, parking lots, sidewalks). They are NOT intended for public roadways with constant vehicle traffic.

11.6.1 They shall be installed flush with the final grade.

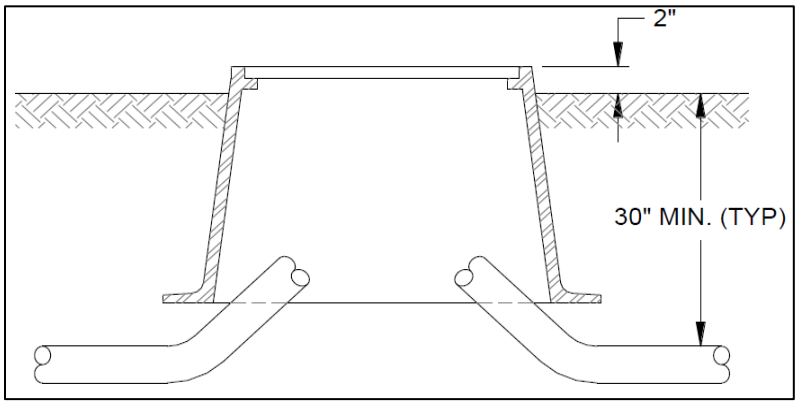


Figure 1 – Handhole Installation (Typical)

12.0 Box Pads

12.1 Be sure to read and follow the previous sections of this standard before continuing.

12.2 For approved Eversource box pads see Table 2 in the Bill of Materials.

12.3 The top surface of a box pad shall be a minimum of 2 inches and a maximum of 4 inches above the surrounding grade.

12.3.1 The minimum clearance is required to open compartment doors.

12.4 The box pad orientation shall be such that its doors open toward the roadway, unless otherwise specified by the Engineer.

12.5 All box pads shall be grounded. Refer to drawings for details.

12.5.1 Install two Copperweld ground rods (5/8 inch diameter preferred), one outside each corner of the box pad.

.1.1. Depth of ground rods shall be at a minimum of 18 inches.

12.5.2 Connect 1/0 AWG bare copper wire to the ground rods by Cadweld or with compression grounding connections.

12.5.3 The grounding connections between the ground wire and ground rods shall be rated for direct-buried applications and either Hy-Ground compression, Cadweld, or mechanical grounding connectors as approved by Eversource.

.3.1. Any connectors used must be bronze/copper.

12.6 Locations where conduits have been installed under a proposed box pad location shall be inspected to ensure that the backfill over the installed conduit has been thoroughly compacted and firm.

12.7 Backfill material to be used for bedding shall be crushed stone with 3/4 inch diameter at a minimum thickness of 12 inches.

13.0 Secondary Bus Enclosure

13.1 A 600 volt secondary bus enclosure (SBE) does NOT have a specified box pad with an Eversource item number associated for it.

13.2 For installation of a 600 volt secondary bus enclosure box pad follow the construction drawing for single-phase or three-phase primary splices in Figure 6.

13.2.1 The secondary bus enclosure shall be installed on a box pad sized properly to fit the manufacturer requirements of the structural supporting frame and the pad enclosure, which houses the secondary bus.

13.2.2 Refer to Material Standard **M2301** for termination and buswork pad-mounted enclosures for more information.

14.0 Drawings

14.1 Installation details for typical fiberglass box pads supporting switches and transformers are listed below.

- Figure 2 – PME-9 Switch, 15 kV
- Figure 3 – PME-9 Switch, 25 kV
- Figure 4 – PVI-9 Switch, 15 kV
- Figure 5 – Transformer, Single-Phase
- Figure 6 – Splices, Single & Three-Phase Primary with #1 AWG Al ONLY
- Figure 7 – Splice, Three-Phase Primary
- Figure 8 – Single-Phase Primary CSS Junction Enclosure, 15 & 25 kV
- Figure 9 – Three-Phase Primary CSS Junction Enclosure, 15 & 25 kV

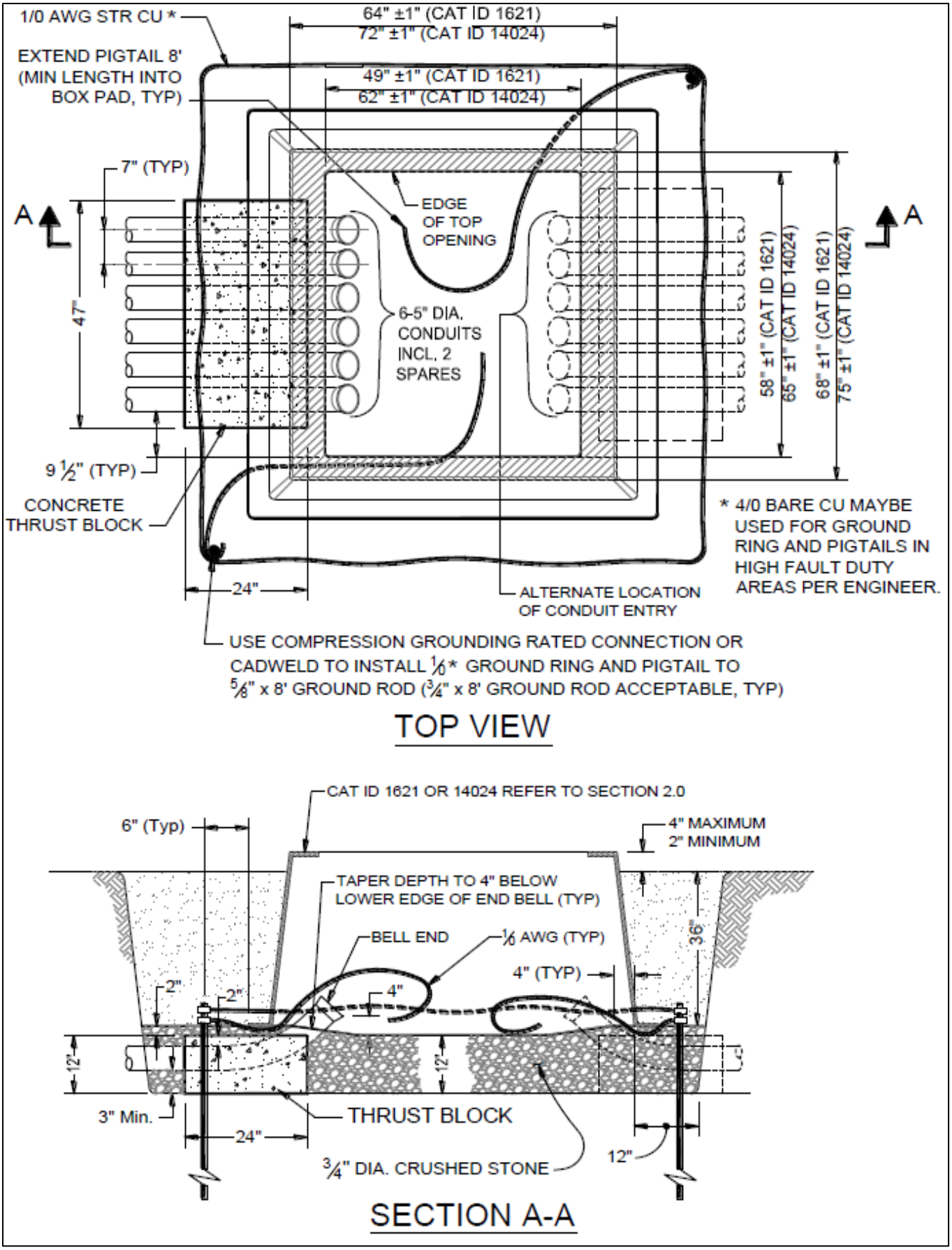


Figure 2 – 15 kV PME-9 Switch Fiberglass Box Pad

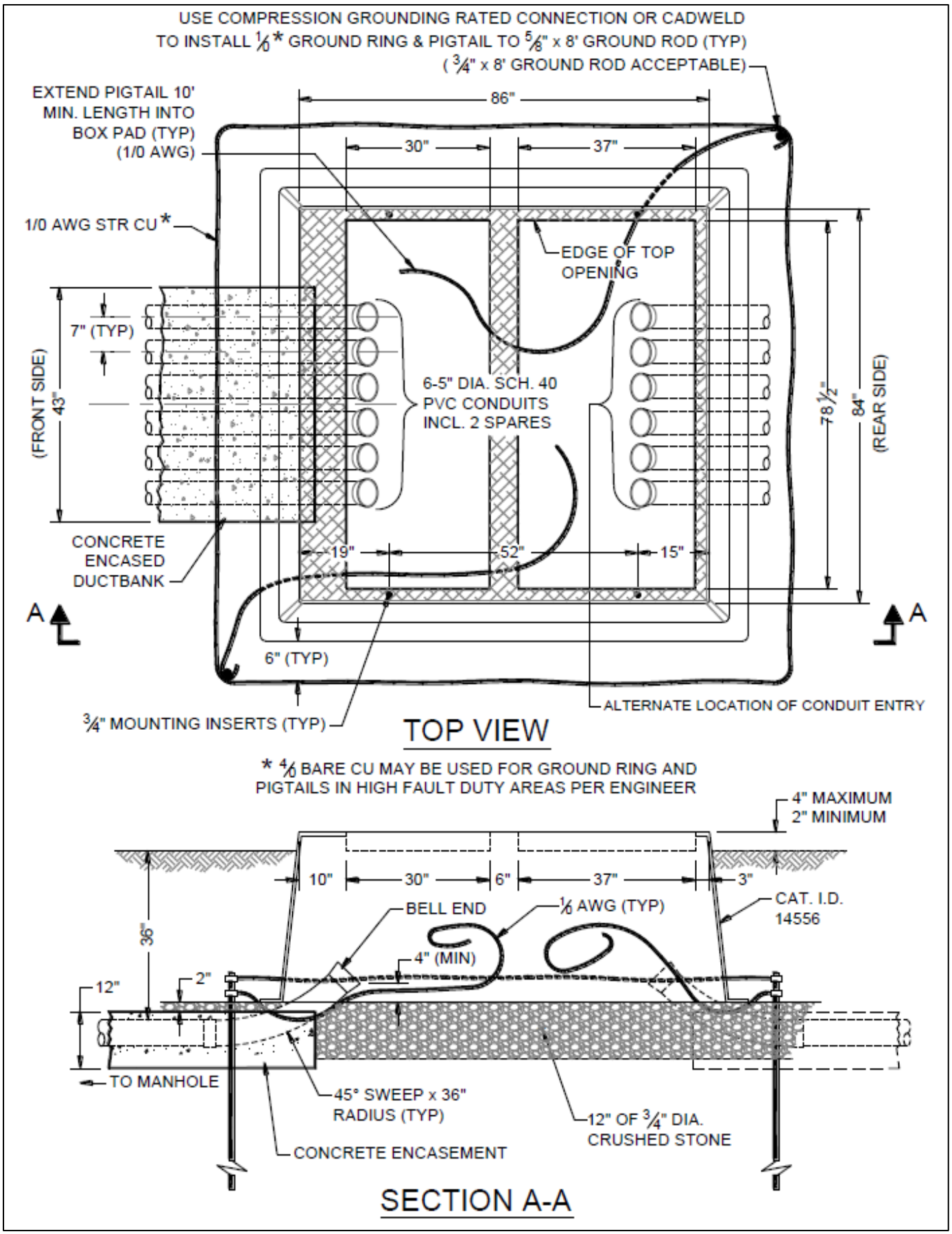


Figure 3 – 25 kV PME-9 Switch Fiberglass Box Pad

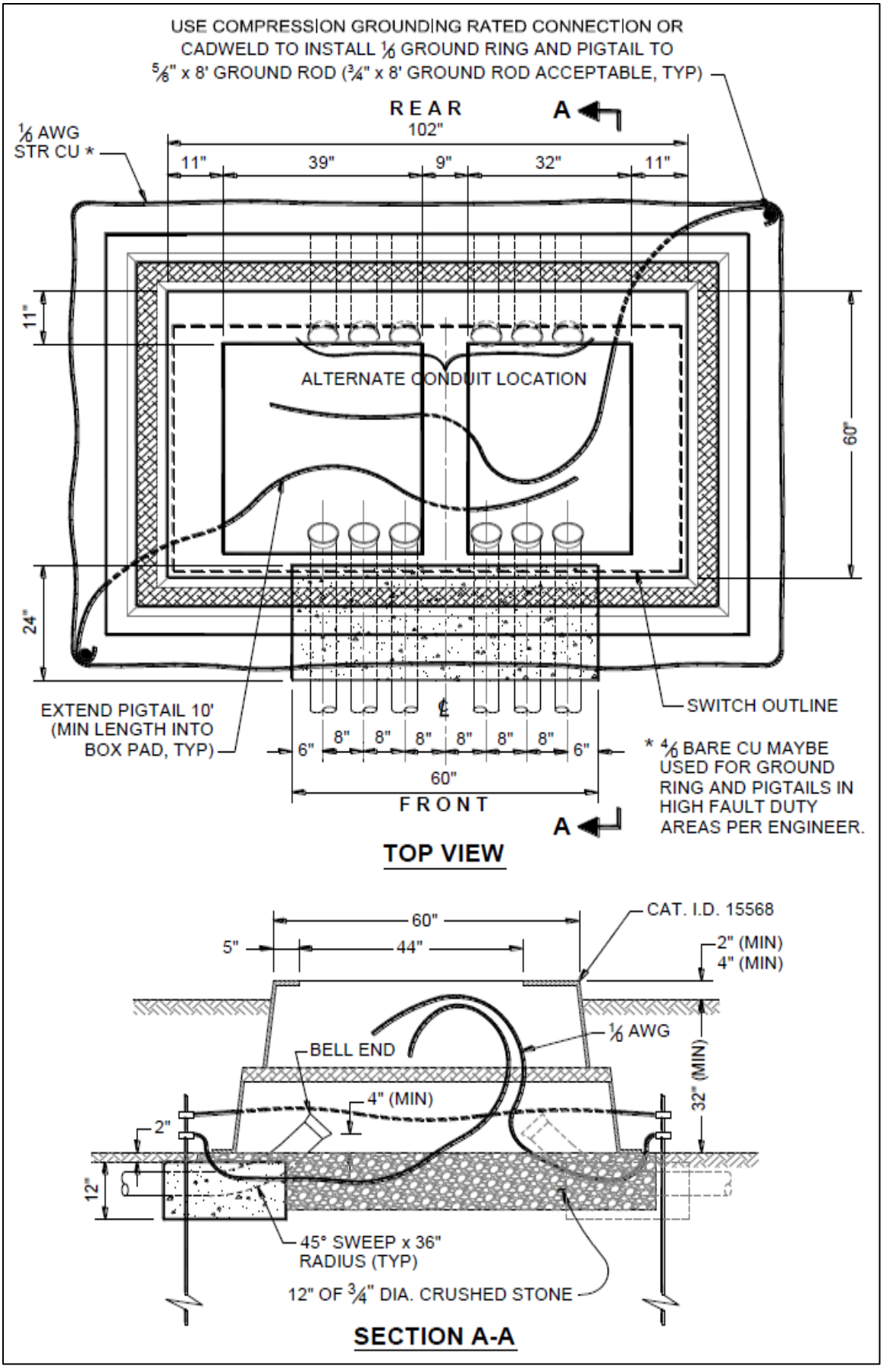


Figure 4 – 15 kV PVI-9 Switch Fiberglass Box Pad

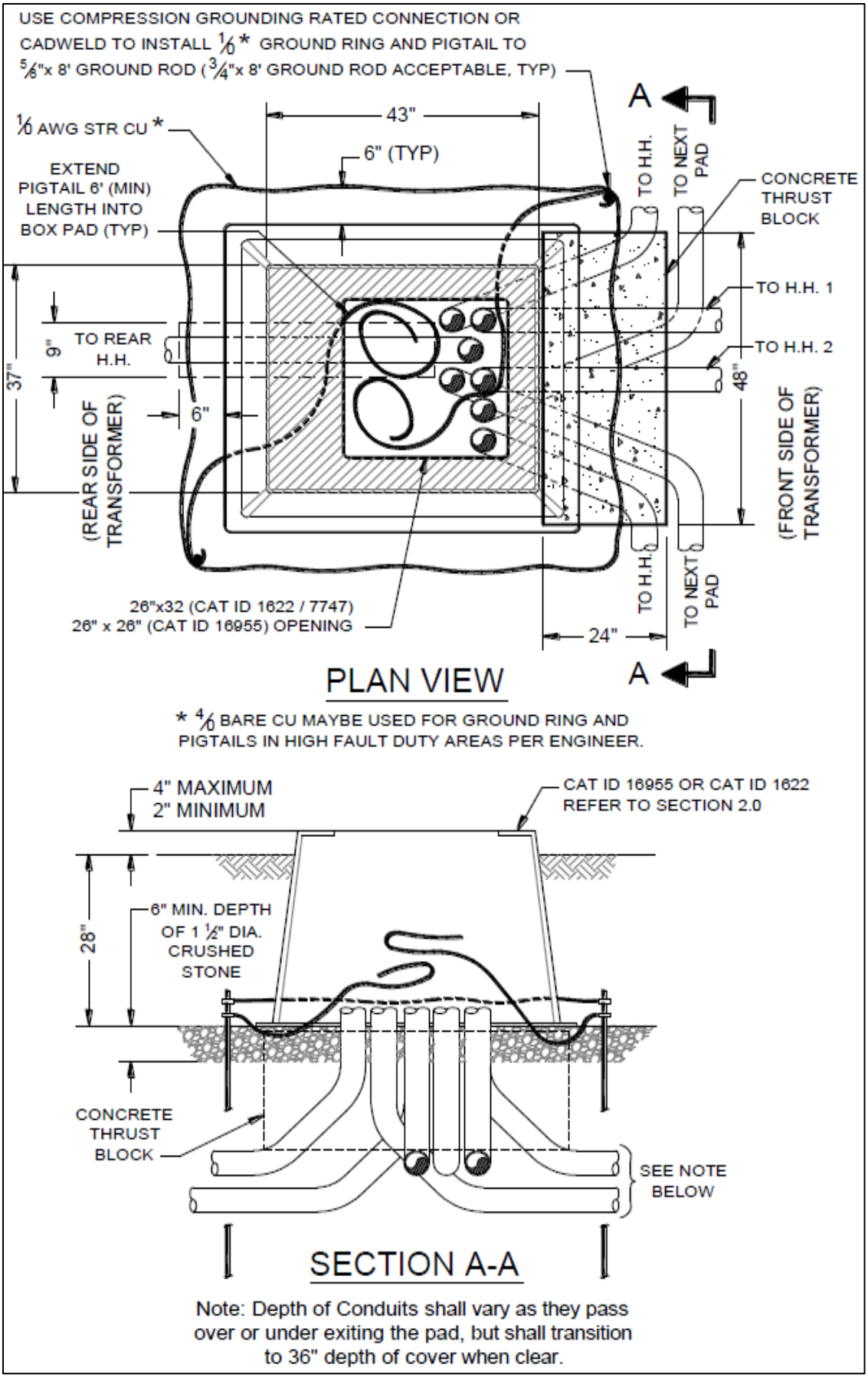


Figure 5 – Single-Phase Transformer Fiberglass Box Pad

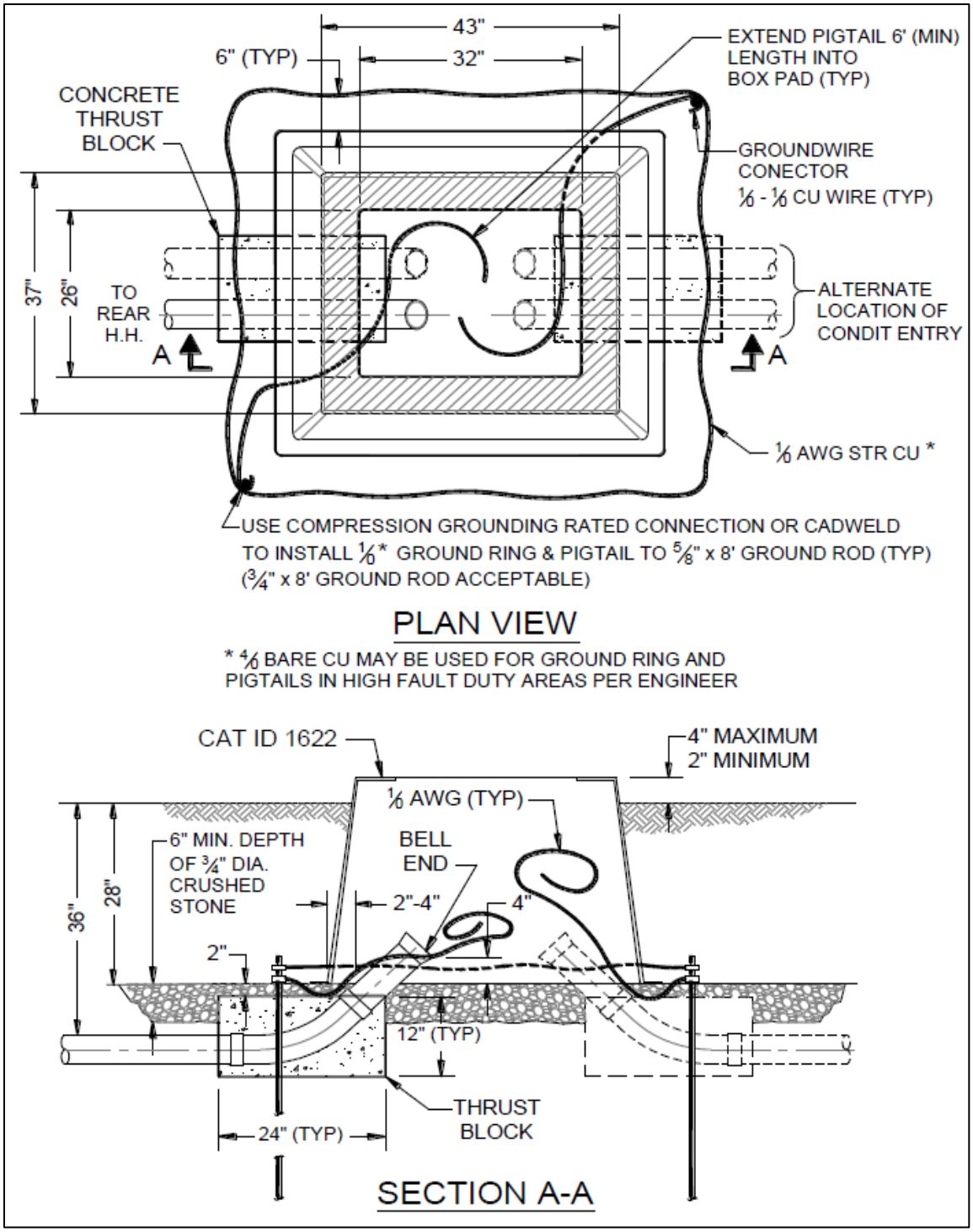


Figure 6 – Single & Three-Phase Primary Splices Fiberglass Box Pad (#1 AWG Al ONLY)

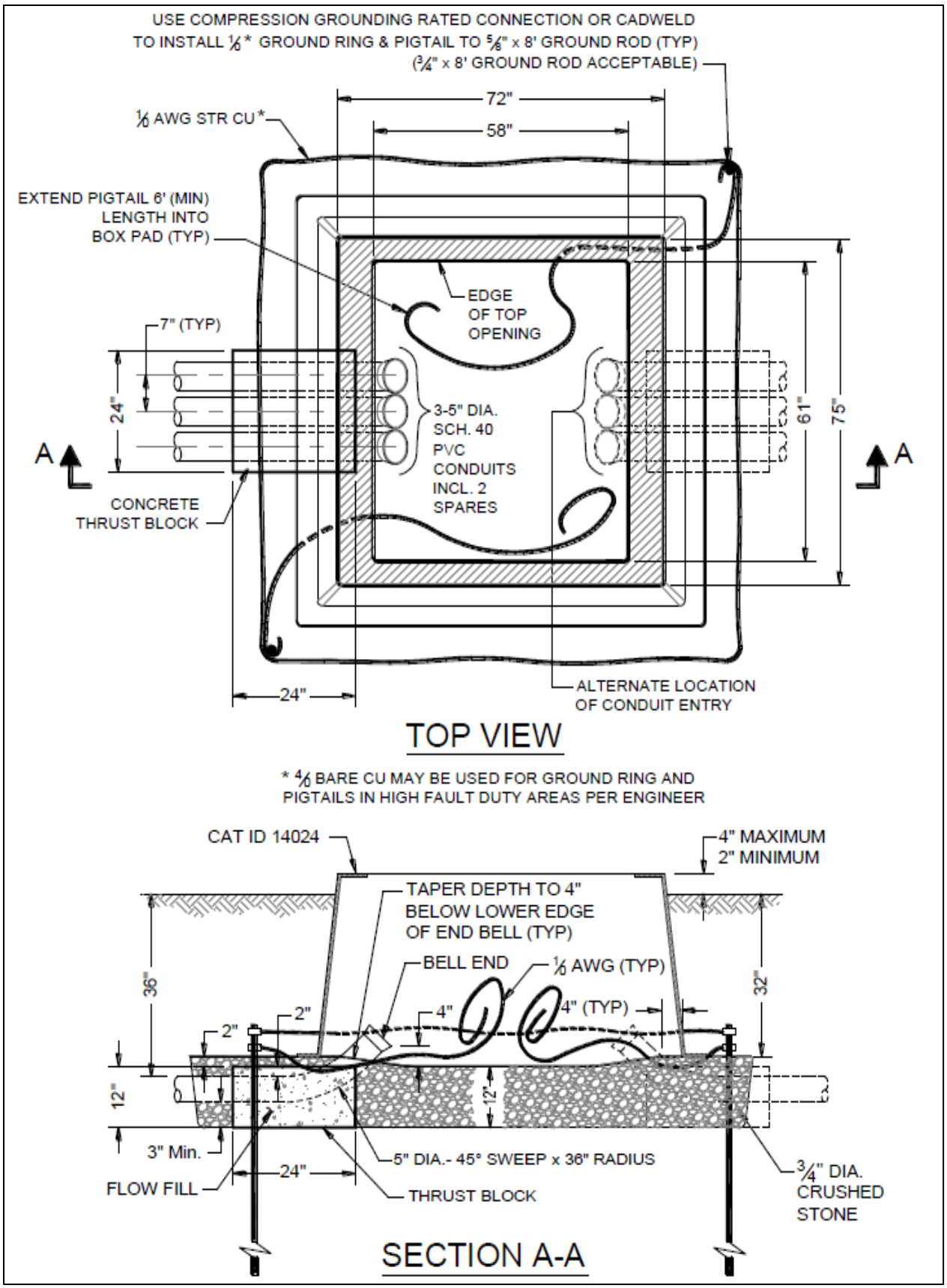


Figure 7 – Three-Phase Primary Splice Fiberglass Box Pad

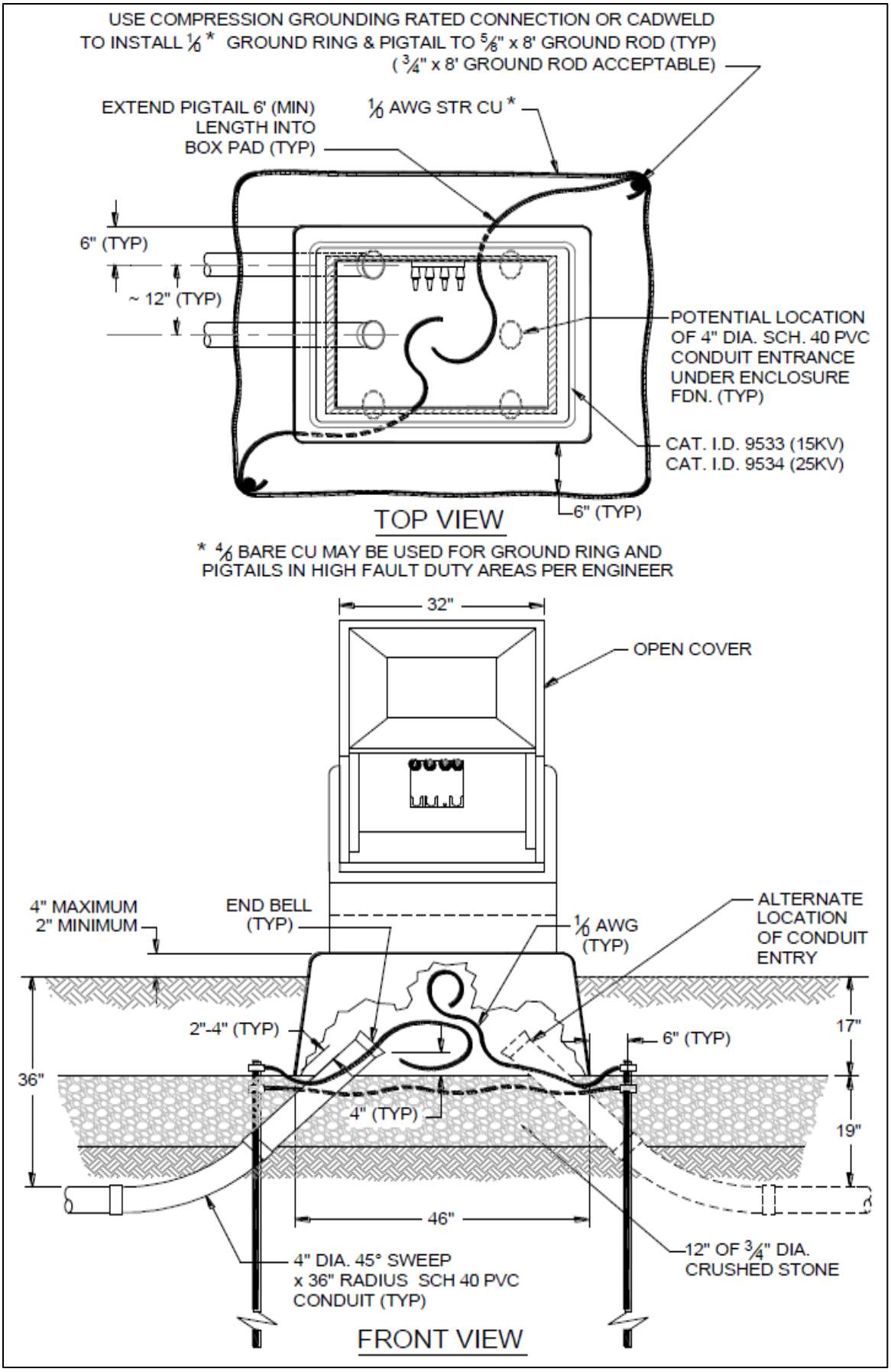


Figure 8 – Single-Phase Primary CSS Junction Enclosure, 15 & 25 kV

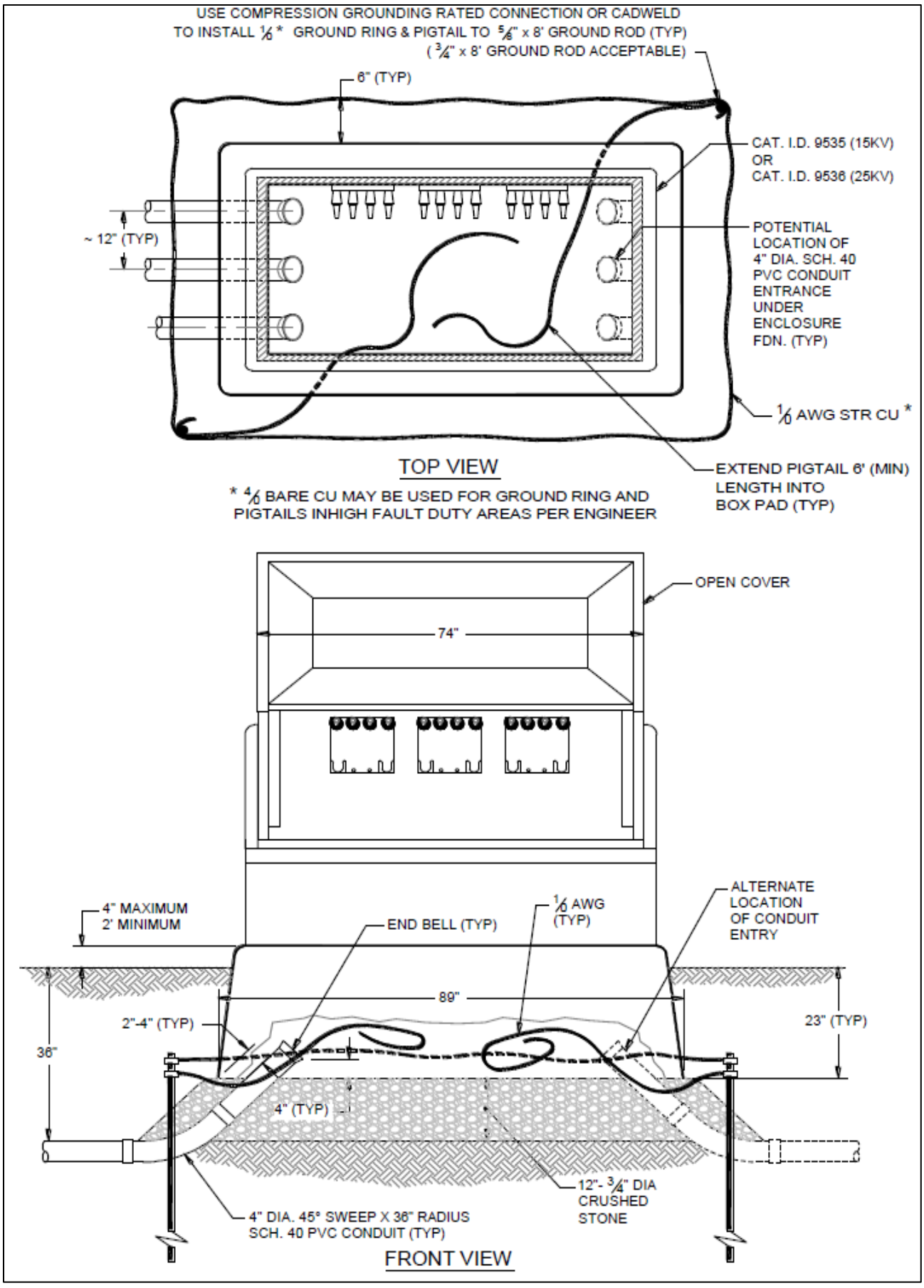


Figure 9 – Three-Phase Primary CSS Junction Enclosure, 15 & 25 kV

Construction Standard Variation		Construction Reference Document
A	Fiberglass Handhole (street light only) 15Lx10Wx12D	DTR63.102.0A
B	Fiberglass Pad for PME-9 Switch 15kV Manufactured after Jan 2001	DTR63.102.0B
C	Fiberglass Handhole 23Lx14Wx15D	DTR63.102.0C
D	Fiberglass Handhole (standard use) 30Lx17Wx18D	DTR63.102.0D
E	Polymer Concrete Handhole 30x17x18	DTR63.102.0E
F	Fiberglass Pad for PME-9 Switch 15 kV Manufactured before Jan. 2001	DTR63.102.0F
G	Fiberglass Pad for PME-9 Switch 25 kV (two pieces)	DTR63.102.0G
H	Fiberglass Pad for PVI-9 Switch 15 kV (two top openings)	DTR63.102.0H
I	EMA North Single-Phase Transf & Base for Old Compact Style CSS Encl.	DTR63.102.0I
J	EMA North Single-Phase Transf (shallow depth)	DTR63.102.0J
K	EMA South Single-Phase Transf	DTR63.102.0K
L	Single & Three-Phase Prmary Splices with 3 - #1 AWG Aluminum ONLY	DTR63.102.0L
M	Three-Phase Prmary Splice	DTR63.102.0M

Item Quantity

UM = Unit of Measure

	M	L	K	J	I	H	G	F	E	D	C	B	A	UM	Item Description	Item Number	
													1	EA	Fiberglass Handhole (street light) only 15Lx10Wx12D	574316	
	1											1		EA	Fiberglass Pad 75Lx72Wx36D with top opening 65x62	579185	
	1											1		EA	Base Cover to use with Pad	579274	
												1		EA	Adapter plate to fit newswitch on old base	579186	
											1			EA	Fiberglass Handhole 23Lx14Wx15D	577332	
										1				EA	Fiberglass Handhole (standard use) 30Lx17Wx18D	574317	
									1					EA	Polymer Concrete Handhole 30x17x18	521914	
								1						EA	Fiberglass Pad 68Lx64Wx36D with top opening 59x50	574476	
								1						EA	Base Cover to use with Pad	574634	
							1							EA	Fiberglass Pad for PME-9 Switch 25 kV (two pieces)	579493	
							1							EA	Base Cover to use with Pad	579494	
						1								EA	Pad: 102 L x 60 W x 36 D (two top openings)	580329	
		1			1									EA	Fiberglass Pad 43Lx37.5Wx32D with top opening 26x32	574477	
		1		1	1									EA	Base Cover to use with Pad (opening 26x32)	574633	
				1										EA	Pad: 43 L x 37.5 W x 15 D (top opening = 26 x 32)	575743	
			1											EA	Pad: 43 L x 37 W x 32 D (top opening = 26 x 26)	581386	
														EA	FG Pad for Single-Phase Pri Cable Switching Sta, 15 kV	577181	
														EA	FG Pad for Single-Phase Pri Cable Switching Sta, 25 kV	577182	
														EA	FG Pad for Three-Phase Pri Cable Switching Sta, 15 kV	574926	
														EA	FG Pad for Three-Phase Pri Cable Switching Sta, 25 kV	577183	

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Proposal No. 606082-129855

Construction Standard Variation		Construction Reference Document
N	FiberglassPad for Single-Phase Primary Cable Switching Station, 3x4 multitap, 15kV	DTR63.102.0N
O	FiberglassPad for Single-Phase Primary Cable Switching Station, 3x4 multitap, 25kV	DTR63.102.0O
P	FiberglassPad for Three-Phase Primary Cable Switching Station, 3x4 multitap, 15kV	DTR63.102.0P
Q	Fiberglass Pad for Three-Phase Primary Cable Switching Station, 3x4 multitap, 25kV	DTR63.102.0Q
R		
S		
T		
U		
V		
W		
X		
Y		
Z		

UM = Unit of Measure

Item Quantity

	Z	Y	X	W	V	U	T	S	R	Q	P	O	N	UM	Item Description	Item Number	
													1	EA	FG Pad for Single-Phase Pri Cable Switching Sta, 15 kV	577181	
												1		EA	FG Pad for Single-Phase Pri Cable Switching Sta, 25 kV	577182	
											1			EA	FG Pad for Three-Phase Pri Cable Switching Sta, 15 kV	574926	
										1				EA	FG Pad for Three-Phase Pri Cable Switching Sta, 25 kV	577183	

Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1215 Revision #0 Page 1 of 5

M1215
****This standard supersedes COM Electric Construction Standard NE-17B

PRECAST CONCRETE MANHOLE
6'- 0"W x 13'-0"L X 6'-6"H INSIDE DIMENSIONS

1.0 Scope – This specification details the dimensions, strength, reinforcement, and appurtenances required for fabrication of precast, concrete manholes.

2.0 General – Vendor design and fabrication drawing shall conform to the minimum requirements of this specification and shall be signed and stamped by a Massachusetts registered professional engineer.

3.0 Design Notes

3.1 Concrete minimum strength - 5000 psi @ 28 days.
3.2 Steel reinforcement - ASTM A615, Grade 60.
3.3 Minimum Steel Cover – 1-1/2 inch.
3.4 Design Loading - AASHTO HS20-44.
3.5 Design Specifications – ACI 318 & AASHTO Load Factor Design Method.
3.6 Manufacturer's name to be stenciled on vertical wall of access chimney.
3.7 Construction Joint – Sealed with 1" diameter Butyl Rubber.

4.0 Bill of Materials

4.1 The catalog ID for the precast manhole is 580126.

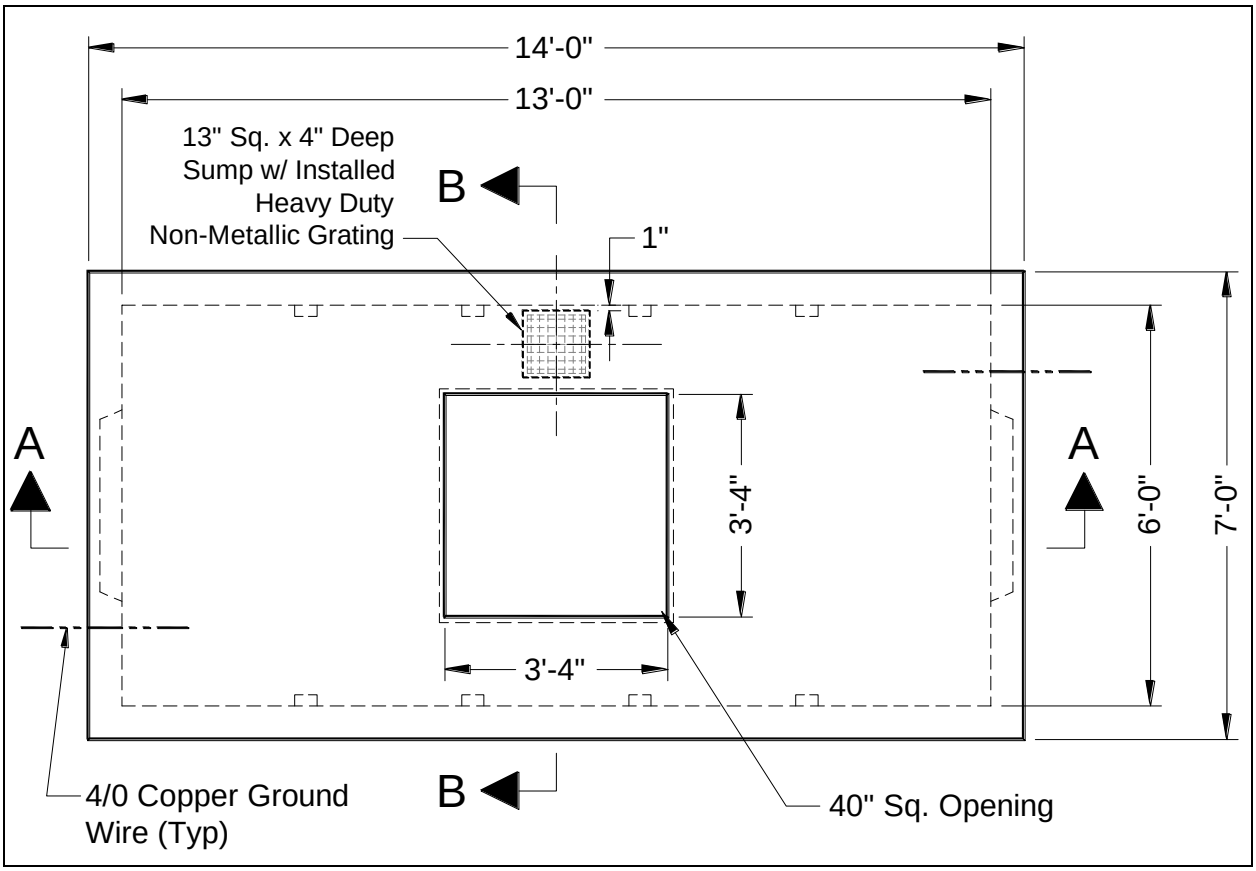
4.2 The catalog ID's for the "1", "2" & "3" position stanchions are "574697", "574698" & "574699" respectively.

4.3 The catalog ID for the bonding frame is "574379". Bonding frame consists of 1 - #4/0 stainless steel ground clamp, 1 - #10 x 1-1/2" lg x 5/16" dia SS screw and 1- lead plug as supplied by Tools Unlimited Inc, Stoughton, MA (or approved equal).

4.4 The recessed pulling eye, "New PI-2", shall be manufactured by Pennsylvania Insert Corp., Spring City, PA (or approved equal).

4.5 The sump grate shall be "Polylock Part No. 3037" as manufactured by Polylock Corp., Wallingford, CT (or approved equal).

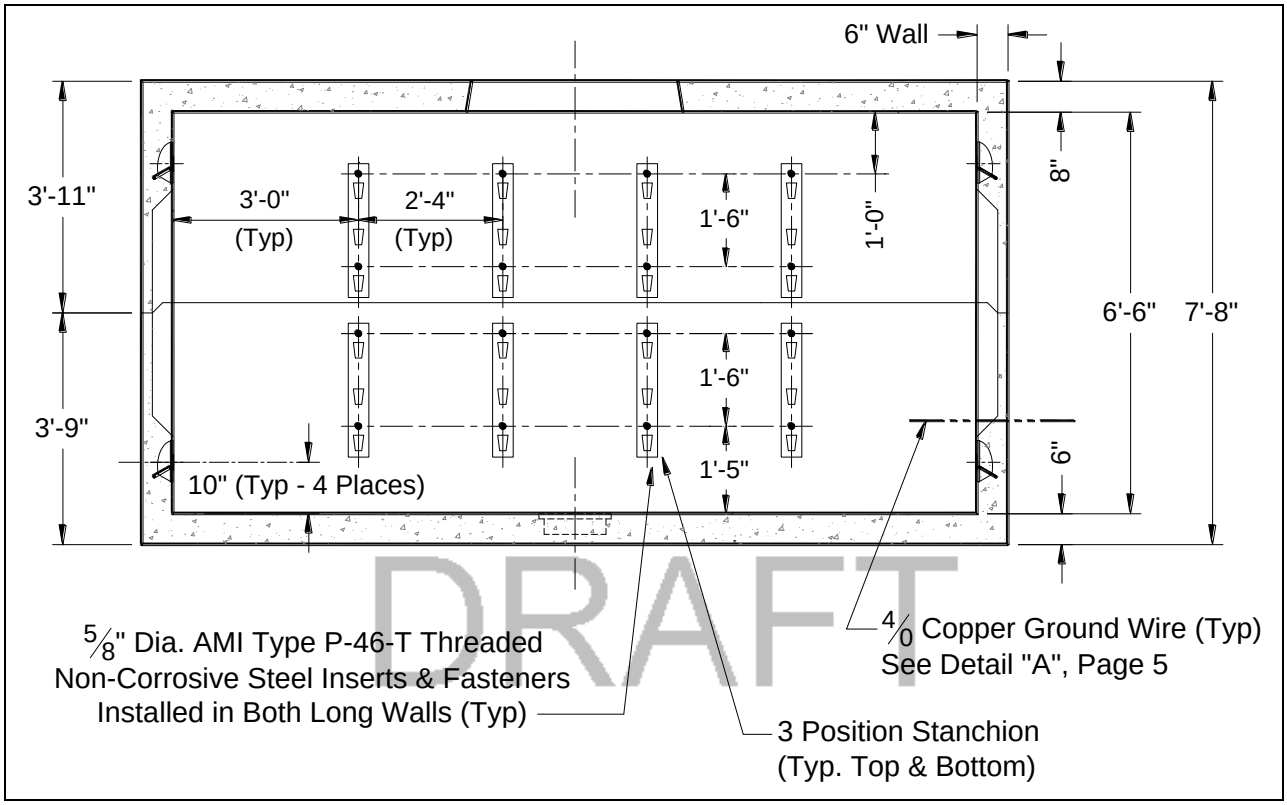
Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1215 Revision #0 Page 2 of 5



PLAN VIEW

NOTE: DRAWING IS NOT TO SCALE

Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1215 Revision #0 Page 3 of 5



SECTION A-A

NOTE: LONG WALLS ARE MIRROR IMAGES.
DRAWING IS NOT TO SCALE.

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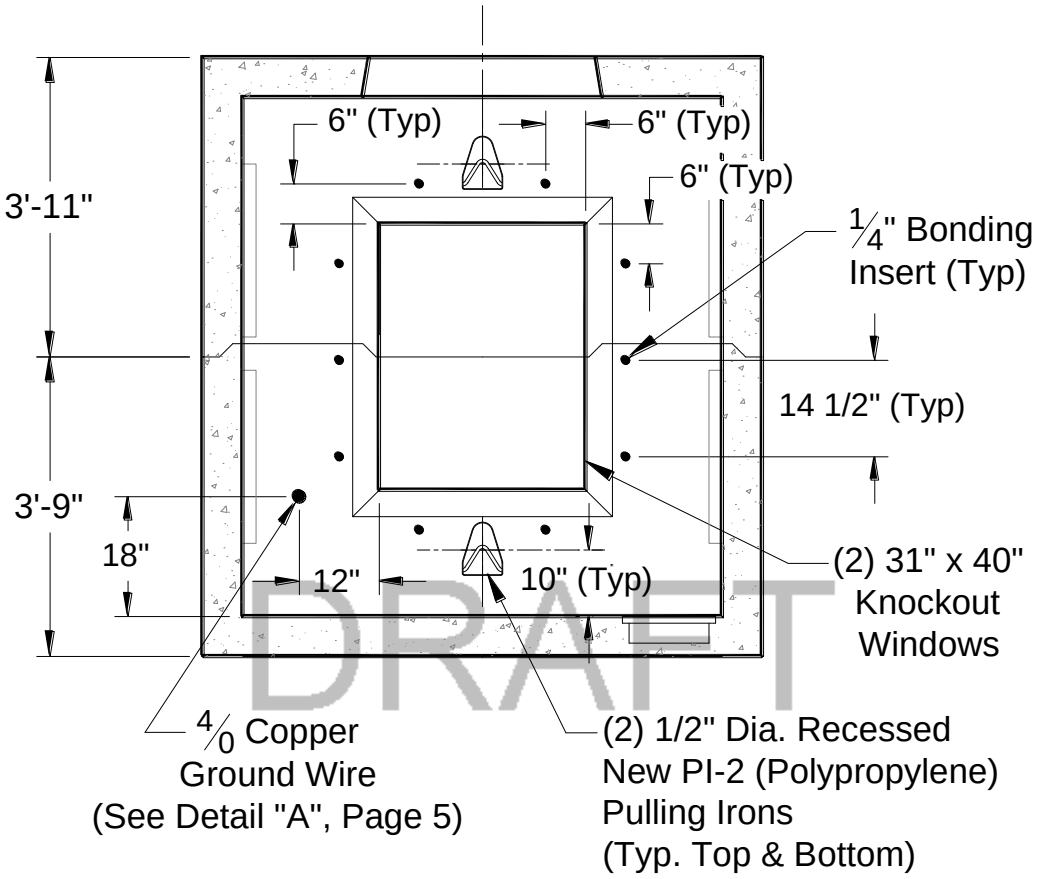
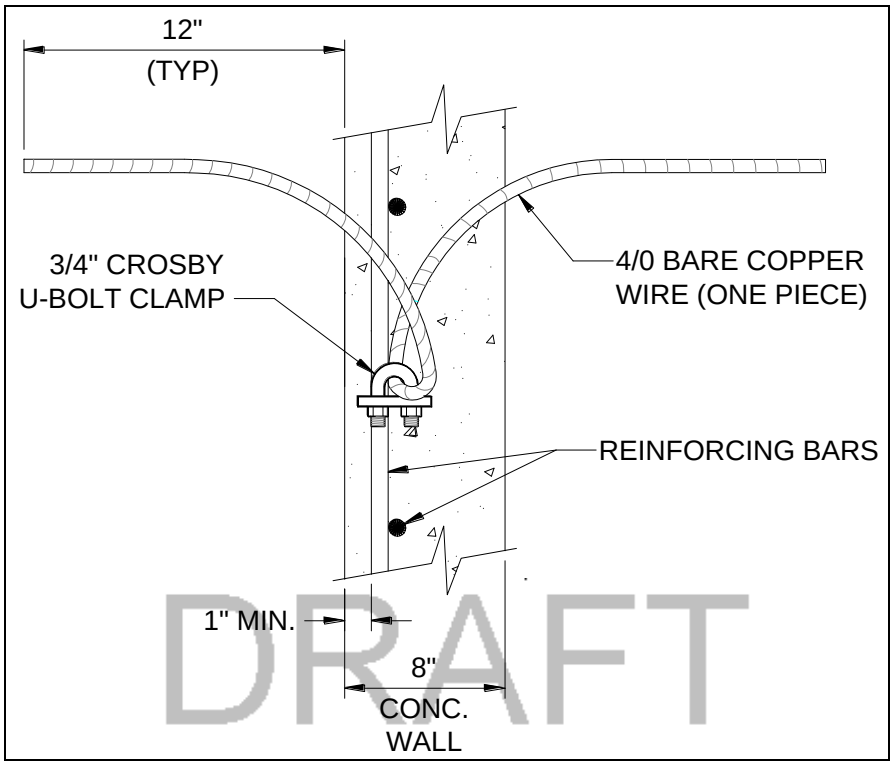


SECTION B-B

NOTE: SHORT WALLS ARE MIRROR IMAGES.
DRAWING IS NOT TO SCALE.

Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1215 Revision #0 Page 5 of 5



DETAIL "A"

NOTE: DRAWING IS NOT TO SCALE

Approved by: Elizabeth J. Leonard
Manager, Distribution
Technical Engineering

Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1216 Revision 0 Page 1 of 4

M1216
****This standard supersedes COM Electric Construction Standard NE-15B****

PRECAST CONCRETE – PRIMARY PULL BOX FOUNDATION 5'-0" x 5'-0" x 5'-0" H INSIDE DIMENSIONS

1.0 Scope – This specification details the dimensions, strength, reinforcement, and appurtenances required for fabrication of precast concrete foundation.

2.0 General – Vendor design and fabrication drawing shall conform to the minimum requirements of this specification and shall be signed and stamped by a Massachusetts registered professional engineer.

3.0 Design Notes

3.1 Concrete minimum strength - 5000 psi @ 28 days.
3.2 Steel reinforcement - ASTM A615, Grade 60.
3.3 Minimum Steel Cover – 1 inch.
3.4 Design Loading - AASHTO HS20-44.
3.5 Design Specifications – ACI 318 & AASHTO Load Factor Design Method.
3.6 Manufacturer's name and year of fabrication to be stenciled on vertical wall of access chimney.
3.7 All Termaducts to have bell ends flush with the inside wall.
3.8 Construction Joint – Sealed with 1" diameter Butyl Rubber or approved equal.

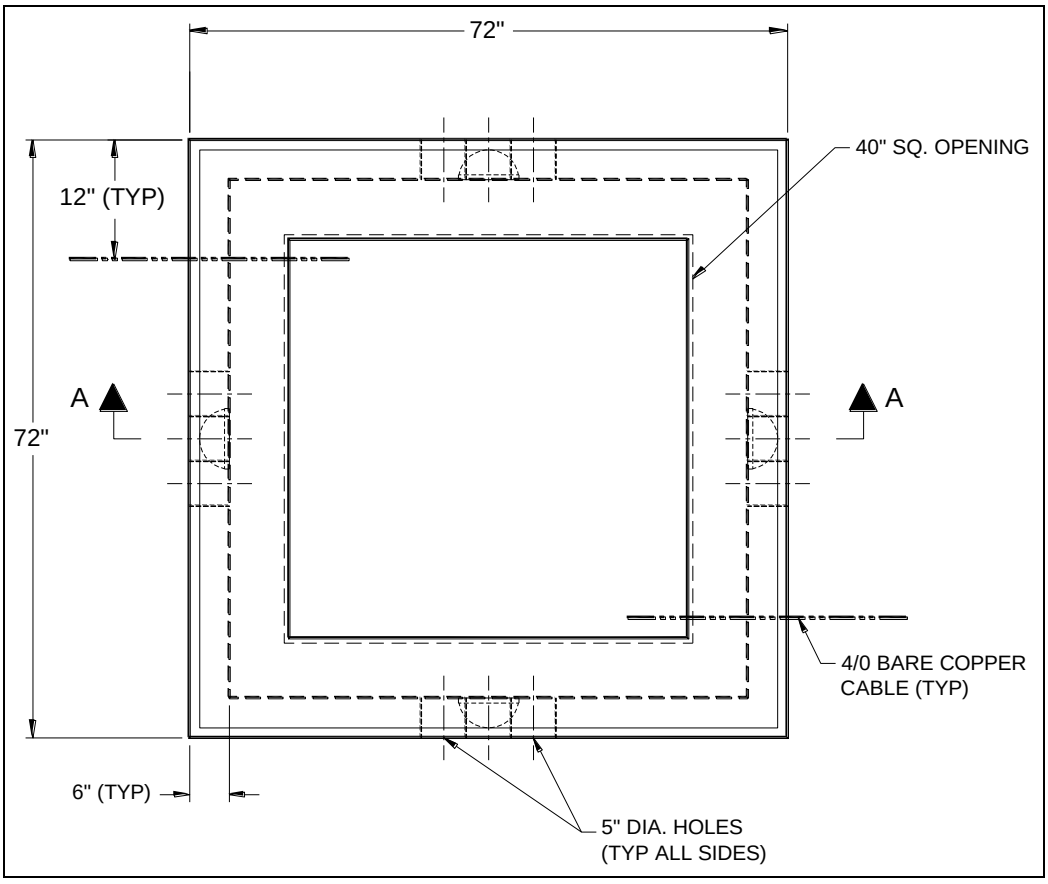
4.0 Bill of Materials

4.1 The catalog ID for the precast manhole is "577043".

4.2 The catalog ID for the bonding frame is "574379". Bonding frame consists of 1- #4/0 stainless steel ground clamp, 1 - #10 x 1-1/2" lg x 5/16" dia SS screw and 1- lead plug as supplied by Tools Unlimited Inc., Stoughton, MA (or approved equal).

4.3 The recessed pulling eye, "New PI-2", shall be manufactured by Pennsylvania Insert Corp., Spring City, PA (or approved equal).

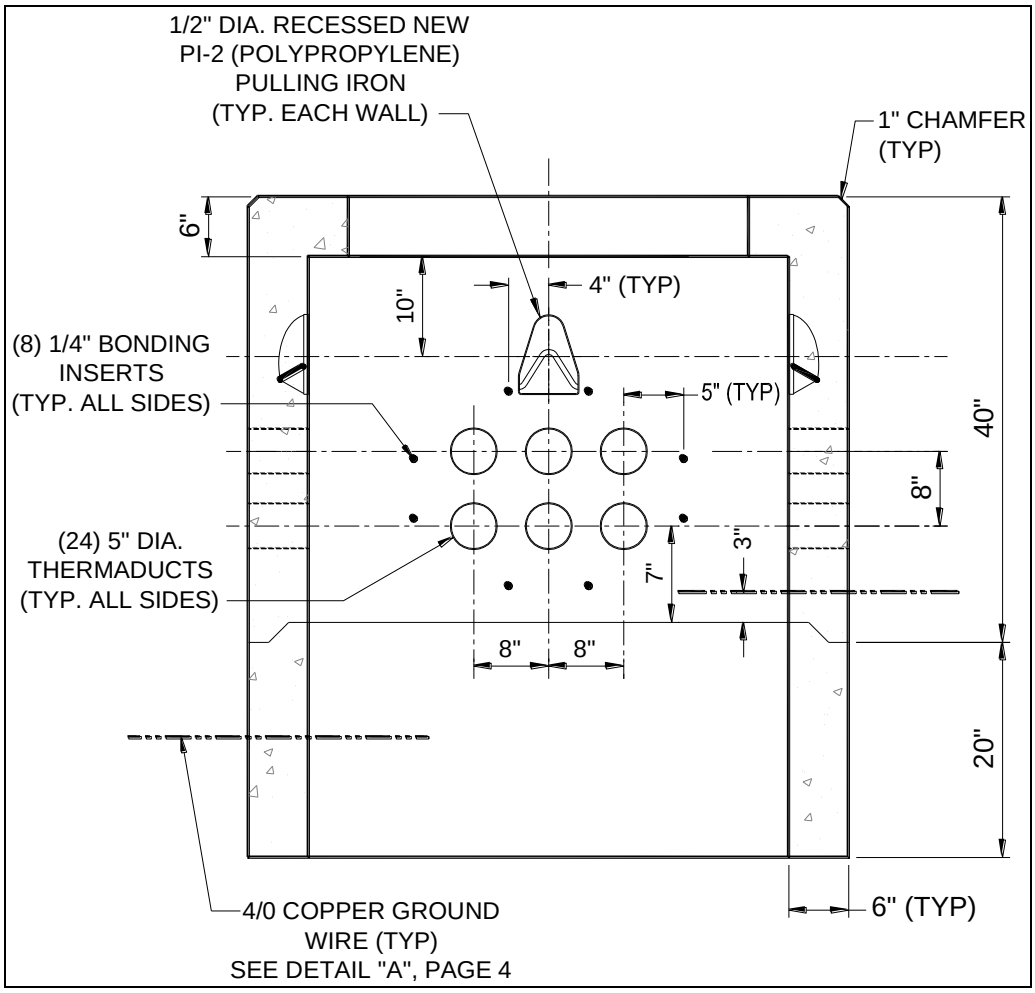
Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1216 Revision 0 Page 2 of 4



PLAN

NOTE: DRAWING IS NOT TO SCALE

Issued 13-Aug-07	MATERIAL STANDARD ELECTRIC OPERATIONS ORGANIZATION NSTAR ELECTRIC	M1216 Revision 0 Page 3 of 4



SECTION A-A

NOTE: DRAWING IS NOT TO SCALE

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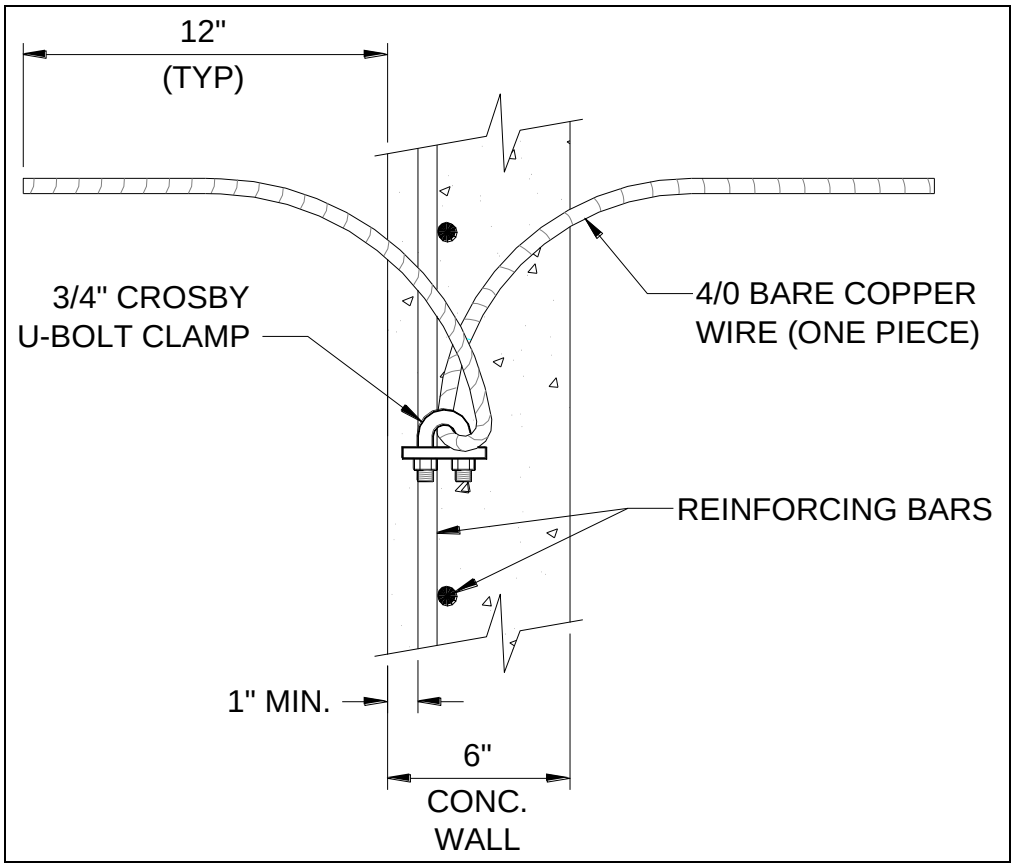

DETAIL "A"

NOTE: DRAWING IS NOT TO SCALE

Approved by: Elizabeth J. Leonard
Manager, Distribution
Technical Engineering

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DOCUMENT A00823

VERIZON TELECOMMUNICATIONS SPECIFICATIONS

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Verizon Telecommunications Specifications

1. Manholes

1.1. Applications

All Verizon communication manhole locations.

1.2. Type

Standard two piece 38Y-1 (6'-0" x 12'-0" x 7'-0" inside dimensions) telephone company communications vault with 24-4" termaducts, 26-½" racking inserts, pulling eyes, sumps and bonding connections.

1.3. Installation

Manholes to be installed level and plumb with a 24" cover on a 12" bed of ¾" gravel. Joint to be sealed with a butyl rubber gasket or equivalent. Installation includes 24" masonry chimney capped with Verizon specific frame and cover on a grout seal. Galvanized steel loop to be placed in the chimney near top for ladder hooks. Galvanized racking and ladder may be left in manholes for telephone company to assemble.

1.4. Accessories

1.4.1. Racking

Verizon standard steel cable racking with support arms galvanized hot dipped to ASTM A153 or mechanical to B695-91.

1.4.2. Ladder

Verizon standard 8' hooked steel ladder galvanized hot dipped to ASTM A153 or mechanical to B695-91.

1.4.3. Frame & Cover

Verizon specific frame with 30" logo cover.

1.5. Providers

The following companies are familiar with Verizon requirements but suppliers are not limited to:

Manholes and Racking:

Chase Precast East Brookfield Rd. 70 N. Brookfield, MA 01535 508-967-8312	Rotundo Precast 41 Almeida Ave Rehoboth, MA 02769 508-336-7600	Utility Precast PO Box 157 153 Cranberry Hwy West Wareham, MA 02576 508-291-1314

Frames & Covers:

East Jordan Iron Works P.O. Box 439 East Jordan, MI 49727 800-874-4100	LeBaron Foundry P.O. Box 746 14 East Union St. Brockton, MA 02303 508-586-3130

Verizon Telecommunications Specifications

2. Conduit

2.1. Applications

All Verizon communication conduit.

2.2. Type

Industry standard type "C" 4 inch Heavy Wall PVC to conform to GTS 8342 or AT&T 8546 or PTS-77 or NEMA TC 10 requirements. Minimum wall thickness to be 0.149 inches. Use only preformed bends and couplings. No hot bending allowed.

2.3. Installation

2.3.1. Duct formation, including concrete encasement, to have 24" minimum cover.

2.3.2. Ducts to be placed on spacers to provide 1" separation between conduits and a 2" envelope around duct bank for concrete encasement. Spacers lock vertically and horizontally. Spacers shall not exceed 8 ft. intervals and shall be placed at each coupling. Intermediate spacers to be used as a cap on the top tier of the duct bank to prevent floating during the pour.

2.3.3. Concrete to be minimum 2000 psi. Vibrator to be used during placement to eliminate gaps between ducts.

2.3.4. Pole sweeps and ducts capped in dirt will not have encasement the last 4' to facilitate relocation and/or future extension. Ducts terminating at pole bases and in dirt for future to have 4" universal plugs.

2.3.5. All ducts terminated in vaults or at base of poles to be roped pneumatically or mechanically for identification and continuity verification.

2.3.6. Minimum 4' radius for all sweeps, including pole sweeps.

2.4. Accessories

2.4.1. Pull Rope

Pull rope to be mule tape, 1500 pound test or greater.

2.4.2. Spacers

Standard 4" spacers to provide at least 1" separation between ducts

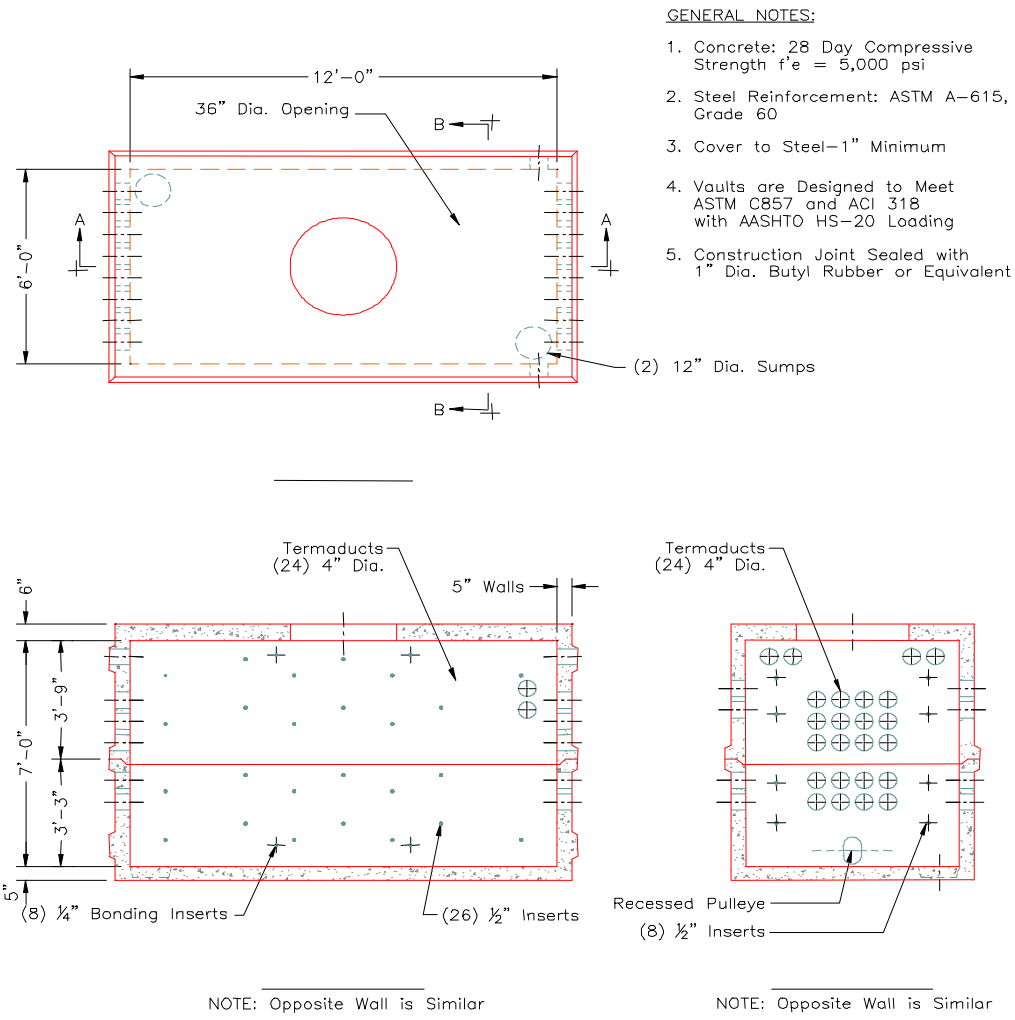
2.4.3. Caps

Standard Universal Plugs with rings to tie pull ropes and provide protection and support to unterminated ducts.

Verizon Telecommunications Specifications

3. Drawings/Attachments

3.1. 38Y-1 Manhole



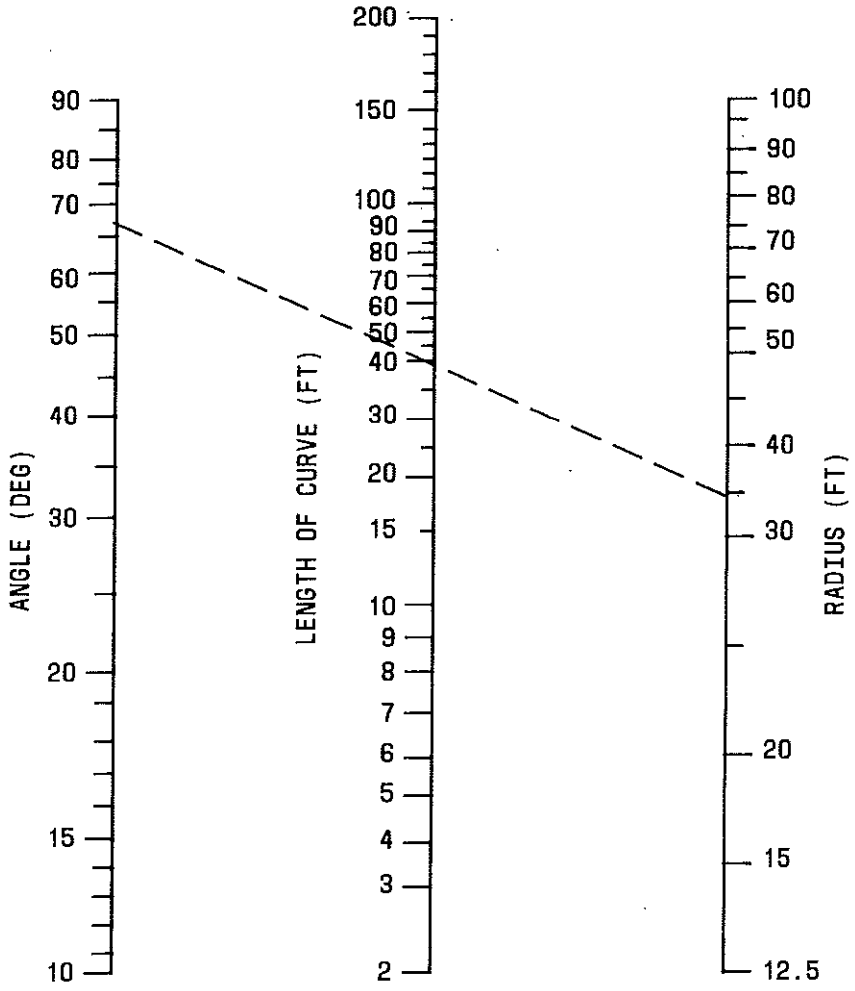
03/04/22

CONDUIT
Curve Design

CURVE DESIGN

Practice 919–240–100

The length of a curve can be found using the following nomogram. (Example: The length of a 64–degree, 35–foot radius curve is 40 feet.)



Subsidiary Conduit

Plastic Conduit. Curves are formed using rigid bends (see Pages 8–21).

Steel Pipe. Bends are formed on the job site using a portable pipe bender (see Practice 622–315–200).

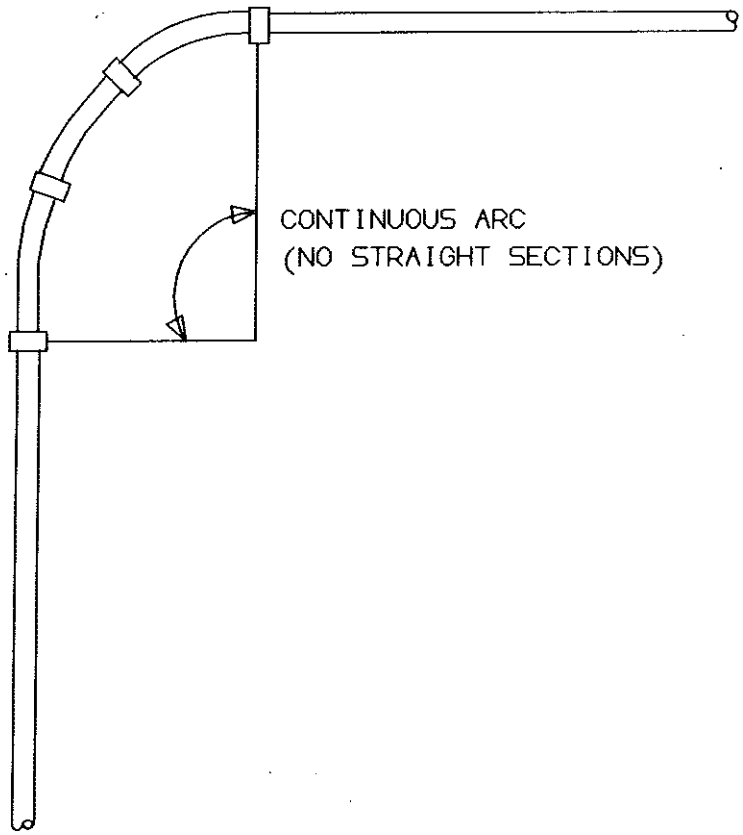
Single–Bore Conduit

Curve Radius 40 Feet or More

Plastic Conduit – Manually bend straight conduit. Conduit must be firmly anchored in trench.

Curve Radius Less Than 40 Feet

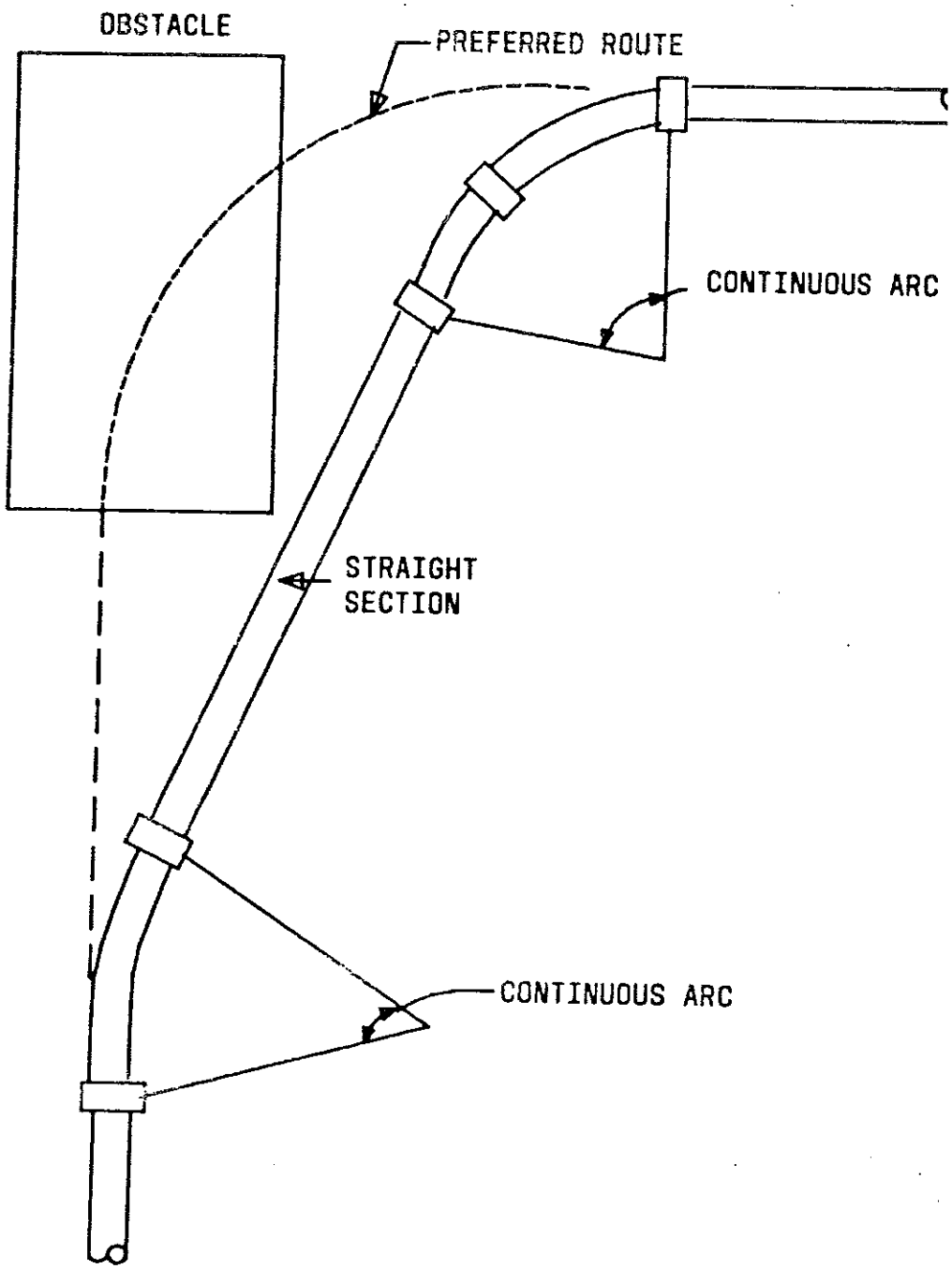
Construct curve in one continuous arc, if possible, using rigid bends without interspersed straight sections, as illustrated below.



For plastic conduit use 15–foot radius bends (7 or 30 degrees, as required. Rigid bends are described on Pages 8–20.

If an obstacle prevents construction of the curve in a single arc, use two arcs connected by a single straight section, as illustrated on Page 8–18.

CONDUIT
Curve Design



CONDUIT AND PIPE

Practice 919–240–400

Factors to Consider in Selecting Type of Conduit

- Material cost and local availability
- Ease of handling
- Ease of joining
- Concrete encasement and backfill requirements
- Soil conditions
- Special conditions (e.g., heat, gas, heavy loads, limited cover).

Advantages of Single–Bore Conduit:

- Lightweight: mechanical handling equipment not required
- Good joint integrity
- Strong, stable structure (if concrete–encased)
- Easily rearranged to avoid obstacles
- Can be pneumatically rodded.

Advantages of Multiple–Bore Conduit

- Long trench openings not required
- Select backfill not required
- Ready–mixed concrete not required.

CONDUIT
Conduit and Pipe

Single–Bore Conduit

Practices 622–020–100, 919–240–400

Straight lengths of single–bore conduit are available as follows:

Material	Length (Ft)	Weight (Lb/Ft		
		Type B	Type C	Type D
Plastic	20*	0.6–1.0	1.0–1.5	1.2–1.7

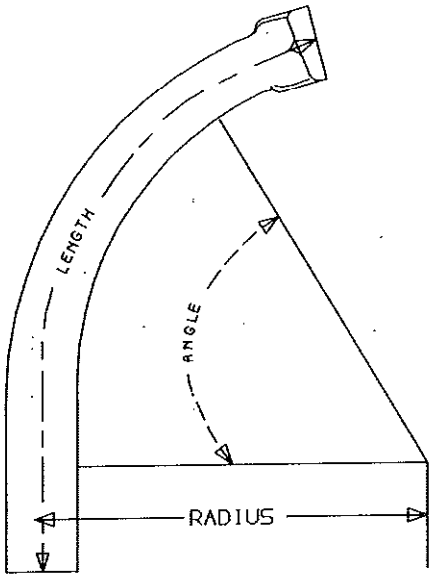
* Longer and shorter lengths available from manufacturer.

Type B (thin wall) requires concrete encasement.

Type C (thick wall) may be buried with selected backfill in straight runs.

Type D is ultraviolet (sunlight) and flame–resistant.

Rigid bends for single-bore conduit are illustrated and listed below.



PLASTIC

RIGID BENDS FOR 4-INCH SINGLE-BORE CONDUIT

Material	Angle (Degrees)	Radius (Feet)	Length (Feet-Inches)
B, C, or D Plastic	7	15	2-4
	30	15	8-4
	30	12	6-9
	45	9	7-7
	45	6	5-3
	45	3	2-10
	90	3	5-3
E Plastic*	90†	3	6-0
	64	3	3-10

* Replaces cast iron for subsidiary conduit.

† Also available in split form for repairs.

For adapters and couplings, see Practices 622-020-100 and 919-240-400.

CONDUIT
Conduit and Pipe

STEEL PIPE

Practice 919–240–400

Steel pipe is used where conduit must be pushed or jacked, where environment is too severe for other conduit, and for submarine crossings. Standard weight pipe is available in the following sizes:

Nominal Size	Plain End		Bell End	
	OD (In.)	ID (In.)	OD (In.)	ID (In.)
1	1.315	1.048	—	—
1-1/2	1.900	1.610	—	—
2	2.375	2.068	—	—
3	3.500	3.068	3.50	3.06
3-1/2	4.000	3.548	4.00	3.54
4	4.500	4.026	4.50	4.02

PLACEMENT

Duct Arrangements

Duct Arrangements are subject to trench width and/or depth constraints imposed by terrain, the presence of other structures, required workman space, etc. The arrangement of ducts in a conduit run should be compatible with the manhole cable racking arrangement. (Refer to "Manholes" later in this section.) Generally, 2–, 3–, or 4–wide arrangements are preferred for single– or double–wall racking. Where a large number of ducts or other circumstances require center racking as well as wall racking, wider duct arrangements may be appropriate.

Separation From Other Structures

Practices 622–100–010, 622–300–205, NESC Rule 320, 919–000–100

The following separations are required for safety of personnel and for protection of telephone equipment:

Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
Railroads (except street railways)	Crossing: 5 feet below top of rail.* Terminating on poles: 12 feet from nearest rail, except 7 feet as sidings
Street railways	3 feet below top of rail.*

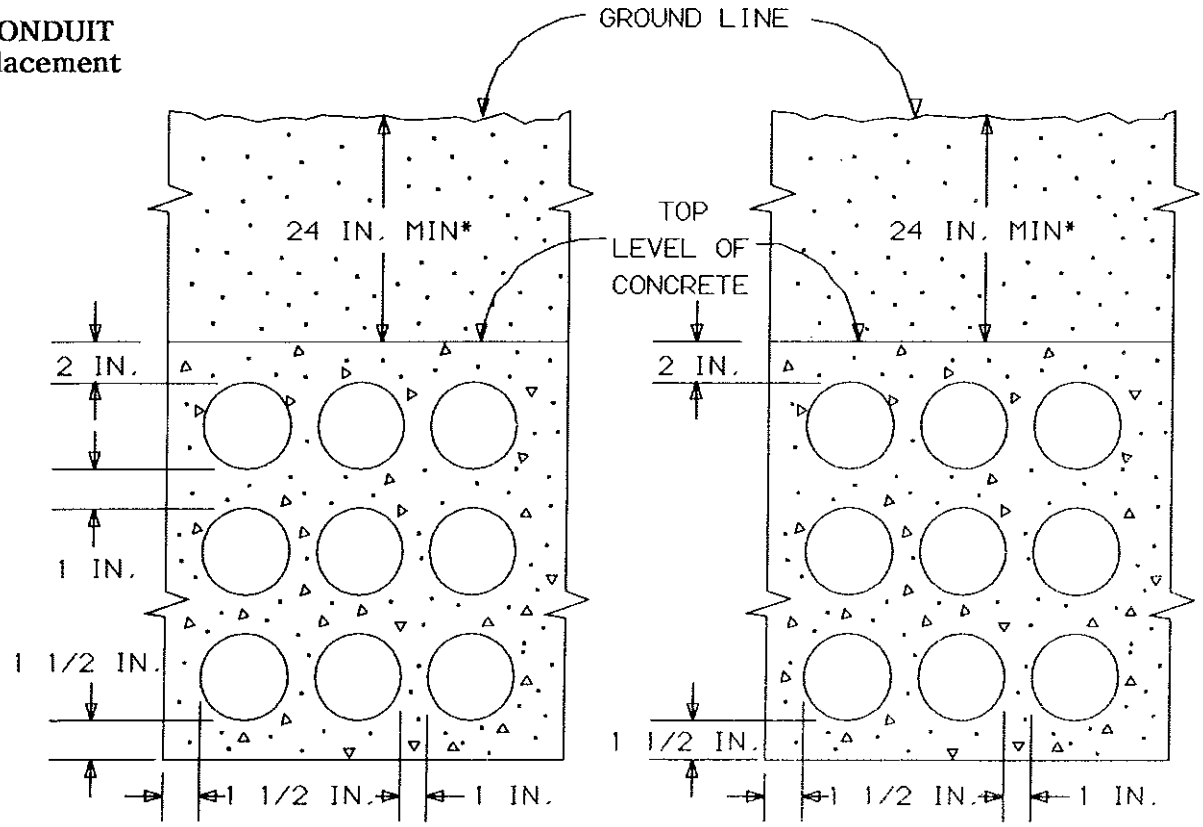
***Exception:** Where impractical, or for other reasons, these clearances may be reduced; however, the top of the conduit or conduit protection shall in no case extend above the bottom of the ballast section which is subject to working or cleaning. Local requirements will prevail.

Spacing and Backfill Requirements

622–020–020
914–240–100
Practice 919–240–400

The next three pages show spacing and backfill requirements for single–bore conduit. The volume of concrete or granular backfill will vary with the trench width and the degree of irregularity of the trench surfaces. Volumes given for each arrangement are for the minimum trench width consistent with the specified clearances. Volumes for sand or granular backfill include an allowance of about 1/12 for compaction.

CONDUIT
Placement



*18 IN. PERMITTED UNDER DRIVEWAYS, SIDEWALKS

CUBIC YARDS OF CONCRETE PER 100 FEET OF TRENCH

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.8	4.9
3-HIGH	5.2	6.6
4-HIGH	6.5	8.3

FOR LARGER FORMATIONS USE:

PLASTIC: .35WH + .35W + .28H

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.4	4.3
3-HIGH	4.2	5.4
4-HIGH	5.1	6.5

FOR LARGER FORMATIONS USE:

PLASTIC: 22WH + .48W + .23H

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

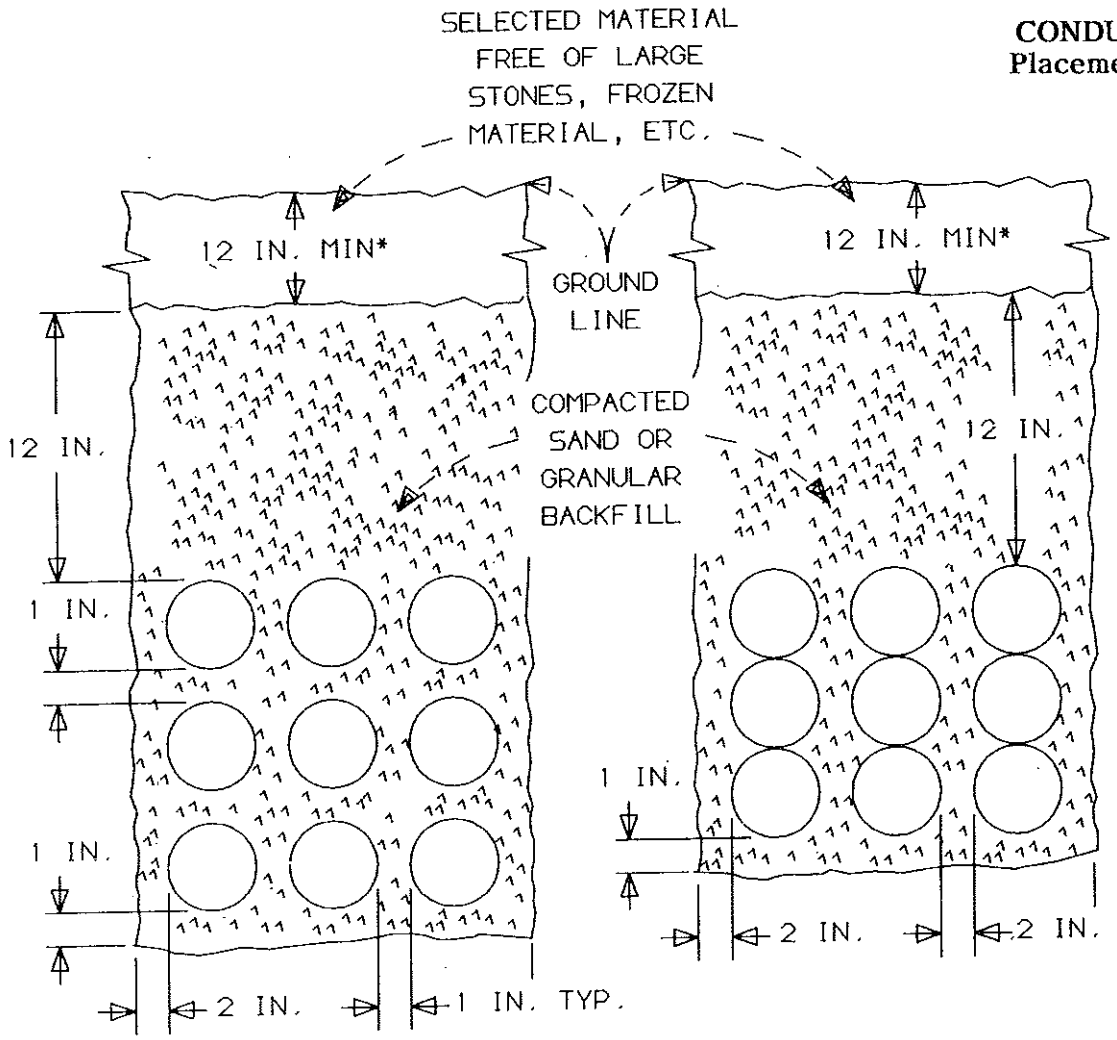
NOTE-OPTIONAL FOR STRAIGHT RUNS OF B PLASTIC.

SINGLE-BORE CONDUIT (ALL TYPES) ON CURVES

NOTE-LIMITED TO 3 TIERS PER POUR. REQUIRES LESS CONCRETE THAN METHOD USING VERT. SEPARATIONS

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

CONDUIT
Placement



CUBIC YARDS OF SAND OR GRANULAR BACKFILL PER 100 FEET OF TRENCH

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	12
3-HIGH	11	14
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .38WH + 1.8W + 4H + 1

C PLASTIC CONDUIT, STRAIGHT RUNS, ANY NUMBER OF TIERS

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	13
3-HIGH	12	15
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

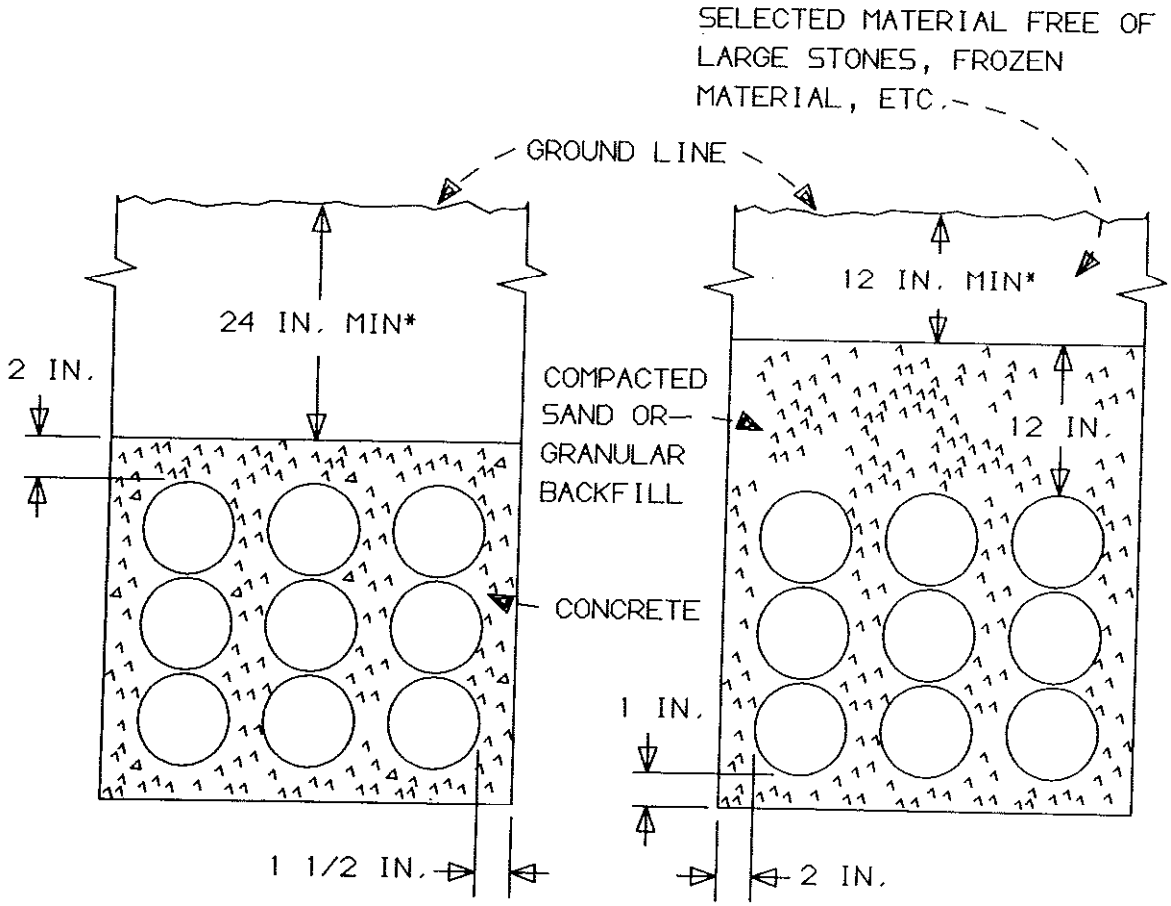
PLASTIC: .36WH + 2.3W + .2H + 7

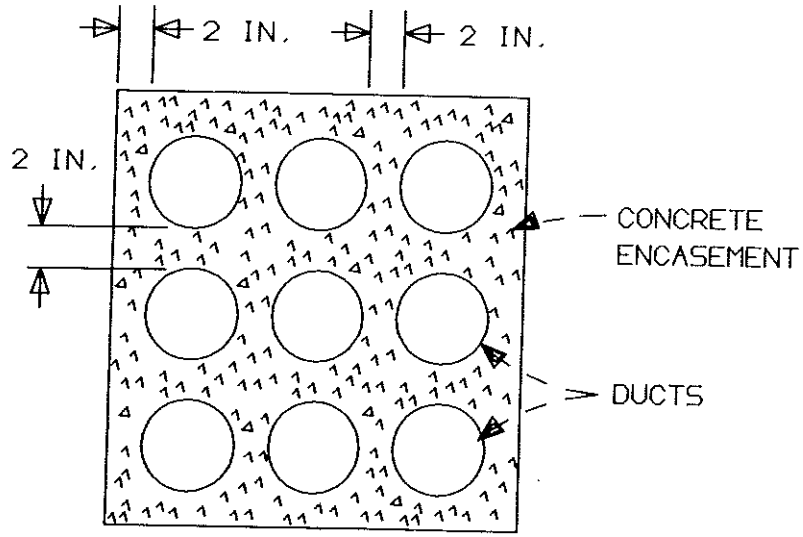
C PLASTIC CONDUIT, STRAIGHT RUNS, UP TO 4 TIERS

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

8-25

CONDUIT
Placement





SINGLE-BORE CONDUIT (ALL TYPES)
AT MANHOLE AND VAULT ENTRANCES

CONDUIT FORMATION

AT&T 622–020–020
914–240–100

CONDUIT FORMATIONS

No. Of DUCTS	Single Bore	Multiple Duct
4	2 Wide x 2 High	One, 4-duct
6	3 Wide x 2 High	One, 6-duct
8	4 Wide x 2 High	Two, 4-duct
9	3 Wide x 3 High	One, 9-duct
10	-	One, 6- duct and One, 4-duct
12	4 Wide x 2 High	Two, 6-duct or One, 12-duct (2)
15	-	One, 9-duct and One, 6-duct
16	4 Wide x 4 High	Four, 4-duct
18	-	Two, 9- duct
20	4 Wide x 5 High	Two, 6-duct and Two, 4-duct
24	4 Wide x 6 High	Four, 6-duct or Two, 12-duct (2)
28	4 Wide x 7 High	-
30	-	Five, 6-duct
32	4 Wide x 8 High	-
36	4 Wide x 9 High	Four, 9-duct (3 wide) and three, 12-duct (2)
40	4 Wide x 10 High	Four, 9-duct (3 wide) and One, 4-duct
Over 40 (1)	-	-

Note 1: Investigate center racking possibilities.
Note 2: 12-duct is available only in F and G concrete conduit.

CONDUIT
Placement

Subsidiary Conduit

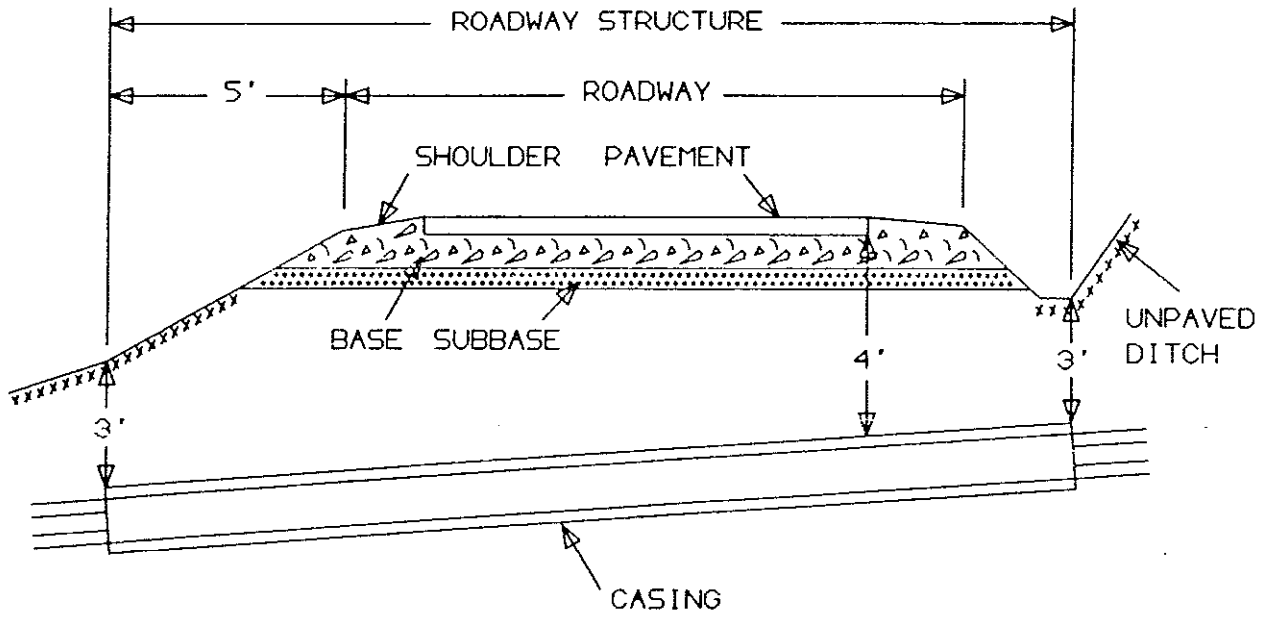
Practice 919–240–400

- Coordinate with builder regarding termination of conduit in a building.
- Use steel pipe or plastic conduit.
- Place in same trench with main conduit, if practicable, and on top of main formation.

Conduit Casings

Practices 919–000–100, 919–240–510

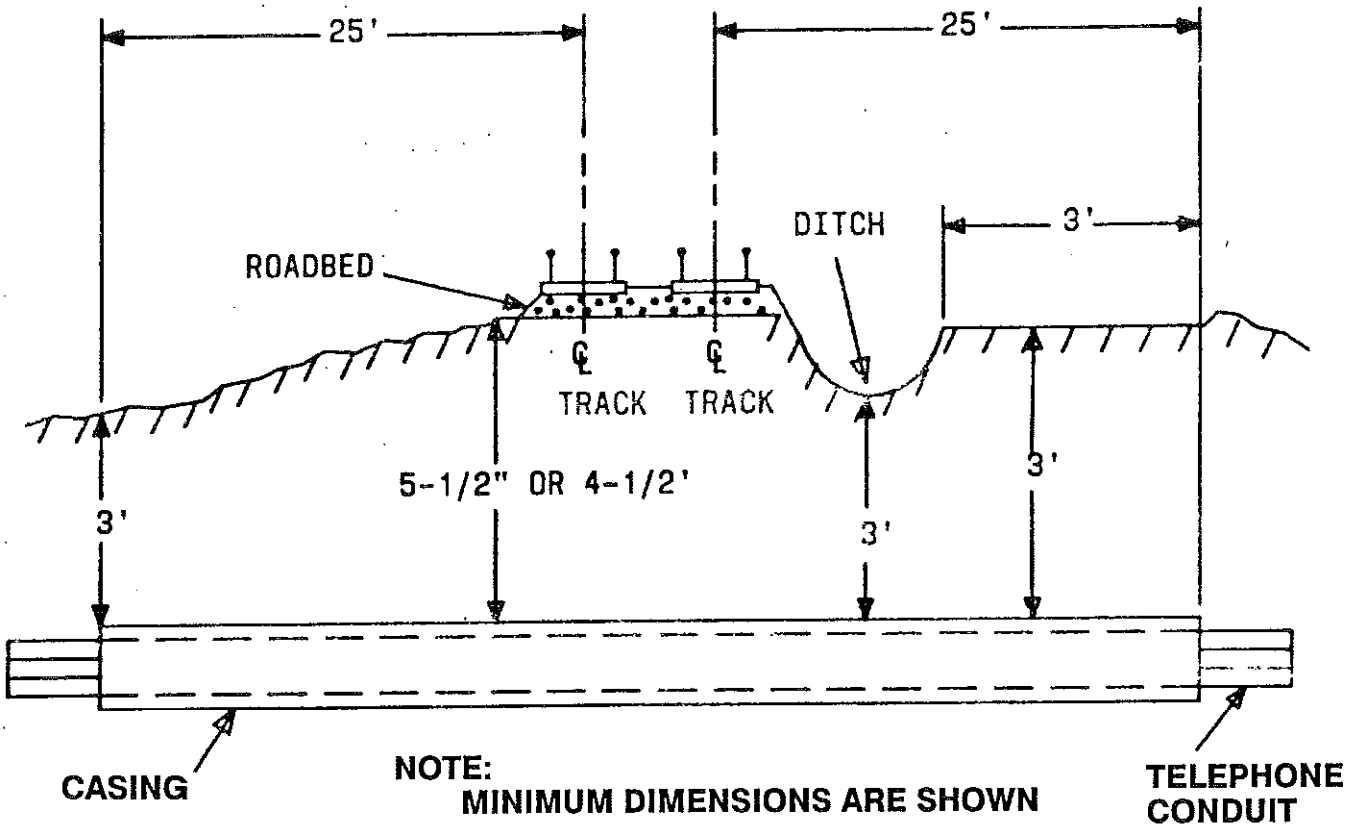
Steel casing pipe is recommended for housing underground conduit under railway and highway crossings. The casings are bored under the crossing to eliminate interference with traffic. Steel casings are also recommended as a supporting structure for conduit placed in unstable soil. Typical installations under a highway and railroad are shown below and on Page 8–29.



NOTE: MINIMUM DIMENSIONS ARE SHOWN

8–28

Conduit Casings Under Highways



Conduit Casings Under Railroads

Note: Design runs to avoid conduit failure due to shearing at junction between casing and regular conduit run, which may result from a difference in settlement rates between casing and regular conduit. Local requirements will prevail.

CONDUIT
Placement
Casings

The table below lists the duct capacity of standard size casings.

STEEL CASING PIPE — DUCT CAPACITY		
Standard Casing OD (Note 1)	Duct Capacity (Max)	
	Bundled Formation (Note 2)	Spaced Formation
12	3	3
16	4	4
18	7	4
20	7	7
24	10	10
30	19	19
36	—	24
42	—	37
48	—	44

Notes:

1. Casings with 22-, 26-, 28-, 34-, and 38-inch diameters are nonstandard sizes and should be avoided.
2. More than 19 ducts in the bundled formation are not recommended and may result in severe deflection of the bottom ducts when top ducts are filled.

The wall thickness of the casing pipe is dependent on several factors such as the live or dynamic load from vehicular traffic, the dead or earth load, and the diameter of the casing used (see table on Page 8–31). The dynamic load is dependent on the type and weight of the vehicle, the type of roadbed, and the depth of the casing. The earth load is dependent on the composition of the soil and the depth of the casing. Dynamic loads decrease and earth loads increase with casing depth.

STEEL CASING WALL THICKNESS	
Nominal Wall Thickness (Inches)	**Nominal Casing Diameter (Inches)**
0.188	under 14
0.219	14 to 16
0.250	18
0.281	20
0.312	22
0.344	24
0.375	26
0.406	28 to 30
0.438	32
0.469	34 to 36
0.500	38 to 48

Bridge Crossings

Practice 919–240–520

The diversity of bridge designs makes it impractical to prescribe a standard method of designing conduit on bridges. However, there are certain fundamentals which must be considered. These are covered in the above practice.

CONDUIT
Trench Work

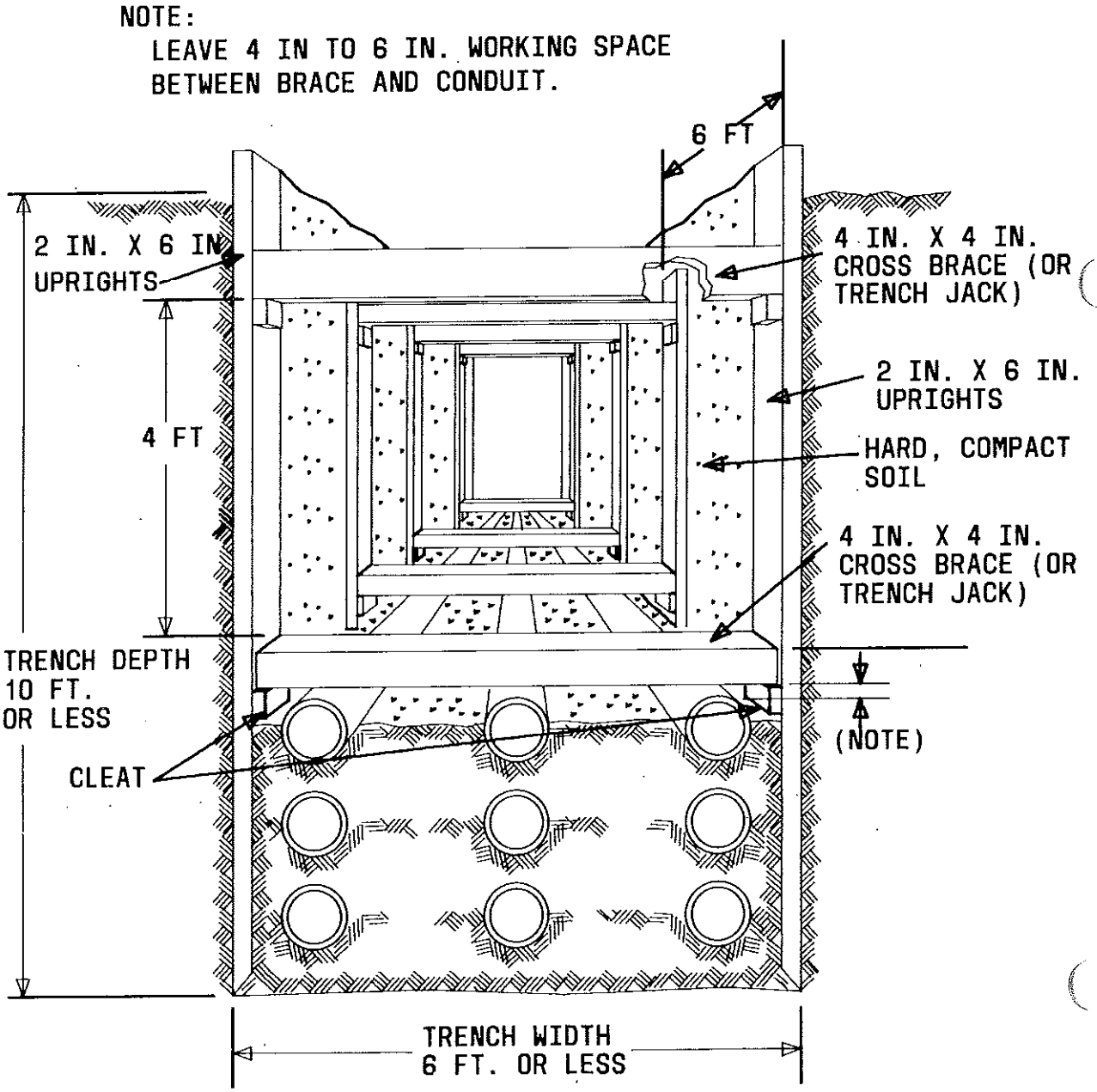
TRENCH WORK

Practice 622–020–020

The Occupational Safety and Health Act (OSHA) requires that all excavations deeper than 5 feet, wherein a craft person is required to enter and work shall have walls shored, sheeted, braced, or otherwise supported unless the excavation is in solid rock, hard shale, hard slag, or where the sidewalls are cut to a slope of 1 foot horizontally for each 2 feet or rise. Typical shoring arrangements are shown as follows.

Trenches less than 5 feet deep should be shored if they constitute a hazardous work location. Someone shall be stationed on the surface to keep the persons in the excavation in sight at all times.

Minimum shoring requirements are shown on the next page.



TRENCH SHORING — MINIMUM REQUIREMENTS
(Wood Member Dimensions in Inches)

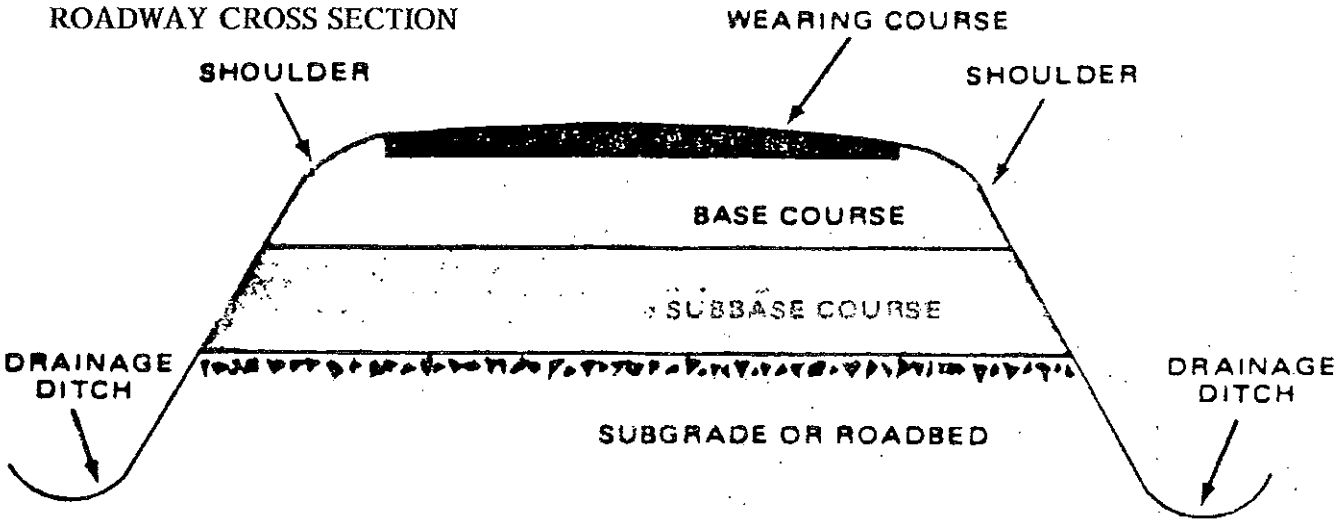
Trench Depth (Ft)	Soil (Note 1)	Uprights		Stringers (Note 2)	Cross Braces for Trench Width up to: (Note 3)			
		Size	Spacing (Ft)		6 Ft	9 Ft	12 Ft	15 Ft
5 to 10	A	3 × 4 or 2 × 6	6	None	4 × 4	4 × 6	6 × 6	6 × 8
	B		3	4 × 6				
	C		Tight	4 × 6	4 × 6	6 × 6	6 × 8	8 × 8
	D		Tight	6 × 8				
10 to 15	A	3 × 4 or 2 × 6 3 × 6	4	4 × 6	4 × 6	6 × 6	6 × 8	8 × 8
	B		2	4 × 6				
	C		Tight	4 × 6	6 × 6	6 × 8	8 × 8	8 × 10
	D		Tight	8 × 10				
15 to 20	All	3 × 6	Tight	4 × 12	6 × 8	8 × 8	8 × 10	10 × 10
>20	All	3 × 6	Tight	6 × 8	8 × 8	8 × 10	10 × 10	10 × 12

Notes:

1. Soil type or condition: A — Hard, compact
   B — Likely to crack
   C — Soft, sandy, or filled
   D — Hydrostatic pressure.
2. Stringer spacing = 4 ft.
3. Cross braces spaced 4 ft vertically, 6 ft horizontally. Trench jacks may be used in lieu of, or in combination with, cross braces.

CONDUIT
Roadway Cross Section

ROADWAY CROSS SECTION



CROSS SECTION OF TYPICAL ROADWAY

NOTE: ROADWAY MAY HAVE ANY COMBINATION OF THE ABOVE COURSES.

Wearing Course

The top layer of material wears off a roadway. It provides a waterproof surface to improve surface drainage and afford protection for the underlying layers against weathering and the abrasive action of traffic. Wearing courses can be classified into two categories:

A. Flexible Type: This type has little "beam" strength. It does not distribute load over the subgrade by its flexural resistance but depends upon the sheer strength of the base and surfacing. Flexible wearing courses may be further classified as follows:

- Intermediate Types: Those in which liquid bituminous materials are used as the binder.
- High Types: Which use asphalt cements and the heaviest grades of tar.

Flexural Type pavement mats are made up of a combination of the following types of coats:

- Prime Coat: A light application of liquid bituminous material used to bind together surface particles and to furnish a bond between the foundation surface and the applied bituminous mat.
- Tack Coat: A light application of liquid bituminous material used as the initial surface treatment to provide a thorough bond between two courses (i.e., the new bituminous mat and concrete pavements, old brick roads, previously treated bituminous surfaces, etc.).

Wearing Course –

- Bituminous Mat: Describes such application or construction which increases the thickness of the wearing course one inch or more.

- Seal Coat: An application of bituminous material followed by a cover of sand or stone chips applied to a new or old pavement which will improve visibility and skid resistance.

B. Rigid Type: This type of pavement includes plain and reinforced Portland cement concrete slabs. With relatively small depths, this type of pavement can transmit wheel loads upon the subgrade by virtue of its flexural strength and load transfer capacity in shear.

Rigid Type pavements are usually made from a cement paste called Portland Cement which combines with water in a chemical reaction called hydration. The resulting paste hardens over a considerable period of time. The adhesive qualities of the past form a strong bond with the aggregate particles to bind them firmly together forming the rock–like structure called concrete. This structure may or may not contain reinforcing such as rebars and/or wire mesh. The hydration of Portland cement can be accelerated (Rapid Curing) by the addition of about 2% calcium chloride by weight of cement. This acceleration is important where concrete is placed in cold weather or where high early strength is required. Agents are also available which will retard the hardening of concrete. This is important in hot weather when the curing is accelerated.

BASE COURSE

The strata of material directly beneath the wearing course. Its purpose is to provide a uniform and non–yielding support for the wearing course and to transfer and distribute traffic wheel loads evenly upon the subgrade. Thickness of this course is generally 5 to 8 inches and is generally made up of the following types of materials: gravel, crushed gravel, crushed rock.

SUB–BASE COURSE

The strata of material found directly beneath the base course and above the subgrade material. Its purpose is to bring the sub–grade material to fairly uniform strength characteristics so that the thickness of the more costly base course can be reduced. It is important that the sub–base have greater stability and bearing power than the sub–grade material that it is to protect.

SUB–GRADE

The bottom layer of material usually composed of existing surface top soil. This course provides for adequate foundation support of the roadway and loads.

CONDUIT
Roadway – Definitions

ROADWAY DEFINITIONS

Gravel

The coarse granular material, larger than sand, resulting from the natural erosion of rock.

Sand

The fine granular material (usually less than ¼" in diameter) resulting from the natural disintegration of rock, or from the crushing of friable sandstone rocks.

Silt

A soft impalpable sediment such as that commonly found in streams or lakes that not only has a fineness of texture but also is weak and unstable as a construction material.

Clay

A material which has a finer particle size than silt and is extremely cohesive and plastic. As indicated above in silts, clay is also weak and unstable as a construction material.

Mixed Soils

A soil composed of two or more of the above 4 classifications.

Washed Aggregate

Natural deposits of sand and gravel usually contain some clay or silt plus injurious amounts of organic coatings on the individual particles which will reduce their usefulness as a construction material. This extraneous material can usually be removed by a process of screening (passing through selves) and washing.

Slump Test

A test designed to measure the consistency of a concrete mix by placing a representative sample into a standardize cone in three equal layers. Each layer is rodded 25 times each. The surface of the top layer is struck off so that the cone is exactly filled. The mold is removed in a vertical direction and the slump (in inches) is measured.

Plant Mix

Asphalt pavement mixed at a mixing plant.

ROADWAY DEFINITIONS – (Cont'd)

Road Mix

Asphalt pavement which can be mixed and placed on the roadway.

Hot Mix, Hot Laid, Cold Mix, Cold Laid

Hot laid mixtures are both mixed and laid hot, whereas the cold laid mixtures may be mixed either hot or cold, but are placed at atmospheric temperatures.

MIX CHARTS

LAY DOWN THICKNESS	MIX NAME	USE	– CONTENTS % – LIQUID ASPHALT	SAND	– INCH STONE – 1/4	3/8	5/8	3/4	FILLER
4"-6"	PLANT MIX	BASE	2.8	5.8	5.8	7.8		77.8	
2"-6"	STABLIZED BASE	BASE	4.5	34.4	8.6	11.4		38.2	2.9
2"-6"	BINDER	INTERMEDIATE COURSE	4.5	34.4	8.6	13.4		38.2	0.9
2"-4"	MABC	TOP	5.2	36.1	8.5	33.2	14.2		2.8
1"-3"	FABC	TOP	5.7	42.4	17.0	32.1			2.8
1"	S.P.	FINE TOP	7.5	65.7	25.0				1.8
1/2"	SHEET	EXTRA FINE TOP	10.0	85.0					5.0
2"	WINTER MIX	TEMP. PVMT.	6.0	42.1	17.0	32.1			2.8

MANHOLES

Practices 622–500–011, 919–240–300

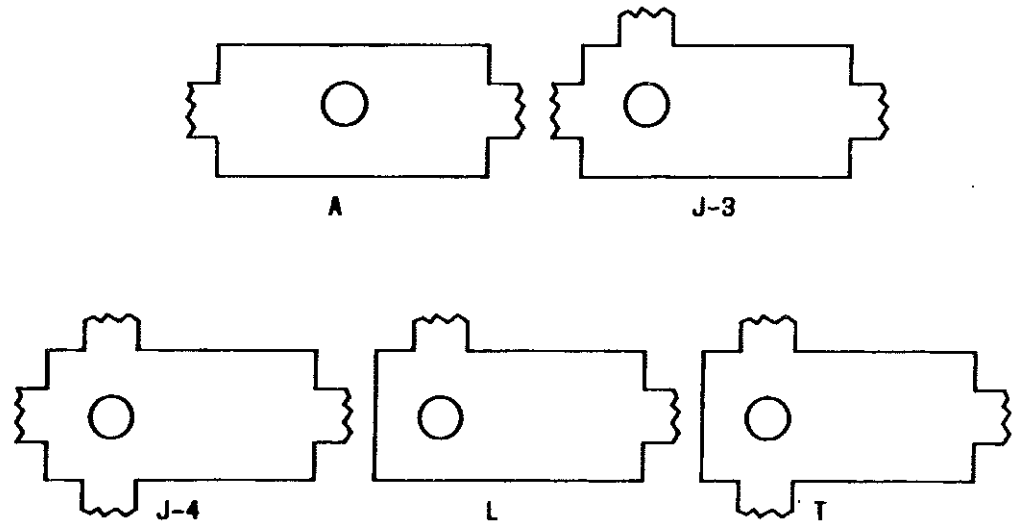
Planning and Design Considerations

- Locate manhole to make optimum use of the connecting conduit structure for cable–placing operations.
- Use precast manholes wherever possible for economy, uniformity, quality control, and quick installation.
- Use cast–in–place construction when: (a) required manhole size exceeds range of precast manholes, (b) obstructions prevent use of precast manholes, (c) manhole is to be rebuilt, or (d) nonstandard designs are required.
- Size manhole for ultimate duct requirements.
- Plug all ducts to minimize entry of water into manholes.

Sizes and Types of Manholes

Basic Manholes

Basic manholes are designated A, J–3, J–4, L, and T, according to the directions in which ducts enter and leave the manhole, as illustrated below.



Sizes

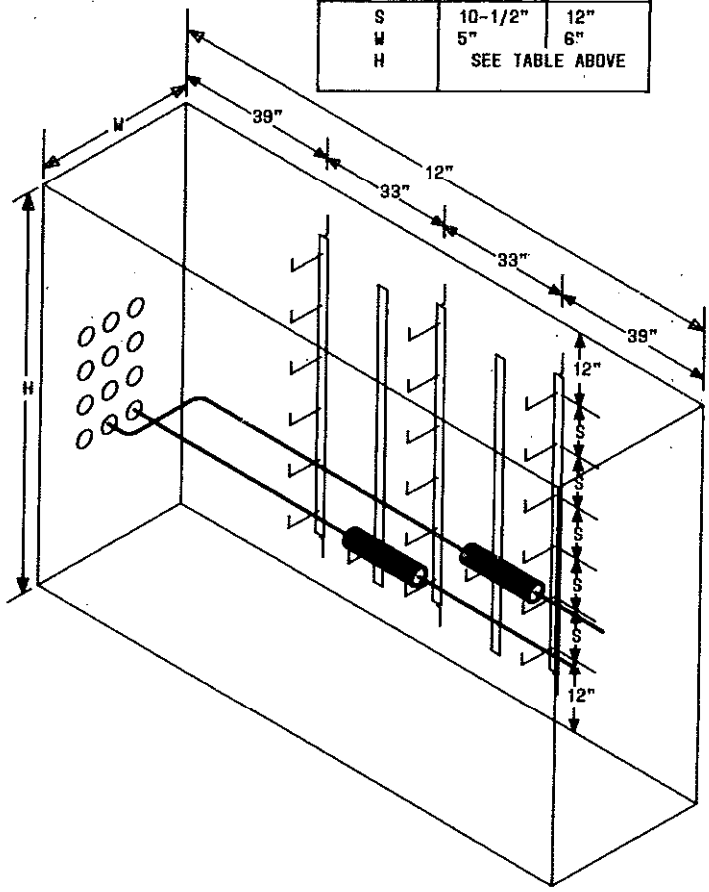
Recommended dimensions of basic manholes are shown below. These sizes allow racking space to accommodate one stub for every four main cables. The ultimate number of main cables must be distributed equally among all racking positions.

BASIC MANHOLE INSIDE DIMENSIONS

Type of Racking	Ultimate No. of Main Cables	Width (Ft)	Length (Ft)	Headroom (Ft)
Single	Any	5	12	7 plus one for every two cables in excess of 20
Double	Up to 20	6	12	7
	>20	6	12	7 plus one for every tier of ducts in excess of 20

CONDUIT
Manholes

DIMENSION	SINGLE-RACK	DOUBLE-RACK
S	10-1/2"	12"
W	5"	6"
H	SEE TABLE ABOVE	



Center Rack Manholes

When the planned cable capacity calls for a manhole of impractical or uneconomical depth, a wider and shallower cast-in-place manhole may be built and arranged for center racking as well as wall racking. A center rack manhole is essentially a double-width manhole with a center cable racking frame.

For the same depth and type of racking, a center rack manhole is twice as wide as a basic manhole and can accommodate twice as many main cables.

Precast Manhole

Practices 622–506–100, 919–24–300

Precast manholes are available with cast–in single or multiple plastic duct terminators to accept single–bore conduit. Thin concrete knockout sections may also be provided for terminating multiple–bore concrete conduit. The top section contains knockouts for subsidiary or lateral ducts.

Precast manholes for general use are listed below. Manholes for loading and carrier apparatus are listed below and on the next page.

PRECAST GENERAL USE MANHOLES

Basic Manhole Designation	Midsection Designation	Config-uration	Number of Sections	Inside Dimensions (Ft)			Capacity (Number of Main Cables)
				W	L	H	
38Y-4046-1 38Y-4046-3	— —	A J, L, T	2	6	12	7	20
38Y-4046-1 38Y-4046-3	38Y-4049-1 38Y-4049-3	A J, L, T	3*	6	12	10*	28
38Y-4046-1 38Y-4046-3	38Y-4050-1 38Y-4050-3	A J, L, T	3*	6	12	12*	36
38Y-4052	—	A	2	4	8	6	4†

*Including midsection.
†For splicing on light, secondary conduit runs or buried cable runs.

CONDUIT
Manholes

PRECAST CARRIER APPARATUS MANHOLES

Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (Ft) W	L	H	Carrier System	Capacity
38Y-4036-6	—	A	2	6	12	6-1/2	T2	2 dual-cable systems using 52-pair cables, or one dual-cable system using 104-pair cables
38Y-4036-7	—	Single-ended						
38Y-4046-1	—	A	2	6	12	7	T1, T1C	Dual 600-pair cables
38Y-4046-1	38Y-4049-1	A	3*	6	12	10*	T1, T1C	Dual 900-pair cables
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	T1, T1C	Dual 1200-pair cables
38Y-4046-4	—	A	2	6	12	7	T4M	One 22-tube coaxial cable
38Y-4046-4	38Y-4049-4	A	3*	6	12	10*	T4M	Two 22-tube coaxial cables
38Y-4052	—	A	2	4	8	6	T1, T1C	Four 475- or 479-type apparatus cases

*Including midsection.

PRECAST LOADING MANHOLES

Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (Ft) W	L	H	Capacity (Number of Coil Cases) (Note)
38Y-4046-1	–	A	2	6	12	7	4
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	10
38Y-4048	—	A	3	6	15	9	20
38Y-4048	38Y-4051	A	4*	6	15	12*	28

Note: Can vary depending on local practice
*Including midsection.

Seperation from other Structures:

Practice 622–100–100

Minimum reccommended speperation between telephone manholes and outside surfaces of foreign structures are as fellows: Electrical light, power or ther conduits, 3 inches. Pipes such as gas, water, oil mains; 6 inches when crossing and 12 inches when in parrallel.

FRAMES, COVERS, AND COLLARS

Practices 622–520–100, 919–240–300

For frames and covers, the 30-inch size is recommended for all applications and should be specified for use with precast manholes. Although 27-inch frames and covers are available, their use is not generally recommended, particularly where only one manhole opening is provided. It is easier to get into and out of the 30-inch size, especially with a blower or pump hose in the opening, and there is more room for placing apparatus into the manhole. **The 24-inch frame and cover should not be used in new construction.** Available frames and covers are listed below.

MANHOLE FRAMES AND COVERS

Type	Opening Dia. (In.)	Height of Frame (In.)	Remarks
A	27, 30	11	Has inner cover and sealing gasket; recommended for central office, carrier-equipped, loading, and critical junction manholes, or wherever a watertight or secured cover is required
SA	27, 30	5-5/8	Shallow version of A type
G	27, 30	10	Has 4 equally spaced 1-inch diameter holes in the frame flange to permit securing the frame to concrete collars and to 38Y manhole roofs. Used with both the G (nonlocking) and H (locking) covers.
SG	27, 30	5-5/8	Shallow version of G type. Same remarks as G type
R	27, 30	1-1/2	Used where not subject to vehicular traffic
D	30	1-1/2	Modified R with pentagonal head locking bolts
H	30	—	Covers only are equipped with two captive bolts with attached locking plates that engage the rim of either the G or the SG frame.

Caution: **For safety, use only one size frame on manholes with more than one opening.**

CONDUIT
Frames, Covers, and Collars
Duct Assignment and Cable Racking

A manhole collar provides a means for raising the manhole frame and cover to grade. Brick-and-mortar collars and concrete collars may be constructed to any height. Alternatively, the following precast concrete collars can be used, either alone or in combination, to attain the desired height for up to 10 feet of cover.

38Y PRECAST COLLARS		
TYPE	Height (in.)	Use
38Y-4039-1	5-1/2	Not a normal collar, but an apron designed to fit around the manhole cover at grade in unpaved areas to provide a solid, ground level work area.
38Y-4039-3 38Y-4039-9 38Y-4039-15	3 9 15	Used with any of the frames listed on table on page 8-40 except for D and R types. Can also be used under 38Y-4039-15R collar.
38Y-4039-15R	15	Includes a 30-inch R-type frame fabricated into collar. For use with R and D covers.

The above collars can be used with precast or cast-in-place manholes. At least one opening should be provided for manholes up to 12 feet in length, two openings beyond 12 feet in length, and three openings beyond 20 feet in length. The number of manhole openings required is doubled for center racked manholes.

Manhole Extension Rings

Practice 622-520-201

Pavement resurfacing operations sometimes necessitate the raising of manhole covers. This may be conveniently accomplished with manhole extension rings.

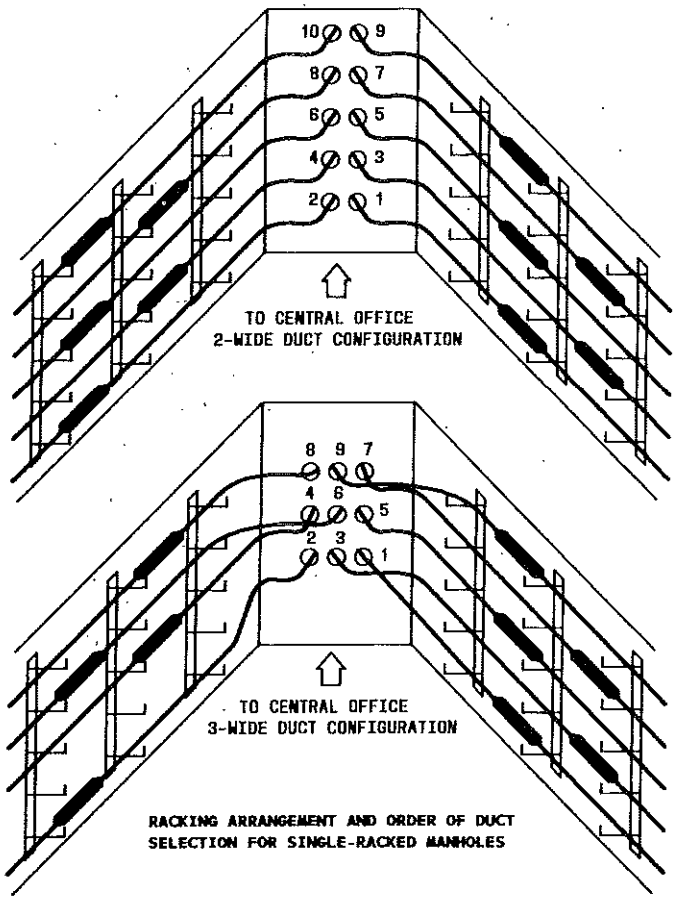
DUCT ASSIGNMENT AND CABLE RACKING

Practices 632-305-215, 919-240-300

Cable rack space should be used in the specified sequence to permit work on cables after placement and to preserve work space for splicing additional cables.

With double–racking arrangements, it is better to use all the outer (against the wall) rack spaces before using any inner (toward the center of the manhole) spaces. With either single or double racking, spaces should be used from the bottom up.

Ducts should be selected to avoid: (1) cable crossovers between the duct entrance and the cable rack, and (2) blockage of future access to vacant ducts. Racking arrangements and order of duct selection for line manholes are shown in the next two illustrations. For A–, L–, and T–type manholes, see referenced practices.

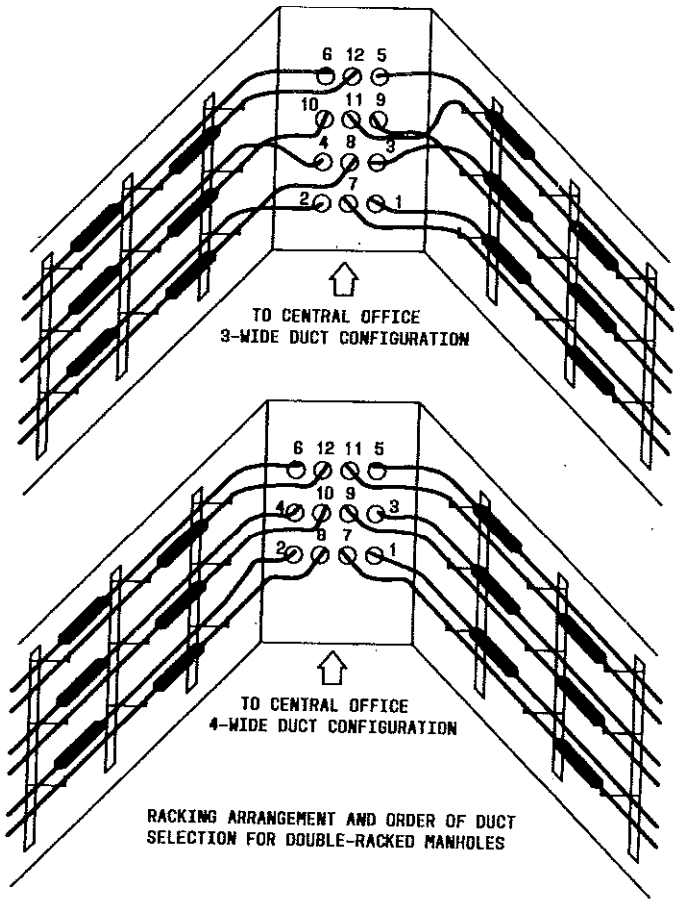


RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR SINGLE-RACKED MANHOLES

CONDUIT
Precast Manholes

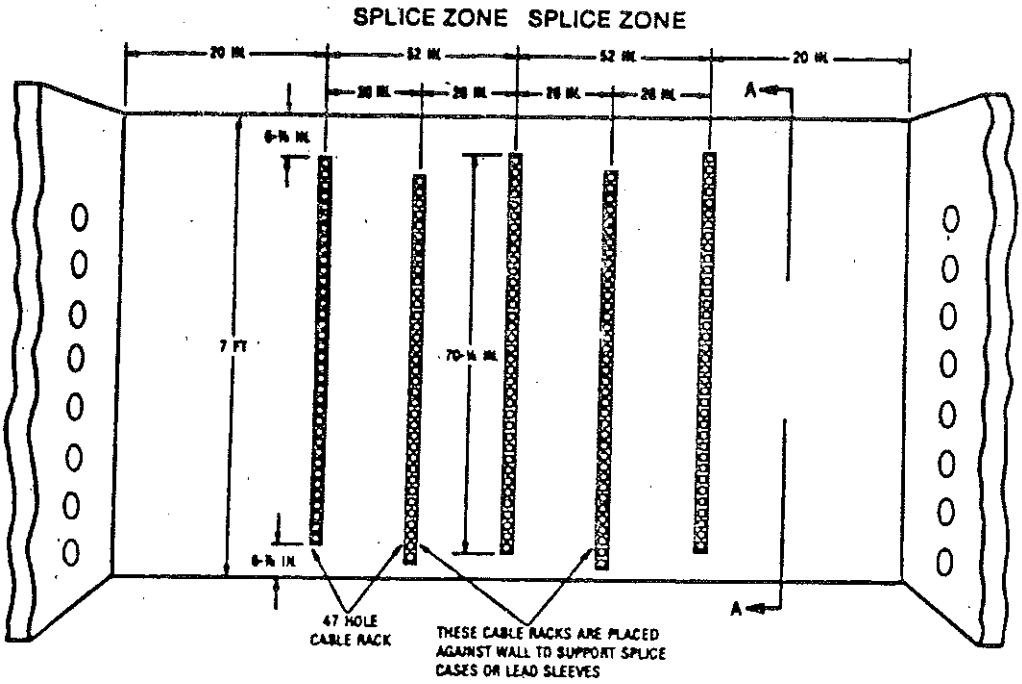
CABLE RACKS

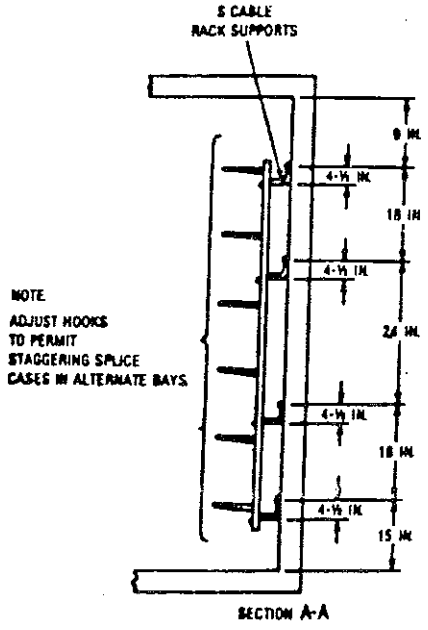
AT&T 622–520–100
919–240–300



RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR DOUBLE-RACKED MANHOLES

CABLE RACKS





NUMBER OF CABLE RACKS PER VERTICAL STRIP OF RACKS

HEAD ROOM	NUMBER OF RACKS			
	14 HOLE RACK	18 HOLE RACK	37 HOLE RACK	47 HOLE RACK
6 ft 6 in.				1
7 ft 0 in.				1
7 ft 6 in.		1	1	
8 ft 0 in.		1	1	
8 ft 6 in.		1		1
9 ft 0 in.		1		1
9 ft 6 in.	2		1	
10 ft 0 in.	2			1
10 ft 6 in.		2	1	
11 ft 0 in.		2		1

SIZE OF RACK	DISTANCE BETWEEN BOLT HOLES
8 Hook Holes	13-½ inches
14 Hook Holes	22 ½ inches
18 Hook Holes	28-½ inches
37 Hook Holes	18 and 24 inches
47 Hook Holes	18 and 24 inches

Cable Racks for

PLACEMENT

Duct Arrangements

Duct Arrangements are subject to trench width and/or depth constraints imposed by terrain, the presence of other structures, required workman space, etc. The arrangement of ducts in a conduit run should be compatible with the manhole cable racking arrangement. (Refer to "Manholes" later in this section.) Generally, 2–, 3–, or 4–wide arrangements are preferred for single– or double–wall racking. Where a large number of ducts or other circumstances require center racking as well as wall racking, wider duct arrangements may be appropriate.

Separation From Other Structures

Practices 622–100–010, 622–300–205, NESC Rule 320, 919–000–100

The following separations are required for safety of personnel and for protection of telephone equipment:

Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
Railroads (except street railways)	Crossing: 5 feet below top of rail.* Terminating on poles: 12 feet from nearest rail, except 7 feet as sidings
Street railways	3 feet below top of rail.*

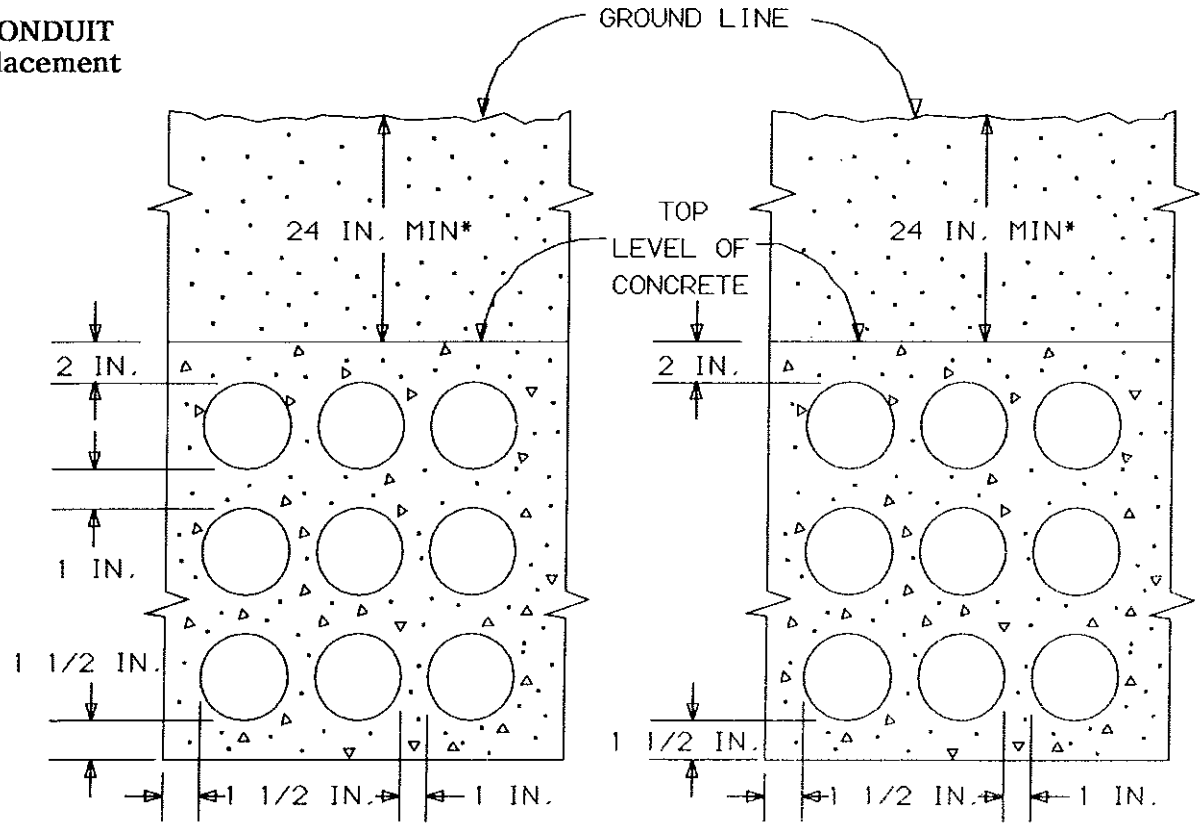
***Exception:** Where impractical, or for other reasons, these clearances may be reduced; however, the top of the conduit or conduit protection shall in no case extend above the bottom of the ballast section which is subject to working or cleaning. Local requirements will prevail.

Spacing and Backfill Requirements

622–020–020
914–240–100
Practice 919–240–400

The next three pages show spacing and backfill requirements for single–bore conduit. The volume of concrete or granular backfill will vary with the trench width and the degree of irregularity of the trench surfaces. Volumes given for each arrangement are for the minimum trench width consistent with the specified clearances. Volumes for sand or granular backfill include an allowance of about 1/12 for compaction.

CONDUIT
Placement



*18 IN. PERMITTED UNDER DRIVEWAYS, SIDEWALKS

CUBIC YARDS OF CONCRETE PER 100 FEET OF TRENCH

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.8	4.9
3-HIGH	5.2	6.6
4-HIGH	6.5	8.3

FOR LARGER FORMATIONS USE:

PLASTIC: .35WH + .35W + .28H

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.4	4.3
3-HIGH	4.2	5.4
4-HIGH	5.1	6.5

FOR LARGER FORMATIONS USE:

PLASTIC: 22WH + .48W + .23H

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

NOTE-OPTIONAL FOR STRAIGHT RUNS OF B PLASTIC.

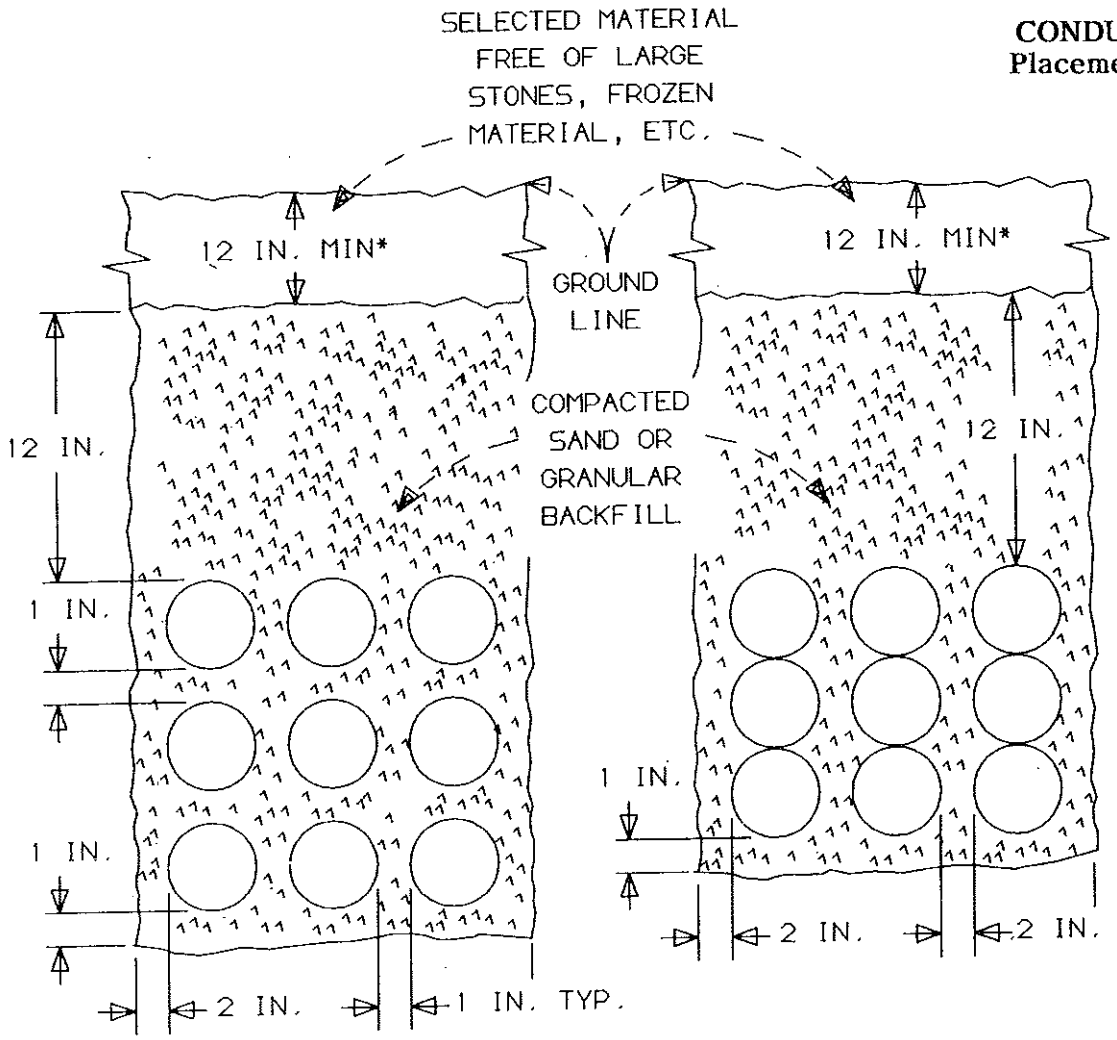
SINGLE-BORE CONDUIT (ALL TYPES) ON CURVES

NOTE-LIMITED TO 3 TIERS PER POUR. REQUIRES LESS CONCRETE THAN METHOD USING VERT. SEPARATIONS

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

8-24

CONDUIT
Placement



CUBIC YARDS OF SAND OR GRANULAR BACKFILL PER 100 FEET OF TRENCH

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	12
3-HIGH	11	14
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .38WH + 1.8W + 4H + 1

C PLASTIC CONDUIT,
STRAIGHT RUNS, ANY
NUMBER OF TIERS

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	13
3-HIGH	12	15
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .36WH + 2.3W + .2H + 7

C PLASTIC CONDUIT,
STRAIGHT RUNS,
UP TO 4 TIERS

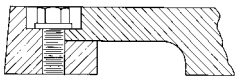
(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

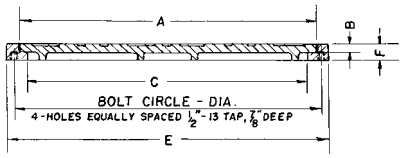
8-25

R-1749 Series
Telephone Design Large Manhole Frame, Solid Lid

Light Duty

Specify if security bolting required (2 per lid).





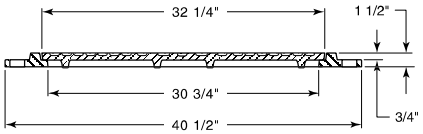
Dimensions in inches

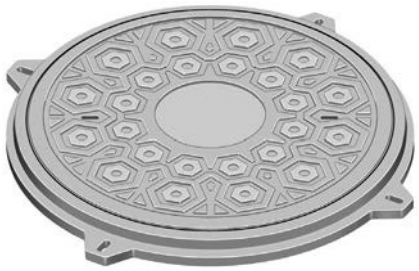
Catalog No.	A	B	C	E	F	Anchor Bolt Circle
R-1749-A	29 1/4	3/4	27 3/4	32	1 1/2	30-1/2
R-1749-B	32 1/4	3/4	30 3/4	35	1 1/2	33-1/2

R-1749-B1
Manhole Frame, Solid Lid

Light Duty

Furnished with four 3/4" x 1" anchor slots on 37" diameter bolt circle.





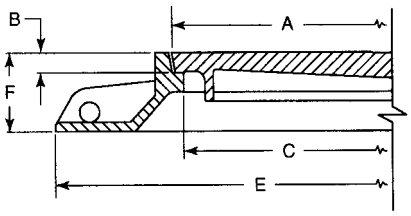
R-1750 Series
Telephone Design Large Manhole Frame, Solid Lid

Heavy Duty

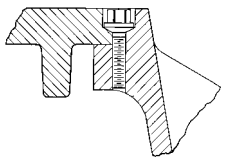
Furnished with machined horizontal and vertical bearing surfaces.

Covers can be bolted to frame with two pentagon head special monel security bolts upon request.

Wrenches available to fit special bolt at extra cost. Advise quantity required.



Illustrating R-1750-B



Dimensions in inches

Catalog No. Standard	Catalog No. Security Bolted	A	B	C	E	F	Anchor Bolt Circle*	Grate Alt.
R-1750-A	R-1750-AB	26	1 3/8	24	43	10		R-2300
R-1750-B	R-1750-BB	29	1 3/8	27	46	10	43-1/2	R-2290
R-1750-B1	R-1750-B1B	29	1 3/8	27	46	5 5/8	43-1/2	R-2290-A
R-1750-B2	R-1750-B2B	29	1 3/8	27	46	3 1/2	43-1/2	
R-1750-C	R-1750-CB	32	1 3/8	30	49	10	43-1/2	
R-1750-C1	R-1750-C1B	32	1 3/8	30	49	5 5/8	43-1/2	
R-1750-C1S	R-1750-C1SB	32	1 3/8	30	46	5 5/8	43-1/2	R-2750
R-1750-CS	R-1750-CSB	32	1 3/8	30	46	10	43-1/2	R-2255

* Furnished standard with four 1" diameter holes in base flange, equally spaced.

PLAN LEGEND

MH 1
W'xL'xH'

Manhole dimensions as given on plans are inside dimensions.
Typical sizes are:
6'x12'x7'
5'x10'x7'
4'x8'x7'
(Size is dictated by cable sizes and amount of splicing expected at the location)

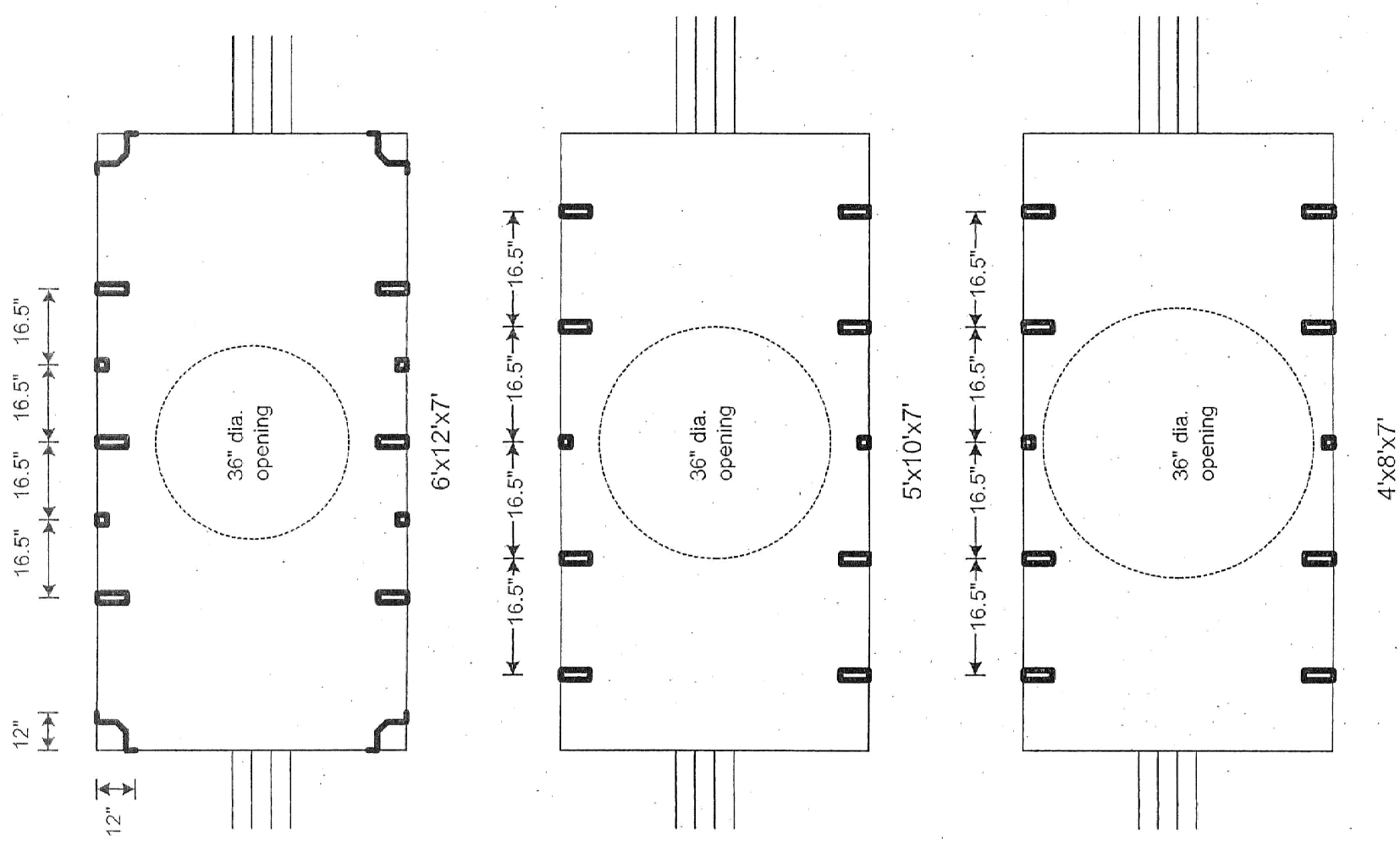
B cable rack support

cable racks secured to S cable rack support

cable racks attached directly to wall

(See included practices for description of cable racking hardware.)

MANHOLE DETAILS



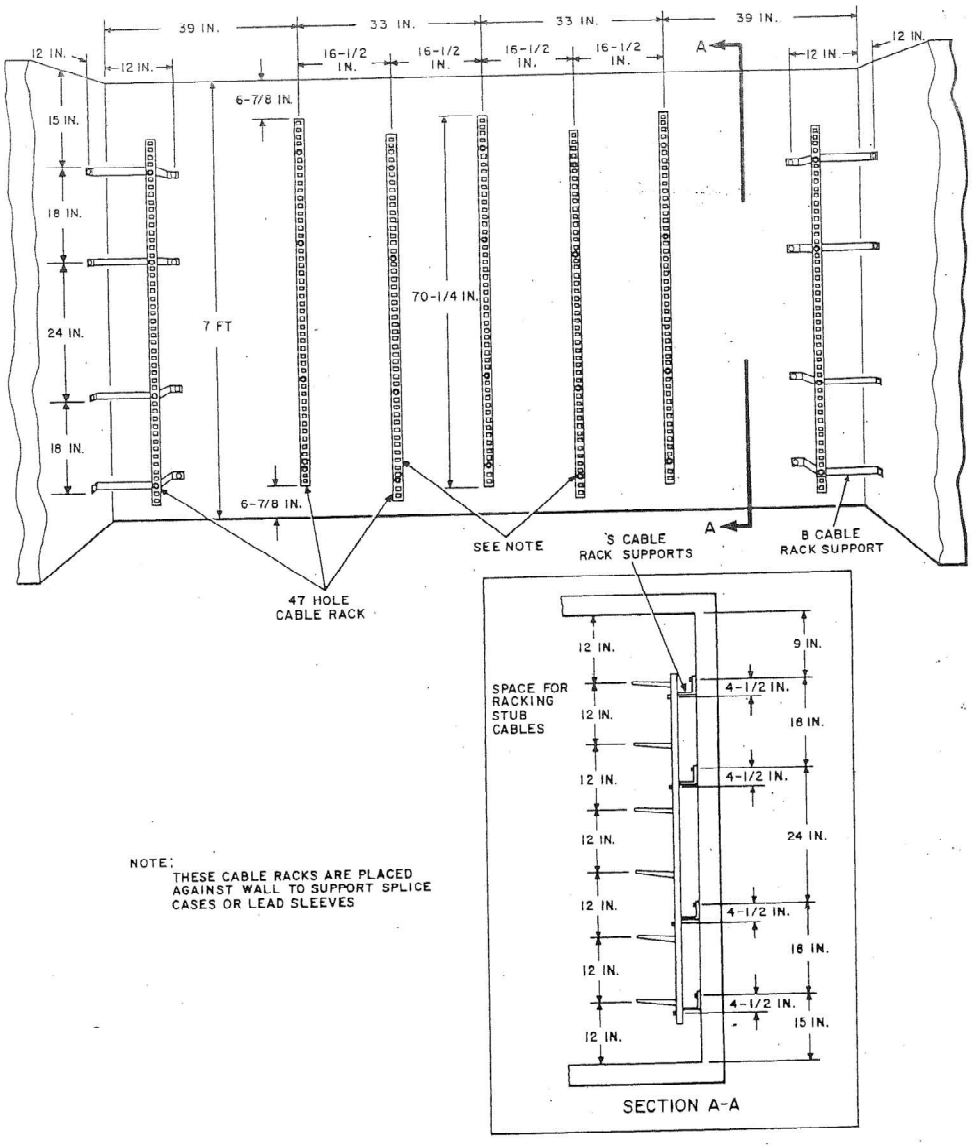


Fig. 9—Location of Cable Racks and Hooks in Typical Double Bay, Double Rack A-Type Manhole

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DOCUMENT A00824

COMCAST DETAILS

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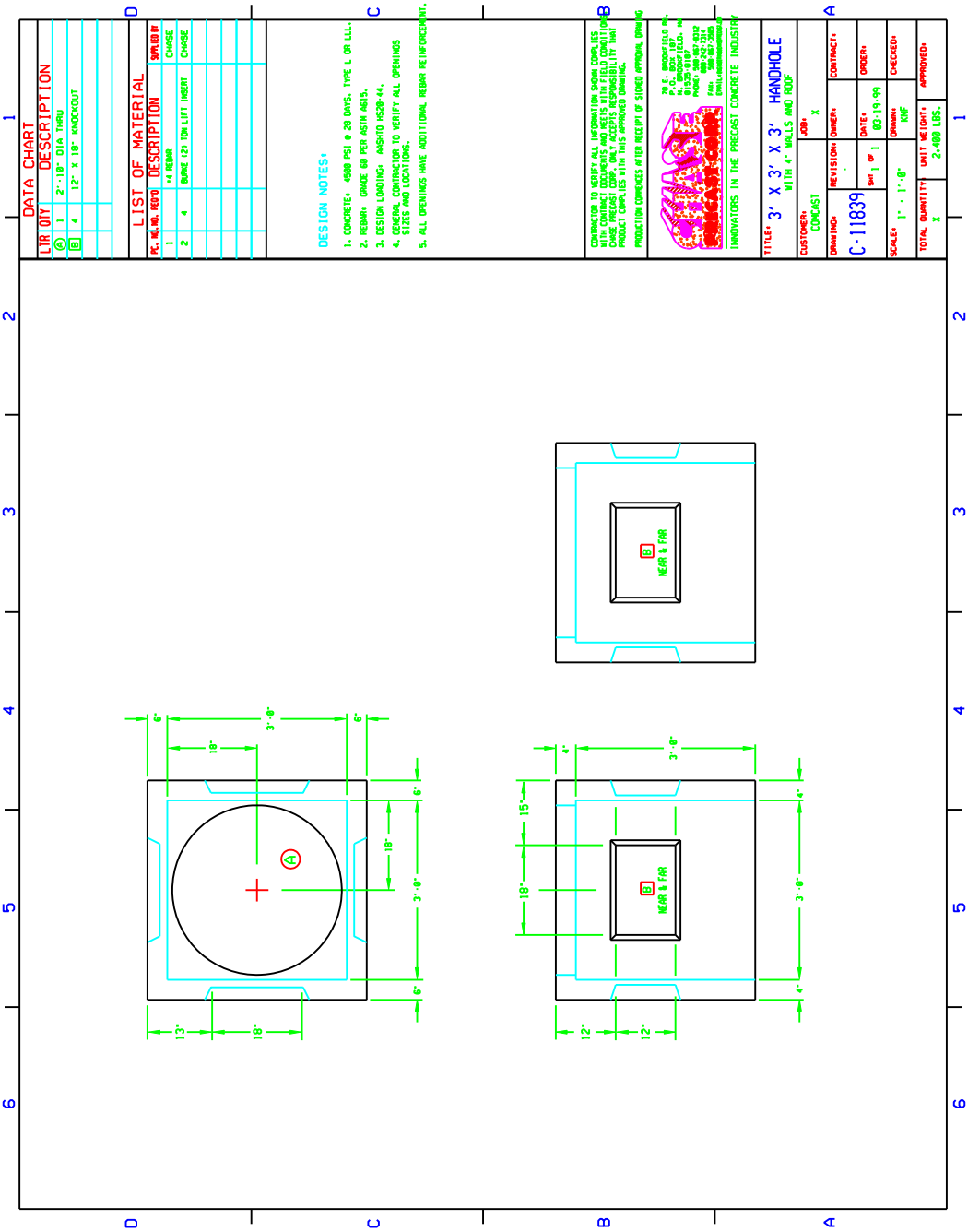
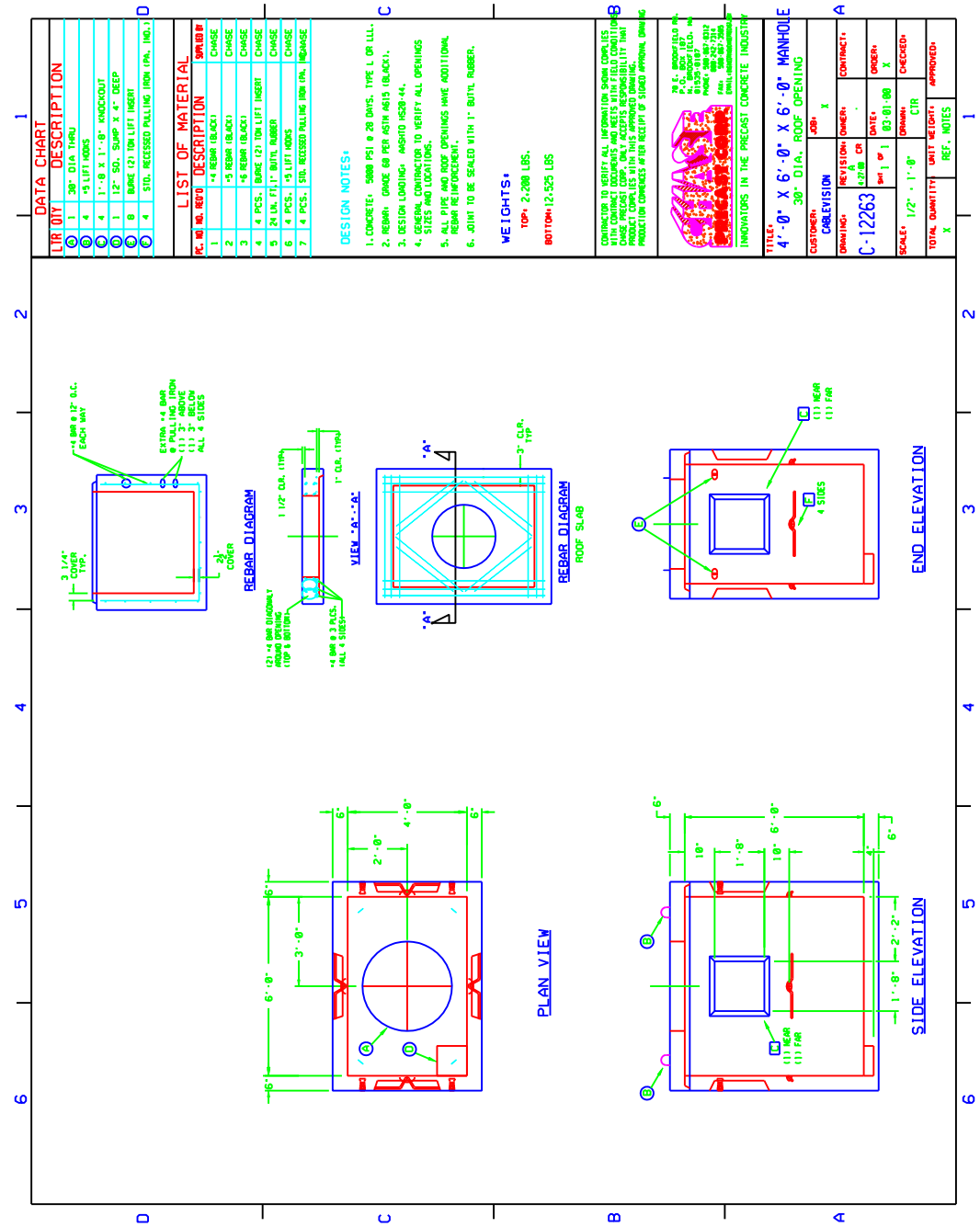


...\3'x3'x3'Handhole(COMCAST).dwg 3/4/2015 4:53:08 PM

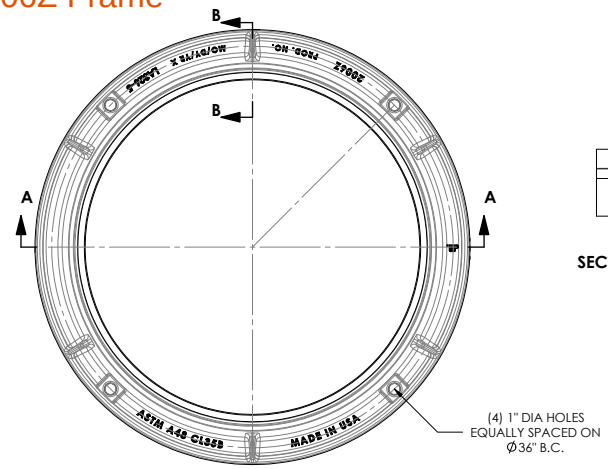


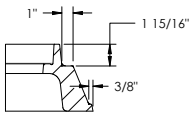
...\4'x6'x6'Manholedwg.dwg 3/4/2015 4:52:24 PM

2006Z/A1GS TGKT CATV CV UND LA326-5

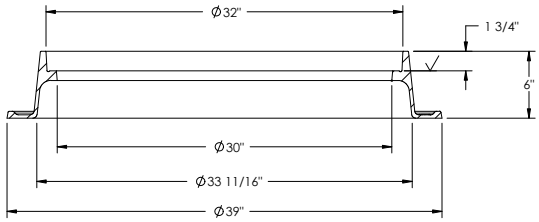
00200693C01

2006Z Frame





SECTION B-B



SECTION A-A

Product Number
00200611

Design Features
-Materials
Gray Iron (CL35B)
-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Undipped
-√ Designates Machined Surface
-Weight
134 lbs

Certification
-ASTM A48
-HS-20 LOAD RATING
-
-Country of Origin: USA

Drawing Revision
4/30/2008 Designer: DEW
3/3/2014 Revised By: DAE

Disclaimer
Weights (lbs/kg), dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

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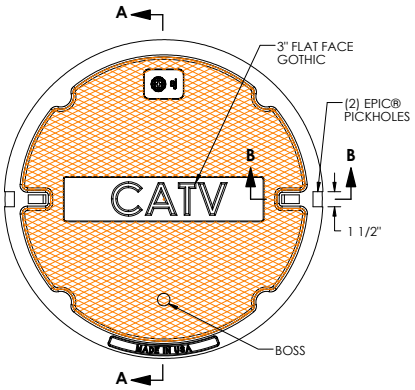
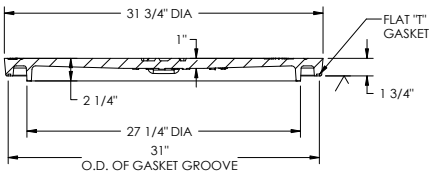
Contact
800 626 4653
ejco.com

00200611
Quantity: 1

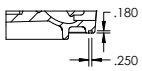
2006A1 Cover



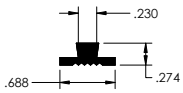
BOTTOM VIEW



SECTION A-A



SECTION B-B



T GASKET
DETAIL

Product Number
00200693

Design Features
-Materials
Gray Iron (CL35B)
-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Undipped
-√ Designates Machined Surface

Certification
-ASTM A48
-
-
-Country of Origin: USA

Drawing Revision
10/22/2012 Designer: DJH
05/01/2014 Revised By: SBB

Disclaimer
Weights (lbs/kg), dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

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00200693
Quantity: 1

Disclaimer

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Contact

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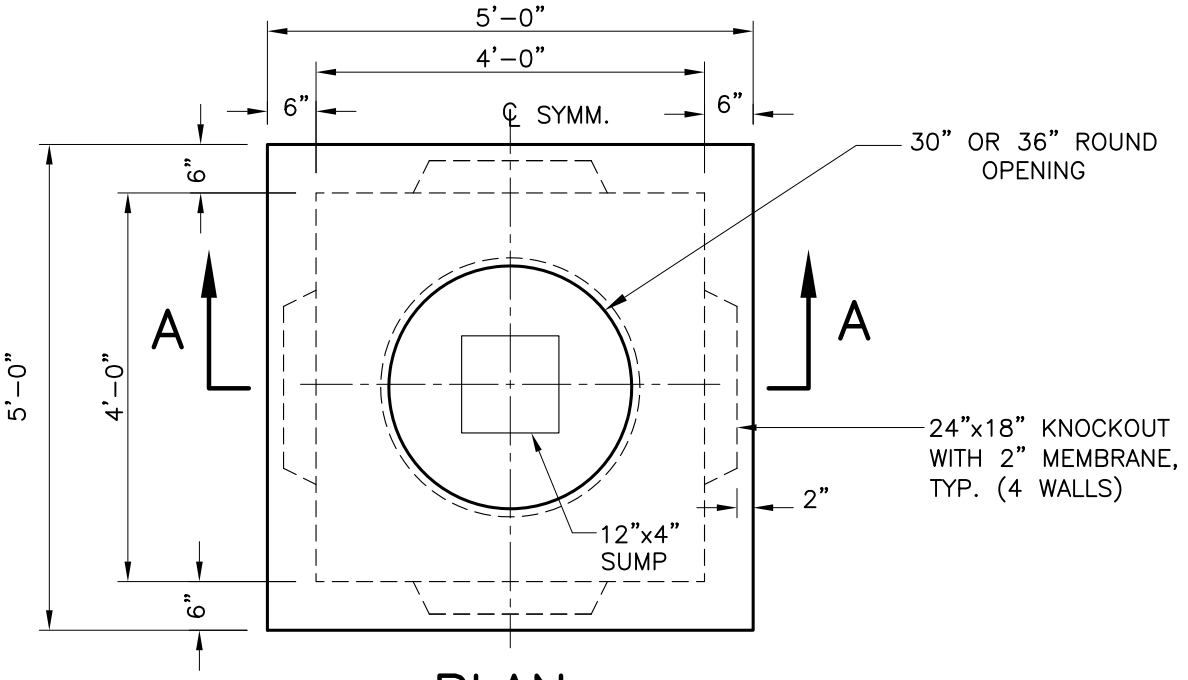
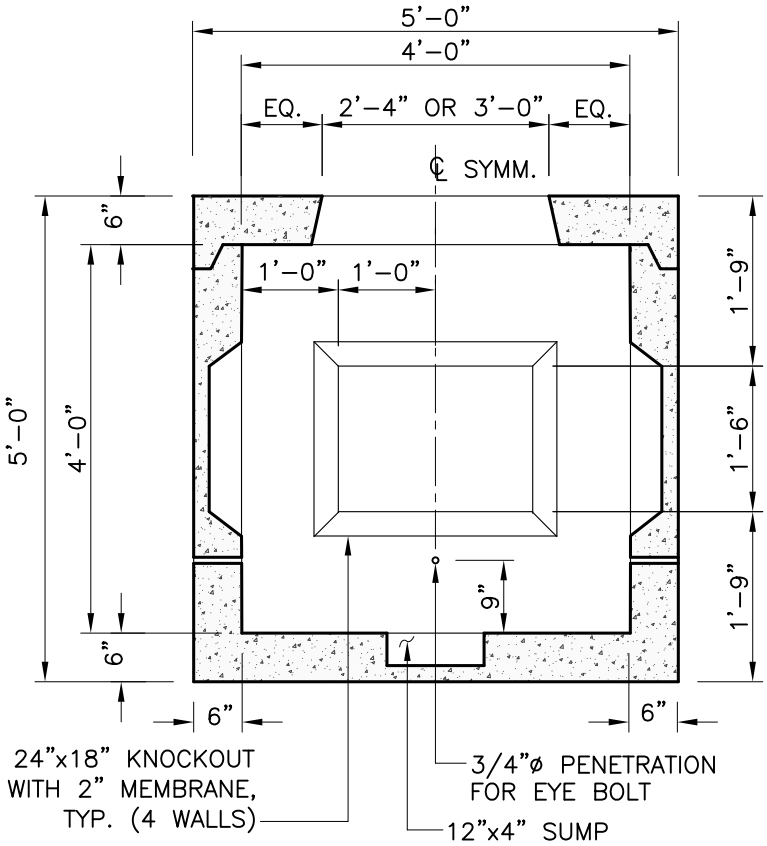
ejco.com

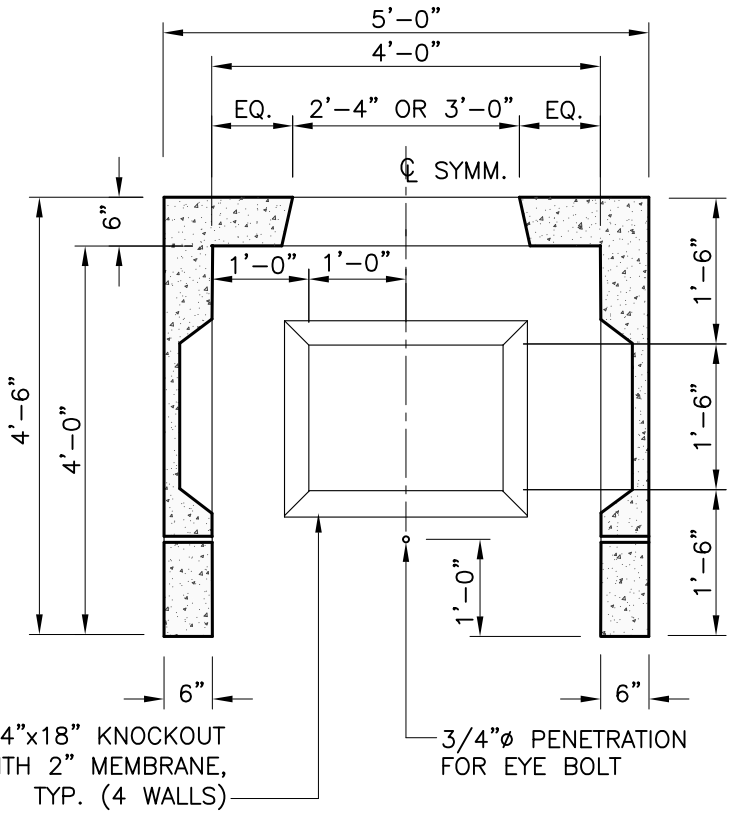


PLAN



SECTION A–A

OPPOSITE/ADJACENT WALLS SIMILAR



SECTION A–A

OPEN BOTTOM

OPPOSITE/ADJACENT WALLS SIMILAR

NOTES:

1. CONCRETE MINIMUM STRENGTH – 5,000 PSI @ 28 DAYS.
2. STEEL REINFORCEMENT – ASTM A615, GRADE 60.
3. MINIMUM STEEL COVER – 1 INCH TYPICAL
4. DESIGN LOADING – AASHTO HS20–44.

SHEA CONCRETE PRODUCTS
New England's Premier Precaster
800–696–7432 (SHEA)
www.sheaconcrete.com

773 Salem Street–Wilmington, MA 153 Cranberry Hwy–Rochester, MA
87 Haverhill Road–Amesbury, MA 160 Old Turnpike Rd–Nottingham, NH
Mail to: PO Box 520–Wilmington, MA 01887

UTILITY MANHOLE
4'–0"W x 4'–0"L x 4'–0"H
WITH KNOCKOUTS

DOCUMENT A00855

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

CONSISTENCY 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: 08/05/2024 22:47:37 UTC
Project code: 2024-0126199
Project Name: 606082 - BOURNE- MEDIAN INSTALLATION ON ROUTE 6 (SCENIC HIGHWAY)

Subject: Consistency letter for the '606082 - BOURNE- MEDIAN INSTALLATION ON ROUTE 6 (SCENIC HIGHWAY)' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated August 05, 2024 to verify that the **606082 - BOURNE- MEDIAN INSTALLATION ON ROUTE 6 (SCENIC HIGHWAY)** (Proposed Action) may rely on the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action will have no effect on the endangered Indiana bat (*Myotis sodalis*) or the endangered northern long-eared bat (*Myotis septentrionalis*). If the Proposed Action is not modified, **no consultation is required for these two species.** If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA section 7(a)(2) may be required.

For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:
If your initial bridge/culvert or structure assessment failed to detect Indiana bats and/or NLEBs use or occupancy, yet later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental

take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

If the Proposed Action may affect any other federally-listed or proposed species and/or designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please advise the lead Federal action agency accordingly.

The following species may occur in your project area and **are not** covered by this determination:

- Monarch Butterfly *Danaus plexippus* Candidate
- Plymouth Redbelly Turtle = Plymouth Redbelly Cooter *Pseudemys rubriventris bangsi* Endangered
- Sandplain Gerardia *Agalinis acuta* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

PROJECT DESCRIPTION

The following project name and description was collected in IPaC as part of the endangered species review process.

NAME

606082 - BOURNE- MEDIAN INSTALLATION ON ROUTE 6 (SCENIC HIGHWAY)

DESCRIPTION

606082 - BOURNE- MEDIAN INSTALLATION ON ROUTE 6 (SCENIC HIGHWAY)
Work on this project consists of installing a median and shoulders to the existing four travel lane cross section providing separation between the eastbound and westbound opposing directions.
Plymouth Redbelly Turtle = Plymouth Redbelly Cooter: After consulting with the Massachusetts Natural Heritage and Endangered Species Program (NHESP), it was determined that there is no data to suggest the presence of habitat and/or individuals at this project location.
Sandplain Gerardia: After consulting with the Massachusetts Natural Heritage and Endangered Species Program (NHESP), it was determined that there is no data to suggest the presence of habitat and/or individuals at this project location.
Tricolored Bat: Proposed Endangered Species only. At this time, no formal USFWS consultation is required.
Monarch Butterfly: Candidate Species only, no conservation measures at this time.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.75917595,-70.5764340769168,14z

DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the endangered Indiana bat and/or the endangered northern long-eared bat. Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for these two species.

QUALIFICATION INTERVIEW

1. Is the project within the range of the Indiana bat[1]?

   [1] See Indiana bat species profile

   Automatically answered
   No

2. Is the project within the range of the northern long-eared bat[1]?

   [1] See northern long-eared bat species profile

   Automatically answered
   Yes

3. [Semantic] Does your proposed action intersect an area where Indiana bats and northern long-eared bats are not likely to occur?

   Automatically answered
   Yes

DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT

This key was last updated in IPaC on October 30, 2023. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the endangered **northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects. The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

IPAC USER CONTACT INFORMATION

Agency: Massachusetts Department of Transportation
Name: Hana Isihara
Address: 10 Park Plaza
City: Boston
State: MA
Zip: 02116
Email hana.l.isihara@dot.state.ma.us
Phone: 6178964454

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

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DOCUMENT A00856

HAZARDOUS MATERIAL REVIEW

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To: **Muazzez G. Reardon**

From: **James M. Smith, Supervisor, Hazardous Materials Review** JMS

Date: **May 22, 2024**

Subject: **Bourne – Median Installation on Route 6 (Scenic Highway)**
Key #606082

SUMMARY

The referenced project was reviewed to evaluate the potential for oil and hazardous material impacts to the proposed work. Information regarding the proposed work was obtained from the 100% submission by HNTB Corporation.

The project consists of the reconstruction of approximately a mile and a half of Route 6 (Scenic Highway), including the installation of a raised cement concrete median, widening of lanes and shoulders, construction of a shared-use path, stormwater management improvements, and traffic signal installation.

Stockpiling and Soil Management Language

Please add the following language to the put-in section of the Special Provisions:

> *CONTAMINATED SOIL*
> *Soil to be removed from the project area shall not be assumed to be uncontaminated, and must be evaluated prior to off-site management for potential contamination with hazardous materials.* ***No soil may be disposed of off-site without proper assessment by the contractor and approval from the Resident Engineer (RE), District Environmental Engineer (DEE), or the project designee.***
>
> *SOIL STOCKPILING DIRECTIVE P-22-001*
> *Any stockpiling of soil must be performed in compliance with Policy Directive P-22-001, Off-Site Stockpiling of Soil from MassDOT Construction Projects. This directive limits the allowable locations for off-site stockpiling of soil generated during MassDOT projects and includes various requirements that must be satisfied by the contractor prior to off-site stockpiling.*

Summary of Potentially Impacting Conditions
Please include the attached Summary of Potentially Impacting Conditions in the bid documents.

Any special provisions recommended for this project are considered standard and, as such, should not be modified without prior written approval from Environmental Services.

This memorandum has been uploaded to ProjectInfo. Should you have any questions regarding the content of this memorandum please contact Katherin McArthur at katherin.mcarthur@dot.state.ma.us.

JMS/kmm

Attachment: Project 606082 - Summary of Potentially Impacting Conditions

Project 606082 - Summary of potentially impacting conditions

The following is a summary of the information obtained during the file review for the release site at Rte 6.

RTN 4-17026, Scenic Hwy Rest Area, Rte 6

- The site currently consists of a paved parking area and scenic viewpoint on the eastern side of Route 6.
- RTN 4-17026 was assigned to the site in 2002 after a tractor-trailer's fuel tank was punctured by debris and diesel fuel was released.
- Response actions included the excavation and removal of impacted soil, along with post-excavation confirmatory sampling.
- An A-2 RAO was submitted for the site in 2002.
- An area seven to ten feet wide and two to thirteen feet deep along the eastern edge of the parking area pavement between approximately Sta 158+00 and Sta 161+00 was excavated. Some petroleum contamination below applicable cleanup levels remains, and excavation immediately outside of the previously excavated zone may encounter contaminated soil.

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DOCUMENT A00857

PROCESSING FORM FOR CATEGORICAL EXCLUSIONS

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Processing Form for Categorical Exclusions
(Refer to the *CE Guide* for detailed instructions to complete this form)
CE Form Updated March 2022

A. General Project Information

MassDOT Project Number: 606082	**Route or Road Name: Route 6 (Scenic Highway)**
Project Name: BOURNE- MEDIAN INSTALLATION ON ROUTE 6 (SCENIC HIGHWAY)	
Municipality(ies): Bourne	**MassDOT Highway District(s): 5**
Project Proponent: MassDOT	
Project Cost and Scheduled Funding Year(s): $39,781,286.55 FY 2025	
Project Manager or Preparer: Muazzez Reardon prepared by Sarah Powers	

B. Purpose and Need

Need for Proposed Action: *Identify and describe the transportation deficiencies, problems and/or concerns that need to be addressed by the proposed action*

The project corridor has existing deficiencies that present hazards for users including substandard travel widths, lack of continuous median separation, inadequate stormwater management, pavement rutting, substandard roadway superelevation, lack of usable shoulders, and lack of pedestrian and bicycle facilities. Substandard conditions have contributed to crashes as reported in a 2014 Road Safety Audit that identified some of the above deficiencies as contributing to hydroplaning within the project corridor. Hydroplaning resulted in vehicles crossing the roadway centerline into the adjacent lane or colliding with guardrail along the side of the roadway and this resulted in 45 crashes between January 2015 and December 2019 according to Bourne Police Department crash records.

Purpose of Proposed Action: *State the desired transportation outcome of the proposed action*

The purpose of the proposed action is to improve roadway conditions to reduce hazards associated with existing substandard deficiencies. The proposed actions will address conditions identified in the 2014 Road Safety Audit contributing to hydroplaning within the project corridor and reduce risk to users of the roadway. The proposed actions will also improve pedestrian and bicycle accessibility by providing accommodations within the project limits where none currently exist.

C. Project Description

Project Location and Limits: *Define the limits of the proposed project, including applicable municipalities and counties where the project is located (Attach corresponding Locus Map)*

Roadway and drainage improvements are proposed along Route 6 (Scenic Highway) in the Town of Bourne, Barnstable County, Massachusetts. The project corridor, which extends

approximately 1.5 miles along Route 6, is located from the intersection of Nightingale Road/Andy Olivia Drive east to the intersection with Edgehill Road. A project locus map is attached.

Existing Conditions: *Describe the current transportation infrastructure conditions, surrounding land uses, and any relevant environmental resources within or adjacent to the project limits*

Route 6 (Scenic Highway) is an urban principal arterial that runs from the Massachusetts/Rhode Island state line to Provincetown, MA. Within the project corridor, Route 6 is under MassDOT jurisdiction and runs generally in a southeast-northwest direction, with two travel lanes in each direction. Specifically, within the project corridor, Route 6 runs generally southwest to northeast. Eastbound (EB) and westbound (WB) lanes are generally undivided within the project corridor, except for a 1,250-foot long raised concrete median west of the signalized Edgehill Road intersection. Within the project corridor, the existing EB and WB lanes west of the Scenic Overlook parcel are generally 10.5 feet wide (10-foot wide minimum), with one-foot outside shoulders. The lane and shoulder widths transition to 12-feet and five-feet, respectively, east of the Scenic Overlook. The EB lane has guardrail for most of the project corridor, except for approximately 900 feet on the west end of the project corridor approaching Nightingale Road/Andy Olivia Drive. There are no pedestrian or bicycle accommodations on either side of the Route 6 Scenic Highway within the project corridor.

At the western limit of the project, Nightingale Road is classified as a local road under local jurisdiction and runs in a north-south direction with one lane in each direction. The roadway provides access to residential neighborhoods to the north of Route 6. There are no posted speed limits along the roadway. An existing sidewalk is located along the west side of the roadway extending to the intersection with Route 6. Andy Olivia Drive is classified as a local road and is under local jurisdiction. Andy Olivia Drive runs in a north-south direction with one lane in each direction. The roadway provides access to Bourne Scenic Park and its associated campground facilities. There are no posted speed limits along the roadway. There are no sidewalks present on either side of the roadway. The four-way intersection of Nightingale Road/Andy Olivia Drive at Route 6 is signalized.

At the eastern limit of the project, Edgehill Road is classified as a local road and is under local jurisdiction. Edgehill Road runs in an east-west direction with two lanes in each direction. The roadway connects to Ernest Valeri Road, which provides access to the Bournedale Elementary School, Bourne Public Works Department, and residential neighborhoods and also connects to Heather Hill Road, which provides access to residential neighborhoods, and Deerpath Trail, which appears to be in the process of being developed based on 2023 aerial imagery. There are no posted speed limits along the roadway. There are no sidewalks present on either side of the roadway. The intersection of Edgehill Road at Route 6 is signalized.

Within the project corridor, stormwater runoff is captured through a series of existing catch basins and conveyed through a closed pipe network to 15 existing outfall locations that discharge to the Cape Cod Canal, located generally south and parallel with Route 6.

Land use adjacent to the project corridor is generally forested in the vicinity of the project to the north and south of the roadway. To the north/northwest, there are areas of low and medium density residential in the area of Nightingale Road. Additionally, Nightingale Pond Conservation Area is located immediately north/northwest of Nightingale Road and a cranberry bog is located just beyond the eastern end of Nightingale Road, beyond the residential neighborhood. Land use abutting the southern side of the roadway for approximately half of the project corridor, beginning at the Nightingale/Andy Olivia Drive intersection, is classified as participation recreation and is associated with Bourne Scenic Park and its campground facilities.

Further west of the project limits land use is a mix of various classifications of residential, commercial, and industrial areas with pockets of forested land. Further east of the project limits, land is mostly forested with an area of mining to the north of Edgehill Road, transitioning into a mix of residential with small areas of commercial and industrial areas. The Cape Cod Canal Federal Navigation Project (FNP) parcel, owned by the U.S. Army Corps of Engineers (USACE) is located southward and downgradient of Route 6 Scenic Highway for the length of the project corridor. The Buzzards Bay Water District, which is owned by the Town of Bourne, abuts the project corridor approximately 0.6 miles west of Edgehill Road.

Based on a site investigation conducted during summer 2020, there are no wetland resource areas subject to federal protections under the U.S. Clean Water Act immediately adjacent to the project corridor. The nearest Federal Emergency Management Act (FEMA) 100-year flood zone coincides with the Cape Cod Canal, which is located down-gradient of Route 6 Scenic Highway and outside of the project corridor to the south of the roadway.

Proposed Improvements: *Describe the proposed scope of work within the project limits and how it accomplishes the identified purpose and need, including any secondary project goals*

The proposed cross-section for Route 6 Scenic Highway within the project corridor includes two EB and two WB lanes that are 11 feet wide with four-foot-wide outside shoulders, and two-feet of additional width for a barrier and guardrail. A 12- to 17-foot-wide median consisting of generally four-foot inside shoulders and a four-foot raised concrete section is proposed between the EB and WB lanes. The existing cross slopes will also be updated to improve vehicular control and improve stormwater catchment to minimize flow across the travel lanes and ponding on the roadway.

The project proposes a 12-foot-wide separated shared use path (SUP) adjacent to the Route 6 Scenic Highway EB travel lane. Sections of the SUP narrow to eight feet in certain areas due to right-of-way constraints. The SUP will be separated from the EB travel lanes by a four-foot-wide shoulder and a guardrail. The SUP will provide a connection from Andy Olivia Drive to the intersection of Route 6 and Edgehill Road. A sidewalk is proposed on Route 6 Scenic Highway EB, north of the Scenic Overlook, to connect the parcel to a new signalized crosswalk at Edgehill Road.

The proposed drainage system upgrades will provide approximately 4-foot wide vegetated swales along the WB side of the roadway and precast deep sump concrete catch basins. The

drainage system upgrades will address ponding in the roadway and reduce the probability of hydroplaning but will not alter the current outfall locations.

Additional components of the project include minor realignment at the project intersections, sidewalk reconstruction, upgraded wheelchair ramps, installation of new traffic signal equipment, replacement or installation of guardrails, roadway resurfacing and new pavement markings.

The project satisfies the purpose of the proposed action to improve roadway conditions and reduce risk to users by providing roadway improvements including an upgraded cross section and drainage upgrades, as well as provide accommodations for non-motorists through construction of a separated shared-use path.

D. No Build and Other Dismissed Alternatives

Describe the No-Build Alternative and any other dismissed alternative(s) to the proposed action, including rationale for each dismissal.

The No-Build Alternative would not provide any roadway improvements beyond regularly scheduled routine maintenance, such as resurfacing, guardrail replacement, and cleaning of the existing drainage network. Additionally, safety issues attributed to substandard roadway design elements and inadequate drainage infrastructure would persist. The No-Build Alternative is not considered a reasonable alternative as it fails to satisfy the purpose and need for proposed action.

The project also considered two other cross section alternatives with a narrower and wider alternative discussed below:

The Narrowed Cross Section Alternative considered a similar travel lane width compared to the preferred alternative but the proposed median under this alternative was a 4-foot center median with 2-foot inside shoulders. No SUP or other pedestrian and bicyclist accommodations were proposed under this alternative. The narrowed median width included a barrier to prevent crossover collisions but did not satisfy median shoulder widths required to prevent ponding on the roadway. This alternative did not reduce risks to motorists identified as contributing to hydroplaning and did not improve non-motorist accommodations and for this reason was dismissed.

The Wider Median Cross Section Alternative proposed two 12-foot travel lanes in each direction, 5-foot outside shoulders in each direction and a 6-foot center median with 2-foot shoulders. This alternative did not propose a SUP or other pedestrian and bicyclist accommodations. The wider median would address roadway deficiencies, but the wider travel lanes with larger shoulders may encourage drivers to speed and the alternative did no provide multi-modal facilities for non-motorists. For these reasons this alternative was dismissed.

E. Environmental Review, Mitigation Measures, and Agency Consultation

1. Wetlands and Waters of the United States (*responses to both questions required)*

a. Are there any wetlands or waters of the United States within the project area that would be temporarily or permanently impacted by the project?
☒**NO**
☐**YES**, *describe potential impacts, required federal, state, and local permitting and proposed mitigation below*:

b. Does the project involve the construction or modification of a bridge or causeway across any navigable waters of the United States?
☒**NO**
☐**YES**, *discuss whether any permit or authorization is required from the U.S. Coast Guard*:

2. Threatened and Endangered Species / Essential Fish Habitat (*responses to both questions required)*

a. Are there any federally listed endangered or threatened species or designated critical habitat potentially present within the project area?
☐NO
☒YES, *identify species and discuss any consultation with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under Section 7 of the Endangered Species Act (Attach corresponding consultation documentation)*.

The project was reviewed by the MassDOT Wildlife Unit and was determined to have *No Effect* on federally listed endangered species including the Northern Long-eared Bat (*Myotis septentrionalis)* (NLEB), as they are not present within the project area. A United States Fish and Wildlife Service No Effect Consistency Letter was generated through the Information for Planning and Consultation (IPaC) online tool on August 5, 2024, and stated that *no consultation is required.* The project's proposed actions are consistent with the February 5. 2018 FHWA, FRA, FTA Programmatic Biological Opinion amended March 23, 2023. The IPaC No Effect Consistency Letter is attached.

In addition, acoustic surveys were conducted for the project in July 2023 and determined NLEB was detected by not confirmed within the project area. The survey report prepared by Stantec, concluded that automated identification detected NLEB, but detections did not have qualifying maximum likelihood estimate scores and were not confirmed via visual vetting, therefore indicating probable absence of NLEB in the project area.

MassDOT reviewed the project area within the Greater Atlantic Region ESA Section 7 Online Mapper and determined that there are no resource areas where NMFS-protected species are present within the project limits, as the project does not impact any waterways.

b. Are there any Essential Fish Habitat (EFH) mapped for the project area?
☐NO
☒YES, *identify species and discuss any consultation with the National Marine Fisheries Service under the Magnuson-Stevens Fishery Conservation and Management Act (Attach corresponding consultation documentation)*

The project area is mapped within Essential Fish Habitat, but due to the limits of work the MassDOT Wildlife Unit has determined that there is no impact to EFH, and no consultation is necessary since the project does not propose any work in or directly adjacent to waterways.

3. Historic Resources

a. Are there any historic or known archaeological resources within the project's Area of Potential Effect that are listed in or eligible for listing in the National Register of Historic Places?
☒**NO**
☐**YES**, *identify resource(s) below*:

Whether "Yes" or "No" is checked above, please indicate which project clearance or effect determination was issued for the project under Section 106 of the National Historic Preservation Act, including discussion of any applicable consultation with the State Historic Preservation Officer, Federally Recognized Tribes, and other consulting parties. (*Attach corresponding Section 106 compliance documentation*).

The MassDOT Cultural Resources Unit have reviewed this project under Section 106 of the National Historic Preservation Act of 1966 and determined on June 28, 2023, that there the project's proposed actions will have No Effect on any historic properties since no properties contributing to the National Register-eligible Cape Cod Canal historic district are within the project's Area of Effect. The MassDOT Archaeologist determined that low sensitivity can be ascribed to the project area for archaeological resources due to previous archaeological surveys and previous development. No further consultation with the State Historic Preservation Officer (SHPO) is required under the terms specified in Stipulation V.B. of Section 106 Programmatic Agreement.

MassDOT submitted project information to the Aquinnah, Mashpee, and the Narragansett Tribal Historic Preservation Officers (THPOs) via email on June 28, 2023, to meet the Section 106 consultation requirements of FHWA and the U.S. Army Corps of Engineers. Record of THPO project notification and the Stipulation V.B. clearance form is attached.

4. <u>Section 4(f) / Section 6(f) Resources</u> (*responses to both questions required)*

a. Are there any properties or facilities protected by Section 4(f) of the DOT Act of 1966 that would be impacted by the project?

☐**NO**

☒**YES**, *identify the applicable resource(s) and discuss any potential impacts, including proposed mitigation measures (if applicable), and coordination with required official(s) with jurisdiction (Attach all documented Section 4(f) impact determinations with sign offs from the applicable official(s) with jurisdiction)*.

The project proposes a total of ten temporary easements on three parcels that serve a significant recreational function and provide public access to open space and are therefore subject to protection under Section 4(f). All of the temporary easements are required for work associated with proposed roadway widening including grading, loam and seed, placement of sediment control barriers, pavement parking, clearing and grubbing, and pavement mill and overlay on Route 6 adjacent to these parcels. The temporary work will not result in any permanent adverse effects and disturbed land will be fully restored after work is completed.

One temporary easement (18-TCA-9) of approximately 6,733 square feet is proposed on Bourne Scenic Park located at 370 Scenic Highway. The Park is owned and maintained by the Bourne Recreation Authority (BRA). John Morrill, the Facility Supervisor and Operations Manager for the BRA, who is the Official With Jurisdiction (OWJ) in accordance with regulations implementing Section 4(f) approved the proposed temporary occupancy on July 2, 2024.

Five temporary easements (18-TCA-2, 18-TCA-3, 18-TCA-4, 18-TCA-5, and 18-TCA-6) totaling 31,994 square feet, are proposed on the parcel located at 0 Scenic Highway. The parcel is owned by the United States Army Corps of Engineers and the temporary easements are located within an area under lease by the BRA. This leased area includes a continuation of the Bourne Scenic Park campground and associated facilities. Joint OWJs Eric Pedersen, Chief of Operations for the USACE New England District, and John Morrill for the BRA, approved the proposed temporary occupancies on August 13 and 14, 2024, respectively.

Four temporary easements (18-TE-16, 18-TE-17, 18-TE-18, and 18-TE-26) totaling 82,695 square feet are proposed on the parcel located at 45-41 Ernest Valeri Road. This is a large parcel that includes the Bournedale Elementary School and its publicly accessible playground and recreational facilities. Marlene McCollem, Town Administrator for the Town of Bourne, who is the OWJ, approved the proposed temporary occupancies on July 10, 2024.

FHWA concurred with the OWJ's approvals on August 21, 2024. The Temporary Occupancy Approval letters with all required signatures are attached.

b. Will the project impact any public park or recreation facility protected by Section 6(f) of the Land and Water Conservation Fund Act?
☒**NO**
☐**YES**, *discuss the consultation process with the National Parks Service, and attach any corresponding documentation*.

5. Noise

a. Is the project classified as a Type I action as defined under 23 CFR 772.5?
☒**NO** *(proceed to Item 6)*
☐**YES**, *describe findings of the Traffic Noise Analysis, including any proposed noise abatement measures below (Attach corresponding Traffic Noise Analysis Report)*.

6. Right-of-Way Requirements

a. Does the project require the acquisition of right-of-way or easements?
☐**NO** *(proceed to Item 7)*
☒**YES**, *indicate whether acquisitions and/or easements will result in any commercial or residential displacements, or substantial adverse impacts on abutting property (Attach necessary right-of-way plan sheets).*

The project will require 9 fee takings, 25 permanent easements, and 28 temporary easements. None of these will occur within a mapped Environmental Justice Community. None of the easements or takings are considered more than minor acquisition, as they will not affect the designated activities or uses of adjacent properties. MassDOT's Right-of-Way Bureau will be responsible for ensuring that all right-of-way acquisitions will be completed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Polices of 1970 (Uniform Act), as amended.

7. **Environmental Justice**

a. Are there any Environmental Justice populations designated as minority, low-income or limited English proficient within or near the project area?
☒**NO** *(proceed to Item 8)*

☐**YES**, *discuss whether the project may have disproportionately high and adverse impacts on these identified populations below (Attach Environmental Justice/Community Impact Assessment Report, if applicable)*.

According to 2020 Census Data published by the Massachusetts Executive Office of Energy and Environmental Affairs online mapper, there are no EJ Communities directly within the project area.

One census tract (Block Group 1, Census Tract 141) is located within 1-mile of the project corridor and meets the EJ criteria for minority and low-income populations. The identified EJ community is associated with Joint Base Cape Cod, which is on the opposite side of the Cape Cod Canal from the project area.

The long-term operation of the project is not anticipated to have disproportionately high and adverse impacts on the identified EJ population associated with Joint Base Cape Cod. The project does not propose any acquisition of right-of-way associated with Joint Base Cape Cod, or changes to the roadway vehicular capacity that would exacerbate pre-existing conditions relative to noise and air quality. Additionally, no residential or business relocations are required for the project.

Route 6 Scenic Highway is vital to the movement of Joint Base Cape Cod personnel, goods, and services, as it provides an important connection between the Bourne and Sagamore Bridges on the mainland side of Cape Cod Canal. The Bourne and Sagamore Bridges are the only vehicular access points between the mainland and Cape Cod. Long-term impacts from the project to the identified EJ community associated with Joint Base Cape Cod will be beneficial due to improved safety of travel along this section of Route 6 Scenic Highway.

During project construction, measures to minimize impacts to local and regional road users will be implemented to the greatest extent practicable, including maintaining all lanes throughout construction, except for a short duration where the two WB travel lanes will be reduced to one travel. The WB travel lane closure will occur during off-peak hours to minimize impacts to through traffic along the project corridor.

8. **<u>Other Environmental Considerations</u>** *This section should discuss any other potential environmental impacts or concerns not covered in the previous sections*

According to available MassGIS data, the project corridor is located within the designated Massachusetts Coastal Zone. The proposed scope of work does not include any foreseeable affects to coastal resources within the Massachusetts Coastal Zone. The Office of Coastal Zone Management was included in the review of the project through the MEPA process and was given the opportunity to provide comments.

F. Public Involvement

Describe prior and planned opportunities for public participation during the project planning and development process, and any concerns and issues that have been generated through public comment to date

Early in project development, MassDOT developed a stakeholder database which identified project stakeholders in the towns of Bourne, Sandwich, Buzzards Bay, and Plymouth. Project stakeholders include local and state officials, and representatives of community-based organizations (CBOs) near the project corridor.

On March 7, 2022, MassDOT held a virtual project briefing for local and state officials, including representatives from the Massachusetts Senate, Massachusetts House of Representatives, and the Town of Bourne. Feedback from this meeting was used to inform future public outreach.

On May 18, 2022, MassDOT held a virtual public information meeting. Stakeholders were notified of the public information meeting through distribution of a flyer that contained project information and procedures for joining the virtual meeting. Although there are no Limited English Proficiency (LEP) populations within one mile of the project corridor, the meeting flyer was translated into both Spanish and Portuguese based on regional demographics.

On June 8, 2023, MassDOT held a virtual Design Public Hearing to present the project's 25% design and schedule. Attendees included local officials, and residents of the towns of Bourne and Sandwich. Attendees expressed support for proposed drainage upgrades to minimize roadway ponding and improve driver safety and discussed the proposed pedestrian and bicycle connections between the project intersections.

On July 17th, 2023, MassDOT filed an Expanded Environmental Notification Form (EENF) and Proposed Environmental Impact Report (EIR) with the Massachusetts Environmental Policy Act (MEPA) Office in compliance with the MEPA implementing regulations at 301 CMR 11.00. The EENF and Proposed EIR were published in the Massachusetts Executive Office of Energy and Environmental Affairs (MA EEA) Environmental Monitor and subject to a 30-day public comment period, through which MassDOT adequately responded to comments from the Cape Cod Commission (CCC) and the Massachusetts Department of Environmental Protection (MassDEP). The Secretary of the MA EEA issued the MEPA Certificate on December 29, 2023, thereby concluding the MEPA review process.

G. Environmental Review and Permitting

List all federal, state, and local environmental reviews and permits required for the project, and the status of approvals

Permit/Review	Agency	Status
Massachusetts Environmental Policy Act	MA EEA	Expanded Environmental Notification Form Certificate issued September 1, 2023

		Environmental Impact Report Certificate issued December 29. 2023
Section 7 Consultation	USFWS	No Effect Consistency Letter issued August 5, 2024
Section 106 Finding of Effect	SHPO	No Historic Properties Affected PA Stipulation V.B. issued June 28, 2023
Open Space Section 4(f)	FHWA	FHWA Concurrence received August 21, 2024

Appendix A. Supporting Documentation

List all supporting documentation that will be attached to the CE Form

- **Project Locus Map**
- **ROW Parcel Summary Sheet**
- **Section 7 IPaC No Effect Consistency Letter**
- **Section 106 Stip. VB Determination**
- **THPO E-mails and Project Notification Form**
- **Open Space Section 4(f) Temporary Occupancy Letters**
- **MEPA EENF and EIR Certificates**
- **EJ Map**
- **Design Public Hearing Transcript**

Categorical Exclusion (CE) Determination

Starting with Section 1, answer the questions by checking Yes or No.

After each of the following sections, there will be instructions that direct the preparer to continue to the next appropriate section of the checklist. The preparer should refer to *MassDOT's Guide for processing Categorical Exclusions* for further information and instructions on completing this checklist.

SECTION 1. CATEGORICAL EXCLUSIONS		
1. Is project on the list of CEs included under23 CFR 771.117(c) or (d)?	☐**NO**	☒**YES**

If "Yes," the preparer should select the appropriate Categorical Exclusion (CE) that is being considered for the proposed action and then complete Section 2 below. If "No," the preparer should complete Section 2 below.

Activity Listed in 23 CFR 771.117(c) (The "C" List)	
1 ☐	Activities that do not involve or lead directly to construction, such as planning and research activities; grants for training; engineering to define the elements of a proposed action or alternatives so that social, economic, and environmental effects can be assessed; and Federal-aid system revisions which establish classes of highways on the Federal-aid highway system.
2 ☐	Approval of utility installations along or across a transportation facility.
3 ☐	Construction of bicycle and pedestrian lanes, paths, and facilities.
4 ☐	Activities included in the State's Highway Safety Plan under 23 U.S.C. 402.
5 ☐	Transfer of Federal lands pursuant to 23 U.S.C. 107(d) and/or 23 U.S.C. 317 when the land transfer is in support of an action that is not otherwise subject to FHWA review under NEPA.
6 ☐	The installation of noise barriers or alterations to existing publicly owned buildings to provide for noise reduction.
7 ☐	Landscaping.
8 ☐	Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur.
9 ☐	The following actions for transportation facilities damaged by an incident resulting in an emergency declared by the Governor of the State and concurred in by the Secretary, or a disaster or emergency declared by the President pursuant to the Robert T. Stafford Act (42 U.S.C. 5121): *i)* Emergency repairs under 23 U.S.C. 125; and *ii)* The repair, reconstruction, restoration, retrofitting, or replacement of any road, highway, bridge, tunnel, or transit facility (such as a ferry dock or bus transfer

	station), including ancillary transportation facilities (such as pedestrian/bicycle paths and bike lanes), that is in operation or under construction when damaged and the action: a) Occurs within the existing right-of-way and in a manner that substantially conforms to the preexisting design, function, and location as the original (which may include upgrades to meet existing codes and standards as well as upgrades warranted to address conditions that have changed since the original construction); and b) Is commenced within a 2-year period beginning on the date of the declaration.
10 ☐	Acquisition of scenic easements.
11 ☐	Determination of payback under 23U.S.C. 156for property previously acquired with Federal-aid participation.
12 ☐	Improvements to existing rest areas and truck weigh stations.
13 ☐	Ridesharing activities.
14 ☐	Bus and rail car rehabilitation.
15 ☐	Alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons.
16 ☐	Program administration, technical assistance activities, and operating assistance to transit authorities to continue existing service or increase service to meet routine changes in demand.
17 ☐	The purchase of vehicles by the applicant where the use of these vehicles can be accommodated by existing facilities or by new facilities that themselves are within a CE.
18 ☐	Track and railbed maintenance and improvements when carried out within the existing right-of-way.
19 ☐	Purchase and installation of operating or maintenance equipment to be located within the transit facility and with no significant impacts off the site.
20 ☐	[Not Applicable]
21 ☐	Deployment of electronics, photonics, communications, or information processing used singly or in combination, or as components of a fully integrated system, to improve the efficiency or safety of a surface transportation system or to enhance security or passenger convenience. Examples include, but are not limited to, traffic control and detector devices, lane management systems, electronic payment equipment, automatic vehicle locaters, automated passenger counters, computer aided dispatching systems, radio communications

	systems, dynamic message signs, and security equipment including surveillance and detection cameras on roadways and in transit facilities and on buses.
22 ☐	Projects, as defined in 23 U.S.C. 101, that would take place entirely within the existing operational right-of-way. Examples include: ☐ Tower lighting ☐ Guardrail installation and replacement (including median cable barriers) where roadway ditches and backslopes will not be relocated. ☐ Improvements to existing MassDOT maintenance facilities. ☐ Construction of new MassDOT maintenance facilities within an existing operational right of way. ☐ Work on pedestrian and vehicle transfer structures and associated utilities, buildings, and terminals. *(For CE C-22, refer to Categorical Exclusion Guide for further information).*
23 ☐	Federally funded projects: a) That receive less than $5,000,000 (as adjusted annually by the Secretary to reflect any increases in the Consumer Price Index prepared by the Department of Labor) of Federal funds; or b) With a total estimated cost of not more than $30,000,000 (as adjusted annually by the Secretary to reflect any increases in the Consumer Price Index prepared by the Department of Labor) and Federal funds comprising less than 15 percent of the total estimated project cost. *(For CE C-23, refer to Categorical Exclusion Guide for further information).*
24 ☐	Localized geotechnical and other investigation to provide information for preliminary design and for environmental analyses and permitting purposes, such as drilling test bores for soil sampling; archeological investigations for archeology resources assessment or similar survey; and wetland surveys.
25 ☐	Environmental restoration and pollution abatement actions to minimize or mitigate the impacts of any existing transportation facility (including retrofitting and construction of stormwater treatment systems to meet Federal and State requirements under sections 401 and 402 of the Federal Water Pollution Control Act (33 U.S.C. 1341; 1342)) carried out to address water pollution or environmental degradation.
26 ☒	Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (including parking, weaving, turning, and climbing lanes). Examples include: ☐ Construction of highway safety and truck escape ramps

	☒ Construction of bicycle lanes and pedestrian walkways, sidewalks, shared-use paths, or facilities and trailhead parking that do not otherwise qualify for a CE C-1 designation. ☐ Beautification or facility improvement projects (*e.g.*, landscaping, curb and gutter installation and replacement, ADA ramps/curb ramps, installation of park benches, or decorative lighting). ☐ Implementation of Complete Street elements to improve safety and/or pedestrian, bicycle, transit, vehicular, or freight mobility.
27 ☐	Highway safety or traffic operations improvement projects, including the installation of ramp metering control devices and lighting. Examples include lane reduction changes, provided traffic analyses are completed.
28 ☐	Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.
29 ☐	Purchase, construction, replacement, or rehabilitation of ferry vessels (including improvements to ferry vessel safety, navigation, and security systems) that would not require a change in the function of the ferry terminals and can be accommodated by existing facilities or by new facilities which themselves are within a CE.
30 ☐	Rehabilitation or reconstruction of existing ferry facilities that occupy substantially the same geographic footprint, do not result in a change in their functional use, and do not result in a substantial increase in the existing facility's capacity. Example actions include work on pedestrian and vehicle transfer structures and associated utilities, buildings, and terminals.
Activity Listed in 23 CFR 771.117(d) (The "D" List)	
1 – 3	[*Reserved*]
4 ☐	Transportation corridor fringe parking facilities.
5 ☐	Construction of new truck weigh stations or rest areas.
6 ☐	Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.
7 ☐	Approvals for changes in access control.
8 ☐	Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.
9 ☐	Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10 ☐	Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks, and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.
11 ☐	Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.
12 ☐	Acquisition of a particular parcel or a limited number of parcels for hardship or protective purposes where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed. An example is right-of-way acquisition only for a bikeway/pedestrian facility (no construction).

SECTION 2. SEGMENTATION REVIEW		
2. Is the action a linear project?	☐**NO**	☒**YES**
If the answer is "Yes," the preparer should respond to Questions 3 through 5 below. If the answer is "No," the preparer should proceed to Section 3.		
3. Does the project have independent utility?	☐**NO**	☒**YES**
4. Does the project connect logical termini?	☐**NO**	☒**YES**
5. Does the project allow further consideration of alternatives for other reasonably foreseeable transportation improvements?	☐**NO**	☒**YES**

If "NO" is checked for any of the Questions 3 through 5, <u>the project does not qualify as a Categorical Exclusion (CE) and consultation between MassDOT and FHWA is required</u>. If "YES" is checked for Questions 3 through 5, the preparer should complete Section 3.

SECTION 3. CE AND UNUSUAL CIRCUMSTANCES REVIEW		
6. Does the project induce significant impacts to planned growth or land use for the area?	☒**NO**	☐**YES**
7. Does the project require the relocation of significant numbers of people?	☒**NO**	☐**YES**
8. Does the project have a significant impact on any natural, cultural, recreational, historic, or other resource?	☒**NO**	☐**YES**
9. Does the project involve significant air, noise, or water quality impacts?	☒**NO**	☐**YES**
10. Does the project have a significant impact on travel patterns?	☒**NO**	☐**YES**
11. Does the project involve substantial controversy on environmental grounds?	☒**NO**	☐**YES**
12. Does the project have a significant impact on Section 4(f) properties or on historic properties?	☒**NO**	☐**YES**
13. Is the project inconsistent with any Federal or state requirement or administrative determination relating to the environmental aspects of the action?	☒**NO**	☐**YES**

If "YES" is checked for any of the questions in Section 3, the project does not qualify as a Categorical Exclusion (CE) and an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is required. If the answer to all questions within Section 3 is "No," the preparer should complete Section 4 below.

SECTION 4. PROGRAMMATIC CATEGORICAL EXCLUSION THRESHOLD REVIEW		
14. Does the project involve residential or commercial displacement, or acquisition of property rights that results in substantial abutter impacts?	☒**NO**	☐**YES**
15. Does the project require submittal of an Interchange Modification Report?	☒**NO**	☐**YES**
16. Does the project have a finding of "may affect, likely to adversely affect" any listed or candidate species or critical habitat that has been designated or proposed under the Endangered Species Act?	☒**NO**	☐**YES**
17. Does the project involve opposition or unresolved objections resulting from consultation or correspondence with Federally Recognized Tribes?	☒**NO**	☐**YES**
18. Does the project have a finding of "Adverse Effect" on historic properties pursuant to Section 106 the National Historic Preservation Act?	☒**NO**	☐**YES**

19. Does the project have an adverse effect on a National Historic Landmark?	☒**NO**	☐**YES**
20. Does the project require the use of Section 4(f) properties that cannot be documented with an FHWA *de minimis* determination?	☒**NO**	☐**YES**
21. Does the project require the acquisition of lands under the protection of Section 6(f) of the Land and Water Conservation Act or other unique areas or special lands that were acquired in fee or easement with public-use money and have deed restrictions or covenants on the property?	☒**NO**	☐**YES**
22. Does the project require a U.S. Army Corps of Engineers Section 404 (33 U.S.C. § 1344) permit other than a General Permit?	☒**NO**	☐**YES**
23. Does the project require a U.S. Coast Guard bridge permit?	☒**NO**	☐**YES**
24. Does the project require work encroaching on a regulatory floodway or work affecting the base floodplain (100-year flood) elevations of a water course or lake?	☒**NO**	☐**YES**
25. Does the project involve impacts subject to the conditions of the Bald and Golden Eagle Protection Act?	☒**NO**	☐**YES**
26. Is the project a "Type I project" requiring a noise analysis?	☒**NO**	☐**YES**
27. Does the project involve acquisition of land for hardship, protective purposes, or early acquisition?	☒**NO**	☐**YES**
28. Does the project generate substantial public controversy or opposition for any reason?	☒**NO**	☐**YES**
29. Does the project involve construction in, across, or adjacent to a river component designated or proposed for inclusion in the National System of Wild and Scenic Rivers?	☒**NO**	☐**YES**
30. Does the project involve the construction of temporary access or closure of existing road, bridge, or ramps?	☒**NO**	☐**YES**

If the answers to Questions 14 through 30 are "NO", then the project qualifies as a Programmatic CE. If any of the answers to Questions 14 through 30 are "YES", then the project cannot be classified as a Programmatic CE and an Individual CE approval from FHWA is required. If the answer to Question 30 is "Yes", the preparer should complete Question 31 below.

31. Does the project meet the following conditions for construction of temporary access or closure of existing road, bridge, or ramps?	☐**NO**	☐**YES**

U.S. Department of Transportation
Federal Highway Administration

massDOT

- Provisions have been made for access by local traffic and are posted;
- There will be no adverse effects on through-traffic dependent business;
- The temporary access or closure of existing road, bridge, or ramps will not interfere with a local special event or festival; or
- The temporary access or closure of existing road, bridge, or ramps will not substantially change the environmental consequences of the project.

If the answer to Question 31 is "YES", then the project qualifies as a Programmatic CE. The checklist and all supporting information should be submitted to the MassDOT Project Manager.

If the answer to Question 31 is "NO", then the project cannot be classified as a Programmatic CE and an Individual CE approval from FHWA is required. The preparer should attach to this checklist all supporting information to clearly establish that there is little or no potential for significant impact. The Individual CE and supporting information will be submitted to the FHWA Massachusetts Division for approval.

CERTIFICATION *(FOR AGENCY USE ONLY)*

Based on the information obtained during environmental review process and included in this checklist, the project is determined to be a Categorical Exclusion pursuant to the National Environmental Policy Act and complies with all other applicable environmental laws, regulations, and Executive Orders.

8/26/2024

Director of Environmental Services
(or designee)

Date

For Individual CEs, the FHWA Division Administrator's signature is also required.

N/A

Division Administrator
(or designee)

Date

FHWA Comments or Conditions:

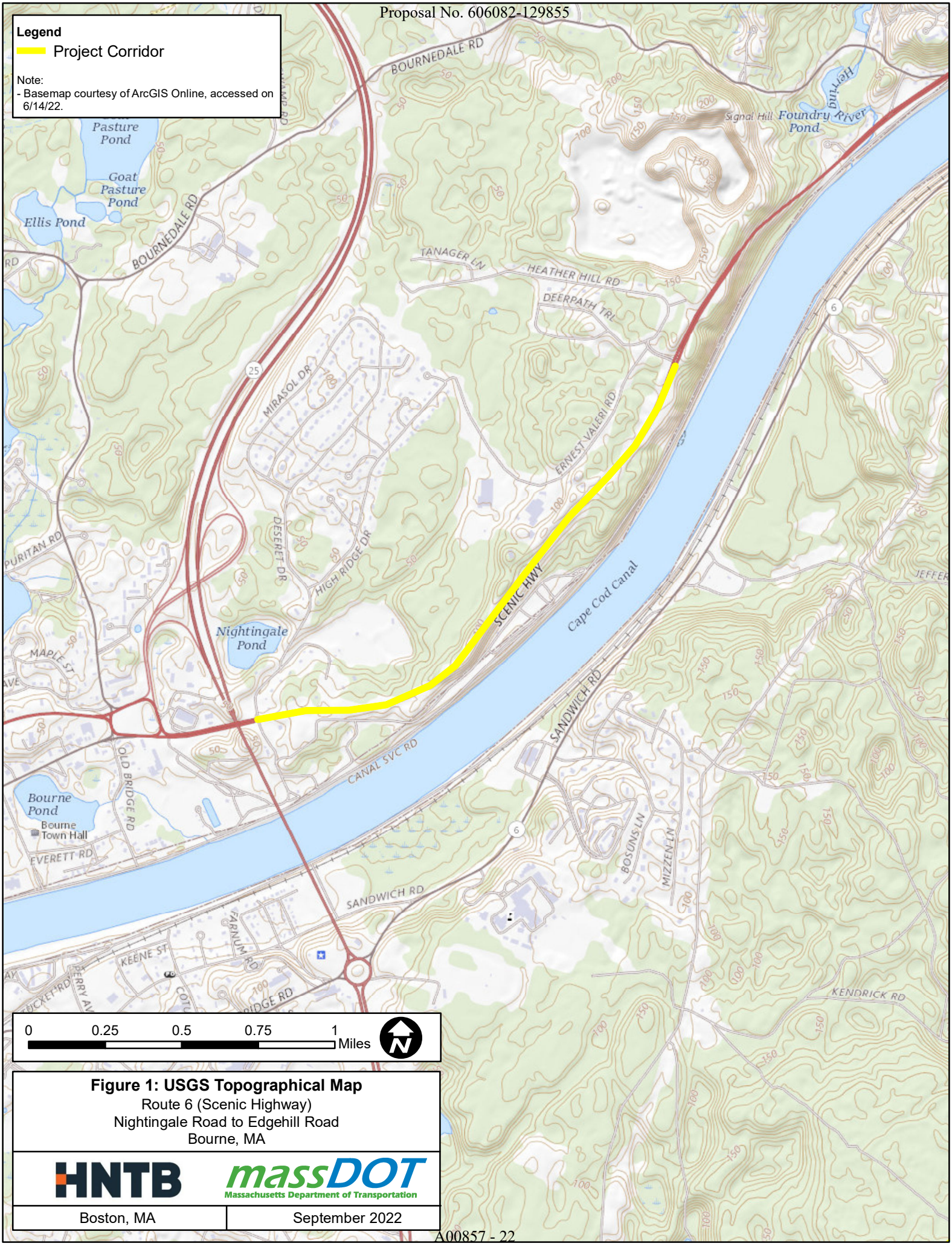

Figure 1: USGS Topographical Map
Route 6 (Scenic Highway)
Nightingale Road to Edgehill Road
Bourne, MA

HNTB

massDOT
Massachusetts Department of Transportation

Boston, MA	September 2022

DOCUMENT A00858

CULTURAL RESOURCES PROJECT RECORD

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Proposal No. 606082-129855

CULTURAL RESOURCES PROJECT RECORD

City/Town: Bourne

Project # 606082

Date Cleared 6/28/2023

Project Name: Roadway Improvements on Route 6

Date Filed 6/28/2023

Finding Under Review ☐

FHWA to MHC

Project Type: Roadway Improvements

Review: Section 106 (PA)

Finding: Stip VB - No historic properties affected

Early Coord. Letter Sent: ☑

Comment Received: ☐ MHC ☐ LHC

Reviewer: JMH

Consultant

Comment: PNFs to ATHPO, MTHPO, NTHPO, and Herring Pond, no comments received. Per 75% plans, infiltration basin proposed at Sta 123 to 126 RT. This location is not archaeologically sensitive as it is shown on the 1966 & 1971 aerial and 1967 USGS map as a cleared pull off area.

Determination based on: ☑ Scope of Work ☑ Plan ☑ Inventory ☑ Site Visit ☐ Archaeological Survey

Attach appropriate documentation for checked items

Projects Requiring No Massachusetts SHPO Review

Programmatic Agreement, Appendix 1 (check all that apply) :

☐ 1) Interstate bridge or roadway projects
☐ 2) Resurfacing, repair existing roadways
* ☐ 3) Reconstruction on existing roadway
* ☐ 4) Roadway geometrics, intersections
* ☐ 5) Curbs and sidewalks
☐ 6) Pavement markings, rumble strips, etc
☐ 7) Curbs, sidewalks (MAAB, ADA)
* ☐ 8) Removal of trees
☐ 9) Landscaping
☐ 10) Utilities
☐ 11) Railroad crossing
☐ 12) Stream stabilization and restoration
☐ 13) Wetland mitigation area
* ☐ 14) Bridge (NR "Not Eligible" or "Conditionally Not Eligible")
* ☐ 15) Bridge (concrete slab post 1900, steel stringer)
☐ 16) Bridge (less than 20' span)
* ☐ 17) Highway safety improvement
☐ 18) Drainage system element
* ☐ 19) Traffic signal, safety improvement
* ☐ 20) Intelligent Transportation System project
☐ 21) Rest area, maintenance facility
* ☐ 22) Bicycle, pedestrian lane, path or facility
☐ 23) Lighting system
☐ 24) Sign
☐ 25) Hazardous waste
☐ 26) Highway fencing
☐ 27) Emergency repair
☐ 28) Erosion control
☐ 29) Noise barrier

* National Register eligibility evaluation required

-OR-

No Historic Properties Affected
Programmatic Agreement Stipulation V.B. (check one):

☐ No NR listed or -eligible properties within Area of Potential Effect
☑ No effect on National Register listed or -eligible properties

Reviewer's Initials: JPS JMH

CULTURAL RESOURCES PROJECT RECORD

Summary of MassDOT Highway Division Finding
(Appendix 1 and Section V.B. Projects only)

MassDOT proposes roadway improvements on a 1.484-mile section of Route 6 in Bourne. The project area extends from the Nightingale Road / Andy Olivia Drive intersection easterly to the Edge Hill Road intersection. Travel lane and shoulder widening will improve substandard widths and a center raised median will address crossover crashes within the corridor. The project will also provide an upgraded drainage system to reduce roadway ponding. Additional project work will include: full depth pavement reconstruction; roadway resurfacing; replacing guardrail; installing a retaining wall and cedar rail fencing; drainage improvements; installing signage and pavement markings; clearing and grubbing; and placing loam and seed. Buried and overhead utilities are located along the north side of Route 6.

A review of MACRIS revealed that the Route 6 project area is adjacent to the Cape Cod Canal (BOU.AF). The Corps determined that the Cape Cod Canal is eligible for listing in the National Register of Historic Places as an historic district. The MA SHPO concurred with the Corps determination of eligibility. The project area will require a permanent utility easement from and temporary occupancies on Corps properties. However, none of these properties are located within the boundaries of the NR-eligible Cape Cod Canal Historic District. The Route 6 project work has no potential to affect the characteristics that qualify the Cape Cod Canal for NR-listing.

A review of the MHC's archaeological maps on MACRIS revealed several recorded pre-contact sites in the vicinity of the project area: 19-BN-620 (Canalscape Loci Findspot); 19-BN-937 (Route 6 Slope Site); and 19-BN-244 (Nightingale Site). 19-BN-620 was identified in 1988 during a survey conducted in advance of the Canalscape land development along the north side of Route 6. The 1988 survey included approximately 0.61 miles of the current Route 6 project corridor. The findspot was determined to be not significant and no further work was recommended.

In 2006-7, PAL conducted an intensive (locational) survey on behalf of MassHighway (now MassDOT) in advance of a Route 6 widening project (#603894). This project corridor extended along the north side of Route 6 approximately 2,000-ft. westerly and 1,600-ft. easterly of the Edgehill Road intersection. The state highway layout was expanded 50-ft. to the north to accommodate the approximately 40-ft. roadway widening, drainage and utility improvements, and guardrail installation. The project work also included the acquisition of the property at 635 Scenic Highway and the removal of the former mid-late 20th century union hall and parking lot. No cultural material was recovered from the PAL survey, and no additional survey was recommended. The approximately 2,000-ft. section of Route 6 westerly of Edgehill Road surveyed by PAL in 2006-7 is included in the current Route 6 project area.

In October 2008 several cultural materials were observed in the slope wash by members of the Wampanoag Tribe of Gay Head (Aquinnah) Tribal Historic Preservation Office during a site visit to the previous Route 6 project area easterly of Edgehill Road. These materials (designated 19-BN-937) were exposed on the ground surface on top of the knolls and along the slope leading down to Route 6. MassHighway (now MassDOT), in consultation with the Wampanoag Tribe of Gay Head/Aquinnah and Mashpee Wampanoag Tribe, requested that machine-assisted stripping and archaeological monitoring be completed within the approximately 1,600-ft section of the project impact area easterly of Edgehill Road. PAL noted that the B/subsoil stratum appeared to have been stripped in some portions of the project area, likely associated with the initial construction and subsequent widening of the Cape Cod Canal, as well as the removal and/or redistribution of soils related to the construction of Route 6. No cultural features were identified within the project area, and no cultural materials were observed within the excavated soils or within the B or C/subsoil matrix.

Other surveys near the current Route 6 project area include the 1994 Cape Cod Canal inventory management plan survey and the 2010 New Generation Wind Project survey. These surveys did not identify any archaeological sites near the current project corridor.

Other disturbances along the north side of Route 6 within the project area include: the shifting of the Nightingale Pond Road intersection to its current alignment ca. 1991; the clearing of the formerly wooded property at 411 Scenic Highway ca. 1985 and the construction of the current residential house and driveway along Route 6 in 2019; the clearing of the property at 635 Scenic Highway ca. 2010; the construction of the Edgehill Road intersection ca. 1991; and the construction of the Bourne Public Works Department facility within a portion of the area surveyed for the Canalscape land development.

Reviewer's Initials: _____

Although undisturbed areas near the Cape Cod Canal are sensitive for archaeological resources, it is the opinion of the MassDOT Archaeologist, Jameson Harwood, that low sensitivity can be ascribed to the Route 6 project's direct area of potential effect (APE) based on the results of previous archaeological surveys, past roadway, utility, and drainage construction, and roadside development. A site visit conducted by the MassDOT Archaeologist in 2023 confirmed the disturbed nature of the project's direct APE.

An early notification letter was forwarded to the Bourne Historical Commission on June 20, 2022. A copy was forwarded to the MHC. No comments have been received from either Commission. PNFs were forwarded to the MTHPO and the ATHPO on June 28, 2023.

Reviewer's Initials: _____

Harwood, Jameson (DOT)

From: Harwood, Jameson (DOT)
Sent: Wednesday, June 28, 2023 9:41 AM
To: Bettina Washington
Subject: MassDOT Project #606082 - Bourne: Route 6 improvements
Attachments: PNF.pdf; Bourne Route 6 (606082) Plans.pdf

Dear Ms. Washington,

MassDOT is submitting the enclosed project information to the THPO to meet the Section 106 consultation requirements of the Federal Highway Administration (as Lead Federal Agency). Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Carrie Lavallee, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood.

You also may send comments, questions, or requests for more information by email to Jameson.Harwood@state.ma.us.

Thank you,
Jamie

Jameson M. Harwood, Cultural Resources Supervisor
Environmental Services Section
***MassDOT* – Highway Division**
10 Park Plaza
Boston, MA 02116

Harwood, Jameson (DOT)

From: postmaster@MassMail.State.MA.US
To: Bettina Washington
Sent: Wednesday, June 28, 2023 9:42 AM
Subject: Relayed: MassDOT Project #606082 - Bourne: Route 6 improvements

Delivery to these recipients or groups is complete, but no delivery notification was sent by the destination server:

Bettina Washington (thpo@wampanoagtribe-nsn.gov)

Subject: MassDOT Project #606082 - Bourne: Route 6 improvements

Harwood, Jameson (DOT)

From: Harwood, Jameson (DOT)
Sent: Wednesday, June 28, 2023 9:40 AM
To: David Weeden
Subject: MassDOT Project #606082 - Bourne: Route 6 improvements
Attachments: PNF.pdf; Bourne Route 6 (606082) Plans.pdf

Dear Mr. Weeden,

MassDOT is submitting the enclosed project information to the Mashpee Wampanoag Tribe to meet the Section 106 consultation requirements of the Federal Highway Administration (as Lead Federal Agency). Please submit any written comments or concerns regarding historic or archaeological properties that may be affected by this project to Carrie Lavallee, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jameson Harwood.

You also may send comments, questions, or requests for more information by email to Jameson.Harwood@state.ma.us.

Thank you,
Jamie

Jameson M. Harwood, Cultural Resources Supervisor
Environmental Services Section
***MassDOT* – Highway Division**
10 Park Plaza
Boston, MA 02116

Harwood, Jameson (DOT)

From: postmaster@MassMail.State.MA.US
To: David Weeden
Sent: Wednesday, June 28, 2023 9:41 AM
Subject: Relayed: MassDOT Project #606082 - Bourne: Route 6 improvements

Delivery to these recipients or groups is complete, but no delivery notification was sent by the destination server:

David Weeden (David.Weeden@mwtribe-nsn.gov)

Subject: MassDOT Project #606082 - Bourne: Route 6 improvements

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Roadway Improvements (MassDOT Project #606082)

Location /Address: Route 6

City/Town: Bourne

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
FHWA	Federal Funding

Project Description (narrative):

MassDOT proposes roadway improvements on a 1.484-mile section of Route 6 in Bourne. The project area extends from the Nightingale Road / Andy Oliva Drive intersection easterly to the Edge Hill Road intersection. The project work includes: roadway widening; full depth pavement reconstruction; roadway resurfacing; replacing guardrail; installing a retaining wall and cedar rail fencing; drainage improvements; installing signage and pavement markings; clearing and grubbing; and placing loam and seed. Buried and overhead utilities are located along the north side of Route 6.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

N/A

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

N/A

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

See plans

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

The project area will require fee takings and easements from US Army Corps property within the Cape Cod Canal (BOU.AF). The Corps determined that the Cape Cod Canal is eligible for listing in the National Register of Historic Places as a historic district. The State Historic Preservation Officer at the Massachusetts Historical Commission concurred with the USACE determination of eligibility.

A review of the MHC's archaeological maps on MACRIS revealed several recorded pre-contact sites in the vicinity of the project area: 19-BN-620 (Canalscape Loci Findspot); 19-BN-937 (Route 6 Slope Site); and 19-BN-244 (Nightingale Site). 19-BN-620 was identified in 1988 during a survey conducted in advance of the Canalscape land development along the north side of Route 6. The 1988 survey included approximately 0.61 miles of the current Route 6 project corridor. The findspot was determined to be not significant and no further work was recommended.

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Other surveys near the current Route 6 project area include the 1994 Cape Cod Canal inventory management plan survey and the 2010 New Generation Wind Project survey. These surveys did not identify any archaeological sites near the current project corridor.

Other disturbances along the north side of Route 6 within the project area include: the shifting of the Nightingale Pond Road intersection to its current alignment ca. 1991; the clearing of the formerly wooded property at 411 Scenic Highway ca. 1985 and the construction of the current residential house and driveway along Route 6 in 2019; the clearing of the property at 635 Scenic Highway ca. 2010; the construction of the Edgehill Road intersection ca. 1991; and the construction of the Bourne Public Works Department facility within a portion of the area surveyed for the Canalscape land development.

Although undisturbed areas near the Cape Cod Canal are sensitive for archaeological resources, it is the opinion of the MassDOT Archaeologist, Jameson Harwood, that low sensitivity can be ascribed to the Route

6 project's direct area of potential effect (APE) based on the results of previous archaeological surveys, past roadway, utility, and drainage construction, and roadside development. A site visit conducted by the MassDOT Archaeologist confirmed in 2023 confirmed the disturbed nature of the project's direct APE.

What is the total acreage of the project area?

			Productive Resources:		
Woodland		acres			
Wetland		acres	Agriculture		acres
Floodplain		acres	Forestry		acres
Open Space		acres	Mining/Extraction		acres
Developed		acres	Total Project Acreage		acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area?

Route 6 highway

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: _____ **Date:** 6/28/2023

Name: Jameson Harwood, Cultural Resources Supervisor

Address: 10 Park Plaza, Room 7360

City/Town/Zip: Boston, MA 02717

Telephone: Email: jameson.harwood@state.ma.us

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC

CC:

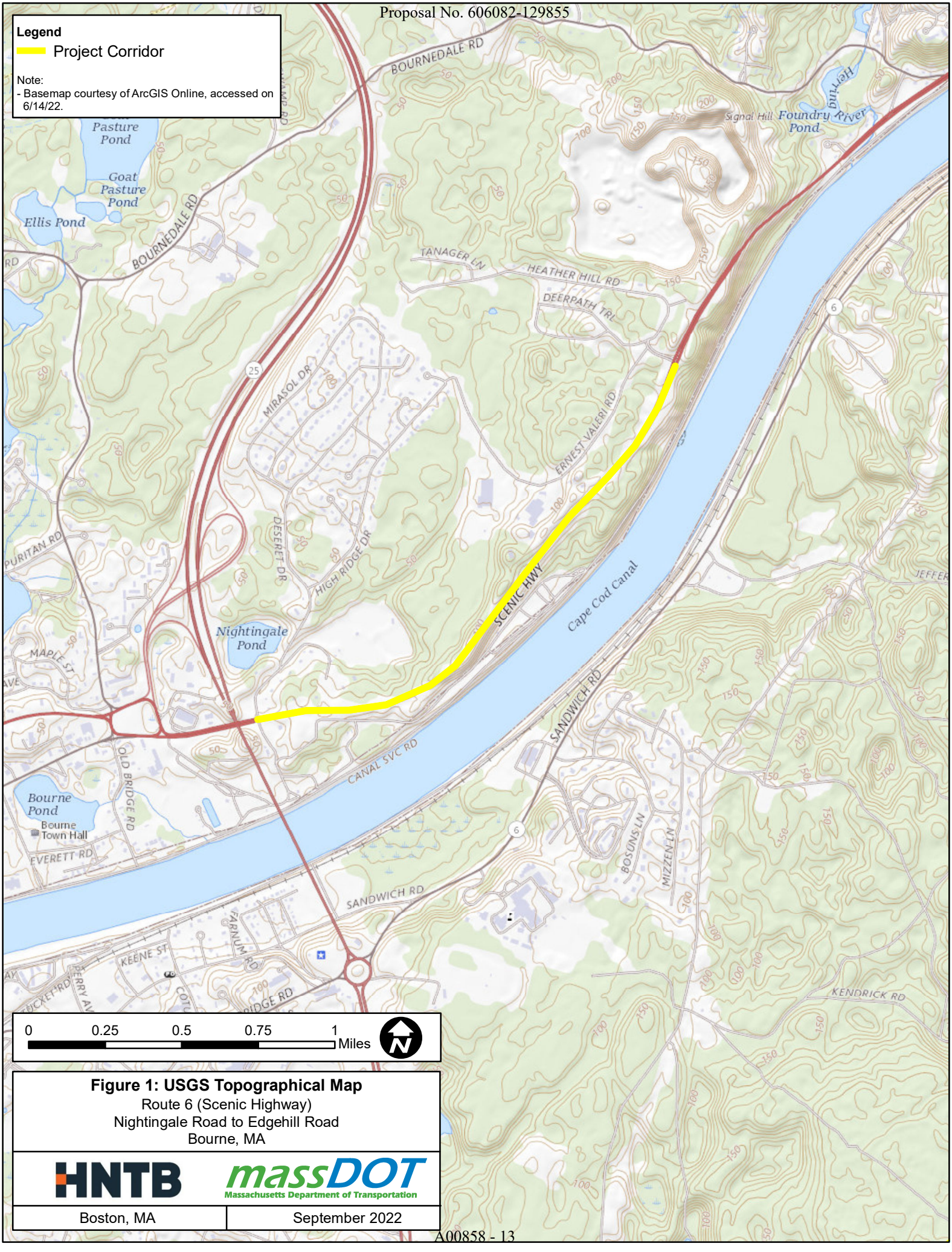

Figure 1: USGS Topographical Map
Route 6 (Scenic Highway)
Nightingale Road to Edgehill Road
Bourne, MA

HNTB

massDOT
Massachusetts Department of Transportation

Boston, MA	September 2022

Aerial Map
Route 6 (Scenic Highway)
From Nightingale Road
To Edgehill Road
Bourne, Barnstable County, MA

Figure 1

HNTB massDOT
Massachusetts Department of Transportation

Boston, MA | December 2019

World Street Map: ESRI

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

BOURNE

For: **Median Installation on Route 6 (Scenic Highway)**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the Town of BOURNE in Barnstable 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 6

Beginning – Station 102+15.65 +/-
Ending –Station 180+90.43 +/-

The contract prices shall include the furnishing of all materials (except as otherwise herein specified), the performing of all the labor requisite or proper, the providing of all necessary machinery, tools, apparatus and other means of construction, the doing of all the abovementioned work in the manner set forth, described and shown in the specifications and on the drawings for the work, and in the form of contract, and the completion thereof within **1989 CALENDAR DAYS** upon receipt of a Notice to Proceed.

The Work of this project is described by the following Items and quantities.

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Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
101.	12	CLEARING AND GRUBBING AT _____ PER ACRE		
102.2	1	TREE TRIMMING AT _____ LUMP SUM		
102.3	40	HERBICIDE TREATMENT OF INVASIVE PLANTS AT _____ PER HOUR		
103.	30	TREE REMOVED - DIAMETER UNDER 24 INCHES AT _____ EACH		
120.	145,900	EARTH EXCAVATION AT _____ PER CUBIC YARD		
121.	1,000	CLASS A ROCK EXCAVATION AT _____ PER CUBIC YARD		
129.2	11,000	OLD PAVEMENT EXCAVATION AT _____ PER SQUARE YARD		
141.1	120	TEST PIT FOR EXPLORATION AT _____ PER CUBIC YARD		
142.	1,555	CLASS B TRENCH EXCAVATION AT _____ PER CUBIC YARD		

Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
145.	5	DRAINAGE STRUCTURE ABANDONED AT _____ EACH		
146.	55	DRAINAGE STRUCTURE REMOVED AT _____ EACH		
150.	50	ORDINARY BORROW AT _____ PER CUBIC YARD		
150.1	50	SPECIAL BORROW AT _____ PER CUBIC YARD		
151.	15,100	GRAVEL BORROW AT _____ PER CUBIC YARD		
156.	105	CRUSHED STONE AT _____ PER TON		
160.1	10	CONTROLLED LOW-STRENGTH MATERIAL - MANUAL EXCAVATABLE (<= 100 PSI) AT _____ PER CUBIC YARD		
160.2	25	CONTROLLED LOW-STRENGTH MATERIAL - MECHANICAL EXCAVATABLE (101-300 PSI) AT _____ PER CUBIC YARD		
160.3	25	CONTROLLED LOW-STRENGTH MATERIAL (> 300 PSI) AT _____ PER CUBIC YARD		

Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
170.	56,300	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	154,700	DISPOSAL OF UNREGULATED SOIL AT _____ PER TON		
181.12	8,900	DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY AT _____ PER TON		
181.13	8,650	DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY AT _____ PER TON		
181.14	870	DISPOSAL OF HAZARDOUS WASTE AT _____ PER TON		
201.	123	CATCH BASIN AT _____ EACH		

Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
202.	58	MANHOLE AT _____ EACH		
202.2	2	MANHOLE (9 TO 14 FOOT DEPTH) AT _____ EACH		
202.5	13	MANHOLE (5 FOOT DIAMETER) AT _____ EACH		
202.6	3	MANHOLE (6 FOOT DIAMETER) AT _____ EACH		
209.1	13	DROP INLET, TYPE DF AT _____ EACH		
220.	22	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH		
220.3	16	DRAINAGE STRUCTURE CHANGE IN TYPE AT _____ EACH		
220.5	1	DRAINAGE STRUCTURE REMODELED AT _____ EACH		
221.1	90	FRAME AND COVER - SECURED AT _____ EACH		

Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
222.1	150	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		
223.2	50	FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED AT _____ EACH		
227.3	170	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT AT _____ PER CUBIC YARD		
227.31	3,640	REMOVAL OF DRAINAGE PIPE SEDIMENT AT _____ PER FOOT		
227.4	15	MASONRY PLUG AT _____ PER SQUARE FOOT		
238.12	360	12 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
241.12	8,940	12 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
241.15	180	15 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
242.12	13	12 INCH REINFORCED CONCRETE PIPE FLARED END AT _____ EACH		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
242.18	2	18 INCH REINFORCED CONCRETE PIPE FLARED END AT _____ EACH		
243.12	90	12 INCH REINFORCED CONCRETE PIPE CLASS IV AT _____ PER FOOT		
244.12	340	12 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
244.18	250	18 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
258.	150	STONE FOR PIPE ENDS AT _____ PER SQUARE YARD		
269.10	300	10 INCH SLOT-PERFORATED CORRUGATED PLASTIC PIPE (SUBDRAIN) AT _____ PER FOOT		
299.1	1	INFILTRATION STORMWATER CONTROL MEASURE AT _____ LUMP SUM		
303.06	230	6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
303.12	1,235	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		

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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
309.	1,750	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
316.12	1,160	12 INCH WATER MAIN REMOVED AND DISPOSED AT _____ PER FOOT		
351.12	2	12 INCH AND UNDER GATE AND GATE BOX REMOVED AND RESET AT _____ EACH		
357.12	10	12 INCH GATE BOX AT _____ EACH		
358.	8	GATE BOX ADJUSTED AT _____ EACH		
369.12	6	12 X 12 INCH TAPPING SLEEVE, VALVE AND BOX AT _____ EACH		
370.4	1	12 X 6 INCH TAPPING SLEEVE, VALVE AND BOX AT _____ EACH		
371.06	4	6 INCH COUPLING AT _____ EACH		
376.	1	HYDRANT AT _____ EACH		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
376.2	10	HYDRANT - REMOVED AND RESET AT _____ EACH		
384.1	2	CURB STOP REMOVED AND RESET AT _____ EACH		
402.	5,065	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER CUBIC YARD		
402.13	5,300	PAVEMENT MILLING MULCH FOR SHOULDERS AT _____ PER FOOT		
415.2	23,000	PAVEMENT FINE MILLING AT _____ PER SQUARE YARD		
431.	85	HIGH EARLY STRENGTH CEMENT CONCRETE BASE COURSE AT _____ PER SQUARE YARD		
443.	336	WATER FOR ROADWAY DUST CONTROL AT _____ PER 1000 GALLONS		
450.23	2,600	SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) AT _____ PER TON		
450.231	7,950	SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC - 12.5 - P) AT _____ PER TON		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
450.31	5,810	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC -12.5) AT _____ PER TON		
450.42	10,110	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		
450.53	2,030	SUPERPAVE LEVELING COURSE - 12.5 (SLC - 12.5) AT _____ PER TON		
451.	260	HMA FOR PATCHING AT _____ PER TON		
452.	11,220	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
453.	18,700	HMA JOINT ADHESIVE AT _____ PER FOOT		
470.	100	HOT MIX ASPHALT BERM AT _____ PER TON		
477.2	13,900	MILLED RUMBLE STRIP (TYPE C) AT _____ PER FOOT		
482.5	1,860	SAWCUTTING ASPHALT PAVEMENT FOR BOX WIDENING AT _____ PER FOOT		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
506.	1,075	GRANITE CURB TYPE VB - STRAIGHT AT _____ PER FOOT		
506.1	430	GRANITE CURB TYPE VB - CURVED AT _____ PER FOOT		
509.	110	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT AT _____ PER FOOT		
509.1	55	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - CURVED AT _____ PER FOOT		
511.1	13,000	GRANITE EDGING TYPE SB - STRAIGHT AT _____ PER FOOT		
512.1	20	GRANITE EDGING TYPE SB (RADIUS 10 FEET OR LESS) AT _____ PER FOOT		
514.	5	GRANITE CURB INLET - STRAIGHT AT _____ EACH		
515.	5	GRANITE CURB INLET - CURVED AT _____ EACH		
580.	1,820	CURB REMOVED AND RESET AT _____ PER FOOT		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
583.	370	EDGING REMOVED AND RESET AT _____ PER FOOT		
620.13	4,500	GUARDRAIL, TL-3 (SINGLE FACED) AT _____ PER FOOT		
627.1	7	TRAILING ANCHORAGE AT _____ EACH		
627.83	3	GUARDRAIL TANGENT END TREATMENT, TL-3 AT _____ EACH		
627.93	3	GUARDRAIL FLARED END TREATMENT, TL-3 AT _____ EACH		
628.21	1	TRANSITION TO NCHRP 350 GUARDRAIL AT _____ EACH		
628.305	13	TEMPORARY IMPACT ATTENUATOR, NON-REDIRECTIVE, TL-3 AT _____ EACH		
628.4	25	TEMPORARY IMPACT ATTENUATOR, REMOVED AND RESET AT _____ EACH		
630.2	9,500	HIGHWAY GUARD REMOVED AND DISCARDED AT _____ PER FOOT		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
655.3	3,720	WOOD RAIL FENCE AT _____ PER FOOT		
665.	340	CHAIN LINK FENCE REMOVED AND STACKED AT _____ PER FOOT		
697.1	150	SILT SACK AT _____ EACH		
701.	2,750	CEMENT CONCRETE SIDEWALK AT _____ PER SQUARE YARD		
701.2	250	CEMENT CONCRETE PEDESTRIAN CURB RAMP AT _____ PER SQUARE YARD		
702.	200	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY AT _____ PER TON		
715.	1	RURAL MAIL BOX REMOVED AND RESET AT _____ EACH		
722.1	1	SCHEDULE OF OPERATIONS (TYPE A) - FIXED PRICE $130,000 AT One Hundred Thirty Thousand Dollars LUMP SUM	$130,000.00	$130,000.00
740.	66	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) AT _____ PER MONTH		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.	50	LOAM FOR ROADSIDES AT _____ PER CUBIC YARD		
751.1	55	LOAM FOR LAWNS AT _____ PER CUBIC YARD		
751.7	1,500	COMPOST BLANKET AT _____ PER CUBIC YARD		
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN AT _____ LUMP SUM		
765.	490	SEEDING AT _____ PER SQUARE YARD		
765.21	120	ANNUAL COVER CROP FOR NATIVE SEEDING AT _____ PER POUND		
765.412	120	SHORT GRASSLAND MIX - SANDY SOIL AT _____ PER POUND		
765.415	60	NATIVE SHORT GRASSLAND MIX AT _____ PER POUND		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
765.472	315	STEEP SLOPE MID-HEIGHT MIX AT _____ PER POUND		
765.553	20	SEED - WETLAND RIPARIAN MIX AT _____ PER POUND		
765.635	50,000	NATIVE SEEDING AND ESTABLISHMENT AT _____ PER SQUARE YARD		
765.664	10,000	MOWING FOR NATIVE SEED ESTABLISHMENT AT _____ PER SQUARE YARD		
767.121	12,600	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
767.9	330	JUTE MESH AT _____ PER SQUARE YARD		
769.	150	PAVEMENT MILLING MULCH UNDER GUARD RAIL AT _____ PER FOOT		
772.043	20	ARBORVITAE - GREEN GIANT 4-5 FEET AT _____ EACH		
773.224	66	PINE - PITCH 4-5 FEET AT _____ EACH		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
773.435	14	PINE - WHITE 4-5 FEET AT _____ EACH		
773.461	20	TUPELO 4-5 FEET #5 AT _____ EACH		
776.519	20	MAPLE - RED 4-5 FEET #5 AT _____ EACH		
777.238	49	OAK - SCARLET 4-5 FEET #5 AT _____ EACH		
777.324	40	OAK - WHITE 4-5 FEET #5 AT _____ EACH		
778.167	68	BIRCH - GRAY 4-5 FEET #5 AT _____ EACH		
783.021	44	SASSAFRAS 4-5 FEET #5 AT _____ EACH		
789.333	155	BAYBERRY SHRUB - NORTHERN 2-3 FEET / #3 AT _____ EACH		
789.433	117	BEACH PLUM SHRUB 2-3 FEET / #3 AT _____ EACH		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
789.669	285	BLUEBERRY - LOWBUSH #1 AT _____ EACH		
792.121	72	SHEEP LAUREL #1 AT _____ EACH		
793.521	96	SAND CHERRY #1 AT _____ EACH		
794.731	66	SUMMERSWEET SHRUB 18-24 INCH / #2 AT _____ EACH		
794.803	98	SWEETFERN #1 AT _____ EACH		
796.009	82	BEARBERRY #1 AT _____ EACH		
796.010	76	CHOKEBERRY - BLACK / #1 AT _____ EACH		
801.402	147	4 INCH ELECTRICAL CONDUIT - TYPE NM (DOUBLE) AT _____ PER FOOT		
801.404	451	4 INCH ELECTRICAL CONDUIT - TYPE NM (4 BANK) AT _____ PER FOOT		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
801.406	45	4 INCH ELECTRICAL CONDUIT - TYPE NM (6 BANK) AT _____ PER FOOT		
801.602	178	6 INCH ELECTRICAL CONDUIT - TYPE NM (DOUBLE) AT _____ PER FOOT		
801.604	68	6 INCH ELECTRICAL CONDUIT - TYPE NM (4 BANK) AT _____ PER FOOT		
801.606	6,307	6 INCH ELECTRICAL CONDUIT - TYPE NM (6 BANK) AT _____ PER FOOT		
801.609	25	6 INCH ELECTRICAL CONDUIT - TYPE NM (9 BANK) AT _____ PER FOOT		
802.401	356	4 INCH TELEPHONE CONDUIT - TYPE NM (SINGLE) AT _____ PER FOOT		
802.4012	4,274	4 INCH TELEPHONE CONDUIT - TYPE NM (12 BANK) AT _____ PER FOOT		
802.402	142	4 INCH TELEPHONE CONDUIT - TYPE NM (DOUBLE) AT _____ PER FOOT		
803.402	6,521	4 INCH CATV CONDUIT - TYPE NM (DOUBLE) AT _____ PER FOOT		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
803.403	6,278	4 INCH CATV CONDUIT - TYPE NM (TRIPLE) AT _____ PER FOOT		
804.2	585	2 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC (UL) AT _____ PER FOOT		
804.3	1,120	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) AT _____ PER FOOT		
806.6	100	6 INCH ELECTRICAL CONDUIT TYPE RM - GALVANIZED STEEL AT _____ PER FOOT		
811.111	18	ELECTRIC MANHOLE AT _____ EACH		
811.113	4	ELECTRIC SWITCHING ENCLOSURE AT _____ EACH		
811.115	3	5 FOOT X 5 FOOT X 5 FOOT ELECTRIC PULLBOX AT _____ EACH		
811.116	2	TRANSFORMER FOUNDATION AT _____ EACH		
811.121	8	TELEPHONE MANHOLE AT _____ EACH		

Project # 606082 Contract # 129855				
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
811.131	16	4 FOOT X 4 FOOT CATV MANHOLE AT _____ EACH		
811.132	2	6 FOOT X 4 FOOT CATV MANHOLE AT _____ EACH		
811.22	5	ELECTRIC HANDHOLE - SD2.022 AT _____ EACH		
811.31	10	PULL BOX 12 X 12 INCHES - SD2.031 AT _____ EACH		
816.01	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 AT _____ LUMP SUM		
816.02	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 2 AT _____ LUMP SUM		
824.11	1	FLASHING WARNING BEACON SIGN SYSTEM AT _____ LUMP SUM		
826.7	7	ELECTRIC SERVICE RISER RELOCATION AT _____ EACH		
826.71	1	ELECTRIC SERVICE RELOCATION AT _____ EACH		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
832.	370	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
847.1	42	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		
848.1	4	SIGN SUP (N/GUIDE)+RTE MKR W/2 BRKWAY POST ASSEMBLIES-STEEL AT _____ EACH		
850.41	70	ROADWAY FLAGGER AT _____ PER HOUR		
851.1	25	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	450	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
852.11	250	TEMPORARY PEDESTRIAN BARRICADE AT _____ PER FOOT		
852.12	2	TEMPORARY PEDESTRIAN CURB RAMP AT _____ EACH		
853.1	5	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
853.21	30,680	TEMPORARY BARRIER REMOVED AND RESET AT _____ PER FOOT		
853.33	12,940	TEMPORARY BARRIER - LIMITED DEFLECTION (TL-3) AT _____ PER FOOT		
853.403	264	TRUCK MOUNTED ATTENUATOR AT _____ PER DAY		
853.8	35	TEMPORARY ILLUMINATION FOR WORK ZONE AT _____ PER DAY		
854.016	88,000	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ PER FOOT		
854.036	3,500	TEMPORARY PAVING MARKINGS - 6 INCH (TAPE) AT _____ PER FOOT		
854.1	8,450	PAVEMENT MARKING REMOVAL AT _____ PER SQUARE FOOT		
856.	264	ARROW BOARD AT _____ PER DAY		
856.12	336	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ PER DAY		

Project # 606082	Contract # 129855			
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
859.	49,000	REFLECTORIZED DRUM AT _____ PER DAY		
861.104	2,400	4 INCH REFLECTORIZED YELLOW LINE (PAINTED) AT _____ PER FOOT		
864.04	260	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) AT _____ PER SQUARE FOOT		
864.31	190	SLOTTED PAVEMENT MARKER ONE-WAY WHITE AT _____ EACH		
864.32	170	SLOTTED PAVEMENT MARKER ONE-WAY YELLOW AT _____ EACH		
864.35	20	SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW AT _____ EACH		
866.104	500	4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
866.106	22,150	6 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
866.112	1,400	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		

Project # 606082	Contract # 129855			
Location : BOURNE				
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ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
867.106	16,100	6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.112	250	12 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
874.	2	STREET NAME SIGN AT _____ EACH		
874.2	1	TRAFFIC SIGN REMOVED AND RESET AT _____ EACH		
874.41	40	TRAFFIC SIGN REMOVED AND DISCARDED AT _____ EACH		
874.71	1	MISCELLANEOUS SIGN REMOVED AND RESET AT _____ EACH		
876.1	1	ITS POLE REMOVED AND RESET AT _____ LUMP SUM		
901.	2.5	4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE AT _____ PER CUBIC YARD		
950.01	1	TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO. 02 AT _____ LUMP SUM		

Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
950.02	1	TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO. 03 AT _____ LUMP SUM		
950.03	1	TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO. 04 AT _____ LUMP SUM		
950.04	1	TEMPORARY EARTH SUPPORT SYSTEM, RETAINING WALL NO. 05 AT _____ LUMP SUM		
986.1	320	MODIFIED ROCKFILL AT _____ PER SQUARE YARD		
996.301	1,314	MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO. 01 AT _____ PER SQUARE FOOT		
996.302	3,351	MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO. 02 AT _____ PER SQUARE FOOT		
996.303	5,301	MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO. 03 AT _____ PER SQUARE FOOT		
996.304	2,152	MECHANICALLY STABILIZED EARTH (MSE) WALLS, WALL NO. 05 AT _____ PER SQUARE FOOT		

Project # 606082	Contract # 129855			
Location : BOURNE				
Description : Median Installation on Route 6 (Scenic Highway)				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
996.41	2,320	PREFABRICATED MODULAR BLOCK GRAVITY RETAINING WALL, WALL NO. 04 AT _____ PER SQUARE FOOT		
Total Qty:	927,633.5			

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DOCUMENT B00853

SCHEDULE OF PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBES)

PRIME BIDDER: _____

DATE OF BID OPENING: _____ PROJECT NO.: 606082

FEDERAL AID PROJECT NO. NHP(NHS)/CMQ-003S(824)X

PROJECT LOCATION: BOURNE

Name, Address, and Phone Number(s) of DBE	Name of Activity	(a)† DBE Contractor Activity Amount *Construction Work*	(b) DBE Other Business Amount *Services, Supplies, Material*	(c) Total amount eligible for credit under rules in Section 6 of Document 00719 - DBE Special Provisions
Total Bid Amount	TOTALS:	$	$	$
$	DBE Percentage of Total Bid:	%	%	%

†*Column (a) must be at least one-half of the DBE participation goal. Attach additional sheets as necessary.*

Is MassDOT Document B00855 (Joint Check Approval) being submitted for any of the above? ☐ Yes ☐ No ☐ Not Known at This Time

Will any of the contractors listed above be using a third party (i.e. manufacturer) to deliver materials or perform any portion of work by a third party? ☐ Yes ☐ No

CERTIFICATION: I HEREBY DECLARE, TO THE BEST OF MY KNOWLEDGE, THAT **I HAVE READ THE SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES - DOCUMENT 00719.** BOTH THIS SCHEDULE AND THE RELEVANT AND ACCOMPANYING LETTER(S) OF INTENT ARE IN FULL COMPLIANCE WITH THE PROVISIONS OF, AND IN ACCORDANCE WITH, TITLE 49 CODE OF FEDERAL REGULATIONS, PART 26 (49 CFR Part 26).

SIGNATURE:_____ DATE_____

NAME AND TITLE (*PRINT*):_____

EMAIL ADDRESS: _____TEL NO.:_____

*** END OF DOCUMENT ***

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DOCUMENT B00854

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 1 of 2)

TO: _____ (Prime Bidder)

FROM: _____ (DBE Firm)

RE: PROJECT NO.: 606082 FEDERAL AID PROJECT NO.: NHP(NHS)/CMQ-003S(824)X

PROJECT LOCATION: BOURNE

DATE OF BID OPENING: _____

I, _____, authorized signatory of the above-referenced DBE firm hereby declare:
Print Name

1. My company is currently certified as a Disadvantaged Business Enterprise (DBE) by the Massachusetts Supplier Diversity Office ("SDO"), formerly known as the State Office of Minority and Women Business Assistance (SOMWBA), as a: (check all applicable, see Section 1 of the Special Provisions For Participation By Disadvantaged Business Enterprises, MassDOT Document 00719 additional guidance is available at Title 49, Code of Federal Regulations, Part 26.55 (49 CFR Part 26.55)):

   ( ) CONTRACTOR ( ) REGULAR DEALER ( ) BROKER
   ( ) MANUFACTURER ( ) TRUCKING OPERATIONS ( ) PROFESSIONAL SERVICES

2. My firm has the ability to manage, supervise and perform the activity described on page 2 of this Letter of Intent. If you are awarded the contract, my company intends to enter into a contract with your firm to perform the items of work or other activity described on the following sheet for the prices indicated.

3. There have been no changes affecting the ownership, control or independence of my company since my last certification review on _____ ___, 20___. If any such change is planned or occurs prior to my company's completion of this proposed work, I will give prior written notification to your firm and to the Massachusetts Department of Transportation ("MassDOT") Office of Civil Rights and SDO.

4. I have read the MassDOT proposal for the Project which may be entitled "Project Contract Documents and Special Provisions" or the draft "Contract" which includes MassDOT Document 00719, and acknowledge that my company will comply with that document and the requirements of 49 CFR Part 26.

5. For the purpose of obtaining subcontractor approval from MassDOT, my firm will provide to you:

   A. ***The following construction work:***
      (i) a resume, stating the qualifications and experience, of the superintendent or foreperson who will supervise on site-work;
      (ii) a list of equipment owned or leased by my firm for use on this project; and
      (iii) a list of all projects (public or private) upon which my firm is currently performing, is committed to perform, or intends to make a commitment to perform. I shall also include, for each project: the name and telephone number of a contact person for the contracting authority, person, or organization; the dollar value of the work; a description of the work; and my firm's work schedule for the project.

   B. ***The following services, materials or supplies***:
      (i) a written agreement and invoices for the materials or supplies, and any other documents evidencing the terms of providing such items;
      (ii) information concerning brokers fees and commissions for providing services or materials; and
      (iii) a statement concerning whether my firm intends or will be required to use a joint check arrangement; and any other documents that may be required by MassDOT.

_____ Date_____
DBE Company Authorized Signature

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 2 of 2)

DATE OF BID OPENING: _____

PROJECT NUMBER: 606082

FEDERAL AID PROJECT NUMBER: NHP(NHS)/CMQ-003S(824)X

PROJECT LOCATION: BOURNE

PRIME BIDDER: _____

DBE COMPANY NAME: _____

Item number if applicable	NAICS Code	Description of Activity with notations such as Services, or Brokerage, Installation Only, Material Only, or Complete	Quantity	Unit Price	Amount
			TOTAL AMOUNT:		

Please give full explanations, attach additional sheets if necessary.

I HEREBY VERIFY THAT _____ WILL SOLELY
(DBE company name)
PERFORM THE WORK, OR PROVIDE THE SERVICES OR MATERIALS, AS DESCRIBED ABOVE.

DBE AUTHORIZED SIGNATURE: _____

NAME AND TITLE (PRINT):_____

TELEPHONE NUMBER: _____FAX NUMBER: _____

EMAIL ADDRESS: _____

Rev'd 9/20/19

*** END OF DOCUMENT ***

DOCUMENT B00855

DBE JOINT CHECK ARRANGEMENT APPROVAL FORM

(to be submitted by Prime Contractor)

Contract No: 129855 **Project No.** 606082 **Federal Aid No.:** NHP(NHS)/CMQ-003S(824)X

Location: BOURNE **Bid Opening Date:** _____

Project Description: Median Installation on Route 6 (Scenic Highway)

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 ***