CITY OF NEWTON
PURCHASING DEPARTMENT

CONTRACT FOR PUBLIC WORKS DEPARTMENT
(M.G.L. Ch. 30, §39M)

PROJECT MANUAL:
TRANSPORTATION IMPROVEMENTS
FOR
PETTEE SQUARE – OAK STREET & CHESTNUT STREET

INVITATION FOR BID #23-100

Pre-Bid Meeting: May 11, 2023 at 10:00 am
Bid Opening Date: May 18, 2023, at 11:00 am

May 2023

Ruthanne Fuller, Mayor

CITY OF NEWTON
TABLE OF CONTENTS
Transportation Improvements for Pettee Square – Oak Street & Chestnut Street

		Page #
Cover Page		1
Table of Contents		2
1.	- Invitation for Bid	3-4
2.	- Instructions to Bidders	5-8
3.	- Bid Form	9-10
4.	- Bidder's Qualification Forms	11-12
	- Certificate of Non-Collusion	13
	- Certification of Tax Compliance	14
	- Certificate of Foreign Corporation	15
	- Debarment Letter	16
	- IRS Form W-9	17
	- Business Category Information Forms	18
5.	- Contract Forms	19
	▪ City - Contractor Contract	20-22
	▪ Certificate of Authority - Corporate	23
	▪ Payment Bond	24
6.	- General Terms & Conditions	25-26
7.	- Wage Rate Requirements	27
	▪ Department of Labor Minimum Wage Rates	28-68
	▪ Notice to Awarding Authorities	69-70
	▪ Statement of Compliance	71
	▪ Weekly Payroll Report	72
8.	- General Conditions of the Contract	73-80
9.	- Summary of Work & Specification Requirements of the Contract	81-83
	▪ General Conditons	84-85
	▪ Item Sheets	86-99
	▪ General Requirements	100-115
	▪ Construction Specifications	116-236
	▪ Attachment 1 - Monthly Price Adjustment	237-239
10.	- Drawings (separate file)	

END OF SECTION

CITY OF NEWTON, MASSACHUSETTS

PURCHASING DEPARTMENT

INVITATION FOR BID #23-100

The City of Newton invites sealed bids in accordance with M.G.L. c.30, §39M from Contractors for:

TRANSPORTATION IMPROVEMENTS FOR PETTEE SQUARE – OAK STREET & CHESTNUT STREET

Pre-Bid Meeting: **10:00 am Thursday, May 11, 2023 (Not Mandatory) Purchasing Department, Room 108, Newton City Hall, 1000 Commonwealth Avenue, Newton, MA 02459**

Bids will be received until: **11:00 am Thursday, May 18, 2023**
at the Purchasing Department, Room 108, Newton City Hall, 1000 Commonwealth Avenue, Newton, MA 02459. Bids will not be accepted nor may submitted bids be corrected, modified or withdrawn after the deadline for bids. Immediately following the deadline for bids, all bids received within the time specified will be publicly opened and read aloud.

The work under this contract consists of intersection improvements at the intersection of Oak Street at Chestnut Street (known as Pettee Square). The project limits include approximately 600 feet along Chestnut Street and 350 feet along Oak Street.

The proposed Base Bid improvements include the reconstruction of the intersection of Oak Street at Chestnut Street to include a new traffic signal, installation; a Rapid Rectangular Flashing Beacon (RRFB) at the Upper Falls Greenway crossing of Oak Street; a raised intersection; stormwater drainage system upgrades; stamped concrete sidewalks and reconstructed curb ramps for ADA/AAB-accessibility; landscape and streetscape amenities; lighting upgrades; and new pavement markings and signing.

The detailed work includes unclassified excavation, pavement micro milling, Superpave asphalt pavement, permeable pavement, new traffic signal, stamped concrete sidewalk, granite curb, stormwater drainage system modifications, landscape and streetscape improvements, new lighting and other incidental work.

The proposed Add Alternate No. 1 work includes furnishing and installation of electric vehicle chargers at the proposed parking area on Chestnut Street.

Documents relating to this Invitation for Bids (Contract Documents) will be available online at **www.newtonma.gov/bids** or pick up at the Purchasing Department after **10:00 am May 4, 2023. Bids must be submitted with one (1) Original and two (2) Copies.**

Only contractors that have been prequalified by MassDOT in the Highway - Construction class of work, or that have an approved waiver, are eligible to bid on this contract that has an estimated value of $2,689,762.50. MassDOT will provide a list of Prequalified Construction Contractors to the City of Newton. Bidders will be verified at the time of Bid Opening.

A bid deposit in an amount that is not less than five percent (5%) of the value of the bid, including all add alternates, is required. Bid deposits, payable to the City of Newton, shall be either in the form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company. Bidders are reminded that the bid deposit covers the City for damages when a bidder withdraws its bid after the bid submission date. **Be advised that to the extent permitted by the law the City will retain all bid deposits for withdrawn bids.**

The costs of any bond and any insurance required in this Invitation for Bid are the responsibility of the bidder; such costs will not be reimbursed by the City and should be included in your bid.

The City of Newton will award the contract to the lowest eligible and responsible bidder. Please Note: this bid, in accordance with the Chapter 303 Acts of 2008, contains Price Adjustments and new Prevailing Wage requirements. All bidders are required to familiarize themselves with these terms and conditions before submitting a bid.

The start date is the date on which the Notice to Proceed is issued, which is anticipated to be June 15, 2023. Time for completion is prior to December 31, 2024.

All bids are subject to the provisions of M.G.L. c.30, §39M. **Wages are subject** to minimum wage rates determined by the Massachusetts Department of Labor and Industries pursuant to M.G.L. c.149, §26 to 27H. The schedule of wage rates applicable to this contract is included in the bidding documents. In addition, the prevailing wage schedule will be updated annually for all public construction projects lasting longer than one (1) year.

You will be required to pay the rates set out in any updated prevailing wage schedule. Increases in prevailing wage schedules will not be the basis for change order requests. The successful bidder will be required to provide a Certificate(s) of Insurance demonstrating current coverage of the type and amounts set forth in the Project Manual**.** The successful bidder will be required to furnish a **Labor and Materials Payment Bond** in the amount of **50%** of the contract total. Wages are paid to drivers for all "**on-site"** work.

Once you've downloaded this bid from the internet website (**www.newtonma.gov/bids**) I strongly suggest you email (**purchasing@newtonma.gov**) your company's Name, address, EMAIL, phone, fax AND the INVITATION FOR BID NUMBER and Project Title, so that we may add you to the Bidders List and you will be notified of any/all addendums.

The City will reject any and all bids in accordance with the above referenced General Laws. In addition, the City reserves the right to waive minor informalities in any or all bids or to reject any or all bids (in whole or in part) if it be in the public interest to do so.

In the event that any person wishes to attend a bid opening, accessible and reasonable accommodations will be provided to persons requiring assistance. If you need a reasonable accommodation, please contact the City of Newton's ADA Coordinator, Jini Fairley, at least two business days in advance of the bid opening: **jfairley@newtonma.gov** or (617) 796-1253. For Telecommunications Relay Service, please dial 711.

CITY OF NEWTON

Nicholas Read
Chief Procurement Officer
May 4, 2023

CITY OF NEWTON

DEPARTMENT OF PURCHASING

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - BIDDER'S REPRESENTATION

1.1 Each General Bidder (hereinafter called the "Bidder") by making a bid (hereinafter called "bid") represents that:

1. The Bidder has read and understands the Bidding Documents, Contract Forms, General Conditions, Conditions of the Contract, General Requirements and Project Specification (collectively, referred to as the "Contract Documents") and the bid is made in accordance therewith.

2. The Bidder has visited the work sites (*See* "Limits of Work," at p. 85 below.) and is familiar with the local conditions under which the work has to be performed.

1.2 Failure to so examine the Contract Documents or the work sites will not relieve any Bidder from any obligation under the bid as submitted.

ARTICLE 2 - REQUEST FOR INTERPRETATION

2.1 Bidders shall promptly notify the City of any ambiguity, inconsistency, or error which they may discover upon examination of the Contract Documents, the site, and local conditions.

2.2 Bidders requiring clarification or interpretation of the Contract Documents shall make a written request to the *Chief Procurement Officer*, at **purchasing@newtonma.gov** or via facsimile (617) 796-1227. The City will answer such requests if received by **Friday, May 12, 2023,** at 12:00 noon.

2.3 Interpretation, correction, or change in the Contract Documents will be made by addendum which will become part of the Contract Documents. The City will not be held accountable for any oral instruction.

2.4 Addenda will be emailed to every individual or firm on record as having taken a set of Contract Documents.

2.5 Copies of addenda will be made available for inspection at the location listed in the Invitation for Bids where Contract Documents are on file, in addition to being available online at **www.newtonma.gov/bids**.

2.6 Bidders or proposers contacting ANY CITY EMPLOYEE regarding an Invitation for Bid (IFB) or a Request for Proposal (RFP), outside of the Purchasing Department, once an IFB or RFP has been released may be disqualified from the bidding process.

2.7 Bidders downloading information off the internet web site are solely responsible for obtaining any addenda prior to the bid opening. If the bidder makes themselves known to the Purchasing Department, at **purchasing@newtonma.gov** or via facsimile (617) 796-1227, they shall be placed on the bidder's list. Bidders must provide the Purchasing Department with their company's name, street address, city, state, zip, phone, fax, email address and **INVITATION FOR BID #23-100**.

ARTICLE 3 - MBE PARTICIPATION

3.1 Notice is hereby given that the Mayor's Affirmative Action Plan for the City of Newton in effect at the time of this solicitation is applicable to all construction contracts in excess of $10,000.00.

3.2 Notice is hereby given that the City of Newton Minority/Women Business Enterprise Plan and the Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program in effect at the time of this solicitation are applicable to all City contracts for goods and services in excess of $50,000.00.

3.3 Copies of the Plans and Program referred to in Sections 3.1 and 3.2 are available at **www.newtonma.gov/government/purchasing**.

ARTICLE 4 - PREPARATION AND SUBMISSION OF BIDS

4.1 Bids shall be submitted on the "Bid Form #23-100," attached.

4.2 All entries on the Bid Form shall be made by typewriter or in ink.

4.3 Where so indicated on the Bid Form, sums shall be expressed in both words and figures. Where there is a discrepancy between the bid sum expressed in words and the bid sum expressed in figures, the words shall control.

4.4 Bid Deposits shall be submitted in the amount specified in the Invitation for Bids. They shall be made payable to the City and shall be either in the form of cash, certified check, treasurer's, or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreements contained in the bid. Bidders are reminded that the bid deposit covers the City for damages when a bidder withdraws its bid after the bid submission date. **Be advised that to the extent permitted by law the City will retain all bid deposits for withdrawn bids.**

Bid deposits of the three (3) lowest responsible and eligible Bidders shall be retained until the execution and delivery of the City/Contractor agreement.

4.5 The bid, including the bid deposit shall be enclosed in a sealed envelope with the following plainly marked on the outside:

* GENERAL BID FOR: **#23-100**
* NAME OF PROJECT: **TRANSPORTATION IMPROVEMENTS FOR PETTEE SQUARE – OAK STREET & CHESTNUT STREET**

* BIDDER'S NAME, BUSINESS ADDRESS, AND PHONE NUMBER

4.6 Date and time for receipt of bids is set forth in the IFB.

4.7 Timely delivery of a bid at the location designated shall be the full responsibility of the Bidder. In the event that Newton City Hall is closed on the date or at the time that bids are due, the date and time for receipt of bids shall be on the next business day following that the Newton City Hall and the Purchasing Department are open.

4.8 Massachusetts law requires all employees who work on Massachusetts public works construction sites must have no Less than 10 hours of OSHA-approved safety and health training. See M.G.L. c.30, §39M(c), M.G.L. c.30, §39S(a)(1), M.G.L. c.149, §44E(2) & M.G.L. c.149, §44F(2).

1. This requirement will apply to any general bid or sub bid submitted.
2. This law directs the Massachusetts Attorney General to restrain the award of construction contracts to any contractor who is in violation to this requirement and to restrain the performance of these contracts by non-complying contractors.
3. The contractor and all subcontractors on this project must certify on the Bid Form compliance with the applicable requirement. Non-compliance with this law will disqualify the bidder.

4.9 Price Adjustment Clauses

It is the intention of the City to include price adjustments in the award of this Contract. These price adjustments shall be for (1) **Fuel**, (2) **Liquid Asphalt** and (3) **Portland Cement** when such commodities have been determined to be integral components of the work.

For those commodities designated to be paid as a 'differential' item then the special provision shall provide for a price adjustment formula for the affected items. This adjustment shall be based on the difference between the **Base Price** and the **Period Price** which shall be evaluated on a **monthly** basis, but price adjustments shall only be made if the monthly cost change exceeds **+/- 5 per cent.** Subsequently each respective price adjustment shall be made as specified under each applicable and separate payment item.

IMPORTANT NOTE: Depending on the prevailing market trends at the time of payment these price adjustments may provide for additional compensation to the Contractor, or they may otherwise result in a repayment to the City. The increase or a decrease in the value of the commodity, during the applicable payment period in which the goods and/or services were rendered, shall be the determinant factor.

The City will refer to the MassDOT price adjustment tables[1] to establish the base price and will be used for the actual period price.

Price Adjustment Clauses – *to apply as follows:*

This Contract contains price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel, and gasoline. Price adjustments shall be made on a monthly basis when the monthly change from the Base Price is +/- 5 percent. Base prices for this contract shall be the period prices posted on the MassDOT website, https://www.mass.gov/massdot-contract-price-adjustments at the time of the bid. For reference the base prices are as follows:[2] liquid asphalt $660.00 per ton, Portland cement $181.15 per ton, diesel fuel $3.274 per gallon, and gasoline $2.684 per gallon.

No price adjustment will be allowed beyond the completion date of the contract unless there is an approved extension of time by the City.

ARTICLE 5 - ALTERNATES

5.1 Each Bidder shall acknowledge Alternates (if any) in Section C on the Bid Form.

5.2 In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicated by writing "No Change", or "N/C" or "0" in the space provided for that Alternate.

5.3 Bidders shall enter on the Bid Form a single amount for each Alternate which shall consist of the amount for work performed by the Contractor.

5.4 The low Bidder will be determined on the basis of the sum of the base bid and the accepted alternates.

ARTICLE 6 - WITHDRAWAL OF BIDS

6.1 Any bid may be withdrawn prior to the time designated for receipt of bids on written or electronic request. Electronic withdrawal of bids must be confirmed over the Bidder's signature by written notice postmarked on or before the date and time set for receipt of bids.

6.2 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids.

6.3 No bids shall be withdrawn within thirty days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

ARTICLE 7 - CONTRACT AWARD

7.1 The City is soliciting prices for the items set forth in the Item Sheets at 86-99 below. It is the City's intent to award one contract to the responsive and eligible bidder offering the lowest Base Bid Total or the lowest Base Bid Total plus Add Alternate #1 Total, as the City may elect. A contract will be awarded within sixty (60) days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids.

7.2 The City of Newton reserves the right to waive minor informalities in or to reject any or all Bids if it be in the public interest to do so.

7.3 The City reserves the right to reject any bidder who has failed to pay any local taxes, fees, assessments, betterments, or any other municipal charge, unless the bidder has a pending abatement application or has entered into a payment agreement with the collector-treasurer.

7.4 As used herein, the term "lowest responsible and eligible Bidder" shall mean the Bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who has met all the requirements of the invitation for bids; (3) who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (4) who, where the provisions of section eight B of chapter twenty-nine apply, shall have been determined to be qualified thereunder.

[1] https://www.mass.gov/massdot-contract-price-adjustments

[2] Base prices as of May 1, 2023.

7.5 Subsequent to the award and within five (5) days, Saturday, Sundays and legal holidays excluded, after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the City a Contract in the form included in the Contract Documents in such number of counterparts as the City may require.

7.6 In the event that the City receives low bids in identical amount from two or more responsive and responsible Bidders, the City shall select the successful Bidder by a blind selection process chosen by the City such as flipping a coin or drawing names from a hat. The low Bidders who are under consideration will be invited to attend and observe the selection process.

ARTICLE 8 - TAXES

8.1 The Bidder shall not include in this bid any tax imposed upon the sale or rental of tangible personal property in this Commonwealth, such as any and all building materials, supplies, services and equipment required to complete the work.

8.2 The City is exempt from payment of the Massachusetts Sales Tax, and the Bidder shall not include any sales tax on its bid. The City's exemption Number is E-046-001-404.

ARTICLE 9 – PROPRIETARY SPECIFICATIONS

9.1 If the City has used a proprietary specification to describe the supply listed in the specification, such specifications are permitted under M.G.L. c. 30, §39M(b), provided that the City state in writing that use of the proprietary specification is in its best interest and that it will accept an "equal" of the item specified. An item is considered equal if (i) it is at least equal in quality, durability, appearance, strength, and design; (ii) will perform the intended function at least equally; and (iii) conforms substantially, even with deviations, to the detailed requirements contained in the specifications. Bidders wishing to provide an equal item should do so with their bids. The City shall have the sole right to determine whether or not said item is equal.

9.2 The required determination and justification have been duly prepared, and a copy may be requested in accordance with the Massachusetts Public Records Law, M.G.L. c. 66, §10.

END OF SECTION

CITY OF NEWTON
DEPARTMENT OF PURCHASING
BID FORM #23-100

A. The undersigned proposes to supply and deliver the materials specified below in full accordance with the Contract Documents and Project Manual supplied by the City of Newton entitled:

TRANSPORTATION IMPROVEMENTS FOR PETTEE SQUARE – OAK STREET & CHESTNUT STREET

for the contract price specified below, subject to additions and deduction according to the terms of the specifications.

B. This bid includes addenda number(s) _____, _____, _____, _____,

C. The Contractor shall insert prices for each item in ink, in both words and figures.

(i) BASE BID TOTAL (p. 98):_____ **or $**_____
(In Words) *(In Numbers)*

(ii) ADD ALTERNATE #1 TOTAL (p. 99):_____ **or $**_____
(In Words) *(In Numbers)*

(iii) TOTAL (i) BASE BID + (ii) ALTERNATE ONE _____

(In Words) *(In Numbers)*

COMPANY:_____

D. The undersigned has completed and submits herewith the following documents:

- ☐ Bidder's Qualifications and References Form, 2 pages
- ☐ Signed Bid Form, 2 pages
- ☐ Item Sheets, 14 pages
- ☐ Certificate of Non-Collusion, 1 page
- ☐ Certificate of Tax Compliance, 1 page
- ☐ Certificate of Foreign Corporation (if applicable), 1 page
- ☐ Debarment Letter, 1 page
- ☐ IRS Form W-9, 1 page
- ☐ Business Category Information Form, 1 page
- ☐ A five percent (5%) bid deposit

E. Prompt Payment Discounts. Bidders are encouraged to offer discounts in exchange for an expedited payment. Payments may be issued earlier than the general goal of within 30 days of receipt of the invoice only when in exchange for discounted prices. Discounts will not be considered in determining the lowest responsible bidder.

Prompt Payment Discount _____%_____Days
Prompt Payment Discount_____%_____ Days
Prompt Payment Discount _____%_____Days

F. The undersigned agrees that, if selected as general contractor, s/he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the City of Newton, execute a contract in accordance with the terms of this bid **and furnish a labor and materials payment bond** of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the City of Newton in the **sum not less than 50% of the contract price**, the premiums for which are to be paid by the contractor and are included in the contract price.

The undersigned hereby certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that s/he will comply fully with all laws and regulations applicable to awards made subject to section forty-four A of M.G.L. c.30, §39M.

The undersigned certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration ("OSHA") that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States OSHA that is at least 10 hours in duration. The undersigned understands that any employee found on a worksite subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

The undersigned further certifies under the penalties of perjury that they have familiarized themselves with the changes to the Prevailing Wage Rates, Price Adjustment Clauses, in accordance with Chapter 303 Acts of 2008.

G. Environmentally preferable products information (which is requested but which will not be considered in awarding a contract):

Description of environmental attributes of Bidder's goods or services:

Steps taken to (a) identify any positive or negative environmental attributes of products or services and (b) ensure that those attributes are being addressed as part of operations:

Date _____

_____
(Name of General Bidder)

BY: _____

_____
(Printed Name and Title of Signatory)

_____
(Business Address)

_____
(City, State Zip)

_____ / _____
(Telephone) (FAX)

_____
(E-mail address)

NOTE: If the bidder is a corporation, indicate state of incorporation under signature, and affix corporate seal; if a partnership, give full names and residential addresses of all partners; if an individual, give residential address if different from business address; and, if operating as a d/b/a give full legal identity. Attach additional pages as necessary.

END OF SECTION

CITY OF NEWTON

BIDDER'S QUALIFICATIONS AND REFERENCES FORM

All questions must be answered, and the data given must be clear and comprehensive. Please type or print legibly. If necessary, add additional sheet for starred items. This information will be utilized by the City of Newton for purposes of determining bidder responsiveness and responsibility with regard to the requirements and specifications of the Contract.

1. FIRM NAME: _____
2. WHEN ORGANIZED: _____
3 INCORPORATED? _____ YES _____ NO DATE AND STATE OF INCORPORATION: _____
4. IS YOUR BUSINESS A **MBE**? _____YES _____NO **WBE**? _____YES _____NO or **MWBE**? _____YES _____NO

* 5. LIST ALL CONTRACTS CURRENTLY ON HAND, SHOWING CONTRACT AMOUNT AND ANTICIPATED DATE OF COMPLETION:

_____
_____
_____
_____
_____

* 6. HAVE YOU EVER FAILED TO COMPLETE A CONTRACT AWARDED TO YOU?
_____ YES _____ NO
IF YES, WHERE AND WHY?

_____
_____

* 7. HAVE YOU EVER DEFAULTED ON A CONTRACT? _____ YES _____ NO
IF YES, PROVIDE DETAILS.

_____
_____

* 8. LIST YOUR VEHICLES/EQUIPMENT AVAILABLE FOR THIS CONTRACT:

_____
_____
_____
_____
_____
_____
_____

* 9. IN THE SPACES FOLLOWING, PROVIDE INFORMATION REGARDING CONTRACTS COMPLETED BY YOUR FIRM SIMILAR IN NATURE TO THE PROJECT BEING BID. A MINIMUM OF FOUR (4) CONTRACTS SHALL BE LISTED. PUBLICLY BID CONTRACTS ARE PREFERRED, BUT NOT MANDATORY.

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____

DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: ____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)

_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____

PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)
_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON:_____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?:_____
(i.e., contract manager, purchasing agent, etc.)
_____
PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #:(____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)

10. The undersigned certifies that the information contained herein is complete and accurate and hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the City of Newton in verification of the recitals comprising this statement of Bidder's qualifications and experience.

DATE: _____ BIDDER: _____

SIGNATURE: _____

PRINTED NAME: _____ TITLE: _____

END OF SECTION

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee club, or other organization, entity, or group or individuals.

_____
(Signature of individual)

_____
Name of Business

CERTIFICATION OF TAX COMPLIANCE**

Pursuant to M.G.L. c.62C, §49A and requirements of the City, the undersigned acting on behalf of the Contractor certifies under the penalties of perjury that the Contractor is in compliance with all laws of the Commonwealth relating to taxes including payment of all local taxes, fees, assessments, betterments and any other local or municipal charges (unless the Contractor has a pending abatement application or has entered into a payment agreement with the entity to which such charges were owed), reporting of employees and contractors, and withholding and remitting child support.*

_____ _____

Signature of Individual (Mandatory) *** Contractor's Social Security Number or Federal Identification Number

Print Name:_____ Date:_____

_____

Corporate Name

By: _____ Date: _____

Corporate Officer
(Mandatory, if applicable)

Print Officer Name:_____

* The provision in this Certification relating to child support applies only when the Contractor is an individual.

** Approval of a contract or other agreement will not be granted until the City receives a signed copy of this Certification.

*** Your social security number may be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Providers who fail to correct their non-filing or delinquency will not have a contract or other agreement issued, renewed, or extended.

CERTIFICATE OF FOREIGN CORPORATION

The undersigned hereby certifies that it has been duly established, organized, or chartered as a corporation under the laws of:

(Jurisdiction)

The undersigned further certifies that it has complied with the requirements of M.G.L. c. 30, §39L (if applicable) and with the requirements of M.G.L. c. 156D, §15.03 relative to the registration and operation of foreign corporations within the Commonwealth of Massachusetts.

Name of person signing proposal

Signature of person signing proposal

Name of Business (Please Print or Type)

Affix Corporate Seal here

City of Newton

Ruthanne Fuller

Purchasing Department
Nicholas Read ⊛ ***Chief Procurement Officer***
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449
purchasing@newtonma.gov

Telephone
(617) 796-1220
Fax:
(617) 796-1227
TDD/TTY
(617) 796-1089

Date

Vendor

Re: Debarment Letter for Invitation For Bid #23-100

As a potential vendor on the above contract, the City requires that you provide a debarment/suspension certification indicating that you are in compliance with the below Federal Executive Order. Certification can be done by completing and signing this form.

Debarment:

Federal Executive Order (E.O.) 12549 "Debarment and Suspension" requires that all contractors receiving individual awards, using federal funds, and all sub-recipients certify that the organization and its principals are not debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency from doing business with the Federal Government.

I hereby certify under pains and penalties of perjury that neither I nor any principal(s) of the Company identified below is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

_____ (Name)
_____ (Company)
_____ (Address)
_____ (Address)
PHONE _____ FAX _____
EMAIL _____

_____Signature

_____Date

If you have questions, please contact Nicholas Read, Chief Procurement Officer at (617) 796-1220.

Form **W-9**
(Rev. October 2007)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Print or type See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name, if different from above

Check appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership
☐ Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶
☐ Other (see instructions) ▶

X Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

or

Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here **Signature of U.S. person ▶** **Date ▶** Name

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

Business Category Information Form*

IFB No. 23-100

Transportation Improvements for Pettee Square – Oak Street & Chestnut Street

Business Type Categories*	Select All That Apply
MBE: Minority-Owned Business Enterprise	
WBE: Women-Owned Business Enterprise	
VBE: Veteran Business Enterprise	
SDVOBE: Service-Disabled Veteran-Owned Business Enterprises	
DOBE: Disability-Owned Business Enterprise	
LGBTBE: Lesbian, Gay, Bisexual, Transgender Business Enterprise	

*Information is being collected as part of a City initiative to open contract opportunities to underrepresented vendors.

□ I do not wish to complete this form.

There is no penalty for persons who do not complete this Form, and whether or not the Form is completed will not be taken into consideration in awarding a bid.

I certify that the foregoing information is true and correct.

_____

By:_____

Date:

END OF SECTION

CONTRACT FORMS

The awarded bidder will be required to complete and submit documents substantially similar in form to the following.

These forms may need to be modified on account of changed circumstances and are provided for informational purposes only.

CITY - CONTRACTOR AGREEMENT

CONTRACT NO. C - _____

THIS AGREEMENT made this ___ day of _____ in the year Two Thousand Twenty-Three by and between the CITY OF NEWTON, a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, hereinafter referred to as the CITY, acting through its Chief Procurement Officer, but without personal liability to him, and hereinafter referred to as the CONTRACTOR.

The parties hereto for the considerations hereinafter set forth agree as follows:

ARTICLE 1. **STATEMENT OF WORK.** The Contractor shall furnish all labor, materials, and equipment and perform all work required in strict accordance with the Contract Documents for the following project:

TRANSPORTATION IMPROVEMENTS FOR PETTEE SQUARE – OAK STREET & CHESTNUT STREET

ARTICLE 2. **TIME OF COMPLETION.** The Contractor shall commence work under this Contract on the date specified in the written notice of the City to proceed and shall fully complete all work hereunder within the time specified in the Summary of Work and Specific Work Requirements of the Project Manual. Time is of the essence with regard to this contract. Failure to complete within the time specified shall be subject to the assessment of liquidated damages in accordance with the provisions contained in the Project Manual. **The start date is the date on which the Notice to Proceed is issued, which is anticipated to be June 15, 2023. Time for completion is prior to December 31, 2024.**

ARTICLE 3. **THE CONTRACT PRICE.** The City shall pay the Contractor for the full and satisfactory performance of the Contract, in current funds a sum not to exceed:

$

ARTICLE 4. **CONTRACT DOCUMENTS.** The Contract Documents consist of the following documents which are either attached to this Agreement or are incorporated herein by reference**:**

a. This CITY-CONTRACTOR Agreement;

b. The City's Invitation For Bid #23-100 issued by the Purchasing Department;

c. The Project Manual for: **TRANSPORTATION IMPROVEMENTS FOR PETTEE SQUARE – OAK STREET & CHESTNUT STREET** including the Instructions to Bidders; General Conditions; Special Conditions; MWBE/AA Requirements, Wage Rate Requirements and Wage Rate Schedule(s) including any updated prevailing wage rate schedules if applicable; The Supplementary Special Conditions; General Requirements and Project Specifications; and Drawings, if included or referenced therein;

d. Addenda Number(s) _____;

e. The Bid Response of the CONTRACTOR submitted for this Project and accompanying documents and certifications;

f. Certificate(s) of Insurance and surety bond(s) submitted by the CONTRACTOR in connection with this Project;

g. Duly authorized and executed Amendments, Change Orders or Shipping Orders issued by the CITY after execution of this CITY-CONTRACTOR Agreement.

This CITY-CONTRACTOR Agreement, together with the other documents enumerated in this Article, constitute the entire Agreement between the CITY and the CONTRACTOR.

ARTICLE 5. **ALTERNATES.** The following Alternates have been accepted and their costs are included in the Contract Price stated in Article 3 of this Agreement:

Alternates: _____

ARTICLE 6. **APPLICABLE STATUTES.** All applicable federal, state and local laws and regulations are incorporated herein by reference and the Contractor agrees to comply with same.

ARTICLE 7. **INSURANCE REQUIREMENTS.** The Vendor shall provide insurance coverage as listed below. This insurance shall be provided at the Vendor's expense and shall be in full force and effect during the full term of this Contract.

WORKER'S COMPENSATION	
Worker's Compensation:	Per M.G.L. c.l49, §34 and c. l52 as amended.
COMMERCIAL GENERAL LIABILITY	
Personal Injury	$500,000 each occurrence $1,000,000 aggregate
Property Damage	$500,000 each occurrence $1,000,000 aggregate
VEHICLE LIABILITY	
Personal Injury	$500,000 each person $1,000,000 aggregate
Property Damage	$300,000 each occurrence $500,000 aggregrate

The City shall be named as additional insureds on the Vendor's Liability Policies

SPACE INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, the parties have caused this instrument to be executed under seal the day and year first above written.

CONTRACTOR

By_____

Print Name _____

Title _____

Date _____

Affix Corporate Seal Here

Certified that City funds are available in the following accounts:
7500R002-530203 ($1,765,000)
AR401 AR40105 2223CV21 530203 (up to $1,009,950)

I further certify that the Mayor, or her designee, is authorized to execute contracts and approve change orders.

By_____
Comptroller of Accounts

Date_____

CITY OF NEWTON

By_____
Chief Procurement Officer

Date_____

By _____
Commissioner of Public Works

Date _____

Approved as to Legal Form and Character

By_____
Associate City Solicitor

Date _____

CONTRACT & BONDS ARE APPROVED

By_____
Mayor or her designee

Date_____

CERTIFICATE OF AUTHORITY – CORPORATE

1 I hereby certify that I am the Clerk/Secretary of _____
(insert full name of Corporation)

2. corporation, and that _____
(insert the name of officer who signed the **contract and bonds**.)

3. is the duly elected _____
(insert the title of the officer in line 2)

4. of said corporation, and that on _____
(insert a date that is ***ON OR BEFORE*** the date the officer signed the **contract and bonds**.)

at a duly authorized meeting of the Board of Directors of said corporation, at which all the directors were present or waived notice, it was voted that

5. _____ the _____
(insert **name** from line 2) (insert **title** from line 3)

of this corporation be and hereby is authorized to execute contracts and bonds in the name and on behalf of said corporation, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this corporation's name and on its behalf, with or without the Corporate Seal, shall be valid and binding upon this corporation; and that the above vote has not been amended or rescinded and remains in full force and effect as of the date set forth below.

6. ATTEST: _____ *AFFIX CORPORATE SEAL HERE*
(Signature of **Clerk or Secretary**)*

7. Name: _____
(Please print or type name in line 6)*

8. Date: _____
(insert a date that is ***ON OR AFTER*** the date the officer signed the **contract and bonds**.)

* The name and signature inserted in lines 6 & 7 **must** be that of the **Clerk or Secretary** of the corporation.

CITY OF NEWTON, MASSACHUSETTS

PAYMENT BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____, as SURETY, are held and firmly bound unto the City of Newton as Obligee, in the sum of _____dollars **($_____)** to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____ _, 2023 for the construction of _____ in Newton, Massachusetts.
(Project Title)

Now, the conditions of this obligation are such that if the PRINCIPAL and all Sub-contractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the SURETY of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, provisions of M.G.L. c. 30, sec. 39A, and M.G.L. c. 149 sec. 29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force, virtue and effect.

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ___day of_____2023.

PRINCIPAL	SURETY
_____	_____
BY_____	BY _____
(SEAL)	(ATTORNEY-IN-FACT) (SEAL)
_____ (Title)	
ATTEST: _____	ATTEST: _____

CITY OF NEWTON, MASSACHUSETTS
PURCHASING DEPARTMENT
GENERAL TERMS AND CONDITIONS

1. The right is reserved to reject any and all bids, to waive informalities, and to make award as may be determined to be in the best interest of the City of Newton.

2. Prices quoted must include delivery to the City, as specified on the Work Order.

3. No charges will be allowed for packing, crating, freight, Express or cartage unless specifically stated and included in the bid.

4. The award to the successful bidder may be canceled if successful bidder shall fail to prosecute the work with promptness and diligence.

5. Time in connection with discount offered will be computed from the date of delivery to the City, as specified on Work order, or from date correct invoice is received by the City, if the latter date is later than the date of delivery.

6. The successful bidder shall replace, repair or make good, without cost to the City, any defects or faults arising within one (1) year after date of acceptance of articles furnished hereunder (acceptance not to be unreasonably delayed) resulting from imperfect or defective work done or materials furnished by the Seller.

7. The Seller shall indemnify and save harmless the City and all persons acting for on behalf of it from all suits and claims against them, or any of them, arising from or occasioned by the use of any material, equipment or apparatus, or any part thereof, which infringes or is alleged to infringe on any patent rights. In case such material, equipment or apparatus, or any part thereof, in any such suit is held to constitute infringement, the Seller, within a reasonable time, will at its expense, and as the City may elect, replace such material, equipment or apparatus with non-infringing material, equipment or apparatus, or remove the material, equipment or apparatus, and refund the sums paid therefor.

8. The successful bidder shall comply with all applicable Federal State and Local laws and regulations.

9. Purchases made by the City are exempt from Federal excise taxes and bid prices must exclude any such taxes. Tax exemption certificates will be furnished upon request.

10. If so stated in the Invitation for Bid the successful bidder will be required to furnish a performance and/or a labor and material payment bond, in an amount, in a form and with a surety satisfactory to the City. The bidder shall be responsible for the cost of the bond(s).

11. If the Invitation for Bids requires bid surety, this surety shall be in the form of a cash, bid bond, cashier's check, treasurer's check, or certified check on a responsible bank, payable to the City of Newton, and must be filed with the original bid in the Office of the Purchasing Agent. Failure to do so will lead to rejection of bid. The bid surety will be returned to the successful bidder within seven (7) days execution of awarded, and approval by the City of performance and/or payment bond(s). In case of default, the bid surety shall be forfeited to the City.

12. Verbal orders are not binding on the City and deliveries made or work done without formal Work Order or Contract are at the risk of the Seller or Contractor and may result in an unenforceable claim.

13. The Seller shall agree to indemnify, defend and hold the City harmless from any and all claims arising out of the performance of this contract.

14. "Equality - An item equal to that named or described in the specifications of the contract may be furnished by the Vendor and the naming of any commercial name, trademark or other identification shall not be construed to exclude any item or manufacturer not mentioned by name or as limiting competition but shall establish a standard of equality only. An item shall be considered equal to the item so named or described if (1) it is at least equal in quality, durability, appearance, strength and design; (2) it will perform at least equally the function imposed by the general design for the work being contracted for or the material being purchased; and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the specifications. The name and identification of all materials other than the one specifically named shall be submitted to the City in writing for approval, prior to purchase, use or fabrication of such items. Subject to the provisions of M.G.L., Ch. 30, Sec. 39J, approval shall be at the sole discretion of the City, shall be in writing to be effective, and the decision of the City shall be final. The City may require tests of all materials so submitted to establish quality standards at the Vendor's expense.

All directions, specifications and recommendations by manufacturers for installation, handling, storing, adjustment and operation of their equipment shall be complied with; responsibility for proper performance shall continue to rest with the Vendor.

For the use of material other than the one specified, the Vendor shall assume the cost of and responsibility for satisfactorily accomplishing all changes in the work as shown. If no manufacturer is named, the Vendor shall submit the product he intends to use for approval of the City.

Except as otherwise provided for by the provisions of M.G.L., Ch. 30, Sec. 39J, the Vendor shall not have any right of appeal from the decision of the City condemning any materials furnished if the Vendor fails to obtain the approval for substitution under this clause. If any substitution is more costly, the Vendor shall pay for such costs."

15. Notice is hereby given that the City of Newton Minority/Women Business Enterprise Plan dated December 1999 is applicable to all City of Newton contracts for materials and supplies. A copy of this plan may be obtained from the Purchasing Department.

16. Right To Know: Any vendor who receives an order or orders resulting from this invitation agrees to submit a Material Safety Data Sheet (MSDS) for each toxic or hazardous substance or mixture containing such substance, pursuant to M.G.L., Ch. 111F, SS8, 9 and 10 and the regulations contained in 441 CMR SS 21.06 when deliveries are made. The vendor agrees to deliver all containers properly labeled pursuant to M.G.L. Ch. 111F, SS 7 and the regulations contained in 441 CMR SS 21.05. Failure to submit an MSDS and/or label on each container will place the vendor in noncompliance with the work order. Failure to furnish MSDSs and/or labels on each container may result in civil or criminal penalties, including bid debarment and action to prevent the vendor from selling said substances or mixtures containing said substances within the Commonwealth. All vendors furnishing substances or mixtures subject to Chapter 111F of the M.G.L. are cautioned to obtain and read the law and rules and regulations referred to above. Copies can be obtained from the State House Book Store, Secretary of State, State House, Room 117, Boston, MA 02133, (617-727-2834) for $2.00 plus $.65 postage.

17. INSURANCE REQUIREMENTS
The Contractor shall provide insurance coverage as listed below. This insurance shall be provided at the Contractor's expense and shall be in full force and effect during the full term of this Contract.

<u>WORKER'S COMPENSATION</u>	
Worker's Compensation:	Per M.G.L. c. l49, §34 and c. l52 as amended.
<u>COMMERCIAL GENERAL LIABILITY</u>	
Personal Injury	$500,000 each occurrence $1,000,000 aggregate
Property Damage	$500,000 each occurrence $1,000,000 aggregate
<u>VEHICLE LIABILITY</u>	
Personal Injury	$500,000 each person $1,000,000 aggregate
Property Damage	$300,000 each occurrence $500,000 aggregate

The City shall be named as additional insureds on the Contractor's Liability Policies.

The Contractor shall not commence the work until proof of compliance with this has been furnished to the City by submitting one copy of a properly endorsed insurance certificate issued by a company authorized to write insurance in the Commonwealth. This certificate shall indicate that the contractual liability coverage is in force.

The Contractor shall file the original and one certified copy of all policies with the City within ten (10) days after contract award. If the City is damaged by the Contractor's failure to maintain such insurance and to so notify the City, then the Contractor shall be responsible for all reasonable costs attributable thereto.

Cancellation of any insurance required by this contract, whether by the insurer or the insured, shall not be valid unless written notice thereof is given by the party proposing cancellation to the other party and City at least thirty days prior to the effective date thereof, which shall be expressed in said notice.

FAILURE TO COMPLY WITH THESE TERMS AND CONDITIONS COULD RESULT IN THE CANCELLATION OF YOUR CONTRACT.

CITY OF NEWTON

WAGE RATE REQUIREMENTS

1. GENERAL

A. This section summarizes the requirements for the payment of wages to laborers and mechanics employed under the Contract.

B. Other duties and requirements of law which may not be specified in this section apply and are inherently a part of the Contract.

2. WAGE RATES

A. The rate per hour to be paid to mechanics, apprentices, teamsters, chauffeurs, and laborers employed on the Work shall not be less than the rate of wages in the attached "Minimum Wage Rates" as determined by the Commissioner of Labor and Industries. This schedule shall continue to be the minimum rate of wages for said employees during the life of this Contract.

B. Keep posted on the site a legible copy of said schedule. Keep on file the wage rates and classifications of labor employed on this Work in order that they may be available for inspection by the Owner, Administrator, or the Architect.

C. Apprentices employed pursuant to this determination of wage rates must be registered and approved by the State Apprenticeship Council wherever rates for journeymen or apprentices are not listed.

D. Pay reserve police officers employed on the Work the prevailing rate of wages paid to regular police officers as required by M.G.L. c149, Sec. 34B, as amended. Such police officers shall be covered by Workmen's Compensation Insurance and Employers Liability Insurance by the Contractor.

E. **The Contractor and all subcontractors shall, on a weekly basis throughout the term of the contract, provide to the City of Newton certified payroll affidavits verifying compliance with M.G.L. c.149, Sec. 27, 27A and 27B.** The Contractor is obligated to provide such records to the City directly on a weekly basis. The City may assess a penalty of $100 for each day beyond the required submission date that such records are received, which amount shall be deducted from any amounts to the Contractor from the City. In the event of chronic late submissions, the City shall report the same to the Office of the Attorney General.

F. The Contractor and all subcontractors shall provide a Statement of Compliance within 15 days of the completion of its portion of the work. This statement shall be submitted to the Owner on the form found elsewhere in this section.

G. The Contractor shall maintain accurate and complete records, including payroll records, during the Contract term and for three years thereafter.

END OF SECTION

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

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

Prevailing Wage Rates

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

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: City of Newton

Contract Number: IFB #23-100 **City/Town:** NEWTON

Description of Work: Transportation Improvements for Pettee Square - Oak St & Chestnut St

Job Location: Oak & Chestnut Street

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The annual update requirement is not applicable to 27F "rental of equipment" contracts. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wages 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 wages chedule. Any apprentice not registered with DAS regardless of whether they are registered with a nother 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 wages chedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wages chedules 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: 04/27/2023 **Wage Request Number:** 20230426-060

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.05	$13.41	$16.01	$0.00	$66.47
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.12	$13.41	$16.01	$0.00	$66.54
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.24	$13.41	$16.01	$0.00	$66.66
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 1*	12/01/2022	$43.93	$9.10	$17.57	$0.00	$70.60
	06/01/2023	$44.93	$9.10	$17.57	$0.00	$71.60
	12/01/2023	$46.18	$9.10	$17.57	$0.00	$72.85
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$43.33	$9.35	$17.82	$0.00	$70.50
	06/01/2023	$44.33	$9.35	$17.82	$0.00	$71.50
	12/01/2023	$45.58	$9.35	$17.82	$0.00	$72.75
	06/01/2024	$47.06	$9.35	$17.82	$0.00	$74.23
	12/01/2024	$48.53	$9.35	$17.82	$0.00	$75.70
	06/01/2025	$50.03	$9.35	$17.82	$0.00	$77.20
	12/01/2025	$51.53	$9.35	$17.82	$0.00	$78.70
	06/01/2026	$53.08	$9.35	$17.82	$0.00	$80.25
	12/01/2026	$54.58	$9.35	$17.82	$0.00	$81.75
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	12/01/2020	$38.10	$12.80	$9.45	$0.00	$60.35
ASPHALT RAKER *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 1*	12/01/2022	$43.93	$9.10	$17.57	$0.00	$70.60
	06/01/2023	$44.93	$9.10	$17.57	$0.00	$71.60
	12/01/2023	$46.18	$9.10	$17.57	$0.00	$72.85
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$43.33	$9.35	$17.82	$0.00	$70.50
	06/01/2023	$44.33	$9.35	$17.82	$0.00	$71.50
	12/01/2023	$45.58	$9.35	$17.82	$0.00	$72.75
	06/01/2024	$47.06	$9.35	$17.82	$0.00	$74.23
	12/01/2024	$48.53	$9.35	$17.82	$0.00	$75.70
	06/01/2025	$50.03	$9.35	$17.82	$0.00	$77.20
	12/01/2025	$51.53	$9.35	$17.82	$0.00	$78.70
	06/01/2026	$53.08	$9.35	$17.82	$0.00	$80.25
	12/01/2026	$54.58	$9.35	$17.82	$0.00	$81.75
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2023	$47.37	$7.07	$20.31	$0.00	$74.75
	01/01/2024	$48.12	$7.07	$20.60	$0.00	$75.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$30.79	$7.07	$13.22	$0.00	$51.08
2	65	$30.79	$7.07	$13.22	$0.00	$51.08
3	70	$33.16	$7.07	$14.23	$0.00	$54.46
4	75	$35.53	$7.07	$15.24	$0.00	$57.84
5	80	$37.90	$7.07	$16.25	$0.00	$61.22
6	85	$40.26	$7.07	$17.28	$0.00	$64.61
7	90	$42.63	$7.07	$18.28	$0.00	$67.98
8	95	$45.00	$7.07	$19.32	$0.00	$71.39

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 (NEWTON)*	02/01/2023	$60.35	$11.49	$22.34	$0.00	$94.18
	08/01/2023	$62.40	$11.49	$22.34	$0.00	$96.23
	02/01/2024	$63.65	$11.49	$22.34	$0.00	$97.48
	08/01/2024	$65.75	$11.49	$22.34	$0.00	$99.58
	02/01/2025	$67.05	$11.49	$22.34	$0.00	$100.88
	08/01/2025	$69.20	$11.49	$22.34	$0.00	$103.03
	02/01/2026	$70.55	$11.49	$22.34	$0.00	$104.38
	08/01/2026	$72.75	$11.49	$22.34	$0.00	$106.58
	02/01/2027	$74.15	$11.49	$22.34	$0.00	$107.98

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$30.18	$11.49	$22.34	$0.00	$64.01
2	60	$36.21	$11.49	$22.34	$0.00	$70.04
3	70	$42.25	$11.49	$22.34	$0.00	$76.08
4	80	$48.28	$11.49	$22.34	$0.00	$82.11
5	90	$54.32	$11.49	$22.34	$0.00	$88.15

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.20	$11.49	$22.34	$0.00	$65.03
2	60	$37.44	$11.49	$22.34	$0.00	$71.27
3	70	$43.68	$11.49	$22.34	$0.00	$77.51
4	80	$49.92	$11.49	$22.34	$0.00	$83.75
5	90	$56.16	$11.49	$22.34	$0.00	$89.99

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2022	$43.73	$9.35	$17.97	$0.00	$71.05
	06/01/2023	$44.73	$9.35	$17.97	$0.00	$72.05
	12/01/2023	$45.98	$9.35	$17.97	$0.00	$73.30
	06/01/2024	$47.46	$9.35	$17.97	$0.00	$74.78
	12/01/2024	$48.93	$9.35	$17.97	$0.00	$76.25
	06/01/2025	$50.43	$9.35	$17.97	$0.00	$77.75
	12/01/2025	$51.93	$9.35	$17.97	$0.00	$79.25
	06/01/2026	$53.48	$9.35	$17.97	$0.00	$80.80
	12/01/2026	$54.98	$9.35	$17.97	$0.00	$82.30
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2022	$42.58	$9.35	$17.97	$0.00	$69.90
	06/01/2023	$43.58	$9.35	$17.97	$0.00	$70.90
	12/01/2023	$44.83	$9.35	$17.97	$0.00	$72.15
	06/01/2024	$46.31	$9.35	$17.97	$0.00	$73.63
	12/01/2024	$47.78	$9.35	$17.97	$0.00	$75.10
	06/01/2025	$49.28	$9.35	$17.97	$0.00	$76.60
	12/01/2025	$50.78	$9.35	$17.97	$0.00	$78.10
	06/01/2026	$52.33	$9.35	$17.97	$0.00	$79.65
	12/01/2026	$53.83	$9.35	$17.97	$0.00	$81.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2022	$42.58	$9.35	$17.97	$0.00	$69.90
	06/01/2023	$43.58	$9.35	$17.97	$0.00	$70.90
	12/01/2023	$44.83	$9.35	$17.97	$0.00	$72.15
	06/01/2024	$46.31	$9.35	$17.97	$0.00	$73.63
	12/01/2024	$47.78	$9.35	$17.97	$0.00	$75.10
	06/01/2025	$49.28	$9.35	$17.97	$0.00	$76.60
	12/01/2025	$50.78	$9.35	$17.97	$0.00	$78.10
	06/01/2026	$52.33	$9.35	$17.97	$0.00	$79.65
	12/01/2026	$53.83	$9.35	$17.97	$0.00	$81.15
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2023	$45.12	$9.33	$19.97	$0.00	$74.42

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.56	$9.33	$1.73	$0.00	$33.62
2	60	$27.07	$9.33	$1.73	$0.00	$38.13
3	70	$31.58	$9.33	$14.78	$0.00	$55.69
4	75	$33.84	$9.33	$14.78	$0.00	$57.95
5	80	$36.10	$9.33	$16.51	$0.00	$61.94
6	80	$36.10	$9.33	$16.51	$0.00	$61.94
7	90	$40.61	$9.33	$18.24	$0.00	$68.18
8	90	$40.61	$9.33	$18.24	$0.00	$68.18

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80

Step 1&2 $30.71/ 3&4 $36.93/ 5&6 $56.82/ 7&8 $63.06

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS -ZONE 2 (Wood Frame)*	04/01/2023	$28.84	$6.69	$6.47	$0.00	$42.00
All Aspects of New Wood Frame Work						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Wood Frame) - Zone 2*

Effective Date - 04/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$14.42	$6.69	$0.00	$0.00	$21.11
2	50	$14.42	$6.69	$0.00	$0.00	$21.11
3	55	$15.86	$6.69	$2.00	$0.00	$24.55
4	55	$15.86	$6.69	$2.00	$0.00	$24.55
5	70	$20.19	$6.69	$6.47	$0.00	$33.35
6	70	$20.19	$6.69	$6.47	$0.00	$33.35
7	80	$23.07	$6.69	$6.47	$0.00	$36.23
8	80	$23.07	$6.69	$6.47	$0.00	$36.23

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80

Step 1&2 $20.09/ 3&4 $24.95/ 5&6 $33.04/ 7&8 $35.91

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEWTON)*	01/01/2023	$49.45	$12.75	$22.74	$0.87	$85.81
	07/01/2023	$50.59	$12.75	$22.74	$0.87	$86.95
	01/01/2024	$51.73	$12.75	$22.74	$0.87	$88.09

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (Newton)*

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.73	$12.75	$15.49	$0.00	$52.97
2	60	$29.67	$12.75	$22.74	$0.87	$66.03
3	65	$32.14	$12.75	$22.74	$0.87	$68.50
4	70	$34.62	$12.75	$22.74	$0.87	$70.98
5	75	$37.09	$12.75	$22.74	$0.87	$73.45
6	80	$39.56	$12.75	$22.74	$0.87	$75.92
7	90	$44.51	$12.75	$22.74	$0.87	$80.87

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.30	$12.75	$15.49	$0.00	$53.54
2	60	$30.35	$12.75	$22.74	$0.87	$66.71
3	65	$32.88	$12.75	$22.74	$0.87	$69.24
4	70	$35.41	$12.75	$22.74	$0.87	$71.77
5	75	$37.94	$12.75	$22.74	$0.87	$74.30
6	80	$40.47	$12.75	$22.74	$0.87	$76.83
7	90	$45.53	$12.75	$22.74	$0.87	$81.89

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 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$54.68	$14.25	$16.05	$0.00	$84.98
	06/01/2023	$55.95	$14.25	$16.05	$0.00	$86.25
	12/01/2023	$57.23	$14.25	$16.05	$0.00	$87.53
	06/01/2024	$58.55	$14.25	$16.05	$0.00	$88.85
	12/01/2024	$60.03	$14.25	$16.05	$0.00	$90.33
	06/01/2025	$61.36	$14.25	$16.05	$0.00	$91.66
	12/01/2025	$62.83	$14.25	$16.05	$0.00	$93.13
	06/01/2026	$64.16	$14.25	$16.05	$0.00	$94.46
	12/01/2026	$65.64	$14.25	$16.05	$0.00	$95.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$35.08	$14.25	$16.05	$0.00	$65.38
	06/01/2023	$35.90	$14.25	$16.05	$0.00	$66.20
	12/01/2023	$36.72	$14.25	$16.05	$0.00	$67.02
	06/01/2024	$37.57	$14.25	$16.05	$0.00	$67.87
	12/01/2024	$38.52	$14.25	$16.05	$0.00	$68.82
	06/01/2025	$39.37	$14.25	$16.05	$0.00	$69.67
	12/01/2025	$40.32	$14.25	$16.05	$0.00	$70.62
	06/01/2026	$41.18	$14.25	$16.05	$0.00	$71.48
	12/01/2026	$42.13	$14.25	$16.05	$0.00	$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2023	$56.06	$8.65	$23.05	$0.00	$87.76
	07/01/2023	$57.26	$8.65	$23.05	$0.00	$88.96
	01/01/2024	$58.46	$8.65	$23.05	$0.00	$90.16
	07/01/2024	$59.66	$8.65	$23.05	$0.00	$91.36
	01/01/2025	$60.86	$8.65	$23.05	$0.00	$92.56

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.03	$8.65	$0.00	$0.00	$36.68
2	55	$30.83	$8.65	$6.27	$0.00	$45.75
3	60	$33.64	$8.65	$6.84	$0.00	$49.13
4	65	$36.44	$8.65	$7.41	$0.00	$52.50
5	70	$39.24	$8.65	$19.63	$0.00	$67.52
6	75	$42.05	$8.65	$20.20	$0.00	$70.90
7	80	$44.85	$8.65	$20.77	$0.00	$74.27
8	90	$50.45	$8.65	$21.91	$0.00	$81.01

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.63	$8.65	$0.00	$0.00	$37.28
2	55	$31.49	$8.65	$6.27	$0.00	$46.41
3	60	$34.36	$8.65	$6.84	$0.00	$49.85
4	65	$37.22	$8.65	$7.41	$0.00	$53.28
5	70	$40.08	$8.65	$19.63	$0.00	$68.36
6	75	$42.95	$8.65	$20.20	$0.00	$71.80
7	80	$45.81	$8.65	$20.77	$0.00	$75.23
8	90	$51.53	$8.65	$21.91	$0.00	$82.09

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 1*	12/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	06/01/2023	$44.33	$9.10	$17.57	$0.00	$71.00
	12/01/2023	$45.58	$9.10	$17.57	$0.00	$72.25

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 1*	12/01/2022	$44.33	$9.10	$17.57	$0.00	$71.00
	06/01/2023	$45.33	$9.10	$17.57	$0.00	$72.00
	12/01/2023	$46.58	$9.10	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 1*	12/01/2022	$44.08	$9.10	$17.57	$0.00	$70.75
	06/01/2023	$45.08	$9.10	$17.57	$0.00	$71.75
	12/01/2023	$46.33	$9.10	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 1*	12/01/2022	$44.33	$9.10	$17.57	$0.00	$71.00
	06/01/2023	$45.33	$9.10	$17.57	$0.00	$72.00
	12/01/2023	$46.58	$9.10	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 1*	12/01/2022	$44.08	$9.10	$17.57	$0.00	$70.75
	06/01/2023	$45.08	$9.10	$17.57	$0.00	$71.75
	12/01/2023	$46.33	$9.10	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 1*	12/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	06/01/2023	$44.33	$9.10	$17.57	$0.00	$71.00
	12/01/2023	$45.58	$9.10	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$68.70	$9.40	$23.12	$0.00	$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$73.60	$9.40	$23.12	$0.00	$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 103*	03/01/2023	$59.23	$13.00	$21.63	$0.00	$93.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 103*
Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$23.69	$13.00	$0.71	$0.00	$37.40
2	40	$23.69	$13.00	$0.71	$0.00	$37.40
3	45	$26.65	$13.00	$16.13	$0.00	$55.78
4	45	$26.65	$13.00	$16.13	$0.00	$55.78
5	50	$29.62	$13.00	$16.63	$0.00	$59.25
6	55	$32.58	$13.00	$17.13	$0.00	$62.71
7	60	$35.54	$13.00	$17.63	$0.00	$66.17
8	65	$38.50	$13.00	$18.13	$0.00	$69.63
9	70	$41.46	$13.00	$18.62	$0.00	$73.08
10	75	$44.42	$13.00	$19.13	$0.00	$76.55

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

Apprentice to Journeyworker Ratio:2:3***

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

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"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/05/2022	$48.67	$14.25	$16.05	$0.00	$78.97
	05/01/2023	$49.91	$14.25	$16.05	$0.00	$80.21
	11/01/2023	$51.15	$14.25	$16.05	$0.00	$81.45
	05/01/2024	$52.39	$14.25	$16.05	$0.00	$82.69
	11/01/2024	$53.68	$14.25	$16.05	$0.00	$83.98
	05/01/2025	$55.12	$14.25	$16.05	$0.00	$85.42
	11/01/2025	$56.41	$14.25	$16.05	$0.00	$86.71
	05/01/2026	$57.85	$14.25	$16.05	$0.00	$88.15
	11/01/2026	$59.14	$14.25	$16.05	$0.00	$89.44
	05/01/2027	$60.57	$14.25	$16.05	$0.00	$90.87
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2022	$50.22	$14.25	$16.05	$0.00	$80.52
	05/01/2023	$51.47	$14.25	$16.05	$0.00	$81.77
	11/01/2023	$52.72	$14.25	$16.05	$0.00	$83.02
	05/01/2024	$53.97	$14.25	$16.05	$0.00	$84.27
	11/01/2024	$55.27	$14.25	$16.05	$0.00	$85.57
	05/01/2025	$56.72	$14.25	$16.05	$0.00	$87.02
	11/01/2025	$58.02	$14.25	$16.05	$0.00	$88.32
	05/01/2026	$59.47	$14.25	$16.05	$0.00	$89.77
	11/01/2026	$60.77	$14.25	$16.05	$0.00	$91.07
	05/01/2027	$62.22	$14.25	$16.05	$0.00	$92.52
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2022	$24.31	$14.25	$16.05	$0.00	$54.61
	05/01/2023	$25.05	$14.25	$16.05	$0.00	$55.35
	11/01/2023	$25.78	$14.25	$16.05	$0.00	$56.08
	05/01/2024	$26.51	$14.25	$16.05	$0.00	$56.81
	11/01/2024	$27.27	$14.25	$16.05	$0.00	$57.57
	05/01/2025	$28.12	$14.25	$16.05	$0.00	$58.42
	11/01/2025	$28.88	$14.25	$16.05	$0.00	$59.18
	05/01/2026	$29.73	$14.25	$16.05	$0.00	$60.03
	11/01/2026	$30.49	$14.25	$16.05	$0.00	$60.79
	05/01/2027	$31.34	$14.25	$16.05	$0.00	$61.64
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 103*	03/01/2023	$59.23	$13.00	$21.63	$0.00	$93.86
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING *ELECTRICIANS* *LOCAL 103*	03/01/2023	$48.34	$13.00	$19.01	$0.00	$80.35
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$43.54	$14.25	$16.05	$0.00	$73.84
	06/01/2023	$44.56	$14.25	$16.05	$0.00	$74.86
	12/01/2023	$45.57	$14.25	$16.05	$0.00	$75.87
	06/01/2024	$46.63	$14.25	$16.05	$0.00	$76.93
	12/01/2024	$47.81	$14.25	$16.05	$0.00	$78.11
	06/01/2025	$48.87	$14.25	$16.05	$0.00	$79.17
	12/01/2025	$50.04	$14.25	$16.05	$0.00	$80.34
	06/01/2026	$51.10	$14.25	$16.05	$0.00	$81.40
	12/01/2026	$52.28	$14.25	$16.05	$0.00	$82.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$25.23	$9.35	$17.82	$0.00	$52.40
	06/01/2023	$25.98	$9.35	$17.82	$0.00	$53.15
	12/01/2023	$25.98	$9.35	$17.82	$0.00	$53.15
	06/01/2024	$27.01	$9.35	$17.82	$0.00	$54.18
	12/01/2024	$27.01	$9.35	$17.82	$0.00	$54.18
	06/01/2025	$28.09	$9.35	$17.82	$0.00	$55.26
	12/01/2025	$28.09	$9.35	$17.82	$0.00	$55.26
	06/01/2026	$29.21	$9.35	$17.82	$0.00	$56.38
	12/01/2026	$29.21	$9.35	$17.82	$0.00	$56.38
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2022	$51.77	$9.33	$20.27	$0.00	$81.37

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.89	$9.33	$1.79	$0.00	$37.01
2	55	$28.47	$9.33	$1.79	$0.00	$39.59
3	60	$31.06	$9.33	$14.90	$0.00	$55.29
4	65	$33.65	$9.33	$14.90	$0.00	$57.88
5	70	$36.24	$9.33	$16.69	$0.00	$62.26
6	75	$38.83	$9.33	$16.69	$0.00	$64.85
7	80	$41.42	$9.33	$18.48	$0.00	$69.23
8	85	$44.00	$9.33	$18.48	$0.00	$71.81

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

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$35.08	$14.25	$16.05	$0.00	$65.38
	06/01/2023	$35.90	$14.25	$16.05	$0.00	$66.20
	12/01/2023	$36.72	$14.25	$16.05	$0.00	$67.02
	06/01/2024	$37.57	$14.25	$16.05	$0.00	$67.87
	12/01/2024	$38.52	$14.25	$16.05	$0.00	$68.82
	06/01/2025	$39.37	$14.25	$16.05	$0.00	$69.67
	12/01/2025	$40.32	$14.25	$16.05	$0.00	$70.62
	06/01/2026	$41.18	$14.25	$16.05	$0.00	$71.48
	12/01/2026	$42.13	$14.25	$16.05	$0.00	$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	01/01/2023	$45.56	$8.65	$23.05	$0.00	$77.26
	07/01/2023	$46.76	$8.65	$23.05	$0.00	$78.46
	01/01/2024	$47.96	$8.65	$23.05	$0.00	$79.66
	07/01/2024	$49.16	$8.65	$23.05	$0.00	$80.86
	01/01/2025	$50.36	$8.65	$23.05	$0.00	$82.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 35 Zone 2*

Effective Date - 01/01/2023

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

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.38	$8.65	$0.00	$0.00	$32.03
2	55	$25.72	$8.65	$6.27	$0.00	$40.64
3	60	$28.06	$8.65	$6.84	$0.00	$43.55
4	65	$30.39	$8.65	$7.41	$0.00	$46.45
5	70	$32.73	$8.65	$19.63	$0.00	$61.01
6	75	$35.07	$8.65	$20.20	$0.00	$63.92
7	80	$37.41	$8.65	$20.77	$0.00	$66.83
8	90	$42.08	$8.65	$21.91	$0.00	$72.64

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 12/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$29.50	$14.25	$0.00	$0.00	$43.75
2	60	$32.18	$14.25	$16.05	$0.00	$62.48
3	65	$34.86	$14.25	$16.05	$0.00	$65.16
4	70	$37.54	$14.25	$16.05	$0.00	$67.84
5	75	$40.22	$14.25	$16.05	$0.00	$70.52
6	80	$42.90	$14.25	$16.05	$0.00	$73.20
7	85	$45.59	$14.25	$16.05	$0.00	$75.89
8	90	$48.27	$14.25	$16.05	$0.00	$78.57

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$30.18	$14.25	$0.00	$0.00	$44.43
2	60	$32.93	$14.25	$16.05	$0.00	$63.23
3	65	$35.67	$14.25	$16.05	$0.00	$65.97
4	70	$38.42	$14.25	$16.05	$0.00	$68.72
5	75	$41.16	$14.25	$16.05	$0.00	$71.46
6	80	$43.90	$14.25	$16.05	$0.00	$74.20
7	85	$46.65	$14.25	$16.05	$0.00	$76.95
8	90	$49.39	$14.25	$16.05	$0.00	$79.69

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2023	$55.31	$14.11	$26.64	$2.83	$98.89
	08/01/2023	$57.01	$14.11	$26.64	$2.83	$100.59
	02/01/2024	$58.71	$14.11	$26.64	$2.83	$102.29
	08/01/2024	$60.46	$14.11	$26.64	$2.83	$104.04
	02/01/2025	$62.21	$14.11	$26.64	$2.83	$105.79
	08/01/2025	$64.06	$14.11	$26.64	$2.83	$107.64
	02/01/2026	$66.01	$14.11	$26.64	$2.83	$109.59
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 103*	03/01/2023	$59.23	$13.00	$21.63	$0.00	$93.86
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2023	$55.31	$14.11	$26.64	$2.83	$98.89
	08/01/2023	$57.01	$14.11	$26.64	$2.83	$100.59
	02/01/2024	$58.71	$14.11	$26.64	$2.83	$102.29
	08/01/2024	$60.46	$14.11	$26.64	$2.83	$104.04
	02/01/2025	$62.21	$14.11	$26.64	$2.83	$105.79
	08/01/2025	$64.06	$14.11	$26.64	$2.83	$107.64
	02/01/2026	$66.01	$14.11	$26.64	$2.83	$109.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PIPEFITTERS LOCAL 537*	03/01/2023	$63.43	$12.50	$20.80	$0.00	$96.73
	09/01/2023	$65.18	$12.50	$20.80	$0.00	$98.48
	03/01/2024	$66.98	$12.50	$20.80	$0.00	$100.28
	09/01/2024	$68.78	$12.50	$20.80	$0.00	$102.08
	03/01/2025	$70.58	$12.50	$20.80	$0.00	$103.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PIPEFITTERS LOCAL 537*	03/01/2023	$63.43	$12.25	$20.80	$0.00	$96.48
	09/01/2023	$65.18	$12.25	$20.80	$0.00	$98.23
	03/01/2024	$66.98	$12.25	$20.80	$0.00	$100.03
	09/01/2024	$68.78	$12.25	$20.80	$0.00	$101.83
	03/01/2025	$70.58	$12.25	$20.80	$0.00	$103.63
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 1*	12/01/2022	$43.93	$9.10	$17.57	$0.00	$70.60
	06/01/2023	$44.93	$9.10	$17.57	$0.00	$71.60
	12/01/2023	$46.18	$9.10	$17.57	$0.00	$72.85
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$43.33	$9.35	$17.82	$0.00	$70.50
	06/01/2023	$44.33	$9.35	$17.82	$0.00	$71.50
	12/01/2023	$45.58	$9.35	$17.82	$0.00	$72.75
	06/01/2024	$47.06	$9.35	$17.82	$0.00	$74.23
	12/01/2024	$48.53	$9.35	$17.82	$0.00	$75.70
	06/01/2025	$50.03	$9.35	$17.82	$0.00	$77.20
	12/01/2025	$51.53	$9.35	$17.82	$0.00	$78.70
	06/01/2026	$53.08	$9.35	$17.82	$0.00	$80.25
	12/01/2026	$54.58	$9.35	$17.82	$0.00	$81.75
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	09/01/2022	$53.85	$13.80	$17.14	$0.00	$84.79

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

Effective Date - 09/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.93	$13.80	$12.42	$0.00	$53.15
2	60	$32.31	$13.80	$13.36	$0.00	$59.47
3	70	$37.70	$13.80	$14.31	$0.00	$65.81
4	80	$43.08	$13.80	$15.25	$0.00	$72.13

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (BOSTON AREA)*	03/16/2023	$52.72	$8.35	$26.70	$0.00	$87.77
	03/16/2024	$53.97	$8.35	$26.70	$0.00	$89.02

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 7 Boston*

Effective Date - 03/16/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$31.63	$8.35	$26.70	$0.00	$66.68
2	70	$36.90	$8.35	$26.70	$0.00	$71.95
3	75	$39.54	$8.35	$26.70	$0.00	$74.59
4	80	$42.18	$8.35	$26.70	$0.00	$77.23
5	85	$44.81	$8.35	$26.70	$0.00	$79.86
6	90	$47.45	$8.35	$26.70	$0.00	$82.50

Effective Date - 03/16/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$32.38	$8.35	$26.70	$0.00	$67.43
2	70	$37.78	$8.35	$26.70	$0.00	$72.83
3	75	$40.48	$8.35	$26.70	$0.00	$75.53
4	80	$43.18	$8.35	$26.70	$0.00	$78.23
5	85	$45.87	$8.35	$26.70	$0.00	$80.92
6	90	$48.57	$8.35	$26.70	$0.00	$83.62

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 1*	12/01/2022	$43.18	$9.10	$17.57	$0.00	$69.85
	06/01/2023	$44.18	$9.10	$17.57	$0.00	$70.85
	12/01/2023	$45.43	$9.10	$17.57	$0.00	$72.10

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 1*

Effective Date - 12/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$25.91	$9.10	$17.57	$0.00	$52.58
2	70	$30.23	$9.10	$17.57	$0.00	$56.90
3	80	$34.54	$9.10	$17.57	$0.00	$61.21
4	90	$38.86	$9.10	$17.57	$0.00	$65.53

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$26.51	$9.10	$17.57	$0.00	$53.18
2	70	$30.93	$9.10	$17.57	$0.00	$57.60
3	80	$35.34	$9.10	$17.57	$0.00	$62.01
4	90	$39.76	$9.10	$17.57	$0.00	$66.43

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.58	$9.35	$17.82	$0.00	$69.75
	06/01/2023	$43.58	$9.35	$17.82	$0.00	$70.75
	12/01/2023	$44.83	$9.35	$17.82	$0.00	$72.00
	06/01/2024	$46.31	$9.35	$17.82	$0.00	$73.48
	12/01/2024	$47.78	$9.35	$17.82	$0.00	$74.95
	06/01/2025	$49.28	$9.35	$17.82	$0.00	$76.45
	12/01/2025	$50.78	$9.35	$17.82	$0.00	$77.95
	06/01/2026	$52.33	$9.35	$17.82	$0.00	$79.50
	12/01/2026	$53.83	$9.35	$17.82	$0.00	$81.00

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER (Heavy & Highway) - Zone 1*

Effective Date - 12/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$25.55	$9.35	$17.82	$0.00	$52.72
2	70	$29.81	$9.35	$17.82	$0.00	$56.98
3	80	$34.06	$9.35	$17.82	$0.00	$61.23
4	90	$38.32	$9.35	$17.82	$0.00	$65.49

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$26.15	$9.35	$17.82	$0.00	$53.32
2	70	$30.51	$9.35	$17.82	$0.00	$57.68
3	80	$34.86	$9.35	$17.82	$0.00	$62.03
4	90	$39.22	$9.35	$17.82	$0.00	$66.39

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 1*	12/01/2022	$43.18	$9.10	$17.57	$0.00	$69.85
	06/01/2023	$44.18	$9.10	$17.57	$0.00	$70.85
	12/01/2023	$45.43	$9.10	$17.57	$0.00	$72.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 1*	12/01/2022	$43.18	$9.10	$17.57	$0.00	$69.85
	06/01/2023	$44.18	$9.10	$17.57	$0.00	$70.85
	12/01/2023	$45.43	$9.10	$17.57	$0.00	$72.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 1*	12/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	06/01/2023	$44.33	$9.10	$17.57	$0.00	$71.00
	12/01/2023	$45.58	$9.10	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	06/01/2024	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
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 1*	12/01/2022	$43.18	$9.10	$17.57	$0.00	$69.85
	06/01/2023	$44.18	$9.10	$17.57	$0.00	$70.85
	12/01/2023	$45.43	$9.10	$17.57	$0.00	$72.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 1*	12/01/2022	$43.18	$9.10	$17.57	$0.00	$69.85
	06/01/2023	$44.18	$9.10	$17.57	$0.00	$70.85
	12/01/2023	$45.43	$9.10	$17.57	$0.00	$72.10
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 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2023	$46.25	$11.49	$20.37	$0.00	$78.11
	08/01/2023	$47.89	$11.49	$20.37	$0.00	$79.75
	02/01/2024	$48.89	$11.49	$20.37	$0.00	$80.75
	08/01/2024	$50.57	$11.49	$20.37	$0.00	$82.43
	02/01/2025	$51.61	$11.49	$20.37	$0.00	$83.47
	08/01/2025	$53.33	$11.49	$20.37	$0.00	$85.19
	02/01/2026	$54.41	$11.49	$20.37	$0.00	$86.27
	08/01/2026	$56.17	$11.49	$20.37	$0.00	$88.03
	02/01/2027	$57.29	$11.49	$20.37	$0.00	$89.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2023

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

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.95	$11.49	$20.37	$0.00	$55.81
2	60	$28.73	$11.49	$20.37	$0.00	$60.59
3	70	$33.52	$11.49	$20.37	$0.00	$65.38
4	80	$38.31	$11.49	$20.37	$0.00	$70.17
5	90	$43.10	$11.49	$20.37	$0.00	$74.96

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2023	$60.37	$11.49	$22.31	$0.00	$94.17
	08/01/2023	$62.42	$11.49	$22.31	$0.00	$96.22
	02/01/2024	$63.67	$11.49	$22.31	$0.00	$97.47
	08/01/2024	$65.77	$11.49	$22.31	$0.00	$99.57
	02/01/2025	$67.07	$11.49	$22.31	$0.00	$100.87
	08/01/2025	$69.22	$11.49	$22.31	$0.00	$103.02
	02/01/2026	$70.57	$11.49	$22.31	$0.00	$104.37
	08/01/2026	$72.77	$11.49	$22.31	$0.00	$106.57
	02/01/2027	$74.17	$11.49	$22.31	$0.00	$107.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$30.19	$11.49	$22.31	$0.00	$63.99
2	60	$36.22	$11.49	$22.31	$0.00	$70.02
3	70	$42.26	$11.49	$22.31	$0.00	$76.06
4	80	$48.30	$11.49	$22.31	$0.00	$82.10
5	90	$54.33	$11.49	$22.31	$0.00	$88.13

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.21	$11.49	$22.31	$0.00	$65.01
2	60	$37.45	$11.49	$22.31	$0.00	$71.25
3	70	$43.69	$11.49	$22.31	$0.00	$77.49
4	80	$49.94	$11.49	$22.31	$0.00	$83.74
5	90	$56.18	$11.49	$22.31	$0.00	$89.98

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1) *MILLWRIGHTS LOCAL 1121 - Zone 1*	01/02/2023	$47.27	$8.58	$21.57	$0.00	$77.42

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 1*

Effective Date - 01/02/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$26.00	$8.58	$5.72	$0.00	$40.30
2	65	$30.73	$8.58	$17.93	$0.00	$57.24
3	75	$35.45	$8.58	$18.98	$0.00	$63.01
4	85	$40.18	$8.58	$20.01	$0.00	$68.77

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 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$24.37	$14.25	$16.05	$0.00	$54.67
	06/01/2023	$24.94	$14.25	$16.05	$0.00	$55.24
	12/01/2023	$25.51	$14.25	$16.05	$0.00	$55.81
	06/01/2024	$26.11	$14.25	$16.05	$0.00	$56.41
	12/01/2024	$26.77	$14.25	$16.05	$0.00	$57.07
	06/01/2025	$27.37	$14.25	$16.05	$0.00	$57.67
	12/01/2025	$28.03	$14.25	$16.05	$0.00	$58.33
	06/01/2026	$28.62	$14.25	$16.05	$0.00	$58.92
	12/01/2026	$29.29	$14.25	$16.05	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$29.57	$14.25	$16.05	$0.00	$59.87
	06/01/2023	$30.27	$14.25	$16.05	$0.00	$60.57
	12/01/2023	$30.96	$14.25	$16.05	$0.00	$61.26
	06/01/2024	$31.68	$14.25	$16.05	$0.00	$61.98
	12/01/2024	$32.48	$14.25	$16.05	$0.00	$62.78
	06/01/2025	$33.20	$14.25	$16.05	$0.00	$63.50
	12/01/2025	$34.00	$14.25	$16.05	$0.00	$64.30
	06/01/2026	$34.72	$14.25	$16.05	$0.00	$65.02
	12/01/2026	$35.52	$14.25	$16.05	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99

Classification For apprentice rates see "Apprentice- OPERATING ENGINEERS"	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2023	$56.06	$8.65	$23.05	$0.00	$87.76
	07/01/2023	$57.26	$8.65	$23.05	$0.00	$88.96
	01/01/2024	$58.46	$8.65	$23.05	$0.00	$90.16
	07/01/2024	$59.66	$8.65	$23.05	$0.00	$91.36
	01/01/2025	$60.86	$8.65	$23.05	$0.00	$92.56

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.03	$8.65	$0.00	$0.00	$36.68
2	55	$30.83	$8.65	$6.27	$0.00	$45.75
3	60	$33.64	$8.65	$6.84	$0.00	$49.13
4	65	$36.44	$8.65	$7.41	$0.00	$52.50
5	70	$39.24	$8.65	$19.63	$0.00	$67.52
6	75	$42.05	$8.65	$20.20	$0.00	$70.90
7	80	$44.85	$8.65	$20.77	$0.00	$74.27
8	90	$50.45	$8.65	$21.91	$0.00	$81.01

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.63	$8.65	$0.00	$0.00	$37.28
2	55	$31.49	$8.65	$6.27	$0.00	$46.41
3	60	$34.36	$8.65	$6.84	$0.00	$49.85
4	65	$37.22	$8.65	$7.41	$0.00	$53.28
5	70	$40.08	$8.65	$19.63	$0.00	$68.36
6	75	$42.95	$8.65	$20.20	$0.00	$71.80
7	80	$45.81	$8.65	$20.77	$0.00	$75.23
8	90	$51.53	$8.65	$21.91	$0.00	$82.09

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2023

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

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.08	$8.65	$0.00	$0.00	$32.73
2	55	$26.49	$8.65	$6.27	$0.00	$41.41
3	60	$28.90	$8.65	$6.84	$0.00	$44.39
4	65	$31.30	$8.65	$7.41	$0.00	$47.36
5	70	$33.71	$8.65	$19.63	$0.00	$61.99
6	75	$36.12	$8.65	$20.20	$0.00	$64.97
7	80	$38.53	$8.65	$20.77	$0.00	$67.95
8	90	$43.34	$8.65	$21.91	$0.00	$73.90

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2023	$45.02	$8.65	$23.05	$0.00	$76.72
	07/01/2023	$46.22	$8.65	$23.05	$0.00	$77.92
	01/01/2024	$47.42	$8.65	$23.05	$0.00	$79.12
	07/01/2024	$48.62	$8.65	$23.05	$0.00	$80.32
	01/01/2025	$49.82	$8.65	$23.05	$0.00	$81.52

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2023

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

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.11	$8.65	$0.00	$0.00	$31.76
2	55	$25.42	$8.65	$6.27	$0.00	$40.34
3	60	$27.73	$8.65	$6.84	$0.00	$43.22
4	65	$30.04	$8.65	$19.06	$0.00	$57.75
5	70	$32.35	$8.65	$19.63	$0.00	$60.63
6	75	$34.67	$8.65	$20.20	$0.00	$63.52
7	80	$36.98	$8.65	$20.77	$0.00	$66.40
8	90	$41.60	$8.65	$21.91	$0.00	$72.16

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	01/01/2023	$45.56	$8.65	$23.05	$0.00	$77.26
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 2*	07/01/2023	$46.76	$8.65	$23.05	$0.00	$78.46
	01/01/2024	$47.96	$8.65	$23.05	$0.00	$79.66
	07/01/2024	$49.16	$8.65	$23.05	$0.00	$80.86
	01/01/2025	$50.36	$8.65	$23.05	$0.00	$82.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2023

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

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.38	$8.65	$0.00	$0.00	$32.03
2	55	$25.72	$8.65	$6.27	$0.00	$40.64
3	60	$28.06	$8.65	$6.84	$0.00	$43.55
4	65	$30.39	$8.65	$7.41	$0.00	$46.45
5	70	$32.73	$8.65	$19.63	$0.00	$61.01
6	75	$35.07	$8.65	$20.20	$0.00	$63.92
7	80	$37.41	$8.65	$20.77	$0.00	$66.83
8	90	$42.08	$8.65	$21.91	$0.00	$72.64

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2023	$43.62	$8.65	$23.05	$0.00	$75.32
	07/01/2023	$44.82	$8.65	$23.05	$0.00	$76.52
	01/01/2024	$46.02	$8.65	$23.05	$0.00	$77.72
	07/01/2024	$47.22	$8.65	$23.05	$0.00	$78.92
	01/01/2025	$48.42	$8.65	$23.05	$0.00	$80.12

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2023

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

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.41	$8.65	$0.00	$0.00	$31.06
2	55	$24.65	$8.65	$6.27	$0.00	$39.57
3	60	$26.89	$8.65	$6.84	$0.00	$42.38
4	65	$29.13	$8.65	$7.41	$0.00	$45.19
5	70	$31.37	$8.65	$19.63	$0.00	$59.65
6	75	$33.62	$8.65	$20.20	$0.00	$62.47
7	80	$35.86	$8.65	$20.77	$0.00	$65.28
8	90	$40.34	$8.65	$21.91	$0.00	$70.90

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.58	$9.35	$17.82	$0.00	$69.75
	06/01/2023	$43.58	$9.35	$17.82	$0.00	$70.75
	12/01/2023	$44.83	$9.35	$17.82	$0.00	$72.00
	06/01/2024	$46.31	$9.35	$17.82	$0.00	$73.48
	12/01/2024	$47.78	$9.35	$17.82	$0.00	$74.95
	06/01/2025	$49.28	$9.35	$17.82	$0.00	$76.45
	12/01/2025	$50.78	$9.35	$17.82	$0.00	$77.95
	06/01/2026	$52.33	$9.35	$17.82	$0.00	$79.50
	12/01/2026	$53.83	$9.35	$17.82	$0.00	$81.00
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$36.88	$13.41	$16.01	$0.00	$66.30
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.54	$9.40	$23.12	$0.00	$57.06
2	60	$29.44	$9.40	$23.12	$0.00	$61.96
3	70	$34.35	$9.40	$23.12	$0.00	$66.87
4	75	$36.80	$9.40	$23.12	$0.00	$69.32
5	80	$39.26	$9.40	$23.12	$0.00	$71.78
6	80	$39.26	$9.40	$23.12	$0.00	$71.78
7	90	$44.16	$9.40	$23.12	$0.00	$76.68
8	90	$44.16	$9.40	$23.12	$0.00	$76.68

Notes:
% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $34.01/ 3&4 $41.46/ 5&6 $62.80/ 7&8 $69.25

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER *PIPEFITTERS LOCAL 537*	03/01/2023	$63.43	$12.25	$20.80	$0.00	$96.48
	09/01/2023	$65.18	$12.25	$20.80	$0.00	$98.23
	03/01/2024	$66.98	$12.25	$20.80	$0.00	$100.03
	09/01/2024	$68.78	$12.25	$20.80	$0.00	$101.83
	03/01/2025	$70.58	$12.25	$20.80	$0.00	$103.63

Apprentice - *PIPEFITTER - Local 537*

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$25.37	$12.25	$8.55	$0.00	$46.17
2	45	$28.54	$12.25	$20.80	$0.00	$61.59
3	60	$38.06	$12.25	$20.80	$0.00	$71.11
4	70	$44.40	$12.25	$20.80	$0.00	$77.45
5	80	$50.74	$12.25	$20.80	$0.00	$83.79

Effective Date - 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$26.07	$12.25	$8.55	$0.00	$46.87
2	45	$29.33	$12.25	$20.80	$0.00	$62.38
3	60	$39.11	$12.25	$20.80	$0.00	$72.16
4	70	$45.63	$12.25	$20.80	$0.00	$78.68
5	80	$52.14	$12.25	$20.80	$0.00	$85.19

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

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBERS & GASFITTERS *PLUMBERS & GASFITTERS LOCAL 12*	02/26/2023	$65.19	$14.07	$18.36	$0.00	$97.62
	09/03/2023	$66.94	$14.07	$18.36	$0.00	$99.37
	03/03/2024	$68.74	$14.07	$18.36	$0.00	$101.17
	09/01/2024	$70.54	$14.07	$18.36	$0.00	$102.97
	03/02/2025	$72.34	$14.07	$18.36	$0.00	$104.77

Apprentice - *PLUMBER/GASFITTER - Local 12*

Effective Date - 02/26/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$22.82	$14.07	$6.63	$0.00	$43.52
2	40	$26.08	$14.07	$7.52	$0.00	$47.67
3	55	$35.85	$14.07	$10.24	$0.00	$60.16
4	65	$42.37	$14.07	$12.04	$0.00	$68.48
5	75	$48.89	$14.07	$13.85	$0.00	$76.81

Effective Date - 09/03/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$23.43	$14.07	$6.63	$0.00	$44.13
2	40	$26.78	$14.07	$7.52	$0.00	$48.37
3	55	$36.82	$14.07	$10.24	$0.00	$61.13
4	65	$43.51	$14.07	$12.04	$0.00	$69.62
5	75	$50.21	$14.07	$13.85	$0.00	$78.13

Notes:

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

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) *PIPEFITTERS LOCAL 537*	03/01/2023	$63.43	$12.00	$20.80	$0.00	$96.23
	09/01/2023	$65.18	$12.00	$20.80	$0.00	$97.98
	03/01/2024	$66.98	$12.00	$20.80	$0.00	$99.78
	09/01/2024	$68.78	$12.00	$20.80	$0.00	$101.58
	03/01/2025	$70.58	$12.00	$20.80	$0.00	$103.38

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWDERMAN & BLASTER *LABORERS - ZONE 1*	12/01/2022	$44.18	$9.10	$17.57	$0.00	$70.85
	06/01/2023	$45.18	$9.10	$17.57	$0.00	$71.85
	12/01/2023	$46.43	$9.10	$17.57	$0.00	$73.10
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$43.58	$9.35	$17.82	$0.00	$70.75
	06/01/2023	$44.58	$9.35	$17.82	$0.00	$71.75
	12/01/2023	$45.83	$9.35	$17.82	$0.00	$73.00
	06/01/2024	$47.31	$9.35	$17.82	$0.00	$74.48
	12/01/2024	$48.78	$9.35	$17.82	$0.00	$75.95
	06/01/2025	$50.28	$9.35	$17.82	$0.00	$77.45
	12/01/2025	$51.78	$9.35	$17.82	$0.00	$78.95
	06/01/2026	$53.33	$9.35	$17.82	$0.00	$80.50
	12/01/2026	$54.83	$9.35	$17.82	$0.00	$82.00
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$35.08	$14.25	$16.05	$0.00	$65.38
	06/01/2023	$35.90	$14.25	$16.05	$0.00	$66.20
	12/01/2023	$36.72	$14.25	$16.05	$0.00	$67.02
	06/01/2024	$37.57	$14.25	$16.05	$0.00	$67.87
	12/01/2024	$38.52	$14.25	$16.05	$0.00	$68.82
	06/01/2025	$39.37	$14.25	$16.05	$0.00	$69.67
	12/01/2025	$40.32	$14.25	$16.05	$0.00	$70.62
	06/01/2026	$41.18	$14.25	$16.05	$0.00	$71.48
	12/01/2026	$42.13	$14.25	$16.05	$0.00	$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 170 - Rosenfeld (Walpole)*	01/01/2023	$25.75	$12.46	$8.00	$0.00	$46.21
	05/01/2023	$26.40	$12.46	$8.00	$0.00	$46.86
	01/01/2024	$26.40	$12.96	$8.00	$0.00	$47.36
	05/01/2024	$27.00	$12.96	$8.00	$0.00	$47.96
	01/01/2025	$27.00	$13.46	$8.00	$0.00	$48.46
	05/01/2025	$27.60	$13.46	$8.25	$0.00	$49.31
	01/01/2026	$27.60	$13.96	$8.25	$0.00	$49.81
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	02/01/2023	$48.53	$12.78	$20.20	$0.00	$81.51
	08/01/2023	$50.03	$12.78	$20.20	$0.00	$83.01
	02/01/2024	$51.28	$12.78	$20.20	$0.00	$84.26
	08/01/2024	$52.78	$12.78	$20.20	$0.00	$85.76
	02/01/2025	$54.03	$12.78	$20.20	$0.00	$87.01
	08/01/2025	$55.53	$12.78	$20.20	$0.00	$88.51
	02/01/2026	$56.78	$12.78	$20.20	$0.00	$89.76

Apprentice - *ROOFER - Local 33*

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.27	$12.78	$5.59	$0.00	$42.64
2	60	$29.12	$12.78	$20.20	$0.00	$62.10
3	65	$31.54	$12.78	$20.20	$0.00	$64.52
4	75	$36.40	$12.78	$20.20	$0.00	$69.38
5	85	$41.25	$12.78	$20.20	$0.00	$74.23

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.02	$12.78	$5.59	$0.00	$43.39
2	60	$30.02	$12.78	$20.20	$0.00	$63.00
3	65	$32.52	$12.78	$20.20	$0.00	$65.50
4	75	$37.52	$12.78	$20.20	$0.00	$70.50
5	85	$42.53	$12.78	$20.20	$0.00	$75.51

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*	02/01/2023	$48.78	$12.78	$20.20	$0.00	$81.76
	08/01/2023	$50.28	$12.78	$20.20	$0.00	$83.26
	02/01/2024	$51.53	$12.78	$20.20	$0.00	$84.51
	08/01/2024	$53.03	$12.78	$20.20	$0.00	$86.01
	02/01/2025	$54.28	$12.78	$20.20	$0.00	$87.26
	08/01/2025	$55.78	$12.78	$20.20	$0.00	$88.76
	02/01/2026	$57.03	$12.78	$20.20	$0.00	$90.01

Classification For apprentice rates see "Apprentice- ROOFER"	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2023	$55.31	$14.11	$26.64	$2.83	$98.89
	08/01/2023	$57.01	$14.11	$26.64	$2.83	$100.59
	02/01/2024	$58.71	$14.11	$26.64	$2.83	$102.29
	08/01/2024	$60.46	$14.11	$26.64	$2.83	$104.04
	02/01/2025	$62.21	$14.11	$26.64	$2.83	$105.79
	08/01/2025	$64.06	$14.11	$26.64	$2.83	$107.64
	02/01/2026	$66.01	$14.11	$26.64	$2.83	$109.59

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$23.23	$14.11	$6.13	$0.00	$43.47
2	42	$23.23	$14.11	$6.13	$0.00	$43.47
3	47	$26.00	$14.11	$11.90	$1.54	$53.55
4	47	$26.00	$14.11	$11.90	$1.54	$53.55
5	52	$28.76	$14.11	$12.88	$1.65	$57.40
6	52	$28.76	$14.11	$13.13	$1.65	$57.65
7	60	$33.19	$14.11	$14.54	$1.83	$63.67
8	65	$35.95	$14.11	$15.52	$1.94	$67.52
9	75	$41.48	$14.11	$17.48	$2.16	$75.23
10	85	$47.01	$14.11	$18.94	$2.36	$82.42

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$23.94	$14.11	$6.13	$0.00	$44.18
2	42	$23.94	$14.11	$6.13	$0.00	$44.18
3	47	$26.79	$14.11	$11.90	$1.58	$54.38
4	47	$26.79	$14.11	$11.90	$1.58	$54.38
5	52	$29.65	$14.11	$12.88	$1.70	$58.34
6	52	$29.65	$14.11	$13.13	$1.70	$58.59
7	60	$34.21	$14.11	$14.54	$1.89	$64.75
8	65	$37.06	$14.11	$15.52	$2.00	$68.69
9	75	$42.76	$14.11	$17.48	$2.23	$76.58
10	85	$48.46	$14.11	$18.94	$2.45	$83.96

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.34	$13.41	$16.01	$0.00	$66.76
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.63	$13.41	$16.01	$0.00	$67.05

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1*	03/01/2023	$66.20	$10.90	$23.20	$0.00	$100.30
	10/01/2023	$67.95	$10.90	$23.20	$0.00	$102.05
	03/01/2024	$69.75	$10.90	$23.20	$0.00	$103.85
	10/01/2024	$71.55	$10.90	$23.20	$0.00	$105.65
	03/01/2025	$73.35	$10.90	$23.20	$0.00	$107.45

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

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$23.17	$10.90	$9.70	$0.00	$43.77
2	40	$26.48	$10.90	$9.70	$0.00	$47.08
3	45	$29.79	$10.90	$9.70	$0.00	$50.39
4	50	$33.10	$10.90	$9.70	$0.00	$53.70
5	55	$36.41	$10.90	$9.70	$0.00	$57.01
6	60	$39.72	$10.90	$11.20	$0.00	$61.82
7	65	$43.03	$10.90	$11.20	$0.00	$65.13
8	70	$46.34	$10.90	$11.20	$0.00	$68.44
9	75	$49.65	$10.90	$11.20	$0.00	$71.75
10	80	$52.96	$10.90	$11.20	$0.00	$75.06

Effective Date - 10/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$23.78	$10.90	$9.70	$0.00	$44.38
2	40	$27.18	$10.90	$9.70	$0.00	$47.78
3	45	$30.58	$10.90	$9.70	$0.00	$51.18
4	50	$33.98	$10.90	$9.70	$0.00	$54.58
5	55	$37.37	$10.90	$9.70	$0.00	$57.97
6	60	$40.77	$10.90	$11.20	$0.00	$62.87
7	65	$44.17	$10.90	$11.20	$0.00	$66.27
8	70	$47.57	$10.90	$11.20	$0.00	$69.67
9	75	$50.96	$10.90	$11.20	$0.00	$73.06
10	80	$54.36	$10.90	$11.20	$0.00	$76.46

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 103*	03/01/2023	$47.38	$13.00	$19.63	$0.00	$80.01

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 103*

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$21.32	$13.00	$0.65	$0.00	$34.97
2	45	$21.32	$13.00	$0.65	$0.00	$34.97
3	50	$23.69	$13.00	$15.20	$0.00	$51.89
4	50	$23.69	$13.00	$15.20	$0.00	$51.89
5	55	$26.06	$13.00	$15.58	$0.00	$54.64
6	60	$28.43	$13.00	$15.96	$0.00	$57.39
7	65	$30.80	$13.00	$16.34	$0.00	$60.14
8	70	$33.17	$13.00	$16.73	$0.00	$62.90
9	75	$35.54	$13.00	$17.11	$0.00	$65.65
10	80	$37.90	$13.00	$17.48	$0.00	$68.38

Notes:

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2023	$59.29	$11.49	$22.34	$0.00	$93.12
	08/01/2023	$61.34	$11.49	$22.34	$0.00	$95.17
	02/01/2024	$62.59	$11.49	$22.34	$0.00	$96.42
	08/01/2024	$64.69	$11.49	$22.34	$0.00	$98.52
	02/01/2025	$65.99	$11.49	$22.34	$0.00	$99.82
	08/01/2025	$68.14	$11.49	$22.34	$0.00	$101.97
	02/01/2026	$69.49	$11.49	$22.34	$0.00	$103.32
	08/01/2026	$71.69	$11.49	$22.34	$0.00	$105.52
	02/01/2027	$73.09	$11.49	$22.34	$0.00	$106.92

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.65	$11.49	$22.34	$0.00	$63.48
2	60	$35.57	$11.49	$22.34	$0.00	$69.40
3	70	$41.50	$11.49	$22.34	$0.00	$75.33
4	80	$47.43	$11.49	$22.34	$0.00	$81.26
5	90	$53.36	$11.49	$22.34	$0.00	$87.19

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$30.67	$11.49	$22.34	$0.00	$64.50
2	60	$36.80	$11.49	$22.34	$0.00	$70.63
3	70	$42.94	$11.49	$22.34	$0.00	$76.77
4	80	$49.07	$11.49	$22.34	$0.00	$82.90
5	90	$55.21	$11.49	$22.34	$0.00	$89.04

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	12/01/2022	$46.58	$9.35	$17.97	$0.00	$73.90
	06/01/2023	$47.58	$9.35	$17.97	$0.00	$74.90
	12/01/2023	$48.83	$9.35	$17.97	$0.00	$76.15
	06/01/2024	$50.31	$9.35	$17.97	$0.00	$77.63
	12/01/2024	$51.78	$9.35	$17.97	$0.00	$79.10
	06/01/2025	$53.28	$9.35	$17.97	$0.00	$80.60
	12/01/2025	$54.78	$9.35	$17.97	$0.00	$82.10
	06/01/2026	$56.33	$9.35	$17.97	$0.00	$83.65
	12/01/2026	$57.83	$9.35	$17.97	$0.00	$85.15

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*	12/01/2022	$42.70	$9.35	$17.97	$0.00	$70.02
	06/01/2023	$43.70	$9.35	$17.97	$0.00	$71.02
	12/01/2023	$44.95	$9.35	$17.97	$0.00	$72.27
	06/01/2024	$46.43	$9.35	$17.97	$0.00	$73.75
	12/01/2024	$47.90	$9.35	$17.97	$0.00	$75.22
	06/01/2025	$49.40	$9.35	$17.97	$0.00	$76.72
	12/01/2025	$50.90	$9.35	$17.97	$0.00	$78.22
	06/01/2026	$52.45	$9.35	$17.97	$0.00	$79.77
	12/01/2026	$53.95	$9.35	$17.97	$0.00	$81.27
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2022	$42.58	$9.35	$17.97	$0.00	$69.90
	06/01/2023	$43.58	$9.35	$17.97	$0.00	$70.90
	12/01/2023	$44.83	$9.35	$17.97	$0.00	$72.15
	06/01/2024	$46.31	$9.35	$17.97	$0.00	$73.63
	12/01/2024	$47.78	$9.35	$17.97	$0.00	$75.10
	06/01/2025	$49.28	$9.35	$17.97	$0.00	$76.60
	12/01/2025	$50.78	$9.35	$17.97	$0.00	$78.10
	06/01/2026	$52.33	$9.35	$17.97	$0.00	$79.65
	12/01/2026	$53.83	$9.35	$17.97	$0.00	$81.15
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.05	$14.25	$16.05	$0.00	$83.35
	06/01/2023	$54.29	$14.25	$16.05	$0.00	$84.59
	12/01/2023	$55.53	$14.25	$16.05	$0.00	$85.83
	06/01/2024	$56.81	$14.25	$16.05	$0.00	$87.11
	12/01/2024	$58.25	$14.25	$16.05	$0.00	$88.55
	06/01/2025	$59.53	$14.25	$16.05	$0.00	$89.83
	12/01/2025	$60.97	$14.25	$16.05	$0.00	$91.27
	06/01/2026	$62.25	$14.25	$16.05	$0.00	$92.55
	12/01/2026	$63.69	$14.25	$16.05	$0.00	$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.92	$13.41	$16.01	$0.00	$67.34
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	12/01/2022	$54.81	$9.35	$18.42	$0.00	$82.58
	06/01/2023	$55.81	$9.35	$18.42	$0.00	$83.58
	12/01/2023	$57.06	$9.35	$18.42	$0.00	$84.83
	06/01/2024	$58.54	$9.35	$18.42	$0.00	$86.31
	12/01/2024	$60.01	$9.35	$18.42	$0.00	$87.78
	06/01/2025	$61.51	$9.35	$18.42	$0.00	$89.28
	12/01/2025	$63.01	$9.35	$18.42	$0.00	$90.78
	06/01/2026	$64.56	$9.35	$18.42	$0.00	$92.33
	12/01/2026	$66.06	$9.35	$18.42	$0.00	$93.83
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	12/01/2022	$56.81	$9.35	$18.42	$0.00	$84.58
	06/01/2023	$57.81	$9.35	$18.42	$0.00	$85.58
	12/01/2023	$59.06	$9.35	$18.42	$0.00	$86.83
	06/01/2024	$60.54	$9.35	$18.42	$0.00	$88.31
	12/01/2024	$62.01	$9.35	$18.42	$0.00	$89.78
	06/01/2025	$63.51	$9.35	$18.42	$0.00	$91.28
	12/01/2025	$65.01	$9.35	$18.42	$0.00	$92.78
	06/01/2026	$66.56	$9.35	$18.42	$0.00	$94.33
	12/01/2026	$68.06	$9.35	$18.42	$0.00	$95.83
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	12/01/2022	$46.88	$9.35	$18.42	$0.00	$74.65
	06/01/2023	$47.88	$9.35	$18.42	$0.00	$75.65
	12/01/2023	$49.13	$9.35	$18.42	$0.00	$76.90
	06/01/2024	$50.61	$9.35	$18.42	$0.00	$78.38
	12/01/2024	$52.08	$9.35	$18.42	$0.00	$79.85
	06/01/2025	$53.58	$9.35	$18.42	$0.00	$81.35
	12/01/2025	$55.08	$9.35	$18.42	$0.00	$82.85
	06/01/2026	$56.63	$9.35	$18.42	$0.00	$84.40
	12/01/2026	$58.13	$9.35	$18.42	$0.00	$85.90
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	12/01/2022	$48.88	$9.35	$18.42	$0.00	$76.65
	06/01/2023	$49.88	$9.35	$18.42	$0.00	$77.65
	12/01/2023	$51.13	$9.35	$18.42	$0.00	$78.90
	06/01/2024	$52.61	$9.35	$18.42	$0.00	$80.38
	12/01/2024	$54.08	$9.35	$18.42	$0.00	$81.85
	06/01/2025	$55.58	$9.35	$18.42	$0.00	$83.35
	12/01/2025	$57.08	$9.35	$18.42	$0.00	$84.85
	06/01/2026	$58.63	$9.35	$18.42	$0.00	$86.40
	12/01/2026	$60.13	$9.35	$18.42	$0.00	$87.90
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2021	$37.34	$13.41	$16.01	$0.00	$66.76
WAGON DRILL OPERATOR *LABORERS - ZONE 1*	12/01/2022	$43.43	$9.10	$17.57	$0.00	$70.10
	06/01/2023	$44.43	$9.10	$17.57	$0.00	$71.10
	12/01/2023	$45.68	$9.10	$17.57	$0.00	$72.35
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 1 (HEAVY & HIGHWAY)*	12/01/2022	$42.83	$9.35	$17.82	$0.00	$70.00
	06/01/2023	$43.83	$9.35	$17.82	$0.00	$71.00
	12/01/2023	$45.08	$9.35	$17.82	$0.00	$72.25
	06/01/2024	$46.56	$9.35	$17.82	$0.00	$73.73
	12/01/2024	$48.03	$9.35	$17.82	$0.00	$75.20
	06/01/2025	$49.53	$9.35	$17.82	$0.00	$76.70
	12/01/2025	$51.03	$9.35	$17.82	$0.00	$78.20
	06/01/2026	$52.58	$9.35	$17.82	$0.00	$79.75
	12/01/2026	$54.08	$9.35	$17.82	$0.00	$81.25
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2022	$53.63	$14.25	$16.05	$0.00	$83.93
	06/01/2023	$54.88	$14.25	$16.05	$0.00	$85.18
	12/01/2023	$56.13	$14.25	$16.05	$0.00	$86.43
	06/01/2024	$57.43	$14.25	$16.05	$0.00	$87.73
	12/01/2024	$58.88	$14.25	$16.05	$0.00	$89.18
	06/01/2025	$60.18	$14.25	$16.05	$0.00	$90.48
	12/01/2025	$61.63	$14.25	$16.05	$0.00	$91.93
	06/01/2026	$62.93	$14.25	$16.05	$0.00	$93.23
	12/01/2026	$64.38	$14.25	$16.05	$0.00	$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & GASFITTERS LOCAL 12*	02/26/2023	$65.19	$14.07	$18.36	$0.00	$97.62
	09/03/2023	$66.94	$14.07	$18.36	$0.00	$99.37
	03/03/2024	$68.74	$14.07	$18.36	$0.00	$101.17
	09/01/2024	$70.54	$14.07	$18.36	$0.00	$102.97
	03/02/2025	$72.34	$14.07	$18.36	$0.00	$104.77
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Additional Apprentice Information:

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

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

All steps are six months (1000 hours.)
Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.
*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF LABOR
DIVISION OF OCCUPATIONAL SAFETY
PREVAILING WAGE PROGRAM
www.mass.gov/dos/pw

NOTICE: TO AWARDING AUTHORITIES AND CONTRACTORS

ISSUED: SEPTEMBER 1, 2006

DRIVERS WHO HAUL BITUMINOUS CONCRETE (ASPHALT)

The Massachusetts Supreme Judicial Court recently affirmed that drivers who haul bituminous concrete to public construction projects are not covered by the Prevailing Wage Law while off-site, including time spent over-the-road and picking-up materials. These drivers are covered by the Prevailing Wage Law only while on-site at the public construction project.

In Teamsters Joint Council No. 10 v. Department of Labor, et al., 447 Mass. 100 (2006), the SJC upheld a 2001 administrative decision limiting the applicability of prevailing wage rates to the time bituminous drivers spend at the public construction site. This most recent decision of the SJC followed a 1989 ruling that had upheld an earlier Department of Labor (and Industries') policy that had deemed this category of drivers to be "teamsters" under the Law and, therefore, entitled to prevailing wage rates. See Construction Industries of Massachusetts v. Commissioner of Labor and Industries, 406 Mass. 162 (1989). However, the earlier court case had left open the question of whether this entitled these bituminous drivers to prevailing wage rates for their over-the-road time as well as their on-site time. This most recent decision has now answered that question.

All of the requirements of the Prevailing Wage Law, including certified weekly payroll requirements, apply to bituminous drivers for all time spent at the public construction site.

DRIVERS WHO HAUL READY-MIX CONCRETE (CEMENT)

Drivers who haul ready-mix concrete to public construction projects are not covered by the Prevailing Wage Law while off-site, including time spent over-the-road and picking-up materials. These drivers are covered by the Prevailing Wage Law while on-site at the public construction project. This applicability determination was established by a 2001 administrative decision of the Department of Labor's Division of Occupational Safety.

All of the requirements of the Prevailing Wage Law, including certified weekly payroll requirements, apply to ready-mix drivers for all time spent at the public construction site.

Please feel free to contact the Division of Occupational Safety at 617-626-6953 if you have any questions. Questions about enforcement of the Prevailing Wage Law may be directed to the Attorney General's Fair Labor and Business Practices Division at 617-727-3465

19 Staniford Street •• 2nd Floor •• Boston, Massachusetts 02114 •• Tel: 617-626-6953 •• Fax: 617-626-6944

The Massachusetts Prevailing Wage Law
M.G.L. ch. 149, §§ 26 – 27

NOTICE TO AWARDING AUTHORITIES

- 'The enclosed wage schedule applies only to the specific project listed at the top and will be updated for any public construction project lasting longer than one (1) year.
- 'You should request an updated wage schedule from the Division of Occupational Safety if you have not opened bids or selected a contractor within 90 days of the date of issuance of the enclosed wage schedule.
- 'The wage schedule shall be incorporated in any advertisement or call for bids for the project for which it has been issued.
- 'Once a contractor has been selected by the awarding authority, the wage schedule shall be made a part of the contract for that project.

NOTICE TO CONTRACTORS

- The enclosed wage schedule, and any updated schedule, must be posted in a conspicuous place at the work site during the life of the project.
- The wages listed on the enclosed wage schedule must be paid to employees on public works projects regardless of whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- The enclosed wage schedule applies to all phases of the project including the final clean up. Contractors whose only role is to perform final clean up must pay their employees according to this wage schedule.
- All apprentices must be registered with the Massachusetts Division of Apprentice Training in order to be paid at the reduced apprentice rates. If a worker is not registered with the Division of Apprentice Training, they must be paid the "total rate" listed on the wage schedule regardless of experience or skill level. For further information, please call (617) 727-3486 or write to the Division of Apprentice Training, 399 Washington Street, 4th Floor, Boston, MA 02108

WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

In addition, every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years.

In addition, each such contractor, subcontractor or public body shall furnish to the Department of Labor & Workforce Development/Division of Occupational Safety within fifteen days after completion of its portion of the work a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 2023

I,_____,_____
(Name of signatory party) (Title)
do hereby state:
That I pay or supervise the payment of the persons employed by
_____ on the _____
(Contractor, subcontractor or public body) (Building or project)
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 _____

DIVISION OF OCCUPATIONAL SAFETY, 399 WASHINGTON STREET, 5TH FL., BOSTON, MA. 02108

WEEKLY PAYROLL REPORT FORM

Company Name:

Project Name:

Awarding Auth.:

Work Week Ending:

Prime Contractor

Subcontractor
List Prime Contractor:

Employer Signature:

Print Name & Title:

Employee Name & Address	Work Classification	Hours Worked							(A) Tot. Hrs.	(B) Hourly Base Wage	Employer Contributions			(F) [B+C+D+E] Hourly Total Wage (prev. wage)	(G) [A*F] Weekly Total Amount
											(C) Health & Welfare	(D) Pension	(E) Supp. Unemp.		
		S	M	T	W	T	F	S							

NOTE: Every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority.

CITY OF NEWTON
GENERAL CONDITIONS OF THE CONTRACT
FOR PUBLIC WORKS CONSTRUCTION

ARTICLE 1
Definitions

The word "Commissioner" shall mean the official duly authorized to act for the City of Newton in the execution of the work of this contract, acting directly or through properly authorized agents.

The word "Engineer," or "City Engineer," shall mean the City Engineer of the City of Newton, acting directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

The word "Contractor" shall mean the party or parties contracting to perform the work covered by this contract or his, or their, legal representatives, successors or assigns.

The word "Plans" shall mean plans, and all related drawings, diagrams, profiles and specifications referred to and included in the Project Manual for this contract.

The word "City" shall mean the City of Newton.

The word “Project” shall mean the services which are the subject of the Contract Documents.

The words “Subcontract” and Subcontractor” shall refer to project contracts between the Contractor and a subcontractor, and the subcontractor thereunder.

The term “Substantial Completion” shall mean either that the work required by the contract has been completed except for the work having a contract price of less than one per cent of the then adjusted contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract.

ARTICLE 2
Plans, Drawings, Profiles

1. The work shall be done in accordance with Plans referred to in Article 1 and such further working and detail plans, drawings and profiles as may be furnished from time to time by the Engineer. All said plans, general and detail, are to be deemed a part of this contract, and the said Plans, specifications and contract are to be considered together, so that any work mentioned in the contract, though not shown on the Plans, and any work shown on the Plans though not mentioned in the contract, is to be provided by the Contractor as a part of this contract. Figured dimensions are to prevail over scale. All things which in the opinion of the Engineer may fairly be inferred from the contract, Plans and specifications, are to be executed by the Contractor as a part of the contract; and the Engineer shall be sole judge as to whether detail plans, drawings and profiles conform to the Plans and the contract.

Discrepancy in Plans

2.The Contractor shall carefully examine all said Plans, profiles, drawings, specifications and orders; all figures, dimensions, lines, marks and scales thereof, and all directions of the Commissioner and the Engineer relating to the work, and conform to those in relation to which there is no doubt or discrepancy, but at once submit all cases of doubt or discrepancy to the Engineer for adjustment. Anything done on any part of the work for which special information or drawing should be procured, unless done in accordance with such information or drawing, or anything done in relation to which there is doubt or discrepancy, except in accordance with the adjustment thereof, or done in violation of law or public authority, is to be redone if the Commissioner shall so direct.

ARTICLE 3
Inspection

The Contractor in carrying on the contract shall conform to all determinations and directions of the Engineer relating to the proper interpretation of the Plans, , the fitness of persons employed on the work or the number thereof, or the suitableness, amount, quality, and value of anything done or any materials used, and the Contractor shall permit the Commissioner and/or the Engineer and/or persons designated by them to enter upon the work and inspect the same at all times and in all places, and shall provide safe and convenient facilities for making such entry and inspection.

ARTICLE 4
Change in Plans and Work

The City, acting through the Commissioner and upon his written order only, from time to time given to the Contractor or his foreman, may change, increase or take away any part of the work, or change the specifications, Plans, drawings, form or materials thereof. Any deduction or addition thereto is to be allowed, or paid for at a price to be determined, within not more than 15 days of the completion of the change, by the City Engineer acting in the same capacity as an architect in a building contract as between City and Contractor. Any demand for addition or deduction must be made in writing to the City Engineer within seven (7) days of the time change was ordered.

ARTICLE 5
Time and Manner of Doing the Work

1. The Contractor shall begin work upon receipt of written Notice to Proceed. Once begun the work shall be carried out in a continuous and uninterrupted fashion with sufficient workforce and resources to assure completion by the date for completion established by the Contract Documents.

2. The Contractor shall carry on the work in accordance with the requirements of law and of all other public authorities, and to the satisfaction of the Commissioner; he shall give all notices, take out all permits, pay all charges and fees, give personal supervision to the work and keep thereon a competent foreman and sufficient employees, skilled in the several parts which are given them to do.

Maintenance of Travel

3. As applicable, the Contractor shall conduct his work so as to interfere as little as possible with public travel, and shall give property owners proper means of access to their property where existing access has been cut off by the work. The Contractor shall keep the streets open for through travel except where, in the opinion of the Commissioner, it is necessary to close the street. The continuous length of the street occupied for the work shall be kept as short as possible, and no part of the work shall be unnecessarily delayed. Wherever the Commissioner shall direct, trenches shall be bridged by the Contractor in a proper and secure manner so as not to interrupt travel. Free access shall be maintained at all times to all water gates, gas gates, and fire hydrants.

Abandonment of Work by Contractor

4. In the event the City Engineer certifies to the Commissioner that the work is not being so carried forward or if the Contractor at any time is not carrying on the work to the satisfaction of the Commissioner, or is not observing any of the provisions of the contract, or has abandoned the work, or become insolvent or assigned his property, the City, acting by the Commissioner and at his discretion, may, with or without notice to the Contractor, or advertising for doing the work, and by contract, day labor or otherwise, do any part of the work which the Contractor has failed to do or replace any part not done to the satisfaction of the Commissioner, or take possession of the work and complete the same, and in doing so may use any implements, machinery or materials on or about the work which are the property of the Contractor, charging the Contractor any excess cost for completing the work, which excess cost the Contractor agrees to pay.

ARTICLE 6
Compensation for Work

1. Subject to the provisions of Paragraph 10 of this Article, the price named in the proposal and accepted by the City shall be paid by the City and received by the Contractor as full compensation for furnishing materials and for use of tools, forms, machinery and other implements, and for labor in moving materials and executing all the work contemplated in this contract, also for loss or damage arising from delay however occasioned, or out of the nature of the work aforesaid or from the action of the elements, from floods, or from any unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work and for well and faithfully completing the work in the proper manner and according to the plans and specifications and requirements of the Commissioner under them.

2. During the first week of each calendar month, the City Engineer shall cause all work done by the Contractor during the previous month to be measured and shall estimate the value thereof and, on or before the 10th of each month issue a certificate to the Commissioner of the measurements and the amount due the Contractor according to the terms of his contract.

3. The City shall pay the Contractor on approval of the Commissioner monthly on or before the 18th of each month for all work done during the preceding month according to the aforementioned certificate of the City Engineer, less 5 per cent of the amount of such work and less any amounts due the City by the Contractor.

Final and Substantial Completion

4. Upon substantial completion of the work required by the Contract, the Contractor must present to the City Engineer written certification that the work is substantially complete. Within 21 calendar days after such certification is presented, the City Engineer shall present to the Contractor either a written declaration that the work is substantially complete or an itemized list of incomplete or unsatisfactory work items sufficient to demonstrate that the work is not substantially complete. The City Engineer shall include with such itemized list a date by which the work items must be completed, which date may not be earlier than the date for substantial completion established in the Contract Documents. If the City Engineer does not respond as provided herein within 21 calendar days, then the date of the Contractor's certification shall become the date for effective declaration of substantial completion.

5. Within 15 calendar days after the effective declaration of substantial completion, the City Engineer shall send to the Contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items. Unless delayed by causes beyond the Contractor's control, with an extension of time granted pursuant to Article 8, the Contractor must complete the work items within 45 calendar days after receipt of the list, or by the contractual completion date, whichever is later? If the contractor fails to complete the work within the required time the City may, notwithstanding other rights and remedies at its disposal, and upon seven days written notice to the Contractor terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the Contractor.

6. Within 65 calendar days following the effective declaration of substantial completion, the City Engineer shall issue to the Commissioner who shall cause to be paid to the Contractor a substantial completion estimate which estimate shall consist of the balance of the then current contract price less a one percent retention, the estimated cost to complete incomplete or unsatisfactory work items, the value of any outstanding claims against the Contractor and the sum of all demands for direct payment made pursuant to Article 12 herein, provided that until final acceptance, the City shall retain five percent of the value of all items planted in the ground.

7. The Contractor shall provide written notice to the City Engineer when the work has been brought to final completion. Within ten days following receipt of such notice, and providing his inspection shows no work items remain incomplete or unsatisfactory, the City Engineer shall issue to the Commissioner a final certificate of the total amount of work done and the money due the Contractor therefor, crediting thereon the amounts of the previous payments. In making the final certificate, the City Engineer shall not be bound by any preceding certificate or estimate of the amount of work done or materials furnished.

8. Within 30 calendar days following receipt of final completion, the City shall pay the Contractor, on the approval of the Commissioner, the percentages retained and the balance due the Contractor according to the aforementioned final certificate of the City Engineer less any indebtedness of the Contractor for incomplete or unsatisfactory work or claims made by or against the City. If a claim or claims are made, or notice of liability given, such amounts due the Contractor may be paid upon satisfaction of such claims or upon furnishing of indemnity to said City against all loss, cost, damage or expense by reason of such claims.

9. The City, on making any payment after the completion of the work, shall be released from all claim or liability to the Contractor for anything done or used, or for any loss or injury sustained in carrying on the contract, or for any act, omission, neglect or mistake of the City or any person relating to or affecting the contract, except for the balance of any sum retained as aforesaid.

Extra Work

10. The Contractor shall be paid for any additions, or deductions as provided in Article 4, paragraph 1, and for extra labor done by, and for extra materials furnished by him in compliance with the written order only of the Commissioner, calling for work not similar in character to that covered by the items given in the proposal, and for which no price is set in the said written order, the direct (not including consequential) cost to the Contractor, as determined to be reasonable by the Commissioner, plus fifteen per cent of said costs as so determined in regard to labor only. For teams or trucks so furnished, no payment shall be made to the Contractor beyond the current local rate as determined by the Commissioner in each case. The direct cost of labor may include the cost of mechanics and laborers furnished and a reasonable proportion of the time of the foreman and timekeeper, but it shall in no case include any charge for the use of tools, for establishment charges or for time spent by the Contractor. The actual cost of insurance on extra pay rolls and of materials furnished for extra work shall be paid without any addition. The labor and materials so ordered shall constitute a part of the work to be done under the contract; and all and singular the provisions of the contract shall apply to said labor and materials as if the same were specified therein. The Contractor shall have no claim for the above-mentioned extra labor and materials unless he furnishes the details and bills therefor within one week after doing any such labor or furnishing any such materials.

11. No claim of the Contractor against the City under this contract shall be deemed valid unless such claim is presented to the Commissioner within ten days from the time when the Contractor first knows of, or has opportunity to know of, the facts and circumstances on which such claim is based.

12. A payment or payments to the Contractor, in cases where these provisions or any of them, are not complied with, shall not be construed as a waiver of said provisions or any part thereof.

Contract Made Subject to Appropriations

13. This contract is made subject to appropriation heretofore made and shall not be altered unless the Contractor, the sureties on the bond, if any, the officer making the contract and the Mayor shall in writing agree thereto.

ARTICLE 7
Liquidated Damages

1. In case the work embraced in the contract shall not have been substantially completed by the date(s) stipulated therein, the Contractor shall pay to the City of Newton as liquidated damages a designated sum per calendar day for the entire period of overrun until the work is substantially completed in accordance with the following Schedule of Deductions and, in addition, the Contractor shall pay without reimbursement the entire cost of all traffic officers, railroad flagmen, inspectors, or other personnel the City Engineer and/or the Chief Engineer of the railroad determines to be necessary during the period of overrun of time.

SCHEDULE OF DEDUCTIONS

Original Contract Amount From More Than	To and Including	Daily Charge Per Calendar Day
$0.00	$25,000.00	$30.00
$25,000.00	$50,000.00	$50.00
$50,000.00	$100,000.00	$100.00
$500,000.00	$1,000,000.00	$150.00
$1,000,000.00	$2,000,000.00	$200.00
$2,000,000.00	-----	$300.00

2. In case the work covered by the contract shall not have been brought to final completion within 45 calendar days following the date of declaration of substantial completion, the Contractor shall pay to the City of Newton as liquidated damages the sum of $150.00 for each week or portion thereof during the period of overrun until the work is complete.

3. Whatever sum of money may become due and payable to the City of Newton by the Contractor under this Article may be retained out of money belonging or owed to the Contractor in the hands and possession of or by the City of Newton. It is agreed that this Article shall be construed and treated by the parties to the contract not as imposing a penalty upon said Contractor for failing fully to complete said work as agreed on or before the time specified in the proposal, but as liquidated damages to compensate said City of Newton for all additional costs incurred by it because of the failure of the Contractor fully to complete said work on or before the date of completion specified in the proposal.

ARTICLE 8
Delays and Extensions of Time

1. If the Contractor is delayed at any time in the progress of the work by an act or neglect of the City, or by changes in the work ordered by the City, or by unseasonably inclement weather, or by other causes deemed by the City Engineer to be beyond the Contractor's control, and which the City Engineer determines may justify delay, then the time for completion may be extended for such reasonable time as the City Engineer may determine.

2. No such extension of time will be allowed unless the Contractor submits a written request for an extension to the City Engineer no later than 10 calendar days of the start of the occurrence or event-giving rise thereto. Each such request must describe the occurrence or event and specify the manner and extent that such occurrence or event is causing or has caused a delay in the work. The City Engineer shall promptly investigate each request and make his written determination to the Commissioner and the Contractor within 10 days after receipt of the request. In his determination the City Engineer may either grant, deny, or modify the length of the requested extension.

3. If the City Engineer's determination so warrants, the Commissioner shall authorize a written Change Order to the Contract extending the time for completion. No extension of time shall be deemed as granted until said Change Order has been duly executed by the parties.

4. Change Orders which may be executed by the City and the Contractor in connection with additions, extra labor and/or extra materials shall not be considered as allowing extensions of the time for completion unless the change order expressly specifies that additional time is allowed in connection with the work under the change order. Once a Change Order has been executed by the parties, any request by the Contractor for an extension of time based solely on the fact that additions, extra labor and/or extra materials are required by the Change Order will be denied by the City Engineer.

5. Permitting the Contractor to continue and finish the work or any part of it after the times fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the City of Newton of any of its rights under the contract. The Contractor remains liable for damages caused other than by delay.

ARTICLE 9
Lines and Grades

The Contractor shall retain a Registered Land Surveyor who shall furnish such boards and stakes and cause to be placed thereon, such lines, marks and directions relating to the work as the Commissioner or City Engineer shall from time to time direct.

ARTICLE 10
Public Service Pipes and Conduits

1. The Contractor shall maintain such pipes or conduits of public service corporations or of the City as are across or within the lines of the work until such time as said public service corporations or the City assume the maintenance or removal of said pipes or conduits. The Commissioner will notify such public service corporations to that effect on the existence of such obstructions to the work being brought to his notice by the Contractor. The City will relocate either temporarily or permanently all water mains and water service pipes, or hydrants, and drains or sewers which may interfere with the work contemplated in this contract. (This clause is not to be construed as applying to such pipes as may be readily supported and protected during the progress of the work.) The cost of shutting off and turning on water in water mains during blasting shall be assumed by the City.

Protection of Existing Structures

2. All existing gas pipes, water pipes, sewers, drains, conduits, or other structures which are uncovered by the excavation shall be carefully supported and protected from injury by the Contractor, and, in case of injury, they shall be restored by him, without compensation therefor, to as good condition as that in which they were found, and shall be kept in repair until 6 months after the completion of the work. The Contractor shall provide suitable temporary channels for water at all water courses. Wherever the work passes under or adjacent to street railway tracks, the Contractor shall make all necessary arrangements with the railway company for doing any work which may affect the property of the company or interfere with the operating of the railway, and he shall be liable for any damage that may be caused by any act, omission or neglect on his part, and shall pay all expenses of every kind incidental to this work.

Changing the Location of Existing Structures

3. Whenever it becomes necessary to change the location of any water or gas pipes, sewers, drains, conduits or other structures not otherwise provided for in these specifications, the Contractor shall do the whole or such portions of the work of making such changes as the Commissioner may require, and shall receive in payment therefor the reasonable cost of the work done as determined by the Commissioner plus 15 per cent of such cost. In estimating such cost, no allowance shall be made to the Contractor for the use of tools not especially provided for this work, for general superintendence, or for any overhead expenses except liability insurance.

ARTICLE 11
Co-operation with Other Contractors

The Contractor shall conduct the work in such manner as not to interfere with other work being done by the City, by contract or otherwise, and if deemed necessary by the Commissioner, the work under this contract shall conform to the progress of said other work; shall co-operate with other contractors or employees who may be doing work for the City, and with public service corporations affected by the work, in arranging for storage places, connections, bracings, temporary support for structures, repairs, etc.

ARTICLE 12
Subcontracts

1. The Contractor, in any contract with a Subcontractor, shall provide that the Subcontractor shall be subject to all specifications, terms, provisions, conditions, requirements and liabilities set forth in this contract so far as such specifications, terms, provisions, conditions, requirements and liabilities are applicable to the work to be done under such Subcontract, and shall also provide that such Subcontract shall be terminated by the Contractor whenever the Commissioner shall certify to him in writing that in his opinion the work of the Subcontractor is unnecessarily or unreasonably delayed or that the Subcontractor has violated any of the provisions of this contract. The Contractor shall at once terminate such subcontract if the Commissioner, after certifying as previously mentioned, shall in writing direct the Contractor to make such termination.

2. Subcontracts shall be made in writing and the Contractor shall furnish the Commissioner with a copy of all Subcontracts on demand.

3. Pursuant to the provisions of M.G.L. Ch. 30, Sec. 39F (1), the following provisions are included in the General Conditions:

(a) Forthwith after the Contractor receives payment on account of a periodic estimate, the Contractor shall pay to each Subcontractor the amount paid for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the Contractor.

(b) Not later than the sixty-fifth day after each Subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the Subcontract less amounts retained by the City as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the Subcontractor; and the City shall pay that amount to the Contractor. The Contractor shall forthwith pay to the Subcontractor the full amount received from the City less any amount specified in any court proceedings barring the payment and also less any amount claimed due from the Subcontractor by the Contractor.

(c) Each payment made by the City to the Contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a Subcontractor shall be made to the Contractor for the account of the Subcontractor; and the City shall take reasonable steps to compel the Contractor to make each such payment to each such Subcontractor. If the City has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the Contractor or which is to be included in a payment to the Contractor for payment to the Subcontractor as provided in subparagraphs (a) and (b), the City shall act upon the demand as provided in this section.

(d) If, within seventy days after the Subcontractor has substantially completed the Subcontract work, the Subcontractor has not received from the Contractor the balance due under the Subcontract including any amount due for extra labor and materials furnished to the Contractor, less any amount retained by the City, the demand shall be by a sworn statement delivered to or sent by certified mail to the City , and a copy shall be delivered to or sent by certified mail to the Contractor at the same time.

The demand shall contain a detailed breakdown of the balance due under the Subcontract and also a statement of the status of the completion of the Subcontract work shall be valid even if delivered or mailed prior to the seventieth day after which the Subcontractor has substantially completed the Subcontract work. Within ten days after the Subcontractor has delivered or so mailed the demand to the City and delivered or so mailed a copy to the Contractor, the Contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the City and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the Subcontract including any amount due for extra labor and materials furnished to the Contractor and of the amount due for each claim made by the Contractor against the Subcontractor.

(e) Within fifteen days after receipt of the demand by the City, but in no event prior to the seventieth day after substantial completion of the Subcontract work, the City shall make direct payment to the Subcontractor of the balance due under the Subcontract including any amount due for extra labor and materials furnished to the Contractor, less any amount (i) retained by the City as the estimated cost of completing the incomplete or unsatisfactory items of work (ii) specified in any court proceedings barring such payment, or, (iii) if the reply shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The City shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The City shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the Contractor and the Subcontractor in a bank in Massachusetts selected by the City or agreed upon by the Contractor and the Subcontractor and shall notify the Contractor and the Subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the Contractor and the Subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the Contractor at the time of receipt of a demand for direct payment from a Subcontractor and out of amounts which later become payable to the Contractor and in the order of receipt of such demands from Subcontractors. All direct payments shall discharge the obligation of the City to the Contractor to the extent of such payment.

(h) The City shall deduct from payments to a Contractor amounts which, together with deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from Subcontractors. All such amounts shall be earmarked for such direct payments, and the Subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the Contractor.

ARTICLE 13
Responsibility for Work-Contractor's Responsibility

The Contractor has made his proposal from his own examinations and estimates, and shall not hold the City, its agents, or employees, responsible for or bound by, any schedule, estimate, sounding, boring, or any plan of any part of the work; shall, if any error in any plan, drawing, specification or direction relating to anything to be done under the contract come to his knowledge, report it at once to the Commissioner; shall not, except as the Commissioner shall authorize in writing, assign or sublet any part of the contract except for the supply of materials and plant, or of anything to be done thereunder; shall, subject to the provisions of the contract take all responsibility of, and bear all losses resulting to him in carrying on the contract, and shall assume the defense of, and hold the City, its agents and employees harmless from all suits and claims against them, or any of them, arising from the use of any invention, patent or patent right, material, labor or implement, by or from any act or omission or neglect of the Contractor, his Subcontractor, his agents or employees, in carrying on the contract, or for any liability of any nature arising under the contract. The Contractor shall be solely responsible and liable for, and shall fully protect and indemnify the City against all claims for damages to persons or property occasioned by or resulting from blasting or other methods or processes in the work of construction, whether such damages be attributable to negligence of the Contractor, his employees or his Subcontractor or otherwise.

ARTICLE 14
LIGHTS--GUARDS

1. The Contractor shall assume all responsibilities of the work and take all proper precautions to protect persons and property from injury and unnecessary interference; leave a reasonably unobstructed way along public and private places for pedestrians, teams, and vehicles, and for access to hydrants; provide proper walks over or around any obstruction made in a public or private place in carrying on the contract, and maintain from the beginning of twilight through the whole of every night, on or near the obstruction sufficient lights and guards to protect travelers from injury thereby, and if, after one notification from the Commissioner that said lights and guards are not sufficient, the Contractor has not placed additional lights and guards to the satisfaction of the Commissioner, the Commissioner shall have the right to take charge of that part

of the work at the expense of the Contractor. While the work is suspended he shall keep all roadways and sidewalks in proper condition, and when the work is completed put the place and vicinity in proper condition and so leave them.

2. The Contractor shall provide proper means of access to property where the existing access is cut off by the Contractor and replace or put in good condition every conduit, catch-basin, tree, wall, fence, or other thing injured by the Contractor in carrying on the contract, unless the same has been permanently done away with, on approval of the Commissioner, as being necessary to the proper carrying on of the contract.

ARTICLE 15
Guaranty

1. Any settlement or other defect, or the failure of any part of the structure or the work due to defective materials or workmanship, that occurs within one year after the work is completed, is to be immediately repaired by the Contractor. In the event of any such settlement, defect, or failure causing liability to the City for damage to persons or property, the Contractor does by this clause agree to hold the City harmless and to assume the defense of any claims therefor.

2. Responsibility under this guaranty for the adequacy of the work does not relieve the Contractor of his obligation to comply with the terms of the contract and to conform to all the requirements of the plans and specifications, nor does it give him the right to deviate in any way from the details of design of the structure or the work.

ARTICLE 16
Defective Work and Materials

The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill his contract as herein described, and defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such work and materials have been previously overlooked by the Engineer and accepted or estimated for payment. If the work or materials, or any part thereof shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Engineer, and if any material brought upon the ground for use in the work or selected for the same, shall be condemned by the Engineer as unsuitable or not in conformity with the specifications, the Contractor shall forthwith remove such materials from the vicinity of the work. Nothing in this contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil, but all materials shall, upon being so attached or affixed, become the property of the City.

ARTICLE 17
Employment of Labor

The Contractor shall give preference in employment, first to citizens of Massachusetts, second, to other citizens of the United States; and shall allow all employees on said work to lodge, board and trade where they choose, and shall not obstruct any other person in doing work for the City; and shall conform to all labor laws of the Commonwealth; and no laborer or teamster, workman or mechanic working within this Commonwealth in the employ of the Contractor or Subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the Contractor shall be requested to, or required to, or work more than eight hours in any one calendar day. This contract is subject to all the laws of the Commonwealth and ordinances of the City and if any clause thereof does not conform to such laws and ordinances, such clause shall be void and such laws and ordinances operated in lieu thereof.

ARTICLE 18
Laws and Regulations - Contractor to Comply with Law

The Contractor shall keep fully informed of all existing or future acts of the legislature, and of all municipal ordinances, prohibitions, rules and regulations in any manner affecting the conduct of the work, and of all orders or decrees of anybody or tribunal having any jurisdiction or authority over the materials, times, places and actions of those employed in the work embraced in the contract. The Contractor shall at all times observe and comply with all existing and future acts, ordinances, prohibitions, rules, regulations, orders and decrees; and shall protect and indemnify the city and its employees against any and all claims arising from or based on any violation of such acts, ordinances, prohibitions, rules, regulations, orders or decrees, and against all violations of law by the Contractor or his agents or employees.

END OF SECTION

CITY OF NEWTON

SUMMARY OF WORK AND SPECIFIC REQUIREMENTS OF THE CONTRACT

FOR PUBLIC WORKS CONSTRUCTION

I. SUMMARY OF WORK

A.1.

1. The work under this contract consists of intersection improvements at the intersection of Oak Street at Chestnut Street (known as Pettee Square). The project limits include approximately 600 feet along Chestnut Street and 350 feet along Oak Street.

The proposed Base Bid improvements include the reconstruction of the intersection of Oak Street at Chestnut Street to include a new traffic signal, installation; a Rapid Rectangular Flashing Beacon (RRFB) at the Upper Falls Greenway crossing of Oak Street; a raised intersection; stormwater drainage system upgrades; stamped concrete sidewalks and reconstructed curb ramps for ADA/AAB-accessibility; landscape and streetscape amenities; lighting upgrades; and new pavement markings and signing.

The detailed work includes unclassified excavation, pavement micro milling, Superpave asphalt pavement, permeable pavement, new traffic signal, stamped concrete sidewalk, granite curb, stormwater drainage system modifications, landscape and streetscape improvements, new lighting and other incidental work.

The proposed Add Alternate No. 1 work includes furnishing and installation of electric vehicle chargers at the proposed parking area on Chestnut Street.

2. All other work described in the Project Manual and/or shown on the Plan(s) unless specifically indicated as not to be done.

B. In addition, the work under the contract includes:

1. Work outside the Project Site as called for in the Project Manual and/or Plan(s) and as required for the performance of the work.

2. The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.

3. All labor, materials, tools, and equipment necessary to do all the work required for the completion of each item as specified, which shall be limited not only to the exact intent mentioned but shall include incidental work necessary or customarily performed for the completion of that item.

4. All items not specifically mentioned or noted in the Project Manual and/or Plan(s), but which are obviously necessary to make a complete working installation.

C. The Proposed Contract Price shall be complete costs, including overhead, profit, insurance, transportation, and all other costs connected with, or incidental to the work described.

II. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. Upon notification the Contractor shall commence the work specified in the Project Manual as required by the City. The work shall proceed in a continuous uninterrupted fashion with adequately staffed crews, in a satisfactory manner, which will assure that the work is completed in a timely manner to the satisfaction of the City.

B. The time for substantial completion pursuant to:

NOTICE: * TIME IS OF THE ESSENCE *

Within five (5) business days of the Notice of Award the Contractor shall submit to the Purchasing Department:

- **A signed contract.**
- **Certificate of Insurance (naming the City as an additional insured party)**
- **A Labor and Materials Payment Bond in the amount of 50% of the contract total.**

The start date is the date on which the Notice to Proceed is issued. Time for completion is prior to December 31, 2024. The successful bidder must be able to accommodate the City of Newton in the scheduling and/or coordination of this work.

Time is of the essence for the completion of this contract. If the Contractor fails to achieve substantial or final completion of the Work within the time required by the contract, and unless an extension of time is granted, the Contractor shall pay to the City as liquidated damages, the applicable amount specified in **Article 7** of the **General Conditions** for each day of delay. If different completion dates are specified in the Contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another section in this Contract, liquidated damages shall not be due the City. The Contractor remains liable for damages caused other than by delay.

III. INSURANCE REQUIREMENTS

A. The Contractor shall carry and maintain until acceptance of the work such Workmen's Compensation, Automobile Liability, Public Liability, Contingent Public Liability, Property Damage and Contingent Property Damage Insurance, each including blasting coverage, as shall protect him and any sub-contractor performing work covered by this contract from all claims and liability for damages for personal injury, including accidental death, and for property damage which may arise from operations under this contract, whether such operations be by himself or by any sub-contractor or by any one directly or indirectly employed by either of them.

B. The City shall be named as an additional insured on such policy.

C. The amounts of such insurance shall be as follows:

1. Workmen's Compensation Insurance as required by Massachusetts General Law.

2. Automobile Liability Insurance on all vehicles owned or hired for a.) Bodily Injury in an amount not less than $500,000.00 for each occurrence, and not less than $1,000,000.00 aggregate; b.) Property Damage in an amount not less than $300,000.00 each occurrence, and not less than $500,000.00 aggregate.

3. Public Liability Insurance and Contingent Public Liability Insurance in an amount not less than $500,000.00 for injuries, including accidental death to any one person, and subject to the same limit for each person, in an amount not less than $1,000,000.00 on account of one accident.

4. Property Damage Insurance and Contingent Property Damage Insurance in an amount not less than $300,000.00 on account of one accident, and in an amount of not less than $500,000.00 on account of all accidents.

5. General Liability Insurance shall include Contractual Liability Insurance.

D. Before any work is started, the successful bidder shall be required to file with the Chief Procurement Officer a certificate(s) of insurance coverage as detailed above, with policy numbers and dates of expiration.

E. The Contractor shall indemnify, hold harmless and defend the City and its departments, officers, employees, servants, and agents from and against all actions, causes of actions, claims, demands, damages, costs, loss of services, expenses and compensation, including attorney's fees and interest arising out of or resulting directly or indirectly from the services rendered pursuant to this Contract, provided that any such action, cause of action, claim, demand, damage, cost, loss of service, expense, compensation (1) in any way grows out of bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, which (2) is caused in whole or in part by any act or omission of the Contractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

END OF SECTION

GENERAL CONDITIONS

The work under this contract consists of intersection improvements at the intersection of Oak Street at Chestnut Street (known as Pettee Square). The project limits include approximately 600 feet along Chestnut Street and 350 feet along Oak Street.

The proposed Base Bid improvements include the reconstruction of the intersection of Oak Street at Chestnut Street to include a new traffic signal, installation; a Rapid Rectangular Flashing Beacon (RRFB) at the Upper Falls Greenway crossing of Oak Street; a raised intersection; stormwater drainage system upgrades; stamped concrete sidewalks and reconstructed curb ramps for ADA/AAB-accessibility; landscape and streetscape amenities; lighting upgrades; and new pavement markings and signing.

The detailed work includes unclassified excavation, pavement micro milling, Superpave asphalt pavement, permeable pavement, new traffic signal, stamped concrete sidewalk, granite curb, stormwater drainage system modifications, landscape and streetscape improvements, new lighting and other incidental work.

The proposed Add Alternate No. 1 work includes furnishing and installation of electric vehicle chargers at the proposed parking area on Chestnut Street.

All work done under this contract shall be in conformance with:

- the City of Newton Standard Specifications and General Construction Details,
- the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges, 2023 Edition, as amended
- the 2017 or latest Massachusetts Department of Transportation Construction Standard Details
- the 2006 Massachusetts Highway Department Project Development and Design Guide,
- the 2009 or latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) with revisions and Massachusetts Amendments,
- the 1996 Construction and Traffic Standards Details (as relates to the Pavement Marking details only)
- the MassDOT Traffic Management Plans and Detail drawings,
- the MassDOT Work Zone Safety Temporary Traffic Control,
- the 1990 Standard Drawings for Signs and Supports,
- the 2015 Overhead Signal Structure and Foundation Standard Drawings,
- the 1968 Standard Drawings for Traffic Signals and Highway Lighting,
- the latest edition of American Standard for Nursery Stock,
- the Contract Project Manual and Plans with any Project Addenda.

The General Conditions, Supplementary Conditions and these Special Provisions shall take precedence over the General Requirements of Division 1 of the Standard Specifications of the Massachusetts Department of Transportation (MassDOT).

If during construction operations the contractor disturbs any survey monuments (temporary or permanent) the engineer may direct the contractor to reestablish the survey monuments at no additional cost to the owner. The contractor shall be required to use a Professional Surveyor registered in the Commonwealth of Massachusetts, unless otherwise required by the Engineer.

It shall be the responsibility of the contractor to coordinate with all third party utility companies that maybe affected by this contract. This shall include but not limited to adjustment or replacement of existing structures as required by the appropriate utility company. The owner shall not compensate the contractor for work done on behalf of a third party.

The scheduling of this work shall be solely at the discretion of the Engineer.

- **The objective of this project is to provide, to the extent possible, a cross slope that matches the roadway. Other criteria are as follows: Minimum profile & gutter gradient – 0.5%; New final roadway pavement shall not alter current overland drainage patterns; and apply level course of dense binder, as required to meet cross slope requirement and / or as required by the Engineer.**

- **If schools are present within the paving limits or along a detour route, such work shall be avoided to the extent feasible and as required by the Engineer while school is in session. Roadway Construction shall not interfere with school operations.**

- **The contractor shall maintain a clean and orderly staging area within city limits for the duration of the project. The staging area shall be free of construction debris by the end of the week (Friday) unless receiving written permission from the Engineer. Failure to comply may result in a fine of up to $1000.00 per day per staging area.**

- **When repairing, installing, adjusting sidewalks and/or curbing the Contractor may only work on one side of the roadway at a time. This allows the opposite side of the roadway to be used for safe pedestrian access.**

- **Work will not be permitted on Federal, State or City Holidays. Work will not be permitted on religious holidays as designated by the City Engineer.**

- **The Contractor shall not be allowed to move any equipment required for the proposed work found in this contract from project zone to project zone under its own power unless prior permission is granted by the Engineer.**

- **Night work is scheduled by Newton Police Department, in consultation with Public Works. Night work shall be performed when road construction during the day interferes with traffic operations to such an extent that public safety is compromised.**

- **Prior to the final installation of the top course, the Engineer may require a pre-construction meeting/walk through to assure that all conditions and specifications required to be completed before final paving have been finalized satisfactory to the Engineer.**

LIMITS OF WORK

This Contract includes work at the intersection of Oak Street and Chestnut Street located in the City of Newton. The exact limits of work must be reviewed and delineated with the Engineer in the field prior to the Contractor beginning work. The Contractor is responsible for taking accurate measurements of actual field conditions prior to ordering proposed materials or beginning construction. Please see attached plans.

ITEM SHEET

The Contractor shall insert unit prices for each item in ink, in both words and figures, and is to show a total bid price (unit price x estimated quantities). In the event a discrepancy between the written words and figures, the written words shall govern. In the event an error in the bidders total bid price, the corrected total bid obtained by the summation of the products of the unit prices multiplied by the respective quantities shall stand as the bidder's total bid price.

The Contractor is required to review any related plans, conduct a full site review, and read all the provisions in the document before inserting prices, and is further advised to make his own determination as to the accuracy of the estimated quantities before inserting bid prices.

Unbalanced bidding is expressly prohibited, and all unit bid prices will be compared for reasonable conformance with the engineer's estimate. The City has the right to reject award of a bid, or part thereof, to protect the public interest if it is apparent that a bid is mathematically unbalanced, the bidder front-end loads its bid as to amount to an advanced payment, there are extreme variations from the engineer's estimate or other bids received, if in the opinion of the City, the unit prices create a reasonable doubt that that apparent low bidder will actually result in the lowest cost to the City, and/or if the overall competitive bidding process has been jeopardized.

***The estimated quantities shown here are based solely upon a reasonable assessment of the project parameters, thus the Contractor is advised that the actual quantities may vary substantially as field conditions may necessitate. Regardless of the amount of actual quantities, however, the quoted unit prices shall always apply.**

There is no separate labor charge under this bid: unit prices shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work as specified herein.

NOTICE: In accordance with MGL Chapter 303 of the Acts of 2008 this bid contains price adjustments for 1) Fuel (combination of Gasoline & Diesel), 2) Liquid Asphalt, and 3) Portland Cement Concrete. It is the bidders' responsibility to familiarize themselves with this price adjustment program prior to entering a bid.

TRANSPORTATION IMPROVEMENTS FOR PETTEE SQUARE – OAK STREET & CHESTNUT STREET

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
102.511	18	TREE PROTECTION - ARMORING & PRUNING AT _____ EACH				
102.55	24	ARBORIST AT _____ HOURS				
103.	6	TREE REMOVED - DIAMETER UNDER 24 INCHES AT _____ EACH				
120.1	2100	UNCLASSIFIED EXCAVATION AT _____ CUBIC YARD				
141.	10	CLASS A TRENCH EXCAVATION AT _____ CUBIC YARD				
141.1	15	TEST PIT FOR EXPLORATION AT _____ CUBIC YARD				
142.	10	CLASS B TRENCH EXCAVATION AT _____ CUBIC YARD				
144.	3	CLASS B ROCK EXCAVATION AT _____ CUBIC YARD				
146.	9	DRAINAGE STRUCTURE REMOVED AT _____ EACH				
151.	1300	GRAVEL BORROW AT _____ CUBIC YARD				
152.8	75	PEA GRAVEL AT _____ TON				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
153.	5	CONTROLLED DENSITY FILL - EXCAVATABLE AT _____ CUBIC YARD				
154.	20	SAND BORROW AT _____ CUBIC YARD				
156.	345	CRUSHED STONE AT _____ TON				
170.	3800	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ SQUARE YARD				
201.	10.8	CATCH BASIN AT _____ EACH				
201.3	3	SPECIAL CATCH BASIN AT _____ EACH				
202.	1.4	MANHOLE AT _____ EACH				
220.	9	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH				
220.2	5	DRAINAGE STRUCTURE REBUILT AT _____ FOOT				
220.3	1	DRAINAGE STRUCTURE CHANGE IN TYPE AT _____ EACH				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
220.6	5	SANITARY STRUCTURE REBUILT AT _____ FOOT				
220.7	2	SANITARY STRUCTURE ADJUSTED AT _____ EACH				
220.8	1	SANITARY STRUCTURE REMODELED AT _____ EACH				
222.3	14	FRAME AND GRATE (OR COVER) MUNICIPAL STANDARD AT _____ EACH				
238.12	60	12 INCH DUCTILE IRON PIPE AT _____ FOOT				
241.12	30	12 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ FOOT				
269.04	400	4 INCH SLOT-PERFORATED CORRUGATED PLASTIC PIPE (SUBDRAIN) AT _____ FOOT				
358.	12	GATE BOX ADJUSTED AT _____ EACH				
360.	1	MONITORING WELL ADJUSTED AT _____ EACH				
381.3	2	SERVICE BOX ADJUSTED AT _____ EACH				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
402.	75	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ CUBIC YARD				
415.3	1800	PAVEMENT MICRO MILLING AT _____ SQUARE YARD				
440.	1750	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL AT _____ POUND				
443.	6	WATER FOR ROADWAY DUST CONTROL AT _____ THOUSAND GALLONS				
451.	70	HMA FOR PATCHING AT _____ TON				
452.	550	ASPHALT EMULSION FOR TACK COAT AT _____ GALLON				
460.23	300	SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) AT _____ TON				
460.31	180	SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC -12.5) AT _____ TON				
460.42	360	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ TON				
460.52	140	SUPERPAVE LEVELING COURSE - 9.5 (SLC - 9.5) AT _____ TON				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
461.	650	POROUS PAVEMENT AT _____ SQUARE YARD				
472.	100	TEMPORARY ASPHALT PATCHING AT _____ TON				
504.	375	GRANITE CURB TYPE VA4 - STRAIGHT AT _____ FOOT				
504.1	300	GRANITE CURB TYPE VA4 - CURVED AT _____ FOOT				
504.11	575	GRANITE PLANTER CURB AT _____ FOOT				
509.	90	GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT AT _____ FOOT				
514.	4	GRANITE CURB INLET - STRAIGHT AT _____ EACH				
517.	9	GRANITE CURB CORNER TYPE B AT _____ EACH				
580.	875	CURB REMOVED AND RESET AT _____ FOOT				
594.	610	CURB REMOVED AND DISCARDED AT _____ FOOT				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
629.01	5	CONCRETE BARRIER REMOVED AND RESET AT _____ EACH				
691.	30	BALANCE STONE WALL REMOVED AND REBUILT AT _____ FOOT				
697.1	20	SILT SACK AT _____ EACH				
701.	450	CEMENT CONCRETE SIDEWALK AT _____ SQUARE YARD				
701.1	90	CEMENT CONCRETE SIDEWALK AT DRIVEWAYS AT _____ SQUARE YARD				
701.2	120	CEMENT CONCRETE PEDESTRIAN CURB RAMP AT _____ SQUARE YARD				
701.21	12	DIRECTIONAL DETECTABLE WARNING PANELS AT _____ EACH				
701.3	975	STAMPED CEMENT CONCRETE SIDEWALK AT _____ SQUARE YARD				
701.4	90	STAMPED CEMENT CONCRETE SIDEWALK AT DRIVEWAYS AT _____ SQUARE YARD				
702.	20	HOT MIX ASPHALT SIDEWALK OR DRIVEWAY AT _____ TON				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
704.	10	STONE DUST WALKS AT _____ TON				
707.01	4	BOULDER REMOVED AND STACKED AT _____ EACH				
707.11	6	BENCH - BACKED AT _____ EACH				
707.12	2	BENCH - BACKLESS AT _____ EACH				
707.13	3	GAME TABLES AND CHAIRS AT _____ EACH				
707.151	7	PARK BENCH REMOVED AND STACKED AT _____ EACH				
707.2	1	TRASH RECEPTACLE AT _____ EACH				
707.21	2	TRASH RECEPTACLE REMOVED AND RESET AT _____ EACH				
707.3	4	TREE GRATE AT _____ EACH				
707.4	4	MOVEABLE PLANTERS REMOVED AND RESET AT _____ EACH				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
707.41	2	MOVEABLE FURNITURE REMOVED AND RESET AT EACH				
707.8	20	STEEL BOLLARD AT EACH				
707.82	7	POST REMOVED AND STACKED AT EACH				
707.9	8	BICYCLE RACK AT EACH				
724.1	26	RADIAL GRANITE WALL WITH ENGRAVING AT FOOT				
724.2	20	GRANITE SEAT WALL AT FOOT				
748.	1	MOBILIZATION AT LUMP SUM				
751.	70	LOAM FOR ROADSIDES AT CUBIC YARD				
752.5	60	PLANTING SOIL AT CUBIC YARD				
752.51	125	STRUCTURAL SOIL AT CUBIC YARD				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
765.	500	SEEDING AT _____ SQUARE YARD				
767.6	10	AGED PINE BARK MULCH AT _____ CUBIC YARD				
775.441	4	LOCUST - HONEY - 'SKYLINE' (3-3.5 INCH CAL B&B) AT _____ EACH				
777.677	3	SWEETGUM (3-3.5 INCH CAL B&B) AT _____ EACH				
786.110	103	JUNIPER - WILTON BLUE RUG (2 GALLON) AT _____ EACH				
786.490	60	JUNIPER - SHORE (2 GALLON) AT _____ EACH				
796.427	167	FEATHER REED GRASS - 'KARL FOERSTER' (2 GALLON) AT _____ EACH				
796.455	31	SWITCH GRASS 'SHENANDOAH' (2 GALLON) AT _____ EACH				
796.764	69	DAYLILY - 'STELLA D'ORO' (2 GALLON) AT _____ EACH				
804.2	580	2 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC (UL) AT _____ FOOT				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
804.3	430	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) AT _____ FOOT				
811.22	1	ELECTRIC HANDHOLE - SD2.022 AT _____ EACH				
811.30	15	PULL BOX 8 X 23 INCHES - SD2.030 AT _____ EACH				
811.31	8	PULL BOX 12 X 12 INCHES - SD2.031 AT _____ EACH				
812.09	10	LIGHT STANDARD FOUNDATION PRECAST AT _____ EACH				
812.20	1	LIGHTING LOAD CENTER FOUNDATION AT _____ EACH				
812.992	10	ORNAMENTAL LIGHT POLE AT _____ EACH				
816.01	1	TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 AT _____ LUMP SUM				
823.60	1	HIGHWAY LIGHTING LOAD CENTER AT _____ LUMP SUM				
824.221	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR) AT _____ LUMP SUM				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
826.51	1	FIRE ALARM BOX REMOVED AND RESET AT _____ EACH				
832.	50	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ SQUARE FOOT				
847.1	14	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH				
852.01	1	TEMPORARY TRAFFIC CONTROL AT _____ LUMP SUM				
854.016	1500	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ FOOT				
854.036	1200	TEMPORARY PAVING MARKINGS - 6 INCH (TAPE) AT _____ FOOT				
864.04	275	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) AT _____ SQUARE FOOT				
865.2	850	PAVEMENT SURFACE COATING AT _____ SQUARE YARD				
866.104	1600	4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ FOOT				
866.112	65	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ FOOT				

CARRIED FORWARD _____

BROUGHT FORWARD _____

BASE BID						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
867.104	625	4 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ FOOT				
874.	4	STREET NAME SIGN AT _____ EACH				
874.2	5	TRAFFIC SIGN REMOVED AND RESET AT _____ EACH				
874.4	10	TRAFFIC SIGN REMOVED AND STACKED AT _____ EACH				
875.1	11	PARKING METER REMOVED AND RESET AT _____ EACH				
875.2	4	PARKING METER REMOVED AND STACKED AT _____ EACH				
999.01	1	MISCELLANEOUS WORK ALLOWANCE (Eng. Discretionary Fund) AT TEN THOUSAND AND ZERO CENTS ALLOWANCE	$10,000	00	$10,000	00
999.02	1	TRAFFIC CONTROL OFFICERS AT ONE HUNDRED FIFTY THOUSAND AND ZERO CENTS ALLOWANCE	$150,000	00	$150,000	00

CARRIED FORWARD _____

BASE BID TOTAL _____

_____

BASE BID IN WRITTEN WORDS

ADD ALTERNATE #1						
ITEM NO.	QTY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE		TOTAL	
			DOLLARS	CENTS	DOLLARS	CENTS
819.91	1	DUAL CAR ELECTRICAL VEHICLE CHARGING STATION AT _____ LUMP SUM				

ADD ALTERNATE #1 TOTAL _____

_____

ADD ALTERNATE #1 IN WRITTEN WORDS

(Total Bid Price must be placed in paragraph "C" of the Bid Form)

END OF SECTION

CITY OF NEWTON

GENERAL REQUIREMENTS

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

A. The purpose of this section is to define the basis of measurement and payment for the unit price or lump sum items listed in these Contract Documents.

B. Section 9.00 of the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges, 2023 Edition, are hereby included in its entirety.

1.02 PAYMENT ITEMS

A. Work Items of this Project are referenced with Item Numbers and Item Descriptions similar to those currently in use by the MassDOT, Highway Division.

1.03 BASIS OF MEASUREMENT AND PAYMENT

A. Method of Measurement and Basis of Payment for Work Items shall be as called for under the appropriate section of the MassDOT Standard Specifications, unless modified in the Special Provisions and the Standard Specifications.

1.04 UNIT PRICES

A. Payment will be computed on the basis of the unit price bid for each Item and the quantity of units completed. Unit prices are to include cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs for items installed complete and accepted by the Engineer. No Payments will be made for the purchase or stockpile of materials or incidentals to the completed items. (See Part 1.06 of this Section.)

B. The Owner reserves the right to increase or decrease the scope of the Contract work by 25% of the original scope.

1.05 LUMP SUM PRICES

A. Payment will be computed on the basis of the percentage of work completed on each item in the contract BID as determined by the Engineer. Lump sum prices are to include the cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs for items installed complete and accepted by the Engineer. No Payments will be made for the purchase or stockpile of materials or incidentals to the completed items. (See Part 1.06 of this Section.)

B. The Contractor's breakdown of the lump sum bid will be used only as a guide to determine the percentage of completion.

1.07 PRICES INCLUDE

A. The prices stated in the Proposal include full compensation not only for furnishing all the labor, equipment and material needed for, and for performing the work contemplated by the Contract, but also for assuming all risks of any kind for expenses arising to facilitate the work in a timely manner and all items and incidentals included in the Contract Documents.

B. The Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

C. The prices for those Items which involve excavation shall include compensation for disposal of surplus excavated material and handling water.

D. In all Items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price, therefore, shall be in addition to the cost of excavating earth and no deduction will be made in the amount for earth excavation.

1.08 PAYMENT

A. In general, payment will be made for all Contract work satisfactorily completed through the end of the previous month. The payment will include any additional work which has been completed and approved and change order work agreed upon by the Owner and Contractor which has been completed and approved.

B. Each application for payment will indicate the total of a minimum percent retainage, held by the Owner on the total of all work completed under the contract and approved for payment to-date.

C. Monthly applications for payment may also indicate reduction or increase of the total Contract price when an approved change order results in a net reduction or net increase in the cost and quantity of work to be performed under the Contract.

D. Special billings and charges against the Contract as credit or payment to the Owner, that are not for change order work, may be subtracted from monies due on any monthly application for payment but shall not serve to reduce the total Contract price.

E. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for work which is incorporated in or made necessary by the Work.

F. Each project location will be billed separately.

FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Survey work and other field engineering responsibilities of the Contractor.

1.02 REQUIREMENTS

A. <u>The Contractor shall be responsible for field survey, layout of the work, and the establishing of lines and grades as shown on the plans or as directed for his use. There shall be no separate payment and considered incidental to the items in this contract.</u>

B. Layout and set all lines, levels, grades, elevations, reference marks, batter boards and measurements required for the construction of the work. Verify such marks by instrument to confirm accuracy. The Engineer shall provide information on the baseline and elevation control available.

C. Locate and protect established horizontal and vertical survey control, and reference points, benchmarks and stone bounds.

D. Make, check, and be responsible for all measurements and dimensions necessary for the proper horizontal and vertical layout and construction of the Work.

E. Control datum for survey shall be as established and depicted in the Existing Conditions and Alignment & Survey Control Plan.

F. Verify location and reset (if needed) street right-of-way bounds and markers by a Professional Land Surveyor (PLS) as per the Contract Documents.

G. All staking shall be directed and performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout of the type required under this contract. The contractor shall submit the qualifications of the survey personnel to the Owner for review and approval. The owner reserves the right to evaluate the performance of the survey personnel during the course of the work and require the replacement of any personnel whose work, in the judgement of the Owner, is unsatisfactory.

H. The Engineer will be permitted to check the lines, elevations, reference marks, batter boards, etc., set by the Contractor. The Contractor shall correct any errors found in lines, elevations, reference marks, batter boards, etc. Such a check shall not be construed as approval of the Contractor's work and shall not relieve or diminish the responsibility of the Contractor for the accurate construction and completion of the Work in compliance with the Contract Documents.

I. The Contractor shall perform an external and garage level inspection and make a video tape and/or photographic record of all existing sideline conditions, prior to the commencement of construction activities, and/or as may be required as the construction activities progress, for the purpose of documenting all decrepit, and/or extraordinary points of concern. All video and picture making shall be done on foot and shall not be 'shot' from a vehicle. This video record shall be made by the Contractor and a copy, or a secondary video tape, shall be delivered to the Engineer. A representative from the Engineering Division shall be present at the time of the inspection and recording.

1.03 QUALITY ASSURANCE

A. The Contractor shall employ a Civil Engineer or Land Surveyor registered in the State of Massachusetts, acceptable to the Owner.

B. The Contractor shall submit an as-built plan signed by the Contractor’s Engineer or Land Surveyor stating that the elevations and locations of the Work are in conformance with the Contract Documents.

PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for project meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. The pre-construction conference will be scheduled and administered within 14 calendar days after the dated "Notice to Proceed." The Contractor shall be prepared to address such topics as understanding of the Contract Documents, Federal/State/Local requirements, projected construction schedules, major personnel, critical work areas, construction facilities and shop drawing/certificates of compliance submittals.

1.03 PROGRESS MEETINGS

A. The Engineer will schedule and administer progress meetings and specially called meetings throughout the duration of the Work at period intervals. Weekly progress meeting are expected in the initial stages of the project. Meetings can later be scheduled to be Bi-Weekly as determined by the Engineer.

B. The time and location of such meetings shall be designated by the Engineer and shall be convenient for all parties involved.

C. The Engineer will prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies.

SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for submission of schedules and shop drawings.

1.02 PROGRESS SCHEDULE

A. Within 14 calendar days after execution of the Contract Documents, the Contractor shall submit to the Engineer for review a construction progress schedule conforming to requirements specified. This schedule should show the proposed dates of commencement and completion of each of the various subdivisions of work required under this Contract and the anticipated monthly percentage of completion, based on the total contract price. The Contractor shall be responsible for updating, and/or revising, this schedule whenever required by the Engineer throughout the duration of the Contract. The schedule shall also include a Traffic Management Plan to be coordinated with City Engineering and Newton Police Department for each phase and location of work to be constructed under this contract.

B. Special attention is directed to the requirement that the Contractor shall start the Work, as specified under this Contract, no later than 30 calendar days after the execution of the Contract Documents, unless otherwise authorized by the Owner. The Contractor shall comply with all pre-construction requirements as specified. The Owner reserves the right to delay the commencement of the Work or any part thereof, if the specified requirements as determined by the Engineer have not been satisfied.

The Owner further reserves the right to limit or, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest and/or safety to do so.

C. The Contractor shall contact the appropriate city authorities concerning any public or semi-public events that may occur during the construction period that may affect construction. The Contractor alone shall be responsible for arranging his construction sequence to conform to any restrictions these events may impose. No claims for extras will be allowed because of any delay, extra materials handling, extra excavation, etc. caused by the imposed restrictions. However, additional time may be granted for completion of the work to compensate for delays caused by said restrictions.

1.03 SHOP DRAWINGS

A. Submit electronic copies of shop and working drawings in PDF format for concrete reinforcement, structural details, piping layout, wiring, materials fabricated especially for the Contract, and materials and equipment for which such drawings are specifically requested.

B. A maximum of two (2) submittals of each shop drawing will be reviewed by the Engineer. If more submittals are required due to the Contractor's neglect or failure to fulfill the requirements of the Contract plans and/or specifications, or to make corrections or modifications required by the Engineer in the review of the first two submittals, the Engineer will review the submittal and the Contractor will be responsible for the cost of the review, as determined by the Owner based on the Engineer's documentation of time and rates for additional services established in the Engineering Agreement between the Owner and the Engineer.

C. If re-submittals on shop and working drawings are required, the Engineer will retain three (3) copies and three (3) copies will be returned to the Contractor. When re-submittals are returned to the Engineer, electronic copies in PDF format, of the complete submittal shall again be required.

D. Such drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When the dimensions are of particular importance, or when specified, the drawings shall be certified by the manufacturer or fabricator as correct for the Contract. The Contractor shall also be required to certify on the submitted drawings or catalog cuts that the equipment or the assembly are accepted by him and in conformance with the Plans and Specifications.

E. When so specified or if considered by the Engineer to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted in place of shop and working drawings.

F. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings to eliminate delay to the Work due to the absence of such drawings. All shop and working drawings must be submitted to the Engineer prior to incorporation into the Work, unless otherwise permitted by the Engineer. Prior to the submittal of any shop drawings, the Contractor shall submit a schedule of proposed shop drawing transmittals. The schedule shall identify the subject matter of each transmittal, the corresponding specification section number and the proposed date of submission. Prior to and during the progress of the Work the schedule shall be revised and resubmitted as requested by the Engineer.

G. No material or equipment shall be purchased or fabricated for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

H. Until the necessary review has been made, the Contractor shall not proceed with any portion of the Work for which review is required.

I. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All drawings shall be clearly marked with the names of the Owner, Contractor, and building, equipment, or structure to which the drawing applies, and shall be suitably numbered. Submitted shop drawings shall be accompanied by a multi-part letter of transmittal provided by the Engineer and completed by the Contractor as required by the Engineer.

J. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer; other drawings shall be returned for correction.

K. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in his letter of transmittal.

L. The review of shop and working drawings by the Engineer will be general only, and nothing contained in this Section shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance as specified.

M. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires, appurtenances, or layouts etc., either existing or as detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do the work necessary to make such modifications.

N. The Contractor shall furnish additional copies of shop drawings or catalog cuts when so requested.

1.04 JOB-MIX FORMULA

A. Work shall not begin on any Newton project nor shall any mixture be accepted until the Contractor has submitted to the Engineer a specific job-mix formula for the particular uniform combination of materials and sources of supply to be used on each project in conformance with the requirements of Section M3 of MassDOT's Standard Specifications. The job-mix formula shall be submitted in writing by the Contractor to the City at least 30 days prior to the start of paving operations.

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Contractor’s quality control of products, suppliers, manufacturers, services, site conditions, and workmanship, to produce work of the specified quality.

1.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Comply fully with manufacturers' instructions, including each step in sequence.

B. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified to be removed, clear area only after field sample has been accepted by the Engineer.

1.04 CERTIFIED WELDERS

A. Structural welds shall be made only by operators who have been qualified by tests, as prescribed in the "Standard Qualification Procedure" of the American Welders Society, to perform the type of work required.

B. Pipe welds shall be made only by operators who have been qualified by the National Certified Pipe Welding Bureau and each operator's qualification record shall be submitted to the Engineer before any work is performed.

C. Shop welding shall be in accordance with the "Code for Welding in Building Construction".

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Qualification, duties, and responsibilities of testing laboratories. Also, coordination and scheduling are responsibilities of the Contractor.

B. Related Sections

1. Materials and Equipment

1.02 PAYMENT PROCEDURES

A. Initial Testing: Unless otherwise specified herein, the Owner will pay for additional initial testing services required by the Engineer.

B. Retesting: When initial tests indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency, and costs thereof will be deducted by the Owner from the Contract Sum.

C. Contractor’s Testing: Inspecting and testing performed exclusively for the Contractor's convenience or as required of him by the technical specifications shall be the sole responsibility of the Contractor.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. E-329-90, Use in the Evaluation of Testing and Inspection Agencies as Used in Construction.

1.04 REQUIREMENTS

1. Asphalt material will only be accepted by the City if the test results from acceptance samples obtained at the production plant and from the compacted pavement indicate conformance to the approved job-mix formula and the quality limits specified in Section M3 of MassDOT's Standard Specifications.

2. Work included:

    1. Cooperate with the Owner's selected testing agency and all others responsible or testing and inspecting the Work.

    2. Provide other testing and inspecting as specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.

    3. Where no testing requirements are described, but the Owner directs testing, the Contractor shall provide testing under the requirements of this Specification.

1.05 QUALITY ASSURANCE

A. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329-90.

B. Regulatory requirements

1. Testing, when required, will be in accordance with all pertinent codes, regulations, and with selected standards of the American Society for Testing and Materials.

2. Regulatory Requirement Inspections and tests required by codes or ordinances, or by a plan approved authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of the Materials and Equipment section.

B. Promptly process and distribute, to the Engineer, required copies of test reports and instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

1.07 SCHEDULING

A. Establishing schedule

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.

2. Provide all required time within the construction schedule.

3. Coordinate testing activity with the appropriate testing laboratory.

B. Revising schedule

1. When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to schedule

1. When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

B. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

C. All work constructed as a deviation from the Contract Documents shall be approved prior by the Engineer in writing. All subject work shall be documented and the submission of required as-builts will be the responsibility of the Contractor.

TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for temporary utilities required during construction.

1.02 GENERAL REQUIREMENTS

A. The Contractor is responsible for payment of all costs associated with the installation and operation of all temporary utilities necessary for the completion of the work. The Contractor shall arrange with the Engineer and Owner methods of determining monthly utility costs for Temporary Utilities prior to connection of any temporary systems. The Contractor shall pay the Owner on a monthly basis for all temporary utility costs. The Temporary Utilities to be paid by the Contractor include, but are not limited to the following: Electricity, Water, Sanitary, Heating, Ventilation, Plumbing and other services required to complete the work.

1.03 TEMPORARY SANITARY FACILITIES

A. Provide adequate sanitary facilities for the use of those employed on the Work. Sanitary facilities shall be made available when the first employees arrive on the site of the Work, be properly secluded from public observation, and be maintained during the progress of the Work in suitable numbers. The location for the placement of sanitary facilities shall be approved in writing by the Engineer.

B. Maintain sanitary facilities in an orderly and sanitary condition at all times and enforce their use. Rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or any adjacent property.

TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for cleaning, maintenance of the project site, barriers and fences required during construction.

1.02 CLEANING DURING CONSTRUCTION

A. Contractor shall perform clean-up operations during construction as herein specified, or as specified elsewhere within the Contract Documents.

1. Control accumulation of waste materials and rubbish; promptly dispose of off-site. Bear all costs, including fees resulting from disposal.

2. Maintain project in accordance with all local, State and Federal Regulatory Requirements.

3. Store volatile wastes in covered metal containers and remove from premises.

4. Prevent accumulation of wastes that create hazardous conditions.

5. Provide adequate ventilation during use of volatile or noxious substances

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on site.

2. Do not dispose or volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

3. Do not dispose of wastes into streams or waterways.

4. Use only those materials which will not create hazards to health or property, and which will not damage surfaces.

5. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and wind-blown debris, resulting from construction operations.

6. Provide on-site containers for collection of waste materials, debris, and rubbish.

7. Remove waste materials, debris, and rubbish promptly from the site and dispose of at legal disposal areas off the construction site.

8. During its progress, the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

9. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc. shall, upon completion of the work, be left in a clean and neat condition.

1.03 DUST CONTROL

A. Provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions or performance obligations of the Contractor.

C. Adequate dust control shall be applied as, and when, required by the Engineer. No additional compensation will be made for such work and shall be incidental to the Contract.

1.04 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

E. Construct sediment control devices for discharge from dewatering trenches.

F. Construct all sedimentation control devices shown on the plans.

1.05 NOISE CONTROL

A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

B. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Equip air compressors with Silencers, and power equipment with mufflers.

2. Manage vehicular traffic and scheduling to reduce noise.

1.07 POLLUTION CONTROL

A. Special care shall be taken to prevent contamination or muddying up or interfering in any way with the stream flows, if any along the line of work. No waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any pools or other bodies of water.

1.08 SURFACE WATER CONTROL

A. Take all precautions to prevent damage to the work or equipment by high waters or by storms. The Engineer with the approval of the Owner may prohibit the carrying out of any work at any time when in his judgment, high water or storm conditions are unfavorable or not suitable, or at any time, regardless of the weather, when proper precautions are not being taken to safeguard previously constructed work or work in progress.

B. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Engineer may require, at no additional expense to the Owner.

1.09 BARRIERS AND ENCLOSURES

A. Fences and Barricades

1. Provide and maintain temporary fences, barriers, lights, guardrails, and barricades as indicated in the Contract Documents, or as necessary to secure the Work and adjacent property and protect persons and property.

2. Obtain necessary approvals and permits and provide temporary expedients as necessary to accommodate tasks requiring items mentioned herein.

B. Protection of Trees

1. The Contractor shall notify the Tree Warden before commencing work within the drip line of any Tree.

2. If, in the opinion of the Engineer or Tree Warden, and so required by either, the Contractor shall be required to provide adequate and satisfactory tree protection (either trunk protection or drip line protection, or both) as directed. No additional compensation will be made for such protection and shall be incidental to the Contract.

3. The Contractor shall take care not to harm trees along the sides of roads or within the existing facility in which the construction work is to be done or trees on adjacent lands except as indicated on the drawings or with the written permission of the Owner and any other owner of the trees involved. Care shall be taken not to cut tree roots to harm the growth of trees to remain.

4. If, in the opinion of the Engineer or Tree Warden, any trees damaged during construction can be repaired, the Contractor shall satisfactorily repair them at no further cost to the Owner.

5. If, in the opinion of the Engineer or Tree Warden, any tree damaged during construction cannot be repaired and should be removed, the Contractor shall satisfactorily remove and replace, with a species specified by and at the direction of the City Tree Warden at no further cost to the Owner.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for traffic control for the duration of the Contract.

1.02 REFERENCES

A. Manual of Uniform Traffic Control Devices (MUTCD) latest edition, including published revisions; Specifications for Temporary Traffic Control.

1.03 PERFORMANCE REQUIREMENTS

A. The Contractor shall prepare and submit to the Engineer a proposed work schedule which complies with the plans and specifications. No work shall start until the Engineer's approval of the schedule is received.

B. The Contractor shall have the sole responsibility for the maintenance and protection of traffic.

C. No construction will be permitted within 300 feet of a school, day care center, or day camp when children are either arriving or departing the facility. The actual hours involved will be obtained by the Contractor from the respective facility.

D. An authorized representative of the Contractor shall be available on a 24-hour basis for the duration of the Contract for the purpose of correcting construction related impediments or hazards. This contact shall be responsible for making corrections in a timely manner. The contact information shall be supplied with the rest of the required submittals.

1.04 SUBMIT TRAFFIC PLANS

A. In accordance with the Submittals section, submit a traffic plan delineating requirement of this section, the Contract Drawings, and the City of Newton.

B. Traffic control plans shall detail all typical, and specific, work zones and detours for each roadway and construction activity for the project to complete the work as listed in the Contract Documents and Construction Plans, as well as the planned accessible pedestrian route through, or adjacent to, the work zone.

1.05 SITE CONDITIONS

A. Replace at no cost to the Owner pavement markings, legends and lane arrows removed or damaged by the construction operation that are not within the Construction Plans.

B. Restore temporary detours to original condition.

C. Replace traffic signal loops damaged during construction **within 72 hours**.

1.06 SCHEDULING

A. The Contractor shall minimize the construction impacts to the traveling public and abutting property owners by limiting the extent of roadway excavation and requiring the restoration of a weather-tight pavement surface as stipulated below. All proposed underground installations (utilities, drainage, sewer, etc.) must be in place prior to the beginning of roadway excavation.

B. The Owner reserves the right to alter the lengths of excavation and other operations in order to ensure the safety of the traveling public and abutting property owners.

PART 2 PRODUCTS

2.01 TRAFFIC CONTROL DEVICES

A. All Traffic Control Devices shall be in accordance with the MUTCD and maintained as such. All Devices shall also meet and be maintained in compliance with the Specifications

PART 3 EXECUTION

3.01 INSTALLATION OF TRAFFIC CONTROL DEVICES

A. Installations shall be in accordance with all requirements and standards as specified in the Manual on Uniform Traffic Control Devices (MUTCD) and shall be the responsibility of the Contractor to install and maintain as required by the Engineer.

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for delivery, storage, handling and installation of systems, materials, manufactured units, equipment, components, and accessories used in the work.

1.02 DELIVERY

A. Refer to Specifications' Sections for requirements pertaining to delivery and handling of materials and equipment.

B. Transport products by methods to avoid product damage.

C. Deliver in undamaged condition in manufacturers' unopened containers or packaging, and dry.

D. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

E. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

1.03 STORAGE AND PROTECTION

A. Refer to Specifications' Sections for requirements pertaining to storage and protection of materials and equipment.

B. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures and maintain within temperature and humidity ranges required by manufacturers' instructions.

C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area and prevent mixing with foreign matter. Loose material shall also be protected in accordance with Erosion Control specifications.

E. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged and are maintained under required conditions.

F. Materials stored and location of storage shall be approved by the Engineer prior to delivery.

1.04 INSTALLATION STANDARDS

A. Comply with Specifications and referenced standards as minimum requirements.

B. Components required to be supplied in quantity within a Specification Section shall be the same and shall be interchangeable.

C. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

F. When work is specified to comply with manufacturers' instructions, submit copies as specified in the Submittals section, distribute copies to persons involved, and maintain one set in field office.

G. Perform work in accordance with details of instructions and specified requirements.

MAINTENANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for maintaining work completed under this Contract.

1.02 MAINTENANCE PERIOD

A. The general maintenance period for all construction or materials under this Contract shall be one (1) year after the date of the acceptance of the work by the Owner, or as provided by other sections of this Specification.

B. If the Owner puts any structure or equipment to use prior to acceptance of all work under the Contract, the maintenance period for such structures or equipment shall be calculated from the time use begins.

C. Contractor agrees to replace the material which does not conform to the Contract requirements, and to repair any damage of material or work without cost to the Owner, to the satisfaction of Engineer, in conformance with Contract Documents provided orders for replacement and/or repairs are received in writing by the Contractor within the one year period.

D. This Section shall in no way limit the duration of the Contractor’s responsibility for the correction of any defect due to workmanship or materials provided by the Contractor which are not in compliance with the Contract Documents.

1.03 ABUSE OF WORK

A. Contractor is not obligated to perform work of replacement or repair that he may prove is required because of abuse by parties other than the Contractor, after the date the Owner puts to continuous use the work requiring replacements or repair, or after date the Owner has approved the Certificate of Completion.

1.04 EMERGENCY REPAIRS

A. If the Owner deems necessary, the Owner shall order replacement or repairs be undertaken within 24 hours.

B. If the Contractor delays or fails to make the ordered replacement or repairs within the time specified, the Owner shall have the right to make such replacements or repairs and the expense shall be deducted from moneys due the Contractor, or moneys of the Contractor retained by the Owner.

END OF SECTION

CITY OF NEWTON

CONSTRUCTION SPECIFICATIONS

SCOPE OF WORK

The work under this contract consists of intersection improvements at the intersection of Oak Street at Chestnut Street (known as Pettee Square). The project limits include approximately 600 feet along Chestnut Street and 350 feet along Oak Street.

The proposed Base Bid improvements include the reconstruction of the intersection of Oak Street at Chestnut Street to include a new traffic signal, installation; a Rapid Rectangular Flashing Beacon (RRFB) at the Upper Falls Greenway crossing of Oak Street; a raised intersection; stormwater drainage system upgrades; stamped concrete sidewalks and reconstructed curb ramps for ADA/AAB-accessibility; landscape and streetscape amenities; lighting upgrades; and new pavement markings and signing.

The detailed work includes unclassified excavation, pavement micro milling, Superpave asphalt pavement, permeable pavement, new traffic signal, stamped concrete sidewalk, granite curb, stormwater drainage system modifications, landscape and streetscape improvements, new lighting and other incidental work.

The proposed Add Alternate No. 1 work includes furnishing and installation of electric vehicle chargers at the proposed parking area on Chestnut Street.

All work done under this contract shall be in conformance with:

- the City of Newton Standard Specifications and General Construction Details,
- the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges, 2023 Edition, as amended
- the 2017 or latest Massachusetts Department of Transportation Construction Standard Details
- the 2006 Massachusetts Highway Department Project Development and Design Guide,
- the 2009 or latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) with revisions and Massachusetts Amendments,
- the 1996 Construction and Traffic Standards Details (as relates to the Pavement Marking details only)
- the MassDOT Traffic Management Plans and Detail drawings,
- the MassDOT Work Zone Safety Temporary Traffic Control,
- the 1990 Standard Drawings for Signs and Supports,
- the 2015 Overhead Signal Structure and Foundation Standard Drawings,
- the 1968 Standard Drawings for Traffic Signals and Highway Lighting,
- the latest edition of American Standard for Nursery Stock,
- the Contract Project Manual and Plans with any Project Addenda.

The General Conditions, Supplementary Conditions and Special Provisions shall take precedence over the General Requirements of Division I of the MassDOT Standard Specifications.

ARCHITECTURAL ACCESS BOARD & AMERICANS WITH DISABILITIES ACT TOLERANCES AND STANDARDS

The Contractor is hereby notified that they are ultimately responsible for constructing all project elements in strict compliance with the current AAB/ADA rules, regulations, and standards. The Contractor's attention is directed to the MAAB Variance attached hereto, which details allowable deviations from AAB rules, regulations, and standards at specific locations identified within the project.

All construction elements in this project associated with sidewalks, walkways, pedestrian curb ramps and curb cuts are controlled by 521CMR - Rules and Regulations of the Architectural Access Board (AAB). The AAB Rules and Regulations specify maximum slopes and minimum dimensions required for construction acceptance. There is no tolerance allowed for slopes greater than the maximum slope or for dimensions less than the minimum dimensions, with the exception of the specific locations identified within the attached MAAB Variance.

Contractors shall establish grade elevations at all pedestrian curb ramp locations and shall set transition lengths according to the appropriate table in the Construction Standards (or to the details shown on the plans).

ORDERING OF MATERIALS AND DRAWINGS

The Contractor shall provide the Engineer within 30 days of receipt of the contract, written evidence that:
1. Contractor has ordered the shop drawings for the materials for which shop drawings are required for this contract;
2. Contractor has ordered from a supplier or manufacturer materials necessary to complete the project.

The Contractor shall further provide the Engineer written evidence within 30 days of receipt of the Contract that these orders have been confirmed in writing by the manufacturer with delivery dates appropriate for timely completion of the project. These confirmations of orders will become part of the project records.

Failure to comply with any of the ordering requirements shall nullify a request for an extension of the project completion date.

SHOP DRAWING SUBMITTAL (Supplementing Subsection 5.02)
The following is a list of items and materials that require shop drawing or catalog cut approval (Contractor to coordinate with Engineer to confirm all submittals as this list may not be deemed complete):

1. **Independent Testing Laboratory to be used**
2. **Individual Tree Protection**
3. **Gravel Borrow (Type B)**
4. **Crushed Stone**
5. **Drainage Structures**
6. **Drainage Pipe**
7. **Frame and Grate (or Cover) Municipal Standard**
8. **SUPERPAVE Hot Mix Asphalt Job Mix Formula**
9. **Granite Curbing**
10. **Detectable Warning Panels**
11. **Stone Dust**
12. **Bench**
13. **Game Tables and Chairs**
14. **Trash Receptacle**
15. **Tree Grate**
16. **Bicycle Rack**
17. **Silt Sack**
18. **Cement Concrete**

19. **Loam and Seed**

20. **Mulch**

21. **Conduit**

22. **Handhole**

23. **Pull Box**

24. **Lighting Equipment**

25. **Rectangular Rapid Flashing Beacon**

26. **Signage**

27. **Pedestrian Temporary Traffic Controls**

28. **Qualifications of construction survey control personnel**

29. **Name and Certification Number of the Massachusetts Certified Arborist**

JOINTS (Supplementing Subsection 460.90)
The application of hot poured rubberized asphalt sealer, where required in accordance with Subsection 460.90 of the Specifications, shall be considered incidental to the work included under Item 460.23, 460.31, 460.42, and 460.52.

CONCURRENT WORK BY OTHERS WITHIN PROJECT LIMITS (Supplementing Subsection 5.06)
Concurrent work may be in progress in the project areas by the City of Newton or utility companies or others. The Contractor is required to coordinate his activities with all work by others within and adjacent to the project limits.

No additional payments will be allowed for any disruption of work schedule caused by or required to coordinate work in this contract and work to be performed by others.

STEEL PLATES IN CONSTRUCTION ZONES (Supplementing Subsection 7.09)
At the end of each working day trenches in areas of public travel shall be backfilled and covered with steel plates, each edge of such plates shall either be beveled or protected by a slope of two (2) feet horizontally to one (1) inch vertically. Any temporary patching material may be used to construct the ramps. The cost of necessary patching materials, and their maintenance and removal, will be considered incidental to the item involved with no separate payment.

PUBLIC SAFETY AND CONVENIENCE (Supplementing Subsection 7.09 of MassDOT's Standard Specifications)
Vehicular and pedestrian travel on the public way shall be maintained by the Contractor during construction and access to abutting land shall be provided at all times. If so directed, temporary walkways will be provided by the Contractor to ensure safe passage under various weather conditions.

PROPERTY BOUNDS (Supplementing Subsection 7.13)
The Contractor shall exercise due care when working around all property bounds, which are to remain. The Contractor shall verify the location and reset (if needed) any street right-of-way bounds or markers damaged or moved by result from the actions of the Contractor, the bound shall be accurately replaced and/or realigned by the Contractor as required by the Engineer. The Contractor shall employ a Land Surveyor registered in Massachusetts to perform this work. No further compensation will be due the Contractor for the materials and labor required to re-establish a bound disturbed by the Contractor, except as otherwise noted herein.

PROTECTION OF UNDERGROUND FACILITIES
The Contractor's attention is directed to the necessity of making his own investigation in order to assure that no damage to existing structures, drainage lines, traffic signal conduits, etc., will occur. The Contractor shall notify the City of Newton and Mass. DIG SAFE and procure a DIG SAFE number for each location prior to disturbing the existing ground in any way.

DIG SAFE Call Center 1-888-344-7233
The Contractor shall notify the City and Dig Safe 72 hours prior to start of construction.

NOTICE TO UNITED STATES POSTAL SERVICE (USPS) POSTMASTER
The Contractor shall give sufficient notice to the USPS Postmaster of his intention to conduct work in an area where a Mail Collection Box, Mail Transfer Box, or the service thereof may be affected by the construction operations. Before commencing work near a Mail Collection Box that will be affected by the construction, the Contractor shall contact the USPS Postmaster responsible for the Mail Box to ensure that proper procedures are followed. The Contractor may not commence work in this area until the unit has been moved by the USPS or its designee.

PROTECTION OF UTILITIES AND PROPERTY (Supplementing Subsection 7.13)
The Contractor, in constructing or installing facilities, alongside or near sanitary sewers, storm drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls or other structures, shall, at his expense, sustain them securely in place, cooperating with the officers and agents of the various utility companies and municipal departments which control them, so that the services of these structures shall be maintained. He shall also be responsible for the repair or replacement, at his own expense, of any damage to such structures caused by his acts or neglect, and shall leave them in the same condition as they existed prior to the commencement of work.

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

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

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

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

The Contractor shall be required to furnish all labor, materials, and equipment necessary to protect underground structures and electrical vaults within the project site from construction debris and water penetration. When underground structures or electrical vault roofs are excavated, the Contractor shall be responsible for maintaining security of these structures or electrical vaults against unauthorized access. The Contractor shall be responsible for leaving the structures and vaults in a state of water tightness equal to that existing at the commencement of the contract.

The Contractor will cooperate fully with all utility companies private or public, and will notify all such companies at least twenty-four hours prior to excavating in the vicinity of any utility. It is understood that the Contractor has considered in his bid the existence of the various utilities and that no additional compensation will be allowed for any delays, inconvenience, or damage sustained by him due to any interference by said utilities.
The Contractor shall pay the serving utility for their services rendered for the connection of the overhead service connections.

DRAINAGE (Supplementing Subsection 7.13)
It shall be the Contractor's responsibility to maintain proper drainage in the areas under construction until the final system is put into use. Existing drainage shall not be taken out of service without prior written notice to the City.

All impacted existing pipes and structures within the limits of this contract shall be left in a clean and operable condition at the completion of the work. It shall be the responsibility of the Contractor to make certain that new drainage systems

carrying run-off from the limit of this project operate efficiently to their points of discharge into existing systems. Debris in pipes and structures, including deposition of hazardous material as a result of the Contractor's operations shall be removed by the Contractor in accordance with state and federal guidelines without compensation. All existing pipes to be abandoned shall be plugged with brick masonry not less than eight (8) inches in thickness in conformance with the MassDOT Standard Specifications, Section 201.62.

Drainage castings in new pavement areas shall be installed at base or binder course grade, as required by the Engineer, and reset to proposed finish surface grade prior to placement of the pavement surface course.

All the above work shall be included under the relevant drainage item without additional compensation. Any adjustments made to new drainage structures will be included under the contract unit price for the respective structures. No separate payment will be made for the maintenance of the existing drainage system or for plugging of pipes, but all costs in connection therewith shall be included in the unit prices bid for the various Contract items.

DRAINAGE STRUCTURES

Where new pipe is shown on the drawings to be connected into an existing drainage structure to remain, the existing structure shall be first cleaned to remove all mud, debris and other material. The existing structure wall shall be carefully and neatly cut to provide the minimum size opening required for the insertion of the new pipe. The proposed pipe end shall be set or cut off flush with the inside face of the existing structure wall and the remaining space around the pipe completely filled with cement grout for the full thickness of the structure wall.

Existing shaped inverts shall be reconstructed, as necessary to provide a smooth and uniform flow channel from the new pipe through the existing structure.

No separate payment will be made for the cost of connecting new pipes into existing structures, cleaning and necessary alterations of existing structures, but all such costs shall be taken as included in the unit prices bid for the various pipe and structure items. In addition no separate cost will be made for existing frame and grate (or cover) to be removed and stacked, but shall be made incidental to the appropriate drainage structure items, whether it be adjusted, change in type, remodeled, abandoned, removed, or proposed.

PROTECTION OF PERSONAL PROPERTY

The Contractor shall exercise due care when working around all personal property and roadside features which are to remain. Trees to remain within work limits shall have tree protection. Any damage resulting from the actions of the Contractor, shall be replaced and/or repaired by the Contractor as required by the Engineer. No further compensation will be due the Contractor for the materials and labor required to protect personal property, roadside features to remain or protection for trees.

SAWCUTTING

All edges of excavation made in existing pavements, driveways and sidewalks shall be squared by sawcutting with power-driven tools to provide a neat, clean edge for joining new pavement and sidewalks. Ragged, uneven edges shall not be accepted.

Areas which have been broken or undermined shall be edged neatly with a minimum disturbance to remaining pavement or sidewalks.

All sawcutting, except for box widening, will be considered incidental to the associated bid items. Additional sawcutting may be required to prevent damage to adjacent structures as required by the Engineer.

Saw-cut surfaces shall be sprayed or painted with a uniform thin coat of RS-1 asphalt emulsion immediately before placement of bituminous concrete material against the surface.

FINE GRADING AND COMPACTION

All areas consisting of existing subbase, newly placed subbase, or any other location where fine grading and compaction is necessary, or required by the Engineer, prior to the installation of top or finish courses shall be thoroughly fine graded and compacted to provide a neat, clean surface for the installation of new materials.

WORK SCHEDULE (Supplementing Subsection 8.02)
Work on this project is restricted to 7:00 A.M. to 4:30 P.M. for **Daytime** work (be advised that the City of Newton may restrict work on arterial streets between the hours of 7:00 A.M. to 9:00 A.M. and from 3:30 P.M. to 4:30 P.M. in certain situations as designated by the Engineer), 8:00 P.M. to 5:00 A.M. of the next day for **Nighttime** work, and 8:00 A.M. to 4:30 P.M. for **Weekend** (Saturday and Sunday) work (be advised that the City of Newton may restrict work on arterial streets between the hours of 7:00 A.M. to 9:00 A.M. and from 3:30 P.M. to 4:30 P.M as well on the weekend. in certain situations as designated by the Engineer). The Contractor is further advised that the hours of operations are set by law. In addition, no weekend or holiday work will be allowed unless special permission is granted. Any work to be completed as part of Nighttime or Weekend time shall be approved or required by the Engineer. Nighttime work also requires a Noise Waiver from the Mayor's Office. These stipulations apply to the Prime Contractor and all Subcontractors working on the same shift. The Prime Contractor will have superintendent on site whenever work is being performed. No work shall be done on this contract on Saturdays, Sundays, or Holidays, unless approved by the City in advance. Work will not be allowed the day before or the day after a long weekend, which involves a holiday without prior approval by the City. Exceptions may be taken if so stated in the Contract Documents.

There shall be no work beyond the winter shut down date, unless approved in writing by the Engineer. Workdays shall be continuous to the winter shut down. No additional compensation shall be made for variations in Work Schedule required by the Engineer, and all costs associated with complying with work schedule shall be considered part of the contract bid price.

SCHEDULE OF OPERATIONS (Supplementing Subsection 8.02)
The Contractor shall construct each phase in order as shown in the limits of work unless otherwise directed or approved by the Engineer. The Contractor may work on more than one phase at a time, coordinated with and approved by the Engineer. It shall be the Engineer's option to alter the phasing of work at any time during the project when a change is deemed to be in the best interest of the public. It should be noted that any costs of delays, incurred by these procedures, or changes in these procedures shall be deemed to be included in the contract prices bid and not cause for additional compensation.

PROVISIONS FOR TRAVEL AND PROSECUTION OF WORK (Supplementing Subsection 8.03)
Before starting any work under this Contract, the Contractor shall submit a Schedule of Operation, as provided in Section 8.02. This work schedule shall include a plan of his construction procedures, detours, and the traffic safety devices he will use during the prosecution of the work as set forth in Section 850.

Any area which the Contractor may require for storage of equipment and materials, or for other purposes necessary in the performance of the work, shall be secured by the Contractor at his own expense. Materials, including excavation intended for backfill, shall not be stored or stacked on roadway surfaces unless specifically permitted by the Engineer.

In general, the Contractor shall coordinate his work with the work to be done by the public utilities or other agencies, and shall so schedule operations as to cause the least interruption to the normal flow of traffic. The Contractor may be required to temporarily suspend operations, when such are considered by the Engineer to be a hindrance hazard to traffic.

The Contractor shall not proceed with surfacing operations without written approval of the Engineer. The Contractor shall provide for the removal of all material spilled from his trucks on existing pavement or other property over which it is hauled, or otherwise deposited thereon whenever, in the judgment of the Engineer, the accumulation is sufficient to cause the formation of mud or dust, or interfere with drainage or create a traffic hazard.

In case of damage to utilities, the Contractor shall promptly notify the Owner and shall, if requested, furnish manpower under the owner's direction in getting access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the owner, either the municipality or the utility company. The cost of such repairs shall be borne by the Contractor without compensation.

The Contractor shall determine the exact location of all existing utilities before commencing work. Contractor agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities. The Contractor shall include in his bid a sufficient allowance to cover the cost of any exploratory excavations, which are needed to verify utility locations and to accomplish all of the required work.

The Contractor shall be responsible for maintenance of flow in all water courses, drains, and other pipes in the way of the proposed work or for any conveyance of the flow to a suitable point of discharge in such a manner that there will be no flow upon or hindrance to other work or cause nuisance of any kind.

Roadways under construction shall remain open to local traffic at all times during the period of time required for the completion of the work, except when specifically directed otherwise by the City. At least one lane of traffic in each direction must be maintained at all times on all roads and all existing turning movements must be maintained through construction. Pedestrian and vehicle access to all abutting properties shall be maintained except for very short periods of time for passing of active construction equipment and vehicles working in the immediate adjacent rights-or-way. When it is necessary to deny access to a property, the Owner shall be informed at least 48 hours in advance and alternative provisions made. **An accessible route for pedestrians shall be made available at all times and shall be properly maintained as such. The accessible route shall be equal to the distance of the route provided to able pedestrians.**

Facilities shall be provided by the Contractor for the safe and convenient passage of pedestrians and vehicles through the project. Particular care should be taken to establish and maintain methods and procedures which will not create unnecessary or unusual hazards to public safety. The placement of necessary devices will be for daily work periods and shall be removed after the completion of work operations.

All proposed utility work must be completed before roadway rehabilitation begins on a particular roadway. Roadway excavations must be squared-off at the end of each day and any open trenches shall be backfilled and covered with steel plates. Backfilling and plating shall be considered incidental to the project and not be cause for additional compensation.

The Contractor may begin excavation at either end of the project but must continue from that end to the completion of the project. During non-working hours, no lateral drop-offs will be permitted within the area of excavation. The excavated areas shall be squared-off and ramped longitudinally at a rate of 12:1 or flatter to meet existing surfaces.

The City reserves the right to alter the lengths of excavation and other operations, for the convenience of the traveling public and abutting property owners.

General Provisions for Travel and Prosecution of Work

The contractor, as required by the Engineer, is responsible for the furnishing erecting, and maintaining the signing of the roadways, and the proper removal of the signs upon the completion of the project. Compensation for signing will be provided under the provisions of Section 850 and under the respective items therein.

Reconstruction work on the project shall not commence until the stage construction signing and traffic barriers as described in the MUTCD have been installed and approved.

Particular care shall be taken to establish and maintain such methods and procedures as will not create hazards of an unusual nature. Access to abutting properties shall be maintained in a responsible and safe manner for the duration of the construction period.

The design and placing of all safety devices shall be with the approval of the Engineer. Payments of work and materials involved in providing adequate safety procedures shall be as specified in Section 850.

The Contractor shall carry on his work concurrently and in conjunction with the Utility Companies involved with the project so as to provide for all possible cooperation towards the satisfactory completion of the work with minimum delay and inconvenience. The Contractor shall be responsible for coordination of all utility work within the project limits.

Roadway excavation must be squared-off at the end of each day. At the end of each workday, any open utility trenches shall be backfilled and covered with steel plates. Backfilling and plating shall be considered incidental to the project and not be cause for additional compensation.

The Contractor shall be responsible for maintenance of flow in all water courses, drains and other pipes in the way of the proposed work or for any conveyance of the flow to a suitable point of discharge in such a manner that there will be no flow upon or hindrance to other work or cause nuisance of any kind.

Lowering of structures in areas of full depth construction shall be considered to be for the Contractors convenience and not cause for additional compensation. Rebuilding and adjustment of such structures shall be measured and paid for under the appropriate pay items. The castings of all structures, which are required to be set or reset under this project, shall not be set complete in place to the final grade until after the bituminous concrete binder course has been completed and top course is scheduled to be completed within ten calendar days.

The Contractor shall order all materials and services required for the work immediately after the execution of the contract. The Contractor shall not start any operation until all materials required for the operation are at the site or until the Engineer is satisfied that the materials will be delivered in such order that there will be no interruption to continuous and efficient progress.

Roadways under construction shall remain open to local traffic at all times during the period of time required for the completion of the work except when specifically directed otherwise by the Engineer.

Reasonable facilities shall be provided by the Contractor for the safe and convenient passage of pedestrians and vehicles through project areas within the public right-of-way and where required by the Engineer at all times.

The placement of warning devices will be for daily work periods and shall be removed after the completion of work operations. Signs having messages that are irrelevant to normal traffic conditions will be removed or properly covered at the end of each work period. Signs are to be kept clean at all times and legends shall be distinctive and unmarred.

The Contractor shall take necessary precautions to avoid spillage from his trucks onto the traveled ways. Any material which may drop from the vehicles when being hauled over the street shall be removed immediately by the Contractor.

SAFETY CONTROLS FOR CONSTRUCTION OPERATIONS (Supplementing Subsections 850.21 and 850.61)
Unless otherwise provided for by specific items in this contract, furnishing safety controls for construction operations shall be considered incidental to this contract and the costs for safety controls shall be included in the various price for those contract items requiring such controls.

Positioning, adjusting and re-positioning of all devices such as traffic cones, drums, barricades, concrete barriers, high level warning devices, etc., not otherwise paid for under other items in this contract, is considered incidental and no separate payment will be made.

Signs having messages that are irrelevant to normal traffic conditions will be removed or properly covered at the end of each work period. Signs are to be kept clean at all times, and legends shall be distinctive and unmarred. The Contractor shall provide, place and erect all necessary barricades and warning signs and maintain adequate lights and illumination therefore. He shall be held responsible for all damage to the work due to any failure of signs and barricades needed to protect the work from traffic, pedestrians, or other causes.

Construction Signing and maintenance of Traffic will be paid for under Item 852.

TEMPORARY TRAFFIC CONTROL PLAN

Construction Staging and Scheduling
The Contractor shall prepare and submit to the Engineer a proposed work schedule which complies with the plans and specifications. No work shall start until the Engineer's approval of the schedule is received.

The Contractor shall notify the City of Newton 14 calendar days before construction starts.

Materials, including excavation intended for backfill, shall not be stored or stacked on roadway surfaces unless specifically permitted by the Engineer.

The following are the suggested stages to be followed in the prosecution of this contract. No work on any stage may begin unless all requirements of the previous stages have been met. It shall be the Engineer’s option to alter the sequence of work for the project at any time during the project when a change in sequence of work is deemed to be in the best interest of the Public. It should be noted that any costs of delays, incurred by these procedures, or changes in these

procedures shall be deemed to be included in the contract prices bid and not cause for additional compensation.

General Construction Stages

1. Full-Depth Roadway Excavation/Pavement Replacement
   a. Construct all proposed utilities to below subgrade, and bring all existing utilities within the proposed roadway limits down to below subgrade in areas of full depth construction and pavement replacement. See plans for additional requirements.
   b. Construct areas of full depth roadway and pavement replacement to binder level as indicated in the plans.
   c. Construct areas of trench repair as required by the Engineer.

2. Sidewalks
   a. Construct sidewalk, islands, and bump-outs

3. Milling
   a. Mill roadway surface

4. Landscaping / Streetscape
   a. Install landscaping / trees
   b. Install streetscape features

5. Top Course
   a. Apply tack coat and place surface course for the entire length of the project. Surface course shall be placed after the intermediate course within time frame indicated on the plans.
   b. Apply pavement markings and associated signing for entire length of project.

Sequence of Construction

It is the intent of these Special Provisions to minimize the construction impacts to the traveling public and abutting property owners by limiting the extent of roadway excavation and requiring the restoration of a weather-tight pavement surface as stipulated in the plans and specifications. All proposed underground installations must be in place prior to the beginning of any roadway paving.

The Contractor shall, as required by the Engineer, lower utility castings to ensure that any interim roadway condition is safe for the traveling public. The demolition, plating, and rebuilding of utility structures as required by interim conditions shall be considered incidental to the project and not cause for additional compensation.

The Contractor shall, as required by the Engineer, provide temporary backfill to ensure that any interim sidewalk condition is safe for the traveling public and provides access to all abutters. Gravel may be used as temporary fill. The placement, compaction and subsequent removal of temporary fill as required by interim conditions shall be considered incidental to the project and not cause for additional compensation. Unless directed otherwise by the Engineer, temporary gravel sidewalk surfaces shall remain in place for no more than 7 calendar days where upon the temporary fill will be removed and replaced with the final sidewalk surface.

Intermediate course will be placed on completed base course sections when there is sufficient distance to permit efficient placement operations. Only after the entire project has been completed to intermediate course level will the top course material be allowed to be placed.

The Engineer reserves the right to alter the lengths of excavation and other operations in order to ensure the safety of the traveling public and abutting property owners.

General

The following general conditions will be followed unless otherwise required by the Engineer.

- Except as permitted by the Engineer, during the day a minimum of one travel lane in each direction must be maintained at all times.
- At least one sidewalk on one side of the street shall remain open at all times.
- Pedestrian and vehicle access to all abutting properties shall be maintained except for very short periods of time.

When it is necessary to deny access to a property, the owner shall be informed at least 48 hours in advance.

- Utility work shall be done prior to the roadway construction operations. The Contractor shall coordinate his work with the City and the utility companies.
- The Contractor shall coordinate his activities with construction operations that may be undertaken concurrently by others.

ENVIRONMENTAL CONTROLS

Contractor shall control all dirt, dust erosion and other related construction emissions from the project to the satisfaction of the City. Contractor shall compile with all applicable local, state and federal environmental regulations and permit requirements.

The Contractor shall clean and flush all affected drainage structures at the end of the work to the satisfaction of the engineer. The price associated with this work will be deemed incidental to the contract.

All construction equipment shall be fitted with suitable muffling devices so that the noise from construction operation shall be properly controlled. The Contractor shall control all dirt, dust erosion and other related construction emissions from the project to the satisfaction of the Designated Agent.

Calcium chloride for roadway dust control and/or water for roadway dust control shall be applied in accordance with Section 440 at the direction of the Engineer. All costs in connection with the application of calcium chloride and/or water shall be included in the various payment items and no additional compensation will be made.

EXCAVATION SUPPORT

Where the Work of the project requires installation of excavation support systems, the furnishing, installing, maintaining, and final removal as required shall be considered incidental to the item to which it pertains. Dewatering, when required, including disposal in accordance with State and Federal guidelines shall also be considered incidental.

DISPOSAL OF SURPLUS MATERIALS

All existing and other materials not required or needed for use on the project, and not required to be removed and stacked, shall become the property of the Contractor and shall be removed from the site during the construction period and legally disposed of. No separate payment will be made for this work, but all costs in connection there with shall be included in the prices bid for various contract items.

CLEARING AND GRUBBING

No tree, including trees in clear & grub areas, shall be removed prior to receiving approval of the City of Newton. The removal of all trees shall be coordinated with the City of Newton prior to removal.

TRAFFIC OFFICERS

Uniformed Traffic Officers will be required during the construction period and shall be paid for directly by the City. It shall be the responsibility of the Contractor to arrange for the necessary police details when approved by the City for each police detail required. This request and approval may be verbal or in writing at the discretion of the City. 48 hour notice to the Police Department is required.

The City will pay the exact charges for police details ordered, with the approval of the Engineer, by the Contractor for this project. There will be no administrative fee, mark-ups, or any other additional costs paid to the Contractor.

If the Contractor fails to cancel any police detail not needed, by the required deadline as set forth by the Newton Police Department, the cost for such detail as invoiced to the City shall be deducted from the total reimbursement to the Contractor, unless otherwise waived by the City. There will be no separate payment for the Contractor's coordination with the Police Department or City to obtain police details.

PRICE ADJUSTMENTS

In accordance with MGL Chapter 30, Section 38A, this Contract shall be subject to the MassDOT Special provisions for price adjustments relative to energy escalation. Price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel and gasoline shall be made on a monthly basis when the monthly change from the Base Price is +/- 5 percent. Base prices for this contract shall be the period prices posted on the MassDOT website, https://www.mass.gov/massdot-contract-

price-adjustments, at the time of the bid. For reference the base prices are as follows:[1] liquid asphalt $660.00 per ton, Portland cement $181.15 per ton, diesel fuel $3.274 per gallon, and gasoline $2.684 per gallon.

ITEMS

The following items reflect special conditions particular to this project. As such, they amend and/or supplement the provisions governing the Item, as described in the Standard Specifications.

DEFINED TERMS (Supplementing Subsection 1.03)

Throughout the MassDOT Standard and Supplemental Specifications, wherever the term "the Department" appears it shall be replaced with "the Owner", which term shall be defined to mean the City of Newton, acting through its Department of Public Works.

COVID 19 GUIDELINES AND PROCEDURES

Per Subsection 5.09 – Inspection of the Work - the Contractor is required to provide assistance to the Engineer to make a complete and detailed inspection of the work. That assistance includes furnishing equipment to perform the inspection, therefore the Contractor will be required to provide CDC compliant Personal Protective Equipment (PPE) to City or City-contracted personnel field staff. The CDC compliant PPE shall consist of face masks, gloves and eye protection.

All costs associated with compliance with this provision are considered to be incidental to the contract cost and therefore the Contractor will not be entitled to any additional compensation.

DESIGNER/PROJECT MANAGER

TEC, Inc.
Lori Aho, P.E.
(978) 794-1792

CONSTRUCTION STAKING (Supplementing Subsection 5.07)

In the first sentence of this section replace, "The Department will" with "The Contractor shall".

Upon request by the Contractor, the Engineer will furnish information and ties for the survey baseline and benchmarks, within ten calendar days. The Contractor shall perform all survey work required to complete the Contract. The Contractor shall utilize a Massachusetts registered Professional Land Surveyor (PLS) to establish, and reestablish as required by the Engineer throughout the construction period, all benchmarks, baselines, and Right of Way boundaries. If requested by the Engineer, the Contractor shall stake out geometry points and 50-foot station locations for the construction baselines.

All survey layout, horizontal and vertical, shall be performed using a total station; GPS is not acceptable.

All costs associated with construction staking and survey are the responsibility of the Contractor and shall be considered incidental to the various contract items. No additional compensation shall be allowed therefore.

MATERIAL TESTING

The Contractor shall obtain the services of a qualified material testing company to provide in-situ compaction and other material testing as ordered by the Engineer. No separate payment will be made, and all costs associated with material testing shall be considered incidental to the various contract items.

[1] Base prices as of May 1, 2023.

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 a traffic level 2 (0.3-10.0) million 18-kip (80-kn) ESALs.

NOTICE TO OWNERS OF UTILITIES (Supplementing Subsection 7.13)

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

Before commencing work on service connections, the Contractor shall be responsible for contacting the Electric Company servicing the area to obtain construction requirements, standards, and to give adequate notice of commencement of work. The Contractor's attention is further directed to the requirements of work in the immediate vicinity of certain underground structures and poles as shown on the construction plans.

NATIONAL GRID EMERGENCY TELEPHONE NUMBERS

GAS:
Emergency: 1-800-233-5325
New Service: 1- 877-696-4743
Customer Support: 1-800-732-3400

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

The following are the local contact names and addresses of some of the agencies which may be affected and must be notified. Completeness of this list is not guaranteed. The Contractor shall ensure that all affected agencies are notified.

City Contract:	Lou Taverna, ltaverna@newtonma.gov, (617) 796-1020
City Construction:	Frank Nichols, fnichols@newtonma.gov, (617) 796-1033
Police:	Lieutenant Chuck Leone, cleone@newtonma.gov, (617) 796-2146
Fire:	Fire Prevention line, (617) 796-2210
Fire Alarm & Wires Division:	Glenn Manning (617) 796-2256
Tree Warden	Marc Welch (617) 796-1500
Water/Sewer/Drain:	Bob Sullivan, Livio Cence (617) 796-1640
Gas:	National Grid, Tammy Saporitio, 978-270-5205 tammy.saporitio@nationalgrid
Electric:	Eversource, Kim Khounesombat kim.khounesombat@eversource.com
MWRA:	Ralph Francesconi, (617) 305-5827
Comcast:	Manual Furtado (508) 884-2362
RCN:	Joe Volpe (617) 828-6904
Verizon:	Stanley Usovicz, stanley.j.usovicz@verizon.com

A list of public and private utilities can be found on the MassDOT Highway Division website at: https://www.mass.gov/info-details/utility-contacts-by-district-and-municipality

Select District 6 → (Newton), and then locate the utility. The Contractor shall inform the following officials in each area that he is assigned to work:
Superintendent, DPW,
Superintendent, Water & Sewer Department,

Police and Fire Departments,
Electric Department

The following are the names of owners and representatives of the principal utilities affected, but completeness of this list is not guaranteed by the Department (See above for local contacts):

Eversource Electric "A" 1165 Massachusetts Avenue Dorchester, MA 02125		Terence Doonan terence.doonan1@eversource.com 617-541-5714
National Grid Gas 40 Sylvan Road Waltham, MA 02451		Melissa Owens Melissa.Owens@nationalgrid.com 781-907-2845
Enbridge 8 Wilson Way Westwood, MA 02090		Kathy M. Aruda Kathleen.aruda@enbridge.com 508-938-7728
Verizon 385 Myles Standish Blvd. Taunton, MA 02780		Karen Mealey Karen.m.mealey@verizon.com 774-409-3160
Water & Sewer Newton DPW 1000 Commonwealth Avenue Newton Centre, MA 02459		Thomas Fitzgerald tfitzgerald@newtonma.gov 617-796-1040
MWRA 2 Griffin Way Chelsea, MA 02150		Ralph Francesconi Ralph.francesconi@mwra.state.ma.us 617-305-5827
MWRA 2 Griffin Way Chelsea, MA 02150		Kevin McKenna Kevin.McKenna@mwra.state.ma.us 617-305-5956
MBTA Document Control Group 500 Arborway Boston, MA 02130		Tyler Scott tscott@mbta.com
RCN 956 Massachusetts Avenue Arlington, MA 02476		Alex Ortiz alex.ortiz@rcn.net 781-316-8878
Comcast Cable PO Box 6505, 5 Omni Way Chelmsford, MA 01824		Wendy Brown Wendy_Brown@comcast.com 978-848-5163
AT&T 50 Mall Road – Suite 203 Burlington, MA 01803		Hayleigh Walker Hayleigh.walker@sienaengineeringgroup.com 781-221-8400
Crown Castle 80 Central Street Boxborough, MA 01719		Mark Bonanno mark.bonanno@crowncastle.com 508-616-7818

Eversource Fiber 247 Station Drive Westwood, MA 02090		Tom Fadipe Oloruntomi.fadipe@eversource.com 781-441-3864
Fire Alarm Newton Fire Alarm & Wires 1164 Centre Street Newton Centre, MA 02459		Glenn Manning gmanning@newtonma.gov 617-796-2256
Newton DPW 1000 Commonwealth Avenue Newton Centre, MA 02459		Lou Taverna ltaverna@newtonma.gov 617-796-1020
Zayo Company 2 Royce Lane Westfield, MA 01886		Richard Moran Richard.moran@zayo.com 978-844-7525
Lumen 1025 Eldorado Blvd. Broomfield, CO 80021		Renoy Thomas relocations@lumen.com 516-712-3041

METHOD OF AWARD

TO ENSURE CONTRACTOR ACCOUNTABILITY, THE OWNER INTENDS TO AWARD ALL ITEMS TO A SINGLE CONTRACTOR. ACCORDINGLY, CONTRACTORS MUST BID ON ALL ITEMS OF WORK, AND THE LOW BIDDER WILL BE THE CONTRACTOR WHOSE TOTAL BID PRICE IS THE LOWEST. THE BID QUANTITIES ARE NOT GUARANTEED, AND THEIR PRIMARY PURPOSE IS FOR THE DETERMINATION OF THE LOW BIDDER.

102.511	**Tree Protection – Armoring & Pruning**	**EA**
102.55	**Arborist**	**HR**
103.	**Tree Removed – Diameter Under 24 Inches**	**EA**
120.1	**Unclassified Excavation**	**CY**
141.	**Class A Trench Excavation**	**CY**
141.1	**Test Pit for Exploration**	**CY**
142.	**Class B Trench Excavation**	**CY**
144.	**Class B Rock Excavation**	**CY**
146.	**Drainage Structure Removed**	**EA**
151.	**Gravel Borrow**	**CY**
152.8	**Pea Gravel**	**TON**
153.	**Controlled Density Fill - Excavatable**	**CY**
154.	**Sand Borrow**	**CY**
156.	**Crushed Stone**	**TN**
170.	**Fine Grading and Compacting – Subgrade Area**	**SY**
201.	**Catch Basin**	**EA**
201.3	**Special Catch Basin**	**EA**
202.	**Manhole**	**EA**
220.	**Drainage Structure Adjusted**	**EA**
220.2	**Drainage Structure Rebuilt**	**FT**
220.3	**Drainage Structure Change in Type**	**EA**
220.6	**Sanitary Structure Rebuilt**	**FT**
220.7	**Sanitary Structure Adjusted**	**EA**
220.8	**Sanitary Structure Remodeled**	**EA**

222.3	**Frame and Grate (or Cover) Municipal Standard**	**EA**
238.12	**12 Inch Ductile Iron Pipe**	**FT**
241.12	**12 Inch Reinforced Concrete Pipe Class III**	**FT**
269.04	**4 Inch Slot-Perforated Corrugated Plastic Pipe (Subdrain)**	**FT**
358.	**Gate Box Adjusted**	**EA**
360.	**Monitoring Well Adjusted**	**EA**
381.3	**Service Box Adjusted**	**EA**
402.	**Dense Graded Crushed Stone for Sub-Base**	**CY**
415.3	**Pavement Micro Milling**	**SY**
440.	**Calcium Chloride for Roadway Dust Control**	**LB**
443.	**Water for Roadway Dust Control**	**MGL**
451.	**HMA for Patching**	**TON**
452.	**Asphalt Emulsion of Tack Coat**	**GAL**
460.23	**SUPERPAVE Surface Course – 12.5 (SSC – 12.5)**	**TON**
460.31	**SUPERPAVE Intermediate Course – 12.5 (SIC – 12.5)**	**TON**
460.42	**SUPERPAVE Base Course – 37.5 (SBC – 37.5)**	**TON**
460.52	**SUPERPAVE Leveling Course – 9.5 (SLC - 9.5)**	**TON**
461.	**Porous Pavement**	**SY**
472.	**Temporary Asphalt Patching**	**TON**
504.	**Granite Curb Type VA4 – Straight**	**FT**
504. 1	**Granite Curb Type VA4 – Curved**	**FT**
504.11	**Granite Planter Curb**	**FT**
509.	**Granite Transition Curb for Pedestrian Curb Ramps - Straight**	**FT**
514.	**Granite Curb Inlet – Straight**	**EA**
517.	**Granite Curb Corner Type B**	**EA**
580.	**Curb Removed and Reset**	**FT**
594.	**Curb Removed and Discarded**	**FT**
629.01	**Concrete Barrier Removed and Reset**	**EA**
691.	**Balance Stone Wall Removed and Rebuilt**	**FT**
697.1	**Silt Sack**	**EA**
701.	**Cement Concrete Sidewalk**	**SY**
701.1	**Cement Concrete Sidewalk at Driveways**	**SY**
701.2	**Cement Concrete Pedestrian Curb Ramp**	**SY**
701.21	**Directional Detectable Warning Panels**	**EA**
701.3	**Stamped Cement Concrete Sidewalk**	**SY**
701.4	**Stamped Cement Concrete Sidewalk at Driveways**	**SY**
702.	**Hot Mix Asphalt Sidewalk at Driveways**	**TON**
704.	**Stone Dust Walks**	**TON**
707.01	**Boulder Removed and Stacked**	**EA**
707.11	**Bench – Backed**	**EA**
707.12	**Bench – Backless**	**EA**
707.13	**Game Tables and Chairs**	**EA**
707.151	**Park Bench Removed and Stacked**	**EA**
707.2	**Trash Receptacle**	**EA**
707.21	**Trash Receptacle Removed and Reset**	**EA**
707.3	**Tree Grate**	**EA**
707.4	**Moveable Planters Removed and Reset**	**EA**
707.41	**Moveable Furniture Removed and Reset**	**EA**
707.8	**Steel Bollard**	**EA**
707.82	**Post Removed and Stacked**	**EA**
707.9	**Bicycle Rack**	**EA**
724.1	**Radial Granite Wall with Engraving**	**FT**
724.2	**Granite Seat Wall**	**FT**
748.	**Mobilization**	**LS**
751.	**Loam for Roadsides**	**CY**
752.5	**Planting Soil**	**CY**

752.51	**Structural Soil**	**CY**
765.	**Seeding**	**SY**
767.6	**Aged Pine Bark Mulch**	**CY**
775.441	**Locust – Honey – 'Skyline' (3-3.5 Inch Cal B&B)**	**EA**
777.677	**Sweetgum (3-3.5 Inch Cal B&B)**	**EA**
786.110	**Juniper – Wilton Blue Rug (2 Gallon)**	**EA**
786.490	**Juniper – Shore (2 Gallon)**	**EA**
796.427	**Feather Reed Grass – 'Karl Foerster' (2 Gallon)**	**EA**
796.455	**Switch Grass 'Shenandoah' (2 Gallon)**	**EA**
796.764	**Daylily – 'Stella D'Oro' (2 Gallon)**	**EA**
804.2	**2 Inch Electrical Conduit Type NM – Plastic (UL)**	**FT**
804.3	**3 Inch Electrical Conduit Type NM – Plastic – (UL)**	**FT**
811.22	**Electric Handhole – SD2.022**	**EA**
811.30	**Pull Box 8 x 23 Inches – SD2.030**	**EA**
811.31	**Pull Box 12 x 12 Inches – SD2.031**	**EA**
812.09	**Light Standard Foundation Precast**	**EA**
812.20	**Lighting Load Center Foundation**	**EA**
812.992	**Ornamental Light Pole**	**EA**
816.01	**Traffic Signal Reconstruction Location No. 1**	**LS**
823.60	**Highway Lighting Load Center**	**LS**
824.221	**Rectangular Rapid Flashing Beacon (Solar)**	**LS**
826.51	**Fire Alarm Box Removed and Reset**	**EA**
832.	**Warning, Regulatory, and Route Marker Aluminum Panel (Type A)**	**SF**
847.1	**Sign Sup (N/Guide)+Rte Mkr w/1 Breakaway Post Assembly - Steel**	**EA**
852.01	**Temporary Traffic Control**	**LS**
854.016	**Temporary Paving Markings – 6 Inch (Painted)**	**FT**
854.036	**Temporary Paving Markings – 6 Inch (Tape)**	**FT**
864.04	**Pavement Arrows and Legends Reflectorized White (Thermoplastic)**	**SF**
865.2	**Pavement Surface Coating**	**SY**
866.104	**4 Inch Reflectorized White Line (Thermoplastic)**	**FT**
866.112	**12 Inch Reflectorized White Line (Thermoplastic)**	**FT**
867.104	**4 Inch Reflectorized Yellow Line (Thermoplastic)**	**FT**
874.	**Street Name Sign**	**EA**
874.2	**Traffic Sign Removed and Reset**	**EA**
874.4	**Traffic Sign Removed and Stacked**	**EA**
875.1	**Parking Meter Removed and Reset**	**EA**
875.2	**Parking Meter Removed and Stacked**	**EA**
999.01	**Miscellaneous Work Allowance (Eng. Discretionary Fund)**	**AL**
999.02	**Traffic Control Officers**	**AL**
819.91	**Dual Car Electrical Vehicle Charging Station**	**LS**

ITEM 102.511 TREE PROTECTION – ARMORING & PRUNING EA

The work under this item shall conform to the relevant provisions of Sections 771 and shall be for furnishing and installing temporary tree trunk protection and for minor limb pruning or removal of lower tree limbs to prevent injury to the tree from construction equipment and activities.

Trunk armoring is for instances where construction activity (the use of heavy equipment) comes close enough to potentially damage the tree trunk or limbs. It is to be used where shown on the plans and as required by the Engineer.

REFERENCES

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

MATERIALS

Trunk armoring shall be such that it prevents damage to the trunk from construction equipment. Selected material shall be such that installation and removal will not damage the trunk.

Acceptable materials include 2x4 wood cladding with wire or metal strapping, or, for instances when duration of construction activities is less than three months, corrugated plastic pipe mounted with duct tape. Height of cladding shall be from base of tree (including root flare) to the bottom of the first branch, eight feet above the ground, or as required by the Engineer. Material and methods shall be approved by the Engineer.

Other materials or methods may be acceptable if approved by the City or by an Arborist (if included in the contract).

METHODS OF WORK

Prior to construction activities, the Engineer, the Contractor, the City Tree Warden, and the Arborist (if item is included in the contract), shall review trees noted on the plans to be protected. Final decision as to trees armored and/or pruned shall be per the Engineer.

Care shall be taken to avoid damage to the bark during installation and removal of armoring. Trunk armoring shall be replaced and maintained such that it is effective for as long as required and shall be removed immediately upon completion of work activities adjacent to trees.

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

DAMAGES & PENALTIES

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

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

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

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

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 102.511 will be measured and paid at the contract unit price per each. This will include full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract.

In the event of tree damage, cost of Arborist services, of remediation measures, and/or tree removal will be borne by the Contractor.

Payment under this item will be scheduled throughout the length of contract:

- 40% of value shall be paid upon installation of trunk armoring and completion of pruning work, if required.
- 60% shall be paid at the end of construction operations that would damage the tree and after protection materials have been removed and properly disposed of by the Contractor. In the event of repairable damages, payment shall be made after the completion of remediation measures.

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

ITEM 102.55 ARBORIST HR

DESCRIPTION

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

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

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

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

SUBMITTALS

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

SCOPE OF WORK

The Arborist shall be responsible for the following tasks:

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

- Oversight
  - direct or execute pruning of branches and/or roots, air spading, and/or other tree care operations
- Monitoring and Inspections
  - periodically inspect fencing and ensure root zones are properly protected and clear of equipment and materials as required by the Engineer
  - reevaluate tree protection measures for various phases of a project
  - submit inspection notes with relevant and dated photos to the Engineer.
- Special Care
  - oversee tree pruning for health and aesthetics
  - recommend fertilization and amendments

- recommend and oversee pest control

METHODS

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

Trees to be removed shall be painted or otherwise marked.

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

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

MEASUREMENT AND BASIS OF PAYMENT

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

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

ITEM 103. TREE REMOVED – DIAMETER UNDER 24 INCHES EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 120.1 UNCLASSIFIED EXCAVATION CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 141. CLASS A TRENCH EXCAVATION CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 141.1 TEST PIT FOR EXPLORATION CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 142. CLASS B TRENCH EXCAVATION CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 144. CLASS B ROCK EXCAVATION CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 146. DRAINAGE STRUCTURE REMOVED EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 100 of the MassDOT Standard Specifications.

ITEM 151. GRAVEL BORROW CY

DESCRIPTION

Work under this Item shall conform to the relevant provisions of Subsections 150 and 170 of the MassDOT Standard Specifications. Gravel Borrow shall conform to Material Specifications M1.03.0

ITEM 152.8 PEA GRAVEL TON

Work under this Item shall conform to the relevant provisions of Section 150 of the Standard Specifications and the following:

The work under this item shall consist of furnishing and placing pea gravel for filter blanket bed in porous pavement areas. Pea gravel shall be 3/8" in conformance with the porous pavement detail and special provision.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Pea Gravel will be measured and paid for at the contract unit price per ton, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 153 CONTROLLED DENSITY FILL - EXCAVATABLE CY

Work under this Item shall conform to the relevant provisions of Section 150 of the Standard Specifications and the following:

Work under this item shall consist of furnishing and placing controlled density fill in mill and overlay pavement construction areas in utility trenches where normal backfill compaction cannot be achieved, and as required by the Engineer. The trench shall be backfilled with controlled density fill to a depth equal to the top of the subbase of the existing pavement structure. The trench shall then be permanently patched with hot mix asphalt to be flush with the existing roadway surface prior to pavement milling in accordance with the Pavement Notes shown on the Typical Sections and Pavement Notes plan sheet.

Controlled density fill material shall conform to Section M4.08.0. Controlled Density Fill and shall be Type 1E – Very Flowable (Excavatable) or Type 2E – Flowable (Excavatable).

METHOD OF MEASUREMENT

Controlled density fill – excavatable, will be measured for payment by the cubic yard, complete in place within the specified limits as required by the Engineer.

BASIS OF PAYMENT

Controlled density fill – excavatable will be paid for at the Contract unit price per cubic yard, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 154. SAND BORROW CY

DESCRIPTION

Work under this Item shall conform to the relevant provisions of Sections 100 of the MassDOT Standard Specifications.

ITEM 156. CRUSHED STONE TN

DESCRIPTION

Work under this Item shall conform to the relevant provisions of Sections 100 of the MassDOT Standard Specifications.

ITEM 170. FINE GRADING AND COMPACTING – SUBGRADE AREA SY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Subsection 170 of the MassDOT Standard Specifications.

ITEM 201. CATCH BASIN EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 200 of the MassDOT Standard Specifications.

ITEM 201.3 SPECIAL CATCH BASIN EA

GENERAL

The work under this item shall conform to the relevant provisions of Section 200 of the Standard Specifications and the following:

Work shall include installation of non-standard (shallow) catch basins with a 4-foot sump and equipped with a hood per the Construction Details included in the plans. The Contractor shall submit to the Engineer for approval each type of special catch basin prior to any work being done related to the special catch basins.

MATERIALS

Prior to ordering of any materials included under this item, the Contractor shall submit to the Engineer shop drawings/catalog cuts for approval.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Special catch basin will be measured and paid for at the contract unit price per each, complete in place and approved, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 202.	**MANHOLE**	**EA**
ITEM 220.	**DRAINAGE STRUCTURE ADJUSTED**	**EA**
ITEM 220.2	**DRAINAGE STRUCTURE REBUILT**	**FT**
ITEM 220.3	**DRAINAGE STRUCTURE CHANGE IN TYPE**	**EA**

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 200 of the MassDOT Standard Specifications.

ITEM 220.6 SANITARY STRUCTURE REBUILT FT

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

Work shall include rebuilding existing sanitary structures when, in the judgment of the Engineer, the masonry shows deterioration the structure shall be rebuilt. The depth of structure rebuilding will be determined in the field by the Engineer. When conditions so warrant, it may be required to rebuild the structure completely. The work shall include, but not be limited to, demolition; excavation; transportation of excavated material; grading; compacted backfill; reinforced concrete; steps and or ladders; brick and mortar, concrete collar and frames to allow the frame to be set to proposed line and grade. The casting and deteriorated masonry shall be neatly removed until a clear sound base is obtained upon which concrete blocks and clay bricks may be set to rebuild the structure. Gravel borrow shall be furnished for backfill where required when excavated material is unsuitable.

The concrete collar shall be brought up only to a height, which will allow a minimum of 3 inches of hot mix asphalt to be placed above the collar. The concrete for collar is to be 4000 psi - 3/4" cement concrete (High Early Strength) and will be considered incidental to this item. Hot Mix Asphalt hand work that is required above the collars, up to the underside grade of the proposed paved surface course will be included under Item 451., Hot Mix Asphalt for Patching.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Sanitary structure rebuilt will be measured for payment by the foot, measured vertically to the nearest 1/10th of a foot increment from the bottom of the rebuilt masonry to the bottom of the casting. If the rebuilding exceeds 3.0 feet from the bottom of the rebuilt masonry to the bottom of the casting, any amount over 3.0 feet, and only said amount, will be paid at 1.3 times the measured depth.
Sanitary structure rebuilt will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment and incidental costs required to complete the work.
Hot mix asphalt handwork and gravel borrow will be paid for separately under HMA for Patching, Item 451., and Gravel Borrow, Item 151., respectively.
No separate payment will be made for removing and resetting frame and covers or for furnishing and installation of the concrete collar, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 220.7 SANITARY STRUCTURE ADJUSTED EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 200 of the MassDOT Standard Specifications.

ITEM 220.8 SANITARY STRUCTURE REMODELED EA

GENERAL

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

When the line, grade, or both line and grade of the sanitary structure changes more than 6 inches the structure shall be remodeled. The maximum casting adjustment allowable shall be 12 inches. Sanitary Structures Remodeled shall include the removal and replacement of precast concrete units, as well as furnishing and installing new precast concrete units, as required, for the structure to conform to the proposed line and grade. All new material and construction methods shall conform to the applicable parts of Section 201 of these Special Provisions.

The concrete collar shall be brought up only to a height, which will allow a minimum of 3 inches of hot mix asphalt to be placed above the collar. The concrete for collar is to be 4000 psi - 3/4" cement concrete (High Early Strength) and will be considered incidental to the respective item. Hot Mix Asphalt hand work that is required above the collars, up to the underside grade of the proposed paved surface course will be paid for under Item 451., Hot Mix Asphalt for Patching.

METHOD OF MEASUREMENT

Sanitary structure remodeled will be measured for payment by each, when the adjustment of structures to line or grade or both line and grade is greater than 6", complete in place.

BASIS OF PAYMENT

Sanitary structure remodeled will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

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

ITEM 222.3 FRAME AND GRATE (OR COVER) MUNICIPAL STANDARD EA

The work under this item shall conform to the relevant provisions of Section 201 and 220 of the Standard Specifications and the following:

The work shall include furnishing and installing municipal standard catch basin frames and grates or manhole frames and covers. New frames, covers, and grates shall be as shown on the City of Newton General Construction Details, as shown on the plans.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Frame and grate (or cover) municipal standard will be measured and paid for at the Contract unit price per Each municipal frame and grate or frame and cover furnished and installed, complete in place, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

Each frame and grate or frame and cover shall be considered as one unit.

ITEM 238.12 12 INCH DUCTILE IRON PIPE FT
ITEM 241.12 12 INCH REINFORCED CONCRETE PIPE CLASS III FT

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 200 of the MassDOT Standard Specifications.

ITEM 269.04 4 INCH SLOT-PERFORATED CORRUGATED PIPE (SUBDRAIN) FT

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

The work shall include the furnishing and placing of perforated pipe or tubing, to the lines and grades as shown on the plans.

The Contractor shall coordinate with the City of Newton and all affected utility owners prior to any work.

QUALIFICATIONS

Manufacturer must be on MassDOT Qualified Construction Materials List (QCML) for all polyethylene pipe.

SUBMITTALS

Provide product data detailing all piping for approval. Include manufacturer's Instructions that indicate special procedures required to install products specified. Certify that products meet or exceed specified requirements.

MATERIALS

This pipe or tubing shall consist of slot-perforated corrugated polyethylene plastic tubing, couplings and fittings. Materials, dimensions, physical properties and fabrication shall be in conformance with AASHTO M252. Pipe/tubing shall be wrapped in filter fabric.

CONSTRUCTION

Corrugated pipe will be laid to the lines and grades shown on the plans, or as otherwise directed.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

4-inch slot-perforated corrugated plastic pipe (subdrain) will be measured and paid for at the Contract unit price per Foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work including excavation, piping, fittings, bedding, initial backfill and backfill materials.

No separate payment will be made for filter fabric, but all costs in connection therewith shall be included in the unit price bid.

No separate payment will be made for coring existing storm drainage structures, but all costs in connection therewith shall be included in the unit price bid.

ITEM 358. GATE BOX ADJUSTED EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 300 of the MassDOT Standard Specifications.

ITEM 360. MONITORING WELL ADJUSTED EA

The work under this item shall conform to the relevant provisions of Section 300 of the Standard Specifications and the following:

The work under this item shall consist of adjusting existing monitoring wells to grade in roadway areas. The work includes removal of the existing roadway box, extending the riser pipe, and resetting the roadway box to the required grade.

Care shall be taken when removing the roadway box to ensure not to damage or misalign the riser pipe in any way. The cap shall remain on the riser pipe at all times to keep soil and other debris from entering the well.

To extend the riser pipe a polyvinylchloride (PVC) coupling of identical diameter shall be installed with additional sections of PVC pipe. After the roadway box is removed, all existing concrete shall be removed from the casing prior to reinstalling. The roadway box shall be reset using 4,000 psi, 1.5 inch, 565 lb Cement Concrete (High Early Strength). The roadway box shall be brought up only to a level which will allow the top course of HMA to be placed.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Monitoring Well Adjusted will be measured and paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 381.3 SERVICE BOX ADJUSTED EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 300 of the MassDOT Standard Specifications.

ITEM 402. DENSE GRADED CRUSHED STONE FOR SUBBASE CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 400 and Material Section M 2.01.7 of the MassDOT Standard Specifications.

ITEM 415.3 PAVEMENT MICRO MILLING SY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 400 and Subsection 415 of the MassDOT Standard Specifications.

ITEM 440. CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL LB
ITEM 443. WATER FOR ROADWAY DUST CONTROL MGL

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 400 of the MassDOT Standard Specifications.

ITEM 451. HMA FOR PATCHING TON
ITEM 452. ASPHALT EMULSION FOR TACK COAT GAL

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 400 and Subsection 450 of the MassDOT Standard Specifications.

ITEM 460.23	**SUPERPAVE SURFACE COURSE – 12.5 (SSC – 12.5)**	**TON**
ITEM 460.31	**SUPERPAVE INTERMEDIATE COURSE -12.5 (SIC – 12.5)**	**TON**
ITEM 460.42	**SUPERPAVE BASE COURSE -37.5 (SBC – 37.5)**	**TON**
ITEM 460.52	**SUPERPAVE LEVELING COURSE (SLC – 9.5)**	**TON**

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 400 and Subsection 460 of the MassDOT Standard Specifications.

METHOD OF MEASUREMENT

Items 460.23, 460.31, 460.42, & 460.52 shall be measured by the ton of actual pavement quantity complete, in place and accepted by the Engineer.

BASIS OF PAYMENT

Items 460.23, 460.31,460.42, & 460.52 will be paid for at the contract unit price per ton. Unit price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 461.	**POROUS PAVEMENT**	**SY**

The work under this item shall conform to the relevant sections of Section 460 of the Standard Specifications and the following:

Work shall include subgrade preparation, installation of the underlying porous media beds, and porous asphalt mix (mix) design, production, and installation. Porous media beds refer to the beds underlying the porous asphalt pavement. Porous asphalt pavement refers to the compacted mix of modified asphalt binder and aggregate.

QUALIFICATIONS

The installer's craftsmen or crew chief shall be certified by the porous pavement manufacturer.

The porous pavement shall be supplied by a manufacturer with at least 10 years of experience that can supply references for similar applications and installations, and that has successfully installed a minimum of 10,000 square feet of porous pavement in the Northeast region within the last two years.

The Porous Pavement installer shall employ an adequate number of skilled workers who are certified by the manufacturer of the Flexible Porous Pavement and are familiar with the specified contract requirements and the methods needed for its installation.

SUBMITTALS

Provide a list of successfully installed Porous Pavement projects, including the address, year of installation, square footage, and photographs for each project.

Provide a list and copies of the certificates of the manufacturer certified workers on staff.

Certificates stating that materials meet or exceed the specified contract requirements, site handling and storage instructions.

Mixing and installation instructions.

A sample that reflects the characteristics of the materials to be installed. The sample, upon arrival, shall be maintained as the standard of minimum quality for all the proposed surfacing and paving work required for the project.

Submittal requirements for samples and certificates include:

Material or Pavement Course*	Properties to be Reported on Certificate**
choker course, reservoir course	gradation, max. wash loss, min. durability index, max. abrasion loss; air voids (reservoir course)
filter course	gradation, permeability
filter blanket	gradation
geotextile filter fabric	manufacturer's certification
striping paint	certificate
binder	PGAB certification
coarse aggregate	gradation, wear, fractured faces, fractured & elongated
fine aggregate	gradation, plasticity index
silicone	manufacturer's certification
fibers (optional)	manufacturer's certification
mineral filler (optional)	manufacturer's certification
fatty amines (optional anti-strip)	manufacturer's certification
hydrated lime (optional anti-strip)	manufacturer's certification

*Samples of each material shall be submitted to the Engineer (or QA inspector for mix).
**At a minimum; more material properties may be required (refer to Materials section).

MATERIALS

All materials, methods of construction and workmanship shall conform to applicable requirements of AASHTO and ASTM Standards.

Provide plant-mixed, hot-laid asphalt-aggregate mixture (open-graded friction course (OG-FC) porous pavement complying with MassDOT standard specifications and meeting the following gradation requirements:

SIEVE DESIGNATION	OG-FC
5/8 INCH	-
1/2 INCH	100
3/8 INCH	90-100
No. 4	30-50
No. 8	5-15
No. 200	1-3
% BITUMEN (AC-20)	6-7

The porous media infiltration beds include, a 4” thick layer of choker course of crushed stone, and a 12” minimum thickness layer of filter course of poorly graded sand (a.k.a. bankrun gravel), 3” minimum thickness filter blanket that is an intermediate setting bed (pea gravel), and a 4” min. reservoir course of crushed stone with underdrain.

Material for the choker course and reservoir course shall meet the following:

Maximum Wash Loss of 0.5%
Minimum Durability Index of 35
Maximum Abrasion Loss of 10% for 100 revs. and max. of 50% for 500 revs.

Material for the choker course and reservoir course shall have the AASHTO No. 57 and AASHTO No. 3 gradations, respectively, as specified in Table 2. If the AASHTO No. 3 gradation cannot be met, AASHTO No. 5 is acceptable with approval of the Engineer.

Reservoir coarse thickness is dependent upon the following criteria:

A 4" minimum thickness of reservoir course is installed as a capillary barrier for frost heave protection at interface between subbase and native materials.

Subdrains, are elevated at minimum 4" from bottom to provide storage and infiltration for 1" water quality volume.

U.S. Standard Sieve Size	Percent Passing (%)			
	Choker Course (AASHTO No. 57)	Filter Coarse (NHDOT 304.2)	Reservoir Course (AASHTO No. 3)	Res. Course lt.* A (AASHTO No. 5)
6" (150mm)	100			
2 ½" (63mm)	-		100	-
2" (50mm)	-		90-100	-
1 ½" (37.5mm)	100		35-70	100
1" (25mm)	95-100		0-15	90-100
3/4" (19mm)	-		-	20-55
½" (12.5mm)	25-60		0-5	0-10
3/8" (9.5mm)	-		-	0-5
#4 (4.75mm)	0-10	25-70	-	-
#8 (2.36mm)	0-5	0-12	-	-

*Alternate gradations (e.g. AASHTO No. 5) may be accepted Engineer's approval.

Filter course material shall have a hydraulic conductivity (also referred to as coefficient of permeability) of 10 to 60 ft/day at 92% compaction unless otherwise approved by the Engineer. Great care needs to be used to not over-compact materials due to loss of infiltration capacity.

Coefficient of permeability for the selected filter course material shall be measured by ASTM D5084 and reported to the Engineer. Filter blanket material between the filter course and the reservoir course shall be an intermediate size between the finer filter course above, and the coarser reservoir course below, for the purpose of preventing the migration of a fine setting bed into the coarser reservoir material.

METHOD OF CONSTRUCTION

Existing subgrade under bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to stone bed placement. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and bring subgrade of stone porous media bed to line, grade, and elevations indicated.

Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of stone. All bed bottoms are level grade.

Upon completion of subgrade work, the Engineer shall be notified and shall inspect at his/her discretion before proceeding with porous media bed installation.

Porous media bed aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of geotextile

at no extra cost to the Owner.

Install coarse aggregate in 8-inch maximum lifts. Lightly compact each layer with equipment, keeping equipment movement over storage bed subgrades to a minimum. Install aggregate to grades indicated on the drawings.

Install choker base course aggregate evenly over surface of stone bed, sufficient to allow placement of pavement, and notify Engineer for approval. Choker base course shall be sufficient to allow for even placement of asphalt but no less than 1-inch in depth.

The porous pavement shall be installed as shown on the plans and in accordance with the manufacturer written instructions.

Pavement shall not be placed shall not be placed between November 15 and March 15 or when ambient temperatures are 50 degrees Fahrenheit and falling.

Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before the time required for adequate cure.

Tack Coat shall not be used.

Spread mix at a minimum temperature of 250 degrees Fahrenheit. Complete compaction before mix temperature cools to 185 degrees Fahrenheit.

Immediately after the asphalt mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling.

Joints between old and new pavements or between successive day's work shall be made to ensure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.

The surface will be tested by the Engineer using a straightedge at least 4.9 m (16 feet) in length at selected locations parallel with the centerline. Any variations exceeding 3 mm (1/8 inch) between any two contact points shall be satisfactorily eliminated. A straightedge at least 3 m (10 feet) in length may be used on a vertical curve. The straightedges shall be provided by the Contractor.

Establish and maintain required lines and elevations as shown on the plans. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks and free of low spots to form puddles. All areas must drain.

Protect adjacent work from splashing of pavement materials. Remove all stains from exposed surfaces of pavement, structures, and grounds. Restore damaged improvements, including existing pavement on or adjacent to the site that has been damaged as a result of construction work, to their original condition or repair as directed to the satisfaction of the Engineer at no additional cost. Remove all waste and spillage.

Pavement Marking installation: Sweep and clean surface to eliminate loose material and dust.
Paint 4-inch-wide parking striping and traffic lane striping in accordance with layouts of plan. Apply paint with mechanical equipment to produce uniform straight edges. Apply in two coats at manufacturer's recommended rates.

Porous pavement beds shall not be used for equipment or materials storage during construction, and under no circumstances shall vehicles be allowed to deposit soil on paved porous surfaces.

QUALITY CONTROL

The Contractor shall submit a mix design at least 10 working days prior to the beginning of production. The Contractor shall make available samples of coarse aggregate, fine aggregate, mineral filler, and a sample of the HMA. A certificate of analysis (COA) will be certified by a laboratory meeting the requirements of AASHTO R18. The Laboratory will be

certified by the state DOT, regional equivalent (e.g. NETTCP), and/or qualified under ASTM D3666. Technicians will be certified by the regional certification agency (e.g. NETTCP) in the discipline of HMA Plant Technician.

If, in the opinion of the Engineer, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

The Engineer shall be notified at least 24 hours prior to all porous media bed and porous pavement work.

The full permeability of the pavement surface shall be tested by application of clean water at the rate of at least 5 gpm over the surface, using a hose or other distribution devise. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the Owner. All applied water shall infiltrate directly without large puddle formation or surface runoff and shall be observed by the Engineer.

Testing and Inspection: Employ at Contractor's expense an inspection firm acceptable to the Engineer to perform soil inspection services, staking and layout control, and testing and inspection of site grading and pavement work. Inspection and list of tests shall be reviewed and approved in writing by the Engineer prior to starting construction. All test reports must be signed by a licensed Engineer.

Test in-place base and surface course for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable work as required by the Engineer.

Surface Smoothness: Test finished surface for smoothness even drainage, using a ten-foot to centerline of paved area. Surface will not be accepted if gaps or ridges exceed 3/16 of an inch.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 461. will be measured and paid for at the Contract unit price per square yard complete in place. Contract unit price shall include all labor, materials, equipment, and incidentals required to complete the work.

ITEM 472. TEMPORARY ASPHALT PATCHING TON

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 400 and Subsection 472 of the MassDOT Standard Specifications.

ITEM 504. GRANITE CURB TYPE VA4 - STRAIGHT FT
ITEM 504.1 GRANITE CURB TYPE VA4 - CURVED FT

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 500 and Subsection 501 of the MassDOT Standard Specifications.

ITEM 504.11 GRANITE PLANTER CURB FT

The work under this item shall conform to the relevant provisions of Section 150, 170, 501 and 901 of the Standard Specifications and the following:

Work under this item shall include furnishing and installing granite planter curb.

Modified Granite Planter Curb - Type VA4 – shall be installed and shall conform to the dimensions and finishes shown on the plans and as required by the Engineer.

Measurement and Payment

Granite Planter Curb will be measured and paid for at the Contract unit price per FOOT, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for storage, transporting and handling, excavation, fine grading and compacting, cement concrete and mortar joints, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 509.	**GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT**	**FT**
ITEM 514.	**GRANITE CURB INLET - STRAIGHT**	**EA**
ITEM 517.	**GRANITE CURB CORNER TYPE B**	**EA**
ITEM 580.	**CURB REMOVED AND RESET**	**FT**
ITEM 594.	**CURB REMOVED AND DISCARDED**	**FT**

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 500 and Subsection 501 of the MassDOT Standard Specifications.

ITEM 629.01	**CONCRETE BARRIER REMOVED AND RESET**	**EA**

The work under this item shall conform to the relevant provisions of Section 600 of the Standard Specifications and the following:

Work under this item shall include removal, transporting, storing, and resetting of the concrete barriers located from STA 26+23 to 26+85 RT.

The concrete barriers shall be reset at the locations shown on the plans after the porous pavement has been installed.

The Contractor shall exercise extreme care in the removal and resetting process and shall take all precautions necessary to protect the existing barriers during the relocation. If the existing planters are damaged by the Contractor during the removal and resetting process, the Contractor shall repair any damage at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Concrete barrier removed and reset will be measured by each, complete in place.

Concrete barrier removed and reset will be paid for at the contract unit price per each unit, which price shall include all labor, material, equipment and incidental costs required to complete the work.

ITEM 691.	**BALANCE STONE WALL REMOVED AND REBUILT**	**FT**

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 600 and Subsection 690 of the MassDOT Standard Specifications.

ITEM 697.1	**SILT SACK**	**EA**

Work under this item shall conform to the relevant provisions of Section 670 of the Standard Specifications and the following:

The work 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 sourced from 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 Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as required by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or surface course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric shall 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 dispose of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost.

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 Contractor's expense. The silt and sediment from the silt sack shall be legally disposed of off-site. Under no circumstance 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 approved by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Silt sack 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, regardless of the frequency of removal and disposal, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 701. CEMENT CONCRETE SIDEWALK SY

The work under this item shall conform to the relevant provisions of Section 701 of the Standard Specifications, City of Newton General Construction Details, and the following:

The work shall include the construction of cement concrete sidewalk in the locations shown on the plans, in accordance with the City of Newton construction details.

The Contractor shall stamp poetry into one panel of cement concrete sidewalk adjacent to the parking area on Chestnut Street in a location designated by the City of Newton. The Contractor shall coordinate with the City of Newton to obtain stamp and determine location of sidewalk poetry.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Cement concrete sidewalk will be measured and paid for at the Contract unit price per square yard, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

Concrete stamping shall be considered incidental to this item.

ITEM 701.1 CEMENT CONCRETE SIDEWALK AT DRIVEWAYS SY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 700 of the MassDOT Standard Specifications.

ITEM 701.2 CEMENT CONCRETE PEDESTRIAN CURB RAMP SY

DESCRIPTION

The work to be done under this item shall conform to the relevant provisions of Subsection 701 of the MassDOT Standard Specifications, City of Newton Sidewalk and Curbing Ordinance latest revision, the current Americans with Disabilities Act (ADA) regulations, as required by the DPW Commissioner, the information contained in Massachusetts Department of Transportation Wheelchair Ramp Standards, and the following:

MATERIALS

The color of all cement concrete sidewalks and curb ramps shall meet the color specifications of the City of Newton. The color shall be “Lamp Black”. The City of Newton Standard is 2.0 pounds of lamp black per cubic yard of concrete. The City shall approve a test section of sidewalk for color prior to installation. Detectable warning panels shall be used on all curb ramps. The contractor shall provide a sample of the panels to the Newton DPW Commissioner for approval. Detectable warning panels shall be “ADA Wet Set” or approved equal. The color of the panels shall be Federal Yellow.

CONSTRUCTION METHODS

All edges of excavations made in sidewalks which will be visible shall be squared by saw cutting with power-driven tools to provide a neat, clean edge for joining new sidewalks as required by the DPW Commissioner. Ragged, uneven edges shall not be accepted. Areas which have been broken or undetermined shall be edged neatly with a minimum disturbance to remaining sidewalks.

ITEM 701.21 DIRECTIONAL DETECABLE WARNING PANEL EA

The work under this item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following:

The work shall include furnishing and installing directional detectable warning panels from STA 11+42 to 11+68 RT as shown on the plans.

Detectable warning panels shall be replaceable directional bar tile panels and the color shall be Federal Yellow.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Directional detectable warning panel will be measured and paid for 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.

ITEM 701.3 STAMPED CEMENT CONCRETE SIDEWALK SY
ITEM 701.4 STAMPED CEMENT CONCRETE SIDEWALK AT DRIVEWAYS SY

The work under these Items shall conform to the relevant provisions of Sections 701 of the Standard Specifications and the following:

Stamped cement concrete sidewalks and driveways shall consist of integrally colored (i.e., incorporated through-out the mix) and dry-shake colored stamped cement concrete complete in place as shown on the plans.

Prior to ordering materials, the Contractor shall submit pattern samples and color samples of each cement concrete type to the Engineer and the City of Newton for approval. Samples of other materials to be used and samples for testing shall be submitted as requested by the Engineer.

A 4 foot by 4 foot cured "mock up" of each type of colored concrete pavement shall be constructed for review and approval by the Engineer in consultation with the City of Newton.

The Contractor shall coordination the location of site amenities prior to the construction of the Sidewalk
.

MATERIALS

- Concrete mix design shall meet the requirements of Section 701 of the Standard Specifications, ASTM C94, and the following:
- Cement: ASTM C150, type 1, Portland cement gray color.
- Minimum Cement Content: 5 sacks per cubic yard of concrete.
- Slump of concrete shall be consistent throughout Project at 4-inches or less. At no time shall slump exceed 5-inches.
- Do not add calcium chloride to mix as it causes mottling and surface discoloration.
- Supplemental admixtures shall not be used unless approved by manufacturer of color admixture.
- Add air entraining agent to concrete work in amounts of 4-7 percent of total concrete volume, or as otherwise recommended by testing lab.
- Add coloring admixture in quantities recommended by admixture manufacturer to achieve selected color. Add colored admixture to the mix according to manufacturer's written instructions in premeasured bags, not by weight of cement content.
- Coloring agents for the colored and stamped concrete shall all be supplied by the same manufacturer as part of an integrated system.

COLOR ADMIXTURES for integrally colored concrete shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are lime proof and UV resistant. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494, and AASHTO M194.
COLOR HARDENERS shall be a heavy-duty grade, UV-stable, dry-shake material for intensely coloring and hardening concrete flatwork. Color hardener shall be a blend of mineral oxide pigments, cement, graded silica aggregates and aluminum oxide, with conditioning agents to improve workability.

RELEASE AGENT: shall be a dry blend of chemical powders and color pigments designed as part of the coloring and patterning system to provide the clean release of the texturing tools form the concrete surface.

CURING COMPOUNDS for Colored Concrete: Curing and sealing compound shall be a ready to use water-based membrane curing compound and sealer designed to increase impact strength of the colored concrete and to repel stains. Curing compound shall comply with ASTM C309, and the slip-resistance requirements of ASTM D-2047, be suitable for exterior use and of same manufacturer as colored admixture, for use with integrally colored concrete.

CONCRETE COLORING SYSTEM COLORS

Color Admixture and Color Hardener for ‘Stamped Cement Concrete Sidewalk’ and for ‘Stamped Cement Concrete Sidewalk at Driveways’ shall be burnt red in color as selected by the Engineer and City of Newton from the manufacturer’s standard color range.

Powder Antiquing Release Agent for each type of stamped concrete: Colors shall be as selected by Engineer from approved manufacturer's standard colors.

Joint Sealant colors shall match the colored concrete surface.

STAMP/IMPRINTING PATTERNS

Stamp pattern for ‘Stamped Cement Concrete Sidewalk’ and for ‘Stamped Cement Concrete Sidewalk at Driveways’ shall be a running bond brick pattern as indicated on the Drawings, or other brick-like pattern as selected by Engineer in consultation with the City of Newton from the approved manufacturer’s standard brick.

PATTERNS

Pattern templates shall be provided for linear accent strip treatment for borders of the stamped concrete, and for running bond pattern for the field of the large paved areas, all as indicated on the detail plans on the drawings.

INSTALLATION

Subgrade preparation and formwork shall be installed to the lines, grades, and depths indicated on the Drawings and in accordance with Section 701.

Place integrally colored concrete mix according to the Standard Specifications and the requirements of ACI 301, 302, and 304. Minimize handling to prevent segregation. Do not add water to the mix in the field.

After consolidating and screeding, float concrete to the gradients indicated.

Apply dry-shake color hardener prior to the application of the imprinting pattern. Apply at rate recommended by manufacturer, in two or more shakes. Float after each shake, and trowel only after the final color hardener shake.

While concrete is still in a plastic state, apply release agent to the troweled surface, and then the surface shall be uniformly stamped/imprinted, applying the pattern as indicated on the drawings and according to the tool manufacturer's instructions. Provide a uniform pattern and uniform depth of stamping. Touch-up pattern and finish edges with hand tools as necessary.

Immediately after finishing concrete, apply curing and sealing compound for integrally colored concrete according to manufacturer's instructions. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency. Curing compound shall be same color as the colored concrete and supplied by same manufacturer of the colored admixture.

Precautions shall be taken in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in CIP 5 Plastic Shrinkage Cracking published by the National Ready Mixed Concrete Association. Do not cover concrete with plastic sheeting.

Minor variations in appearance of colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Stamped cement concrete sidewalk and stamped cement concrete sidewalk at driveways will be measured and paid for at the respective Contract unit prices per Square Yard, which price shall include all labor, materials, equipment, "mock up", and all incidental costs required to complete the work.

ITEM 702. HOT MIX ASPHALT SIDEWALK OR DRIVEWAY TON

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 700 and Subsection 702 of the MassDOT Standard Specifications.

ITEM 704. STONE DUST WALKS TON

DESCRIPTION

The work under this item shall conform to the relevant provisions of Section 150 and 701 of the Standard Specifications and the following:

The work shall include the furnishing and placing of stone dust for use as a walkway as shown on the plans and as required by the Engineer. Weed barrier fabric shall be installed between the subbase and the stone dust.

SUBMITTALS

Prior to construction, the Contractor shall submit a sample of the stone dust and weed barrier fabric to the Engineer for review and approval.

MATERIALS

Stone dust shall consist of clean, inert, hard, durable grains of quartz or other hard durable rock, free from loam or clay, surface coatings and deleterious materials.

Stone dust must meet or exceed the following gradation:

100% passing 3/8"
90-100% passing #4
80-100% passing #8
50-80% passing #16
25-60% passing #30
10-30% passing #50
2-10% passing #100
0-3% passing #200
FM = 2.6-2.9

Color shall be dark gray.

Weed barrier fabric shall be a free draining geotextile commonly used to prevent vegetation growth that can be placed between layers of soil.

CONSTRUCTION

Place, grade and compact at the lines and grades as shown on the plans and as required by the Engineer. The stone dust shall be spread and compacted to yield a compacted depth of 4 inches and shall be compacted to the acceptance of the Engineer using either power rollers or tamping rollers or other devices approved for use by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Stone dust walks will be measured and paid for at the contract unit price per ton, 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 weed barrier fabric, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 707.01 BOULDER REMOVED AND STACKED EA

The work shall include removing and stacking existing boulders at STA 26+32 to 26+68 RT. The boulders shall be stacked at a location outside the work zone to allow for sidewalk construction and grading of the slope behind the sidewalk. This location shall be outside of the clear zone which shall be defined as a minimum of 14-feet behind the proposed gutter line.

The Contractor shall exercise extreme care in the removal and stacking process. Blankets and lifting straps, or other methods as approved by the Engineer, shall be utilized as to prevent damage to the existing stones.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Boulder removed and stacked will be measured and paid for at the Contract unit price bid per each boulder removed and stacked at the agreed upon location, which price shall include all labor, materials, equipment, and incidental costs required to complete the work as described.

ITEM 707.11 BENCH - BACKED EA
ITEM 707.12 BENCH - BACKLESS EA
ITEM 707.13 GAME TABLES AND CHAIRS EA
ITEM 707.2 TRASH RECEPTACLE EA

The work under this item shall conform to the relevant provisions of Sections 150 and 170 of the Standard specifications and the following:

Work under this item shall include furnishing and installing steel benches, games tables and chairs, and steel trash receptacles as shown on the plans.

References

ASTM Testing Standards:
- ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
- ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
- ASTM D 523 – Standard Test Method for Specular Gloss.
- ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
- ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
- ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
- ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

1. ISO Testing Standards:
   ISO 1520 – Paints and Varnishes – Cupping Test.
   ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.
2. ANSI/BIFMA Testing Standards:
   ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.

Submittals

Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.

Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

Submit manufacturer's samples of materials, finishes, and colors.

Submit Manufacturer's standard warranty.

Delivery, Storage and Handling

Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.

Protect materials and finish during handling and installation to prevent damage.

Warranty

Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.

The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.

The manufacturer shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized service representative.

Purchasers should be aware that normal use of these products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

Materials

Item 707.11 Bench-Backed shall be 6'-0" cast aluminum bench leg with full height back and arms, steel slat seat. All steel members shall be hot dipped galvanized then finished with a polyester powder coating, color shall be black, surface mounted with ½" x 3 ¾" expansion anchor bolts.
Bench-Backed shall be: Dumor, model number "493-60"; Landscape Forms, Scarborough Bench, Backed, 72" length; Victor Stanley, CR-196 Standard Bench with Ductile Iron End Frames; or approved equal.
Item 707.12 Bench – Backless shall be 6'-0" cast aluminum bench leg w/arms, steel slat seat. All steel members shall be hot dipped galvanized then finished with a polyester powder coating, color shall be black, surface mounted with ½" x 3 ¾" expansion anchor bolts.
Bench -Backless shall be: Dumor, model number "494-60"; Landscape Forms Scarborough Bench, Backless, 72" Length; Victor Stanley CR-296 Standard Backless Bench with Ductile Iron End Frames; or approved equal

Item 707.13 Game Tables and Chairs shall be 36" square in-ground mount table including optional game board top. All steel members shall be hot dipped galvanized then finished with a polyester powder coating, color shall be black.
Game Table and Chairs (3 per table) shall be: Victor Stanley Inc., model number "IPR-36" Steelsite™ Series table with chairs (24" wide x 24" deep, backed seat, in-ground mount, model number "NRS-24" Steelsite™ Series); Dumor 78-32, 2-Seat ADA Game Table; Maglin MTB-1100-00005, 3-Seat Steel Game Table; or approved equal.
Item 707.2 Trash Receptacles shall be: Victor Stanley, model number "SD42"; Dumor 157-32SH W/CVB-30-FTO, 32-Gallon Receptacle with Shield; Maglin MTR-0200-00016 32 Gallon Receptacle with Spun Metal Dome Lid; or approved equal.
All products and materials shall be approved by the City prior to ordering.

Finishes

All fabricated metal components are steel shotblasted, etched, phosphatized, preheated, and electrostatically powder-coated with TGIC polyester powder coatings. Products are fully cleaned and pretreated, preheated and coated while hot to fill crevices and build coating film. Coated parts are then fully cured to coating manufacturer's specifications.

The thickness of the resulting finish averages 8-10 mils (200-250 microns).

Hardware

Fasteners: Stainless steel hardware.

Adhesive

Bench, table, and trash receptacle supports shall be secured with Construction Adhesive to prevent vandalism, as approved by the Engineer.

Construction Adhesive shall dry clear.

Concrete Footing

Concrete footings shall be 4000 psi, 3/4 inches high early strength concrete conforming to Section M4 and constructed to the dimensions shown on the Contract Documents.

Grout

Grout as required for anchoring shall be a pourable, quick setting, non-metallic and non-shrinking hydraulic cement grout equal to the following:

1. Five Star Grout
   U.S. Grout Corporation
   425 Stillson Road
   Fairfield, CT 06430
   (800) 243-2206

2. Sika Grout 212
   Sika Corporation
   Lyndhurst, NJ 07071
   (201) 933-8800

3. Harris Construction Grout
   AH Harris & Sons
   10 West Mill St.
   Medfield, MA 02052
   (508) 359-7321

Construction Methods

Inspect all work areas at the Project Site to assure that proper conditions exist to receive delivery of items fabricated under this Section. Notify the Engineer in writing before delivery should any condition exists that requires correction. Failure to make such a report shall be construed as acceptance of the existing conditions at the Project Site and the responsibility for delays of Work and damage to Items.

Newly fabricated work shall be shop assembled in sections or entirely so far as practicable, except as indicated the Drawings, and accurately finished with any separate sections match-marked for coordinated field erection. Where necessary, measurements shall be made of prior installed construction before fabrication of the items so that work included shall properly fit the construction.

All work shall conform to details indicated on the Drawings, be clean and straight with sharply defined profiles. Unless otherwise noted, finish surfaces shall be smooth.

Dimensions of new materials and details of assembly and support shall be provided as indicated on Drawings or as otherwise required to provide ample strength and stiffness.

Provide holes and connections as required on the Drawings to accommodate the work of other trades for site assembly of Miscellaneous Metals work. Holes shall be drilled or punched only and, as required, tapped or reamed in the shop. Show sizes and locations of all such machining on the Shop Drawings.

Joints and connections exposed to weather shall be formed or otherwise made to exclude water.

Installation

Examine areas to receive benches, games tables and chairs, and trash receptacles. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not begin installation until unacceptable conditions are corrected.

Install benches and tables and chairs in accordance with manufacturer's instructions at locations indicated on the Drawings.

Install benches and tables and chairs level. Threaded anchor rods in holes drilled in concrete or other surface material.

Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Engineer.

Remove and replace damaged components that cannot be successfully repaired as determined by Engineer.

Do not use harsh cleaning materials or methods that could damage finish.

Protect installed benches to ensure that, except for normal weathering, benches will be without damage or deterioration at time of Substantial Completion.

Apply construction adhesive according to manufacturer's instructions.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Benches, Game Table and Chairs, and Trash Receptacles will be measured and paid for at the Contract unit price bid per each complete in place, which price shall include all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for excavation, gravel borrow, base materials, steel for bench supports, reinforcing steel for table or chair supports, concrete footings, finishes, grout, hardware, adhesive or fine grading and compacting, but all costs in connection therewith shall be included in the contract unit price bid.

ITEM 707.151 PARK BENCH REMOVED AND STACKED EA

The work under this item shall conform to Section 120 and 150 of the Standard Specifications and the following:

The work under this item shall include the removal and stacking of existing park benches at the locations shown on the plans and as required by the Engineer.

The wood slats, posts, and all hardware shall be stacked on boards for pick-up by the City of Newton, as determined by the Engineer.

The work shall also include the removal and disposal of footings, if present, up to a depth of 12 inches below the proposed surface.

Existing slats, posts and/or hardware determined to be unsatisfactory for reuse shall become the property of the Contractor and shall be removed and discarded. All slats, posts and/or hardware designated to be discarded shall be carefully removed, transported and discarded in accordance with all applicable regulations.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Park bench removed and stacked will be measured and paid at the Contract unit price per Each, which price shall include all labor, equipment, materials and all incidental costs required to complete the work.

ITEM 707.21 TRASH RECEPTACLE REMOVED AND RESET EA

The work under this item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following:

The work shall include removing the existing trash receptacles, including their foundations, and resetting them at the locations shown on the plans or as required by the Engineer. If the existing foundations are unsuitable for reuse, a new foundation of similar size and material shall be provided.

The Contractor shall exercise extreme care in the removal and resetting process and shall take all precautions necessary to protect the existing trash receptacles during the relocation. If the existing trash receptacles are damaged by the Contractor during the removal and resetting process, the Contractor shall repair any damage or replace the trash receptacle if damaged beyond repair at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Trash receptacle removed and reset will be measured and paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for excavation, backfill, or foundations if required, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 707.3 TREE GRATE EA

The work under this item shall conform to the relevant provisions of Sections 150 and 170 of the Standard Specifications and the following:

Work under this item shall include furnishing and installing Cast Iron Tree Grates.

References

ASTM Testing Standards:

ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
ASTM D 523 – Standard Test Method for Specular Gloss.
ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

3. ISO Testing Standards:
ISO 1520 – Paints and Varnishes – Cupping Test.
ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

4. ANSI/BIFMA Testing Standards:
   ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.

Submittals
Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.

Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

Samples: Submit manufacturer's samples of materials, finishes, and colors.

Warranty: Manufacturer's standard warranty.

Delivery, Storage and Handling
Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.

Protect materials and finish during handling and installation to prevent damage.

Warranty Information

Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.

The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.

The manufacturer shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized service representative.

Purchasers should be aware that normal use of these products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

Materials – General

Item 707.3 Tree Grate shall be 48" x 48" square grate with 18" dia tree opening size, ADA Compliant slot sizes.

Tree Grate shall be: Neenah Foundry, model number "R-8706-1A"; Urban Accessories 4' Square Kiva Tree Grate with 4' Square Type "S" Pedestrian Duty Frame; EJ, Product 00867101, 8671 Sunray 48" Square Tree Grate with 18" Diameter Tree Opening (to be installed with EJ Product TF48482000 48" Square 2-Piece Tree Frame Standard Anchor); or approved equal.

Concrete Footing

Concrete footings shall be 4000 psi, 3/4 inches high early strength concrete conforming to Section M4 and constructed to the dimensions shown on the Contract Documents.

Grout

Grout as required for anchoring shall be a pourable, quick setting, non-metallic and non-shrinking hydraulic cement grout equal to the following:

1. Five Star Grout
   U.S. Grout Corporation
   425 Stillson Road

Fairfield, CT 06430
(800) 243-2206

2. Sika Grout 212
   Sika Corporation
   Lyndhurst, NJ 07071
   (201) 933-8800
3. Harris Construction Grout
   AH Harris & Sons
   10 West Mill St.
   Medfield, MA 02052
   (508) 359-7321

Construction Methods

Inspect all work areas at the Project Site to assure that proper conditions exist to receive delivery of items fabricated under this Section. Notify the Engineer in writing before delivery should any condition exists that requires correction. Failure to make such a report shall be construed as acceptance of the existing conditions at the Project Site and the responsibility for delays of Work and damage to Items.

General

Newly fabricated work shall be shop assembled in sections or entirely so far as practicable, except as indicated the Drawings, and accurately finished with any separate sections match-marked for coordinated field erection. Where necessary, measurements shall be made of prior installed construction before fabrication of the items so that work included shall properly fit the construction.

All work shall conform to details indicated on the Drawings, be clean and straight with sharply defined profiles. Unless otherwise noted, finish surfaces shall be smooth.

Dimensions of new materials and details of assembly and support shall be provided as indicated on Drawings or as otherwise required to provide ample strength and stiffness.

Provide holes and connections as required on the Drawings to accommodate the work of other trades for site assembly of Miscellaneous Metals work. Holes shall be drilled or punched only and, as required, tapped or reamed in the shop. Show sizes and locations of all such machining on the Shop Drawings.

Examination
Examine areas to receive tree grates.
Notify Architect of conditions that would adversely affect installation or subsequent use.
Do not begin installation until unacceptable conditions are corrected.

Installation
Install tree grates in accordance with manufacturer's instructions at locations indicated on the Drawings.

Adjusting
Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Engineer.

Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Engineer.

Cleaning: Do not use harsh cleaning materials or methods that could damage finish.

Protection: Protect installed tree grates to ensure that, except for normal weathering, tree grates will be without damage or deterioration at time of Substantial Completion.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Tree Grates will be measured and paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for excavation, gravel borrow, base materials, concrete footings, finishes, grout, hardware, adhesive or fine grading and compacting, but all costs in connection therewith shall be included in the contract unit price bid.

ITEM 707.4 MOVEABLE PLANTERS REMOVED AND RESET EA

The work under this item shall conform to the relevant provisions of Sections 150 and 170 of the Standard Specifications and the following:

Work under this item shall include removal, transporting, storing, and resetting of the movable planters located from STA 26+25 to 26+66 RT.

The planters shall be reset at the locations shown on the plans after the porous pavement and sidewalk have been installed.

The Contractor shall exercise extreme care in the removal and resetting process and shall take all precautions necessary to protect the existing planters during the relocation. If the existing planters are damaged by the Contractor during the removal and resetting process, the Contractor shall repair any damage or replace the planter if damaged beyond repair at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Movable Planters removed and reset will be measured by each, complete in place.

Movable Planters removed and reset will be paid for at the contract unit price per each unit, which price shall include all labor, material, equipment and incidental costs required to complete the work.

ITEM 707.41 MOVEABLE FURNITURE REMOVED AND RESET EA

The work under this item shall conform to the relevant provisions of Sections 150 and 170 of the Standard Specifications and the following:

Work under this item shall include removal, transporting, storing, and resetting Movable Furniture at the following locations:

Table and Chairs at STA 22+83, 59' RT and STA 22+90, 57' RT
Picnic Tables at STA 26+33, 30' RT and STA 26+59, 30' RT

The Contractor shall exercise extreme care in the removal and resetting process and shall take all precautions necessary to protect the existing furniture during the relocation. If the existing furniture is damaged by the Contractor during the removal and resetting process, the Contractor shall repair any damage or replace the furniture if damaged beyond repair at the Contractor's expense.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Movable Furniture removed and reset will be measured as a set of one table and three chairs or one picnic table. The complete table and chairs set, or picnic table will be measured by EACH, complete in place.

Movable Furniture removed and reset will be paid for at the contract unit price per EACH set, which price shall include all labor, material, equipment and incidental costs required to complete the work.

ITEM 707.8 STEEL BOLLARD EA

The work under this item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following:

The work shall include the installation steel bollards in accordance with the plan and detail. Steel bollards shall be painted, or powder coated black. Paint shall conform to the requirements under section M7.00.0.

Submittals
Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.

Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

Samples: Submit manufacturer's samples of materials, finishes, and colors.

Warranty: Manufacturer's standard warranty.

Delivery, Storage and Handling
Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.

Protect materials and finish during handling and installation to prevent damage.

Cement concrete fill shall conform to the relevant provisions of Section 900 of the Standard Specifications and the manufacturer's specifications.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Steel bollard will be measured and paid for at the Contract unit price per each steel bollard installed, complete in place. Contract unit price shall include all labor, materials, equipment and incidentals required to complete the work, including concrete encasement, gravel borrow, and steel reinforcing bars.

ITEM 707.82 POST REMOVED AND STACKED EA

The work under this item shall conform to the relevant provisions of Sections 120 and 150 of the Standard Specifications and the following:

Work shall include removal and stacking of posts as shown on the plans. The post shall be carefully removed and stacked on wooden boards at the City of Newton Department of Public Works at 74 Elliot Street, Newton, MA 02464 or at a location determined by the Engineer. The Contractor shall exercise care and make every effort to protect the post and keep it intact during removal and transport.

The Contractor shall completely remove the post and backfill with compacted gravel all holes resulting from the removal of the existing post and their foundations and restore the area to match existing conditions of adjacent areas.

The work shall also include the removal and disposal of footings, if present, up to a depth of 12 inches below the proposed sidewalk surface.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Post Removed and Stacked will be measured for payment per each as called out on the plans or as required by the Engineer, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for excavation, backfill, or transportation but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 707.9 BICYCLE RACK EA

The work under this item shall conform to the relevant provisions of Sections 150 and 170 of the Standard Specifications and the following:

Work under this item shall include furnishing and installing stainless steel bike racks or City of Newton Standard Bike Rack.

References

1. ASTM Testing Standards:
   ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.
   ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
   ASTM D 523 – Standard Test Method for Specular Gloss.
   ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
   ASTM D 3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
   ASTM D 3363 – Standard Test Method for Film Hardness by Pencil Test.
   ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

2. ISO Testing Standards:
   ISO 1520 – Paints and Varnishes – Cupping Test.
   ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

Submittals

Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.

Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

Samples: Submit manufacturer's samples of materials, finishes, and colors.

Warranty: Manufacturer's standard warranty.

Quality Standards

The current issue of Standard Code of Arc and Gas Welding in Building Construction shall apply to this Section, Bike Racks, as though written out in full. Welding shall be in accordance with the Structural Welding Code of the American Welding Society.

Where structural joints are made by welding, the details of all joints, techniques of welding employed, the appearance and quality of welds made, and the methods used to correct defective work shall conform to requirements of the AISC and AWS codes.

Welds shall be made only by welders who have previously been qualified by tests as prescribed in AWS "Standard Qualification Procedure" for the type of work required.

All dissimilar metals shall be insulated to prevent bimetallic interaction.

Workmanship and finish shall be equal to the best practice of modern shops for each item of work. Metal fabrication shall be accomplished using the highest standards of workmanship. All work shall be executed by experienced metal workers, shall conform to the requirements of the Contract Documents, and meet the following requirements.

1. Individual metal pieces shall be saw cut and carefully fitted together.
2. Sections shall be well formed to shape and size with sharp lines and angles; curved work shall be sprung evenly to curves.
3. Exposed surfaces shall have a smooth finish and sharp, well defined lines and arises.
4. Grind all edges of bars and plates completely free from nicks and machine marks.
5. All surfaces and connections of metal items shall be without visible grinding marks, surface differentiation or variation.
6. All fabricated metal items shall be fine sanded throughout to produce a high standard of surface smoothness.
7. Welding shall be continuous and shall extend for the entire length of the joints except where specifically indicated on the Contract Documents. All exposed welds shall be ground smooth.
8. Weld with uncoated wire to prevent flux deposits. If coated wire is used, all flux residue shall be thoroughly removed and bare white metal exposed, prior to galvanization, if applicable. Where overlapping surfaces are welded, seal off contact area by welding all edges around contact area.
9. All welds shall be water tight.
10. All shop connections shall be full seam welded and ground flush and smooth. Field connections bolted unless otherwise permitted as indicated in this specification.

Where the work of this specification must be attached to other materials or where it must be assembled and installed in the field, Contractor shall cut, drill, punch and ream, countersink and tap, or otherwise provide the required holes in the shop, unless such connections are to be welded. The sizes and locations
of all such holes shall be shown on the Shop drawings.

Metalwork to be built in with concrete shall be of the form required for anchorage or shall be provided with suitable anchors or expansion shields.

All materials and workmanship under this specification shall be subject to inspection in the mill, shop or field by the Architect, or by qualified inspectors retained by the Owner. Inspection shall be without expense to the Contractor. However, such inspection, wherever conducted, shall not relieve Contractor of his responsibility to furnish materials and workmanship in accordance with Contract requirements.

Delivery, Storage and Handling

Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.

Handling: Protect materials and finish during handling and installation to prevent damage.

Warranty

Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.

The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.

The manufacturer shall, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.

Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

Materials

Metals - Stainless Steel

Pipe and tubing shall conform to Schedule 10s, Type 304 circular stainless steel meeting the requirements of ASTM A312/A312M.

Stainless steel hardware shall be AISI Type 304 conforming to the requirements of ASTM A193M, Identification Symbol B8 or B8A.

Stainless steel finish shall be No. 4 unless specified otherwise. Stainless steel shall have a surface roughness of 0.5 microns or less.

Recycled content shall be:

1. Recycled Material Content: Minimum 65 percent.
2. Post-Consumer Material Content: Minimum 50 percent.
3. Pre-Consumer Material Content: Minimum 15 percent.
4. Recyclable: 100 percent.

Bike Rack

Bike rack shall be a "ring" rack conforming to the Contract Documents. Bike rack shall have the capacity to store two bicycles.

Bike rack shall be made of tubular steel with an Outside Diameter of 1.5 inches and a Wall Thickness of 0.120 inches.

Bike rack shall be 32 inches high by 25 inches wide by 1 ½ inches deep.

Concrete Footing

Concrete shall be 4000 psi, 3/4 inches high early strength concrete conforming to Section M4 and constructed as shown on the Contract Documents.

Grout

Grout as required for anchoring shall be a pourable, quick setting, non-metallic and non-shrinking hydraulic cement grout equal to the following:

1. Five Star Grout
   U.S. Grout Corporation
   425 Stillson Road
   Fairfield, CT 06430
   (800) 243-2206

2. Sika Grout 212
   Sika Corporation
   Lyndhurst, NJ 07071
   (201) 933-8800

3. Harris Construction Grout
   AH Harris & Sons
   10 West Mill St.
   Medfield, MA 02052
   (508) 359-7321

Construction Methods

Inspect all work areas at the Project Site to assure that proper conditions exist to receive delivery of items fabricated under this Section. Notify the Engineer in writing before delivery should any condition exists that requires correction. Failure to make such a report shall be construed as acceptance of the existing conditions at the Project Site and the responsibility for delays of Work and damage to Items.

Installation

The Contractor shall install in accordance with manufacturer's instructions at locations indicated on the Drawings.

Bike racks shall be installed level and shall be securely anchored in place.

Metal Fabrication – General

Take all measurements required at the work site. Check measurements, compare dimensions and other data with various trades installing adjoining work to assure proper coordination.

Do all shop drilling, shop fitting, shop cutting, shop welding, and bolting required to erect, install and fit metal work to adjoining work. Conform to AISI Code for Stainless Steel as applicable. Furnish all screws, bolts, anchors, etc., required to attach metal work securely to adjoining work.

Welding shall be continuous except where tack welding is specifically permitted. Tack welding will not be permitted on exposed surfaces. All exposed welds shall be ground smooth.

Do not enlarge unfair holes by burning and forcing, but correct by reaming.

Furnish all required metal inserts, anchor slots, anchors, anchor bolts, fastenings, etc., for attachment of work of all trades to cast-in-place concrete and concrete pavers, except where otherwise specified or obviously included under other specifications.

Weld with uncoated wire to prevent flux deposits. If coated wire is used, all flux residue shall be thoroughly removed and bare white metal exposed. Where overlapping surfaces are welded, seal off contact area by welding all edges around contact area.

Installation

All metal items fabricated under this specification shall be transported to the construction site and installed in accordance with the requirements of this specification. Cost of transportation of all items fabricated under this specification shall be paid for under this Section.

Install fabricated site metal in conformance to the Contract Documents and approved Shop Drawings.
Core drill all holes in concrete in precise locations established in the field with fabricated site metal furnishings on hand.

Set posts in cored holes with non-shrink grout, recessed 0.75 inches to receive sealant. All care shall be taken to prevent cracks, chips, or scratches to the accepting materials surface during the core drilling process.

Adjusting

Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Engineer.

Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Engineer.

Cleaning

Clean rack promptly after installation in accordance with manufacturer's instructions. Do not use harsh cleaning materials or methods that could damage finish.

Protection

Protect installed racks to ensure that, except for normal weathering, racks will be without damage or deterioration at time of Substantial Completion.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Bicycle rack will be measured and paid for at the Contract unit price bid per each complete in place, which price shall include all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for excavation, base materials, concrete footings, metal and metal fabrication, grout, adjusting or cleaning, or fine grading and compacting, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 724.1 RADIAL GRANITE WALL WITH ENGRAVING FT
ITEM 724.2 GRANITE SEAT WALL FT

GENERAL

The work of these Items consists of furnishing and installing all granite landscape features, engraving recessed lettering and graphics into select stone, lithichrome staining of engravings, and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to radial granite wall with engraving and granite seat walls.

References

Unless otherwise specified or indicated, materials and workmanship shall conform with the latest edition of the following standards, codes, specifications, requirements and regulations:

ASTM: American Society for Testing and Materials.
C 97 Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
C 99 Test Methods for Modulus of Rupture of Dimension Stone
C 170 Test Method for Compressive Strength of Dimension Stone
C 615 Specification for Granite Dimension Stone
C 880 Test Method for Flexural Strength of Dimension Stone

SSPC: Steel Structures Painting Council.

NBGQA Specifications: National Building Granite Quarries Association Specifications, latest edition.

Submittals, Samples, and Shop drawings

At least thirty (30) days prior to intended use, the Contractor shall provide the following samples and submittals for approval. Do not order materials until Engineer's approval of samples, certifications and/or test results has been obtained. Delivered materials shall closely match the approved samples. Samples and Approvals which are not obtained prior to the ordering of materials or the completion of work shall result in possible disapproval of obtained materials or completed work. Take measurements and verify dimensions at site before submitting Shop Drawings and constructing samples.

Shop Drawings: Submit black line copies of each of detailed Shop Drawings for each item required to be fabricated or installed under this Section. Include plans, sections and details as required to show all materials, layout, dimensions, jointing and connections for all items required. Shop drawings required for radial granite wall with engraving, template for engravings for radial granite wall.

Material Samples: Submit 3 representative samples of the following materials:

Granite for granite walls, complete showing finishes and full-size engraving with lithichrome stain. Sample sizes shall

be two (2) inches thick sized to receive engraving with one (1) inch free margin all sides. Submit name and address of granite quarry supplying granite for approval by the Engineer.

Manufacturer's Literature: Submit four (4) copies of each of manufacturer's material descriptions, color chips and/or installation instructions lithichrome stone paint for engraving

Quality Standards

Workmanship and finish shall be equal to the best practice of modern shops for each item of work. Exposed surfaces shall have a smooth finish and sharp, well-defined lines and arises. Sections shall be well formed to shape and size with sharp lines and angles; curved work shall be sprung evenly to curves.

Delivery, Storage and Handling

Deliver and store work under this Section in a manner to prevent wracking or stress of components, and to prevent mechanical damage or damage by the elements.

Deliver work to the site in sufficient time to avoid delay in job progress and at such times as to permit proper coordination of the various parts.

Guarantee

Furnish and deliver standard written manufacturer's guarantee in Owner's name covering all materials and workmanship under these Items.

Supplier shall pay for repairs of any damage to any part of the project caused by defects in his work and for any repair to the materials or equipment caused by replacement. All repairs are to be done to as required by the Engineer.

Any part of the work installed under this contract requiring excessive maintenance shall be considered as being defective, and shall be replaced by the Supplier during the one-year period at no cost to the Owner.

MATERIALS

Aggregate Base Course

Base shall be compacted gravel borrow, M1.03.0, Type C.

Cement Concrete Pavement

In accordance with M4.02.00 Cement Concrete, 4000 psi, 3/4-inch aggregate.

Cement Concrete

In accordance with M4.02.00 Cement Concrete, 4000 psi, 3/4-inch aggregate.

Radial Granite Wall with Engraving and Granite Seatwall

All stone shall be of structural granite, hard and durable, and the color as specified. Granite shall be free from seams that impair its structural integrity of smooth splitting character. Natural variations characteristic of the deposit will be permitted. Granite shall come from an approved quarry. Test samples shall conform to the requirements of ASTM C615.

Color of granite pier shall be a light-medium gray as specified below with no veining within stone. Color of granite collar shall be a charcoal gray-black as specified below with no veining within stone.

Granite for granite pier shall be one of the following or approved equivalents:

- Chelmsford Grey Granite supplied by Fletcher Granite Co., LLC, 534 Groton Road, Westford, MA 01863, phone: (978) 251-4031

- Woodbury Grey Granite supplied by Swenson Granite Works, 369 North State Street, Concord, NH 03301, phone: (603) 225-4322

- Midnight Gray Granite Supplied by New England Stone LLC, 285 Smith Street, North Kingstown, RI 02852, phone: (401) 294-1200

Granite Properties

Use only one source for each type of granite throughout the entire Project.

Granite material shall meet to the following minimum requirements:

Abrasion: 70.0 Ha
Absorption: 0.4% (average)
Compressive strength: 19,000 psi (average)
Modulus of rupture: 1,500 psi (average)

Granite Fabrication Requirements

Exposed surfaces shall be finished with a thermal finish.

Fabricate granite in accordance with the tolerances specified in NBGQA Specifications and as indicated.

All faces shall be at right angles as required by the plans and detailed drawings.

Granite shall be cut accurately to required shapes and dimensions.

Holes, cut-outs, sinkages and openings in granite work for anchors, cramps, dowels, supports, and lifting devices shall be accurately cut or drilled to required dimensions, as shown on the approved shop drawings, and as necessary to secure granite in place to ensure correct location and accurate fit of all fixtures. Setting beds shall be shaped to fit supports.

Arrises shall be cut sharp and true to square, and continuous with adjoining arrises. Where exposed, arrises shall be eased.

Flatness Tolerance: Variation from true plane, or flat surfaces, shall be determined by use of a 4-foot long straightedge, applied in any direction on the surface. Such variation on surfaces at the bed and joint arris lines shall not exceed 1/4" of the specified joint width.

Thermal finish shall not exceed 3/16-inch variations from true plane to other parts of the face surfaces.

Engraving and Lithichrome Painting

Letters shall also be carved or sandblasted 1" deep. Text letters shall receive a high-quality dark gray "Lithichrome" coating to be approved by the Engineer.

"Lithichrome" coating for carved or sandblasted lettering shall be stone paint specifically designed and manufactured for providing color-fast, ultra-violet light resistant pigments to granite. Chemical carrier shall be monocyclic terpene composed of acrylic resin, methyl isobutyl ketone, ethyl acetate, and acetone.

CONSTRUCTION METHODS

Compacted Aggregate Base

Contractor shall excavate, place compacted aggregate base and backfill materials in accordance with Section 100 – EARTHWORK, GRADING, DEMOLITION, RODENT CONTROL AND BORINGS, of the Standard Specification for Highways and Bridges.

Cement Concrete Pavement

In accordance with Section 701, SIDEWALKS, WHEELCHAIR RAMPS AND DRIVEWAYS, of the Standard Specification. Provide formwork and broom finish in accordance with the plans and detailed drawings

Cement Concrete

In accordance with Section 901, CEMENT CONCRETE MASONRY, of the Standard Specification.

Radial Granite Wall with Engraving and Granite Seat Wall

Fabricate granite walls and engraving as shown on approved Shop Drawings.

Install engraved granite walls in quantity and location as shown on the Drawings.

Set walls plumb and at the height shown on the plans and detail drawings.

Lifting and handling of all granite pieces shall be done with fabric or leather straps. No chains will be permitted.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Radial Granite Wall with Engraving and Item 724.2 Granite Seatwall will be measured and paid for at the Contract unit price bid per Foot, complete in place, which price shall include all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for excavation, backfill and base materials, footing materials, engraving and stone paint, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 748. MOBILIZATION LS

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 700 and Subsection 748 of the MassDOT Standard Specifications.

ITEM 751. LOAM FOR ROADSIDES CY

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 700 and Subsection 751 of the MassDOT Standard Specifications.

ITEM 752.51 STRUCTURAL SOIL CY

The work under this item shall conform to the relevant provisions of Sections 150, 170, 751 and 770 of the Standard Specifications and the following:

The work shall include sand based structural soil and related items as indicated on the Drawings or specified herein, but is not limited to, testing, placing, spreading and grading planting media and related items.

This Section specifies administrative and procedural requirements for manufactured structural planting soil including, but not limited, to the following:

1. Evaluation of rough subgrade water infiltration.
2. Planting soil material acquisition
3. Testing and analysis for specification conformance.
4. Inspection and testing of subgrade for preparation of subgrade.
5. Preparation of soil mediums and testing for conformance.
6. Installation and placement of soils.
7. De-compaction of soils.
8. Final in-place testing of soils.
9. Coordination with other contractors.
10. Placement of aeration grates and piping
11. Clean-up.

REFERENCES AND STANDARDS

Comply with applicable requirements of:

1. State of Massachusetts, Department of Transportation, latest edition.
2. American Association of Nurserymen, American Standards for Nursery Stock, (ANSI Z60.1), latest edition, published by the American Association of Nurserymen, 1250 I Street, N.W., Suite 500 Washington, D.C. 20005.
3. ASTM: American Society of Testing Materials.
4. ANSI: American National Standards Institute.
5. AOAC: Association of Official Agricultural Chemists.
6. USDA: United Stated Department of Agriculture.

Quality Assurance/Definitions

Structural Soil: Planting Medium composed of a blend of three base components: base loam, organic material and sand. The quality of the blend depends on the quality of the original components. Contractor responsible for locating and obtaining approval of sources for base loam, organic material and sand that meet the Specification requirements. Contractor is then responsible for mixing the components. Approximate mixing ratios are provided, but may require adjustment, depending on the final materials and with the approval of the Landscape Architect or their representative, in order to meet Specification requirements for each blend.

1. Base Components
   a. Base Loam: a natural growing medium.
   b. Organic Material or Compost: a fully decomposed organic material.
   c. Sand: uniformly graded medium to coarse sand.

2. Sand Based Structural Soils: a soil blend for trees where planting soils are beneath paving.

Testing, Submittals, Mock-Ups And Inspections

Critical Path Processing - Soils Testing Report Submittals:

1. Contractor responsible for recognizing that these critical project materials warrant timely and serious attention, that the testing process to achieve approved materials shall be considered a lead time item, and that under no circumstance shall failure to comply with all specification requirements be an excuse for "staying on project construction schedule" or for expedient substitution of unacceptable material(s).

Product Data: submit most recent printed information from manufacturer in accordance with the requirements of Item 752.5 Planting Soil.

Certificates: Submit certification that soil blend components and soil mediums meet environmental standards of the State of Massachusetts for use in residential zones.

Testing for Structural Soil: Testing is required at the following intervals:

1. Submit 1 gallon planting soil samples in two phases. Submit samples concurrent with horticultural soil test reports in both phases. Submit as phase one, structural planting soil base components for approval. Only after approval of phase one components, submit as phase two, soil blend mix for approval. All reports must be from recent analyses, less than 90 days old, and represent materials that are available for delivery to the site.
   a. Phase One Submittals of Structural Planting Soil Base Components:
      1). Base Loam/On-Site Stripped Topsoil
      2). Organic Amendment Materials (Compost)
      3). Sand
   b. Phase Two Submittals of Sand-Based Structural Soil: mixing and batching of soil medium to be submitted in the same manner as bulk soils and will be prepared prior to delivery to site.
   c. Submit reports for each of the above samples: Submit sample from each proposed source for testing and approval. Deliver samples to both the testing laboratory and the project soil scientist and pay costs. Send report directly to Landscape Architect.
   d. Soil Sample Submittals: Sampling shall be done by the Contractor. The size of the samples and method of sampling shall be as follows: Samples shall be representative of the material to be brought to the site. Each sample shall be a Composite Sample, which consists of 5 separate sub-samples taken from a minimum of (5) different locations at each source and mixed together to make the test sample.
      1). Organic amendment (Compost): duplicate samples of 1 gallon.
      2). Base Loam: duplicate samples of 1 gallon.
      3). Coarse Sand: duplicate samples of 1 gallon.
      4). Sand-Based Structural Soil, after approval of individual components: duplicate samples of 1 gallon.
   e. The Contractor shall schedule this testing in order to permit reasonable time for testing, evaluation, and approvals prior to scheduled installation.

Test Reports: Submit certified reports for tests as described Section 32 9119 PLANTING SOILS for mechanical gradation, silt and clay by Hydrometer Testing, Chemical Analysis, testing for soil Organic Matter, soil CEC, Soluble Salts, Buffer pH. In addition to the requirements of Section 329119 for testing, provide the following:

1. In-place density tests shall be carried out at a rate of one test per 2,000 square feet for each type of material placed.

Sources for Soil Components and Soil Mixes: Submit information identifying sources for soil components and the firm responsible for mixing of soil mixes.

1. Landscape Architect shall have the right to reject any soil supplier.
2. Soil mix supplier shall have a minimum of five years experience at supplying custom planting soil mixes.
3. Submit supplier name, address, telephone and fax numbers and contact name.
4. Submit certification that accepted supplier is able to provide sufficient quantities of materials and mixes for the entire project.

Inspection

1. Do not place planting soil on subgrade prior to inspection and approval of Landscape Architect of subgrades for compliance with scarification, de-compaction and re-compaction specifications. Contractor shall request inspection before proceeding.
2. Do not place sand-based structural soil on sand drainage blanket prior to inspection and approval of Landscape Architect of drainage blankets for compliance with depth and connection with associated drainage line specifications. Contractor shall request inspection before proceeding.

Delivery, Storage And Handling

In addition, the following provision is established: Material shall not be handled or hauled, placed or compacted when it is wet as after a heavy rainfall or is frozen. Soil shall be handled only when the moisture content is less than at field capacity. The Landscape Architect shall be consulted to determine if the soil is too wet to handle.

Store and handle packaged materials in strict compliance with manufacturer's instructions and recommendations. Protect all materials from weather, damage, injury and theft.

Sequence deliveries to avoid delay. On-site storage space is permissible only with written notice from Construction Manager. Deliver materials only after preparations for placement of planting soil have been completed.

Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil.

Soil that is to be stockpiled longer than two weeks, whether on or off site, shall not be placed in mounds greater than six feet high. If soil stockpiles greater than six feet high are present longer than two weeks then the contractor shall break down and disperse soil so that mounds do not exceed the six-foot height restriction for longer than two weeks.

Vehicular access to the site is restricted. Before construction, the Contractor shall submit for approval a plan showing proposed routing for deliveries and site access.

Soil Moisture Content- Do not work soil when moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in the air or that clods will not break readily, nor when it is frozen. Apply water, if necessary, to bring soil to an optimum moisture content for tilling and planting.

1. Field Tests
   a. Form soil in palm of hand, if soil retains shape and crumbles upon touching, the soil may be worked.
   b. If the soil will not retain shape it is too dry and should not be worked.
   c. If the soil retains shape and will not crumble, it is too wet and should not be worked.
   d. If the soil glistens or free water is present after lightly patting the sample, the soil is too wet and should not be worked

MATERIALS

Soil Materials

1. Soil medium materials shall fulfill the requirements as specified and be tested to confirm the specified characteristics.
2. Samples of individual components of sand-based structural soil mix in addition to blended soil mix including mulch materials shall be submitted by the Contractor for testing and analysis to the approved testing laboratory. Comply with specific materials requirements specified.
   a. No base component material or soil components for structural planting soil medium shall be used until certified test reports by an approved agricultural chemist have been received and approved by the Landscape Architect.
   b. Make soil medium amendments and resubmit test reports indicating amendments until approved.
3. The Landscape Architect may request additional testing by Contractor for confirmation of medium quality and/or soil medium amendments at any time until completion.

Base Loam

1. Base Loam shall be imported and be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Base Loam shall also be free of quack-grass rhizomes, Agropyron Repens, and the nut-like tubers of nutgrass, Cyperus Esculentus, and all other primary noxious weeds. Base Loam shall not be delivered or used for planting while in a frozen or muddy condition. Base Loam for mixing shall conform to the following grain size distribution for material passing the #10 sieve:

	Percent Passing	
U.S. Sieve Size Number	Minimum	Maximum
10	---	100
18	85	100
35	70	95
60	50	85
140	36	53
270	32	46

0.002mm	3	6

2. The ratio of the particle size for 80% passing (D80) to the particle size for 30% passing (D30) shall be 8 or less (D80/D30 < 8). Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample. Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition. The organic content shall be between 4.0 and 8.0 percent by weight.
3. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH.

Coarse Sand

1. Sand for blending, protection layer above filter fabrics, and drainage below planting soils shall be uniformly graded medium to coarse sand consisting of clean, inert, rounded to sub-angular grains of quartz or other durable rock free from loam or clay, mica, surface coatings and deleterious materials with the following gradation.

	Percent Passing	
U.S. Sieve Size Number	Maximum	Minimum
10	100	--
18	60	80
35	25	45
60	8	20
140	0	8
270	0	3
0.002mm	0	0.5

2. Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 15% by weight of the total sample. The ratio of the particle size for 70% passing (D70) to the particle size for 20% passing (D20) shall be 3.2 or less (D70/D20 <3.2). Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition. pH shall be less than 7.5.

Organic Amendment (Compost)

1. Organic Matter for amending planting soils shall be a stable, humus-like material produced from the aerobic decomposition and curing of Leaf Yard Waste Compost, composted for a minimum of one year (12 months). The leaf yard waste compost shall be free of debris such as plastics, metal, concrete or other debris. The leaf yard waste compost shall be free of stones larger than 1/2", larger branches and roots. Wood chips over 1" in length or diameter shall be removed by screening. The compost shall be a dark brown to black color and be capable of supporting plant growth with appropriate management practices in conjunction with addition of fertilizer and other amendments as applicable, with no visible free water or dust, with no unpleasant odor, and meeting the following criteria as reported by laboratory tests.
   a. The ratio of carbon to nitrogen shall be in the range of 12:1 to 25:1.
   b. Stability shall be assessed by the Solvita procedure. Protocols are specified by the Solvita manual (version 4.0). The compost must achieve a maturity index of 6 or more as measured by the Solvita scale. Stability tests shall be conducted by Woods End Research Laboratory, Mt. Vernon, Maine.
   c. Pathogens/Metals/Vector Attraction reduction shall meet 40 CFR Part 503 rule, Table 3, page 9392, Vol. 58 No. 32, and Commonwealth of Massachusetts 310 CMR 32.00 (for applications to soils with human activity).
   d. Organic Content shall be at least 20 percent (dry weight). One hundred percent of the material shall pass a 3/8-inch (or smaller) screen. Debris such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry shall not be visible and shall not exceed one percent dry weight. Organic content shall be determined by weight loss on ignition for particles passing a number 10 sieve

according to procedures performed by the West Experiment Station at the University of Massachusetts, Amherst or equal as follows. A 50-cc sub-sample of the screened and mixed compost is ground to pass the number 60 sieve. Two to three grams (+ 0.001g) of ground sample, dried to a constant weight at 105 degrees C is placed into a muffle furnace. The temperature is slowly raised (5C/minute) to 450C and maintained for three hours. The sample is removed to an oven to equilibrate at 105C and the weight is taken. Organic matter is calculated as loss on ignition.

e. pH: The pH shall be between 6.5 to 7.2 as determined from a 1:1 soil-distilled water suspension using a glass electrode pH meter American Society of Agronomy Methods of Soil Analysis, Part 2, 1986.

f. Salinity: Electrical conductivity of a one to five soil to water ratio extract shall not exceed 2.0 mmhos/cm (dS/m).

g. The compost shall be screened to 3/8 inch maximum particle size and shall contain not more that 3 percent material finer that 0.002mm as determined by hydrometer test on ashed material.

h. Nutrient content shall be determined by the University of Massachusetts Soil Testing Laboratory or equivalent laboratory and utilized to evaluate soil required amendments for the mixed soils. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Iron, Manganese, Lead, Soluble Salts, Cation Exchange Capacity, soil reaction (pH), and buffer pH.

3/4 inch Crushed Stone

1. 3/4-inch Crushed Stone shall conform to Massachusetts Highway Specification M2.01.4. Crushed Stone (3/4-inch) shall be used above the Sand-Based Structural Soil as shown on the Drawings.

Blended Soils – General Requirements

Uniformly mix ingredients on an approved hard surface area or with soil blending equipment. Organic Amendment shall be maintained moist, not wet, during mixing. Amendments shall not be added unless approved to extent and quantity by the owner and additional tests have been conducted to verify type and quantity of amendment is acceptable. Percentages of components, unless otherwise noted, will be established upon completion of individual test results for components of the various mixes.

Sand-Based Structural Soil

Sand-Based Structural Soil Planting Medium shall consist of a blend of approximately four parts by volume of Coarse Sand, one part by volume of Base Loam and one and one half parts by volume of Organic Amendment. Blending of the components shall be carried out with earth moving equipment prior to placement. The components shall be blended to create a uniform mixture as determined by the Landscape Architect.

The final blended Sand-Based Structural Soil Planting Medium shall conform to the following grain size distribution for material passing the #10 sieve:

U.S. Sieve Size No.	Percent Passing	
	Minimum	Maximum
10	100	-
18	68	90
35	38	63
60	18	39
140	10	18
270	7	10
0.002mm	1	2

1. Maximum size shall be one inch largest dimension. The maximum retained on the #10 sieve shall be 15% by weight of the total sample.
2. The ratio of the particle size for 70% passing (D70) to the particle size for 20% passing (D20) shall be 3.5 or less (D70/D20 <3.5). Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

3. Organic content shall be between 2.5 and 3.0 percent.

Pre-Plant Fertilizer

Complete, fertilizer made from all-natural ingredients complying with State and Federal fertilizer laws. Fertilizer shall contain the following available plant food by weight, unless soils test indicate a need for different composition: NPK 2-3-3

Fertilizer to be delivered in original unopened standard size bags showing weigh, analysis ingredients and manufacturer's name.

Soil Amendments

Superphosphate: finely ground phosphate rock, commonly used for agricultural purposes and shall contain not less than 20 percent available phosphoric acid.

Ground Limestone: dolomitic limestone and contain not less than 50 percent of total carbonates and 25 percent total magnesium with a neutralizing value of at least 100 percent. Material shall be ground to such fineness that 40 percent will pass 100 mesh U.S. standard sieve and 98 percent will pa 20 mesh U.S. standard sieve.

Aeration & Passive Irrigation System For Structural Soil

Provide corrugated, perforated pipe, fittings, elbows, tees, and risers as necessary to create an aeration and passive irrigation system for the four trees in pavement. Components shall include the following:

4-inch Atrium Grate, black color. Size to fit 4-inch corrugated pipe.
4-inch ID pipe shall be highway single wall perforated pipe, perforated and wrapped
Fittings, elbows, and all connections shall be standard grade HDPE or PVC as required to accomplish the configurations shown or implied on the Drawings.

CONSTRUCTION

Pre-Installation Examination And Preparation

Coordinate activities with other project contractors so that there is no soil disturbance from traffic or other construction activities subsequent to placement.

Pre-Installation Examination Required: The Contractor shall examine previous work, related work, and conditions under which this work is to be performed and shall notify Landscape Architect in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions. The Contractor shall not place any planting soil until all work in adjacent areas is complete and approved by the Landscape Architect.

Examination of Subgrade: The subgrade shall be examined by the Contractor prior to the start of soil placement and planting. Any deficiencies shall be noted and related to the Landscape Architect in writing prior to acceptance of the subgrade by the Landscape Contractor. Deficiencies include, but shall not be limited to the following:

1. Construction debris present within the planting areas.
2. The subgrade is at incorrect depths for installing the designed soil profile and drainage layer.
3. Incomplete irrigation and/or subsurface drainage installation.
4. Subgrade not compacted to levels specified.
5. Subgrade must infiltrate water at the rate of at least one inch per hour.
6. Standing water or muddy subgrade conditions.

Preparation And Mixing Of Structural Soil

Examine soil and remove foreign materials, stones and organic debris over 1/2" in size.

Correct deficiencies in soil as required by horticultural soil test results. If lime is to be added, it shall be mixed with dry soil before fertilizer is added and mixed.

Structural soil mixture shall be produced with equipment that blends together each component in a thorough and uniform manner.

Preparation and mixing shall be accomplished when the soil moisture content is less than field capacity and at a moisture content approved by the Landscape Architect.

Incorporate pre plant fertilizer as directed.

Preparation Of Structural Soil

Correct deficiencies in structural soil as required by soil test results. Thoroughly incorporate amendments into planting mixture to ensure even distribution.

Incorporate pre plant fertilizer at a rate of 30 pounds per cubic yard of structural soil. Amendment rate will be 6 times square foot application rate per cubic yard of planting mixture.

Excavation And Removal

Refer to applicable Section 150 of the Standard Specifications.

Backfilling Of Planting Soil Layers

Soil Placement Preparation:

1. Verify plumbing for the irrigation system has been installed and accepted.
2. Verify underdrainage system has been installed and accepted.
3. Notify Landscape Architect of soil placement operations at least seven calendar days prior to the beginning of work.
4. Place plant stock simultaneously with the planting soil. The Landscape Architect will stake trees during placement of the planting soil.
5. Verify that the subgrade passes the minimum water infiltration requirement.
6. Following planting and soil placement protocols described in Item 752.5 Planting Soil.
7. Never move or work structural soil when wet or frozen.
8. Place barricades as required to prevent compaction of planting soil from vehicles, equipment, or pedestrian traffic.

Placement Of Drainage Layer

1. Drainage layer Sand shall be placed in conformance with the Drawings and shall be graded smooth and parallel to the finish grades.
    a. Compact Sand drainage layers to between 90 and 94 percent Standard Proctor.
    b. In all cases, soil being placed shall be in a dry to damp condition. No wet soils shall be placed. Test in-place density for planting mediums in accordance with ASTM D 2922-01: Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

Aeration Grates And Passive Irrigation System

General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of structural planting medium under concrete pavement. Location and arrangement of grates and piping shall be coordinated with placement of concrete paving. It is the intent of these specifications that the drain covers be as inconspicuous as possible and set directly in locations shown and as required by the Landscape Architect.

Install structural planting medium in conjunction with all granular base material beneath the concrete pavement.

Use proper couplings to connect perforated plastic pipe to atrium grates

Extend piping beyond the limits of paving to terminate at the vertical risers in plant beds and tree pits to tree pits as indicated.

Placement Of Sand-Based Structural Soil

After subgrade levels have been reached and approved spread Sand-Based Structural Soil in lifts not greater than eight inches and compact with a minimum of two passes of vibratory compaction equipment to a density between 92 and 95 percent Standard Proctor.

Place Sand-Based Structural Soil within the areas shown on Drawings.

Place layer of 3/4-inch crushed stone over Sand-Based Structural Soil to thicknesses shown on Drawings prior to placing concrete pavement.

Protection

Refer to Section 150 of the Standard Specifications.

Protect newly graded areas from traffic, freezing and erosion. Keep free of trash, debris or construction materials from other work.

Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace material to a depth as required by the Landscape Architect; reshape and re-compact at optimum moisture content to the required density.

Where settling occurs, before final acceptance or during the warranty period, remove finish surfacing, backfill with additional approved material, compact to specified rates, and restore any disturbed areas to a condition acceptable to the Owner.

Post-Installation Testing

In-place density testing is required in structural soil areas. The standard test for surface and subsurface density shall be ASTM D 2922-01: Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Sand Based Structural Soil will be measured and paid for at the contract unit price per cubic yard, complete in place, which price shall include all labor, materials, equipment and incidental cost required to complete the work.

No separate payment will be made for filling operations to establish sub-grade or subsoil elevations or fine grading and compacting, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 752.5 PLANTING SOIL CY

The work under this item shall conform to the relevant provisions of Sections 150, 170, 751 and 770 of the Standard Specifications and the following:

The work shall include planting soil and related items as indicated on the Drawings or specified herein, but is not limited to, testing, placing, spreading and grading planting media and related items.

REFERENCES AND STANDARDS
The following related terms are used herein and shall mean:

1. AOAC: Association of Official Agricultural Chemists.

SUBMITTALS

At least 30 days prior to ordering the below listed materials, submit certified testing results and representative samples to Engineer for selection. No materials shall be ordered or delivered until required samples, certifications, manufacturer's literature and test results have been reviewed by Engineer. Delivered materials shall closely match the approved samples. The Engineer reserves the right to reject, on or after delivery, any material that does not meet these Specifications.

The Contractor shall perform testing in two stages.

The Contractor shall sample and test Base Loam and Sand for mechanical gradation, percent organics and chemical analysis as follows:

The Contractor shall provide one cubic foot representative samples from each proposed source of Base Loam and Sand for testing and analysis at the Contractor's own expense. Contractor shall deliver samples to testing laboratories and shall have the testing report sent directly to the Engineer. Tests for gradation and organics shall be performed by a private testing laboratory approved by the Engineer. Tests for soil chemistry and pH may be performed by a public agricultural extension service agency. All tests shall be performed in accordance with the current standards of the Association of Official Agricultural Chemists. See Soil Testing requirements in this Section for required tests and recommendations.

In addition to soil testing of Base Loam and Sand, submit the following:

Compost: Submit a one quart-size sample.

Contractor shall provide a written certification from the supplier that compost contents shall meet all requirement of the specification.

Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications

Acidulant: Submit supplier's certification that the acidulant being supplied conforms to these Specifications

Soil Testing

Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System. Sieve analysis shall be by combined hydrometer and wet sieving using sodium hexametaphosphate as a dispersant in compliance with ASTM D 422 after destruction of organic matter by H_2O_2. To facilitate review and approval of sieve analysis, provide a computer-generated gradation curve from UMASS Soil & Plant Tissue Laboratory.

Percent of organic matter shall be determined by the loss on ignition of oven-dried samples. Test Samples shall be oven-dried to a constant weight at a temperature of 230 degrees Fahrenheit, plus or minus 9 degrees F.

Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Iron, Manganese, Copper, Zinc, extractable Aluminum, Soluble Salts, and acidity (pH) and buffer (pH). Nutrient levels shall be measured in parts per million (PPM). Cation Exchange Capacity shall be measured.

Soil analysis tests shall show recommendations for fertilizers to nutrient deficiencies as necessary for (species of plants) (and) (lawn planting) on the construction site. Recommendations for fertilization shall indicate NPK proportions, secondary and micro-nutrients and rates of application in either gallons or pounds per 1,000 square feet.

MATERIALS

General

The planting soil mix shall be manufactured from three base components: Base Loam, Sand and Compost, in proportions to meet the requirements specified herein.

Base Loam

Base Loam shall be existing topsoil stripped and stockpiled at the site or shall be imported. Stripped topsoil shall be sampled and tested for grain size distribution and organic content according to tests as specified. Test results shall be reported to the Engineer, who may recommend minor adjustments to specified approximate mixing ratios and mix requirements for each mix type. Stripped topsoil which has been contaminated by incorporation of subsoil shall not be acceptable for use and shall be replaced with imported topsoil meeting specification requirements at no cost to be owner.

Base Loam as required for the work shall be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Base Loam shall also be free of quack-grass rhizomes, Agropyron Repens, and the nut-like tubers of nutgrass, Cyperus Esculentus, and all other primary noxious weeds. Base Loam shall not be delivered or used for planting while in a frozen or muddy condition. Base Loam for mixing shall conform to the following grain size distribution for material passing the #10 sieve:

Percent Passing U.S. Sieve Size Number	Minimum	Maximum
10	---	100
18	85	100
35	**70**	**95**
60	50	85
140	36	53
270	32	42
0.002mm	3	6

The ratio of the particle size for 80% passing (D80) to the particle size for 30% passing (D30) shall be 8 or less. (D80/D30 < 8)

Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.

The organic content shall be between 4.0 and 8.0 percent

Sand

Sand: for mixing with base loam to meet specification requirements shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

Percent Passing U.S. Sieve Size Number	Minimum	Maximum
10	100	---
18	65	90
35	35	60
60	15	30
140	0	8
270	0	3
0.002mm	0	0.5

Maximum size shall be one inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.

The ratio of the particle size for 70% passing (D70) to the particle size for 20% passing (D20) shall be 3.0 or less. (D70/D20 <3.0)

Compost

Compost for amending seeding and planting media: stable, humus-like material produced from the aerobic decomposition of organic residues consisting of Leaf or Yard Waste Compost which shall be composted for a minimum of one year (12 months). Compost shall be free of debris such as plastics, metal, concrete or other debris and stones larger than 1/2", larger branches and roots and wood chips over 1/2" in length or diameter. Compost shall be a dark brown to black color and be capable of supporting plant growth with appropriate management practices in conjunction with addition of fertilizer and other amendments as applicable, with no visible free water or dust, with no unpleasant odor, and meeting the following criteria as reported by laboratory tests.

1. The ratio of carbon to nitrogen shall be in the range of 12:1 to 25:1

2. Stability shall be assessed by the Solvita procedure. Protocols are specified by the Solvita manual (version 4.0). The compost must achieve a maturity index of 6 or more as measured by the Solvita scale.

3. Pathogens/Metals/Vector Attraction reduction shall meet 40 CFR Part 503 rule, Table 3, page 9392, Vol. 58 No. 32, and Commonwealth of Massachusetts 310 CMR 32.00 (for applications to soils with human activity).

4. Organic Content: at least 20 percent (dry weight). One hundred percent of the material shall pass a 3/8-inch (or smaller) screen. Debris such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry shall not be visible and shall not exceed one percent dry weight. Organic content shall be determined by weight loss on ignition or H2O2 for particles passing a Number 10 sieve according to procedures performed by the West Experiment Station at the University of Massachusetts, Amherst or equivalent. For loss by ignition, a 50-cc sub-sample of the screened and mixed compost is ground to pass the number 60 sieve. Two to three grams (+ 0.001g) of ground sample, dried to a constant weight at 105 degrees C is placed into a muffle furnace. The temperature is slowly raised (5C/minute) to 450C and maintained for three hours. The sample is removed to an oven to equilibrate at 105C and the weight is taken. Organic matter is calculated as loss on ignition.

5. pH: shall be 6.5 to 7.2, as determined from a 1:1 soil-distilled water suspension using a glass electrode pH meter - American Society of Agronomy Methods of Soil Analysis, Part 2, 1986.

6. Salinity: Electrical conductivity of a one to five soil to water ratio extract shall not exceed 2.0 mOhms/cm (dS/m).

7. Compost shall be screened to 1/2 inch maximum particle size and shall contain not more that 3 percent material finer than 0.002mm as determined by hydrometer test on ashed material.

Nutrient content shall be determined by the University of Massachusetts Soil Testing Laboratory or equivalent laboratory and utilized to evaluate soil required amendments for the mixed soils. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Chromium, Iron, Manganese, Lead, Soluble Salts, Cation Exchange Capacity, soil reaction (pH), buffer pH, and micronutrients.

Planting Soil Mix - General

Planting soil mixes shall be free of plants and their roots, debris and other extraneous matter. They shall be uncontaminated by salt water, foreign matter and substances harmful to plant growth. The electrical conductivity (EC2) of a 1:2 soil-water suspension shall be equal to or less than 1.0 millimhos/cm. (Test minus sieve #4 material).

Loam Borrow

Loam borrow shall be a blended mix of base loam, sand and compost to create a planting soil medium for use in for seeding areas and planting beds and as specified herein.

Base Loam, Sand and Compost, each as specified above, shall be combined in an approximate mix ratio of two parts by volume Sand to one and one half parts by volume Base Loam to one part by volume Compost (2S:1.5L:1C) to create a uniform blend which meets the following requirements.

Gradation for Material Passing the Number 10 Sieve:

Percent Passing U.S. Sieve Size Number	Minimum	Maximum
10	100	---
18	70	90
35	45	72
60	26	40
140	15	22
270	11	14
0.002mm	2	5

Maximum size shall be one inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample

Ratio of the particle size for 80% passing (D80) to the particle size for 30% passing (D30) shall be 5.5 or less. (D80/D30 <5.5)

Saturated hydraulic conductivity of the mix: not less than 3 inches per hour according to ASTM D5856-95 (2000) when compacted to a minimum of 88% Standard Proctor, ASTM 698

Organic content: between 4 and 5.5 percent by weight.

Amendments to Modify pH of Planting Soil Mixes

Ground limestone for adjustment of loam pH shall be in accordance with the requirements of Section M6.01.0 of the Standard Specifications.

Sulphur for adjustment of loam pH shall be commercial or flour sulfur, unadulterated, and shall be delivered in containers with the name of manufacturer, material analysis, and net weight appearing on each container.

CONSTRUCTION

General

All areas to receive Planting Soil shall be inspected by the Contractor before starting work and any defect such as incorrect grading shall be reported to the Engineer prior to beginning this work.

Amendments

Incorporate amendments to modify pH, per recommendations of test reports, to meet the requirements of this Specification. Soil amendments shall be spread and thoroughly incorporated into the layer of planting soil media by harrowing or other methods reviewed by the Engineer.

Filling and Compacting Planting Soil Mix

Perform percolation tests on existing, in place sub-soils or placed fill prior to placing and spreading planting soil media. Testing shall be conducted after the requirements of Item 120 Earth Excavation have been met.

1. Perform percolation testing of subsoil or placed fills to determine whether or not the sub-grade, sub-soils, and placed fills drain properly. Perform percolation tests for each lift as specified in herein.

2. In the event that percolation testing indicates that the sub-grade, subsoil, placed fills have been over compacted and do not drain, the contractor shall loosen up the top sixteen (16") inches of the compacted layers by ripping or other mechanical means. Re-compact the borrow by driving a small, tracked bulldozer over the area at low speeds so that the tracks of the bulldozer pass over the affected area and the soil is compacted to a density that shall percolate as specified under the work herein. Under no circumstances shall wheeled vehicles be driven over subsoil, placed fills or ordinary borrow that have been shown to percolate or subsoil, placed fills or ordinary borrow that has been loosened and shown to percolate. The work of loosening the top sixteen (16") inches of soil and re-compacting the soil shall be as specified, performed and paid for under Item 120 Earth Excavation.

3. Perform sufficient percolation tests in areas of poorly draining or compacted subsoil or compacted placed fills as required by the Engineer to ensure that these underlying soils drain. Likewise, perform sufficient percolation tests after ripping and loosening to ensure that the soils are no longer too compact to drain.

All areas to be spread with any of the three planting soil media shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place planting soil media when soil materials are frozen. No soil material containing ice or frozen lumps shall be used.

Protect existing trees in areas to be spread with planting soil media. Avoid compacting any existing soil, subsoil, subgrade or planting soil media in the vicinity of existing tree roots and do not use heavy equipment within the drip line of existing trees. Placement of lifts of any of the three planting soil media shall not exceed 6 inches in depth over existing tree roots and no fill shall come in contact with existing tree trunks. Filled areas around existing trees shall be graded to drain away from existing trees at a minimum slope of 2 percent.

The Contractor shall notify the Engineer when areas to be filled are ready for formal inspection. Placement of fill material shall not begin until Engineer has approved sub-grade.

The Engineer shall reject the use of the Contractor's compaction equipment if, in the opinion of the Engineer, the equipment is unsuited to or inadequate for compacting materials to the specified densities within a reasonable length of time, or if equipment or procedures are likely to damage underlying materials.
All fill material is to be placed "in-the-dry" to which dewatering may be required. Spreading and drying of each layer may also be required.

Conversely, if the testing laboratory determines that the fill material is too dry for proper compaction, water shall be added to provide the specified optimum moisture content, as necessary for proper compaction.

Compaction of each lift shall be done with hand-operated equipment, as specified herein and as determined by ASTM Test, D1556. Fill shall be placed in successive horizontal lifts no thicker 6 inches and compacted to required density as specified herein. Maximum dry density shall be determined in accordance with ASTM D1557, Method D. Maximum dry densities for planting soil media shall be between 86 and 88 percent.

In planting areas, compaction requirements for planting soil media shall be considered minimums and maximums within the density percentages called for, and any over-compaction of existing soils or fills which would be detrimental to planting objectives shall be corrected by tilling or other means and re-compacting to specified compaction limits at no additional cost.

Fine Grading
Planting soil media shall be spread in accordance with these specifications over approved areas to a depth sufficiently greater than shown on the drawings so that after required compaction, the planting soil media depth shall equal that which is required by the Drawings.

Select equipment and otherwise phase the installation of the planting soil media to ensure that wheeled equipment does not travel over subsoil, placed fills or ordinary borrow or already installed planting soil media. Movement of tracked equipment over said soils shall be reviewed and considered for approval by the Engineer. If it is determined by the Engineer that wheeled equipment must travel over already installed soil, provide a written description of sequencing of work that ensures that compacted soil is loosened and recompacted as the work progresses. Alternatively, place one-inch thick steel plate ballast (or equivalent ballast approved by the Engineer) over the length and width of any travel way to protect planting soils from compaction.

After initial filling, Contractor shall request approval of rough grading by Engineer.

Following approval of rough grading, Contractor shall supply additional planting soil media as necessary so that following finish grading and compaction, the depth of the planting soil media fill shall conform to the depth required.

No soil shall be placed in a wet or frozen condition.

Sufficient grade stakes shall be set for checking the finished grades. Deviation from elevations shown on Drawings that are greater than one-tenth of a foot shall not be permitted. Connect contours and spot elevations with an even slope. Finish grades shall be smooth and continuous with no abrupt changes at the top or bottom of slopes.

After seeding and planting media has been spread, it shall be carefully prepared by hand raking.

Contractor shall obtain Engineer's written approval of fine grading and bed preparation before doing any planting.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Planting Soil will be measured and paid for at the contract unit price per cubic yard, complete in place, which price shall include all labor, materials, equipment and incidental cost required to complete the work.

No separate payment will be made for filling operations to establish sub-grade or subsoil elevations or fine grading and compacting, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 765.	**SEEDING**	**SY**
ITEM 767.6	**AGED PINE BARK MULCH**	**CY**

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 700 of the MassDOT Standard Specifications.

ITEM 775.441	**LOCUST – HONEY 'SKYLINE' (3-3.5 INCH CAL B&B)**	**EA**
ITEM 777.677	**SWEETGUM (3-3.5 INCH CAL B&B)**	**EA**
ITEM 786.110	**JUNIPER – WILTON BLUE RUG (2 GALLON)**	**EA**
ITEM 786.490	**JUNIPER – SHORE (2 GALLON)**	**EA**
ITEM 796.427	**FEATHER REED GRASS – 'KARL FOERSTER' (2 GALLON)**	**EA**
ITEM 796.455	**SWITCH GRASS 'SHENANDOAH' (2 GALLON)**	**EA**
ITEM 796.764	**DAYLILY – 'STELLA D'ORO' (2 GALLON)**	**EA**

The work under these items shall conform to the relevant provisions of Sections 150, 170, 751, 770 and 771 of the Standard Specifications and the following:

The work of this Section consists of amendment of soils, planting mix, planting trees, shrubs, ornamental grasses, guarantee of plants and related items as indicated on the Drawings or specified herein.

REFERENCES AND STANDARDS

The following related terms are used herein and shall mean:

1. Standard Specification: State of Massachusetts, Standard Specification for Highways and Bridges, latest edition including Supplement C2015.
2. ASNS: "American Standard for Nursery Stock," ASNS 260.1, latest edition, published by the American Association of Nurserymen, (AAN).
3. SPN: "Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.
4. AOAC: Association of Official Agricultural Chemists.
5. Pruning Standards: The "Standards for Pruning Shade Trees" of the National Arborist Association, 174 Route 101, Bedford, NH 03102.

SUBMITTALS

At least 30 days prior to ordering the below listed materials, submit certified testing results and representative samples to Engineer for selection. No materials shall be ordered or delivered until required samples, certifications, manufacturer's literature and test results have been reviewed by Engineer. Delivered materials shall closely match the approved samples.

Fertilizer
Submit one sample packet of planting fertilizer
Antidesiccant: Submit manufacturer's literature.

Examination of Conditions
All areas to be planted, shall be inspected by the Contractor before starting work and any defect such as incorrect grading shall be reported to the Engineer prior to beginning this work.

The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing and maintaining plants temporarily and re-handling plants prior to final installation.

MATERIALS

Plant Materials

The Contractor shall furnish all plants shown on the Drawings, as specified, and in quantities listed on the PLANT SCHEDULE. No substitutions will be permitted. All plants shall be nursery grown.
Plants shall be in accordance with the ASNS Standards of the American Association of Nurserymen (AAN) as a minimum requirement for acceptance. Plants designated as "Specimen Quality" on the Drawings shall have a form of higher quality (as determined by the Engineer), than typical plants of their species and shall be selected in the nursery by the Engineer. Botanical plant names shall be in accordance with plant designations included in Standardized Plant Names.

All plants other than those designated on the Drawings as "Specimen Quality" shall be typical of their species or variety and have a normal habit of growth. All plants including "Specimen Quality" shall be legibly tagged with the proper name. Only plant stock grown within hardiness Zones 1 through 5, as established by the Arnold Arboretum, Jamaica Plain, Massachusetts, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 5 or hardier conditions. Plants not so certified will not be accepted.

The root system of each plant shall be well provided with fibrous roots. All parts shall be moist and show active green cambium when cut. They shall be sound, healthy, and vigorous, well-branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae.

All plants must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8-ounce burlap, firmly held in place by a stout cord or wire in containers of a size as specified or of adequate size to allow root development for the plant size as per ASNS requirements. Plants prepared with plastic or other non-biodegradable wrappings will not be accepted. The diameter and depth of the balls of earth on balled and burlapped plants must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant. No plant will be accepted when the ball of earth surrounding its roots has been badly cracked or broken prior to, or during the process of planting or after the burlap, staves, ropes, container or platform required in connection with its transplanting have been removed. The plants and balls shall remain intact during all operation. All balled and burlapped plants that cannot be planted at once must be heeled in by setting in the ground and covering the balls with soil and watering.

Deciduous Trees
All deciduous trees shall meet the following standards:

Trees shall have a single, straight trunk, well formed, and sturdy. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety.

Trees with multiple leaders shall conform to all standards noted in this Section, for single leader trees and shall be accepted only as noted on the PLANT SCHEDULE.

All pruning wounds shall show vigorous bark on all edges at the time of harvest. Trees shall be free from all signs of pest and disease damage. The trunk shall be free from sun scald, frost cracks, and wounds resulting from abrasions, fire, animal damage, or other causes. Pruning scars within the crown of any tree shall be clean cut and shall leave no protrusion beyond the branch collar.

All trees shall have healthy, vigorous leaves or needles of normal size, color, shape, and texture for the particular species and variety.

Deciduous shade trees and deciduous flowering trees shall have fall color typical for their species and variety.

Unless otherwise indicated on the PLANT SCHEDULE, the height and spread of deciduous shade trees shall be the minimum requirements.

Take caliper measurements for deciduous trees 6 inches above ground level up to and including 4 inches caliper size and 12 inches above ground for larger sizes.

No deciduous tree shall be pruned after the Engineer has tagged the plant in the nursery except as required by the Engineer.

Unless otherwise noted on the PLANT SCHEDULE, shade trees for use in paved areas shall have no branches lower

than 6.5 feet from finish grade and no higher than 7.5 feet from finish grade. Flowering trees for use in areas away from pedestrian traffic shall have the first branch of their crowns no higher than 4 feet from finish grade.

Branching of all deciduous trees shall be best quality representatives of the species, cultivar or variety with lateral branching around the entire trunk to form a symmetrical tree for 80 percent to 100 percent of the tree's outer perimeter. All branches on deciduous trees shall meet the trunk at angles no less than 30 degrees and no greater than 90 degrees from the vertical.

Evergreen Trees
Evergreen trees shall meet the following standards:

The height of the evergreen trees (measured from the trunk flair at the natural ground line of the tree to the midpoint of the terminal leader) shall be not less than the minimum size designated on the PLANT SCHEDULE.

No trees with double-leaders or twin-heads will be permitted.

Evergreen trees shall be of specified height with spread in proportion to height, as designated in ASNS Standards, and shall be well-branched to the ground.

All pruning wounds shall show vigorous bark on all edges at the time of harvest.

Terminal and top whorl buds of all evergreen trees shall be in healthy and whole condition at the time of harvest.

No evergreen tree shall be pruned after the Engineer has tagged the tree in the nursery except as required by the Engineer.

All trees shall have healthy, vigorous leaves or needles of normal size, color, shape, and texture for the particular species and variety.

Shrubs
All shrubs shall meet the following standards:

All shrubs shall be healthy and vigorous plants which are very well shaped, heavily branched, densely foliated, and true to form for the variety.

Canes or Trunk(s) and Branches:

1. Well-formed and sturdy.
2. Branching shall be uniformly distributed close to the ground.
3. Scars shall be free of rot and not exceed 1/4 the diameter of the wood beneath in greatest dimension unless completely healed (except pruning scars).
4. Pruning scars shall be clean cut and shall leave little or no protrusion from the trunk or branch.
5. Graft unions shall be completely healed.
6. No suckers or water sprouts.
7. Contain no dead wood.
8. Free of cracks, splits, or cambium peeling.

No shrub with pest or mechanical damage will be accepted.

Shrubs shall show no signs of frost or winter damage to the foliage. Foliage shall not be in a state of drought stress. Leaves or needles shall show no signs of wilt or desiccation due to weather stress at any season of the year.

Perennials
All perennials shall meet the following standards:

Perennials shall be potted 3 year stock, field grown clumps, and all clumps shall have not less than 6 buds, eyes or crowns.

Perennials shall be healthy and well cared for, with no evidence of insects or diseases present. Insect-ridden or diseased plants shall be rejected. Plants shall have a deep green foliage and dense, compact growth. Perennials shall have multi-stemmed bases and shall be two year potted stock minimum, one year in cutting bench and one year in pots.

Container Grown Stock

Each plant shall have an extensive, symmetrically balanced fibrous root system. Any root ball which shows signs of asymmetry, injury, or damage to the root system shall be rejected.

Curling or spiraling of the roots along the walls of rigid containers will not be accepted.

All parts of the fibrous root system of all plants shall be moist and fresh with a white color when washed of soil. When the plant is removed from the container, the visible root mass shall be healthy with white root tips. The root systems of all plants shall be free of disease, insect pests, eggs, or larvae.

All trees, and all shrubs which are not grown in containers must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8 ounce natural, biodegradable fabric burlap, firmly laced with stout, natural biodegradable cord or twine. The base of the tree trunks shall be wrapped with a protective burlap layer, surrounded by a cardboard trunk protector, and loosely tied with twine.

The diameter and depth of the balls of earth must encompass the fibrous and root feeding system necessary for the healthy recovery of the plant. Minimum root ball diameters and depths shall be in accordance with ASNS standards.

No plants shall be loose in the container.

Container grown plants which have roots growing out of the container will be rejected.

Plants delivered by truck and plants requiring storage on site shall be properly wrapped and covered to prevent wind-drying and desiccation of branches, leaves or buds; plant balls shall be firmly bound, unbroken, reasonably moist to indicate watering prior to delivery and during storage and tree trunks shall be free from fresh scars and damage in handling. No trees with double-leaders or twin-heads will be acceptable without the written approval of the Engineer. No plant material from cold storage will be accepted.

Planting Fertilizer

Fertilizer shall be provided for each plant through the use of slow-release fertilizer packets which are designed and certified by the manufacturer to provide controlled release of fertilizer over a minimum 3 year period. Each packet shall consist of 4 ounces of water soluble fertilizer with a minimum guaranteed analysis of available elements as follows:

16% Nitrogen, 8% Phosphoric Acid, and 16% Potash

Bone meal shall be fine ground, steam-cooked, packing house bone with a minimum analysis of 23 percent phosphoric acid and 1.0 percent of nitrogen.

Planting Mix

Planting mix shall be per Item 752.5 PLANTING SOIL. Planting mix shall conform to the following pH levels:

1. For ericaceous plants and broad-leaved evergreens requiring an acid soil, planting loam shall have a true pH of 4.5 to 5.5. If it does not, it shall be amended by the Contractor to the proper pH range by mixing with sulfur as specified herein.

2. Planting loam for general planting of non-acid loving plants shall have a true pH value of 5.5 to 6.5. If it does not, it shall be amended by the Contractor to the proper pH range by mixing with dolomitic limestone as specified herein.

3. The amount of either sulfur or limestone required to adjust the planting loam to the proper pH range (above) shall be approved by the Engineer on the basis of soil tests as specified herein. It is not possible to safely add more than two hundred pounds (200 lbs.) of limestone/one thousand (1,000) square feet of loam, incorporated into the soil, or

fifty pounds (50 lbs.) of limestone/one thousand (1,000) square feet of loam, surface application, within a single season. Therefore loam shall have a starting pH of no lower than 4.2 for ericaceous plants and broad-leaved evergreens, and a starting pH of no lower than 5.0 for general planting of non-acid loving plants.

Planting mix shall consist of pH adjusted loam which has been thoroughly premixed with organic material in the proportions of one (1) part organic matter, (leaf compost or peat), with five (5) parts of approved loam.

Aged Pine Bark Mulch

Pine Bark Mulch shall be pine bark mulch aged a minimum of six (6) months and not longer than two (2) years. The mulch shall be dark brown in color, free of pieces of wood thicker than one-quarter inch. Mulch must be free of stringy material over 4 inches in length, free of pieces over 3 inches in width and shall not contain, in the judgment of the Engineer, an excess of fine particles. Do not use wood chips.

Anti-desiccants

Anti-desiccants shall be emulsions or other materials which will provide a protective film over plant surfaces permeable enough to permit transpiration and specifically manufactured for that purpose. Manufacturer of anti-desiccant shall be subject to the Engineer's approval. Anti-desiccant shall be delivered in containers of the manufacturer and shall be mixed according to the manufacturer's instructions.

Water

The Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

CONSTRUCTION

Planting

Furnishing and planting of plant material shall include, but shall not be limited to, the digging of the pits and plant beds, amendment of loam as required to produce planting soil mix, provision of soil additives required to adjust for pH requirements of specific plants, furnishing the plants as specified as well as the labor of planting, fertilizing, mulching, and maintenance.

The Contractor shall locate plant material sources and ensure that plants are shipped in timely fashion for installation.

Contractor shall locate all underground utilities within 10 feet of the proposed planting pits and notify the Engineer of any conflicts prior to digging plant pits.

Location for all trees and shrubs and outlines for groundcover and bulb planting areas shall be staked on the ground by the Contractor for approval by the Engineer before any plant pits or plant beds are dug. Notify the Engineer no less than 3 days prior to desired date of inspection of staking to schedule site visit.

Seasons for Planting:

Spring:	Deciduous materials - March 21 through May 1
	Evergreen materials - April 15 through June 1
Fall:	Deciduous materials - Oct. 1 through Dec. 1
	Evergreen materials - Aug. 15 through October 15

Certain trees, as shown on the Plant List on the Drawings, shall only be planted in the spring. Contractor shall arrange project schedule as necessary to allow for spring planting of these trees. Substitutions of other plants for the trees specified in order to perform fall planting will not be accepted.

Planting

At least one month prior to the expected planting date, the Contractor shall request that the Engineer provide a representative to select and tag stock to be planted under this Section. The Contractor shall pay for the transportation, subsistence, and overnight accommodations, if necessary, for the Engineer's representative during the period of time required to select and

tag the plant material. Time spent to locate plant material shall be paid for by Contractor only if Engineer is sent to site where materials were not satisfactory to Engineer or cannot be located.

A representative of the Contractor shall accompany the Engineer on all plant material selection field trips, unless otherwise ordered by the Engineer.

All trees, a representative sample of each shrub species, and all plants designated as "specimen quality" on the Plant List shall be selected by the Engineer at the place of growth prior to digging for conformity to specification requirements as to quality, size, and variety. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work. Cost of replacement of materials rejected by the engineer at the site shall be borne by the Contractor.

All plants for the project shall be individually tagged prior to digging with the Engineer's seals. No plants shall be accepted for delivery to the site without such seals.

Tree trunks shall be protected during shipping by a heavy walled cardboard sleeve or other suitable material, then unwrapped for inspection by Engineer after installation. Trees shall then be rewrapped as specified herein unless instructed otherwise by Engineer.

All trees and shrubs shall be planted within 5 working days of arrival on site or shall be rejected by the Engineer. Container grown shrubs stored on site shall be shaded from direct sunlight at all times and shall not be stored on paved surfaces.

Keeping Trees Plumb: Contractor shall keep trees plumb and upright at all times. Monitor plants on a regular basis and, if a tree is moved out of plumb, then straighten the tree to a vertical, upright condition.

Plant pits shall be excavated as shown on Drawings. Holes for trees and planting mix backfill shall be at least 4 feet greater in diameter than the ball and one foot deeper than the ball. Tree planting excavations shall extend a total of 6 feet from the center of each tree. The area greater than 2 feet from the tree's root ball shall be 18 inches deep. Shrub planting beds shall be excavated 2 feet below proposed finish grade and shall extend a minimum of 1 foot beyond the rootball of shrubs placed at the edge of the planting bed.

Loosen the perimeter roots on the rootball of all container-grown shrubs, groundcovers and perennials prior to planting, as required by the Engineer.

Remove groundcovers and perennials from their pots immediately before planting. Handle plants carefully to prevent damaging roots. Place each plant in individual hole and firm the loam around the roots. Water thoroughly and mulch as shown on the Drawings. Groundcover plants may be planted after the bark mulch is placed.

All plant roots and earth balls must be damp and thoroughly protected from sun and wind from the beginning of the digging operation, during transportation and at the site until the final planting. Remove container plants from containers prior to planting. Trees and shrubs shall be placed in the center of plant pits, plumb with the crown of their roots exposed and located above the surrounding finish grade. After completion of planting installations, remove rope, burlap and wire baskets from only the top 1/3 of the root balls. Loam shall be backfilled in layers of not more than 6 inches and each layer watered sufficiently to settle before the next layer is put in place. Enough loam shall be used to bring the surface to finished grade when settled. A saucer shall be formed around each plant at a depth of 6 inches for trees and 4 inches for shrubs.

At the time of planting, install fertilizer packets at a depth of 6 to 8 inches equally spaced around the plant as it is being backfilled. Packets shall be placed approximately 3 inches away from the plant roots or plant ball. Packets shall not be cut, ripped or damaged. If it becomes necessary to remove and replace dead or unhealthy plants, any damaged or broken packets shall be replaced with new packets. The application rates for fertilizer packets shall be as follows:

Type of Plant	Rate
Deciduous Shade Trees	One packet for each inch of caliper

Evergreen and Small Flowering Trees	One packet for each 18 inches of height
Shrubs	One packet for each 12 inches of height or spread

All plants shall be watered immediately following planting as necessary to thoroughly moisten rootball and plant pit loam and thereafter shall be inspected frequently for watering needs and watered, as required, to provide adequate moisture in the planting pit. The Contractor shall inspect tree pits 24 hours after initial watering to confirm that they are draining properly. If surface water or excessively saturated plant pit soils exist, the Contractor shall immediately notify the Engineer.

Aged Pine Bark Mulch shall be placed in tree and shrub planting beds to a depth shown on the drawings, after settlement, no later than one week after planting. No aged pine bark mulch shall be placed in contact with tree trunks or shrub stems. No mulch shall be applied prior to the first watering of the plant materials.

Pruning

1. Trees and shrubs shall be pruned following planting in accordance with the American Nurserymen's Association Standards for Class I, fine pruning, to preserve the natural character of the plant, as required by the Engineer.
2. Tree pruning as required, shall be undertaken to the full height of affected trees.
3. All dead wood or suckers and all broken or badly bruised branches shall be removed. Never cut a leader.

Anti-desiccant shall be applied to all evergreen and other plants in the late fall as required by the Engineer.

Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition as required by the Engineer, at no cost to the Department.

Plant Maintenance

Contractor shall maintain all new plantings as indicated below. Maintenance shall begin immediately after each plant is planted and shall continue for a minimum of 90 days following the completion of all planting installations, or until the final acceptance of all planting work, whichever is a longer period of time.

Maintenance of new plantings shall consist of keeping the plants in a healthy growing condition and shall include but is not limited to watering, weeding, cultivating, pruning, re-mulching, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.

1. Plants shall be inspected for watering needs at least twice each week and watered as necessary to promote plant growth and vitality.

2. Planting beds shall be kept free of weeds, and mulch shall be maintained at the required depth. Beds and individual pits shall be neat in appearance with clearly defined edges and maintained to the designed layout.

3. Plants that die during the maintenance period shall be removed by the Contractor within one week of notification and replaced during that growing season.

Work of pruning, fertilizing, spraying, and similar activities shall be undertaken only by certified arborists and chemical applicators, as pertinent to the work being performed.

During the maintenance period, any decline in the condition of existing trees and new plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures. The Engineer shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the Engineer.

Clean Up

Absolutely no debris may be left on the site. Repair any damage to site or structures to restore them to their original condition, as directed, at no cost to the Department.

Acceptable Standards

General:

1. The Engineer will inspect the work upon the request of the Contractor. Requests for inspection shall be received by the Engineer at least ten days before the anticipated date of inspection.
2. The inspection dates shall follow the minimum maintenance periods called out for respective work items.
3. Upon acceptance of the work, the Engineer shall issue a written Certificate of Acceptance notice to the Contractor.

Planting:

1. At the time of inspection, if the plant materials and workmanship are acceptable by the Engineer, the date of the inspection shall establish the end of the maintenance period and the commencement of the required guarantee period for planting work.
2. At the time of inspection or if, in the Engineer's opinion plant materials and/or workmanship is deficient, acceptance will not be granted until the Contractor's responsibility for deficiencies are corrected. All dead and unsatisfactory plants shall be removed promptly from the project. Replacement plants shall conform in all respects to the Specifications for the original plants and shall be planted in the same manner.

Plant Material Warrantee Replacements

All trees, shrubs, woody seedlings, vines, and groundcovers shall be inspected by the Engineer one year after acceptance and shall be alive and in satisfactory growth at the end of that time.

Each plant shall show at least 75 percent healthy growth and shall have the natural character of a plant of its species as determined by the Engineer. Plants found to be unacceptable shall be removed promptly from the site and replaced immediately or during the next normal planting season, as permitted by the specifications, until the replaced plants live for one full year. A final replacement inspection will be made after the replacement plantings have lived through one full year.

All replacements shall be plants of the species, variety and size specified in the PLANT SCHEDULE. The cost shall be borne by the Contractor, except for possible replacements due to vandalism or neglect on the part of others.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The quantity of trees, shrubs, and ground covers shall be measured by each, as specified on the PLANT SCHEDULE on the Contact Documents, complete in place.

Planting of trees, shrubs, woody seedlings, ground covers and vines will be paid for at the contract unit price per each, which price shall include all labor, plant materials, equipment and incidental cost required to complete the work as described herein.

Planting Items WILL NOT INCLUDE PAYMENT for planting soil. These MATERIALS will be paid for under its respective payment items.

For plants that do not show at least 75 percent healthy growth and that do not have the natural character of a plant of its species at the time of acceptance, no payment for planting shall be allowed at the time of acceptance. At the time the final payment requisition is being prepared by the Contractor, the plantings will again be inspected by the Engineer and if replacement plants have been satisfactorily established, the plantings will be included for partial payment.

No separate payment will be made for fine grading and compacting, soil amendments, mulching, watering or pruning, but all costs in connection therewith shall be included in the Contract unit price bid.

Loam borrow and seeding, as part of ground restoration work where required or as required by the Engineer, will be paid for separately under Loam Borrow, Item 751., and Seeding, Item 765., in accordance with the relevant provisions of Sections 751 and 765, respectively.

Earth excavation will be paid for under Item 120, planting soil will be paid for under Item 752.5

Seed corridor mix will be paid for under Item 765.41.

ITEM 804.2	**2 INCH ELECTRICAL CONDUIT TYPE NM – PLASTIC (UL)**	**FT**
ITEM 804.3	**3 INCH ELECTRICAL CONDUIT TYPE NM – PLASTIC (UL)**	**FT**
ITEM 811.22	**ELECTRIC HANDHOLE – SD2.022**	**EA**
ITEM 811.30	**PULL BOX 8 X 23 INCHES – SD2.030**	**EA**
ITEM 811.31	**PULL BOX 12 X 12 INCHES – SD2.031**	**EA**

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 812.09 LIGHT STANDARD FOUNDATION PRECAST EA

The work under this item shall conform to the relevant portions of Section 801 and M4 of the Standard Specifications and the following:

Work under this item shall include furnishing and installing precast concrete light pole bases for street lighting units. The bolt pattern shall be provided by the lighting manufacturer.

The Contractor shall install the bases in accordance with the requirements of industry standards and as recommended by the lighting standard fixture manufacturer.

The Contractor shall examine the site and all the drawings before proceeding with the layout and installation of this work and shall install foundations as closely as possible to layouts shown on drawings. The Contractor shall consult the Engineer before modifying any work as necessary to meet job conditions and to clear other equipment.

Dimensions, elevations and locations are shown approximately. Verify measures in field.

The Contractor shall not install part of a system until all critical components of the system and related system have been approved.

METHOD OF MEASUREMENT

Light Standard Foundation Precast will be measured per each foundation installed complete in place.

BASIS OF PAYMENT

Light Standard Foundation Precast will be paid for at the Contract unit price per each, which price shall include the foundation, all labor, material, equipment and incidental costs required to complete the work.

ITEM 812.20 LIGHT LOAD CENTER FOUNDATION EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 812.992 ORNAMENTAL LIGHT POLE EA

The work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

GENERAL

The light pole and luminaire mounting arm shall be designed for aesthetic and functional compatibility and interchangeability.

The light poles, bases, cross arms and luminaires shall be as shown on the plans.

SUBMITTALS

Submittals are required for this Item.

The Contractor shall be responsible for verifying the accuracy of current manufacturers catalog model number or style. Shop drawings for all lamps, luminaries, globes, louvers, cross arms, light poles, bases and all other lighting equipment, and a sample of light pole finish, shall be submitted for approval, by the Engineer, prior to any order being placed.

MATERIALS

Lighting types shall conform to the details included on the Drawings.

Poles for all lighting types shall be finished by the manufacturer with a primer and black finish paint. All poles shall be wired to service an electrical outlet box located at the top of the pole.

All units shall conform to and meet all the current and revised requirements of the Massachusetts Electric Code, the National Electrical Manufacturers Association, Illuminating Engineering Society, American Standards Association, and the American Society for Testing Materials wherever such standards shall apply.

Luminaires shall be completely pre-wired and require only the attachment of power supply leads.

Complete luminaires shall conform to and meet all the current requirements of the National Electrical Manufacturers Association; American Standards Association; The Illuminating Engineering Society; and the Massachusetts Electric Code, wherever such standards shall apply.

All wiring shall be complete and proper operation shall only require attachment of the power supply leads. All power supply leads shall be clearly identified by means of permanently attached metal tags. A color lead for bonding the luminaire shall be furnished with each unit in addition to the power supply leads. Any required splicing in the luminaire shall be accomplished with insulated, compression type connectors. Under NO CONDITIONS shall wire nuts or non-compression type connectors be allowed.

The Contractor shall provide an additional 10% (Minimum of 3) of all fixtures as spares for the City of Newton Department of Public Works.

CONSTRUCTION METHODS

POLES

The Contractor shall exercise special care in erecting cast aluminum alloy posts to insure that they are firmly secured to the concrete foundation and plumbed in accordance with the details shown on the plans and to the satisfaction of the Engineer. The shims furnished with the post shall be used if necessary. The pole shall not be installed until the related underground wiring has been completed and tested. The Contractor shall exercise special care to insure that paint finish is not damaged and shall repair any damage with factory supplied touch-up paint.

LUMINAIRES

The Contractor shall exercise special care in installing luminaire to insure that they are firmly attached to the pole and level in accordance with the details shown on the plans and to the satisfaction of the Engineer. The luminaires shall not be installed until the related underground wiring has been completed and tested. All lights are to be individually fused in the handhole.

Luminaires shall be wired with #10 AWG cable as per specification with a fused light connector, with appropriate fuse in the power lead. All cables shall be identified with the appropriate colored marking tape. All leads shall be continuous from the pull box to the post top. Neutral and bond leads shall be connected using insulated pressure connectors.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Ornamental Light Pole 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 necessary to furnish and install light poles, fixtures, cabling, receptacles, and all other ancillary labor and materials, all as described in the previous sections herein or as shown on the plans.

Conduit will be paid separately under Item 804.2, 2 Inch Electrical Conduit, Type NM Plastic (UL). Pull boxes will be paid separately under Item 811.30, 8" x 23" Pull Boxes - SD2.030. Ornamental Light Pole foundations will be paid for separately under Item 812.09, Light Standard Foundation Precast.

i. (value)
ii. The cabinet temperature (value)
iii. The cabinet humidity (value)
iv. The presence of AC power (OK or Fail)
v. The flashing status of the intersection (OK or Flashing)
vi. Stop Time status (OK or Stop Time Active)
vii. The cabinet door status (Open or Closed)
viii. The intersection fan status (Fan on or Fan off)
ix. It shall be possible to view graphs of each of the value parameters in graphical form, over the recent two-week period. This includes real time graphs of:
    1. The AC mains voltage
    2. The battery back-up voltage
    3. The cabinet temperature
    4. The cabinet humidity

ITEM 816.01 TRAFFIC SIGNAL RECONSTRUCTION LOCATION NO. 1 LS

Work under this item shall conform to the relevant provisions of Section 815 of the *2021 Standard Specifications for Highway and Bridges* (Standard Specifications), the *2009 Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), and the following:

The work shall include the furnishing and installation of part or all of the following items: local traffic signal controller; cabinet and foundation with concrete pad; mast arm assemblies with anchor bolts and foundations; signal posts, bases, and foundations; signal housings; retroflective backplates; vehicular and bicycle video detection; pedestrian signals with countdown timers; accessible pedestrian signals (APS) push buttons with signage; emergency vehicle preemption; all cable and wiring; ground rods, equipment grounding and bonding; service connections; removal of existing traffic signal equipment, and all other equipment, materials and incidental costs necessary to provide complete, fully operational traffic control signal system as specified herein and as shown on the plans at the following location:

- Location 1 (Item 816.01): Chestnut Street at Oak Street

A list of major traffic signal items as required at this location is included on the traffic signal plans. It is not intended that every fitting, minor detail or feature be shown and described, as the assumption is made that the Contractor and/or their Subcontractor is an expert in the particular area of responsibility and is capable of interpreting the plans, Specifications, and Special Provisions so that the bid and/or construction shall include all items required to provide complete, fully operational traffic control signal system and that they shall be provided and installed in a neat and workmanlike manner.

All traffic signal equipment shall comply with the MassDOT Qualified Traffic Control Equipment List unless otherwise approved by the Engineer:

(https://www.mass.gov/lists/massdot-qualified-traffic-control-equipment-qtce)

Maintenance of Traffic Signals

It shall be the responsibility of the Contractor to provide all labor, equipment and material required for the total maintenance and repair of all existing and proposed traffic signal control equipment, including damage by automobile accidents until final completion and acceptance of the project, unless otherwise specified under Subsection 7.17 "Traffic Accommodation: of the Standard Specifications as amended, in which case Subsection 7.17 will govern. These provisions will apply to the signalized location included as part of this construction Contract from the date of written notice given to the Engineer that the Contractor will work on or adjacent to the existing signal until the date when the City accepts the complete project. This written notice must be given before the Contractor may proceed with any work on a specified traffic signal location.

For the purpose of these Special Provisions, the phrase "Traffic Signal Control Equipment" is intended to include, but is not limited to, controllers, signal housings, supporting structures, cabinet accessories and panels, wires, conduit and all other ancillary electrical equipment used for traffic control.

Shop Drawings and Certificate of Compliance

Within 30 days following Notice to Proceed, the Contractor shall submit a list of equipment and manufacturer's equipment specifications he proposes to install to the Engineer in accordance with the relevant provisions of Section 815.20. No equipment or accessories will be accepted unless type tested and approved by the MassDOT – Highway Division prior to the date of proposal, unless otherwise noted in the plans or the Special Provisions.

The Contractor shall commence no work until approval of the shop drawings 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 required by the plans and these specifications.

Along with the shop drawings the Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

Existing Traffic Signal Installations

All of the existing traffic signal equipment shall be removed unless otherwise indicated. The existing traffic signal at the location(s) to be reconstructed under Item 816.01 shall be maintained in operation throughout the construction period and until the new signal is 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. Prior to installation any temporary installations not part of the original design shall be reviewed and approved by the Engineer. This includes adjusting (relocating) traffic signal heads to accommodate maintaining traffic requirements associated during construction. As applicable, this work includes adjusting existing and temporary traffic signal heads, wiring, fittings, cabling, and all other materials and labor required to ensure complete and operating traffic signals. If an existing signal is to be turned off temporarily to allow controller switch over or rewiring, police details 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 as required by the Engineer in accordance with Section 815.65. Old cable and unusable materials shall be disposed of by the Contractor.

Prior to initial turn-on of the new or modified signals, equipment, signal displays, and vehicle detection as shown on the plans and called for in these special provisions, shall be installed and operable. Applicable signs and pavement makings shall also be in place when the signals are put into operation.

Modifying Existing Controller and Cabinet

The existing cabinets, controllers and ancillary signal equipment at Location 1 (Items 816.01) shall be removed and stacked. The Contractor shall excavate the existing foundation and a new cabinet and foundation are to be installed.

The existing cabinet and controller shall remain in operation until the new traffic signal is operational. Should the cabinet and controller equipment need to be powered off during the removal of the existing cabinet and the new installation, a police detail shall be provided to maintain traffic operations during the temporary period.

Service Connection

Under Item 816.01, the service connection shown on the plans is approximate only. The Contractor shall determine exact location from the servicing utility, arrange to complete the service connection, and be responsible for all charges incidental thereto. The existing service connection to be modified under Item 816.01 shall be maintained in operation throughout the construction period and until the new traffic signal is ready for operation. The existing service connection shall be removed by the contractor after the new traffic signal is fully operational and the existing service connection is no longer required. The contractor shall arrange to have the existing service connection disconnected by the servicing utility company. Once the existing connection is disconnected, the contractor shall remove and dispose of legally all existing wiring, risers, and all other hardware and materials related to the existing service connection.

It shall be the Contractor's responsibility to contact the utility company. The electric company will connect and disconnect power as required. No work shall be done in manholes or on power poles without a representative of the electric company being present. The Contractor will be responsible for coordinating work with the electric company.

The utility will provide a connection at the overhead structure and make the connection from the power source to the meter socket. The Contractor will install the conduit connecting the connection to the controller cabinet foundation. The service connection shall include a riser, weatherhead, and disconnect switch.

The Contractor shall furnish and install, or cause to be installed, all service equipment to the satisfaction of the electric utility company. It shall also be the Contractor's responsibility to pay all charges to the utility company for performing the work previously described.

Openings where cables enter the bottom of the controller cabinet, and each pull box shall be sealed with approved elastic sealing compound.

No direct reimbursement will be made under this contract to the Contractor for payments made to electric company, it being understood that full compensation for any payment made by the Contractor to the utility company will be included in the contract prices bid.

Testing of Grounding System

Grounding Cable - Grounding cable shall be bare copper No. 8 AWG wires. All proposed traffic signal equipment shall have new cabling.

The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer and the City in accordance with the Standard Specifications.

Traffic Controller Cabinet

Controller Cabinet shall conform to the NEMA TS 2 Standards, Section 7. Cabinet size shall be as indicated on the plans and as shown below:

TS 2 Type 1 Configuration Table

Item #	NEMA TS 2 Cabinet Size	Nominal *Cabinet Size* (HxWxD)*	Config. Type	Load Switch Positions	Flash Transfer Relays	BIUs Required w/ spare	Detector Rack Type	MMU (Channels)
816.01	6	52x44x24	4	16	6	4	2	16

*Approximate cabinet dimensions are provided in inches.

The cabinet shall be made of aluminum and painted gloss black.

The cabinet shall be equipped with filter vents and two (2) thermostatic fans for forced air cooling.

The top of the cement concrete foundation for the controller cabinet shall be 18 inches above grade. Controller cabinet foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is impaired. Anchor bolts shall be internal to the cabinet. A 1/2- inch bead of silicone sealant is required to form a waterproof seal between the controller cabinet and the top of the concrete foundation.

All sweeps to be installed in cabinet foundation shall be 3-inch (PVC) sweeps with sufficient 3-inch PVC riser to project above the finish grade of the base. A cement concrete pad and walkway shall abut the front and one side of the cabinet and shall be built in accordance with the MassDOT's sidewalk specifications. The width of the concrete pad and walkway shall be a minimum of 3 feet wide.

The cabinet shall be installed with the door opening positioned in order to allow general observation of the flow of traffic and the inside of the cabinet at the same time.

The cabinet shall also be wired with a normally closed switch connected to a user defined input to the controller for remote monitoring of the control cabinets' door open status (future use).

Provisions shall be made for manual override of the traffic controller. Manual override equipment shall include an automatic-manual switch and interval advance hand-push button switch, both located within the auxiliary police door. Hand-push button switch shall have flexible cord of sufficient length to allow movement by the operator to observe the operation of the intersection from the controller cabinet.

The cabinet shall include a document tray mounted below the bottom shelf. The tray shall be sufficient size to contain cabinet wiring diagrams and two manuals. The tray shall slide out on nylon rollers or ball bearings. The tray shall have hinged cover to protect documents. The closed cover shall be able to support a laptop computer. All cables shall be tied away to allow the tray to be opened and closed smoothly without any obstructions.

Cabinet Door Sticker

The Contractor shall supply and install a laminated door sticker on all existing and proposed cabinets. This sticker shall be permanently affixed to the upper left-hand side of the interior main cabinet door, unless unable based on cabinet size. The sticker shall contain, at a minimum, the following:

- Plan view of traffic signals influence area; including signal housing locations, pole and post locations, detector zones, etc.
- Vehicle detection information including rack position, detector channel assignment, phase assigned, approach and termination points.
- Network communications information including IP address, subnet mask and MAC address.
- Per approach preemption information including channel, approach/direction and termination points.

GFI Duplex Outlets

The Contractor shall supply and install a second separate GFI protected duplex outlet in the proposed controller cabinets and mounted on the side wall of the cabinets for servicing other devices.

Ethernet Switch

The controller cabinet shall be equipped with a minimum 8 port industrially-hardened managed Ethernet switch capable of Ethernet communication over proposed fiber optics and existing copper. The Ethernet switch shall be NEMA TS-2 rated.

This work shall consist of furnishing, installing, and testing an Ethernet Switch that meets the requirements of a 100 Mbps Ethernet Switch. The Ethernet Switch shall include a minimum of four single mode fiber optic patch cords, each one meter in length, and terminated on both ends with Type SC single mode fiber optic connectors.

The Ethernet Switch shall include sufficient Category 6 Ethernet patch cords, each one meter in length, and terminated on both ends with Type RJ45 connectors to provide full connectivity within the cabinet as shown in the Contract Documents.

The Ethernet Switch shall include all accessories required for a full and complete installation, including but not limited to all connecting cables, serial to Ethernet modems, power supplies, and mounting hardware.

Traffic Signal Controller

The traffic signal controller shall be a Yunex m60 (former Siemens m6) or City approved equal. The traffic controller supplied shall conform to Section 3 "Controller Units" of the NEMA TS 2 Standard and ATC standards. The traffic controller shall be supplied in a TS 2 Type P Configuration as required in the list of major traffic signal items included on the plans for this intersection. Specifically, the controller unit (CU) shall be supplied as actuated controller with NTCIP capabilities; defined as Type A1N in Subsection 3.2 of the NEMA TS 2 Standard.

The TS 2 Type P cabinet shall, at a minimum, meet the requirements of configuration 3 as defined in Table 5-2, "Type 1 Configurations" of the NEMA TS 2 Standard.

The controller unit 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. The controller unit shall also meet the requirements of Paragraph 3.3.6 "NTCIP Requirements" of the NEMA TS 2 Standard.

The controller unit 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. The controller shall include an integrated Ethernet port and USB port.

The controller unit shall be keyboard-entry menu-driven unit with internal time base coordination, emergency preemption, and programmatic capability. The controller shall also be complete with a module for closed loop system functions.

The controller and cabinet shall be capable of accommodating flashing yellow arrow (FYA) operations per Section 4D.18 and 4D.20 of the MUTCD.

Flashing Operation

The controller shall be capable of functioning with both incoming and outgoing coordination.

The controller shall be equipped with a separate emergency flashing mechanism capable of providing flashing operation at the rate of 50 to 60 flashes per minute. This mechanism shall be so wired and so mounted within the cabinet that it will continue to cause the signals to flash even when the basic controller is removed from the cabinet.

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Section 4D.28-31 of the MUTCD. Flashing yellow arrow operations shall be in conformance with Section 4D.18 and 4D.20 of the M.U.T.C.D.

Traffic Signal Cabinet Equipment

The traffic signal controller unit (CU), MMU, detector amplifiers, cabinet power supply, bus interface units (BIUs) and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the NEMA

Standard No. TS 2-1998, Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements.

Malfunction Management Unit

The MMU shall comply with Section 4 of the NEMA TS 2 standard. The MMU shall be capable of operating as either a Type 16 with 16 channels (8 vehicle, 4 pedestrian, 4 overlap) or a Type 12 with 12 channels (8 vehicle, 4 overlap). The MMU's supplied shall be configured to operate as Type 16 units. The MMU supplied shall be set-up to operate in conflict monitor mode. The MMU shall be compatible with the traffic signal controller and shall include an integrated Ethernet port, or approved equivalent.

The MMU's in either the Type 16 or Type 12 configuration shall be capable of operating in a NEMA TS 2 Type 1 cabinet, a NEMA TS 2 Type 2 cabinet, or a NEMA TS 1 cabinet without loss of functionality.

The MMU shall be capable of accommodating FYA operations per Section 4D.18 and 4D.20 of the MUTCD.

Bus Interface Units

The BIUs 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 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.

Cabinet Power Supply

A separate power supply shall be supplied and installed in the TS 2 cabinet. As a minimum, the power supply shall meet all requirements of Paragraph 5.3.5 of the National Electrical Manufacturers Association (NEMA) TS 2 Standard. The unit shall be AC line powered and provide regulated DC power, unregulated AC power, a line frequency reference for the rack mounted loop amplifiers, bus interface units, load switches and other auxiliary cabinet equipment as required.

The power supply shall be either shelf mounted or installed as part of the detector rack assembly.

The unit shall contain four LED indicators on the front panel to indicate the four outputs;

1. + 12 VDC +/- 1 VDC @ 2.0 amps,
2. + 24 VDC +/- 2 VDC @ 2.0 amps,
3. 12 VAC @ 250 milliamps, and
4. 60 Hz line frequency reference.

A test point terminal shall also be located on the unit's front panel for + 24VDC and logic ground testing.

Load Switches

Load switches shall comply with Subsection 6.2 of the NEMA TS 2 standard. All load switches shall utilize optically isolated encapsulated modular solid-state relays. Discrete components on circuit boards are not acceptable.

Load switch indicator lights shall be LED-type and wired on the input side of the device.

Flasher

Flashers shall comply with Subsection 6.3 of the NEMA TS 2 Standard and be equipped with two output indicator lights which will show flashing power out to the cabinet assembly.

Flash Transfer Relays

Flash transfer relays shall comply with Subsection 6.4 of the NEMA TS 2 standard. The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

Spare Equipment

The Contractor shall provide the following spare signal equipment in the traffic signal controller cabinet listed below:

- A full complement of load switches to accommodate each available position on the back panel;
- A full complement of flash transfer relays to accommodate each available position on the back panel;
- Two (2) Bus Interface Units (BIU's)
- One (1) Video Detection Module
- A 25-foot RS-232 cable for communication function with a laptop computer

Surge Suppression

Each cabinet shall have each input and output surge protected except signal outputs from cabinet load switches. (The load switches act as surge suppressors.)

The surge protector must be electrically connected to the nearest grounded metal structure or nearest ground rod.

Surge protection for power service shall conform to the NEMA TS-2 standard. The product complies when a lab report summary from an independent test laboratory stating the product passes the current NEMA TS-2(5.4.2.4) specification is submitted with the shop drawings.

Surge protection for all loop, pedestrian button, and pre-emption connections shall have peak surge current protection of at least 10kA with a response time of less than 5 nanoseconds. The product complies when a lab report summary from an independent test laboratory stating the product passes this specification is submitted with the shop drawings.

Units shall be plug mounted in the controller cabinet.

At a minimum surge suppression shall be provided for loop detectors, power service, and emergency preemption.

Units shall be unconditionally warrantied for at least 5 years. Manufacturers without publicly advertised 5-year warranties must provide written confirmation that they will warranty the surge suppression unit for five years and this documentation is to be provided with the shop drawing submission.

Emergency Vehicle Preemption - GPS

The emergency vehicle preemption system shall be per City Standards, shall be fully compatible with City of Newton Fire Department equipment, including any coding requirements and installed in the same cabinet as the controller. It is the responsibility of the Contractor to determine pre-emption operation requirements through the City's Fire Chief.

The City is procuring a city wide Traffic Signal Preempt and Remote Monitoring System (the TSPRMS). The intention of the TSPRMS is to allow the following to key requirements to be provided:

1. The system shall track emergency response vehicles and provide preemption and priority requests to the traffic signal controller.
2. The system shall be capable of configuring preemption and priority requests for more than 120 seconds before the vehicle approaches the intersection.
3. A web-based configuration utility shall provide an easy way of preemption and priority zones.

4. The system shall use a GPS position of the vehicle to determine when to send a preemption request to the traffic signal controller.
5. The system shall have redundant communication from the vehicles to the traffic intersections using both 900MHz radio and Cellular communications.
6. Display of the real time fault status of the Agency traffic intersections.
7. Issue real time alerts via SMS and email to the appropriate response personnel immediately a fault occurs, so that the Agency no longer has to rely on notification by the public.
8. Operating the TSPRMS with cloud hosted software with user web based access, and with no software or IT infrastructure for The Agency to install or maintain (except if the Agency desires to host the software on its own servers). The client user interface will be browser based, with no software to be installed on client computers except for a standard browser.
9. The monitoring of the preempt system assures that the preempt devices (both in vehicle and in cabinet) are functioning correctly, and that the system will be available when required.
10. The field devices must be capable of receiving "over the air" software and security updates. The over the air updates allows new features to be installed remotely without having to physically go to the field devices.
11. The hardware shall be under warrantee for as long as the devices have a connectivity and support license and connected to the Remote Beacon Monitoring System.

Traffic Signal Preempt and Remote Monitoring System Client User Interface Requirements

The TSPRMS software user interface shall provide, as a minimum, features to meet the following requirements:

2. General
    a. The user interface shall be web based, and to be able to be viewed using a browser. Internet Explorer, Chrome and Firefox browsers shall be supported, as well as Safari on an iPad. Systems that use remote desktop or similar to view a thick-client user interface will not be acceptable.
    b. The TSPRMS shall require a username and password to log on.
    c. The RSBMS systems shall be mobile friendly, and operators shall be able to open the system on a mobile phone to access the data and control the school beacons. The web-based system shall be viewable on any modern web browser on a mobile phone and automatically sized for the screen.

3. Map Display
    a. The TSPRMS shall include a scrollable, zoomable map display, with the intersections and emergency vehicles shown as representative icons on the map. The map shall include the ability to see the intersections using Google Streetview.
    b. 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 alarm.
    c. 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 alarm.
    d. The icons shall change to be able to clearly indicate if an intersection is offline.
    e. Clicking on the icon on the map shall expose a box with the current parameters of the intersection shown.
    f. 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.
    g. The map view shall have the ability to show Google traffic overlays on the map.
    h. The map view shall be able to show vehicle trails when the vehicles have been in an emergency or not active.

4. Regional Intersection and Vehicle Grouping
    a. The TSPRMS shall provide for intersections and Vehicles to be logically grouped into regional groupings (for example, north; south; Fire 1; Fire 2)
    b. The TSPRMS user logon shall be configurable so that if a maintenance or operational person is responsible for, say, the north intersections and emergency vehicles then when that user logs on, the user has visible only the intersections that belong to the group that the user is authorized to view.

5. Intersection Detail Display

a. It shall be possible to drill down, either from the map icon or from the list to a device level detail for the intersection, which as a minimum shall display the following parameters:
b. The alarm status, with priority indicated, and a text description of the alarm (if an alarm is present for this device).
c. The time since the last communication with the device
d. The following parameters (real time now values, minimum for the day values, maximum for the day values, and average for the day values)
    i. The AC mains voltage (value)
    ii. The battery back-up voltage (value)
    iii. The cabinet temperature (value)
    iv. The cabinet humidity (value)
    v. The presence of AC power (OK or Fail)
    vi. The flashing status of the intersection (OK or Flashing)
    vii. Stop Time status (OK or Stop Time Active)
    viii. The cabinet door status (Open or Closed)
    ix. The intersection fan status (Fan on or Fan off)
    x. It shall be possible to view graphs of each of the value parameters in graphical form, over the recent two-week period. This includes real time graphs of:
        1. The AC mains voltage
        2. The battery back-up voltage
        3. The cabinet temperature
        4. The cabinet humidity

6. Diagnostics and Log Display
    a. From the device level detail, it shall be possible to further drill down to get the raw data; the error logs; and the communications logs to allow a technician to fault-find problems on the TSPRMS.
    b. It shall be possible to filter the logs by Device; by Device Type and/or by Group as well as between dates.
    c. It shall be possible to print these selected logs to a local printer or a PDF file.
    d. It shall be possible to export these logs to Excel on the local computer for further analysis.

7. Alarms
    a. The TSPRMS shall have a comprehensive alarm generation capability
    b. It shall be possible to configure alarms to be generated on any parameter becoming out of tolerance, including analog values, digital values and enumerated values.
    c. Alarms shall be configurable to be of Low, High or Critical Priority.
    d. The alarm priority shall be displayed throughout the TSPRMS, on all displays, using color codes such as red-critical; yellow – high; and amber-low to indicate the priority of the alarm.
    e. The current active alarms shall be accessible for view via an expandable window, to see which alarms are active and when the alarm occurred. The highest priority alarms shall rise to the top of the list.

8. Alerts
    a. The TSPRMS shall have comprehensive alerting capability, to enable the response personnel to be notified when an abnormal situation has occurred.
    b. It shall be possible 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.
    c. The alert shall be configurable to optionally send via email and/or via SMS a message when an alarm clears.
    d. The intention is that the TSPRMS provides the alerts to the user in near real time. The SMS and email shall be issued within 30 seconds of the occurrence of event which results in an alert being issued.

9. Reports
    a. It shall be possible to view reports on the screen, in the browser of the TSPRMS, and if desired print the report to a printer or a PDF file.
    b. Alarm Activity Report
        i. The TSPRMS shall include a report which shows the alarms activity for a period.

ii. The Alarm Report shall indicate the time the alarm occurred; by color the priority of the alarm; whether it is still active; and if not active then the time that the alarm cleared.
iii. It shall be possible to filter the alarms by Device Type; by Device and/or by Device Group as well as by date time to be able drill down into a large alarm list to be able to view, for example, the alarm activity for a particular intersection or controller type over a three-month period.

c. User Activity Report
   i. The TSPRMS shall include a report which shows user activity for a given period, to enable an audit of a user's response to an alarm to be made.
   ii. The report shall show which screens the user viewed; when the screen was viewed, and the IP address of the computer from which the screen was viewed.

d. Preempt System Operational Availability Report
   i. The TSPRMS shall include a report which shows the overall operational availability of the Agency intersections. The intersection is available when not in an alarm condition such as flashing or power fail.
   ii. The availability report shall be detailed for each intersection for the period (say 1 month) and summarized by group (region) and for each controller type and shall result in a KPI for each region; for each controller type; and an overall system KPI for the intersection system availability.
   iii. Using this report, it shall be possible to determine if system availability is trending up or down for the overall intersection system; by region and/or by controller type. It shall also be possible to compare the system availability by region; and also, to compare system availability by controller type.

e. Fault Occurrence by Controller Type Report
   i. The TSPRMS shall include a report which shows the number and type of faults that have occurred in each intersection, which can be summarized by region and/or by controller type.
   ii. This report will allow the user to compare the frequency of faults by region and by controller type.

f. Response Time for Fault Repair Report
   i. The TSPRMS shall include a report which shows the response time to clear faults, for a given time frame (say 1 month).
   ii. This report will allow the user to determine the number of faults, and the total and average time to clear the fault.
   iii. This report will allow the response times by region to be compared.

g. Vehicle Trip Report
   i. The TSPRMS shall include a report which shows all the emergency vehicle trips and include information on start time, end time, total travel time, average speed and destination point.
   ii. The report shall provide the user the ability to select a start date and end date.
   iii. This report will show response times to emergency call outs and how quickly the vehicle arrived.

10. Vehicle Trails
    a. The maps display shall show live information of the preempt status of the emergency vehicles on the system.
    b. The user shall have the option to select which class of emergency vehicles to display on the map via the information overlay menu.
    c. The information overlay will provide the option to select the number of hours of live data the operator would like to see. This ranges from 1 hour to 24 hours. The user shall have the ability to select that the trails will fade away as the data becomes older.
    d. The information overlay shall provide the ability for user to display the device names on the map, for easy identification of both intersections and emergency vehicles.

e. Operators will have the ability to display legends that explain the emergency vehicle trails color codes, including idle, preempt service requested, left turn indicator, and right turn indicator so that it is easy to see the behavior of the emergency vehicle.

11. Vehicle Playback
    a. The TSPRMS shall include the ability to playback the activity of the emergency vehicles, so that retrospective fault finding of the preempt system can be carried out.
    b. Playback shall support the same controls for panning and zooming the map, as well as using the information overlay to select the type of data being displayed on the playback menu.
    c. Users shall have the additional functionality of controlling which devices are displayed by selecting the checkboxes on a selection panel on the left of the map.
    d. The playback screen should provide the user with the option to select a date range via a drop-down date selector menu. The menu will provide a full calendar and the option to select the exact start time and end time for the playback.
    e. The bottom section of the map screen shall display the timestamp based on the location within playback.
    f. The user shall have controls that allow one click access to start from the beginning, rewind, play, fast-forward, and scroll to end.
    g. The user shall have the option to use a slider that is operated by click and drag to the time of interest in the playback.

12. Remote Power Cycle
    a. The TSPRMS shall include the ability to remotely cycle power to the outlets on the back of the field device. In this way it shall be possible to cycle power to ancillary connected equipment such as network switches, cameras and similar equipment.
    b. The user interface shall display the status of the outlets and provide confirmation via an associated input whether the sockets are energized or not.

Preempt System Functional Requirements

The Traffic Signal Preemption system shall conform to the following requirements:

1. Overall Requirements
    a. When emergency vehicle requests preempt service, the TSPRMS shall reliably request a preempt from the traffic controller by activating a digital output (which is connected to one of the preempt inputs on the traffic controller) when the circumstance of the emergency vehicle (location, speed, estimated time of arrival, indicator) comply with the rules established by the configuration of the intersection.
    b. The preempt activation shall be managed by implementing the following rules/parameters. It shall be possible to have up to 32 rules.
        i. The approach area of a rule shall be bounded by a left and right direction, and a minimum and maximum distance. A preempt shall only be activated if the vehicle is within this boundary and approaching the intersection.
        ii. If enabled, the preempt shall be activated when the estimated time of arrival (ETA) for the vehicle is less than the set parameter.
        iii. If enabled, the preempt shall be activated when the vehicle is less than the minimum distance to the intersection.
        iv. If enabled, the preempt shall only be activated if the vehicle has the left turn signal, or right turn signal, active as configured.
        v. If enabled, the preempt shall be activated early if congestion is detected in front of the emergency vehicle (and congestion will be detected by the emergency vehicle travelling below a threshold speed) so that the early activation of the preempt can help clear the congested traffic out from in front of the emergency vehicle.
        vi. Each rule shall cause a particular preempt to be activated. Multiple rules can be associated with a particular preempt.
        vii. If configured, a preempt rule shall stay active until the vehicle is detected at a safe distance away from the intersection and moving away from the intersection.

viii. The preempt shall be released once all active rules that triggered the preempt have become deactivated.

c. The preempt system shall support eight (8) preempt or pulsed low priority outputs. All inputs are optically isolated.
d. The status of preempts shall be indicated by LEDs on the front of the in-cabinet preempt unit.
e. It shall be possible to test each of the preempts by pressing a test button (with an associated selector switch) which will cause each preempt to be triggered. This will allow for the wiring, and operation of the signal controller, to be tested without actually driving a vehicle down each approach.
f. The system shall be able to support service calls on a first come first serve basis.

2. Communications Requirements
   a. The preempt system shall support both radio and cellular communications.
   b. The radio system shall operate on unlicensed bands and shall not require user certification.
   c. The radio shall have a range in excess of 2500 feet.
   d. The system latency shall support real time communications on a second-by-second basis from the vehicle to the intersection.
   e. Data paths shall be established (if configured) to operate via radio and via cell network. In this way, the preemption request packets from the vehicle will potentially arrive at the intersection from both communication paths. The intersection shall process the packet that arrives first and ignore the packet that arrives subsequently.
   f. The system shall continue to operate correctly in the event of radio or cellular failure.

3. Central Configuration Requirements
   a. It shall be possible to configure the parameters required to implement the desired rules on a browser client connected to the central computer.
   b. Setting of left and right direction limits, and distances, shall be accomplished by clicking and dragging of lines on a map of the roads.
   c. Other rule parameters shall be entered on the user interface and saved and/or sent to the intersection as required.
   d. Systems that require the installation of software onto client computers will not be acceptable.

4. Local Configuration Requirements
   a. It shall be possible to edit the preemption rules at the roadside by connecting a laptop computer to the controller with an Ethernet cable.
   b. The editing of the rules shall be accomplished by using a local web site hosted by the preempt controller, using a browser.
   c. Systems that require the user to load custom configuration software on the laptop for the purpose of editing the preemption rules will not be acceptable.

Intersection Device Requirements

It is a requirement that the TSPRMS operate independent of the brand/type of intersection controller deployed at the intersection. The TSPRMS contractor shall install a small field device into each intersection cabinet which connects to the terminal strip in the cabinet (via a wiring harness) and makes the TSPRMS functions independent of controller operation. The TSPRMS Field Device (TSPRMSFD) shall conform to the following requirements:

a. The TSPRMSFD shall function correctly between -34 degrees C and +74 degrees C.
b. The maximum size of the TSPRMSFD shall be 19" x 7,455" by 1.719" (1U) and shall be suitable for placing in an AGENCY traffic cabinet.
c. The TSPRMSFD shall be provided with appropriately rated connects that allows the TSPRMSFD to be exchanged by unplugging connectors, without tools.
d. The RMDFD shall incorporate an integrated GPS and cell modem.
e. The configuration of the TSPRMSFD shall be accomplished by accessing the internal web server with a browser. It shall be possible to configure the TSPRMSFD without any special software.
f. The TSPRMSFD shall be powered via a standard 120V input power.

g. The TSPRMS FD shall allow for the routing of the controller configuration packets to and from the controller (either by Ethernet or serial communications) for the three types of controllers that are utilized by the AGENCY. In this way is shall be possible to configure the controller and utilize the controller specific software to interrogate the controller, and the TSPRMS shall provide the communications pipe which allows this to be accomplished.
h. The TSPRMSFD shall utilize field-initiated communications. This allows for a low cost cellular data plans to be used, with infrequent polling. However, when an abnormal event occurs and is detected by the TSPRMSFD, then the TSPRMSFD will immediately initiate the transfer of a data packet to the TSPRMS to enable real-time alerting of response personnel to take place.
i. The TSPRMSFD shall, within the size limitations above, include a battery and battery charging/monitoring circuit, to allow the TSPRMS to function correctly even when all power to the intersection has failed. The battery shall continue to power the TSPRMSFD for a minimum of 5 hours after all power has failed to the intersection.
j. The TSPRMSFD shall incorporate an integrated GPS which will allow the TSPRMSFD to geo-locate itself on the map, without configuration.
k. The TSPRMSFD shall operate without requiring a static IP address. The only configuration required at the TSPRMSFD is to enter the URL of where the TSPRMS central software is hosted.
l. In the event that the cell service is interrupted or is not available, the TSPRMSFD shall store any events that occur in internal memory and forward these events automatically to the TSPRMS 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. The system will store 5000 events.
m. The TSPRMSFD shall utilize HTTP and HTTPS protocols, and XML data structures, for communications with the TSPRMS. In this way the data will be open for future expansion and competition. The use of secret proprietary protocols is not permitted.
n. The TSPRMSFD shall be a 1U 19” rack mount device, with all connections on the rear, and LED indicators, power switches and selector switches on the front.
o. The TSPRMSFD shall include Ethernet communications with an RJ45 connector.
p. The TSPRMSFD shall use no self-tapping screws.
q. The TSPRMSFD shall be powered coated aluminum enclosures.
r. The TSPRMSFD shall include weatherproof antennas if installed externally.

In-vehicle Device Requirements

The Traffic Preempt System Vehicle Device (TPSVD) shall conform to the following requirements:

a. The TPSVD shall function correctly between -34 degrees C and +74 degrees C.
b. The TPSVD shall be capable of being mounted inside a vehicle either under a seat or strapped under the dashboard. The unit will come with all wiring needed to connect the system to the vehicle.
c. The TPSVD shall interface to a non- invasive road sensor for environmental measurements via either RS485 or Bluetooth connection.
d. The TPSVD shall be provided with appropriately rated and keyed connectors that allows the TPSVD to be exchanged by unplugging connectors, without tools.
e. The TPSVD shall incorporate an integrated GPS and cell modem.
f. The configuration of the TPSVD shall be accomplished by accessing the internal web server with a browser. It shall be possible to configure the TPSVD without any special software.
g. The TPSVD shall utilize field-initiated communications. This allows for low-cost cellular data plans to be used, with infrequent polling. However, when an abnormal event or significant change in road conditions occurs, then the RCMSDC will immediately initiate the transfer of a data packet to the RCMS to enable real-time road condition information to be displayed on the TPSVD.
h. The TPSVD shall incorporate an integrated GPS which will allow the TPSVD to geo-locate itself on the map, without configuration.
i. The TPSVD shall operate without requiring static IP address. The only configuration required at the TPSVD is to enter the URL of where the TSPRMS central software is hosted.
j. In the event that the cell service is interrupted or is not available, the TPSVD shall store any events that occur in internal memory and forward these events automatically to the RCMS 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.

k. The TPSVD shall utilize HTTP and HTTPS protocols, and XML data structures, for communications with the RCMS. In this way the data will be open for future expansion and competition. The use of secret proprietary protocols is not permitted.
l. The TPSVD shall support Ethernet, cellular and license free radio communication.
m. The TPSVD shall have the option of being supplied with an enhanced GPS, which provides GPS coordinates based on dead-reckoning even when the GPS signal is shielded from the vehicle such as under an overpass, in a tunnel or in between tall buildings in a city. The dead reckoning system shall include accelerometers, gyroscopes and a distance measure that will provide accuracy of better than 20 feet in 1000 feet, when there is no information from the GPS satellites. The enhanced GPS shall optionally be connected to the vehicle OBD-II port; the J1939 ECU port (for heavy vehicles) or a wheel tick sensor as the project requires. The enhanced GPS shall self-calibrate the wheel tick input.

Installation

All installation work in the Agency cabinets shall be carried out by personnel certified by Agency for work in Agency traffic cabinets. The City will be responsible for installing the GPS vehicle kits within their own vehicles.

Hosting and Connectivity and Service

a. The TSPRMS contractor, as part of the quote, shall include 5- or 10-years options for Connectivity and Service, as part of the purchase price. The RSBMS contractor, as part of the response to this RFQ, shall provide the option to extend the operation for a further 5 years of the Connectivity and Service agreement of the RSBMS.
b. The Connectivity and Service agreement shall include at a minimum:
    - Cellular Connectivity
    - Upgrade the cellular modem if the technology is not supported by the cellular networks.
    - Telephone and email support
    - No cellular overage charges
    - Extended warranty on the hardware for the period of the Connectivity and Service Agreement
    - Over-the-air software updates
    - Over-the-air security updates
    - Future Connected Vehicles Service

Commissioning, Training and Documentation

The TSPRMS contractor shall configure the system and reports, and train the Agency in the correct operation of the TSPRMS, to enable the Agency to utilize the TSPRMS for the objectives outlined above.

Extensibility

1. The TSPRMS shall be designed to be extensible to cover the monitoring, maintenance and operations of additional ITS systems such as:
    a. School Beacons
    b. Speed Feedback Radars
    c. Dynamic message signs
    d. Mobile systems such as maintenance vehicles, and Remote Weather tracking vehicles.
    e. Traffic detection systems.
    f. ITS cabinet monitoring systems.
    g. Remote Weather Information Systems (RWIS)
    h. Over-height vehicle detection and warning systems
    i. High Mast lighting control systems

Emergency Vehicle Preemption – Optical

In addition to the Emergency Vehicle Preemption – GPS, the intersection and traffic signal controller cabinets shall provide Optical Emergency Vehicle Preemption. The emergency vehicle preemption system shall be GTT OPTICOM Priority Control System Model 700 series installed in the same cabinet as the controller.

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. The optical detectors shall be GTT OPTICOM model 711 series.

The phase selector shall be a rack-mounted plug-in four channel, dual priority device manufactured by GTT OPTICOM model 700 series with built in Ethernet port. The phase selector shall plug into the Loop Detector Rack. Programming the phase selector shall be via a PC-based computer utilizing unit specific software.

Cabling for the emergency preemption system shall be separate from the cable associated with the traffic signal system.

The Contractor shall install a confirmation strobe at the traffic signal location as shown on the plans. The confirmation strobe shall serve to validate to the driver of the emergency vehicle that the traffic signal has recognized the preemption call and will initiate the proper preemption sequence. The confirmation strobe shall be a white lens.

The Contractor shall be responsible for the proper programming of the phase selector, final orientation of the optical detectors (should field conditions warrant a different direction per the plans), and all other work necessary to provide a complete and operating emergency vehicle preemption system. The Contractor may be required to field adjust the location of the optical detectors in the presence of the Engineer to properly detect preemption calls from approaching vehicles.

Existing Loop Detectors

Existing loop detection shall be maintained throughout work until new traffic signal and new detection is operational. Should the existing loop detectors be within an area of milling and overlay, the existing loops shall be removed. If the existing detection is compromised by other work; detection shall be restored within 10 calendar days. All lead-in cables shall be disposed by the contractor at no additional expense.

Video Detection

Video detection shall be installed for vehicle and bicycle detection at the intersection of Chestnut Street / Oak Street as part of Item 816.01. Specific video detection to be installed at this location is specified on the plans. This section covers the minimum requirements for a system that detects vehicles on a roadway using only video images of vehicle traffic.

The video detection system shall be manufactured by ITERIS and consist of the Vantage Versicam and Interface card.

The video detection system (VDS) shall consist of one or more video cameras, a video detection processor (VDP); a detector rack mounted extension module (as needed), field video monitor and pointing device, software and all associated equipment required to set up and operate the system in the field. The equipment shall include camera mountings, extensions, connectors and standard detector rack with power supply. The system software shall be capable of detecting vehicles in multiple lanes using only the video image. Detection zones shall be defined using only onboard video menu and a pointing device to place the zones on a video image. Up to 24 detection zones per camera shall be available.

Camera Monitor

The Contractor shall install a 7-inch TFT L.C.D. video monitor that is to be permanently mounted in the controller cabinet on a swivel mount of Item 816.01. The Contractor shall provide any wires or ancillary equipment to allow for communication between the L.C.D. monitor and the traffic signal controller cabinet.

System Hardware

Processor shall be a 2-channel processor. The video detection system shall consist of one or more video cameras, a video detection processor (VDP) which mounts in a standard detector rack, and a pointing device.

System Software

The system shall include software that detects vehicles in multiple lanes using only the video image. Detection zones shall be defined using only an onboard video menu and a pointing device to place the zones on a video image. Up to 24 detection zones per camera shall be available. A separate computer shall not be required to program the detection zones.

Video software and a transfer cable shall be supplied to the City of Newton at the time of acceptance.

Limited Warranty

The supplier shall provide a two-year warranty on the entire video detection system (equipment and software).

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.

During the warranty period, updates to VDP software shall be available from the supplier without charge.

Maintenance Support

The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system. These parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale for said parts.

The supplier shall maintain an ongoing program of technical support for the video detection system. This technical support shall be available via telephone, or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale for on-site technical support services.

Installation or training support shall be provided by a factory authorized representative. All product documentation shall be written in the English language.

Functional Capabilities

The VDP shall process video from one or two sources, as specified. The source can be a video camera or video tape player. The video shall be input to the VDP in RS170 format and shall be digitized and analyzed in real time. Dual video VDP's shall process images from both inputs simultaneously.

The VDP shall detect the presence of vehicles in up to 24 detection zones per camera. A detection zone shall be approximately the width and length of one car.

Detection zones shall be programmed via an on-board menu displayed on a video monitor and a pointing device connected to the VDP. The menu shall facilitate placement of detection zones and setting of zone parameters or to view system parameters. A separate computer shall not be required for programming detection zones or to view system operation.

The VDP shall store up to three different detection zone patterns. The VDP can switch to any one of the three different detection patterns within 1 second of user request via menu selection with the pointing device.

The VDP shall detect vehicles in real time as they travel across each detector zone.

The VDP shall have an RS-232 port for communications with an external computer. The VDP RS-232 port shall be multi-drop compatible.

The VDP shall accept new detector patterns from an external computer through the RS-232 port when the external computer uses the correct communications protocol for downloading detector patterns. A Windows™-based software designed for local or remote connection and providing video capture, real-time detection indication and detection zone modification capability shall be provided with the system.

The VDP shall send its detection patterns to an external computer through the RS-232 port when requested when the external computer uses the appropriate communications protocol for uploading detector patterns.

VDP communications shall be accommodated by methods using differential signals to reject electrically coupled noise.

The camera system shall be able to transmit an NTSC video signal, with minimal signal degradation, up to 1000 feet under ideal conditions.

The associated VDP shall default to a safe condition, such as a constant call on each active detection channel, in the event of loss of video signal.

The system shall be capable of automatically detecting a low-visibility condition such as fog and respond by placing all defined detection zones in a constant call mode. A user-selected output shall be active during the low-visibility condition that can be used to modify the controller operation if connected to the appropriate controller input modifier(s). The system shall automatically revert to normal detection mode when the low-visibility condition no longer exists.

Vehicle Detection

A minimum of 24 detection zones shall be supported and each detection zone shall be user definable in size and shape to suit the site and the desired vehicle detection region.

A single detection zone shall be able to replace multiple inductive loops and the detection zones shall be OR'ed as the default or may be AND'ed together to indicate vehicle presence on a single phase of traffic movement.

Placement of detection zones shall be done by using only a pointing device, and a graphical interface built into the VDP and displayed on a video monitor, to draw the detection zones on the
video image from the video camera. No separate computer shall be required to program the detection zones.

A minimum of 3 detection zone patterns shall be saved within the VDP memory. The VDP's memory shall be non-volatile to prevent data loss during power outages. The VDP shall continue to operate (e.g. detect vehicles) using the existing zone configurations even when the operator is defining/modifying a zone pattern. The new zone configuration shall not go into effect until the configuration is saved by the operator.

The selection of the detection zone pattern for current use shall be done through a menu or remote computer via RS-232 port. It shall be possible to activate a detection zone pattern for a camera from VDP memory and have that detection zone pattern displayed within 1 second of activation.

When a vehicle is detected crossing a detection zone, the corners of the detection zone (for the entire polygon) will flash on the video overlay display screen to confirm the detection of the vehicle.

Detection shall be at least 98% accurate in good weather conditions and at least 96% accurate under adverse weather conditions (rain, snow, or fog). Detection accuracy is dependent upon site geometry; camera placement, camera quality

and detection zone location, and these accuracy levels do not include allowances for occlusion or poor video due to camera location or quality.

Detector placement shall not be more distant from the camera than a distance of ten times the mounting height of the camera.

The VDP shall provide up to 24 channels of vehicle presence detection per camera through a standard detector rack edge connector and one or more extension modules.

The VDP shall provide dynamic zone reconfiguration (DZR) to enable normal detector operation of existing channels except the one where a zone is being added or modified during the setup process. The VDP shall output a constant call on any detection channel corresponding to a zone being modified.

Detection zone setup shall not require site specific information such as latitude, longitude, date and time to be entered into the system.

The VDP shall output a constant call for each enabled detector output channel if a loss of video signal occurs. The VDP shall output a constant call during the background learning period.

Detection zone outputs shall be configurable to allow the selection of presence, pulse, extend, and delay outputs. Timing parameters of pulse, extend, and delay outputs shall be user definable between 0.1 to 25.0 seconds.

Up to six detection zones shall be capable to count the number of vehicles detected. The count value shall be internally stored for later retrieval through the RS-232 port. The data collection interval shall be user definable in periods of 5, 15, 30 or 60 minutes.

VDP Hardware

The VDP shall be specifically designed to mount in a standard TS-1, TS-2, and 170 type detector rack, using the edge connector to obtain power and provide contact closure outputs. No adapters shall be required to mount the VDP in a standard detector rack. Detector rack rewiring shall not be required or shall be minimized.

The VDP shall operate in a temperature range from -34°C to +74°C and a humidity range from 0%RH to 95%RH, non-condensing.

The VDP shall be powered by 12- or 24-volts DC. These modules shall automatically compensate for the different input voltages.

VDP power consumption shall not exceed 300 milliamps at 24 VDC.

The VDP shall include an RS-232 port for serial communications with a remote computer. The VDP RS-232 port shall be multi-drop compatible. This port shall be a 9-pin "D" subminiature connector on the front of the VDP.

The VDP shall utilize flash memory technology to enable the loading of modified or enhanced software through the RS-232 port without modifying the VDP hardware.

The VDP shall include detector output pin out compatibility with industry standard detector racks.

The front of the VDP shall include detection indications, such as LED's, for each channel of detection that display detector outputs in real time when the system is operational.

The front of the VDP shall include one or two BNC video input connection suitable for RS-170 video inputs as required. The video input shall include a switch selectable 75-ohm or high impedance termination to allow camera video to be routed to other devices, as well as input to the VDP for vehicle detection. Video must be inputted via a BNC connector on the front face of the processor. RCA type connectors/jacks for video input are not allowed. Video shall not be routed via the edge connectors of the processor.

The front of the VDP shall include one BNC video output providing real time video output that can be routed to other devices. An RCA type connector/jack for video output is not allowed.

The front panel of the VDP shall have a detector test switch to allow the user to place calls on each channel. The test switch shall be able to place either a constant call or a momentary call depending on the position of the switch.

Video Detection Camera

The video cameras used for traffic detection shall be furnished by the VDP supplier and shall be qualified by the supplier to ensure proper system operation.

The camera shall produce a useable video image of the bodies of vehicles under all roadway lighting conditions, regardless of time of day. The minimum range of scene luminance over which the camera shall produce a useable video image shall be the minimum range from nighttime to daytime, but not less than the range 0.1 lux to 10,000 lux.

The camera shall use a charge coupled device (CCD) sensing element and shall output monochrome video with resolution of not less than 380 lines vertical and 380 lines horizontal.

The camera shall include an electronic shutter control based upon average scene luminance and shall be equipped with a factory adjusted manual iris. Auto-iris lenses are not allowed.

The camera shall include a variable focal length lens with variable focus that can be adjusted, without opening up the camera housing, to suit the site geometry by means of a portable interface device designed for that purpose and manufactured by the detection system supplier.

The horizontal field of view shall be adjustable from 8.1 to 45.9 degrees. A single camera configuration shall be used for all approaches in order to minimize the setup time and spares required by the user. The camera electronics shall include automatic gain control (AGC) to produce a satisfactory image at night.

The camera shall be housed in a weather-tight sealed enclosure. The housing shall be field rotatable to allow proper alignment between the camera and the traveled road surface.

The camera enclosure shall be equipped with a sunshield. The sunshield shall include a provision for water diversion to prevent water from flowing in the camera's field of view. The camera enclosure with sunshield shall be less than 6" diameter, less than 15" long, and shall weigh less than 6 pounds when the camera and lens are mounted inside the enclosure.

The camera enclosure shall include a thermostatically controlled heater to assure proper operation of the lens shutter at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure.

When mounted outdoors in the enclosure, the camera shall operate satisfactorily in a temperature range from -34 °C to +60 °C and a humidity range from 0% RH to 100% RH.

The camera shall be powered by 120-240 VAC 50/60 Hz. Power consumption shall be 15 watts or less under all conditions.

Recommended camera placement height shall be at least 20 feet (or 6 meters) above the roadway, and over the traveled way on which vehicles are to be detected. For optimum detection the camera should be centered above the traveled roadway. The camera shall view approaching vehicles at a distance not to exceed 200 feet for reliable detection (height to distance ratio of 10:100). Camera placement and field of view (FOV) shall be unobstructed and as noted in the installation documentation provided by the supplier.

The camera enclosure shall be equipped with separate, weather-tight connections for power and setup video cables at the rear of the enclosure. These connections may also allow diagnostic testing and viewing of video at the camera while the camera is installed on a mast arm or pole using a lens adjustment module (LAM) supplied by the VDP supplier. Video and power shall not be connected within the same connector.

The video signal output by the camera shall be black and white in RS170 or CCIR format.

The video signal shall be fully isolated from the camera enclosure and power cabling.

Co-Axial Cable

The coaxial cable to be used between the camera and the VDP in the traffic cabinet shall be Belden 8281 or a 75-ohm, precision video cable with 20-gauge solid bare copper conductor (9.9 ohms/M), solid polyethylene insulating dielectric, 98% (min) tinned copper double-braided shield and black polyethylene outer covering. The signal attenuation shall not exceed 0.78 dB per 100 feet at 10 MHz. Nominal outside diameter is 0.304 inches. The coax cable shall be a continuous unbroken run from the camera to the VDP. This cable shall be suitable for installation in conduit or overhead with appropriate span wire. 75-ohm BNC plug connectors should be used at both the camera and cabinet ends. The coaxial cable, BNC connector, and crimping tool shall be approved by the supplier of the video detection system, and the manufacturer's instructions must be followed to ensure proper connection.

Power Cabling

The power cabling shall be 16 AWG three-conductor cable. The cabling shall comply with the National Electric Code, as well as local electrical codes. Cameras may acquire power from the luminaire if necessary.

Execution

The video detection system shall be installed by supplier factory certified installers and as recommended by the supplier and documented in installation materials provided by the supplier. Proof of factory certification shall be provided.

Testing of Cameras

The following test procedure shall be performed in the presence of the Engineer before and after the camera detection is used. The cost of equipment, labor, and materials to perform such testing and similar re-testing following repairs, replacement, or adjustment of any camera within the project area shall be included in the contract unit price for this Item.

After installation of cameras above the roadway each camera shall be tested (at the controller cabinet) for proper installation.

<u>Mast Arms, Poles, and Foundations (less than 60 feet in length)</u>

The Contractor shall supply and install Type 2 galvanized steel, ornamental traffic signal mast arms poles and foundations at locations as shown on the Plans, as well as luminaries with luminaire arms. All of which shall be designed in accordance with *American Association of State Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals*, latest edition. Mast arm poles shall be fabricated and constructed in conformance with the 2015 *MassDOT Overhead Signal Structure and Foundation Standard Drawings* and as stated below.

Mast arms/ poles, luminaries, and luminaire arms shall be per City standards and shall match (i.e., style and color) the equipment associated with the West Newton Square Roadway Improvements Project and shall meet or exceed the following requirements:

- Luminaires -
  - Manufacturer: GHISAMESTIERE
  - Description: OSLO LARGE F-A4L, 525mA, Type B
  - Light Source: LED
  - IES Classification: Type II
  - MH: 26.5
  - LLF: 0.800
  - Lum. Lumens: 12874

- Wattage: 87W
- Current – 525mA
- Finish – Black

- Luminaire arms -
  - Manufacturer: King Luminaire
  - Style: KA24
  - Arm Length: 6 feet
  - Arrangement: 2 arms at 90 degrees
  - Material: Aluminum
  - Finish: TGIC Powder coat – Gloss Black

- Mast arm poles -
  - Manufacturer: Millerbernd
  - Arm Style: Curved Rigid, Monotube
  - Pole Style: Round Taper
  - Pole Height: 25' – 2"
  - Material: Galvanized steel sized to satisfy dead and wind load requirements (MassDOT standard)
  - Finish: TGIC Powder coat Gloss Black
  - Handhole: 3" x 5"

- Pole bases -
  - Manufacturer: Millerbernd
  - Style: Coast
  - Height: 39"
  - Base: 32"
  - Material: Two-Piece Clamshell, Aluminum Casting
  - Finish: TGIC Powder coat Gloss Black
  - Catalogue No.: BCCST3239

Note: Prior to ordering mast arms/poles and luminaire arms/ luminaries the Contractor shall confirm the above with the City.

Acceptance of Type 2 mast arm poles will be contingent upon review and approval of shop drawings submitted by the Contractor. Longhand design calculations shall be submitted by the Contractor with the shop drawings for the Type 2 mast arm pole. The Contractor shall provide a set of calculations, stamped by a Structural Engineer registered in the Commonwealth of Massachusetts, along with plans and specifications for review by the Engineer.

The mast arm pole foundations shall be a cored pier foundation and constructed in conformance with MassDOT Standard Drawings included in the plans and priced per the table provided below.

Pier Foundation Assumptions for 110 MPH Wind Speed Zone

STA/OFF	Soil Type	Mast Arm Length	Fdn. Dia.	Fdn. Depth	Vertical Bars	Tie Bars
22+16.8 LT 20.7'	Dry Sand (Loose)	35'	3'-6"	11'-6"	18-#8	#5 @ 9"
22+64.6 RT 22.7'	Dry Sand (Loose)	35'	3'-6"	11'-6"	18-#8	#5 @ 9"

Concrete foundations shall be constructed of 4000 psi, 565 Cement Concrete. The Contractor shall submit shop drawings of any bolt circle details for approval by the Engineer. Anchor bolts shall be set accurately, and tops shall be formed neatly. 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. At the time of foundation construction, the Contractor shall be responsible to complete material testing of mast arm foundation concrete and rebar in accordance with the Standard Specifications.

Relocation of utilities for the convenience of drilling may be needed and shall be at the expense of the Contractor if requested. The Contractor shall be responsible for all items required to install traffic signal infrastructure at location(s); including, but not limited to, shielding of overhead primary / secondary wires within 10-feet, insulation of overhead wires, relocation of overhead wires, and/or for the potential use of other low-profile installation and/or excavation techniques as necessary. The Contractor shall be responsible for making all necessary arrangements to have the proper utility company(s) relocate overhead wires in order for the proper mast arm clearances or visibility to traffic signal indications to be obtained, should any conflicts arise. The Contractor shall take extra care and precaution in placing signal heads to ensure the existing or proposed/future overhead utility wires do not interfere with the visibility of the signal heads located above the roadway. All measurements to determine the exact dimensions and clearances to existing overhead utility lines shall be made in the field by the Contractor for incorporation into the erection plans and shop drawings which are submitted for approval. This may require relocation of overhead wires in coordination with the utility company.

No separate payment will be made for work considered incidental to the traffic signal equipment related to the utility company coordination or implementation as noted, but all costs in connection therewith shall be included in the lump sum bid price for Item 816.01.

In the event that soil conditions or ledge prevent the use of MassDOT standard foundation type, the Contractor shall coordinate with the Engineer to select and design alternative foundation types that fit within the existing right-of-way. Alternative foundation types could include spread footings, coring and socketing into rock or other foundations previously used to support similar loads, within reason.

The bottom of the signal head shall have a minimum clearance of not less than 17’-6” or greater than 19 feet above the pavement grade at the center of the roadway.

New mast arm pole foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is impaired. The installation shall be in compliance with ADA/AAB standards.

No separate payment will be made for work considered incidental to the excavation, including but not limited to, mast arm foundations, dewatering, etc. but all costs in connection therewith shall be included in the lump sum bid price for Item 816.01.

The height of each mast arm assembly shall be manufactured to provide for street lighting luminaires under separate item.

Mast Arm Sign Hanger Brackets

Sign hanger brackets for mast arms shall be used in all locations where a sign is to be mounted to the mast arm. Mast arm sign hanger brackets shall consist of a mast arm clamp assembly cast from 356-T6 aluminum alloy or equivalent, vertical support tube extruded from 6063 aluminum or equivalent, stainless-steel bands, clamp screw, hardware and all miscellaneous materials necessary to fix mount the sign to the mast arm. The sign hanger bracket shall be universally adjustable capable of making horizontal, vertical and 360-degree rotational adjustments so that any sign mounted on a mast arm can be adjusted to provide proper alignment and sight perpendicular to the flow of traffic. Vertical support tubes shall be of sufficient length to allow mounting of the sign to within 3-inches of the top and bottom of the sign.

Signal Posts / Stanchions and Foundations

Traffic signal posts, stanchions, and bases shall be per City standards and shall match (i.e., style and color) the equipment associated with the West Newton Square Roadway Improvements Project and shall meet or exceed the following requirements:

Post bases -

- Style: 35275
- Height: 9.75”
- Base: 15”
- Material: Two-Piece Clamshell, Aluminum Casting
- Finish: TGIC Powder coat Gloss Black
- 2”x4” Handhole

Note: Prior to ordering posts /bases the Contractor shall confirm the above with the City.

New signal base foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is impaired and installation shall be in compliance with ADA/AAB standards. Sidewalk extensions shall be provided when needed in order to maintain minimum ADA/AAB compliance.

The new pedestal posts on new foundations may utilize either precast or cast-in-place cement concrete pedestal post foundations constructed in conformance with the MassDOT Standard Drawings.

No separate payment will be made for work considered incidental to the excavation, including but not limited to, pedestal post foundations, dewatering, etc. but all costs in connection therewith shall be included in the lump sum bid price for Item 816.01.

Steel Equipment

Galvanizing

All bolts, screws, nuts, rods and washers shall be galvanized in accordance with AASHTO M232 and the Standard Specifications. The hardened machine screws may be electroplate galvanized. Stainless steel studs, bolts, screws, nuts, straps and washers shall not be galvanized. Galvanized hardware need not be painted; however, the ends of bolts, nuts, and washers shall be painted in the field according to section “Touch-up and Repairs.” Immediately prior to galvanizing, the steel shall be immersed in a bath of zinc ammonium chloride. The dry kettle galvanizing process shall be used.

All steel components, other than above, shall be galvanized after fabrication in accordance with AASHTO M111. The galvanizing bath shall contain nickel (0.05% to 0.09% by weight).

Galvanized members requiring shop assembly shall be welded and drilled prior to galvanizing.

The applicator shall ensure that all components are smooth and without sharp protrusions that would present and injury hazard to pedestrians. Also, the fabricator shall ensure that all welds shall be cleaned thoroughly in accordance with good practice and according to AWD D1.5 and ASTM A123-89a and shall have a suitable surface to accept the galvanizing.

Coating Over Galvanized Steel

Prior to painting, the applicator shall ensure that all components are smooth and without sharp protrusions that would present an injury hazard to pedestrians. Also, the fabricator shall ensure that all welds shall be cleaned thoroughly in accordance with good practice and according to AWD D 1.5 and ASTM A 123-89a and shall have a suitable surface to accept the galvanizing.

In preparation for the two-coat painting system, the surface shall be blast cleaned in accordance with the requirements of SSPC SP7 "Brush-Off Blast Cleaning" or other method producing equivalent results and uniform profile, to achieve a 1.0 to 1.5 mils anchor profile as indicated be a Keane Tator Profile Comparator or similar device. The creation of the anchor profile shall be performed prior to the formation of "white rust" on the galvanized surface. Following blast cleaning, the zinc coating thickness shall be measured to verify that the coating thickness is in accordance with AASHTO M111.

A two-coat painting system shall be applied by the Galvanizer in his own facility within twelve hours of galvanizing the steel components.

The prime coat material shall be a polyamide epoxy applied to minimum dry film thickness of 2.0 to 4.0 mils (0.002-0.004 in.) and force cured as given below for the finish coat.

The finish coat material shall be a two component, catalyzed aliphatic urethane applied by airless spray to a minimum dry film thickness of 4.0 mils.

The fabricator shall submit to the Engineer for approval, paint chips of the intended color prior to any work being done under this Item.

All finish coat material shall be applied under conditions within the following tolerances:

- Air Temperature 50 °F min., 90 °F max.
- Surface Temperature 50 °F min., 100 °F max.
- Surface temperature must be at least 3 °F above the dew point. The finish coat shall be cured in a booth capable of maintaining 150 °F for 2-4 hours.

All paint coating over galvanized steel must be furnished with a five (5) year manufacturer warranty.

Touch-Up and Repairs

Should any damage occur to the galvanized coating during shipping or handling at the job site, the Contractor shall repair and touch-up any damaged areas to the satisfaction of the Engineer and the following:

Touch-up of galvanizing before the finish coat is applied shall be accomplished by applying galvanizing repair paint in accordance with Subsection M7.04.11. The dry film thickness of the applied repair paint shall not be less than 4.0 mils. Applications shall be in accordance with the manufacturer's instructions.

Field touch-up procedures shall conform to the recommendations of the galvanizer. Touch-up of the finish coat shall be by applying a coating of a two-part urethane, as supplied by the Galvanizer, to achieve a dry film thickness of at least 4.0 mils. Prior to the application of the paint, remove all damaged coatings down to a solidly adhered coating and apply galvanizing repair paint as primer. Allow the primer to dry for at least 4 hours prior to top coating.

The Contractor shall also use the touch-up paint material and procedures to paint the galvanized hardware used in field erection that has not been finish coated previously.

<u>Aluminum Equipment</u>

All aluminum signal pedestal posts shall have been painted gloss black. The coating shall be a polyester-TGIC (triglycidyl isocyanurat) resin system conforming to the following:

Quality	Test	Limits
Abrasion	Taber abraser CS-10, 1000 gram load, 1000 cycle, ASTM D4060	100 mg. Maximum weight loss
Adhesion	ASTM D .59 Initial 1000 hours	 5A 5A
Gloss	ASTM D 523 60° - 600 hours 60° - 1000 hours	 82% retention 90% retention (washed)
Hardness	ASTM D 3363	2H – No Gouge
Impact	ASTM D 2794 Direct	Pass 80 inch-lb.
Salt Spray Resistance	ASTM B 177 ASTM D 1654	

	1000 hours unscribed 400 hours scribed	Table 2-10 Table 1-10
Weather Resistant	ASTM G 23, 1000 hours, 18 min. waterspray, 102 min. light	No film failure
Color	Gloss Black	
Identify	Infrared fingerprint	Match
Flexibility	180° bend; ½" dia, mandrel within 10 seconds	No breaks, flaking or cracks. Tested with a Q-panel with 2 mils or less of coating
Humidity	ASTM D 2247, 1000 hours	No blister or film failure
Thickness		4 mils +/- 1 mils
Mar Resistance		Good

A Certificate of Compliance of the powder coating system is required for the Engineer's approval.

Signal Housings

Signal housings mounted on mast arms shall be rigidly attached to the mast arms unless otherwise noted. All signal housings mounted overhead on mast arms shall be installed with the bottom of the signals at the same height. All traffic signal lenses shall be 12 inches in diameter unless otherwise noted on the plans. All proposed post-mounted signal housings shall be retrofitted or installed with retroreflective backplates. All backplates shall be 5" wide beyond the signal housing and consist of s 3" yellow retroreflective strip. The border shall be made from an adhesive-backed retroreflective yellow micro-prismatic sheeting, Type III or IV, and cover the entire perimeter of the backplate. Each indication section of the signal housing shall be installed with a tunnel visor as noted on the plans. All signal housings shall be equipped with ball and/or arrow light emitting diode (LED) modules.

LED Signal Modules

All signal and pedestrian displays shall be equipped with LED signal modules. All red, yellow, green, and pedestrian signal housings with the exception of optically programmed and fiber optic housings shall conform to the following where applicable:

- ITE's Vehicle Traffic Control Signal Housings – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated April 3, 2006.
- ITE's Vehicle Traffic Control Signal Housings – 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.

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 housing 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 Signal Housings with Countdown Timers

All pedestrian signal housings shall be 16-inch, single units, with countdown timers. All pedestrian signal housings shall include audible devices, if not installed as part of the push button, in conformance with the MassDOT Accessible Pedestrian Signal (APS) Installation Policy, dated June 1, 2012 and as revised. Pedestrian signal housing indications shall be illuminated L.E.D. type displaying graphical filled-in symbols of a walking person and/or upraised hand. The countdown module shall display the number of seconds remaining throughout the flashing don't walk (UPRAISED HAND) interval, and blank out during the steady walk (WALKING PERSON) and steady don't walk (UPRAISED HAND) intervals. The countdown module shall be automatically set by the intersection controller based upon the walk (WALKING PERSON) and flashing don't walk (UPRAISED HAND) 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 L.E.D. indications on the pedestrian signal shall have an automatic dimming circuit for night illumination to reduce long-term degradation to the LEDs.

Pedestrian signal heads shall come equipped with cut-away visors. Heavy duty blind clamp fittings are required for mounting hardware as necessary. Where mast arm mounting is required, including at intermediate arm locations, signal heads shall be all vertically fixed-mounted.

Pedestrian Push Buttons and Audible Devices

Pedestrian push buttons shall be in conformance with the MassDOT Accessible Pedestrian Signal (APS) Installation Policy, dated June 1, 2012 and as revised. Pedestrian push buttons shall be 4-wire. Countdown signage shall be 9"x15".

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.

Pedestrian push buttons shall be located as close as practical 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.

Upon installation, the push button should be perpendicular to the crosswalks with the raised arrow on the push button parallel to the path of pedestrian travel. The audible device (which may be part of the push button assembly) should be capable of providing alternative audio messages / sound for those locations in which two push buttons for two separate crosswalks are within ten (10) feet of each other. At locations where two separate push buttons are within ten (1) feet of each other, different audible tones shall be set for each audible device and the audible walk indication shall be a speech "WALK"-type message. As the plans call for exclusive pedestrian phasing at the intersection of Chestnut Street / Oak Street, the audible push button shall be programmed as the same audio message / sound.

A maximum mounting height of 42-inches above the finish sidewalk grade shall be used for pedestrian push buttons. A maximum pedestrian reach from a level surface to any installed pedestrian push button shall be no more than 10-inches. Where final installation results in more than a 10-inch reach from a level surface, the contractor shall be responsible to retrofit the push button with an extension arm or device compatible with the push button and associated pole/post.

Equipment Finish and Color

Traffic signal equipment including, but not limited to, signal pedestal posts, bases, signal housings, visors (outside), doors, service meter socket box, optical preemption detectors, hardware, and rigid mounting brackets for signals and signs shall be painted BLACK. The Contractor shall submit to the Engineer paint chips and sample finishes on steel and aluminum of the intended color prior to any work being done under this heading.

Signal housings, doors, visors, mounting brackets, and hardware supplied direct from the manufacturer in the color stipulated above may be acceptable provided it meets or exceeds the finish process for the material indicated below.

Software

All local controller, malfunction management unit, and amplifier software shall be supplied with the latest available revision. Any software upgrades released by the manufacturer shall be supplied at no charge to the Owner for a period of five years after acceptance of the traffic signal installation.

Data Base Programming

Each programmable local hardware component (i.e., controller, malfunction management unit, preemption unit, and 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 by the Contractor.

The Contractor shall supply a laminated copy of the traffic signal design plans and sequence and timing chart to be left in the cabinet's documentation envelope mounted on the inside of the cabinet door.

Electric Power Cost

The payment for power under Item 816.01 will be undertaken by the Contractor during the construction period. After the project's completion and acceptance by the City, the utility charges and account will be transferred to the City of Newton.

Traffic Signal Timing – Fine Tuning

After the Contractor has finished installing the controllers and all other associated signal control equipment and after the Contractor has set the signal equipment to operate as specified in the contract documents, the fine tuning, adjusting and testing period shall begin. The Contractor shall advise the Engineer and City in writing of the date of the beginning of the fine-tuning and testing period.

During this period, the Contractor, under the direction of the Engineer will make necessary adjustments and tests to ensure safe and efficient operation of the equipment. This period shall not last be less than 30 days. The contract completion date shall take this testing period into consideration. No request for final acceptance will be considered until successful completion of the testing period.

The Contractor shall notify the City of Newton and the Engineer in writing of the starting date of the fine-tuning period and shall have the City present for an inspection of the traffic signal.

The cost of electrical energy consumed by the operation of the traffic signal during the construction, fine-tuning and testing until final acceptance of the signal shall be borne by the Contractor.

Final Acceptance

Upon successful completion of the 30-day testing period wherein the traffic signal system has operated for 30 days without failure, the Contractor shall notify the City. The Engineer will make a final inspection of the installation in the presence of the City and the Contractor. An inspection check will be made to ensure that all equipment, materials, installations and operations are in accordance with the construction contract, plans and specifications. Items to be checked will include, but not be limited to, traffic signal systems operation, cabinet equipment, documents (wiring diagrams, as-built plans, instruction manuals, parts list, warranties, grounding resistivity test report, etc.), signs, and pavement markings, and street hardware (posts, bases, housings, brackets, etc.).

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

Guarantee After Final Acceptance

The Contractor shall diagnose (troubleshoot) the system and replace any part of the traffic signal system found to be defective in workmanship, material or manner of functioning within six months from date of final acceptance of all the installations under this Contract. This requirement does not affect the one-year warranty period on equipment specified in Subsection 815.20 of the Standard Specifications. Note: some of the equipment installed under this Contract shall have a warranty period beyond one year as noted.

Upon the date of acceptance of the project by the City, the Contractor shall turn over all guarantees and warranties to the City.

As-Built Plans

It will be the responsibility of the Contractor to provide the Design Engineer with as-built traffic signal layout plans indicating all changes made during the construction. The plans shall indicate the location of all traffic signal equipment installed including detectors, signal posts, mast arms, strain poles, pedestrian and vehicular signal heads, controller cabinets, conduit, pull boxes, service connections and pre-emption equipment. The plans shall also indicate the final as-built timing and sequence, major item list, power-pole number and meter number. Upon receipt of the above as-built information from the Contractor, the Design Engineer will field verify the as-built information and plans. Following field verification, the Design Engineer will prepare the as-built Traffic Signal Layouts and/or Permits for submission to the City of Newton prior to the final acceptance of the project.

The Contractor shall supply As-Built Plans and wiring diagrams in 2018 AutoCAD DWG, DWF, and PDF formats.

Technical Manuals and "Box Prints"

Per MassDOT Specifications the Contractor shall provide prior to final acceptance as furnished by the manufacturer.

1. Controller Unit, Flasher, Load Switches, Conflict Monitor an all external logic units.
    a. Electronic schematic of circuit boards.
    b. Pictorial layout of components on circuit boards.
    c. Service manual for troubleshooting.
    d. Manual describing the theory of operations.
    e. Parts list showing manufacturer's part number and location.
2. Controller cabinet.
    a. Cabinet wiring diagram (3 sets).
    b. Field wiring diagram (3 sets).

Traffic Signal Removed and Stacked

The work under this item shall also consist of removing, transporting, protection, temporary storage and stacking existing traffic control signal equipment as shown on the plans.

The Contractor shall exercise extreme care in the removal, transporting, and stacking of the existing traffic control signal equipment. Any equipment damaged by the Contractor's operations shall be replaced at no additional cost.

The existing traffic control signal equipment shall be stacked on boards at the City of Newton DPW Yard, unless otherwise required by the City or Engineer.

Method of Measurement and Basis of Payment

Item 816.01 all labor, material, equipment and incidental costs required to complete the work.

No separate payment will be made for adjusting or readjusting of proposed vehicle detection zones, but all costs in connection therewith shall be included in the lump sum price bid for Item 816.01.

Controlled Density Fill – Excavatable shall be paid separately under Item 153.

Conduit shall be paid separately under Item 804.3, 3-Inch Electrical Conduit, Type NM Plastic (UL).

Pull boxes and handholes for signal components shall be paid separately under Items 811.22 Electric Handhole – SD2.022 and 811.31 or 12" x 12" Pull Boxes - SD2.030.

ITEM 823.60 HIGHWAY LIGHTING LOAD CENTER LS

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 800 and Subsection 820 of the MassDOT Standard Specifications.

ITEM 824.221 RECTANGULAR RAPID FLASHING BEACON (SOLAR) LS

The work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

Description

The work shall include furnishing and installing a solar-powered, pedestrian-actuated, rectangular rapid flashing beacon (RRFB) system at the locations shown on the plans and in accordance with the details shown on the plans. RRFBs are intended to provide suppemental warning to approaching vehicles of the potential for pedestrinas to be crossing in an adjacent crosswalk.

Materials

An RRFB system shall, at a minimum, consist of the following items, which shall be included in the lump sum bid:

- (2) Concrete foundations;
- (2) 15' traffic signal posts (painted gloss black) and pedestal base (painted gloss black);
- (2) APS pushbutton systems;
- (4) dual rectangular yellow LED beacons in NEMA enclosures;
- (2) 9"x12" R10-25 (PUSH BUTTON TO TURN ON WARNING LIGHTS) signs;
- (4) 30"x30" W11-2 (Pedestrian Warning); substitute W11-15 or S1-1 signs as shown on the plans
- (2) 24"x12" W16-7pR and (2) 24"x12" W16-7pL (Diagonal Downward Arrow) signs;
- (2) solar panels;
- (2) NEMA Type 3R or higher enclosures to house:
    - Electrical components, including wiring and solid-state circuit boards;
    - On-board user interface;
    - Battery; and
    - Frequency hopping spread spectrum (or other alternate FCC approved) wireless activation unit with a minimum 150' range; and

- All mounting and supporting hardware and wiring required to complete a working system.

RRFB controller and LED beacons, APS pushbutton systems, and traffic signal posts and pedestals shall be listed on the Qualified Traffic Control Equipment List. Pedestals shall be cast iron.

The light intensity of the LED beacons during daytime conditions shall meet the minimum specifications of Class 1 yellow peak luminous intensity in the Society of Automotive Engineers (SAE) Standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January, 2005. An automatic signal dimming device shall be included to reduce the brilliance of the LED beacons during nighttime conditions.

All signs shall be MUTCD-compliant. R10-25 signs shall have a black border and legend on a white background. W11-2, W11-15, S1-1, W16-7pR and W16-7pL signs shall have a black border and legend on a fluorescent yellow-green background. All sign sheeting materials shall be per Subsection 828.41.

R10-25 signs may be integrated into the APS pushbutton system as a single unit or mounted separately on Type A aluminum.

W11-2, W11-15, S1-1, W16-7pR, W16-7pL signs shall be Type A aluminum per Subsection 828.42.

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

The solar panels shall be affixed to an aluminum plate and bracket, adjustable at an angle of 45º to 60º and each assembly shall be mounted on a 360º rotatable pole cap mount to facilitate adjustment for maximum solar collection and optimal battery strength. The solar panel assemblies shall be rated for 90 mph wind conditions.

The batteries shall conform to Battery Council International specifications and have a capacity allowing up to 30 days of autonomy without sunlight and varying with ambient temperature and number of activations. The batteries shall be rated for a minimum lifespan of 3 years. Batteries shall be replaceable independent of other components.

The solar panels and battery shall have a minimum operating temperature range of -40º to 122ºF (-40º to 50ºC).

The Contractor shall provide shop drawings and calculations to confirm solar panel sizing and battery/solar energy storage will meet the functional requirements of the system.

Functional Requirements

The RRFB system shall remain dark until pedestrian actuation.

Upon actuation, all LED beacons shall activate and flash in a rapidly flashing sequence . Each sequence shall last 800 milliseconds and there shall be 75 sequence per minute. The sequence shall be the same for each pair of LED beacons in an enclosure and shall be as follows:

1. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.
2. Both RRFB indications shall be dark for approximately 50 milliseconds.
3. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.
4. Both RRFB indications shall be dark for approximately 50 milliseconds
5. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.
6. Both RRFB indications shall be dark for approximately 50 milliseconds.
7. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.
8. Both RRFB indications shall be dark for approximately 50 milliseconds.
9. Both RRFB indications shall be illuminated for approximately 50 milliseconds.
10. Both RRFB indications shall be dark for approximately 50 milliseconds.

11. Both RRFB indications shall be illuminated for approximately 50 milliseconds.
12. Both RRFB indications shall be dark for approximately 50 milliseconds.

The flash rate of each induvial RRFB indication, as applied over the full flashing sequence, shall not be between 5 and 30 seconds.

All RRFBs within the system shall commence and cease operation simultaneously.

The length of the flashing cycle upon actuation and the minimum allowable time between actuations shall be per the plans. These settings shall be user-programmable through the on-board user interface. No-fee wireless (Wi-Fi, Bluetooth, etc.) may be used as alternative programming method.

Each APS pushbutton shall have a tactile arrow and locator tone. The tactile arrow shall be oriented to point in the direction of the crosswalk. The locator tone shall have a duration of 0.15 seconds or less and shall repeat at 1-seond intervals. The locator tone shall be set 2 to 5 dBA above ambient sound, shall automatically adjust intensity, but cap at a maximum volume of 100 dBA. The tone shall be audible whenever the LED modules are not active.

Upon activation of the LED modules, a speech message shall state, “Yellow lights are flashing.” This message shall be stated twice. No vibrotactile or percussive indications shall be used.

If a pushbutton is pressed before the minimum time between actuation intervals is met, a speech message shall state, “Wait,” and the locator tone shall resume until the LED modules activate.

RRFB Post and Bases

RRFB posts and bases shall be per City standards and shall match (i.e., style and color) the equipment associated with the West Newton Square Roadway Improvements Project and shall meet or exceed the following requirements:
Post bases -

- Style: 35275
- Height: 9.75”
- Base: 15”
- Material: Two-Piece Clamshell, Aluminum Casting
- Finish: TGIC Powder coat Gloss Black
- 2”x4” Handhole

Note: Prior to ordering posts / bases the Contractor shall confirm the above with the City.

New signal base foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is impaired and installation shall be in compliance with ADA/AAB standards. Sidewalk extensions shall be provided when needed in order to maintain minimum ADA/AAB compliance.

The new pedestal posts on new foundations may utilize either precast or cast-in-place cement concrete pedestal post foundations constructed in conformance with the MassDOT Standard Drawings.

No separate payment will be made for work considered incidental to the excavation, including but not limited to, pedestal post foundations, dewatering, etc. but all costs in connection therewith shall be included in the lump sum bid price for Item 816.01.

Testing of Grounding System

Grounding Cable - Grounding cable shall be bare copper No. 8 AWG wires. All proposed RRFB equipment shall have new cabling.

The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer and Town in accordance with the Standard Specifications.

Construction Methods

No work shall commence until the shop drawings are approved.

Layout and design of the RRFB system shall conform to the plans.

Foundation installations shall be per Subsection 801.62. The top of the foundations shall be ¼" to 1" proud of the sidewalk and chamfered at 45 degrees. Gaps between the sidewalk and foundations shall be no larger than ¼" and grouted with performed joint filler.

The Contractor shall diagnose and replace any part of the pedestrian activated warning system that is found to be defective in the workmanship, material, or manner of functioning within six months of final acceptance by the Engineer. This requirement does not supersede the one-year warranty period on materials specified in Subsection 815.20.

Maintenance and Power Costs

It shall be the responsibility of the Contractor to provide all labor, equipment and material required for the total maintenance and repair of all proposed RRFB equipment, including damage by automobile accidents until final completion and acceptance of the project, unless otherwise specified under Subsection 7.17 "Traffic Accommodation: of the Standard Specifications as amended, in which case Subsection 7.17 will govern. These provisions will apply to the RRFB locations included as part of this construction Contract from the date of written notice given to the Engineer that the Contractor will work on or adjacent to the proposed RRFBs until the date when the City accepts the complete project. Maintenance costs for the RRFBs shall be paid by the City following acceptance by the City.

The payment for power under Item 824.221 shall be undertaken by the Contractor during the construction period. After the project's completion and acceptance by the City, the utility charges and account (as needed based on solar powered units) shall be transferred to the City of Newton.

Basis of Payment

Rectangular Rapid Flashing Beacon (Solar), Location 1 will be paid for at the Contract unit price per lump sum, respectively, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 826.51 FIRE ALARM BOX REMOVED AND RESET EA

The work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

This work shall consist of removing, and reinstalling Fire Alarm Box. The work shall be performed in coordination with the Engineer and the Newton Fire Department. Existing Fire Alarm Box shall be photographed prior to removal and submitted to the Engineer for record. Fire Alarm Box shall be reset in a location determined by the Engineer / Fire Department, closely matching the original condition of its installation as possible. Prior to fire alarm box relocation, telecommunication and power supply connection shall be confirmed in the field. The connections shall be relocated to the new fire alarm box location as required by the Engineer and/or Fire Department.

Contractor shall notify the Newton Fire Department at least 1 week in advance of construction operations to test and verify the function of the reinstalled Fire Alarm Box. Disconnecting and reconnecting of telecommunication and power supply for Fire Alarm Box shall be performed by a licensed electrician.

Fire Alarm Box shall not be relocated without the written consent of a qualified Fire Department representative.

METHOD OF MEASUREMENT

Fire Alarm Box Removed and Reset will be measured for payment per each as called out on the plans.

PAYMENT

Fire Alarm Box Removed and Reset will be paid for at the contract unit price per each, which price shall include all labor, material, equipment and incidental costs required to complete the work.

ITEM 832. WARNING-REGULATORY AND ROUTE MARKER – ALUMINUM PANEL (TYPE A) SF

ITEM 847.1 SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL EA

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 852.01 TEMPORARY TRAFFIC CONTROL LS

DESCRIPTION

Work under this item shall conform to the applicable requirements of Section 850 of the MassDOT Standard Specifications, The Manual on Uniform Traffic Control Devices (MUTCD), and/or as required by the Engineer.

The Contractor shall furnish, erect, maintain, wash, move, adjust, repair, relocate, re-erect, and store all temporary construction signs, sign mountings, portable barricades, pedestrian ramps, traffic cones, reflectorized drums, delineators, arrow boards, portable changeable message signs, and other warning devices when, where, and as specified. A group of ten (10) reflectorized drums with sequential flashing warning lights is considered one (1) unit and will be measured by the day. Each period of up to 24 hours during which this unit is in use will be measured as one day regardless of the number of times that the drums are positioned, repositioned, removed, or returned to service.

CONSTRUCTION METHODS

Temporary Traffic Control devices shall cover all work related to the furnishing, installation, maintenance, and movement of traffic protective devices on the project.

The Contractor shall provide a sufficient number of signs and other warning devices as required by the nature of the work as determined by the MUTCD and/or the Engineer. Devices that do not meet or exceed MUTCD standards will not be considered an acceptable means for temporarily controlling traffic.

When, in the opinion of the Engineer, the sign or device shall be so severely damaged as to warrant replacement, the Contractor shall provide a new device that shall be deemed to be included in this item without additional compensation.

The Contractor shall keep all signs, barricades, and other protective devices in proper position, clean, and legible at all times. Care shall be taken so that weeds, shrubbery, construction materials and equipment, and spoil are not allowed to obscure any sign, lights, or barricade. Signs that do not apply to existing conditions shall be removed or adjusted so that the legend is not visible to approaching traffic. All signs and markers shall indicate actual conditions existing and shall be moved, removed, or changed immediately, as conditions require. When construction is not in progress, all unnecessary signs will be adequately covered.

No work is to be undertaken until the Contractor has established construction signs and/or safety devices around and about the project zone periphery. To that end the Contractor shall not commence operations until he has verified that semi-permanent signs (i.e. ‘Road Under Construction’) and/or daily signing (i.e. ‘Detour’) has been appropriately established. The Contractor shall be responsible for establishing supplemental signage, and/or safety devices, as he deemed necessary in order to further provide for the safety of the pedestrian and the motoring public, as well as for affording the opportunity to move the construction process forward without interruption.

Under this clause the Contractor shall work closely with the Engineer in order to coordinate the signing activities in a timely and reasonable manner. Said devices shall conform to the Temporary Traffic Control section of the most recent version of the Manual on Uniform Traffic Control Devices (MUTCD). Further, due to the nature of this work, the Contractor shall be required, from time to time, to erect, move, relocate, repair, and/or to remove at days end, any site sign in order to either expedite his work or to otherwise accommodate the safety and/or delineate the project zone and/or its active or inactive detour status and route line, and this work shall be done either at his discretion and/or at the request of a City of Newton Agent(s) or Officer. Non-compliance with any such request, as herein described, shall be grounds for the City to halt work until such remedial measures have been taken, and any such loss of time by the Contractor shall be at his own expense. Any devices provided which are lost, stolen, destroyed or deemed unacceptable while their use is required on the project shall be replaced without additional compensation.

The lump sum for this item shall include full compensation for all labor, equipment, materials and incidentals needed to complete the following:

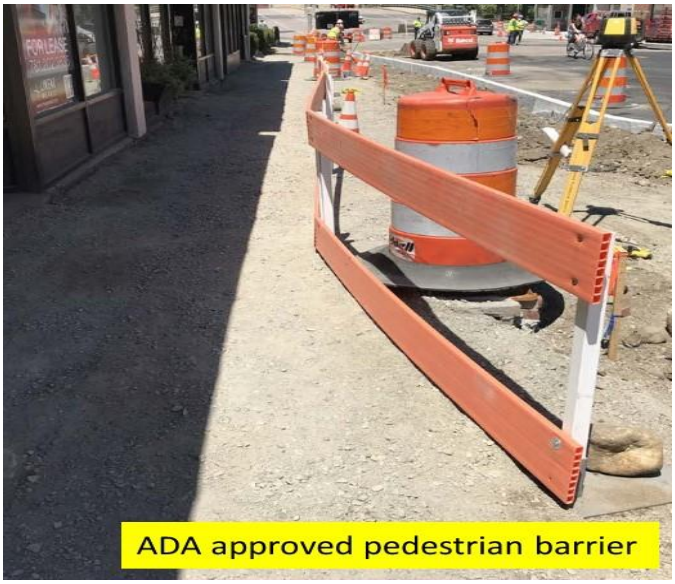
1. Fabricating, furnishing, erecting, maintaining, removing, and relocating the traffic management devices for the overall project during construction activities, complete-in-place, as required by the Engineer.
2. Providing additional traffic management devices to provide a clear and visible traffic control through the project area, if required.
3. The Contractor shall be required to reposition the traffic control devices as many times as necessary to ensure the safe passage of vehicular traffic and pedestrians. Supplemental signs and traffic control devices directing traffic around and/or through the work zones shall be supplied as operations require or as required by the Engineer. Payment for these traffic control measures shall be included, as part of this item and no additional payment will be made.
4. At a minimum, traffic control shall include the following:
    a. Temporary Traffic Control Signs including detour signs as required.
    b. Channelizing Devices including drum barricades and/or traffic cones.
    c. Type III Barricades.
    d. Temporary Barriers.
    e. Temporary Pedestrian Bypass.
5. Other work, whether direct or incidental, associated with the traffic control not specifically identified herein.
6. The City of Newton requires that all work zones maintain a safe pedestrian access route around or through individual work sites that is ADA accessible during the execution of this contract.
    a. Sidewalks – when repairing, installing, adjusting sidewalks and/or curbing the Contractor may only work on one side of the roadway at a time. This allows the opposite side of the roadway to be used for safe pedestrian access. Proper signage must be positioned as required by the Engineer (see d. below)
    b. ADA Access Ramps – only one ADA ramp may be excavated/worked-on at a time at any intersection. Only after the initial ADA ramp is made pedestrian and ADA accessible (see e. below) may a second ADA ramp be worked on.
    c. Temporary Ramps – if required for safe access, the Engineer may require temporary ADA compliant HMA access ramps.
    d. The Engineer will identify the proper location for appropriate signage to direct pedestrians safely around any active work area. Signage will include “Sidewalk Closed Ahead – Cross Here” signs (with the appropriate directional arrow) and “Sidewalk Closed” signs. The signs must be stable and not prone to falling over.
    e. Temporary Safe Access – placement of HMA or dense grade material compacted as required by the Engineer may be used to obtain a suitable smooth stable base for temporary pedestrian access prior to placement of concrete.
7. The Contractor will receive the following checklist for their use to maintain adequate pedestrian access during construction:

Pedestrian Considerations in the Field

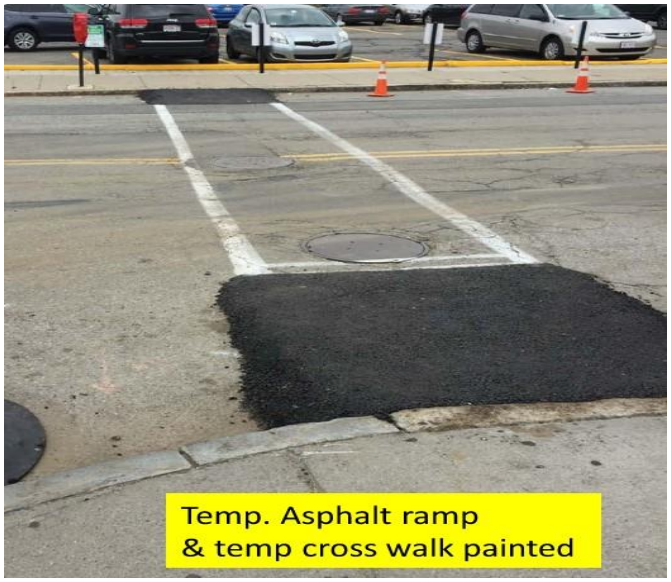
Construction/Maintenance/Utility

- ☐ Public notices for construction projects include information about pedestrian closures and detours with specific outreach to organizations representing people with disabilities.
- ☐ Construction phasing considers continuous access through or around the impacted area. For example, removing curb ramps at all four corners of an intersection simultaneously will reduce access.
- ☐ TPARs are readily accessible and usable by individuals with disabilities, to the maximum extent feasible, and infeasible items are documented.
- ☐ The path is maintained and clear of debris and other items that may obstruct pedestrian access. Temporary routes and ramps are stable with non-slip surfaces.
- ☐ At intersections, pedestrian access is controlled, and traffic control devices provide advance notification of sidewalk closures and guidance to safe crossing locations including audible messages.
- ☐ The pedestrian signal head is clear of visual obstructions such as fencing and/or equipment.
- ☐ Additional signing/markings are installed, and transit stops are added or relocated, as necessary.
- ☐ Physical barriers separate pedestrians from vehicular traffic, and protective features are installed as needed.
  Pedestrians are protected from the work space with barricades detectable by cane, and barricades are continuous, stable, and non-flexible.

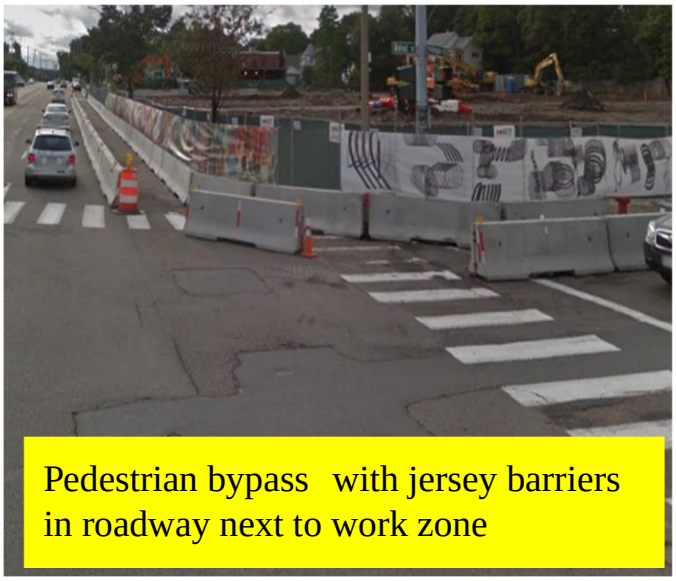
  Field Device Criteria: Consider barricades with a solid toe rail covering an area 1.5 to 6 inches above the ground. The top of the barricade should be 36" to 42" in height with diagonal strips having at least 70% contrast. Also see MUTCD references listed above for additional detail.
- ☐ Signs are adequately placed so that pedestrians are not confronted with mid-block obstacles on or above the TPAR. Signs and other devices mounted lower than 7 feet above the TPAR do not project more than 4 inches into the accessible path. Information on signs is communicated to pedestrians with visual or other disabilities.
- ☐ Temporary traffic signals are modified or installed, including pedestrian signals and push buttons, as necessary. Ensure pedestrian clearance times adequately account for walking speeds and travel distances. Ensure that push buttons are accessible to pedestrians with disabilities.
- ☐ Inspections include pedestrian accommodations during construction, and an appropriate timeline for inspection is being followed.
- ☐ Traffic control devices and the pedestrian area are in well-maintained and safe condition and are accessible, clean, sturdy, firm, smooth, continuous, detectable, and do not pose tripping hazards.



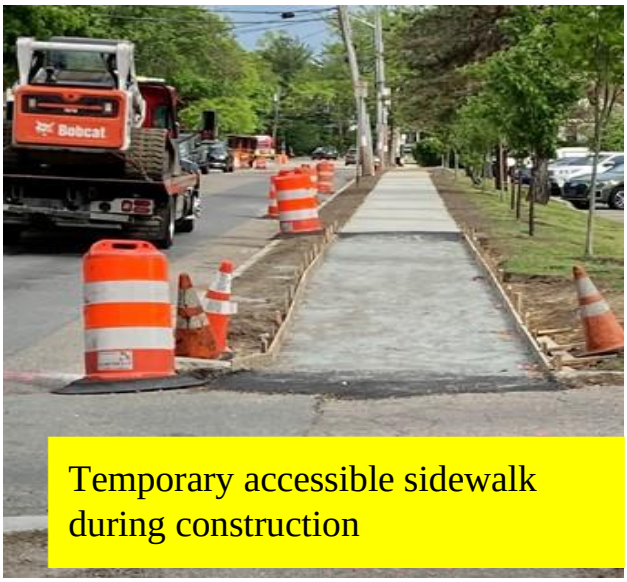
ADA approved pedestrian barrier



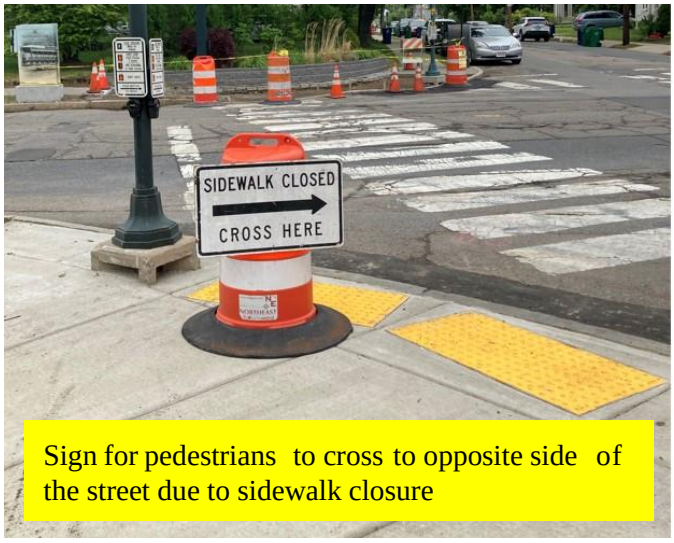
Temp. Asphalt ramp
& temp cross walk painted



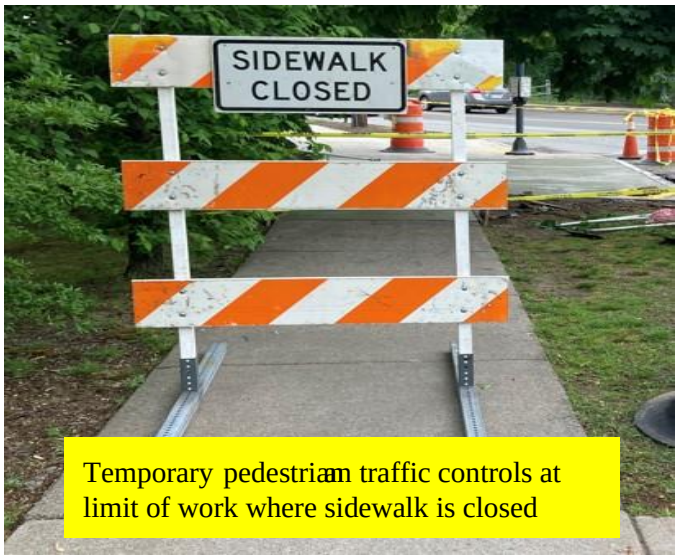
Pedestrian bypass with jersey barriers in roadway next to work zone



Temporary accessible sidewalk during construction



Sign for pedestrians to cross to opposite side of the street due to sidewalk closure



Temporary pedestrian traffic controls at limit of work where sidewalk is closed

PAYMENT

Payment under this item shall be by the Contract Unit Price bid per Lump Sum. If, after notice by the City, signage is determined to be inadequate, the City may withhold payment on this item until it is addressed satisfactorily by the Contractor. The prices so-stated constitute full and complete compensation for all labor, materials, and equipment associated with (but not limited to) furnishing temporary ramps, temporary safe access, erecting, maintaining, washing, movement, adjustment, repair, relocation, re-erection, storing of all temporary construction signs, sign mountings, portable barricades, traffic cones, delineators, drum barricades, channelizing devices, and all other devices, clean-up, legal disposal of all materials, and all other incidentals required to finish the work, complete and accepted by the Engineer. Any damage shall be the Contractor's responsibility.

ITEM 854.016 TEMPORARY PAVING MARKINGS – 6 INCH (PAINTED) FT
ITEM 854.036 TEMPORARY PAVING MARKINGS – 6 INCH (TAPE) FT

DESCRIPTION

Work under these items shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 864.04 PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) SF

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 865.2 PAVEMENT SURFACE COATING SY

The work under this Item shall be in accordance with Section 860 of Standard Specifications for Highways and Bridges and the following: The work under this Item shall include preparation of the pavement surface in conjunction with the application of one or more courses of a polymer modified flexible cement surfacing material that may be used as a complete light, durable, skid resistant, composite wearing surface, or textured and colored on sections of pavement to simulate hand laid brick and/or conventional masonry where shown on the plans or as required by the Engineer.

This work shall be for the proposed raised intersection at Oak Street/Chestnut St, including the crosswalks, and labeled as "pavement surface coating" on the plans.

At crosswalk locations, the color shall be brick red and pattern shall be standard size brick arranged in a running bond, brick orientation. The pattern shall be oriented such that the continuous lines of the brick pattern shall be perpendicular to the parallel edges of the proposed crosswalk.
The raised intersection "table top" shall be gray and pattern shall be a cobblestone pattern as shown on the plans or as otherwise required by the city.

Prior to installation, the Contractor shall submit pattern samples and color samples to the Engineer and the City of Newton for approval.

PREPARATION

The areas to be surfaced with the specified material(s) must be structurally sound and may consist of either asphalt or cement concrete. When these material(s) are intended for application on a newly paved asphalt surface a curing period will be required to ensure that no concentration of oils are present. A suitable approved pavement heater may be employed to expedite curing when a delayed work schedule is not advisable.

Surface preparation will then be performed in the following general manner:

The pavement surface is to be thoroughly cleaned by approved methods removing all contaminants that may prevent proper adhesion of the new surfacing material(s). A suitable approved pavement heater shall be employed where surface oils, fuel and the like exist on the surface, to remove these incompatible materials. New bituminous concrete shall be added as necessary, thermally bonded to the pavement and compacted to achieve a density equal to the surrounding or adjacent pavement. No work shall be initiated until the surface condition conforms to manufacturer recommended standards for both structure and cleanliness.

All applications shall be installed in a neat and uniform manner by approved methods. The Contractor will be responsible for furnishing and placing a sufficient number of safety cones together with caution tape to adequately protect all work zones, and to insure the orderly flow of vehicular and pedestrian traffic.

Residues resulting from this element of the work shall be immediately removed from the jobsite(s) and must be disposed of in a proper manner. There will be no additional compensation for the disposal of excess or unused materials. Pavement sections where the surfacing work is incomplete must be left in a neat and clean condition, satisfactory to the Engineer at the end of each workday.

INSTALLATION

Contractor shall be responsible for the preparation, placement and patterning of the polymer modified flexible concrete surfacing material(s) for all applications according to the
manufacturer's guidelines and subject to the approval of the Engineer. When required, this composite paving material shall be uniformly and homogeneously formulated with color stable pigments and surface textured to simulate hand laid brick and/or masonry.

A simulated mockup consisting of the color(s) and pattern(s) as selected by the Engineer and the City, will be constructed, within a designated section of the overall work area,-at least five working (5) days prior to the initiation of this phase of construction. The mockup site will be determined by the Engineer. Weather permitting and only with approval of the completed sample section, the work shall begin. The cost of the mockup shall be included in the unit price for this item and shall encompass a minimum surface area of 3'x3'.

A working knowledge of the specialized technology contained within these specifications is required. Only certified applicators may be employed for this work. In the event that this material and/or surfacing system constitutes, or is claimed to constitute proprietary technology subject to U.S. Patent protection, the Contractor will be required to furnish written evidence satisfactory to the Owner that he/she is an accredited, authorized and/or licensed installer of the patented material/process.

The installation phase of this work shall be performed in the following general manner:

Using manufacturer prescribed methods and equipment as described herein, the Contractor shall properly blend and mix the water, polymer modified cement, aggregate and pigments (color will be selected by the City) to achieve the desired consistency. The polymer shall be an acrylic based material furnished in an aqueous emulsified state to prevent the loss of internal strength and bond which may result in cohesive and adhesive failure. The measuring and mixing operation shall be capable of producing a workable, consistent, homogeneous mixture for the intended application. Only then shall the Contractor apply the composite to the surface of a hardened, structurally sound bituminous concrete pavement as directed.

Using specialized equipment and tools as necessary the desired ultra-thin composite mixture shall be sufficiently and uniformly applied to the surface. The finished material must be capable of being spread to a consistent build thickness of as little as .0625 inches per layer. Segregation of the mixed material shall be avoided. Should this condition present itself the material and/or application must be corrected immediately or replaced, as determined by the Engineer. When this newly constructed ultra-thin finish is applied over bituminous concrete it shall provide a flexible, fuel, skid and UV resistant surface, which results in a reduction of susceptibility to natural oxidation.

No material shall be applied when precipitation is present or imminent inclement weather will prevent proper curing. No material may be allowed to exceed the workability limitations of the composite mixture.

Hand applications will be utilized for smaller sections when a color distinction and/or surface pattern is required. Patterned applications intended to resemble masonry will be constructed in two (2) layers and colors in accordance with the design drawings or as otherwise required by the City. Finish patterns and colors may only be applied after the first course has adequately cured.

Once the newly finished surfaces have cured sufficiently, the application area may be opened to vehicular and/or pedestrian traffic. Any residue resulting from this work shall be removed and disposed of in a proper manner. The completed work area is to be left in a neat and clean condition, satisfactory to the Engineer.

The Contractor shall take reasonable precautions and steps during construction to prevent bodily harm or injury or damage to adjacent structures such as curbing, sidewalks, drainage, or water supply facilities. If during the execution of the work, the Contractor, through willfulness or carelessness, permits or causes any damage to public or private property, the cost of repair or replacement shall be the responsibility of the Contractor at no expense to the City.

The Contractor shall maintain minimum eleven (11) foot vehicular travel lanes at all times during this operation unless otherwise approved.

MATERIALS

The composite material(s) used for this polymer modified thin surfacing system must support a documented performance history satisfactory to the City that is compatible with the functions and characteristics detailed within these specifications. This material must also be able to demonstrate long term adhesion, flexibility and abrasion resistance characteristics, scrub ability, as well as color stability, chemical and fuel resistance.

The Contactor will be required to furnish to the Engineer five (5) applications that have been placed on main thoroughfares, complete with contact information and locations using the material(s) as specified herein. The ultra-thin layer polymer composite(s) used on these projects must support a documented history of field performance and integrity for the type of work described herein for a minimum period of five (5) years. No waiver of this condition will be allowed.

The composite material shall be flexible with form stability which is compatible with existing bituminous pavements and be formulated using polymer modifications as necessary to suit local traffic and climate conditions. The specified polymer modified composite material(s) when mixed and cured in accordance with manufacturer's guidelines shall demonstrate the physical properties outlined in the following table.

MATERIAL PROPERTIES

Physical Properties	Test Method		Minimum Test Value
Compressive Strength	ASTM C 39		3,100 PSI
Solar Reflectivity Index	ASTM EI918 ASTM C 1549	>29	
Shear Bond Adhesion	ASTM C 1583		>250 PSI
Skid Resistance (mixed)	ASTM E-274	>40	
Tensile Strength	ASTM C 190		615 PSI (3.9 MPa)
Freeze-Thaw Scaling Resistance	ASTM C672-98	0	

MATERIAL COMPONENTS

Water. The water used in mixing these composite(s) shall be of potable quality and free from soluble salts.

Chemical Admixtures/pigments. All chemical admixtures shall be introduced during the manufacturing process. Pigments may only be added on site to achieve a particular color quality or tint preference as directed.

Surface Sealer. A suitable approved surface sealer, if required, may be applied to the polymer modified composite(s) to provide additional protection in fueling areas, or to prevent surface efflorescence when colors are utilized.

Material Verification. Upon request the Contractor shall provide a Certificate of Analysis (COA) for the polymer

emulsion, aggregate and aggregate dry blend verifying that the materials meet the specific requirements outlined herein.

Questionable product with just cause may be subjected to all of the specified testing procedures. All material testing will be conducted by a third party independent certified laboratory acceptable to the Engineer, and will be the financial responsibility of the Contractor. Samples failing in any test category will result in immediate rejection of the material from further consideration or use and may disqualify the contractor from this phase of the work.

Material(s) furnished pursuant to this work shall not be harmful to humans or the environment and must possess a Design for the Environment (DfE) as designated by the United States Environmental Protection Agency (EPA).

No payment will be rendered for any work until a manufacturer's certificate of compliance has been furnished by the Contractor. A Material Safety Data Sheet (MSDS) will also be required before any work is initiated.

EQUIPMENT

Contractor must have access to and be familiar with the specialized machinery and tools necessary to perform the procedures as outlined and contained within these technical specifications. These items shall include but not be limited to dedicated surfacing equipment designed exclusively for use in applying thin layer polymer modified composite(s), appropriate trucks, air compressors, miscellaneous dispensers, mixers, applicators, heaters, cutters and/or specialized tools etc.

To ensure optimum work site efficiency and project safety considerations, multiple crews may be required when hand applications or custom patterns as described previously are necessary.

MOBILIZATION

Construction of these flexible ultra-thin surfaces shall commence within twenty-four (24) hours of written notification to proceed as issued by the Contractor. Work shall commence within this timeframe without regard to the number of mobilizations that may be required by the Engineer to complete this work.

Due to the logistical complications inherent to this type of specialized construction, and given the general project size, scope, schedule and public safety concerns, the Contractor may not assume that a single mobilization will be sufficient to complete this entire phase of the work required in a safe and orderly fashion. No separate payment will be made for any additional mobilization or demobilization as may be necessary to complete the project.

GUARANTEE / WARRANTY

The Contractor shall warranty all applications from defects resulting from improper workmanship and faulty or inferior materials for a minimum period of three (3) years. All defective materials and/or substandard work will be corrected or replaced within the warranty period as required by the Engineer.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 865.2 Pavement Surface Coating will be measured for payment by the Square Foot, completed in place.

Item 865.2 Pavement Surface Coating will be paid for at the Contract unit price per Square Foot, which price shall include all labor, materials, equipment, mobilization, expansion joint filler, mockup and incidental costs required to complete this work including ancillary preparation of the pavement. No payment deductions will be made for structures within the work area such as manholes, catch basins or water covers.

ITEM 866.104 4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) FT
ITEM 867.104 4 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) FT

The work to be done under these items shall conform to the relevant provisions of Section 860 of the Standard Specifications and the following:

Work shall consist of furnishing and installing 4 inch permanent pavement markings at locations shown on the plans.

Method of Measurement and Basis of Payment

4 inch reflectorized white line (thermoplastic) and 4 inch reflectorized yellow line (thermoplastic) will be measured and paid at the Contract unit price per Foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 866.112 12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) FT

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 874. STREET NAME SIGN EA

DESCRIPTION

Work under this item shall conform to the relevant provisions of Section 800 of the MassDOT Standard Specifications.

ITEM 874.2 TRAFFIC SIGN REMOVED AND RESET EA

GENERAL

Work under this item shall conform to the relevant provisions under Section 828 of the standard specifications and the following:

The Contractor shall carefully remove and reset all designated existing signs including attachment hardware and sign support posts located as needed and where required by the Engineer.

Work shall include the dismantling, removal, transporting, storing and resetting of existing traffic signs at the locations shown on the plans. The Contractor shall completely remove the sign and post and reset said sign and post at the new location. If existing sign and/or post are not suitable for reuse as determined by the Engineer, the contractor shall provide new sign and/or post under items 832. and/or 847.1 respectively. New attachment hardware shall be furnished as necessary to replace any missing or unusable existing hardware. Work shall also include the removal and disposal of footings up to a depth of 12 inches below the proposed surface of sidewalks and driveways as well as up to 36 inches below the proposed roadway.

Existing sign and/or post damaged by the Contractor's operations shall be replaced in-kind by the Contractor at no additional compensation.

Included under this item are warning, regulatory, and route marker signs and miscellaneous directional signs.

The Contractor shall backfill with compacted gravel all holes resulting from the removal of the existing signs and their foundations and restore the area to match existing conditions of adjacent areas.

Method of Measurement and Basis of Payment

Traffic sign removed and reset will be measured and paid for by each traffic sign removed and reset, 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 gravel backfill or excavation and disposal of existing footings, if required, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 874.4 TRAFFIC SIGN REMOVED AND STACKED EA

GENERAL

Work under this item shall conform to the relevant provisions under Section 828 of the standard specifications and the following:

Work shall include removing, transporting, protection, temporary storage and stacking of signs, posts and hardware. The signs, posts and hardware within City Layout shall be stacked on boards for pick-up by the City of Newton Department of Public Works, as determined by the Engineer. Work shall also include the removal and disposal of footings up to a depth of 12 inches below the proposed surface of sidewalks and driveways as well as up to 36 inches below the proposed roadway.

Traffic signs determined to be unsuitable for reuse shall become the property of the Contractor and shall be removed and discarded.

The Contractor shall completely remove the sign and post. If existing sign and/or post are damaged by the Contractor's operations, a new sign and/or post of the same size and material shall be provided to the City at the Contractor's expense.

The Contractor shall backfill with compacted gravel all holes resulting from the removal of the existing signs and their foundations and restore the area to match existing conditions of adjacent areas.

Method of Measurement and Basis of Payment

Traffic sign removed and stacked shall be measured and paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

No separate payment will be made for gravel backfill or excavation and disposal of existing footings, if required, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 875.1 PARKING METER REMOVED AND RESET EA

Work under this item shall conform to the relevant provisions under Sections 120 and 800 of the Standard Specifications and the following:

Work to be performed under this item shall consist of removing and resetting (R&R) parking meters and parking meter posts in accordance with the plans and/or as required by the DPW Commissioner, and the following:

Prior to the Removal and Resetting of parking meter posts the Contractor shall make arrangements with the Traffic and Parking Department for the removal of the parking meter heads prior to commencing work. The Contractor shall notify the Traffic and Parking Department 72 hours prior to removing any parking meter posts. The location and quantities of parking meter posts to be Removed and Reset are not exact and arrangements shall be made with the Traffic and Parking Department to establish the exact locations for reset or new parking meter posts. The installation of parking meter posts shall be in accordance with the City of Newton Transportation Division standards.

METHOD OF MEASUREMENT

Parking Meter Removed and Reset will be measured for payment each, complete in place.

BASIS OF PAYMENT

Parking Meter Removed and Reset will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment and incidental costs required to complete the work.

ITEM 875.2 PARKING METER REMOVED AND STACKED EA

General

The work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

The work to be done under this Item shall consist of the careful and complete removal, transport, and storage of any existing parking meters and posts called out on the plans as "R&S" (Remove and Stacked).

Prior to removal of the parking meters, the Contractor shall coordinate with the City of Newton to ensure no money remains within the meters. The Contractor shall contact the City of Newton Parking Clerk at (617) 796-1344 a minimum of 48-hours in advance of any work involving the meters.

The Contractor shall backfill with compacted gravel all holes resulting from the removal of the parking meters and their foundations and restore the area to match existing conditions of adjacent areas.

Parking meters to be removed shall be stacked on boards for pick up by the City of Newton Department of Public Works.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Parking Meter Removed and Stacked will be measured and paid for at the Contract unit price per each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

ITEM 999.01 MISCELLANEOUS WORK ALLOWANCE ALLOWANCE

DESCRIPTION

The intent of this section is for work and materials which are unique in nature and rendered as a direct request of the Engineer. These items of work shall be completed only when and as required by the Engineer. The Contractor may not proceed with any work under this section without the written notice of the Engineer to complete the work under the "Miscellaneous Work Allowance".

The sum to be allowed for the work of this item shall be up to 5% of the total contract cost. All work under this item shall be paid for by one or more or a combination of the following methods at the City's discretion:

1. Unit prices for this project.
2. An agreed lump sum.

MEASUREMENT AND PAYMENT

Payment for work completed under **Item 999.01** shall be as specified above, in full or in part, as pre-approved by the Engineer.

DESCRIPTION

The Contractor shall include in his bid an allowance for payment of traffic control officers as approved by the Engineer. This allowance will be used as a basis for comparison of bids only.

Under this item the Contractor shall be responsible for ordering, and for canceling details on a day-to-day basis. In the event the Contractor has ordered police details and does not give the police department ample advance notice that work has been cancelled for that day due to inclement weather or for any other reason, then the Contractor shall bear the expense of that billed detail.

The Contractor shall completely familiarize himself with the current policies regarding and/or regulating police details.

In the event police detail requests cannot be completely filled to cover the Contractor's scheduled work for any particular day, then the Contractor shall adjust his work schedule accordingly and shall not hold the City responsible for any loss of time, or for any other financial loss. The City of Newton will however grant an extension of time to the original contract term for each day lost due to insufficient police staffing.

Uniformed Traffic Officers will be required during the construction period and shall be paid for directly by the City. It shall be the responsibility of the Contractor to arrange for the necessary police details when approved by the City for each police detail required. This request and approval may be verbal or in writing at the discretion of the City. **Forty-Eight (48) hour notice to the Police Department is required.**

The City will pay the exact charges for police details ordered, with the approval of the Engineer, by the Contractor for this project. There will be no administration fee, mark-ups, or any other additional costs paid to the Contractor.

If the Contractor fails to cancel any police detail not needed, by the required deadline, as set forth by the Newton Police Department, the cost for such detail as invoiced to the City shall be deducted from the total reimbursement to the Contractor, unless otherwise waived by the City. There will be no separate payment for the Contractor's coordination with the Police Department or City to obtain police details.

MEASUREMENT AND PAYMENT

Under Item 999.02, the Contractor shall submit paid invoices to the Engineer. The Contractor shall then be reimbursed the full invoice amount for City of Newton Police Department charges and/or, when applicable, for Massachusetts State Police charges, as full reimbursement under the allowance for payment of Traffic Control Officers.

The original invoice issued by the billing authority must be submitted to the Engineer for payment under this item.

ADD ALTERNATE #1

ITEM 819.91 DUAL CAR ELECTRICAL VEHICLE CHARGING STATION LUMP SUM

The work under this item shall conform to the relevant provisions of Section 800 of the Standard Specifications and the following:

The work shall include furnishing and installing a Chargepoint CT4000 Level 2 Commercial Charging Station (dual port bollard mount) and electric meter with connection to power source. The work shall also include the installation of 8"x23" pull boxes and 2" schedule 80 PVC conduit for the future installation of additional charging stations.

The installation of the charging station shall be according to manufacturer's specifications. Contractor shall coordinate with manufacturer and utility companies to confirm the power source and installation requirements.

BASIS OF PAYMENT

Dual car electrical vehicle charger will be paid for at the Contract unit price per lump sum, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

No separate payment will be made for pull boxes, conduit, electric meter, and electric service connection, but all costs in connection therewith shall be included in the Contract unit price bid.

END OF SECTION

Bidders are responsible for downloading the specifications from the City's web site www.newtonma.gov/bids .

Attachment 1

DOCUMENT 00811

MONTHLY PRICE ADJUSTMENT FOR

HOT MIX ASPHALT (HMA) MIXTURES ENGLISH UNITS

Revised: 07/08/2016

This provision applies to all projects using greater than 100 tons of hot mix asphalt (HMA) mixtures containing liquid asphalt cement. 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 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 period price for the month in which this project is bid shall be considered the Base Price and 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 http://www.mhd.state.ma.us/ within two (2) business days following its receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted the Department the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor. This method of period price determination was formerly called the New Asphalt Period Price Method. Separate website postings using both the New Asphalt Period Price Method and the Old Asphalt Period Price Method were discontinued after June 2013.

Price Adjustment Determination, Calculation and Payment

The Contract Price of the HMA mixture will be paid under the respective item in the Contract. Price Adjustments, as herein provided, either upwards or downwards, will be made after the work has been performed using the monthly period price for the month during which the work was performed. Price Adjustments will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03. Price Adjustments will be separate payment items. The pay item numbers are 999.401 for a positive price adjustment (a payment) and 999.402 for a negative price adjustment (a deduction). Price Adjustments will be calculated using the following equation:

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

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

DOCUMENT 00812
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE – ENGLISH UNITS

Revised: 01/26/2009

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 (www.mhd.state.ma.us) 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 (that are included in the contract) 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

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