

**CITY OF NEWTON
PURCHASING DEPARTMENT**

CONTRACT FOR PUBLIC WORKS

PROJECT MANUAL:

CIP PROJECT 8 SEWER REHABILITATIONS

INVITATION FOR BID #22-50

MWRA LOCAL FINANCIAL ASSISTANCE PROGRAM

PROJECT NO. WRA-P11-24-3-1158

Bid Opening Date: March 10, 2022 at 11:00 a.m.



A handwritten signature in blue ink that appears to read "David Elmer".

Digitally signed by
David Elmer
Date: 2022.02.15
15:33:26-05'00'

February 2022

Ruthanne Fuller, Mayor

**CITY OF NEWTON
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CIP PROJECT 8 SEWER REHABILITATIONS**

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END OF SECTION

**CITY OF NEWTON
PURCHASING DEPARTMENT
INVITATION FOR BID #22-50**

The City of Newton (City) invites sealed bids from Contractors to:

CIP¹ PROJECT 8 SEWER REHABILITATIONS

Bids will be received until:

11:00 a.m., Thursday, March 10, 2022

at the Purchasing Department, Room 108, Newton City Hall, 1000 Commonwealth Avenue, Newton, MA 02459. Immediately following the deadline for bids, all bids received within the time specified will be publicly opened and read aloud

Contract Documents will be available online at www.newtonma.gov/bids or for pickup in the Purchasing Department after **10:00 a.m., February 17, 2022**. There will be no charge for contract documents.

Open cut repair of 302 lf of sewer, replacement of 24 sewer service connections, chemical root treatment of 18,037 lf of sewer, chemical root treatment of 17 manholes, installation of 67,942 lf of cured-in-place pipe and reinstatement of 787 service connections, installation of 16,003 lf of structural cured-in-place pipe and reinstatement of 264 service connections, installation of 20 cured-in-place lateral liners, cutting of 38 protruding service connections, cementitious lining of 6,010 vf of manholes, installation of 38 frames and covers, building of five (5) manhole benches and inverts, installation of 17 inflow dishes, grouting to stop leaks in four (4) manholes, installation of three (3) plugs to abandon upstream sewer, cleaning inspection of 1,305 lf of sewer, and post construction flow isolation of 76,764 lf of sewer.

All bids shall be submitted as one ORIGINAL and one COPY. The City will award the contract to the lowest responsible and eligible bidder.

A bid deposit in an amount that is not less than five percent (5%) of the value of the bid, including all alternates, is required. Bid deposits, payable to the City, 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.**

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 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.

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 City and should be included in your bid.

All contractors are hereby notified of the TRENCH PERMIT pursuant to G.L. c.82A, §1 and 520 CMR 7.00 et seq. (as amended). Please refer to ATTACHMENT - B TRENCH PERMIT in Specification Section 00890 Permits.

All City bids are available on the City's web site, www.newtonma.gov/bids. It is the sole responsibility of the contractor downloading these bids to ensure they have received any and all addenda prior to the bid opening. Addenda will be available online within the original bid document as well as a separate file. If you download bids from the internet site and would like to make it known that your company has done so, you may fax the Purchasing Department (617) 796-1227 or email to purchasing@newtonma.gov with your NAME, ADDRESS, PHONE, FAX AND INVITATION FOR BID NUMBER.

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 any 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.

¹ Capital Improvement Plan.

In the event that any person wishes to attend a bid opening or pre-bid meeting, 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 meeting: jfairley@newtonma.gov or (617) 796-1253. For Telecommunications Relay Service, please dial 711.

CITY OF NEWTON

A handwritten signature in black ink that reads "Nicholas Read". The signature is written in a cursive, slightly slanted style.

Nicholas Read
Chief Procurement Officer
February 17, 2022

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 Contract Documents and the bid is made in accordance therewith.
 2. The Bidder has visited the work site and is familiar with the local conditions under which the work has to be performed.
- 1.2 Failure to so examine the Contract Documents, visit the worksite or become familiar with local conditions 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 only answer such requests if received Friday, March 4, 2022 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 communication.
- 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 procurement 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 itself known to the Purchasing Department, at purchasing@newtonma.gov or via facsimile (617) 796-1227, it 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 #22-50**.

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/purchasing.

ARTICLE 4 - PREPARATION AND SUBMISSION OF BIDS

- 4.1 Bids shall be submitted on the "Bid Form # 22-50," 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 IFB. 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.

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

Bidders are reminded that the bid deposit covers the City for damages when a bidder withdraws its bid after the bid submission date. **Bid advised that to the extent permitted by law the City will retain all bid deposits for withdrawn bids.**

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 Newton City Hall is open.

- 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 FORM: **IFB #22-50**

* NAME OF PROJECT AND INVITATION NUMBER: **CIP PROJECT 8 SEWER REHABILITATIONS**

* 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.
- 4.8 Bids shall be submitted with one **original** and one **copy**.
- 4.9 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).
 - A. This requirement will apply to any general bid or sub bid submitted.
 - B. 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.
 - C. 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.

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 indicate 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 telegraphic request. Telegraphic 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 may be withdrawn within sixty 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 items set forth in Bid Form #22-50 attached hereto. It is the City's intent to award one (1) contract to the responsible and eligible bidder offering the lowest Base Bid Total Price. A contract will be awarded within sixty (60) days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids.
- 7.2 The City reserves the right to waive any 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.
- 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 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 The City has used a proprietary specification to describe the supply listed in the specifications. 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 #22-50

A. The undersigned proposes to furnish all labor and materials required in accordance with the Contract Documents supplied by the City of Newton entitled:

CIP PROJECT 8 SEWER REHABILITATIONS

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 proposed BASE BID TOTAL PRICE is:

_____ DOLLARS (\$ _____).
(The figure inserted above shall be the Total Price for the Base Bid as computed on the Item Sheets pp. 13-29 attached hereto.)

COMPANY: _____

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

- Bid Item Sheets, 17 pages
- Signed Bid Form, 2 pages
- Bidder's Qualifications and References Form; 3 pages
- Certificate of Non-Collusion, 1 page
- Certification of Tax Compliance, 1 page
- Certificate of Foreign Corporation (if applicable), 1 page
- Debarment Letter for Contract, 1 page
- IRS W9 Form, 1 page
- Business Category Information Form, 1 page
- A five percent (5%) bid deposit/bid guarantee.

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 s/he is selected as general contractor, s/he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general 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. Chapter 30, s 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.

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

INSTRUCTIONS FOR ITEM SHEETS

The Contractor shall insert prices for each item in ink, in both words and figures, and is to show a total bid price. 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.

The quantities listed in the following Item Sheets are the City's best estimates based on prior experience. Actual quantities may be more or less than those estimated and can vary substantially as field conditions may necessitate. Regardless of the amount of the actual quantities, the unit price(s) shall be that set forth in the Bidder's Item Sheets.

ITEM SHEETS

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
----------	---------------------	---	------------------

BASE BID (Items 1 to 16)

1 Sewers Complete in Place

1a	152 l.f.	8-inch PVC sewers, where excavation length is less than 20 linear feet, per linear foot	\$ _____
		_____ (dollars)	
		and _____ (cents)	
		(\$ _____)	

1b	150 l.f.	8-inch PVC sewers, where excavation length is greater than or equal to 20 linear feet, per linear foot	\$ _____
		_____ (dollars)	
		and _____ (cents)	
		(\$ _____)	

2 Building Connection Systems

2a	24 wyes or tees	8x6 inch wye or tee branches for PVC pipe, each	\$ _____
		_____ (dollars)	
		and _____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
2b	90 v.f.	6-inch sewer chimneys, per vertical foot	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
2c	475 l.f.	6-inch PVC building connections, per linear foot	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
2d	85 c.y.	Controlled density fill, per cubic yard	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
3		Additional Earthwork	
3a	100 c.y.	Earth excavation and backfill below normal grade, per cubic yard	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
3b	500 c.y.	Earth excavation and backfill above normal grade, per cubic yard _____ (dollars) and _____ (cents) (\$ _____)	\$ _____
3c	100 c.y.**	Rock excavation and disposal, per cubic yard (minimum) _____ Sixty _____ (dollars) and Zero _____ (cents) (\$ 60.00 _____)	\$6,000.00
3d	100 c.y.**	Rock excavation and disposal, per cubic yard (additional) _____ (dollars) and _____ (cents) (\$ _____)	\$ _____

*Quantity assumed for comparison of bids.

**The unit price in Item 3c is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 3d.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
3e	100 c.y.	Test pits, per cubic yard	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
4		Pavement Replacement	
4a	30 l.f.	Type A – Permanent binder course trench width pavement (6-inches thick), per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
4b	425 l.f.	Type B – Permanent binder course trench width pavement (4-inches thick), per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
4c	525 l.f.	Type A and Type B – Permanent top course trench width pavement (2-inches thick) with cold planning, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
4d	100 tons	Additional pavement, per ton	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
5		Water and Drain Reconstruction	
5a	15 reconstructions	Water and drain reconstruction within sewer trench limits, per reconstruction	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
5b	1 l.s.	Woodcliff Road drain replacements (plan sheet C-16), lump sum	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
5c	1 l.s.	Arnold Road drain replacement (plan sheet C-20), lump sum	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
6		Sewer Line and Manhole Chemical Root Treatment	
6a	16,159 l.f.	Chemical root treatment of 8-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
6b	1,211 l.f.	Chemical root treatment of 10-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
6c	667 l.f.	Chemical root treatment of 24-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
6d	17 manholes	Chemical root treatment of manholes, per manhole	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
7		Cured-in-Place Pipe	
7a	182 l.f.	Cured-in-place pipe for 6-inch sewers, per linear foot	\$ _____
		_____ (dollars) and _____ (cents) (\$ _____)	
7b	51,017 l.f.	Cured-in-place pipe for 8-inch sewers, per linear foot	\$ _____
		_____ (dollars) and _____ (cents) (\$ _____)	
7c	6,840 l.f.	Cured-in-place pipe for 10-inch sewers, per linear foot	\$ _____
		_____ (dollars) and _____ (cents) (\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
7d	2,722 l.f.	Cured-in-place pipe for 12-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
7e	2,377 l.f.	Cured-in-place pipe for 18-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
7f	4,804 l.f.	Cured-in-place pipe for 24-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
7g	787 services	Grout reinstated service connections, pe service	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
8		Structural Cured-in-Place Pipe	
8a	13,704 l.f.	Structural cured-in-place pipe for 8-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		(cents)	
		(\$ _____)	
8b	1,317 l.f.	Structural cured-in-place pipe for 10-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		(cents)	
		(\$ _____)	
8c	982 l.f.	Structural cured-in-place pipe for 12-inch sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		(cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
8d	264 services	Grout reinstated service connections, per service	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
9		Cured-in-Place Lateral Liners	
9a	6 laterals	Cleaning and inspection of laterals in 8-inch to 12-inch diameter mainline (where lateral liners cannot be installed), per lateral	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
9b	20 laterals	Cured-in-place short liner for 8-inch to 12 inch diameter mainline, up to 5 feet, per lateral	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
9c	260 l.f.	Cured-in-place lateral liner in 8-inch to 12-inch diameter mainline, additional linear footage beyond 5-feet, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
10		Service Connection Rehabilitation	
10a	38 services	Cutting of protruding service connections, per service	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
11		Sewer Manhole Rehabilitation	
11a	6,010 v.f.	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
11b	34 frames and covers	Furnish and install manhole fame and cover, per frame and cover	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
11c	1 frame and cover	Furnish and install bolted and gasketed manhole frame and cover, per bolted and gasketed frame and cover	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
11d	3 manholes	Replace manhole chimney above grade and furnish and install bolted and gasketed manhole frame and cover, per manhole	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	
11e	5 bench and inverts	Build manhole bench and invert, per bench and invert	\$ _____
		_____ (dollars)	
		and	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
11f	17 inflow dishes	Furnish and install manhole inflow dish, per inflow dish <hr/> (dollars) and <hr/> (cents) (\$ _____)	\$ _____
11g	3 v.f.	Install internal drop connection, per vertical foot <hr/> (dollars) and <hr/> (cents) (\$ _____)	\$ _____
11h	4 manholes	Manhole grouting to stop leaks, per manhole <hr/> (dollars) and <hr/> (cents) (\$ _____)	\$ _____
11i	1 l.s.	Install plug in manhole A004-91 to abandon upstream 8-inch diameter sewer, lump sum <hr/> (dollars) and <hr/> (cents) (\$ _____)	\$ _____

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
11j	1 l.s.	Install plug in manhole A007-30 to abandon upstream 8-inch diameter sewer, lump sum	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
11k	1 l.s.	Install plug in manhole A009-1 to abandon upstream 18-inch diameter sewer, lump sum	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
11l	1 manhole	Repair manhole chimney (exterior) above grade, per manhole	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
12		Cleaning and Inspection of Sewers	
12a	1,305 l.f.	Cleaning and inspection of sewers, per linear foot	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
13		Post Construction Flow Isolation	
13a	76,764 l.f.	Post construction flow isolation of sewers, per linear foot	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	
14		Portable Changeable Message Signs	
14a	20 days	Portable changeable message sign, per day	\$ _____
		(dollars)	
		and	
		(cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
15		Mobilization	
15a	1 l.s.	Mobilization, lump sum (not more than 5% of Items 1 to 14)	\$ _____
_____ (dollars)			
and _____			
_____ (cents)			
(\$ _____)			

16 Allowances for Services of Uniformed Officers

16a	12,000 hours	Uniformed officers for traffic control, per hour	\$660,000.00
_____ Fifty-five _____			
_____ (dollars)			
and _____ Zero _____			
_____ (cents)			
(\$ 55.00 _____)			

The BASE BID TOTAL PRICE (Items 1 to 16, inclusive) is:

_____ Dollars
(In Words)
and _____ Cents (\$ _____)
(In Words) (In Figures)

*Quantity assumed for comparison of bids.

CITY OF NEWTON

BIDDER'S QUALIFICATIONS AND REFERENCES FORM

Bidder must demonstrate qualifications to perform the Work. Each Bidder must be prepared to submit within five days after Bid opening, upon Owner's request, detailed written evidence such as financial data, previous experience, present commitments and other such data as may be called for below. Each Bid must contain evidence of Bidder's qualifications to do business in the state where the project is located or covenant to obtain such qualification prior to award of contract.

The City (Owner) and/or its Engineer may make such investigation as deemed necessary to determine the ability of the bidders to perform the work, and the bidders shall furnish to the Owner all such information data for this purpose as the Owner may request.

No award will be made to any bidder who cannot meet all of the following requirements:

- a. Shall not have defaulted on any contract within three years prior to the bid date.
b. Shall maintain a permanent place of business.
c. Shall have suitable financial status to meet obligations incident to the work.
d. Shall have appropriate technical experience satisfactory to the Owner in the class of work involved.
e. Shall be registered with the Secretary of State of the Commonwealth of Massachusetts to do business in Massachusetts.
f. Shall not have failed to perform satisfactorily on contracts of a similar nature.
g. Shall not have failed to complete previous contracts on time.
h. Shall have ample crews with adequate personnel and equipment to perform the work expeditiously.

Owner reserves the right to reject any bid if the foregoing requirements are not satisfied or if any other evidence fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated.

Nothing indicated herein will prejudice Owners right to seek additional pertinent information as is provided in Article 18, Award of Contract.

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 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 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
(Voluntary) or Federal Identification Number

Print Name: _____

Date: _____

OR

Company Name
(Corporation, Partnership, LLC, etc.)

By: _____
**Corporate Officer (Mandatory)

Print Name: _____

Date: _____

- * 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)

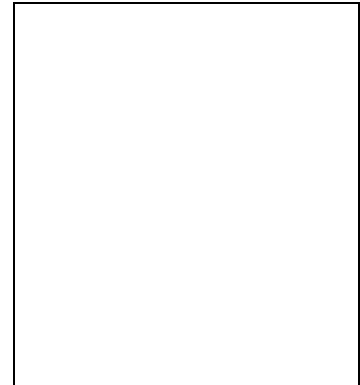
The undersigned further certifies that it has complied with the requirements of M.G.L. c. 30, §39L (if applicable) and with the requirements of M.G.L. c. 156D, §15.03 relative to the registration and operation of foreign corporations within the Commonwealth of Massachusetts.

Name of person signing proposal

Signature of person signing proposal

Name of Business (Please Print or Type)

Affix Corporate Seal here





Mayor
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 IFB #22-50

Dear:

As the awarded 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.

Your signature certifies that neither you nor your principal(s) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

PHONE _____ -- FAX _____
EMAIL _____

Signature _____ Date

If you have questions, please contact me at (617) 796-1220.

Sincerely,

Nicholas Read
Chief Procurement Officer

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: <input type="checkbox"/> Individual/Sole proprietor <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶ <input checked="" type="checkbox"/> Exempt payee <input type="checkbox"/> Other (see instructions) ▶	
	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. 22-50

CIP Project 8 Sewer Rehabilitations

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:

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 -

AGREEMENT made this ___ day of _____ in the year Two Thousand and Twenty Two 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:

- I. SCOPE OF WORK.** The Contractor agrees to furnish and to deliver to the City at such times, at such place or places, in such manner, and in such quantities as the City may direct, and at the unit prices quoted in the Contractor's bid the following item or items:

CIP PROJECT 8 SEWER REHABILITATIONS

- II. 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 # #22-50 issued by the Purchasing Department;
 - c. The Project Manual for CIP Project 8 Sewer Rehabilitations 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), if any, submitted by the CONTRACTOR in connection with this Project;
 - g. Duly authorized and executed Amendments, Change Orders or Work 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.

- III. PRIORITY OF DOCUMENTS.** In the event of inconsistency between the terms of this CITY -CONTRACTOR Agreement and the Project Manual, the terms of this Agreement shall prevail.
- IV. APPLICABLE STATUTES.** All applicable federal, state and local laws and regulations are incorporated herein by reference and the Contractor agrees to comply with same.
- V. CONTRACT TERM.** 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 (including warranty re-test inspection) hereunder as described in the Summary of Work and Specific Work Requirements of the Project Manual by December 31, 2024.

The work of the Base Bid must be brought to final substantial completion, exclusive of final paving and re-test inspection, within 395 calendar days of the start date fixed in the "Notice to Proceed." The contractor shall complete re-test inspection within 84 calendar days of the commencement of re-test inspection. Time is of the essence in the performance of the work of this contract.

Bidders attention is directed to the provisions in the Project Manual regarding the assessment of liquidated damages for failure to complete the work within the time specified. Liquidated damages shall apply to both the final substantial completion duration (395 calendar days from the start date fixed in the Notice to Proceed) and the warranty re-test duration (84 calendar days from commencement of warranty re-test inspection).

- VI. QUANTITIES.** The quantities specified in the Project Manual are approximate and are based on previous consumption. It is specifically understood the City does not agree to purchase any specific quantity, and purchases will be made to cover actual requirements only. The City may increase or decrease the quantity of any item specified without change in price per unit of quantity as stated in the Contractor's Bid Response.
- VII. MATERIALS.** The Contractor agrees, unless otherwise specified, that all equipment, materials and supplies furnished under this contract are to be first quality, new and unused.
- VIII. AUTHORIZATION OF AND PAYMENT FOR WORK PERFORMED.** The execution of this contract does not constitute a notice to proceed or authorization to perform work or make deliveries. No work shall be commenced or deliveries made unless authorized by a written Work Order issued by the City specifying the equipment, materials or supplies to be delivered. The Contractor will be paid following completed delivery and acceptance of the equipment, materials or supplies ordered in accordance with the Contract. The City will use best efforts to pay within thirty (30) days of receipt of an invoice for the delivered equipment, materials or supplies or acceptance of same whichever date is later.
- IX. CLAIMS FOR MATERIALS OR LABOR.** In the event any claims have been filed with the City for material or labor delivered or performed pursuant to this contract, the City shall be under no obligation to make any payment until such claims are adjusted to the satisfaction of the City. Any and all liens for supplies may be paid off by the City within twenty (20) days after the filing for record as provided by law of a notice of such liens, except where the claim on which the lien is filed is being litigated by the Contractor, and in such case the City may pay the amount of any final judgment or decree on any such claim. All money paid by the City in settlement of liens and claims as aforesaid, with the costs and expenses incurred by the City in connection therewith shall be charged to the Seller, bearing interest at the rate of six percent (6%) per annum, and be deducted from the next payment falling due the Seller under the terms of this contract.
- X. UNIT PRICES.** It is agreed that the unit prices listed are maximum prices and that the City shall be entitled to take advantage of any decreasing market conditions, decreases to be governed by the manufacturers' price listing as might be generally adopted in the trade, or by the same percentage that the Seller may reduce prices to others who purchase in similar quantities and under similar conditions.
- XI. RESPONSIBILITY FOR THE WORK/INDEMNIFICATION.** In the performance of any work, including the delivery of equipment, materials or supplies, pursuant to this Contract, the Contractor shall take all responsibility for the work, and shall take all precautions for preventing injuries to persons and property in or about the work and shall defend, indemnify and hold the City harmless from all loss, cost, damage or expense arising from injuries to persons or property in or about the work. The Contractor shall be responsible for any damage, which may be caused by the failure or insufficiency of any temporary works. He shall effectively protect his work and shall be liable for all damage and loss by delay or otherwise caused by his neglect or failure so to do.
- XII. WARRANTY.** Except as may be otherwise provided in the Project Manual, the Contractor 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 equipment, materials or supplies furnished hereunder (acceptance not to be unreasonably delayed) resulting from imperfect or defective work done or materials furnished by the Contractor.
- XIII. PATENT INDEMNIFICATION.** The Contractor agrees to assume the defense of and shall indemnify and save harmless the City and all persons acting for or 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 Contractor, within a reasonable time, shall at its own 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.
- XIV. INSPECTION.** For the purposes of inspection of the equipment, materials and supplies covered by this contract, the Contractor shall give the City free access to his works and furnish every facility for properly inspecting such equipment, materials and supplies, and shall furnish full information, whenever requested, relating thereto. Approval by any inspector of the City shall not relieve the Contractor from his obligation to comply in all respects with the contract.

- XV. ASSIGNMENT/SUB-CONTRACTING.** The Contractor agrees that he will not sell, assign or transfer this Contract or any part thereof or interest therein without the prior written consent of the City.
- XVI. INSTALLATION.** If any of the equipment, materials and supplies covered by this contract is to be installed by either the Contractor or the City, the Contractor shall, upon request of the City, furnish a competent employee to supervise the installation without expense to the City, unless otherwise provided herein. Such supervisor, or other employees furnished by the Contractor, shall be the agents of the Contractor and not of the City, and the Contractor hereby agrees to indemnify the City and hold it harmless from and against any and all loss, costs, damage, and expense sustained as the result of negligence or other conduct on the part of such supervisor or employee.
- XVII. TERMINATION.** The City of Newton may, by written notice of default to the Contractor, terminate the whole or any part of this Contract or any Work Order issued pursuant thereto in any one of the following circumstances:
 - a. If the Contractor fails to make delivery of the equipment, goods or supplies or to perform the services within the time specified herein or any extension thereof;
 - b. If the Contractor fails to perform any of the other provisions of this contract or, if in the opinion of the City, Contractor so fails to make progress as to endanger performance of this contract in accordance with its terms, and in either of these two circumstances does not correct such failure within thirty (30) days (or such longer period as the City may authorize in writing) after receipt of notice from the City specifying such failure.

XVIII. 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.

WORKER'S COMPENSATION

Worker's Compensation: Per M.G.L. c.. 149, s. 34 and c.. 152 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 aggregate

- XIX. GOVERNING LAW.** This Contract shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts.
- XX. SEVERABILITY.** The provisions of this Contract are severable. If any section, paragraph, clause or provision of this Contract shall be finally adjudicated by a court of competent jurisdiction to be invalid, the remainder of this Contract shall be unaffected by such adjudication and all of the remaining provisions of this Contract shall remain in full force and effect as though such section, paragraph, clause or provision, or any part thereof so adjudicated to be invalid, had not been included herein, unless such remaining provisions, standing alone, are incomplete and incapable of being executed in accordance with the intent of the parties to this Contract.
- XXI. AMENDMENTS TO THIS CONTRACT.** This Contract may not be amended except in writing executed in the same manner as this CITY-CONTRACTOR Agreement.

THIS 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

CITY OF NEWTON

By _____

By _____
Chief Procurement Officer

Print Name _____

Date _____

Title _____

By _____
Commissioner of Public Works

Date _____

Date _____

Affix Corporate Seal Here

Certified that additional funds are in the following accounts:
7159M401, 7160M401-586007

Approved as to Legal Form and Character

By _____
Associate City Solicitor

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

Date _____

CONTRACT AND BONDS APPROVED

By _____
Comptroller of Accounts

By _____
Mayor or her designee

Date _____

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 _____, 2022, 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, §39A, and M.G.L. c.149, §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 _____ 2022.

PRINCIPAL

SURETY

BY _____

BY _____

(SEAL)

(ATTORNEY-IN-FACT) (SEAL)

(Title)

ATTEST: _____

ATTEST: _____

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 "Plan" shall mean plans referred to and included in the Project Manual for this contract. The word "City" shall mean the City of Newton.

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

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 executed 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 general plans and the contract.

Discrepancy in Plans

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, specifications, profiles or drawings, the fitness of persons employed on the work or the number thereof, or the suitability, amount, quality, and value of anything done or any materials used, and the Contractor shall permit the Commissioner and the Engineer and 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 owner 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

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

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

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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

1. 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.

2. 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 acts and circumstances on which such claim is based.

3. 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

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 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.

\$1,850.00 for each consecutive calendar day

2. 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 to the Contractor in the hands and possession of 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**

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

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

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 aforesaid, 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 his 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 general contractor receives payment on account of a periodic estimate, the general 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 general 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 awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring the payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general 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 general contractor for the account of the subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority 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 general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority, the demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general 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 awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority 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 general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority 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 general contractor, less any amount (i) retained by the awarding authority 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 awarding authority 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 awarding authority 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 general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general 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 general 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 general 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 general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general 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 general 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

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.

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

1. 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 of Newton.

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

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



CHARLES D. BAKER
Governor

RAKYN E. POLIHO
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

ROSALIND COSTA
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority: City of Newton
Contract Number: IFB #22-50 **City/Town:** NEWTON
Description of Work: CIP Project 8 Sewer Rehabilitations; trenchless and excavate and replace sewer rehabilitations throughout the City.
Job Location: various locations

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- 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 from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
 - The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
 - All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
 - 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. Awarding authorities are required to request these updates 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, 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. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
 - Every contractor or subcontractor which performs construction work on the project is required to 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. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
 - Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
 - Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
 - 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.
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2021	\$37.05	\$13.41	\$16.01	\$0.00	\$66.47
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2021	\$37.12	\$13.41	\$16.01	\$0.00	\$66.54
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2021	\$37.24	\$13.41	\$16.01	\$0.00	\$66.66
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.93	\$9.10	\$17.57	\$0.00	\$68.60
	06/01/2022	\$42.93	\$9.10	\$17.57	\$0.00	\$69.60
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.93	\$9.10	\$17.57	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2020	\$38.10	\$12.80	\$9.45	\$0.00	\$60.35
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.93	\$9.10	\$17.57	\$0.00	\$68.60
	06/01/2022	\$42.93	\$9.10	\$17.57	\$0.00	\$69.60
	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"						

Issue Date: 02/10/2022

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i> For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"	12/01/2021	\$41.93	\$9.10	\$17.57	\$0.00	\$68.60
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
2	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
3	70	\$32.27	\$7.07	\$12.59	\$0.00	\$51.93
4	75	\$34.58	\$7.07	\$13.49	\$0.00	\$55.14
5	80	\$36.88	\$7.07	\$14.38	\$0.00	\$58.33
6	85	\$39.19	\$7.07	\$15.29	\$0.00	\$61.55
7	90	\$41.49	\$7.07	\$16.18	\$0.00	\$64.74
8	95	\$43.80	\$7.07	\$17.09	\$0.00	\$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (NEWTON)</i>	02/01/2022	\$57.15	\$11.39	\$22.34	\$0.00	\$90.88
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Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Newton

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.58	\$11.39	\$22.34	\$0.00	\$62.31
2	60	\$34.29	\$11.39	\$22.34	\$0.00	\$68.02
3	70	\$40.01	\$11.39	\$22.34	\$0.00	\$73.74
4	80	\$45.72	\$11.39	\$22.34	\$0.00	\$79.45
5	90	\$51.44	\$11.39	\$22.34	\$0.00	\$85.17

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i> For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i> For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$42.33	\$9.10	\$17.72	\$0.00	\$69.15
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$41.18	\$9.10	\$17.72	\$0.00	\$68.00

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$41.18	\$9.10	\$17.72	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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 <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	09/01/2021	\$44.18	\$8.58	\$19.82	\$0.00	\$72.58
	03/01/2022	\$44.78	\$8.58	\$19.82	\$0.00	\$73.18
	09/01/2022	\$45.43	\$8.58	\$19.82	\$0.00	\$73.83
	03/01/2023	\$46.03	\$8.58	\$19.82	\$0.00	\$74.43

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 09/01/2021		Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Step	percent					
1	50	\$22.09	\$8.58	\$1.70	\$0.00	\$32.37
2	60	\$26.51	\$8.58	\$1.70	\$0.00	\$36.79
3	70	\$30.93	\$8.58	\$14.63	\$0.00	\$54.14
4	75	\$33.14	\$8.58	\$14.63	\$0.00	\$56.35
5	80	\$35.34	\$8.58	\$16.36	\$0.00	\$60.28
6	80	\$35.34	\$8.58	\$16.36	\$0.00	\$60.28
7	90	\$39.76	\$8.58	\$18.09	\$0.00	\$66.43
8	90	\$39.76	\$8.58	\$18.09	\$0.00	\$66.43

Effective Date - 03/01/2022		Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Step	percent					
1	50	\$22.39	\$8.58	\$1.70	\$0.00	\$32.67
2	60	\$26.87	\$8.58	\$1.70	\$0.00	\$37.15
3	70	\$31.35	\$8.58	\$14.63	\$0.00	\$54.56
4	75	\$33.59	\$8.58	\$14.63	\$0.00	\$56.80
5	80	\$35.82	\$8.58	\$16.36	\$0.00	\$60.76
6	80	\$35.82	\$8.58	\$16.36	\$0.00	\$60.76
7	90	\$40.30	\$8.58	\$18.09	\$0.00	\$66.97
8	90	\$40.30	\$8.58	\$18.09	\$0.00	\$66.97

Notes:
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$30.19/ 3&4 \$36.28/ 5&6 \$55.87/ 7&8 \$62.01

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS -ZONE 2 (Wood Frame)</i>	04/01/2021	\$27.87	\$7.21	\$5.80	\$0.00	\$40.88
	04/01/2022	\$28.62	\$7.21	\$5.80	\$0.00	\$41.63
	04/01/2023	\$28.97	\$7.21	\$5.80	\$0.00	\$41.98

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 - 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$13.94	\$7.21	\$0.00	\$0.00	\$21.15
2	50	\$13.94	\$7.21	\$0.00	\$0.00	\$21.15
3	55	\$15.33	\$7.21	\$2.00	\$0.00	\$24.54
4	55	\$15.33	\$7.21	\$2.00	\$0.00	\$24.54
5	70	\$19.51	\$7.21	\$5.80	\$0.00	\$32.52
6	70	\$19.51	\$7.21	\$5.80	\$0.00	\$32.52
7	80	\$22.30	\$7.21	\$5.80	\$0.00	\$35.31
8	80	\$22.30	\$7.21	\$5.80	\$0.00	\$35.31

Effective Date - 04/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$14.31	\$7.21	\$0.00	\$0.00	\$21.52
2	50	\$14.31	\$7.21	\$0.00	\$0.00	\$21.52
3	55	\$15.74	\$7.21	\$2.00	\$0.00	\$24.95
4	55	\$15.74	\$7.21	\$2.00	\$0.00	\$24.95
5	70	\$20.03	\$7.21	\$5.80	\$0.00	\$33.04
6	70	\$20.03	\$7.21	\$5.80	\$0.00	\$33.04
7	80	\$22.90	\$7.21	\$5.80	\$0.00	\$35.91
8	80	\$22.90	\$7.21	\$5.80	\$0.00	\$35.91

Notes:
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$19.75/ 3&4 \$24.54/ 5&6 \$32.52/ 7&8 \$35.31

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING 01/01/2020 \$49.07 \$12.75 \$22.41 \$0.62 \$84.85
 BRICKLAYERS LOCAL 3 (NEWTON)

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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$12.75	\$15.41	\$0.00	\$52.70
2	60	\$29.44	\$12.75	\$17.41	\$0.62	\$60.22
3	65	\$31.90	\$12.75	\$18.41	\$0.62	\$63.68
4	70	\$34.35	\$12.75	\$19.41	\$0.62	\$67.13
5	75	\$36.80	\$12.75	\$20.41	\$0.62	\$70.58
6	80	\$39.26	\$12.75	\$21.41	\$0.62	\$74.04
7	90	\$44.16	\$12.75	\$22.41	\$0.62	\$79.94

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

Apprentice to Journeyworker Ratio:1:3

Issue Date: 02/10/2022 Wage Request Number: 20220210-049 Page 5 of 31

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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 <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$52.38	\$14.00	\$16.05	\$0.00	\$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$33.69	\$14.00	\$16.05	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2022	\$53.66	\$8.65	\$23.05	\$0.00	\$85.36
	07/01/2022	\$54.86	\$8.65	\$23.05	\$0.00	\$86.56
	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

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.83	\$8.65	\$0.00	\$0.00	\$35.48
2	55	\$29.51	\$8.65	\$6.27	\$0.00	\$44.43
3	60	\$32.20	\$8.65	\$6.84	\$0.00	\$47.69
4	65	\$34.88	\$8.65	\$7.41	\$0.00	\$50.94
5	70	\$37.56	\$8.65	\$19.63	\$0.00	\$65.84
6	75	\$40.25	\$8.65	\$20.20	\$0.00	\$69.10
7	80	\$42.93	\$8.65	\$20.77	\$0.00	\$72.35
8	90	\$48.29	\$8.65	\$21.91	\$0.00	\$78.85

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.43	\$8.65	\$0.00	\$0.00	\$36.08
2	55	\$30.17	\$8.65	\$6.27	\$0.00	\$45.09
3	60	\$32.92	\$8.65	\$6.84	\$0.00	\$48.41
4	65	\$35.66	\$8.65	\$7.41	\$0.00	\$51.72
5	70	\$38.40	\$8.65	\$19.63	\$0.00	\$66.68
6	75	\$41.15	\$8.65	\$20.20	\$0.00	\$70.00
7	80	\$43.89	\$8.65	\$20.77	\$0.00	\$73.31
8	90	\$49.37	\$8.65	\$21.91	\$0.00	\$79.93

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN LABORERS - ZONE 1	12/01/2021	\$41.33	\$9.10	\$17.57	\$0.00	\$68.00
	06/01/2022	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
	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"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 1	12/01/2021	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
	06/01/2022	\$43.33	\$9.10	\$17.57	\$0.00	\$70.00
	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	12/01/2021	\$42.08	\$9.10	\$17.57	\$0.00	\$68.75
	06/01/2022	\$43.08	\$9.10	\$17.57	\$0.00	\$69.75
	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"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 1</i>	12/01/2021	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
	06/01/2022	\$43.33	\$9.10	\$17.57	\$0.00	\$70.00
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$42.08	\$9.10	\$17.57	\$0.00	\$68.75
	06/01/2022	\$43.08	\$9.10	\$17.57	\$0.00	\$69.75
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.33	\$9.10	\$17.57	\$0.00	\$68.00
	06/01/2022	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
	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 <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	09/01/2021	\$56.36	\$13.00	\$20.54	\$0.00	\$89.90
	03/01/2022	\$57.32	\$13.00	\$20.82	\$0.00	\$91.14
	09/01/2022	\$58.76	\$13.00	\$20.86	\$0.00	\$92.62
	03/01/2023	\$60.43	\$13.00	\$20.91	\$0.00	\$94.34

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - *ELECTRICIAN - Local 103*

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$22.54	\$13.00	\$0.68	\$0.00	\$36.22
2	40	\$22.54	\$13.00	\$0.68	\$0.00	\$36.22
3	45	\$25.36	\$13.00	\$15.36	\$0.00	\$53.72
4	45	\$25.36	\$13.00	\$15.36	\$0.00	\$53.72
5	50	\$28.18	\$13.00	\$15.84	\$0.00	\$57.02
6	55	\$31.00	\$13.00	\$16.31	\$0.00	\$60.31
7	60	\$33.82	\$13.00	\$16.77	\$0.00	\$63.59
8	65	\$36.63	\$13.00	\$17.25	\$0.00	\$66.88
9	70	\$39.45	\$13.00	\$17.71	\$0.00	\$70.16
10	75	\$42.27	\$13.00	\$18.19	\$0.00	\$73.46

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$22.93	\$13.00	\$0.69	\$0.00	\$36.62
2	40	\$22.93	\$13.00	\$0.69	\$0.00	\$36.62
3	45	\$25.79	\$13.00	\$15.62	\$0.00	\$54.41
4	45	\$25.79	\$13.00	\$15.62	\$0.00	\$54.41
5	50	\$28.66	\$13.00	\$16.10	\$0.00	\$57.76
6	55	\$31.53	\$13.00	\$16.58	\$0.00	\$61.11
7	60	\$34.39	\$13.00	\$17.04	\$0.00	\$64.43
8	65	\$37.26	\$13.00	\$17.52	\$0.00	\$67.78
9	70	\$40.12	\$13.00	\$17.98	\$0.00	\$71.10
10	75	\$42.99	\$13.00	\$18.46	\$0.00	\$74.45

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

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86
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Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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 <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2021	\$46.53	\$13.75	\$15.80	\$0.00	\$76.08
	05/01/2022	\$47.86	\$13.75	\$15.80	\$0.00	\$77.41
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2021	\$48.06	\$13.75	\$15.80	\$0.00	\$77.61
	05/01/2022	\$49.22	\$13.75	\$15.80	\$0.00	\$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2021	\$23.16	\$13.75	\$15.80	\$0.00	\$52.71
	05/01/2022	\$23.83	\$13.75	\$15.80	\$0.00	\$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	09/01/2021	\$56.36	\$13.00	\$20.54	\$0.00	\$89.90
	03/01/2022	\$57.32	\$13.00	\$20.82	\$0.00	\$91.14
	09/01/2022	\$58.76	\$13.00	\$20.86	\$0.00	\$92.62
	03/01/2023	\$60.43	\$13.00	\$20.91	\$0.00	\$94.34
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE <i>LOCAL 103</i>	09/01/2021	\$43.40	\$13.00	\$18.37	\$0.00	\$74.77
	03/01/2022	\$44.71	\$13.00	\$18.74	\$0.00	\$76.45
	09/01/2022	\$46.42	\$13.00	\$18.87	\$0.00	\$78.29
	03/01/2023	\$48.34	\$13.00	\$19.01	\$0.00	\$80.35
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$41.76	\$14.00	\$16.05	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$24.50	\$9.10	\$17.57	\$0.00	\$51.17
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	09/01/2021	\$49.38	\$8.58	\$20.12	\$0.00	\$78.08
	03/01/2022	\$50.18	\$8.58	\$20.12	\$0.00	\$78.88

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - FLOORCOVERER - Local 216S Zone 1

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.69	\$8.58	\$1.79	\$0.00	\$35.06
2	55	\$27.16	\$8.58	\$1.79	\$0.00	\$37.53
3	60	\$29.63	\$8.58	\$14.75	\$0.00	\$52.96
4	65	\$32.10	\$8.58	\$14.75	\$0.00	\$55.43
5	70	\$34.57	\$8.58	\$16.54	\$0.00	\$59.69
6	75	\$37.04	\$8.58	\$16.54	\$0.00	\$62.16
7	80	\$39.50	\$8.58	\$18.33	\$0.00	\$66.41
8	85	\$41.97	\$8.58	\$18.33	\$0.00	\$68.88

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.09	\$8.58	\$1.79	\$0.00	\$35.46
2	55	\$27.60	\$8.58	\$1.79	\$0.00	\$37.97
3	60	\$30.11	\$8.58	\$14.75	\$0.00	\$53.44
4	65	\$32.62	\$8.58	\$14.75	\$0.00	\$55.95
5	70	\$35.13	\$8.58	\$16.54	\$0.00	\$60.25
6	75	\$37.64	\$8.58	\$16.54	\$0.00	\$62.76
7	80	\$40.14	\$8.58	\$18.33	\$0.00	\$67.05
8	85	\$42.65	\$8.58	\$18.33	\$0.00	\$69.56

Notes: Steps are 750 hrs.
 % After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
 Step 1&2 \$32.59/ 3&4 \$39.26/ 5&6 \$59.69/ 7&8 \$66.41

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$33.69	\$14.00	\$16.05	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2022	\$43.16	\$8.65	\$23.05	\$0.00	\$74.86
	07/01/2022	\$44.36	\$8.65	\$23.05	\$0.00	\$76.06
	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 - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.58	\$8.65	\$0.00	\$0.00	\$30.23
2	55	\$23.74	\$8.65	\$6.27	\$0.00	\$38.66
3	60	\$25.90	\$8.65	\$6.84	\$0.00	\$41.39
4	65	\$28.05	\$8.65	\$7.41	\$0.00	\$44.11
5	70	\$30.21	\$8.65	\$19.63	\$0.00	\$58.49
6	75	\$32.37	\$8.65	\$20.20	\$0.00	\$61.22
7	80	\$34.53	\$8.65	\$20.77	\$0.00	\$63.95
8	90	\$38.84	\$8.65	\$21.91	\$0.00	\$69.40

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.18	\$8.65	\$0.00	\$0.00	\$30.83
2	55	\$24.40	\$8.65	\$6.27	\$0.00	\$39.32
3	60	\$26.62	\$8.65	\$6.84	\$0.00	\$42.11
4	65	\$28.83	\$8.65	\$7.41	\$0.00	\$44.89
5	70	\$31.05	\$8.65	\$19.63	\$0.00	\$59.33
6	75	\$33.27	\$8.65	\$20.20	\$0.00	\$62.12
7	80	\$35.49	\$8.65	\$20.77	\$0.00	\$64.91
8	90	\$39.92	\$8.65	\$21.91	\$0.00	\$70.48

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS OPERATING ENGINEERS LOCAL 4	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
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Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$28.26	\$14.00	\$0.00	\$0.00	\$42.26
2	60	\$30.83	\$14.00	\$16.05	\$0.00	\$60.88
3	65	\$33.40	\$14.00	\$16.05	\$0.00	\$63.45
4	70	\$35.97	\$14.00	\$16.05	\$0.00	\$66.02
5	75	\$38.54	\$14.00	\$16.05	\$0.00	\$68.59
6	80	\$41.10	\$14.00	\$16.05	\$0.00	\$71.15
7	85	\$43.67	\$14.00	\$16.05	\$0.00	\$73.72
8	90	\$46.24	\$14.00	\$16.05	\$0.00	\$76.29

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2022	\$53.70	\$13.80	\$25.60	\$2.79	\$95.89
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For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 103</i>	09/01/2021	\$56.36	\$13.00	\$20.54	\$0.00	\$89.90
	03/01/2022	\$57.32	\$13.00	\$20.82	\$0.00	\$91.14
	09/01/2022	\$58.76	\$13.00	\$20.86	\$0.00	\$92.62
	03/01/2023	\$60.43	\$13.00	\$20.91	\$0.00	\$94.34

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2022	\$53.70	\$13.80	\$25.60	\$2.79	\$95.89
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For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2021	\$57.94	\$11.70	\$20.24	\$0.00	\$89.88
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2021	\$57.94	\$11.70	\$20.24	\$0.00	\$89.88
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.93	\$9.10	\$17.57	\$0.00	\$68.60
	06/01/2022	\$42.93	\$9.10	\$17.57	\$0.00	\$69.60
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.93	\$9.10	\$17.57	\$0.00	\$68.60
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For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2021	\$51.40	\$13.80	\$17.14	\$0.00	\$82.34
	09/01/2022	\$53.85	\$13.80	\$17.14	\$0.00	\$84.79

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.70	\$13.80	\$12.42	\$0.00	\$51.92
2	60	\$30.84	\$13.80	\$13.36	\$0.00	\$58.00
3	70	\$35.98	\$13.80	\$14.31	\$0.00	\$64.09
4	80	\$41.12	\$13.80	\$15.25	\$0.00	\$70.17

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 <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	09/16/2020	\$48.66	\$8.10	\$25.10	\$0.00	\$81.86
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Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 09/16/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.20	\$8.10	\$25.10	\$0.00	\$62.40
2	70	\$34.06	\$8.10	\$25.10	\$0.00	\$67.26
3	75	\$36.50	\$8.10	\$25.10	\$0.00	\$69.70
4	80	\$38.93	\$8.10	\$25.10	\$0.00	\$72.13
5	85	\$41.36	\$8.10	\$25.10	\$0.00	\$74.56
6	90	\$43.79	\$8.10	\$25.10	\$0.00	\$76.99

Notes:
** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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
LABORER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
	06/01/2022	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
	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

Apprentice - LABORER - Zone 1

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.71	\$9.10	\$17.57	\$0.00	\$51.38
2	70	\$28.83	\$9.10	\$17.57	\$0.00	\$55.50
3	80	\$32.94	\$9.10	\$17.57	\$0.00	\$59.61
4	90	\$37.06	\$9.10	\$17.57	\$0.00	\$63.73

Effective Date - 06/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$25.31	\$9.10	\$17.57	\$0.00	\$51.98
2	70	\$29.53	\$9.10	\$17.57	\$0.00	\$56.20
3	80	\$33.74	\$9.10	\$17.57	\$0.00	\$60.41
4	90	\$37.96	\$9.10	\$17.57	\$0.00	\$64.63

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
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Apprentice - LABORER (Heavy & Highway) - Zone 1

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.71	\$9.10	\$17.57	\$0.00	\$51.38
2	70	\$28.83	\$9.10	\$17.57	\$0.00	\$55.50
3	80	\$32.94	\$9.10	\$17.57	\$0.00	\$59.61
4	90	\$37.06	\$9.10	\$17.57	\$0.00	\$63.73

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
	06/01/2022	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
	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"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
	06/01/2022	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.33	\$9.10	\$17.57	\$0.00	\$68.00
	06/01/2022	\$42.33	\$9.10	\$17.57	\$0.00	\$69.00
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
	06/01/2022	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
	06/01/2022	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
	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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2022	\$43.69	\$11.39	\$20.37	\$0.00	\$75.45

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.85	\$11.39	\$20.37	\$0.00	\$53.61
2	60	\$26.21	\$11.39	\$20.37	\$0.00	\$57.97
3	70	\$30.58	\$11.39	\$20.37	\$0.00	\$62.34
4	80	\$34.95	\$11.39	\$20.37	\$0.00	\$66.71
5	90	\$39.32	\$11.39	\$20.37	\$0.00	\$71.08

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2022	\$57.17	\$11.39	\$22.31	\$0.00	\$90.87
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Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.59	\$11.39	\$22.31	\$0.00	\$62.29
2	60	\$34.30	\$11.39	\$22.31	\$0.00	\$68.00
3	70	\$40.02	\$11.39	\$22.31	\$0.00	\$73.72
4	80	\$45.74	\$11.39	\$22.31	\$0.00	\$79.44
5	90	\$51.45	\$11.39	\$22.31	\$0.00	\$85.15

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	01/03/2022	\$45.52	\$8.58	\$21.57	\$0.00	\$75.67
	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 - 01/03/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$25.04	\$8.58	\$5.72	\$0.00	\$39.34
2	65	\$29.59	\$8.58	\$17.93	\$0.00	\$56.10
3	75	\$34.14	\$8.58	\$18.98	\$0.00	\$61.70
4	85	\$38.69	\$8.58	\$20.01	\$0.00	\$67.28

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 <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$23.48	\$14.00	\$16.05	\$0.00	\$53.53
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$28.44	\$14.00	\$16.05	\$0.00	\$58.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
Painter (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2022	\$53.66	\$8.65	\$23.05	\$0.00	\$85.36
	07/01/2022	\$54.86	\$8.65	\$23.05	\$0.00	\$86.56
	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

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.83	\$8.65	\$0.00	\$0.00	\$35.48
2	55	\$29.51	\$8.65	\$6.27	\$0.00	\$44.43
3	60	\$32.20	\$8.65	\$6.84	\$0.00	\$47.69
4	65	\$34.88	\$8.65	\$7.41	\$0.00	\$50.94
5	70	\$37.56	\$8.65	\$19.63	\$0.00	\$65.84
6	75	\$40.25	\$8.65	\$20.20	\$0.00	\$69.10
7	80	\$42.93	\$8.65	\$20.77	\$0.00	\$72.35
8	90	\$48.29	\$8.65	\$21.91	\$0.00	\$78.85

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.43	\$8.65	\$0.00	\$0.00	\$36.08
2	55	\$30.17	\$8.65	\$6.27	\$0.00	\$45.09
3	60	\$32.92	\$8.65	\$6.84	\$0.00	\$48.41
4	65	\$35.66	\$8.65	\$7.41	\$0.00	\$51.72
5	70	\$38.40	\$8.65	\$19.63	\$0.00	\$66.68
6	75	\$41.15	\$8.65	\$20.20	\$0.00	\$70.00
7	80	\$43.89	\$8.65	\$20.77	\$0.00	\$73.31
8	90	\$49.37	\$8.65	\$21.91	\$0.00	\$79.93

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2022	\$44.56	\$8.65	\$23.05	\$0.00	\$76.26
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2022	\$45.76	\$8.65	\$23.05	\$0.00	\$77.46
	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

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.28	\$8.65	\$0.00	\$0.00	\$30.93
2	55	\$24.51	\$8.65	\$6.27	\$0.00	\$39.43
3	60	\$26.74	\$8.65	\$6.84	\$0.00	\$42.23
4	65	\$28.96	\$8.65	\$7.41	\$0.00	\$45.02
5	70	\$31.19	\$8.65	\$19.63	\$0.00	\$59.47
6	75	\$33.42	\$8.65	\$20.20	\$0.00	\$62.27
7	80	\$35.65	\$8.65	\$20.77	\$0.00	\$65.07
8	90	\$40.10	\$8.65	\$21.91	\$0.00	\$70.66

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.88	\$8.65	\$0.00	\$0.00	\$31.53
2	55	\$25.17	\$8.65	\$6.27	\$0.00	\$40.09
3	60	\$27.46	\$8.65	\$6.84	\$0.00	\$42.95
4	65	\$29.74	\$8.65	\$7.41	\$0.00	\$45.80
5	70	\$32.03	\$8.65	\$19.63	\$0.00	\$60.31
6	75	\$34.32	\$8.65	\$20.20	\$0.00	\$63.17
7	80	\$36.61	\$8.65	\$20.77	\$0.00	\$66.03
8	90	\$41.18	\$8.65	\$21.91	\$0.00	\$71.74

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2022	\$42.62	\$8.65	\$23.05	\$0.00	\$74.32
PAINTERS LOCAL 35 - ZONE 2	07/01/2022	\$43.82	\$8.65	\$23.05	\$0.00	\$75.52
	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 - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.31	\$8.65	\$0.00	\$0.00	\$29.96
2	55	\$23.44	\$8.65	\$6.27	\$0.00	\$38.36
3	60	\$25.57	\$8.65	\$6.84	\$0.00	\$41.06
4	65	\$27.70	\$8.65	\$7.41	\$0.00	\$43.76
5	70	\$29.83	\$8.65	\$19.63	\$0.00	\$58.11
6	75	\$31.97	\$8.65	\$20.20	\$0.00	\$60.82
7	80	\$34.10	\$8.65	\$20.77	\$0.00	\$63.52
8	90	\$38.36	\$8.65	\$21.91	\$0.00	\$68.92

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.91	\$8.65	\$0.00	\$0.00	\$30.56
2	55	\$24.10	\$8.65	\$6.27	\$0.00	\$39.02
3	60	\$26.29	\$8.65	\$6.84	\$0.00	\$41.78
4	65	\$28.48	\$8.65	\$7.41	\$0.00	\$44.54
5	70	\$30.67	\$8.65	\$19.63	\$0.00	\$58.95
6	75	\$32.87	\$8.65	\$20.20	\$0.00	\$61.72
7	80	\$35.06	\$8.65	\$20.77	\$0.00	\$64.48
8	90	\$39.44	\$8.65	\$21.91	\$0.00	\$70.00

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	01/01/2022	\$43.16	\$8.65	\$23.05	\$0.00	\$74.86
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2022	\$44.36	\$8.65	\$23.05	\$0.00	\$76.06
	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

Issue Date: 02/10/2022

Wage Request Number: 20220210-049

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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.58	\$8.65	\$0.00	\$0.00	\$30.23
2	55	\$23.74	\$8.65	\$6.27	\$0.00	\$38.66
3	60	\$25.90	\$8.65	\$6.84	\$0.00	\$41.39
4	65	\$28.05	\$8.65	\$7.41	\$0.00	\$44.11
5	70	\$30.21	\$8.65	\$19.63	\$0.00	\$58.49
6	75	\$32.37	\$8.65	\$20.20	\$0.00	\$61.22
7	80	\$34.53	\$8.65	\$20.77	\$0.00	\$63.95
8	90	\$38.84	\$8.65	\$21.91	\$0.00	\$69.40

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.18	\$8.65	\$0.00	\$0.00	\$30.83
2	55	\$24.40	\$8.65	\$6.27	\$0.00	\$39.32
3	60	\$26.62	\$8.65	\$6.84	\$0.00	\$42.11
4	65	\$28.83	\$8.65	\$7.41	\$0.00	\$44.89
5	70	\$31.05	\$8.65	\$19.63	\$0.00	\$59.33
6	75	\$33.27	\$8.65	\$20.20	\$0.00	\$62.12
7	80	\$35.49	\$8.65	\$20.77	\$0.00	\$64.91
8	90	\$39.92	\$8.65	\$21.91	\$0.00	\$70.48

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2022	\$41.22	\$8.65	\$23.05	\$0.00	\$72.92
PAINTERS LOCAL 35 - ZONE 2	07/01/2022	\$42.42	\$8.65	\$23.05	\$0.00	\$74.12
	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 - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.61	\$8.65	\$0.00	\$0.00	\$29.26
2	55	\$22.67	\$8.65	\$6.27	\$0.00	\$37.59
3	60	\$24.73	\$8.65	\$6.84	\$0.00	\$40.22
4	65	\$26.79	\$8.65	\$7.41	\$0.00	\$42.85
5	70	\$28.85	\$8.65	\$19.63	\$0.00	\$57.13
6	75	\$30.92	\$8.65	\$20.20	\$0.00	\$59.77
7	80	\$32.98	\$8.65	\$20.77	\$0.00	\$62.40
8	90	\$37.10	\$8.65	\$21.91	\$0.00	\$67.66

Effective Date - 07/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.21	\$8.65	\$0.00	\$0.00	\$29.86
2	55	\$23.33	\$8.65	\$6.27	\$0.00	\$38.25
3	60	\$25.45	\$8.65	\$6.84	\$0.00	\$40.94
4	65	\$27.57	\$8.65	\$7.41	\$0.00	\$43.63
5	70	\$29.69	\$8.65	\$19.63	\$0.00	\$57.97
6	75	\$31.82	\$8.65	\$20.20	\$0.00	\$60.67
7	80	\$33.94	\$8.65	\$20.77	\$0.00	\$63.36
8	90	\$38.18	\$8.65	\$21.91	\$0.00	\$68.74

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.18	\$9.10	\$17.57	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PANEL & PICKUP TRUCKS DRIVER <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2021	\$36.88	\$13.41	\$16.01	\$0.00	\$66.30
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	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 <i>PIPEFITTERS LOCAL 537</i>	03/01/2021	\$57.94	\$11.70	\$20.24	\$0.00	\$89.88
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Apprentice - PIPEFITTER - Local 537

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$23.18	\$11.70	\$8.25	\$0.00	\$43.13
2	45	\$26.07	\$11.70	\$20.24	\$0.00	\$58.01
3	60	\$34.76	\$11.70	\$20.24	\$0.00	\$66.70
4	70	\$40.56	\$11.70	\$20.24	\$0.00	\$72.50
5	80	\$46.35	\$11.70	\$20.24	\$0.00	\$78.29

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

PIPELAYER <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
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For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PLUMBERS & GASFITTERS <i>PLUMBERS & GASFITTERS LOCAL 12</i>	09/01/2021	\$61.79	\$13.57	\$17.26	\$0.00	\$92.62
	02/27/2022	\$63.39	\$13.57	\$17.26	\$0.00	\$94.22
	09/04/2022	\$65.09	\$13.57	\$17.26	\$0.00	\$95.92
	02/26/2023	\$66.79	\$13.57	\$17.26	\$0.00	\$97.62
	09/03/2023	\$68.54	\$13.57	\$17.26	\$0.00	\$99.37
	03/03/2024	\$70.34	\$13.57	\$17.26	\$0.00	\$101.17
	09/01/2024	\$72.14	\$13.57	\$17.26	\$0.00	\$102.97
	03/02/2025	\$73.94	\$13.57	\$17.26	\$0.00	\$104.77

Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.63	\$13.57	\$6.24	\$0.00	\$41.44
2	40	\$24.72	\$13.57	\$7.08	\$0.00	\$45.37
3	55	\$33.98	\$13.57	\$9.63	\$0.00	\$57.18
4	65	\$40.16	\$13.57	\$11.33	\$0.00	\$65.06
5	75	\$46.34	\$13.57	\$13.03	\$0.00	\$72.94

Effective Date - 02/27/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$22.19	\$13.57	\$6.24	\$0.00	\$42.00
2	40	\$25.36	\$13.57	\$7.08	\$0.00	\$46.01
3	55	\$34.86	\$13.57	\$9.63	\$0.00	\$58.06
4	65	\$41.20	\$13.57	\$11.33	\$0.00	\$66.10
5	75	\$47.54	\$13.57	\$13.03	\$0.00	\$74.14

Notes:

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

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2021	\$57.94	\$11.70	\$20.24	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Issue Date: 02/10/2022

Wage Request Number: 20220210-049

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	12/01/2021	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
	06/01/2022	\$43.18	\$9.10	\$17.57	\$0.00	\$69.85
	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) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$42.18	\$9.10	\$17.57	\$0.00	\$68.85
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$33.69	\$14.00	\$16.05	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 170 - Rosenfeld (Walpole)</i>	01/01/2022	\$25.00	\$11.96	\$8.00	\$0.00	\$44.96
	05/01/2022	\$25.75	\$11.96	\$8.00	\$0.00	\$45.71
	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 <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofing &Roofers Dampproofg) <i>ROOFERS LOCAL 33</i>	02/01/2022	\$47.03	\$12.28	\$19.45	\$0.00	\$78.76

Issue Date: 02/10/2022

Wage Request Number: 20220210-049

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Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.52	\$12.28	\$5.21	\$0.00	\$41.01
2	60	\$28.22	\$12.28	\$19.45	\$0.00	\$59.95
3	65	\$30.57	\$12.28	\$19.45	\$0.00	\$62.30
4	75	\$35.27	\$12.28	\$19.45	\$0.00	\$67.00
5	85	\$39.98	\$12.28	\$19.45	\$0.00	\$71.71

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	02/01/2022	\$47.28	\$12.28	\$19.45	\$0.00	\$79.01
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For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 - A	02/01/2022	\$53.70	\$13.80	\$25.60	\$2.79	\$95.89
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Apprentice - SHEETMETAL WORKER - Local 17-A

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$22.55	\$13.80	\$6.01	\$0.00	\$42.36
2	42	\$22.55	\$13.80	\$6.01	\$0.00	\$42.36
3	47	\$25.24	\$13.80	\$11.26	\$1.51	\$51.81
4	47	\$25.24	\$13.80	\$11.26	\$1.51	\$51.81
5	52	\$27.92	\$13.80	\$12.23	\$1.62	\$55.57
6	52	\$27.92	\$13.80	\$12.48	\$1.63	\$55.83
7	60	\$32.22	\$13.80	\$13.87	\$1.80	\$61.69
8	65	\$34.91	\$13.80	\$14.84	\$1.91	\$65.46
9	75	\$40.28	\$13.80	\$16.77	\$2.13	\$72.98
10	85	\$45.65	\$13.80	\$18.20	\$2.33	\$79.98

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
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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
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SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	03/01/2021	\$62.45	\$10.00	\$21.25	\$0.00	\$93.70
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.86	\$10.00	\$11.99	\$0.00	\$43.85
2	40	\$24.98	\$10.00	\$12.70	\$0.00	\$47.68
3	45	\$28.10	\$10.00	\$13.41	\$0.00	\$51.51
4	50	\$31.23	\$10.00	\$14.13	\$0.00	\$55.36
5	55	\$34.35	\$10.00	\$14.84	\$0.00	\$59.19
6	60	\$37.47	\$10.00	\$15.55	\$0.00	\$63.02
7	65	\$40.59	\$10.00	\$16.26	\$0.00	\$66.85
8	70	\$43.72	\$10.00	\$16.98	\$0.00	\$70.70
9	75	\$46.84	\$10.00	\$17.69	\$0.00	\$74.53
10	80	\$49.96	\$10.00	\$18.40	\$0.00	\$78.36

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

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	09/01/2021	\$43.40	\$13.00	\$18.37	\$0.00	\$74.77
	03/01/2022	\$44.71	\$13.00	\$18.74	\$0.00	\$76.45
	09/01/2022	\$46.42	\$13.00	\$18.87	\$0.00	\$78.29
	03/01/2023	\$48.34	\$13.00	\$19.01	\$0.00	\$80.35

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$19.53	\$13.00	\$0.59	\$0.00	\$33.12
2	45	\$19.53	\$13.00	\$0.59	\$0.00	\$33.12
3	50	\$21.70	\$13.00	\$14.79	\$0.00	\$49.49
4	50	\$21.70	\$13.00	\$14.79	\$0.00	\$49.49
5	55	\$23.87	\$13.00	\$15.12	\$0.00	\$51.99
6	60	\$26.04	\$13.00	\$15.47	\$0.00	\$54.51
7	65	\$28.21	\$13.00	\$15.84	\$0.00	\$57.05
8	70	\$30.38	\$13.00	\$16.20	\$0.00	\$59.58
9	75	\$32.55	\$13.00	\$16.57	\$0.00	\$62.12
10	80	\$34.72	\$13.00	\$16.92	\$0.00	\$64.64

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$20.12	\$13.00	\$0.60	\$0.00	\$33.72
2	45	\$20.12	\$13.00	\$0.60	\$0.00	\$33.72
3	50	\$22.36	\$13.00	\$15.06	\$0.00	\$50.42
4	50	\$22.36	\$13.00	\$15.06	\$0.00	\$50.42
5	55	\$24.59	\$13.00	\$15.39	\$0.00	\$52.98
6	60	\$26.83	\$13.00	\$15.74	\$0.00	\$55.57
7	65	\$29.06	\$13.00	\$16.11	\$0.00	\$58.17
8	70	\$31.30	\$13.00	\$16.48	\$0.00	\$60.78
9	75	\$33.53	\$13.00	\$16.85	\$0.00	\$63.38
10	80	\$35.77	\$13.00	\$17.20	\$0.00	\$65.97

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 - MARBLE & TILE	02/01/2022	\$56.09	\$11.39	\$22.34	\$0.00	\$89.82
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Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.05	\$11.39	\$22.34	\$0.00	\$61.78
2	60	\$33.65	\$11.39	\$22.34	\$0.00	\$67.38
3	70	\$39.26	\$11.39	\$22.34	\$0.00	\$72.99
4	80	\$44.87	\$11.39	\$22.34	\$0.00	\$78.60
5	90	\$50.48	\$11.39	\$22.34	\$0.00	\$84.21

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$42.58	\$9.10	\$17.72	\$0.00	\$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$41.30	\$9.10	\$17.72	\$0.00	\$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2021	\$41.18	\$9.10	\$17.72	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$50.83	\$14.00	\$16.05	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2021	\$37.92	\$13.41	\$16.01	\$0.00	\$67.34
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2021	\$53.41	\$9.10	\$18.17	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2021	\$55.41	\$9.10	\$18.17	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2021	\$45.48	\$9.10	\$18.17	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2021	\$47.48	\$9.10	\$18.17	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2021	\$37.34	\$13.41	\$16.01	\$0.00	\$66.76
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
	06/01/2022	\$42.43	\$9.10	\$17.57	\$0.00	\$69.10
	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"						

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 1 (HEAVY & HIGHWAY)</i>	12/01/2021	\$41.43	\$9.10	\$17.57	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2021	\$51.38	\$14.00	\$16.05	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	09/01/2021	\$61.79	\$13.57	\$17.26	\$0.00	\$92.62
	02/27/2022	\$63.39	\$13.57	\$17.26	\$0.00	\$94.22
	09/04/2022	\$65.09	\$13.57	\$17.26	\$0.00	\$95.92
	02/26/2023	\$66.79	\$13.57	\$17.26	\$0.00	\$97.62
	09/03/2023	\$68.54	\$13.57	\$17.26	\$0.00	\$99.37
	03/03/2024	\$70.34	\$13.57	\$17.26	\$0.00	\$101.17
	09/01/2024	\$72.14	\$13.57	\$17.26	\$0.00	\$102.97
	03/02/2025	\$73.94	\$13.57	\$17.26	\$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.

Issue Date: 02/10/2022

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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 c.149, §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

_____, 2022

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 M.G.L. c149, §§26-27.

Signature _____

Title _____

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

CITY OF NEWTON
SUMMARY OF WORK AND SPECIFIC REQUIREMENTS OF THE CONTRACT
FOR PUBLIC WORKS CONSTRUCTION

I. SUMMARY OF WORK

A. The Work under the Contract consists of:

Open cut repair of 302 lf of sewer, replacement of 24 sewer service connections, chemical root treatment of 18,037 lf of sewer, chemical root treatment of 17 manholes, installation of 67,942 lf of cured-in-place pipe and reinstatement of 787 service connections, installation of 16,003 lf of structural cured-in-place pipe and reinstatement of 264 service connections, installation of 20 cured-in-place lateral liners, cutting of 38 protruding service connections, cementitious lining of 6,010 vf of manholes, installation of 38 frames and covers, building of five (5) manhole benches and inverts, installation of 17 inflow dishes, grouting to stop leaks in four (4) manholes, installation of three (3) plugs to abandon upstream sewer, cleaning inspection of 1,305 lf of sewer, and post construction flow isolation of 76,764 lf of sewer.

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 directed 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 work of the Base Bid must be brought to final substantial completion, exclusive of final paving and re-test inspection, within 395 calendar days of the start date fixed in the "Notice to Proceed." The contractor shall complete re-test inspection within 84 calendar days of the commencement of re-test inspection. Time is of the essence in the performance of the work of this contract. Bidders attention is directed to the provisions in the Project Manual regarding the assessment of liquidated damages for failure to complete the work within the time specified. Liquidated damages shall apply to both the final substantial completion duration (395 calendar days from the start date fixed in the Notice to Proceed) and the warranty re-test duration (84 calendar days from commencement of warranty re-test inspection).

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 \$250,000.00 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 \$250,000.00 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 certificates 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 SUMMARY OF WORK

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

The following Special Conditions supplement the City of Newton General Conditions of the Contract for Public Works Construction. The following clauses relate in particular to this contract. In the event of conflict or ambiguity between the General Conditions and these Special Conditions, the Special Conditions take precedence and shall govern.

1. The Contractor shall provide such police officers as the Engineer deems necessary for the direction and control of traffic entering, passing through and leaving the site of the contract. Such officers shall wear regulation policemen's uniforms and fluorescent safety vests. The City will reimburse the Contractor for payments made for the services of all traffic officers. The Contractor is required to submit to the Engineer copies of evidence of payment.
2. Unless otherwise specified elsewhere in this contract or specifically directed by the Engineer, all excavated material shall be wasted off-site at the Contractors' expense. No City of Newton disposal area will be available for this purpose.
3. The Contractor shall make his own arrangements with the owners of land other than the City easements occupied by or used by him in the prosecution of this contract and shall hold the City harmless from any and all claims for damages caused by or arising from such occupation or use. All temporary roadways built to accommodate equipment, trucks, etc., shall be built at the Contractor's own expense.
4. The City does not guarantee the locations of existing pipes or underground conduits. The locations of these structures shown on the plans are approximate. In private lands where sprinkler systems, driveway, walk and step heating cables and/or heating pipes are encountered, the Contractor shall use due caution when excavating in the vicinity of these structures.
5. The City does not guarantee the nature of any material encountered in any excavation. The Contractor must make his own examination, by boring, test holes, or otherwise, for determining the nature of the material to be excavated or the conditions under which the work is to be performed, and make his bid in sole reliance thereon.
6. The Contractor shall clean up the entire project before the City will accept the work. All rubbish, tree stumps, boulders from any excavation, surplus excavated material, unless specifically ordered by the Engineer to do otherwise, or any other debris shall be disposed of by the Contractor. The entire area within the easements and all other areas disturbed by the Contractor shall be graded and left in a condition comparable to that as found originally and satisfactory to the Engineer. All the work mentioned in this paragraph shall be included in the Furnishing, Trenching and Laying Item.
7. All trenches and areas resurfaced by the Contractor shall be guaranteed against settlement, upheaval or failure of any kind for a period of one (1) year after the City accepts the work and he shall replace such resurfacing at his own expense. The City Engineer shall be sole judge as to what constitutes a failure and which portion of the resurfacing is to be replaced, and his decision shall be final.
8. Before starting the work and from time to time during its progress, as the Engineer may request, the Contractor shall submit to the Engineer a written description of the methods he plans to use in doing the work and the various steps he intends to take.
9. The terms "earth excavation" and "excavation" used throughout these specifications shall include all the material to be excavated and/or removed (except rock excavation) including peat, muck, roots, trees, stumps, and all other material necessary for the completion of the work to be done as specified.
10. The term "complete in place" used throughout these specifications shall include all the work to be done for the completion of the item as specified.
11. The Contractor shall cooperate with other Contractors, Utility Companies and/or City of Newton Departments that may be working on or near the work site covered by the contract. The Engineer will decide as to the respective rights of the parties involved and his decisions shall be final.
12. The Contractor shall assume all liability, financial or otherwise, in connection with this contract and shall protect and save harmless the City of Newton for any and all damages or claims that may arise because of inconveniences, delays or loss experienced by him because of the presence and operations of other Contractors, Utility Companies and/or City of Newton Departments working near or within the limits of the contract.

13. The Contractor shall begin on receipt of written orders to do so, and the work once begun shall be continuously carried forward with a force of men adequate in the opinion of the Engineer to complete the work in a reasonable and expeditious manner, inclement and unseasonable weather conditions excepted. In the event the Engineer determines that the Contractor has not begun work on written orders to do so, or that the work once begun has been abandoned without authority, then the Engineer shall give the Contractor seventy-two (72) hours' notice (Sunday excepted) to begin work, or resume work in case of abandonment. Failure of the Contractor to act within this specified time shall be deemed a breach of this contract and the Contractor shall be held liable for any damage or expense arising from such breach of contract.
14. Upon commencement of the work the Contractor shall assume full charge and care thereof and he shall take every necessary precaution against injury or damage to the work by action of the elements, or from any cause whatever, whether arising from the execution or the non-execution of the contract. The Contractor shall bear all losses resulting to him on account of the amount or character of the work or because the nature of the land in or on which the work is done is different from what was estimated or expected, or on account of the weather elements or other causes.
15. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the work occasioned by any of the above causes before the completion and final acceptance of the work, and shall bear the expense thereof.
16. All notices, demands, requests, instructions, approvals and claims must be in writing. Any such notice shall be deemed to have been given as of the time of delivery, or of actual receipt in the case of telegrams or, in the case of mailing, when it should have been received in due course of post. For communicating purposes, the office address of the Contractor shall be that stated on the signature page of the contract; that of the City shall be as stated in the Notice to Contractors. Any subsequent change in address of either party shall be communicated to the other in writing.
17. The City will furnish to the Contractor, without charge, all copies of the specifications reasonably necessary in the performance of the contract work.
18. The Contractor shall supply to the City the name and telephone number of a responsible person who may be contacted during off-hour emergencies on the project. The Contractor shall cooperate at all times with the City and the Project Manager, and ensure the cooperation of his key personnel and that of his subcontractors.
19. The work must be completed in a continuous uninterrupted operation. The Contractor must use sufficient men and adequate equipment to complete all the necessary work requirements within a minimum period of time. The work shall be conducted between the hours of 7:00 a.m. and 4:30 p.m. on Monday through Friday. No work shall be done on holidays, Saturdays or Sundays other than for emergencies, or unless specifically authorized by the City.
20. The Contractor shall, with each monthly invoice submitted during the term of this Contract, submit to the City two (2) legible copies of his payrolls documenting the wages paid to all employees performing on site labor relating to the work of this Contract. These copies shall be prepared on forms supplied by the City.
21.
 - a.) Unless specifically so stated to the contrary the use of a manufacturer's name or style number is not restrictive, and is intended solely as an identification of the type and quality of the materials and services required. In all cases, the words "or approved equal" if not inserted are implied.
 - b.) An item equal to that named or described in the specifications may upon written approval of the City be furnished by the Contractor. 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 public work being contracted for or the material being purchased; (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the specifications.
 - c.) 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 Contractor's expense.
 - d.) For the use of material other than the one specified, the Contractor shall assume the cost of and responsibility for satisfactorily accomplishing all changes in the work as shown. All directions, specifications and recommendations by manufacturers for the installation, handling, storing, adjustment, and operation of their equipment shall be complied with and responsibility for proper performance shall continue to rest with the Contractor.

- f.) Except as otherwise provided for by the provisions of M.G.L. Ch. 30, Sec. 39J, the Contractor shall not have any right of appeal from the decision of the City condemning any materials furnished if the Contractor fails to obtain the approval for substitution in accordance with these provisions. If any substitution is more costly, the Contractor shall pay for such costs.
22. In addition to other guarantees or warranties required under law or other sections of the specification, the Contractor warrants all materials furnished and labor performed under this Contract to be free from defects or errors in workmanship or installation for a period of one year from the date of Completion of the work, as certified by the Project Manager. The Contractor shall indemnify the City of Newton for the full cost of any damage to the property that may result by reason of such defects or errors and shall indemnify the City of Newton from and against any and all claims, demands, losses, costs, expenses, liabilities and damages, including reasonable attorney's fees and expenses, arising out of or on account of this Contract, including but not limited to claims brought against the City of Newton for alleged infringement of patents based upon any methods of construction or application of upon materials furnished under the Contract.
23. The Contractor shall make no excavation in any public way or utility easement unless at least seventy-two (72) hours, exclusive of Saturdays, Sundays and legal holidays, before the proposed excavation is to be made, he has given notice in writing by registered mail, of the proposed excavation to such Public Utility Companies as supply gas, electricity and telephone service in the City, to such private companies as supply cable television service in the City, the Massachusetts Water Resources Authority (MWRA) and also to the City of Newton Water Department. Such notice shall set forth the name of the street and a reasonably accurate description of the location in which the excavation is to be made. The Contractor shall comply with the Dig Safe Law (G.L. c. 82, Sec. 40).
24. The Contractor shall exercise the greatest of care to ensure that no material being hauled either to or from the site by him or his sub-contractor's, is spilled onto any way, public or private, within the City limits. In the event that such spillage does occur, it shall be the Contractors' responsibility to remove the spilled material and clean the area by the end of the workday. If in the judgment of the Engineer, the Contractor has not satisfactorily cleaned the area of any spill, the Engineer may then order the area to be cleaned by the City at the Contractors' expense.
25. No cement or bituminous concrete shall be poured from October 30 to April 15, unless the Contractor receives prior written authority to do so from the Commissioner of Public Works.
26. By submitting a bid Contractor represents and warrants that it has the capability to perform in a year 2000 compliant manner. For the purpose of this paragraph "year 2000 compliant" means that Contractor will continue to perform in accordance with all requirements of this Agreement from, into and between the twentieth and twenty-first centuries, without delay or interruption in performance or delivery of services relating to the ability of systems used by the Contractor, or by parties upon whom the Contractor relies in the performance of this Agreement, to accurately interpret, convert, or process date/time data in electronic format.

END OF SECTION

DRAWINGS

30 Pages of DRAWINGS – Separate File

DRAWINGS MAY BE OBTAINED THROUGH THE PURCHASING DEPARTMENT. HOWEVER, THE CONTRACTOR IS ADVISED TO CALL AHEAD TO ENSURE THAT A COMPLETE SET OF DRAWINGS IS READILY AVAILABLE. (617-796-1220)

END OF SECTION

SECTION 00331

TV INSPECTION AND MH INSPECTION REPORTS PROVIDED BY THE OWNER

PART 1 - GENERAL

1.01 PURPOSE:

A. PURPOSE OF REPORTS:

1. The purpose of the TV Inspection and Manhole Inspection Reports was to determine the condition of the existing sewer system and assess the extent of cleaning, repairs and/or replacement required for the system.
2. The inspections and observations provided information to prepare the design specifications included in these contract documents and to meet the requirements of the Owner.
3. Information reported from the TV Inspection and Manhole Inspection reports are those observed in the field at the particular location and time the observations were made, and do not necessarily represent the present conditions.

1.02 SCOPE:

A. TV INSPECTION REPORTS:

1. TV Inspection of existing pipelines has been performed, with reasonable care. The results of the inspection program are appended hereto and are a part of the Contract Documents. Contractors may, after obtaining Owner's permission, carry out additional pipeline inspection, at no expense to the Owner.
2. TV Inspection Reports provided in the Contract Documents are limited by the methods used for obtaining and expressing such data, and is subject to various interpretations. The terms used to describe conditions encountered are subject to local usage and individual interpretation.
3. TV Inspections have been taken substantially at the locations indicated on the drawings and shown on the reports. Information presented in the inspection reports, as to the pipe condition, material build up in the pipe; etc. is based on visual observation from the videos. Information reported on the TV Inspection reports are those observed in the field at the particular location and at the time the videos were taken, and do not necessarily represent the present conditions. Condition of the pipeline, material build up in the pipe, and other factors may differ now from those originally observed. Contractors should be aware that present conditions might affect methods of construction.

B. MANHOLE INSPECTION REPORTS:

1. Manhole Inspections of existing manhole structures have been performed, with reasonable care. The results of the inspection programs are appended hereto and are a part of the Contract Documents. Contractors may, after obtaining Owner's permission, carry out additional manhole inspections at no expense to the Owner.
2. Manhole Inspection Reports provided in the Contract Documents are limited by the methods used for obtaining and expressing such data and is subject to various interpretations. The terms used to describe conditions encountered are subject to local usage and individual interpretation.
3. Manhole Inspection Reports have been taken substantially at the locations indicated on the drawings and shown on the Reports. Information presented in the inspection Reports, as to extent of manhole failure, infiltration rates; material build up in the manholes; etc. is based on visual observation. Information reported on the Manhole Inspection Reports is those observed in the field at the particular location and at the time observations were made, and do not necessarily represent the present conditions. Condition of the manholes, infiltration rates, and material build up in the manholes, and other factors may differ now from those originally observed. The Contractors should be aware that present conditions might affect methods of construction.

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.01 EXECUTION:

- A. TV Inspection and Manhole Inspection Reports are for the general information of the Contractors. The Contractors are obligated, to examine the site, records of investigations and other data pertinent to the site, and then, based upon their own interpretations and investigations, decide the character and quantity of material to be encountered, the difficulties or obstacles likely to be encountered, and other conditions affecting the work. The TV Inspection and Manhole Inspection Reports are accurate only at the particular locations and times the original inspections were made. No other warranty, either expressed or implied, by the Owner, Engineer or their agents is made to the accuracy of the information contained on TV Inspection and Manhole Inspection Reports, or other data shown on the drawings or presented in the Contract Documents.

END OF SECTION

SECTION 00890

PERMITS

PART 1 – GENERAL

1.01 DESCRIPTION:

This Section provides specific information and defines specific requirements of the Contractor regarding the preparation and acquisition of permits required to perform the work of this project.

1.02 RELATED WORK:

- A. Section 01110, CONTROL OF WORK AND MATERIALS
- B. Section 01550, SIGNAGE (TRAFFIC CONTROL)
- C. Section 01562, DUST CONTROL
- D. Section 01570, ENVIRONMENTAL PROTECTION
- E. Section 02240, DEWATERING
- F. Section 02222, ABANDONMENT OF SEWERS AND DRAINS
- G. Section 02300, EARTHWORK

1.03 GENERAL REQUIREMENTS:

- A. The contractor shall obtain and pay for all permits required.

Permits

City of Newton - Street Opening Permit	(Attachment A)
City of Newton - Trench Permit (520 CMR 14.00) (eff. date 3/1/09)	(Attachment B)
MWRA One-Time Only Discharge Request Permit	(Attachment C)
MWRA Request to Conduct a Root Control Project	(Attachment D)

Contractor shall prepare permit applications and obtain the permits after contract is awarded, bearing all expenses.

PART 2 - PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS:

- A. The Contractor shall perform the work in accordance with the Contract Documents, including the attached permits, and any applicable municipal requirements.
- B. Prior to commencing any construction activities, the Contractor shall demonstrate to the Owner and the Engineer, through on-site inspection and submitting copies of permits or approvals, that it is in full compliance with the terms and conditions of all permits specified herein. The Contractor shall maintain full compliance with all permits throughout the performance of the work, and upon request, grant access to permitting authorities to inspect the site for the purpose of verifying such compliance.

END OF SECTION

\\wse03.local\WSE\Projects\MA\Newton\2191041 - CIP PROJECT 8 DESIGN\SPECIFICATIONS\DIVISION 0 BIDDING AND CONTRACT REQUIREMENTS\SECTION 00890 - PERMITS

ATTACHMENT A
STREET OPENING PERMIT



**CITY OF NEWTON
MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS/ENGINEERING DIVISION
PERMITS APPLICATION**
617-796-1020

PERMIT NO. _____
LOCATION OF WORK _____
 TYPE OF WORK _____

PROPERTY OWNER _____ TEL: _____
APPLICANTS ADDRESS _____ SBL: _____
 I am making this application under the terms and conditions as set forth on the reverse side of this form.
APPLICANT SIGNATURE _____ DATE: _____

CONTRACTOR/FIRM _____ TEL: _____
BUSINESS ADDRESS _____
 Note: Nothing is to be buried until it has been inspected by the City Engineer. I will give at least 48 hour notice prior to any installation (617-796-1020) and that any actual installation work is to be made under the direct supervision of the City Engineer/Designer. For Marking Water and Sewer Line Locations please call 617-796-1640
 Please call for MWA-Massachusetts Water Resources Water/Sewer Locations.
SIGNATURE _____ DATE: _____

Signature of Contractor's Authorized Representative
 *1. IF APPLYING FOR MORE THAN ONE PERMIT ON SAME PROPERTY BONDS MAY BE COMBINED.
 *2. STREET OPENING PERMITS MUST BE OBTAINED WHEN WORK IS BEING PERFORMED IN THE PUBLIC WAY.
 *3. IF APPLYING FOR ONE OR MORE PERMITS, A MAXIMUM OF 5 SETS OF PLANS NEEDED.
 *4. A DIG SAFE NUMBER IS REQUIRED WITH ALL PERMITS. (1-888-344-7233).
 *5. APPLICATION FEES MAY BE PAID WITH ONE CHECK/CHECKS PAYABLE TO THE CITY OF NEWTON.

[OFFICIAL USE ONLY]

ENGINEERING DIVISION CONDITION REPORT

CERTIFICATE OF INSURANCE EXPIRATION DATE of: _____
 All work will be completed by the BOND EXPIRATION DATE of: _____

Prior to start of work: _____ DATE _____

Completion of work: _____ DATE _____

ENGINEERS APPROVAL _____ DATE _____

PUBLIC WORKS APPROVAL RECORD

Permission denied (see Engineers remarks)
 Permission to proceed will be granted once this office receives the required articles

Commissioner of Public Works or Designer _____ Date _____
 Permission is granted for the work to commence subject to the TERMS & CONDITIONS of this agreement

[OFFICIAL USE ONLY]

ENGINEER'S REMARKS
 [OFFICIAL USE ONLY]

PERMIT TYPE	PERMIT REQUIREMENTS		CERTIFICATE INSURANCE	# PLANS*3	DIG SAFE CONFIRMATION NO.	PERMIT REQUIREMENTS	
	BONDS*1	INSURANCE				DIG SAFE CONFIRMATION NO.	APPLICATION FEES*5
<input type="checkbox"/> SEWER	\$5,000(MIN.)	\$1,000,000	\$1,000,000	Approved Plan			\$100 VB
<input type="checkbox"/> DRAIN	\$5,000(MIN.)	\$1,000,000	\$1,000,000	Approved Plan			\$100 VB
<input type="checkbox"/> STREET *2 OPENING	\$5,000(MIN.)	\$1,000,000	\$1,000,000				\$100 + \$150 ^{INSP. /MT} _{CE} VB
<input type="checkbox"/> INSTALL CURB SIDEWALK	\$5,000(MIN.)	\$1,000,000	\$1,000,000				\$0 VB
<input type="checkbox"/> SIDEWALK CROSSING	\$1,000(MIN.)						\$50 VB
<input type="checkbox"/> OCCUPY	\$1,000(MIN.)						\$50 VB
Totals _____							

Totals _____ + _____ = _____
 TOTAL APP. FEE _____ TOTAL FEE _____
 INSPI/MTCE _____
 Note: Fees are not refundable

Acct: 27 422019 Water/Sewer Acct: 13 131005 Utilities
 Acct: 27 422-18 Drain Acct: 13E4011A 442082 Insp/Mtce Fee
 Acct: 01401 442115 Application Fee

White: DPW/Engineering Pink: Applicant Canary: Water/Sewer

ATTACHMENT B
TRENCH PERMIT

FAMILIAR WITH, ALL LAWS AND REGULATIONS APPLICABLE TO WORK PROPOSED, INCLUDING OSHA REGULATIONS, G.L. c. 82A, 520 CMR 7.00 et seq., AND ANY APPLICABLE MUNICIPAL ORDINANCES, BY-LAWS AND REGULATIONS AND THEY COVENANT AND AGREE THAT ALL WORK DONE UNDER THE PERMIT ISSUED FOR SUCH WORK WILL COMPLY THEREWITH IN ALL RESPECTS AND WITH THE CONDITIONS SET FORTH BELOW.

THE UNDERSIGNED OWNER AUTHORIZES THE APPLICANT TO APPLY FOR THE PERMIT AND THE EXCAVATOR TO UNDERTAKE SUCH WORK ON THE PROPERTY OF THE OWNER, AND ALSO, FOR THE DURATION OF CONSTRUCTION, AUTHORIZES PERSONS DULY APPOINTED BY THE MUNICIPALITY TO ENTER UPON THE PROPERTY TO MONITOR AND INSPECT THE WORK FOR CONFORMITY WITH THE CONDITIONS ATTACHED HERETO AND THE LAWS AND REGULATIONS GOVERING SUCH WORK.

THE UNDERSIGNED APPLICANT, OWNER AND EXCAVATOR AGREE JOINTLY AND SEVERALLY TO REIMBURSE THE MUNICIPALITY FOR ANY AND ALL COSTS AND EXPENSES INCURRED BY THE MUNICIPALITY IN CONNECTION WITH THIS PERMIT AND THE WORK CONDUCTED THEREUNDER, INCLUDING BUT NOT LIMITED TO ENFORCING THE REQUIREMENTS OF STATE LAW AND CONDITIONS OF THIS PERMIT, INSPECTIONS MADE TO ASSURE COMPLIANCE THEREWITH, AND MEASURES TAKEN BY THE MUNICIPALITY TO PROTECT THE PUBLIC WHERE THE APPLICANT OWNER OR EXCAVATOR HAS FAILED TO COMPLY THEREWITH INCLUDING POLICE DETAILS AND OTHER REMEDIAL MEASURES DEEMED NECESSARY BY THE MUNICIPALITY.

THE UNDERSIGNED APPLICANT, OWNER AND EXCAVATOR AGREE JOINTLY AND SEVERALLY TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE MUNICIPALITY AND ALL OF ITS AGENTS AND EMPLOYEES FROM ANY AND ALL LIABILITY, CAUSES OR ACTION, COSTS, AND EXPENSES RESULTING FROM OR ARISING OUT OF ANY INJURY, DEATH, LOSS, OR DAMAGE TO ANY PERSON OR PROPERTY DURING THE WORK CONDUCTED UNDER THIS PERMIT.

APPLICANT SIGNATURE

_____ DATE _____

EXCAVATOR SIGNATURE (IF DIFFERENT)

_____ DATE _____

OWNER'S SIGNATURE (IF DIFFERENT)

_____ DATE: _____

For City/Town use -- Do not write in this section	
PERMIT APPROVED BY	\$ _____ Application Fee
PERMITTING AUTHORITY	
CONDITIONS OF APPROVAL	

CONDITIONS AND REQUIREMENTS PURSUANT TO G.L.C.82A AND 520 CMR 7.00 et seq. (as amended)

By signing the application, the applicant understands and agrees to comply with the following:

- i. No trench may be excavated unless the requirements of sections 40 through 40D of chapter 82, and any accompanying regulations, have been met and this permit is invalid unless and until said requirements have been complied with by the excavator applying for the permit including, but not limited to, the establishment of a valid excavation number with the underground plant damage prevention system as said system is defined in section 76D of chapter 164 (DIG SAFE);
- ii. Trenches may pose a significant health and safety hazard. Pursuant to Section 1 of Chapter 82 of the General Laws, an excavator shall not leave any open trench unattended without first making every reasonable effort to eliminate any recognized safety hazard that may exist as a result of leaving said open trench unattended. Excavators should consult regulations promulgated by the Department of Public Safety in order to familiarize themselves with the recognized safety hazards associated with excavations and open trenches and the procedures required or recommended by said department in order to make every reasonable effort to eliminate said safety hazards which may include covering, barricading or otherwise protecting open trenches from accidental entry.
- iii. Persons engaging in any in any trenching operation shall familiarize themselves with the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CFR 1926.650 et.seq., entitled Subpart P “Excavations”.
- iv. Excavators engaging in any trenching operation who utilize hoisting or other mechanical equipment subject to chapter 146 shall only employ individuals licensed to operate said equipment by the Department of Public Safety pursuant to said chapter and this permit must be presented to said licensed operator before any excavation is commenced;
- v. By applying for, accepting and signing this permit, the applicant hereby attests to the following: (1) that they have read and understands the regulations promulgated by the Department of Public Safety with regard to construction related excavations and trench safety; (2) that he has read and understands the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CMR 1926.650 et.seq., entitled Subpart P “Excavations” as well as any other excavation requirements established by this municipality; and (3) that he is aware of and has, with regard to the proposed trench excavation on private property or proposed excavation of a city or town public way that forms the basis of the permit application, complied with the requirements of sections 40-40D of chapter 82A.
- vi. This permit shall be posted in plain view on the site of the trench.

Summary of Excavation and Trench Safety Regulation (520 CMR 14.00 et seq.)

This summary was prepared by the Massachusetts Department of Public Safety pursuant to G.L.c.82A and does not include all requirements of the 520 CMR 14.00. To view the full regulation and G.L.c.82A, go to www.mass.gov/dps. Pursuant to M.G.L. c. 82, § 1, the Department of Public Safety, jointly with the Division of Occupational Safety, drafted regulations relative to trench safety. The regulation is codified in section 14.00 of title 520 of the Code of Massachusetts Regulations. The regulation requires all excavators to obtain a permit prior to the excavation of a trench made for a construction-related purpose on public or private land or rights-of-way. All municipalities must establish a local permitting authority for the purpose of issuing permits for trenches within their municipality. Trenches on land owned or controlled by a public (state) agency requires a permit to be issued by that public agency unless otherwise designated.

In addition to the permitting requirements mandated by statute, the trench safety regulations require that all excavators, whether public or private, take specific precautions to protect the general public and prevent unauthorized access to unattended trenches. Accordingly, unattended trenches must be covered, barricaded or backfilled. Covers must be road plates at least ¾” thick or equivalent; barricades must be fences at least 6’ high with no openings greater than 4” between vertical supports; backfilling must be sufficient to eliminate the trench. Alternatively, excavators may choose to attend trenches at all times, for instance by hiring a police detail, security guard or other attendant who will be present during times when the trench will be unattended by the excavator.

The regulations further provide that local permitting authorities, the Department of Public Safety, or the Division of Occupational Safety may order an immediate shutdown of a trench in the event of a death or serious injury; the failure to obtain a permit; or the failure to implement or effectively use adequate protections for the general public. The trench shall remain shutdown until re-inspected and authorized to re-open provided, however, that excavators shall have the right to appeal an immediate shutdown. Permitting authorities are further authorized to suspend or revoke a permit following a hearing. Excavators may also be subject to administrative fines issued by the Department of Public Safety for identified violations.

For additional information please visit the Department of Public Safety’s website at www.mass.gov/dps

Summary of 1926 CFR Subpart P -OSHA Excavation Standard

This is a worker protection standard, and is designed to protect employees who are working inside a trench. This summary was prepared by the Massachusetts Division of Occupational Safety and not OSHA for informational purposes only and does not constitute an official interpretation by OSHA of their regulations, and may not include all aspects of the standard.

For further information or a full copy of the standard go to www.osha.gov.

Trench Definition per the OSHA standard:

- An excavation made below the surface of the ground, narrow in relation to its length.
- In general, the depth is greater than the width, but the width of the trench is not greater than fifteen feet.

Protective Systems to prevent soil wall collapse are always required in trenches deeper than 5', and are also required in trenches less than 5' deep when the competent person determines that a hazard exists. Protection options include:

- Shoring. Shoring must be used in accordance with the OSHA Excavation standard appendices, the equipment manufacturer's tabulated data, or designed by a registered professional engineer.
- Shielding (Trench Boxes). Trench boxes must be used in accordance with the equipment manufacturer's tabulated data, or a registered professional engineer.
- Sloping or Benching. In Type C soils (what is most typically encountered) the excavation must extend horizontally 1 ½ feet for every foot of trench depth on both sides, 1 foot for Type B soils, and ¾ foot for Type A soils.
- A registered professional engineer must design protective systems for all excavations greater than 20' in depth.
- **Ladders** must be used in trenches deeper than 4'.
- Ladders must be inside the trench with workers at all times, and located within 25' of unobstructed lateral travel for every worker in the trench.
- Ladders must extend 3' above the top of the trench so workers can safely get onto and off of the ladder.

Inspections of every trench worksite are required:

- Prior to the start of each shift, and again when there is a change in conditions such as a rainstorm.
- Inspections must be conducted by the competent person (see below).

Competent Person(s) is:

- Capable (i.e., trained and knowledgeable) in identifying existing and predictable hazards in the trench, and other working conditions which may pose a hazard to workers, and
- Authorized by management to take necessary corrective action to eliminate the hazards. Employees must be removed from hazardous areas until the hazard has been corrected.

Underground Utilities must be:

- Identified prior to opening the excavation (e.g., contact Digsafe).
- Located by safe and acceptable means while excavating.
- Protected, supported, or removed once exposed.

Spoils must be kept back a minimum of 2' from the edge of the trench.

Surface Encumbrances creating a hazard must be removed or supported to safeguard employees. Keep heavy equipment and heavy material as far back from the edge of the trench as possible.

Stability of Adjacent Structures:

- Where the stability of adjacent structures is endangered by creation of the trench, they must be underpinned, braced, or otherwise supported.
- Sidewalks, pavements, etc. shall not be undermined unless a support system or other method of protection is provided.

Protection from water accumulation hazards:

- It is not allowable for employees to work in trenches with accumulated water. If water control such as pumping is used to prevent water accumulation, this must be monitored by the competent person.
- If the trench interrupts natural drainage of surface water, ditches, dikes or other means must be used to prevent this water from entering the excavation.

Additional Requirements:

- For mobile equipment operated near the edge of the trench, a warning system such as barricades or stop logs must be used.
- Employees are not permitted to work underneath loads. Operators may not remain in vehicles being loaded unless vehicles are equipped with adequate protection as per 1926.601(b)(6).
- Employees must wear high-visibility clothing in traffic work zones.
- Air monitoring must be conducted in trenches deeper than 4' if the potential for a hazardous atmosphere exists. If a hazardous atmosphere is found to exist (e.g., O₂ <19.5% or >23.5%, 20% LEL, specific chemical hazard), adequate protections shall be taken such as ventilation of the space.
- Walkways are required where employees must cross over the trench. Walkways with guardrails must be provided for crossing over trenches > 6' deep.
- Employees must be protected from loose rock or soil through protections such as scaling or protective barricades.

ATTACHMENT C
MWRA ONE-TIME-ONLY DISCHARGE
REQUEST PERMIT



**MASSACHUSETTS WATER RESOURCES AUTHORITY
TOXIC REDUCTION AND CONTROL
2 GRIFFIN WAY
CHELSEA, MASSACHUSETTS 02150-3334**

**One-Time-Only Discharge Request
To discharge from a Cured-in-Place Pipe (CIPP) Lining process as part of a
sewer rehabilitation project into the Municipality or Authority sewerage
system**

Please, allow three weeks for processing this request

Name of Municipality: _____

Project Name: _____

Name of the person from the Municipality to contact concerning the information provided herein. *(Please, sign the signature page of this questionnaire, without a signature from the Municipality the MWRA will not be able to process this request.)*

Name: _____

Title: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

E Mail: _____

Contractor designated by the Municipality to conduct the project.

Name: _____

Title: _____

Company: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

E Mail: _____

MWRA Permit Number: _____

Person designated by the Municipality to receive correspondence from the MWRA regarding this project.

Name: _____

Title: _____

Company: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

GENERAL INFORMATION:

Please answer all of the questions

(If more space is needed, attach additional pages).

a) Cured-in-Place Pipe (CIPP)Liner is defined as a woven or non-woven or combination of woven and non-woven material surrounded or impregnated with resin which when installed and processed, forms to the shape and size of the interior walls of the host conduit as defined in ASTM Standard F1216.

b) Host Conduit is defined as the existing pipeline to be rehabilitated by CIPP Lining. The host conduit for this project must be indicated on the Contract Drawings.

1. Indicate the project scope. Provide pipe location and pipe length and diameter of each pipe to be treated. Use a pipe identification naming scheme that references the drawings and that will be recognizable by all parties. Identify all of the connection (using the name provide in Attachment A of the MWRA Municipal Discharge Permit) of the receiving MWRA interceptor and submit a diagram and drawing that will trace the flow from the project pipe to the MWRA interceptor.

Project scope and location: _____

Pipe Location Sewer Connection of the receiving MWRA interceptor <i>(Provide name in Attachment A of the MWRA Municipal Discharge Permit)</i>	Pipe Length (Feet)	Pipe Diameter (Inches)
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____

2. Indicate how you will conduct the pipe cleaning process prior to the lining process.

3. Indicate the proposed installation method that you will employ for the CIPP liner into the existing pipe.

4. Indicate all of the appropriate Federal, state, and local permits and approvals obtained for this CIPP project.

5. Submit the Materials Safety Data Sheet(s) for the CIPP lining materials.

6. Indicate all source(s) of wastewater curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc to be discharged into MWRA sewer system from this project.

Wastewater Type(s)	Source(s)
Curing water	<hr/> <hr/>
Cooling water	<hr/> <hr/>
Rinsing water	<hr/> <hr/>
Pre-cleaning water	<hr/> <hr/>
Post-cleaning water	<hr/> <hr/>
Other (Describe) <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/>
Other (Describe) <hr/> <hr/>	<hr/> <hr/>

7. Describe the proposed pretreatment for the wastewater curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc and provide equipment/flow diagram(s).

8. Indicate the storage method for treated and/or untreated curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, etc, and provide its capacity in gallons prior to discharge into the MWRA sanitary sewer system.

Wastewater Type(s)	Storage method prior to discharge into MWRA sanitary sewer system.	Storage capacity (gallons)
Curing\lining process water		
Cooling water		
Rinsing water		
Pre-cleaning water		
Post-cleaning water		
Other (<i>Describe</i>) _____ _____		

9. Indicate proposed volume of wastewater (curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc..) flow into the MWRA sewer system per day gallons per day (GPD).

Wastewater Type(s)	Volume(GPD) Discharge into MWRA sanitary sewer system	Pretreatment Yes/No	Pretreatment Type(s)
Curing\lining process water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Cooling water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Rinsing water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Pre-cleaning water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Post-cleaning water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Other (<i>Describe</i>) <hr/> <hr/>		Yes <input type="checkbox"/> No <input type="checkbox"/>	

10. Describe other method(s) for the collection and disposal for the curing\lining process wastewater, cooling water, and/or rinse water if pretreatment is not viable, and the discharge to the MWRA sanitary sewer system is not authorized.

11. Indicate if solids will be generated from the treatment process, including solidified styrene and other solid byproducts. All solids must be removed from the cure water and subsequent cooling and rinsing operations, prior to discharge into MWRA sewer system, pursuant 360 C.M.R. 10.023(8).

12. Indicate proposed date(s) of discharge into the MWRA sewer system.

Anticipated first day of discharge: _____

Anticipated last day of discharge: _____

Proposed hours of discharge into MWRA sewer system: _____

13. Provide the construction schedule for the project including specific proposed date(s) and start and end times. If specific dates are not known, please use Day 1 (one) for taking the pipe out of service and count forward from there. If individual operating time will take less than twenty-four hours, specify start and end times in military time.

Action(s)	Date (mm/dd/yyyy)	Operating Time (hrs:min:sec)	Comments(s)
Taking pipe out of service			
Pre-cleaning of pipe (Start)			
Pre-cleaning of pipe (End)			
Line installation (Start)			
Line installation (End)			
Curing process (Start)			
Curing process (End)			
Cooling process (Start)			
Cooling process (End)			
Rinsing (Start)			
Rinsing (End)			
Return pipe to service			
Other (Describe)			

14. Indicate how you will ensure that sufficient capacity (gallons) at the construction zone in the event of a storm event. Describe how flow through the pipe will be diverted around the construction zone and provide rerouting plans, and pipe blockage techniques that you will employ. Specify materials that will be used and storage measures that will be employed.

15. CERTIFICATION STATEMENT AND SIGNATURE:

The questionnaire for a One-Time-Only Discharge Request must be signed and dated by an authorized representative. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the sewer system, a new authorization satisfying the requirements of this section must be submitted to the MWRA prior to or together with any reports to be signed by an authorized representative.

An authorized representative of a municipality includes:

- a) a responsible public official, including a Mayor, City Manager, Town Administrator, Chair of the Board of Selectman, District Manager, or any other person who performs similar policy or decision-making functions for the municipality, or the director, manager, or superintendent of the department responsible for operating or overseeing the operation of the sewer system, if authority to sign documents has been assigned or delegated to the individual in accordance with the municipality's procedures.
- b) the duly authorized representative of the individual designated in (a) of this section if:
 - i) the authorization is made in writing by the individual described in (a);
 - ii) the authorization specifies either an individual or a position having responsibility for the overall operation of the sewer system from which the discharge originates, such as the position of superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the municipality;
 - iii) the written authorization is submitted to the MWRA.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the sewer system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative

Please Print Name of Authorized Representative

Title

Date

PLEASE, ALLOW THREE WEEKS FOR PROCESSING THIS REQUEST
Do not alter this form

To discharge wastewater from a sewer pipe lining/curing project into the Authority sewer system. Submit the completed form to:

Massachusetts Water Resources Authority
Toxic Reduction and Control
2 Griffin Way, Chelsea MA 02150-3334
Attention: Kattia Thomas, Project Manager, Permitting

If you have any questions regarding the approval process, you may contact Kattia Thomas, at 617-305-5667.

ATTACHMENT D
MWRA REQUEST TO CONDUCT A ROOT
CONTROL PROJECT

Submit your request for approval to use the foaming root control herbicide to Kattia Thomas, Project Manager, Permitting, Massachusetts Water Resources Authority, Toxic Reduction and Control, 2 Griffin Way, Chelsea MA 02150-3334. Also, you may fax the request to Ms. Thomas, the fax number is 617-371-1604.

If you have any questions regarding the approval process, you may contact Kattia Thomas, at 617-305-5667.

3. Indicate the name of the active ingredient that will be used each day.
Provide the MSDS(s) for the chemical(s) that will be used.

4. Indicate the name and volume (gallons) of the solvent or water and the active ingredient to be used each day.

5. The total pounds of solution (the active ingredient) to be used each day?

6. The total pounds of solution (the active ingredient) to be used for the entire project?

7. The total number of days the pipes will be treated?

Anticipated first day of the project: _____

Anticipated last day of the project: _____

8. The time of day for the treatment?

9. The amount of time (hours) the active ingredient will remain in the sewer pipe after the treatment process?

FAX this page to Kattia Thomas, Proj. Mgr, Permitting, TRAC, the fax number is 617-371-1604.

PLEASE, ALLOW THREE WEEKS FOR PROCESSING THIS REQUEST

SECTION 01014

SCOPE AND SEQUENCE OF WORK

PART 1- GENERAL

1.01 WORK INCLUDED:

- A. This Section of the specifications covers the scope and sequence of work for the “CIP Project 8 Rehabilitations” Newton, Massachusetts, including:

Open cut repair of 302 lf of sewer, replacement of 24 sewer service connections, chemical root treatment of 18,037 lf of sewer, chemical root treatment of 17 manholes, installation of 67,942 lf of cured-in-place pipe and reinstatement of 787 service connections, installation of 16,003 lf of structural cured-in-place pipe and reinstatement of 264 service connections, installation of 20 cured-in-place lateral liners, cutting of 38 protruding service connections, cementitious lining of 6,010 vf of manholes, installation of 38 frames and covers, building of five (5) manhole benches and inverts, installation of 17 inflow dishes, grouting to stop leaks in four (4) manholes, installation of three (3) plugs to abandon upstream sewer, cleaning inspection of 1,305 lf of sewer, and post construction flow isolation of 76,764 lf of sewer.

- B. The Contractor shall furnish all labor, materials, equipment, and incidentals required to complete the work as shown on the drawings and as specified herein.

- C. Sewer system rehabilitations include:

1. Chemical root treatment (refer to Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT);
2. Cleaning and inspection of sewer mains (refer to Section 02440, SEWER CLEANING AND INSPECTION);
3. Lining of sewer mains (manhole to manhole) to repair and seal multiple cracks and holes which are leaking or have the potential to leak (refer to Section 02428, CURED-IN-PLACE PIPE);
4. Lining of laterals to repair and seal multiple cracks and holes which are leaking or have the potential to leak (refer to Section 02436, CURED-IN-PLACE LATERAL LINER);
5. Rehabilitating service connections including cutting protruding services; television inspecting, pressure testing and grouting to seal a reinstated service connection at a liner (refer to Section 02443, SERVICE CONNECTION REHABILITATION);
6. Rehabilitating manholes including invert sealing, exterior sealing and interior coating (refer to Section 02435, SEWER MANHOLE REHABILITATION);

7. Installing plug to abandon sewer main (refer to Section 02435, SEWER MANHOLE REHABILITATION).
8. Flow isolation, as required by the Engineer, on all rehabilitation reaches less than 15-inch diameter following the completion of construction (refer to Section 02427, FLOW ISOLATION).

1.02 RELATED WORK:

- A. SECTION 01110 - CONTROL OF WORK AND MATERIALS

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION

3.01 SEQUENCE OF WORK:

- A. The Contractor shall be responsible for scheduling its activities and the activities of any subcontractors involved, to meet the completion date, or milestones, established for the contract. Scheduling of all work shall be coordinated with the Owner and Engineer.
- B. Root treatment of sewers and manholes shall be conducted first. Any other work in the root treated segments of sewer (manhole to manhole) shall not be performed until a waiting period has passed in accordance with Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.
- C. Replacement of manhole frames and covers, installation of bolted and gasketed manhole frames and covers, replacement of manhole chimneys above grade and installation of bolted and gasketed frames and covers, and repair of manhole chimneys (exterior) shall be completed prior to any other manhole work, except root treatment, and prior to any manhole-to-manhole liner installation or cleaning and inspection of sewers in adjacent line segments.
- D. Cleaning and inspecting shall be performed prior to all other pipeline rehabilitation work in each segment of sewer (manhole to manhole).
- E. Replacement of sewer pipe (point repair of gravity sewers) shall be performed prior to any other trenchless pipeline rehabilitation work required in that line segment.
- F. Cutting of protruding service connections required in a segment of sewer (manhole to manhole) shall be performed prior to the installation of short liners required in that segment.
- G. Lining (manhole to manhole) and short liners required in a segment of sewer (manhole to manhole) shall be completed prior to any television inspecting, pressure testing, or grouting of service connections required in that segment.

- H. Lining (manhole to manhole) shall be completed prior to any cementitious lining or exterior grouting in adjacent manholes.
- I. Abandonment of sewers shall be completed prior to cementitious lining or exterior grouting in adjacent manholes.
- J. Abandonment of external drop connections in manholes shall be completed prior to cementitious lining or exterior grouting in the manhole.
- K. All rehabilitated reaches, in pipes 15-inch diameter and less, shall be flow isolated after completion of all other construction tasks and warranty re-test and repairs as described in Section 02427, FLOW ISOLATION.
- L. All work may be scheduled at the Contractor's discretion within the time of contract so long as it adheres to this scope and sequence of work and all plans and specifications. The schedule is also subject to approval by the Engineer.

END OF SECTION

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SECTION 01110

CONTROL OF WORK AND MATERIALS

PART 1 – GENERAL

Not Used.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 HAULING, HANDLING AND STORAGE OF MATERIALS:

- A. The Contractor shall, at its own expense, handle and haul all materials furnished by it and shall remove any of its surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by it that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.
- C. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such location as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.
- D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

3.02 EASEMENTS:

- A. As indicated on the drawings, the work is located in easements obtained by the Owner. The Contractor has no rights outside of the easements unless they are obtained from the property owner.
- B. Contractor shall schedule work so that it will cause minimum inconvenience and nuisance to abutting property owners, over the shortest possible time.
- C. Easements shall be kept clean; no rubbish or discarded construction materials shall be allowed to accumulate. Storage of excess construction materials, including soil, ledge, equipment, or machinery on easements will not be allowed.

- D. Restoration of fences, shrubs, trees and grass shall be completed immediately following completion of the work in an easement, to minimize disruption and inconvenience to property owners.
- E. Unless approved by the Engineer, the use of easements for ease of access to and egress from other areas of the project will not be permitted.

3.03 OPEN EXCAVATIONS:

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at its own expense, provide suitable and safe means for completely covering all open excavations and for accommodating travel when work is not in progress.
- B. Bridges provided for access to private property during construction shall be removed when no longer required.
- C. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer.
- D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of trench and prohibiting stocking excavated material in the street.
- E. All street excavations shall be completely closed at the end of each work day. Backfilling or use of non-skid steel plates of adequate strength to carry traffic shall be used. Non-skid steel plates shall be recessed between November 1st and April 30th.

3.04 MAINTENANCE OF TRAFFIC:

- A. Unless permission to close the street is received in writing from the proper authority, all excavated materials and equipment shall be placed so that vehicular and pedestrian traffic may be safely maintained at all times.
- B. Should the Chief of Police deem it necessary, uniformed officers will be assigned to direct traffic. The Contractor shall make all arrangements in obtaining uniformed officers required.
- C. The Contractor shall at its own expense, as directed by the Police Traffic Control/Safety Officer, provide and erect acceptable barricades, barrier fences, traffic signs, and all other traffic devices not specifically covered in a bid item, to protect the work from traffic, pedestrians, and animals. The Contractor shall provide sufficient temporary lighting such as lanterns/flashers (electric battery operated) or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public, at no additional cost to the Owner. See Section 01552 CONSTRUCTION ZONE SAFETY PLAN.

- D. The Contractor shall furnish all construction signs that are deemed necessary by and in accordance with Part VI of the Manual on Uniform Traffic Control Devices as published by the U.S. Department of Transportation. In addition, the Contractor may be required to furnish up to 128 square feet of additional special construction warning signs. Size and exact wording of signs shall be determined by the Engineer during construction.
- E. The intent of policing is to ensure public safety by direction of traffic. Police officers are not to serve as watchmen to protect the Contractor's equipment and materials.
- F. Nothing contained herein shall be construed as relieving the Contractor of any of its responsibilities for protection of persons and property under the terms of the Contract.

3.05 CARE AND PROTECTION OF PROPERTY:

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be promptly restored by the Contractor, at its expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

3.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

- A. All existing buildings, utilities, pipes, poles, wires fences, curbing, property line markers and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. Should such property be damaged, it shall be restored by the Contractor, at no additional cost to the Owner.
- B. The Contractor shall determine the location of all underground structures and utilities (including existing water services, drain lines, electrical lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by Contractor.
- C. When fences interfere with the Contractor's operations, it shall remove and (unless otherwise specified) promptly restore them in accordance with Section 01564 EXISTING FENCES.
- D. On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are shaped so as to cut or otherwise damage such surfaces.

- E. All property damaged by the Contractor's operations shall be restored to a condition at least equal to that in which it was found immediately before work was begun. Suitable materials and methods shall be used for such restoration.
- F. Restoration of existing property and structures shall be carried out as promptly as practicable and shall not be left until the end of the construction period.

3.07 MAINTENANCE OF FLOW:

- A. The Contractor shall at its own cost, provide for the flow of sewers and drains interrupted during the progress of the work, and shall immediately cart away and dispose of all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.
- B. All existing drainage facilities including, but not limited to; brooks, streams, canals, channels, ditches, culverts, catch basins and drainage piping shall be adequately safeguarded so as not to impede drainage or to cause siltation of downstream areas in any manner whatsoever. If the Contractor damages or impairs any of the aforesaid drainage facilities, it shall repair the same within the same day.
- C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by its operations as described in Section 01740, CLEANING UP.

3.08 REJECTED MATERIALS AND DEFECTIVE WORK:

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.
- B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.
- C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or its employees, as determined by the Engineer, occurring previous to the final payment.

3.09 SANITARY REGULATIONS:

Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such locations as may be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on or about the work. Any employees found violating these provisions shall be discharged and not again employed

on the work without the written consent of the Engineer. The sanitary conveniences specified above shall be the obligation and responsibility of the Contractor.

3.10 SAFETY AND HEALTH REGULATIONS:

This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et. seq.)." The Contractor shall be familiar with the requirements of these regulations.

3.11 SITE INVESTIGATION:

The Contractor acknowledges that it has satisfied itself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the drawings and specifications made a part of this contract. Any failure of the Contractor to acquaint itself with available information will not relieve it from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of the information made available by the Owner.

3.12 ELECTRIC SERVICE:

- A. The Contractor shall make all necessary applications and arrangements and pay for all fees and charges for electrical energy for power and light necessary for the proper completion of this contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. There shall be sufficient electric lighting so that all work may be done in a workmanlike manner where there is not sufficient daylight.

3.13 HAZARDOUS WASTE:

Should the Contractor, while performing work under this contract, uncover hazardous materials, as defined in Massachusetts Hazardous Waste Regulations 310 CMR 30.00, he shall immediately notify the Engineer. The Contractor is not, and has no authority to act as, a handler, generator, operator or disposer of hazardous or toxic substances found or identified at the site, and the Owner shall undertake all such functions.

3.14 SEWER SERVICE CONNECTIONS:

- A. All sewer service connections shall be identified and located prior to each segment replacement to expedite reconnection.
- B. The Contractor shall affix a written notice to the door of each home that has sewer service on the segment to be replaced 1-week prior to disconnection of the service and again 24-hours prior to disconnection.
- C. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575 HANDLING EXISTING FLOWS
- D. Once the new mainline is available for connection, the existing service pipeline shall be removed to at or near the property line and replaced as described in Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.

END OF SECTION

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SECTION 01140

SPECIAL PROVISIONS

PART 1 - GENERAL

Not used

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

3.01 WATER FOR CONSTRUCTION PURPOSES:

- A. In locations where water is in sufficient supply, the Contractor may be allowed to use water without charge for jetting backfill and other construction purposes. The express approval of the Owner shall be obtained before water is used. Waste of water by the Contractor shall be sufficient cause for withdrawing the privilege of unrestricted use.
- B. The Contractor shall obtain a hydrant meter and backflow preventer from the City prior to using any fire hydrants. A refundable deposit is required per hydrant meter/backflow preventer setup.
- C. The Contractor shall use hydrants connected to 10-inch diameter water mains and larger. A map will be provided to the Contractor identifying water mains with 10-inch diameter and larger.

3.02 PIPE LOCATION:

Pipe shall be located substantially as indicated on drawings. The Owner reserves the right, acting through the Engineer, to make such modifications as may be deemed desirable to avoid interference with existing structures or for other reasons.

3.03 DIMENSIONS OF EXISTING STRUCTURES:

Where the dimensions and locations of existing structures are of critical importance in the installation or connections of new work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment that is dependent on the correctness of such information.

3.04 OCCUPYING PRIVATE PROPERTY:

The Contractor shall not enter upon nor occupy with men, equipment or materials any property outside of the public highways or Owner's easements, except with the written consent of the property owner or property owner's agent.

3.05 EXISTING UTILITY LOCATIONS – CONTRACTOR'S RESPONSIBILITY:

- A. The location of existing underground services and utilities shown on the drawings is based on available records. It is not warranted that all existing utilities and services are shown, or that shown locations are correct. The Contractor shall be responsible for having the utility companies locate their respective utilities on the ground prior to excavating.
- B. To satisfy the requirements of Massachusetts law, Chapter 82, Section 40, the Contractor shall, at least 72 hours, exclusive of Saturdays, Sundays and holidays, prior to excavation in the proximity of telephone, gas, cable television and electric utilities, notify the utilities concerned by calling "DIG SAFE" at telephone number: 1-888-344-7233 and MWRA Permitting Department, Field Operations at (617) 305-5956
- C. The Contractor shall coordinate all work involving utilities and shall satisfy itself as to the existing conditions of the areas in which it is to perform his work. It shall conduct and arrange its work so as not to impede or interfere with the work of other contractors working in the same or adjacent areas.

3.06 COORDINATION OF WORK:

The General Contractor shall be responsible for coordinating its own work as well as that of any subcontractors. It shall be responsible for notification of the Engineer when each phase of work is expected to begin and the approximate completion date.

3.07 TIME FOR COMPLETION OF CONTRACT:

The time for completion of this contract is stipulated in the Form of/for General Bid. The Bidder shall base its bid on completing the proposed work by the completion date stipulated in the Bid Form.

3.08 MAINTENANCE OF TRENCH SURFACE:

After backfilling and compacting the trench, the Contractor shall be responsible for keeping the ground surface dry and passable at all times until the surface has been restored to original conditions.

3.09 COMPLIANCE WITH PERMITS:

The Contractor shall perform all work in conformance with requirements of the Permits, which appear in Section 00890 – PERMITS.

3.10 CUTTING, FITTING AND PATCHING:

- A. The Contractor shall do all cutting, fitting, or patching of its work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors, as shown upon or reasonably implied by the drawings and the specifications for the completed structure, including all existing work.
- B. The Contractor shall not endanger any work by cutting, digging, or otherwise and shall not cut or alter the work of any other Contractor, save with the consent of the Engineer.
- C. All holes or openings required to be made in new or existing work, particularly at pipe, conduit, or other penetrations not covered by escutcheons or plates shall be neatly patched. All such holes shall be made completely watertight as approved by the Engineer.
- D. Size and locations of holes required in steel, concrete, or other structural or finish materials for piping, wiring, ducts, etc., which have not been located and detailed on the drawings shall be approved by the Engineer prior to layout and cutting thereof. All holes shall be suitably reinforced as required by the Engineer.
- E. Workmanship and materials of patching and repair work shall match the adjacent similar work and shall conform to the applicable sections of the specification. Patches and joints with existing work shall provide, as applicable in each case, visual, structural, and waterproofing continuity.

3.11 CONTRACTOR'S REPRESENTATIVE:

The Contractor shall designate a representative who will be available to respond to emergency calls by the Owner at any time day and night and on weekends and holidays should such a situation arise.

3.12 HOURS OF CONSTRUCTION ACTIVITY:

- A. The Contractor shall conduct all construction activity between 7:00 a.m. and 5:00 p.m., Monday through Friday; or as specified on the plans. No construction work shall be allowed on Saturdays, Sundays or Holidays without written authorization from the Owner. The Owner may require work be performed at night in high traffic areas.
- B. The contractor shall obtain a noise ordinance waiver from the City of Newton for all work performed outside of the contract hours. The Contractor shall apply for noise ordinance waivers at http://apps.newtonma.gov/apps/noise_ordinance_waiver/.
- C. The Owner will provide personnel for assistance in locating and operating valves at no cost to the Contractor during the Owner's normal working hours (Monday through Friday 7:00 a.m. to 3:00 p.m.). When this assistance is required by the Contractor outside of the Owner's normal working hours the cost will be incurred by the Contractor at the prevailing overtime rate of pay for the personnel providing the assistance. The Owner will bill the Contractor directly.

3.13 CONSTRUCTION CREWS:

The Contractor shall not increase the number of construction crews assigned to the work without providing one-week advance notice to the Engineer.

3.14 MASSACHUSETTS DATA SECURITY REGULATIONS:

The Contractor is required to comply with data security regulations contained in 201 CMR 17.00 that have been established to safeguard personal information of Massachusetts residents contained in paper or electronic records. The Contractor shall not submit to the Engineer or Owner documents in paper or electronic form that contain personal information (person's name combined with one or more of the following – Social Security Number, driver's license number or state-issued identification card number, financial institution account number, or credit or debit card number). Any document submitted to the Engineer that violates this provision shall be returned to the Contractor and the Contractor shall remove personal information from the document prior to resubmitting it to the Engineer. The Contractor shall require each Subcontractor to also comply with the MA data security regulations insofar as they involve submittal of personal information to the Engineer and Owner.

END OF SECTION

SECTION 01250

PRICE ADJUSTMENTS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Price adjustments, as required by MGL Chapter 30, Section 38A, shall be implemented for this Project. Price adjustments, as enumerated in Part 3 of this specification, shall be made for the following items:

Water and Sewer Projects

- Diesel fuel and gasoline
- Liquid asphalt
- Portland cement contained in cast-in-place concrete

Road and Bridge Projects

- Diesel fuel and gasoline
- Asphalt
- Concrete
- Steel

- B. Price adjustments shall be made in accordance with the methodology adopted by the Massachusetts Department of Transportation in the following SPECIAL PROVISIONS documents, which are attached, but modified as contained herein:

1. Document 00811 Monthly Price Adjustment for Hot Mix Asphalt Mixtures, revised July 8, 2016
2. Document 00812 Monthly Price Adjustment for Diesel fuel and Gasoline, revised January 26, 2009
3. Document 00813 Price Adjustments for Structural Steel and Reinforcing Steel, dated October 11, 2018
4. Document 00814 Price Adjustments for Portland Cement concrete Mixes, dated January 12, 2009

- C. Base and Period Prices used to calculate price adjustments shall be as published by the Massachusetts Department of Transportation as presented in Documents 00811 through 00814.

- D. No price adjustments will be allowed beyond the completion date of the contract, unless there is an approved extension of time.

1.02 CONTRACTOR CREDIT TO OWNER SHOULD PRICES DECREASE:

- A. Price adjustments will only be made if the variance between the base price and the period price is Five Percent (5%) or more.
- B. In the instance where the period price is below the base price by 5% or more, then the Contractor shall credit the Owner the adjustment.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

3.01 DIESEL FUEL AND GASOLINE:

- A. Price adjustments shall be determined based on documented quantities of diesel fuel and gasoline usage for site dedicated equipment. This methodology shall replace the price adjustment basis on fuel usage factors, as described within the Massachusetts Department of Transportation Document 00812.
- B. All site dedicated equipment shall be approved by the Engineer for the calculation of any qualifying price adjustment. Prior to the start of work the Contractor shall submit to the Engineer a list of all dedicated equipment for the project. The Contractor shall forward updated submittals, as necessary, throughout the duration of the contract. Only that equipment included within the current approved list shall be considered eligible for calculating a price adjustment under this Section 01250.
- C. The Contractor shall submit fuel delivery slips to the Engineer as a basis for calculating total diesel fuel and gasoline usage for site dedicated equipment. At a minimum, the delivery slips will include the name of the fuel delivery company, the date and location of fueling, the type of fuel, description of the fueled equipment and the quantity for each type of fuel delivered in gallons. Any slips not providing the minimum information shall not be included in the calculation of total diesel fuel and gasoline usage for price adjustment purposes.

3.02 LIQUID ASPHALT:

- A. The "Period Price Method" shall be used to determine price adjustments. For projects utilizing reclaimed asphalt include Reclaimed Asphalt Pavement (RAP) Factor (0.0 to <1.0) in calculation of the total price adjustment. Otherwise, use RAP Factor = 1.0.
- B. For bid items involving asphalt paving that are measured and paid on a linear foot basis, or some other basis besides tonnage, the number of tons shall be determined by the Engineer using compacted measure of thickness within the established payment limits.

- C. Asphalt paving not separately measured for payment but rather included as an incidental component of work under a related bid item shall not be considered for price adjustment.

3.03 STRUCTURAL AND REINFORCING STEEL:

- A. Steel price adjustments shall not be made for water and sewer projects.
- B. Period prices for steel are subject to change up to four (4) months after the date of original publication. Therefore, no price adjustment will be made until the index for the period is finalized.

3.04 PORTLAND CEMENT AND CONCRETE:

- A. The price adjustment applies to all projects contained herein in Section 1.01A.
- B. Field Concrete used in water and sewer projects, typically used for thrust blocks and concrete encasement, shall not be considered for price adjustment. Cast-in-place concrete used on these projects will be included in the price adjustment determination.

END OF SECTION

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ATTACHMENT FOR SECTION 01250 PRICE ADJUSTMENTS

MASSDOT DOCUMENTS 00811-00814

DOCUMENT 00811
SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
ENGLISH AND METRIC UNITS
Revised: 07/08/2016

This provision applies to all projects using greater than 100 tons (91 megagrams) of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

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

Base Price

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

Period Price

The Period Price is the price of liquid asphalt for each monthly period as determined by the Department using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. The Department will post this Period Price on its website at <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:

$$\text{Price Adjustment} = \text{Tons of HMA Placed} \times \text{Liquid Asphalt Content \%} \times \text{RAP Factor} \times (\text{Period Price} - \text{Base Price})$$

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

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

DOCUMENT 00812

SPECIAL PROVISIONS
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 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 *****

DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

October 11, 2018

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

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

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

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

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

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

Base Prices and Period Prices are defined as follows:

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

The Base Price Date is the month and year in which MassDOT opened bids for the project. This date is used to select the Base Price Index.

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

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

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

Period Prices are determined as follows:

Period Price = Base Price X Index Factor

Index Factor = Period Price Index / Base Price Index

Example of a Period Price Calculation:

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

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

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

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

Period Price = Base Price X Index Factor = \$0.82/Pound X 0.950 = \$0.78/Pound

Since \$0.82 - \$0.78 = \$0.04 is less than 5% of \$0.82, no price adjustment is required.

If the \$0.04 difference shown above was greater than 5% of the Base Price, then the price adjustment would be 1,000 Pounds X \$0.04/Pound = \$40.00. Since the Period Price of \$0.78/Pound is less than the Base Price of \$0.82/Pound, indicating a drop in the price of steel between the bid and the delivery of material, a credit of \$40.00 would be owed to MassDOT. When the Period Price is higher than the Base Price, the price adjustment is owed to the Contractor.

* To access the PPI website and obtain a Base Price Index or a Period Price Index, go to <http://data.bls.gov/cgi-bin/srgate>

End of example.

The Contractor will be paid for unfabricated structural steel and unfabricated reinforcing steel under the respective contract pay items for all components constructed of either structural steel or reinforced Portland cement concrete under their respective Contract Pay Items.

Price adjustments, as herein provided for, will be paid separately as follows:

Structural Steel

Pay Item Number 999.449 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.457 for negative (-) pay adjustments (credits to MassDOT Highway Division)

Reinforcing Steel

Pay Item Number 999.466 for positive (+) pay adjustments (payments to the Contractor)

Pay Item Number 999.467 for negative (-) pay adjustments (credits to MassDOT Highway Division)

No price adjustment will be made for price changes after the Contract Completion Date, unless the MassDOT Highway Division has approved an extension of Contract Time for the Contract.

BASE PRICES

The Department's table of Base Prices specified above is updated monthly. The current table is attached to this Document 00813 and included in each new contract.

DOCUMENT 00814

SPECIAL PROVISIONS
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

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

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

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

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

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

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

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

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

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

*

END OF DOCUMENT

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 - DESCRIPTION

1.01 GENERAL:

- A. The following subsections describe the measurement of and payment for the work to be done under the items listed in the Bid Form.
- B. All work performed as described in these contract documents will be paid for under one or more of the items listed in the Bid Form. All other activities required in connection with performance of the work, including all work required under Division 1, GENERAL REQUIREMENTS, whether described in the contract documents or mandated by applicable codes, permits and laws, will not be separately paid for unless specifically provided for in the form of general bid, but will be considered incidental to performance of the overall project.
- C. Each unit or lump-sum price stated in the Bid Form shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications, including cleanup.
- D. The payment items listed herein and in the Bid Form are intended to provide full payment for the work shown on the drawings and specified herein. Any work called for or implied in the documents but not listed as a payment item shall be considered incidental to the overall project.
- E. Unless otherwise noted, each item shall be furnished and installed in accordance with the technical section whether a specific applicable payment item exists or not.
- F. Unless otherwise noted, all earthwork shall be included under any item requiring excavation. The prices for those items that involve excavation shall include compensation for disposal of surplus excavated material, and installation of all necessary sheeting and bracing.
- G. In all items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price therefor shall be in addition to the cost of excavating earth and no deduction shall be made in the amount for earth excavation.
- H. The price for all pipe items for sewers, wyes, tees, building connections, chimneys, service connections, and other pipelines shall constitute full compensation for furnishing, laying, jointing, and testing pipe; earth excavation and backfill; crushed stone bedding; and cleaning up.

1.02 SEWERS COMPLETE IN PLACE:

A. PVC SEWERS:

1. The length of sewers to be paid for under the appropriate subdivisions of this item shall be measured by the linear foot along the completed sewers, including wyes and tees, of actual sewers installed. In locations where a sewer service is being replaced and the mainline sewer is not specifically called out for replacement, replacement of mainline sewer, as described in specification section 02442; 3.04, 2, shall be considered incidental to the work and shall not be measured separately for payment.
2. The unit prices under the appropriate subdivisions of this item shall constitute full compensation for constructing the sewers, complete in place, as indicated on the drawings and as specified, including removal and disposal of existing sewers where necessary, furnishing and installing pipe and fittings, drop connections, making connections to the existing sewer, excavation, backfill, bedding, select material, clearing, grubbing, tree protection, testing, removal and replacement of sidewalks and curbing and all work incidental thereto and not specifically included for payment under other items, as described in Section 02442, POINT REPAIR OF GRAVITY SEWERS.
3. Payment for 8-inch diameter PVC gravity sewer, where excavation length is less than 20 linear feet, shall be paid at the contract unit price under Item 1a.
4. Payment for 8-inch diameter PVC gravity sewer, where excavation length is greater than or equal to 20 linear feet, shall be paid at the contract unit price under Item 1b.

B. EXTERNAL DROP CONNECTIONS:

1. External drop connections, tees for external drop connections, and concrete encasement shall be considered incidental to the work and shall not be measured separately for payment.
2. Connections to existing structures shall be considered incidental to the work and shall not be measured separately for payment.

1.03 BUILDING CONNECTIONS SYSTEMS:

A. WYES AND TEES:

1. The unit price to be paid for under the appropriate subdivisions of this item shall be measured for payment per wye or tee installed within the main sewer.
2. The contract unit price under the appropriate sub-divisions of this item shall constitute full compensation for furnishing and installing wyes or tees in the main sewer, complete, as indicated on the drawings and/or specified, including removal and disposal of existing wyes or tees and four (4) linear feet of adjacent mainline

replacement where necessary, pavement replacement, and all work incidental thereto and not specifically included for payment under other items.

3. The work under this item shall be paid at the contract unit price under Items 2a.

B. CHIMNEYS:

1. The unit price to be paid for under the appropriate subdivisions of this item shall be measured for payment per vertical foot of chimney completed in place. Measurement shall be based on the distance from the crown of the sewer to the plug of the top wye branch of the completed chimney.
2. The contract unit price under the appropriate subdivisions of this item shall constitute full compensation for constructing the chimney, including removal and disposal of existing chimney where necessary, excavation and backfill, pavement replacement, ductile iron tee, vertical pipe and encasement, wye and plug at the top, and the additional incremental cost of the transition pipe and fittings needed at the top of the chimney, as shown on the drawings and/or as specified, including all work incidental thereto and not specifically included for payment under other items.
3. The work under this item shall be paid at the contract unit price under Item 2b.

C. BUILDING CONNECTIONS:

1. The length of building connections to be paid for under the appropriate subdivisions of this item shall be measured per linear foot along the horizontal projection of the centerline of the completed building connection, from the centerline of the main sewer to the end of the building connection.
2. Building connections shall be paid at the contract unit price under the Item "6-inch PVC Building Connections." The unit price under this Item shall include removal and disposal of existing building connection where necessary, excavation, backfill, crushed stone and select backfill; connection of building connection to existing sewer service lateral at the property line, furnishing and installing pipe, fittings, detectable tracer tape, end plug, restoration of the ground surface, loaming and seeding, surface restoration, sidewalk and curb replacement, pavement replacement, and incidentals necessary to construct the building connections as shown on the drawings and/or as specified.
3. The work under this item shall be paid at the contract unit price under Items 2c.

D. CONTROLLED DENSITY FILL

1. Controlled density fill shall be measured per cubic yard installed in place.
2. Controlled Density Fill shall be paid at the unit prices under the item "Controlled Density Fill." The unit price for this item shall include excavation and disposal of

existing material.

3. The work under this item shall be paid at the contract unit price under Item 2d.

1.04 SEWER MANHOLES AND APPURTENANCES:

A. CONNECTIONS TO EXISTING STRUCTURES:

Connections to existing structures shall be considered incidental to the work and shall not be measured separately for payment.

1.05 EARTHWORK:

Earthwork shall be considered incidental to the work and shall not be measured separately for payment.

1.06 CONCRETE ENCASEMENT:

Concrete encasement, when required per technical specifications, shall be considered incidental to the work and shall not be measured separately for payment.

1.07 SHEETING LEFT IN PLACE:

1. Unless designated otherwise, the work as specified in Section 02252 - SUPPORT OF EXCAVATION shall not be measured separately for payment, but shall be considered incidental to the pipeline or structure for which it is required.
2. No payment will be made for trench boxes, sheeting, or steel plates used at the Contractor's option in the course of the work.

1.08 ADDITIONAL EARTHWORK:

A. EARTH EXCAVATION AND BACKFILL BELOW NORMAL GRADE:

1. If, in the opinion of the Engineer, the material at or below normal grade for the bottom of trench excavation is unsuitable for foundation, it shall be removed to such depths and widths within the limits of payment as he may order. Normal grade is defined as the elevation of the proposed sewer trench bottom, as shown on the drawings.
2. The quantity of earth excavation below normal grade (limit of normal excavation) to be included for payment under this item shall be the number of cubic yards of unsuitable material excavated, measured to the depths and lengths ordered, and to the width between payment limits for normal excavation as indicated on the drawings.
3. The unit price for this item shall constitute full compensation for excavation below

normal grade, disposal of unsuitable material and furnishing, installing and compacting gravel borrow as indicated on the drawings.

4. The Contractor will not be reimbursed for over-excavation that has not been ordered by the Engineer. The Contractor shall backfill any such overexcavated areas in accordance with the specifications, at no additional cost to the Owner.
5. The Contractor will not be reimbursed under this pay item for rock excavation that qualifies for payment under the pay item for "rock excavation and disposal."
6. The work under this section shall be paid at the contract unit price under Item 3a.

B. EXCAVATION AND BACKFILL ABOVE NORMAL GRADE:

1. If, in the opinion of the Engineer, the material at or above normal grade is unsuitable for use as backfill, it shall be removed and disposed of to such depths and widths within the limits of payment as he may order. Normal grade is defined as the elevation of the trench bottom, as shown on the drawings.
2. The quantity of earth excavation and backfill above normal grade to be included for payment shall be the number of cubic yards of material ordered to be removed and measured by the Engineer within the normal trench limits shown on the contract drawings.
3. Removal of topsoil, paving materials, frozen material, material displaced by manholes, pipes, or crushed stone, or rock excavation above the normal grade of the trench excavation will not be considered for payment.
4. The unit price for this item shall constitute full compensation for excavation of unsuitable material above normal grade, disposal of unsuitable material and furnishing, installing and compacting approved backfill materials.
5. The Contractor will not be reimbursed for excavation of unsuitable material above normal grade, which has not been ordered by the Engineer.
6. The work under this section shall be paid at the contract unit price under Item 3b.

C. ROCK EXCAVATION AND DISPOSAL:

1. The cost of pre-blast surveys, vibration air blast monitoring, blasting records and post-blast inspection shall be considered incidental to the cost of rock excavation and disposal and will not be separately paid.
2. Rock excavated and disposed of off-site by the Contractor shall be measured by the cubic yard, within the limits of excavation as defined in Paragraph 4 below. The unit price established by the Engineer under Item 3c is the minimum unit price to be used for rock excavation. The unit price to be inserted by the Contractor in his bid under

Items 3d is intended to reflect the Contractor's additional costs for performing the rock excavation, should he decide that the minimum unit price in Item 3c is insufficient compensation.

3. Where rock is encountered, it shall be uncovered but not excavated until measurements have been made by the Engineer, unless in the opinion of the Engineer, satisfactory measurements can be made in some other manner.
4. Payment for this item includes rock excavation and disposal, furnishing and installing gravel borrow in its place, and providing all required documentation.
5. The bidder should include in his bid for items involving excavation, the cost of doing the entire excavation as earth, the price for the Item "Rock Excavation and Disposal" being intended to cover the difference between the cost of rock excavation and the cost of earth excavation. The price for this item shall be paid in addition to any payment made for earth excavation.
6. For all manholes and structures, measurement will be to one foot outside the widest dimension of the structure or shall be the maximum connecting trench width, whichever is greater. No allowance will be made for overbreakage.
7. The work under this section shall be paid at the contract unit price under Items 3c and 3d.

D. TEST PITS:

1. Test pits as ordered by the Engineer and not incidental to construction shall be measured per cubic yard excavated and backfilled under the Item "Test Pits."
2. Test pits shall be paid at the contract unit price under the item "Test Pits." The unit price under this item shall constitute full compensation for all excavation, backfill, pavement repair, surface restoration, or other work incidental to excavation or restoration of test pits.
3. The work under this item shall be paid at the contract unit price under Item 3e.

1.09 PAVEMENT REPLACEMENT:

A. BITUMINOUS PAVEMENT:

1. Bituminous pavement shall be measured per linear foot or ton of work completed and shall be paid at the contract unit prices under the subdivisions of the item "Pavement Replacement" as further described below.
2. Pavement disturbed by the Contractor's operations outside of payment limits shall not be paid for under these items, but shall be repaired to its original condition by the Contractor at no additional cost to the Owner.

3. Pavement replacement for sewer services shall be considered incidental to the work and shall not be measured separately for payment.
4. Pavement replacement for manholes shall be considered incidental to the work and shall not be measured separately for payment.
5. Items measured per linear foot shall be measured along the centerline of the completed mainline pipeline trench. In locations where a sewer service is being replaced and the mainline sewer is not specifically called out for replacement, pavement replacement shall be considered incidental to the work and shall not be measured separately for payment.

6. Pavement Type A – Permanent Trench Width Binder Course Pavement (6-inches thick):

Permanent trench width binder course pavement (6-inches thick) shall be measured per linear foot and shall include, furnishing, preparation and installation of 12-inch depth of compacted gravel borrow subbase, tack coat, and permanent trench width binder course pavement as shown on the drawings and as specified.

7. Pavement Type B – Permanent Trench Width Binder Course Pavement (4-inches thick):

Permanent trench width binder course pavement (4-inches thick) shall be measured per linear foot where mainline sewer is replaced and shall include, furnishing, preparation and installation of 12-inch depth of compacted gravel borrow subbase, tack coat, and permanent trench width binder course pavement (4-inches thick) as shown on the drawings and as specified.

8. Pavement Type A and Type B – Permanent Top Course Pavement and Cold Planing:

Permanent top course pavement (2-inches thick) and cold planing shall be measured per linear foot and shall include cold planing, tack coat, asphalt joint sealant, furnishing, preparation and installation of top course pavement as shown on the drawings and as specified.

10. Additional Pavement:

- a. Additional pavement beyond the payment limits of the trench shall be measured per ton for payment at the unit price, where ordered by the Engineer and not included for payment under other items.
- b. Payment for additional pavement shall include furnishing, preparation and installation of the additional pavement ordered by the Engineer, outside of the normal trench limits.

11. Raising and adjusting of new and existing castings shall be incidental to pavement replacement and not included separately for payment. Castings belonging to private utilities shall be raised by their own forces at their expense.
12. Except as otherwise indicated, repainting of traffic markings shall be included in the payment for this item. Provision of stop bars, traffic arrows, printed words and lane striping dividers shall also be included in the payment for this item.
13. Pavement replacement shall be paid at the contract unit price under Items 4a, 4b, 4c, and 4d.

1.10 CURBING REPLACEMENT

Curbing replacement shall be considered incidental to the work and shall not be measured separately for payment.

1.11 SIDEWALK REPLACEMENT

Sidewalk replacement shall be considered incidental to the work and shall not be measured separately for payment.

1.12 WATER AND DRAIN RECONSTRUCTION:

A. WATER AND DRAIN RECONSTRUCTION:

1. Reconstruction of water mains and drains shall be measured per water main or drain reconstructed and shall be paid at the contract unit price under Item 5a.
2. Only pipe which is not shown on the drawings or located for the Contractor in the field shall be considered for payment.
3. Pipes damaged by the Contractor which pass below the proposed pipeline or are outside the specified trench limits shall be repaired by the Contractor at no cost to the Owner.

B. WOODCLIFF ROAD DRAIN REPLACEMENTS (PLAN SHEET C-16):

1. The lump sum for this item shall constitute full compensation for constructing the drains, complete in place, as indicated on the drawings and as specified, including removal and disposal of existing drains where necessary, furnishing and installing pipe and fittings, drop connections, wyes, tees, making connections to the existing drain, excavation, backfill, bedding, select material, clearing, grubbing, tree protection, testing, removal and replacement of sidewalks, curbing, and pavement and all work incidental thereto and not specifically included for payment under other items.

2. The work under this section shall be paid at the contract unit price under Item 5b.

C. ARNOLD ROAD DRAIN REPLACEMENT (PLAN SHEET C-20):

1. The lump sum for this item shall constitute full compensation for constructing the drains, complete in place, as indicated on the drawings and as specified, including removal and disposal of existing drains where necessary, furnishing and installing pipe and fittings, drop connections, wyes, tees, making connections to the existing drain, excavation, backfill, bedding, select material, clearing, grubbing, tree protection, testing, removal and replacement of sidewalks, curbing, and pavement and all work incidental thereto and not specifically included for payment under other items.
2. The work under this section shall be paid at the contract unit price under Item 5c.

1.13 SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT:

A. Sewer Line Chemical Root Treatment:

1. Chemical root treatment shall be measured at the unit price bid per linear foot of sewer treated.
2. Measurement shall be based on the actual length of treated sewer from center line of manhole to center line of manhole. Sewers shall be chemically treated for root control as specified in Section 02437, SEWER LINE CHEMICAL ROOT TREATMENT.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Items 6a, 6b, and 6c.

B. Manhole Chemical Root Treatment:

1. Chemical root treatment shall be measured at the unit price bid per manhole treated.
2. The contract unit price per manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to chemically treat the manholes for root control as specified in Section 02435, SEWER MANHOLE SEALING and Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.

4. The work under this section shall be paid at the contract unit price under Item 6d.

1.14 CURED-IN-PLACE PIPE:

A. General:

1. The work of this item shall be measured at the unit price bid per linear foot of lined pipe.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual length of pipes lined as determined by the Engineer. Pipes shall be lined as specified in Section 02428, CURED-IN-PLACE PIPE.
3. Grouting of any infiltration sources required to install the liner shall be considered incidental to the work and shall not be measured separately for payment.
4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
5. Reinstatement and brushing of service connections shall be considered incidental to the work and shall not be measured for payment.
6. Television inspection of relined sewer pipes shall be considered incidental to the work and shall not be measured separately for payment.
7. Notification, as required per Specification Section 02428, 3.04, shall be considered incidental to the work and shall not be measured separately for payment.
8. The work shall be paid for at the contract unit price under Items 7a, 7b, 7c, 7d, 7e, and 7f.

B. Grout reinstated Service Connections:

1. The work for this item shall be measured per service connection inspected and grouted.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to TV inspect and grout the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. The work shall be paid for at the contract unit price under Items 7g.

C. Ten percent of the payment for the subdivisions of the item "Cured-in-Place Pipe" shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02428, CURED-IN-PLACE PIPE.

1.15 STRUCTURAL CURED-IN-PLACE PIPE:

A. General:

1. The work of this item shall be measured at the unit price bid per linear foot of lined pipe.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual length of pipes lined as determined by the Engineer. Pipes shall be lined as specified in Section 02428, CURED-IN-PLACE PIPE.
3. Grouting of any infiltration sources required to install the liner shall be considered incidental to the work and shall not be measured separately for payment.
4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
5. Reinstatement and brushing of service connections shall be considered incidental to the work and shall not be measured for payment.
6. Television inspection of relined sewer pipes shall be considered incidental to the work and shall not be measured separately for payment.
7. Notification, as required per Specification Section 02428, 3.04, shall be considered incidental to the work and shall not be measured separately for payment.
8. The work shall be paid for at the contract unit price under Items 8a, 8b, and 8c.

B. Grout Reinstated Service Connections:

1. The work for this item shall be measured per service connection inspected and grouted.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to TV inspect and grout the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. The work shall be paid for at the contract unit price under Item 8d.

C. Ten percent of the payment for the subdivisions of the item "Structural Cured-in-Place Pipe" shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02428, CURED-IN-PLACE PIPE.

1.16 CURED-IN-PLACE LATERAL LINER:

A. Cleaning and Inspection of Laterals in 8-inch to 12-inch Diameter Mainline (Where Lateral Liners Cannot Be Installed):

1. The work of this item shall be measured at the unit price bid per 4-inch diameter lateral, 5-inch diameter lateral, 6-inch diameter, or 8-inch diameter lateral cleaned and inspected from the mainline or manhole to the property line.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual number of laterals cleaned and television inspected as determined by the Engineer. Laterals shall be cleaned and inspected as specified in Section 02436, CURED-IN-PLACE LATERAL LINER.
3. This item shall only be utilized for payment where a lateral liner cannot be installed. All efforts shall be made to install laterals liners where indicated on the Drawings.
4. The work shall be paid for at the contract unit price under Item 9a.

B. Cured-in-Place Lateral Liner in 8-inch to 12-inch Diameter Mainline (Initial Five (5) Linear Feet from Mainline):

1. The work of this item shall be measured at the unit price bid per 4-inch diameter cured-in-place lateral liner, 5-inch diameter cured-in-place lateral liner, 6-inch, or 8-inch diameter cured-in-place lateral liner from the mainline to five (5) linear feet up the lateral. Cured-in-place lateral liners in 8-inch to 12-inch diameter mainline pipes shall include a full wrap at the mainline.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual number of laterals lined as determined by the Engineer. Cured-in-place lateral liners shall be installed as specified in Section 02436, CURED-IN-PLACE LATERAL LINER.
3. The Contractor is responsible for measuring the length of liner to be installed. Measurement of the liner to be installed shall be considered incidental to the work and shall not be measured separately for payment.
4. Pre and post cleaning and inspection of the lateral shall be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the contract unit price under Item 9b.

C. Cured-in-Place Lateral Liner in 8-inch to 12-inch Diameter Mainline (Additional Linear Footage Beyond Initial Five (5) Feet):

1. The work of this item shall be measured at the linear foot price bid per 4-inch diameter cured-in-place lateral liner, 5-inch diameter cured-in-place lateral liner, 6-inch, or 8-inch diameter cured-in-place lateral liner beyond the first (5) linear feet of the lateral.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual footage of cured-in-place lateral liner installed beyond the first five (5) feet as determined by the Engineer. Cured-in-place lateral liners shall be installed as specified in Section 02436, CURED-IN-PLACE LATERAL LINER.
3. The Contractor is responsible for measuring the length of liner to be installed. Measurement of the liner length to be installed shall be considered incidental to the work and shall not be measured separately for payment.
4. Pre and post cleaning and inspection of the lateral shall be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the contract unit price under Item 9c.

1.17 SERVICE CONNECTION REHABILITATION:

A. Cutting Protruding Service Connections:

1. The work of this item shall be measured per protruding service connection cut.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to cut the protruding service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. Television inspection of cut service connections shall be considered incidental to the work and shall not be measured separately for payment.
5. The work shall be paid for at the contract unit price under Item 10a.

1.18 SEWER MANHOLE REHABILITATION

A. Cementitious Lining of Manholes:

1. The work of this item shall be measured at the unit price bid per vertical foot of manhole actually lined which will be measured from the top of the manhole bench

to the bottom of manhole frame.

2. The contract unit price per vertical foot of manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to line the manhole as specified in Section 02435, SEWER MANHOLE REHABILITATION. Cementitious Lining includes invert sealing, exterior chemical sealing, and interior sealing.
 3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 4. The work under this section shall be paid at the contract unit price under Item 11a.
- B. Furnish and Install Manhole Frames and Covers:
1. The work of this item shall be measured per manhole frame and cover installed.
 2. Pavement replaced related to furnish and install manhole frames and covers shall be considered incidental to the work and shall not be measured separately for payment.
 3. The contract unit price to be paid per manhole frame and cover installed shall constitute full compensation for supplying all material, labor, tools, and equipment required to install the manhole frame and cover, including removal and disposal of existing frame and cover, as described in Section 02435 SEWER MANHOLE REHABILITATION.
 4. The work under this section shall be paid at the contract unit price under Item 11b.
- C. Furnish and Install Bolted and Gasketed Manhole Frames and Covers:
1. The work of this item shall be measured per bolted and gasketed manhole frame and cover installed.
 2. The contract unit price to be paid per bolted and gasketed manhole frame and cover installed shall constitute full compensation for supplying all material, labor, tools, and equipment required to install the bolted and gasketed manhole frame and cover as described in Section 02435 SEWER MANHOLE REHABILITATION.
 3. Removal and disposal of existing frames and covers shall be considered incidental to the work and shall not be measured separately for payment.
 4. The work under this section shall be paid at the contract unit price under Item 11c.

D. Replace Manhole Chimney Above Grade and Furnish and Install Bolted and Gasketed Manhole Frames and Covers:

1. The work of this item shall be measured per manhole chimney replaced above grade and bolted and gasketed manhole frame and cover installed.
2. The contract unit price to be paid per manhole chimney replaced above grade and bolted and gasketed manhole frame and cover installed shall constitute full compensation for supplying all material, labor, tools, manhole encapsulation system (Canusa-CPS WrapidSeal or approved equal), and equipment required to replace manhole chimney above grade and install the bolted and gasketed manhole frame and cover as described in Section 02435 SEWER MANHOLE REHABILITATION.
3. Removal and disposal of existing concrete, bricks, and existing manhole frames and covers shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 11d.

E. Build Manhole Benches and Inverts:

1. The work of this item shall be measured per manhole bench and invert built.
2. The contract unit price to be paid per manhole bench and invert built shall constitute full compensation for supplying all material, labor, tools, and equipment required to build the manhole bench and invert as specified in Section 02435, SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under Item 11e.

F. Furnish and Install Manhole Inflow Dish:

1. The work of this item shall be measured per manhole inflow dish installed.
2. The contract unit price to be paid per manhole inflow dish installed shall constitute full compensation for supplying all material, labor, tools, and equipment required to install the manhole inflow dish as described in Section 02435, SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under Item 11f.

G. Internal Drop Connection:

1. Internal drop connections shall be measured per vertical foot of the drop connection completed in place. Measurement shall be based on a vertical projection of the distance from the invert of the incoming sewer down to the invert of the completed

drop connections.

2. The contract unit price per vertical foot of drop connection to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to install internal drop connection, as specified in Section 02435, SEWER MANHOLE REHABILITATION.
 3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 4. The work under this section shall be paid at the contract unit price under Item 11g.
- H. Manhole Grouting to Stop Leaks:
1. The work of this item shall be measured per manhole grouted and sealed.
 2. The contract unit price per manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to grout manhole to stop leaks, as specified in Section 02435, SEWER MANHOLE REHABILITATION.
 3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 4. The work under this section shall be paid at the contract unit price under Item 11h.
- I. Install Plug in Manhole A004-91 to Abandon Upstream 8-inch Diameter Sewer
1. The lump sum for this item shall constitute full compensation for supplying all material, labor, tools, and equipment required to install plug in manhole B035-91 to abandon the upstream 8-inch diameter sewer, as specified in Section 02435, SEWER MANHOLE REHABILITATION; Section 02222, ABANDONMENT OF SEWERS; and as indicated on the drawings.
 2. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 3. The work under this section shall be paid at the contract price under Item 11i.
- J. Install Plug in Manhole A007-30 to Abandon Upstream 8-inch Diameter Sewer
1. The lump sum for this item shall constitute full compensation for supplying all material, labor, tools, and equipment required to install plug in manhole A007-30 to abandon the upstream 8-inch diameter sewer, as specified in Section 02435, SEWER MANHOLE REHABILITATION; Section 02222, ABANDONMENT OF SEWERS; and as indicated on the drawings.

2. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 3. The work under this section shall be paid at the contract price under Item 11j.
- K. Install Plug in Manhole A009-1 to Abandon Upstream 18-inch Diameter Sewer
1. The lump sum for this item shall constitute full compensation for supplying all material, labor, tools, and equipment required to install plug in manhole A009-1 to abandon the upstream 18-inch diameter sewer, as specified in Section 02435, SEWER MANHOLE REHABILITATION; Section 02222, ABANDONMENT OF SEWERS; and as indicated on the drawings.
 2. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 3. The work under this section shall be paid at the contract price under Item 11k.
- L. Repair Manhole Chimney (Exterior) Above Grade:
1. The work of this item shall be measured per manhole chimney (exterior) repaired above grade.
 2. The contract unit price to be paid per manhole chimney (exterior) repaired above grade and shall constitute full compensation for supplying all material, labor, tools, and equipment required to replace manhole chimney above grade and install the bolted and gasketed manhole frame and cover as described in Section 02435 SEWER MANHOLE REHABILITATION.
 3. The work under this section shall be paid at the contract unit price under Item 11l.
- M. Ten percent of the payment for the subdivisions of the Items "Cementitious Lining of Manholes" shall be withheld until the pipeline rehabilitations have satisfactorily complete and passed field testing/inspection(s) as specified in Section 02435, SEWER MANHOLE REHABILITATION.

1.19 CLEANING AND INSPECTION OF SEWERS

- A. Cleaning and Inspection of Sewers:
1. The work under this item shall be measured at the unit price bid per linear foot cleaned and inspected.
 2. Measurement shall be based on the actual length of sewer cleaned and inspected from center line of manhole to center line of manhole. Sewers shall be cleaned and inspected as specified in Section 02440, SEWER CLEANING AND INSPECTION. Verification of adequate cleaning shall be made by television

inspection.

3. The television inspection work, external hard drives, by-pass pumping, plugging or blocking of sewer flow, and the storage, testing and disposal of any material retrieved from sewer cleaning shall be considered incidental to the work and shall not be considered for payment. External hard drives, as described in Section 01331, DOCUMENTATION shall be given to the Owner upon completion of the project.
4. The work under this section shall be paid at the contract unit price under Item 12a.

1.20 POST CONSTRUCTION FLOW ISOLATION

A. Post Construction Flow Isolation:

1. The work of this item shall be measured at the unit price per linear foot of 8-inch diameter to 12-inch diameter sewer flow isolated.
2. Measurement shall be based on the actual length of sewer flow isolated from the centerline of manhole to centerline of manhole. Sewer lines shall be flow isolated as specified in Section 02427, POST CONSTRUCTION FLOW ISOLATION.
3. Plugging of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 13a.

1.21 PORTABLE CHANGEABLE MESSAGE SIGNS

Trailer-mounted portable changeable message signs shall be measured per day unit in-use and paid for under Item 14a. Work shall include all fuel, configuration, and operation expenses. Portable changeable message signs shall be deployed as indicated on the drawings and as required by the Engineer and City of Newton Police Department.

1.22 MOBILIZATION:

- A. The lump sum for this item shall constitute full compensation to the Contractor for the general mobilization necessary to make the contract operational, exclusive of the cost of materials. The total for mobilization shall not exceed 5 percent of the total of all bid items excluding this item and Uniformed Officers for Traffic Control.
- B. The work under this section shall be paid at the contract unit price under Item 15a.

1.23 ALLOWANCES FOR SERVICES OF UNIFORMED OFFICERS:

- A. The services of uniformed officers shall be measured per hour worked.
- B. The services of uniformed officers shall be paid at the contract unit prices under the subdivisions of the item "Allowances for Services of Uniformed Officers." The unit prices under this item include administration charges required by the police.
- C. The set prices in the Bid Form for Uniformed Officers are based on the prevailing hourly wage rates. Payment will be made based on invoices submitted by the traffic authority to the Contractor. The Contractor shall forward copies of these invoices to the Engineer and include the cost in his Application for Payment. Actual payment to the traffic authority shall be made by the Contractor and the Contractor shall be reimbursed by the Owner through the payment estimate. If police wages change during the course of the Contract, the unit prices under this item will be changed accordingly.
- D. The work under this section shall be paid at the contract unit price under Item 16a.

1.24 LATERAL EQUIPMENT TESTING:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.25 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

Unless otherwise indicated, protection or temporary removal and replacement of existing utilities and structures as describes in Section 01110 shall not be separately measured for payment, but shall be considered incidental to the project.

1.26 HANDLING EXISTING FLOWS:

Handling existing sewage flows in accordance with the specifications, including providing, installing, and removing all required equipment, piping, and pumping as required shall not be measured separately for payment, but shall be considered incidental to the project.

1.27 DEWATERING:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.28 ENVIRONMENTAL PROTECTION:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.29 SURFACE RESTORATION:

- A. The work for surface restoration shall include loaming and seeding and all incidentals thereto for all disturbed areas. This work shall not be separately measured for payment,

but shall be considered incidental to the project.

- B. Any existing fences which are required to be removed and reset shall not be separately measured for payment, but shall be considered incidental to the project.

1.30 SIGNAGE (TRAFFIC CONTROL):

The work for signage shall include meeting with Newton Police Department, Boston Police Department, Brookline Police Department, providing all warning signs, barricades, barrier fences, traffic signs, no parking signs, and other traffic control devices as required by the City of Newton Police Department and the MUTCD, Boston Police Department, or Brookline Police Department, as described in Section 01550, SIGNAGE. The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.31 DOCUMENTATION:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.32 LOAMING AND SEEDING:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.33 WARRANTY INSPECTION:

All warranty inspections and related work shall not be separately measured for payment but shall be considered incidental to the project.

1.34 SUPPORT OF EXCAVATION:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.35 TRACER TAPE:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project

1.36 FIELD CONCRETE:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.37 CONSTRUCTION ZONE SAFETY PLAN:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.38 REMOVAL OF TUBERCULATION:

Removal of tuberculation in ductile iron pipe or cast iron pipe shall be considered incidental to the work and shall not be measured separately for payment.

1.39 LANDSCAPING:

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.40 NOTIFICATION

Notification, as required per Specification Section 02442, 3.02, shall be considered incidental to the work and shall not be measured separately for payment.

1.41 PRICE ADJUSTMENTS

Price adjustments for certain payment items shall be as described in Specification Section 01250 PRICE ADJUSTMENTS. Payment shall be made by change order.

1.42 CUTTING REINFORCED CONCRETE ROADWAY

Cutting of reinforced concrete roadway shall be considered incidental to the work and shall not be measured separately for payment.

1.43 DUST CONTROL

Dust control as described in Specification Section 01562 shall not be separately measured for payment, but shall be considered incidental to the project.

1.44 COVID-19 requirements mandated by the State of Massachusetts or City of Newton shall be considered incidental to the work and shall not be measured separately for payment.

END OF SECTION

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SECTION 01330

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The Contractor shall provide the Engineer with submittals as required by the contract documents.

1.02 RELATED WORK:

- A. Divisions 1 – 3 of these specifications that require submittals.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 GENERAL:

- A. As required by the General Conditions, Contractor shall submit a schedule of shop and working drawing submittals.
- B. The Contractor shall submit the shop and working drawing submittals electronically. Hard copy submittals will not be accepted.

3.02 ELECTRONIC SUBMITTALS:

- A. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer by email (davida@wseinc.com) or on Compact Disc (mail to Weston & Sampson Engineers, attention: CSD), one electronic copy in Portable Document Format (PDF) of shop or working drawings required as noted in the specifications, of equipment, structural details and materials fabricated especially for this Contract.
- B. Each electronic copy of the shop or working drawing shall be accompanied by the Engineer's standard shop drawing transmittal form, included as Exhibit 1 of this section (use only for electronic submittals), on which is a list of the drawings, descriptions and numbers and the names of the Owner, Project, Contractor and building, equipment or structure.
- C. The Contractor shall receive a shop drawing memorandum with the Engineer's approval or comments via email.

3.03 SHOP AND WORKING DRAWINGS:

- A. Shop and working drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish of shop coat, grease fittings, etc., depending on the subject of the drawings. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.
- B. 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 shop and working drawings shall be prepared on standard size, 24-inch by 36-inch sheets, except those, which are made by changing existing standard shop or working drawings. All drawings shall be clearly marked with the names of the Owner, Project, Contractor and building, equipment or structure to which the drawing applies, and shall be suitably numbered. Each shipment of drawings shall be accompanied by the Engineer's (if applicable) standard shop drawing transmittal form on which is a list of the drawings, descriptions and numbers and the names mentioned above.
- C. Only drawings that have been prepared, 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 Contract Documents in all respects. Shop drawings shall be reviewed and marked with the date, checker's name and indication of the Contractor's approval, and only then shall be submitted to the Engineer. Shop drawings unsatisfactory to the Contractor shall be returned directly to their source for correction, without submittal to the Engineer. Shop drawings submitted to the Engineer without the Contractor's approval stamp and signature will be rejected. Any deviation from the Contract Documents indicated on the shop drawings must be identified on the drawings and in a separate submittal to the Engineer, as required in this section of the specifications and General Conditions.
- D. The Contractor shall be responsible for the prompt submittal and resubmittal, as necessary, of all shop and working drawings so that there will be no delay in the work due to the absence of such drawings.
- E. The Engineer will review the shop and working drawings as to their general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections of comments made on the drawings during the review do not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner. The review of the shop drawings is general and shall not relieve the Contractor of the responsibility for details of design, dimensions, code compliance, etc., necessary for interfacing with other components, proper fitting and construction of the work required by the Contract and for achieving the

specified performance. The Engineer will review submittals two times: once upon original submission and a second time if the Engineer requires a revision or corrections. The Contractor shall reimburse the Owner amounts charged to the Owner by the Engineer for performing any review of a submittal for the third time or greater.

- F. With few exceptions, shop drawings will be reviewed and returned to the Contractor within 30 days of submittal.
- G. No material or equipment shall be purchased or fabricated especially for this Contract nor shall the Contractor proceed with any portion of the work, the design and details of which are dependent upon the design and details of equipment or other features for which review is required, until the required shop and working drawings have been submitted and reviewed by the Engineer as to their general conformance and compliance with the project and its Contract Documents. All materials and work involved in the construction shall then be as represented by said drawings.

END OF SECTION

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EXHIBIT 1 TO SECTION 01330 SUBMITTALS
SHOP DRAWING TRANSMITTAL FORM

Shop Drawing Transmittal



Instruction for Preparing Transmittal

No action will be taken on any item unless accompanied by this form.

TRANSMITTAL NOS. to be consecutive (1, 2, 3, etc.).

Each resubmittal of same item shall use same number with suffix letter (A, B, etc.).

SPEC. SECT. NO: Only one spec. section no. to each transmittal.

DESCRIPTION: Complete identification of document or group of documents.

SOURCE: Originator of document(s) being submitted.

DRAWING NO: Identification of document(s).
 CONTRACT DRAWING REFERENCE: Contract drawing number(s) showing details of document(s).
 SPECIAL INSTRUCTIONS: Special cases and emergencies, changes in distribution and special handling requests, etc. should be entered here.
 SIGNATURE OF CONTRACTOR: Signature of individual who reviews and approves material prior to submittal to engineer.

THIS SECTION TO BE COMPLETED BY CONTRACTOR

TRANSM. NO.	SPEC. SECT. NO.	DATE	CONTRACTORS JOB NO.	W&S JOB NO.
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PROJECT NAME & CONTRACT NO.					LOCATION
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Attention: CSD (David@wseinc.com)				
Weston & Sampson Engineers, Inc.				
55 Walkers Brook Drive				
Reading, MA 01867				

ITEM NO.	DESCRIPTION	SOURCE	DRAWING NO. CATALOG NO. BROUCHURE, ETC	NO. OF COPIES	CONTRACT DRAWING REF.	BY W&S	
						ACTION CODE	REVIEWED BY
1							
2							
3							
4							

THIS CERTIFIES THAT ALL ITEMS SUBMITTED HERewith HAVE BEEN CHECKED BY THE CONTRACTOR, ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, EXCEPT AS NOTED, AND ARE APPROVED BY THE CONTRACTOR FOR THIS PROJECT.

SIGNATURE & TITLE	
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THIS SECTION TO BE COMPLETED BY W&S

ACTION CODE:	1. FURNISH AS SUBMITTED	a. INSTALLATION SHALL PROCEED ONLY WHEN ACTION CODE IS 1 OR 2
2. FURNISH AS NOTED	3. REVISE AND RESUBMIT	b. ACTION CODED 3 SHALL BE RESUBMITTED WITHIN TIME LIMIT SET IN CONTRACT
4. REJECTED- SEE REMARKS	5. ACKNOWLEDGEMENT	c. REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY OF COMPLIANCE WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS
6. SUBMITTAL NOT REQUIRED, RETURNED WITHOUT REVIEW	Weston & Sampson	

SECTION 01331

DOCUMENTATION

PART 1 – GENERAL

1.01 WORK INCLUDED:

- A. This section covers the requirements for documentation to be furnished by the Contractor on this project.

1.02 RELATED WORK:

- A. Section 02427, FLOW ISOLATION
- B. Section 02428, CURED-IN-PLACE PIPE
- C. Section 02440, SEWER CLEANING AND INSPECTION
- D. Section 02435, SEWER MANHOLE REHABILITATION
- E. Section 02436, CURED-IN-PLACE LATERAL LINER
- F. Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT
- G. Section 02442, POINT REPAIR OF GRAVITY SEWERS (OPEN-CUT)
- H. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 DOCUMENTATION:

- A. The Contractor shall maintain printed television inspection logs of sewers, for each sewer undergoing repair/rehabilitation under this contract and provide one (1) copy of the logs within five (5) working days of the work being performed. Log sheet format shall be approved by Engineer prior to start of work.
- B. The log sheet(s) as a minimum shall clearly identify:
 - 1. Project Name
 - 2. Street Location, Name, Intersection, Station
 - 3. Date of inspection

4. Total Length of Line Inspected
 5. Line Size(s)/Joint Spacing/Type
 6. Line and Manhole(s) Condition
 7. Significant observations such as service connections, offset joints, drop joints, broken/cracked pipe, protruding services, roots, collapsed sections, infiltration, presence of scale and corrosion and other discernible features.
 8. Filename.
- C. All logs shall be provided to the Engineer in PDF format (one log per PDF file) at the completion of the project.
- D. All television inspection shall be recorded in MPEG format and shall include accompanying audio. Inspections shall be recorded one at a time, with each segment recorded as a separate file. The Contractor shall provide videos to the Owner, at no additional cost, as requested by the Engineer during the Project. Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. "AR-050 to AR-049 Downstream"
- E. The Contractor shall additionally provide one (1) copy of all logs relative to work performed on sewer manholes within five (5) working days of the work being performed.
- F. The Contractor shall take a digital photograph, in JPEG format, at each manhole before and after manhole rehabilitation. Filenames shall contain sub-area and manhole designations e.g. "AR-049." Digital photographs shall have a minimum resolution of ten (10) megapixels.
- G. The Contractor shall provide Flow Isolation data in Microsoft Excel format.
- H. The Contractor shall deliver to the Owner, at no additional cost, two (2) external hard drives each including the following information at the end of the project. The external hard drives shall be USB powered and capable of USB 3.0 connectivity and will become the property of the Owner upon delivery. The Contractor shall use file folders to organize individual types of data on the external hard drives. The Contractor shall include the following data on the external hard drives prior to delivery to the Engineer.
- **Sewer Manhole Rehabilitation**
 - Pre and Post Rehabilitation Manhole Inspection Photos in JPEG format
 - Filenames shall contain sub-area and manhole designations e.g. "A004-19"
 - Each manhole rehabilitation log as a separate PDF file
 - Filenames shall contain sub-area and manhole designations e.g. "A004-19"

- **Flow Isolation**
 - Microsoft Excel file with flow isolation data
 - Field logs as a PDF file
- **Sewer Line and Manhole Chemical Root Treatment**
 - Field logs as a PDF file
- **Cleaning and Inspection**
 - Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
- **Cured-in-Place Pipe (and Structural Cured-in-Place Pipe) – Organized per Inversion**
 - Pre-inversion Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each pre-inversion television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each liner order sheet (describing the material ordered) as a separate PDF file
 - Each service connection reinstatement sign-off sheet as a separate PDF file
 - Each thermo couple log kept during inversion process as a separate PDF file
 - Post-inversion Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each post-inversion television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each material testing results report as a separate PDF file
- **Cured-in-Place Lateral Liner – Organized per Mainline Sewer Segment and Stationing**
 - Pre-inversion Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each pre-inversion television inspection log as a separate PDF file

- Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each liner order sheet (describing the material ordered) as a separate PDF file
 - Each thermo couple log kept during inversion process as a separate PDF file
 - Post-inversion Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each post-inversion television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each material testing results report as a separate PDF file
- **Service Connection Test and Grout**
 - Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
- **Point Repair of Gravity Sewer (Open Cut) and Pipe Bursting**
 - Television Inspection MPEG Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “A004-19 to A004-18 Downstream”
- **“Push Camera” Service Connection Television Inspection**
 - Television inspection MPEG Files
 - Filenames shall contain street address of service connection

PART 2 – PRODUCTS – Not Used

PART 3 – EXECUTION – Not Used

END OF SECTION

SECTION 01550

SIGNAGE (TRAFFIC CONTROL)

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing and installing traffic control signs and other devices.

1.02 SYSTEM DESCRIPTION:

The Contractor shall furnish and install all construction signs deemed necessary by and in accordance with the latest edition of Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) as published by the U.S. Department of Transportation.

PART 2 - PRODUCTS

2.01 TRAFFIC WARNING AND REGULATING DEVICES:

Contractor shall provide warning signs, barricades and other devices in accordance with the specifications provided in the MUTCD. Size of signs, lettering, colors, method of support and other factors prescribed in the MUTCD shall be adhered to.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Contractor shall erect barricades, barrier fences, traffic signs, and other traffic control devices as required by the City of Newton Police Department and in accordance with MUTCD, or as required by the Engineer, to protect the work area from traffic, pedestrians, and animals.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses.
- C. Unless extended protection is required for specific areas, when the work has been completed, all temporary warning and regulatory devices used by the Contractor shall be removed so that traffic can move unimpeded through the area.
- D. Contractor shall meet with the Newton Police Department prior to excavation work. Road closures and detours shall be as required by the Newton Police Department.

END OF SECTION

SECTION 01551

PORTABLE CHANGEABLE MESSAGE SIGN

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The work covered under this section shall consist of furnishing, maintaining, transporting and using a Trailer-Mounted Changeable Message Sign.
- B. All messages displayed shall be approved by the Engineer and the Newton Police Department.

1.02 REFERENCES

- A. The following standard forms part of these specifications and indicates a minimum required standard:

Massachusetts Department of Transportation Standard Specifications for Highways and Bridges

Manual on Uniform Traffic Control Devices (MUTCD)

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Materials required under this Section need not be new but must be in first class condition and acceptable to the Engineer. Any materials that in the judgement of the Engineer are unsatisfactory in appearance and/or performance shall be immediately replaced by acceptable units.

2.02 SPECIFIC REQUIREMENTS:

Refer to Sections 01330 – SUBMITTALS and Section 01140 – SPECIAL PROVISIONS for information regarding required certification that all materials, products, equipment and/or services.

- A. The Trailer-Mounted Changeable Message Sign shall meet the requirements of this specification and shall consist of the following major components;
 - 1. Message Board
 - 2. Operator Interface (CPU and Keyboard)
 - 3. Power Supply
 - 4. Towable Trailer

B. Message Board

1. Type - The display can be Flip Disk, LED or a combination of both Flip Disk and LED (Hybrid).
2. Size – The message board shall have a minimum height of 48-inches, maximum height of 55-inches and minimum width of 88-inches, maximum width of 96-inches.
3. Colors - The display shall be either fluorescent yellow or ITE amber.
4. Lines - The sign board shall have the capability of displaying at least three lines of 18- inch high characters with 1 to 8 characters per line.
5. Visibility and Viewing Angle - The sign shall be visible for one-half mile and legible from a minimum distance of 650 feet with a viewing angle of no less than 30 degrees, during both daytime and nighttime operation.

2.03 OPERATOR INTERFACE:

- A. A means of creating/controlling the on-site display message(s) shall be provided with each sign. The operator interface shall contain as a minimum the following:
1. Operator's Display terminal with keyboard will provide a full screen display to allow the operator to preview the message content and format before it is sent to the sign panel. The keyboard shall be of a standard design.
 2. Controller (CPU)
 3. Lockable weatherproof enclosure for interface components.

2.04 CONTROLLER:

- A. The controller shall possess, as a minimum, the following features:
1. Full 32K user memory with the option for an additional 32K archive memory.
 2. Capacity to store a minimum of 199 pre-defined messages and a minimum of 50 user-created messages (not to exceed 32K).
 3. Changeable message flash rate capability.
 4. A minimum of 24-hour battery back-up.
 5. Password activation shall be software available.

2.05 POWER-SUPPLY

- A. The sign shall be capable of operation from the following sources:
1. A diesel powered generator with a battery backup.
 2. A battery with diesel generator charging or solar charging.
 3. The power supply shall have a cover for weather protection and shall be lockable for security.

2.06 TOWABLE TRAILER

- A. The trailer shall be of rugged construction suitable for towing at highway speeds and at low speed over rugged construction site terrain. The trailer shall have at least the following features:
1. Complete lighting to standard highway specifications.
 2. A single axle with two (2) – 15-inch wheels (3500 GVW rated).
 3. Two (2) inch ball coupler with heavy duty safety chains.
 4. Four (4) corner-located leveling swivel jacks capable of leveling the trailer on one (1) in six (6) grade and capable of stabilizing the trailer in high winds of up to 80 MPH. in addition, a tongue leveling swivel jack shall be provided.
 5. Surge breaks with lockable parking in conformance with Federal weight regulations.
 6. The sign shall be capable of being locked in a stowed position while being towed.
 7. A hydraulic lift mechanism shall be provided to elevate the sign to its operating position.
 8. It shall be possible to lock the sign panel in several off-angle positions with respect to the trailer axis for enhanced visibility.

2.07 ENVIRONMENTAL:

- A. The Trailer-Mounted Changeable Message Sign shall be capable of performing all functions at ambient temperatures ranging from -30 degrees F to +165 degrees F. There shall be no degradation of operation due to fog, rain or snow.

2.08 MAINTENANCE:

- A. All components of the Trailer-Mounted Changeable Message Sign shall be readily accessible for ease of maintenance. Standard commercially available parts shall be used where possible.
- B. The sign shall require no special scheduled maintenance. Maintenance shall include periodic cleaning. When not being used, at the discretion of the Engineer, the sign shall be stored in an approved secure area.

2.09 DOCUMENTATION:

- A. As a minimum, the following documentation shall be supplied with each Trailer-Mounted Changeable Message Sign:
 - 1. Operating Manual
 - 2. Parts Manual
 - 3. Wiring Diagrams
 - 4. Troubleshooting Guide

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. All warning devices shall be subject to removal, replacement and/or repositioning as often as necessary. The changeable message unit shall be available for immediate use on the project and be positioned as required by the Engineer and the City of Newton Police Department. The Contractor shall be responsible for the maintenance of such device and appurtenances, throughout its use on the project, with no additional compensation thereof, other than as provided under the contract unit price. Should the unit be found defective in any way it shall be replaced immediately at the Contractor's expense.

END OF SECTION

SECTION 01552

CONSTRUCTION ZONE SAFETY PLAN

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the provisions for complying with Commonwealth of Massachusetts requirements for construction zone safety plans on public works projects.

1.02 DESCRIPTION:

- A. The Contractor shall implement traffic safety and control measures through the construction zone through road closures and detours and mitigate impacts on traffic outside of the construction zone in accordance with these contract documents.

1.03 RELATED WORK:

- A. SECTION 01110, CONTROL OF WORK AND MATERIALS (MAINTENANCE OF TRAFFIC)
- B. SECTION 01550, SIGNAGE (TRAFFIC CONTROL)
- C. SECTION 01553, UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL

1.04 REFERENCES:

701 CMR 7.00 Use of Road Flaggers and Police Details on Public Works Projects

Massachusetts Department of Transportation Standard Specifications for Highways and Bridges – latest edition

PART 2 - PRODUCTS

- 2.01 Traffic control devices utilized by the Contractor shall meet the requirements of these contract documents and the latest Massachusetts Department of Transportation (MassDOT) Standard Specifications and Manual On Uniform Traffic Control Devices (MUTCD).

PART 3 - EXECUTION

3.01 OPERATION:

- A. Contractor shall be responsible for providing all temporary traffic control devices including barricades, barrier fences, signs, drums, cones, impact attenuators and other traffic control

devices in accordance with typical traffic management plans and details shown on the drawings or as required by the Engineer.

- B. The Contractor shall prepare temporary traffic management plans and details that deviates significantly from the typical plans shown on the drawings and submit to the Engineer for review and approval prior to start of the work.
- C. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as required by the Owner's Traffic Control Officer or the Engineer.
- D. Police details shall be required for a safe work site on this project as determined by the Newton police department.
- E. If police details fail to show up for work at the construction zone at the usual time for start of work, or otherwise leave the jobsite before work is completed for the day, the provisions of the Alternative Plan will be followed by the Contractor.

3.02 ALTERNATIVE PLAN:

- A. In accordance with 701 CMR 7.06(6), whenever required police details do not arrive on time or fail to show up for work, the Alternative Plan will be implemented by the Contractor.
- B. The Alternative Plan for this project is as follows:
 - 1. Redeploy crew to work in areas not requiring temporary traffic control (if available).

END OF SECTION

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SECTION 01553

UNIFORMED OFFICERS FOR TEMPORARY TRAFFIC CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the provisions for furnishing Uniformed Officers for Traffic Control and Maintenance of Traffic as described in Section 01110 CONTROL OF WORK AND MATERIALS.

1.02 DESCRIPTION:

- A. The Contractor shall coordinate with the Newton's Traffic Control Officer to determine the number of Officers deemed necessary to provide for public safety and to maintain a smooth flow of traffic through the construction area(s) affected.

1.03 RELATED WORK:

- A. SECTION 01110, CONTROL OF WORK AND MATERIALS (MAINTENANCE OF TRAFFIC)
- B. SECTION 01550, SIGNAGE (TRAFFIC CONTROL)
- C. SECTION 01552, CONSTRUCTION ZONE SAFETY PLAN

PART 2 - PRODUCTS

2.01 UNIFORMED OFFICERS:

- A. Contractor shall provide the Traffic Control Officer with a minimum of 48 hours' notice indicating the time of day, street location and confirm number of officers required for traffic control.
- B. Contractor shall give the Traffic Control Officer a minimum of 2 hours prior cancellation notice should Contractor determine that due to weather or conditions beyond his control he would not need the scheduled officers.
- C. Contractor shall pay for officer(s) at the prevailing rate established by the local police department should officers not be needed and the Contractor fails to cancel the officers as noted in 2.01.B above.
- D. Where the Owner is paying directly for Traffic Officers and the Contractor cancels scheduled officers, the Contractor shall be responsible for payment of the wages for cancellations if not cancelled in accordance with 2.01.B and 2.01.C above.

PART 3 - EXECUTION

3.01 OPERATION:

- A. Contractor shall provide barricades, barrier fences, traffic signs, and other traffic control devices as required by the Owners Traffic Control Officer, or as required by the Engineer, to protect the work area from traffic, pedestrians, and animals.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as required by the Owners Traffic Control Officer or the Engineer.

END OF SECTION

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SECTION 01562

DUST CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION:

This section of the specification covers the control of dust via calcium chloride and water.

PART 2 - PRODUCTS

2.01 CALCIUM CHLORIDE:

- A. Calcium chloride shall conform to the requirements of AASHTO-M 144, Type I or Type II and Specification for Calcium Chloride, ASTM D98. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.
- B. Calcium chloride failing to meet the requirements of the aforementioned specifications or that which has become caked or sticky in shipment, may be rejected by the Engineer.

2.02 WATER:

- A. Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

PART 3 - EXECUTION

3.01 APPLICATION:

- A. Calcium chloride shall be applied when ordered by the Engineer and only in areas which will not be adversely affected by the application. See Section 01570, ENVIRONMENTAL PROTECTION.
- B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as required by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.
- C. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.
- D. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

END OF SECTION

SECTION 01564

EXISTING FENCES

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. This section of the specification covers the removal and resetting of existing fences.
- B. Where the removal of existing fences, at locations shown on the plans and where required by the Engineer, is required, the Contractor shall remove and reset such fences as required by the Engineer.

PART 2 - PRODUCTS

2.01 FENCING:

- A. The materials removed shall be utilized to reset the fence. Where necessary, new posts and bases shall be furnished and installed by the Contractor. Any materials damaged or lost during or subsequent to removal shall be replaced by the Contractor without additional compensation.
- B. All new materials required shall be equal in quality and design to the materials in the present fences.

PART 3 - EXECUTION

3.01 REMOVAL OF EXISTING FENCES:

- A. The present fences shall be carefully removed together with all appurtenances and satisfactorily stored and protected until required for resetting.

3.02 ERECTION:

- A. Fences shall be reset plumb and to the grades required and shall conform to the original fence or as the Engineer requires. Backfilling around the posts shall consist of suitable material satisfactorily compacted. If the fence posts were originally set in concrete bases they shall be reset in concrete bases.

3.03 PAINTING:

- A. Painting, if required, shall be done as required by the Engineer.

END OF SECTION

SECTION 01570

ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.01 DESCRIPTION:

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply to cross-country areas, river and stream crossings, and construction in and adjacent to wetlands, unless otherwise specifically stated.
- C. All work under this Contract shall be in accordance with any conditional requirements applied, all of which are attached to Section 00890, PERMITS.
- D. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01330, SUBMITTALS
- C. Section 01562, DUST CONTROL
- D. Section 02240, DEWATERING
- E. Section 02252, SUPPORT OF EXCAVATION
- F. Section 02300, EARTHWORK

1.03 SUBMITTALS:

- A. The Contractor shall submit details and literature fully describing environmental protection methods to be employed in carrying out construction activities within 100 feet of wetlands or across areas designated as wetlands.

PART 2 - PRODUCTS

2.01 STRAW WATTLES

- A. Straw Wattles shall consist of a 100% biodegradable exterior jute or coir netting with 100% wheat straw interior filling as manufactured by GEI Works, Sebastian, Florida (Phone: 772-646-0597; website: www.erosionpollution.com), or approved equal.

2.02 CATCH BASIN PROTECTION:

- A. To trap sediment and to prevent sediment from clogging drainage systems, catch basin protection in the form of a siltation sack (Siltsack as manufactured by ACF Environmental, Inc. or approved equal) shall be provided as approved by the Engineer.

PART 3- EXECUTION

3.01 NOTIFICATION AND STOPPAGE OF WORK:

- A. The Engineer will notify the Contractor in writing of any non-compliance with the provisions of the Order of Conditions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Owner may order stoppage of all or part of the work through the Engineer until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop work orders shall be made unless it was later determined that the Contractor was in compliance.

3.02 AREA OF CONSTRUCTION ACTIVITY:

- A. Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

3.03 PROTECTION OF WATER RESOURCES:

- A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.
- B. Special measures should be taken to insure against spillage of any pollutants into public waters.

3.04 CONSTRUCTION IN AREAS DESIGNATED AS WETLANDS ON THE DRAWINGS:

- A. Insofar as possible, the Contractor shall make every effort to minimize disturbance within areas designated as wetlands or within 100-feet of wetland resource areas. Total easement widths shall be limited to the widths shown.
- B. The Contractor shall perform his work in such a way that these areas are left in the condition existing prior to construction.
- C. The elevations of areas designated as wetlands shall not be unduly disturbed by the Contractor's operations outside of the trench limits. If such disturbance does occur, the Contractor shall take all measures necessary to return these areas to the elevations which existed prior to construction.
- D. In areas designated as wetlands, the Contractor shall carefully remove and stockpile the top 24 inches of soil. This topsoil material shall be used as backfill for the trench excavation top layer. The elevation of the trench shall be restored to the preconstruction elevations wherever disturbed by the Contractor's operation.
- E. The Contractor shall use a trench box, sheeting or bracing to support the excavation in areas designated as wetlands.
- F. Excavated materials shall not be permanently placed or temporarily stored in areas designated as wetlands. Temporary storage areas for excavated material shall be as required by the Engineer.
- G. The use of a temporary gravel roadway to construct the pipeline in the wetlands area is not acceptable. The Contractor will be required to utilize timber or rubber matting to support his equipment in these areas. The timber or rubber matting shall be constructed in such a way that it is capable of supporting all equipment necessary to install the pipeline. The timber or rubber matting shall be constructed of materials and placed in such a way that when removed the material below the matting will not be unduly disturbed, mixed or compacted so as to adversely affect recovery of the existing plant life.
- H. During construction, easements within wetlands shall be lined with a continuous line of straw wattles (aka compost filter tube, silt/filter sock).

3.05 LOCATION OF STORAGE AREAS:

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the Engineer. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.
- B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage

facility. Adequate measures for erosion and sediment control such as the placement of baled straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.

- C. There shall be no storage of equipment or materials in areas designated as wetlands.
- D. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.
- E. Storage areas in cross-country locations shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

3.06 PROTECTION OF LANDSCAPE:

- A. The Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the Owner. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The Contractor shall, in any event, be responsible for any damage resulting from such use.
- B. Branches, limbs, and roots shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.
- C. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by his blasting or other operations, the Engineer may require the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed.
- D. Cultivated hedges, shrubs, and plants which could be injured by the Contractor's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

3.07 DISCHARGE OF DEWATERING OPERATIONS:

- A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands. When constructing in a wetlands area, the Contractor shall discharge water from dewatering operations directly to the nearest drainage system, stream, or waterway after filtering by an approved method.
- C. The pumped water shall be filtered through filter fabric and baled straw, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

3.08 DUST CONTROL:

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. If the Engineer decides it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed. Calcium chloride shall be as specified under Section 01562, DUST CONTROL.
- B. Calcium Chloride shall not be used for dust control within a drainage basin or in the vicinity of any source of potable water.

3.09 BALED STRAW:

- A. To trap sediment and to prevent sediment from clogging drainage systems, baled straw shall be used where shown on the drawings. Care shall be taken to keep the bales from breaking apart. The bales should be securely staked to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically. Hay bales shall not be placed within a waterway during construction of the pipeline crossing.

3.10 CATCH BASIN PROTECTION:

- A. Catch basin protection shall be used for every catch basin, shown on the plans or as required by the Engineer, to trap sediment and prevent it from clogging drainage systems and entering wetlands. Siltation sacks shall be securely installed under the catch basin grate. Care shall be taken to keep the siltation sacks from breaking apart or clogging. All deposited sediment shall be removed periodically and at times prior to predicted precipitation to allow free drainage flow. Prior to working in areas where catch basins are to be protected, each catch basin sump shall be cleaned of all debris and protected. The Contractor shall properly dispose of all debris at no additional cost to the Owner.

- B. All catch basin protection shall be removed by the Contractor after construction is complete.

END OF SECTION

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SECTION 01575

HANDLING EXISTING FLOWS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all materials, equipment, and labor required to handle existing sanitary sewage and drain flows and installation and maintenance of all temporary connections, plugs, and by-pass pumping.

1.02 RELATED WORK:

Section 01330, SUBMITTALS

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Submit complete, checked shop drawings, showing equipment, method of by-passing, and the method of transferring flows from the existing system to the new system. Prior to starting work, the Contractor shall submit flow calculations for each pipeline to be bypassed that show pump capacity to be provided. Comply with requirements of Section 01330.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.01 MAINTAINING EXISTING FLOWS:

- A. The Contractor shall maintain all flows in the existing system until construction or rehabilitation is complete and ready for safe operation.
- B. The Contractor shall protect against surcharging of the existing system upstream of the work area by installing adequate temporary by-pass pumping to handle dry weather and wet weather flows.
- C. The Contractor shall repair any damage that occurs to existing pipes and structures to the satisfaction of the Engineer. Work performed under this section shall be considered incidental and shall not be measured separately for payment.
- E. The Contractor shall not allow sanitary flow to discharge to any salt or fresh water body by means of overflow, by-pass pumping, or any other method that may contaminate these water areas.

END OF SECTION

SECTION 01740

CLEANING UP

PART 1 - GENERAL

1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of its work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon request by the Engineer provide adequate material, equipment and labor to cleanup and make safe any and all areas deemed necessary by the Engineer.

1.02 RELATED WORK:

- A. Section 01110 CONTROL OF WORK AND MATERIALS
- B. Section 01140 SPECIAL PROVISIONS
- C. Section 01570 ENVIRONMENTAL PROTECTION

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

3.01 DAILY CLEANUP:

- A. The Contractor shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.
- B. Upon written notification by the Engineer, the Contractor shall within 24 hours clean up those areas, which in the Engineer's opinion are in violation of this section and the above referenced sections of the specifications.
- C. If in the opinion of the Engineer, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

3.02 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES:

- A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

3.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

- A. On or before completion of the work, the Contractor shall, unless otherwise specifically required or permitted in writing, tear down and remove all temporary buildings and structures it built; shall remove all temporary works, tools and machinery or other construction equipment it furnished; shall remove all rubbish from any grounds which it has occupied; shall remove silt fences and hay bales used for trapping sediment; and shall leave the roads and all parts of the property and adjacent property affected by its operations in a neat and satisfactory condition.

3.04 RESTORATION OF DAMAGED PROPERTY:

- A. The Contractor shall restore or replace, when and as required, any property damaged by its work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk and landscaping work. Materials, equipment, and methods for such restoration shall be as approved by the Engineer.

3.05 FINAL CLEANUP:

- A. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the construction site to its original or specified condition. This cleanup shall include removing all trash and debris off of the premises. Before acceptance, the Engineer shall approve the condition of the site.

END OF SECTION

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SECTION 02058

CONTROLLED DENSITY FILL (CDF)

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Controlled Density Fill is to be used where indicated on the contract drawings or as described in any Massachusetts Department of Transportation road opening permits included in the project.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01270, MEASUREMENT AND PAYMENT
- D. Section 01330, SUBMITTALS
- E. Section 02300, EARTHWORK
- F. Section 02252, SUPPORT OF EXCAVATION
- G. Section 02745, PAVING

1.03 REFERENCES:

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges - Subsection M4.08.0, CONTROLLED DENSITY FILL.

1.04 SUBMITTALS:

Proposed Mix Designs for the type(s) of Controlled Density Fill shall be submitted for review and approval from the Contractor's Ready Mix provider in accordance with Section 01330.

PART 2 - PRODUCTS

2.01 MATERIALS:

Materials employed in the Controlled Density Fill shall meet the requirements as described in MassDOT Standard Specifications Subsection M4.08.0.

2.02 TYPE OF CONTROLLED DENSITY FILL:

Controlled Density Fill for this project shall be Type 1E - Very Flowable (Excavatable) as described in MassDOT Subsection M4.08.0.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Controlled Density Fill shall be batched at a ready mix plant and is to be used at a high or very high slump of approximately 10- to 12-inches. It shall be flowable, require no vibration and after it has been placed for Type 1E and 2E, be excavatable by hand tools and/or small machines.
- B. Controlled Density Fill shall be placed so as to not disturb adjacent structures, utilities or the sidewalls of trenches.
- C. Controlled Density Fill shall be installed to the limits shown on the drawings, or required by permit and shall be kept below the top of the trench to allow for the placement of the required depth of pavement as specified in these documents or as indicated in the contract drawings.
- D. Steel road plates shall protect the Controlled Density Fill until the fill reaches a point that it will not be deformed by traffic passing over it. Plates are not to be removed until the day that paving operations are performed.

END OF SECTION

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SECTION 02085

POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS(SDR-35)

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers the furnishing and installation of Polyvinyl Chloride (PVC) pipe and fittings, as indicated on the drawings and as specified herein.

1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK
- C. Section 02518, TRACER TAPE
- D. Section 02631, PRECAST MANHOLES

1.03 REFERENCES:

- A. The following standards form a part of these specifications as referenced:

American Society for Testing and Materials (ASTM)

ASTM	D2321	Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
ASTM	D3034	Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM	D3212	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM	F679	Specification for Polyvinyl Chloride (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

Manufacturer's literature of the materials of this section.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. PVC nonpressure sewer pipe 4-inches through 15-inches diameter shall conform to ASTM D3034, 18-inches through 60-inches diameter to ASTM F679, all with SDR of 35 unless noted, and shall meet the specific requirements and exceptions to the aforementioned specifications that follow.
- B. PVC nonpressure sewer pipe shall be furnished in standard lengths.
- C. One pipe bell consisting of an integral wall section with a solid cross section rubber ring, factory assembled, shall be furnished with each standard, random and short length of pipe. Rubber rings shall be provided to the requirements of ASTM D3212.
- D. The rubber ring shall be retained within the bell of the pipe by a precision formed groove or recess designed to resist fishmouthing or creeping during assembly of joints.
- E. Spigot pipe ends shall be supplied with bevels from the manufacturer to ensure proper insertion. Each spigot end shall have an "assembly stripe" imprinted thereon to which the bell end of the mated pipe will extend upon proper jointing of the two pipes.
- F. PVC fittings shall be provided with bell and/or spigot configurations with rubber gasketed joints compatible with that of the pipe. Bend fittings with spigot ends shorter than the pipe recess bells will not be allowed. The shorter spigot end would not allow proper seating of the spigot in the mating bell and would permit undesired contact between the mating bell and the outside of the fitting bell.
- G. All pipe delivered to the job site shall be accompanied by independent testing laboratory reports certifying that the pipe and fittings conform to the above-mentioned specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such of the tests specified as he may from time to time deem necessary.
- H. All cutting of pipe shall be done with a machine suitable for cutting PVC pipe. Cut ends shall be beveled when recommended by the pipe manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Except as modified herein, installation of the PVC pipe shall be in accordance with ASTM D2321.
- B. Each pipe length shall be inspected before being laid to verify that it is not cracked. Pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be so laid as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required grade.
- C. The pipe shall be supported by compacted crushed stone. Crushed stone shall be as specified under Section 02300, EARTHWORK.
- D. The pipe shall not be driven down to grade by striking it with a shovel handle, timber, rammer, or other unyielding object. When each pipe has been properly bedded, enough of the backfill material shall be placed and compacted between the pipe and the sides of the trench to hold the pipe in correct alignment.
- E. Before a joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that inverts are matched and conform to the required line and grade.
- F. For pipe placed on crushed stone, immediately after the joint is made, the jointing area shall be filled with suitable materials so placed and compacted that the ends of either pipe will not settle under backfill load.
- G. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
- H. Branches and fittings shall be laid by the Contractor as indicated on the drawings, and/or as required by the Engineer. Open ends of pipe and branches shall be closed with PVC caps secured in place with premolded gasket joints or as required by the Engineer.
- I. All pipe joints shall be made as nearly watertight as practicable. There shall be no visible leakage at the joints and there shall be no sand, silt, clay, or soil of any description entering the pipeline at the joints. Where there is evidence of water or soil entering the pipeline, connecting pipes, or structures, the defects shall be repaired to the satisfaction of the Engineer.
- J. The Contractor shall build a tight bulkhead in the pipeline where new work enters an existing sewer. This bulkhead shall remain in place until the Engineer authorizes its removal.

- K. Care shall be taken to prevent earth, water, and other materials from entering the pipe, and when pipe laying operations are suspended, the Contractor shall maintain a suitable stopper in the end of the pipe and also at openings for manholes.
- L. As soon as possible after the pipe and manholes are completed on any street, the Contractor shall flush out the new pipeline using a rubber ball ahead of the water, and none of the flushing water or debris shall be permitted to enter any existing sewer.

3.02 QUALITY ASSURANCE

1. On completion of a section of sewer, including building connections installed to the property line, the Contractor shall TV inspect the section in accordance with Section 02440, Sewer Cleaning and Inspection at no additional cost to the Owner.
2. The Contractor shall be responsible for the satisfactory water-tightness of the entire section of the sewer. Should the Engineer determine that the sections inspected are unsatisfactory, the Contractor shall do all work required to locate and repair the defects and re-inspect as the Engineer may require without additional compensation.
3. A plan of the method for repairing any defects that are found shall be submitted to the Engineer for review.

END OF SECTION

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SECTION 02089

DUCTILE IRON GRAVITY PIPE
AND FITTINGS FOR SEWERS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers the furnishing, handling, hauling, laying, jointing, and testing of ductile iron pipe used for gravity sewer construction, including fittings and appurtenant work as indicated on the drawings and as specified.

1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK
- C. Section 02631, PRECAST MANHOLES

1.03 QUALITY ASSURANCE

- A. All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Engineer sworn certificates of such tests.
- B. In addition, the Owner reserves the right to have any or all pipe, fittings and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.

1.04 REFERENCES:

- A. The following standards form a part of these specifications as referenced:

American Water Works Association

AWWA	C110	Ductile-Iron and Gray-Iron Fittings, 3 inches through 48 inches, for Water and Other Liquids
AWWA	C111	Rubber Gasket Joints for Ductile- Iron and Gray-Iron Pressure Pipe and Fittings
AWWA	C150	Thickness Design of Ductile-Iron Pipe
AWWA	C116	Protective Fusion Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings

AWWA	C151	Ductile-Iron Pipe, Centrifugally Cast for Water or Other Liquids
AWWA	C153	Ductile-Iron Compact Fittings, 3 inches through 64 inches for Water Service.
AWWA	C600	Installation of Ductile-Iron Water Mains

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Manufacturer's literature of the materials of this section.
- B. Shop drawings consisting of manufacturer's scale drawings, cuts or catalogs including descriptive literature and complete characteristics and specifications, and code requirements. Shop drawings shall be submitted for the ductile iron pipe, type of joint, fittings, couplings, filling rings, and lining and coating in accordance with specifications.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. The Contractor shall use push-on joint type ductile iron pipe unless otherwise indicated on the plans or specified herein.
- B. All ductile iron pipe shall be designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151.
- C. Unless otherwise indicated or specified, ductile iron pipe shall be Thickness Class 52.
- D. All pipe delivered to the job site shall be accompanied by independent testing laboratory reports certifying that the pipe and fittings conform to the above-mentioned specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such of the tests specified, as he may from time to time deem necessary.
- E. All cutting of pipe shall be done with a machine suitable for cutting DI pipe. Cut ends shall be beveled when recommended by the pipe manufacturer.

2.02 FITTINGS:

- A. Fittings shall conform to the requirements of AWWA C110 or C153 as appropriate and shall be of a pressure classification at least equal to that of the pipe with which they are used.
- B. The Contractor shall use ductile iron fittings. Cast-iron, Class 250 fittings may be substituted, upon approval of the Engineer, for ductile iron fittings.
- C. Unless otherwise indicated, fittings shall have all bell mechanical joint ends.

2.03 GASKETS, GLANDS, NUTS AND BOLTS:

- A. Gaskets, glands, nuts, bolts and accessories shall conform to AWWA C111 or C153 as appropriate.
- B. Gaskets shall be of plain tipped rubber, suitable for exposure to the liquid within the pipe.
- C. Glands shall be ductile or cast iron.
- D. Bolts and nuts shall be high strength alloy.

2.04 LINING AND COATING:

- A. The inside of pipe and fittings shall have a coating of Protecto 401 Ceramic Epoxy Interior Coating in accordance with coating manufacturers recommendations and applied at a 40 mils nominal thickness to interior surfaces of the pipe; or a fusion bonded epoxy [FBE] primer at 5 mils thickness and a fusion bonded polyethylene [FRP] surface coating, which may be used for pipe fittings.
- B. The outside of pipe and fittings shall be coated with the standard asphaltic coating specified under the appropriate AWWA Standard Specification for pipe and fittings.
- C. Machined surfaces shall be cleaned and coated with a suitable rust preventative coating at the shop immediately after being machined.

2.05 FLEXIBLE COUPLINGS:

- A. All sleeve-type couplings and accessories shall be of a pressure rating at least equal to that of the pipeline in which they are to be installed.
- B. Couplings shall be cast or ductile iron and shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
- C. Couplings for buried pipe shall be Dresser 153; Smith-Blair Type 441 or 443; Romac Style 501; Ford Style FC1 or FC2; or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION BEFORE INSTALLATION:

Pipes and fittings shall be subjected to a careful inspection just before being laid or installed.

3.02 HANDLING AND CUTTING:

- A. Any pipe or fitting which has a damaged lining, scratched or marred machine surface and/or abrasion of the pipe coating or lining shall be rejected and removed from the job-site.

- B. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.
- C. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used will be perfectly sound. The cut shall be made in the sound barrel at a point at least 12-inches from the visible limits of the crack.
- D. Except as otherwise approved, all cutting shall be done with a machine suitable for cutting ductile iron pipe. Hydraulic squeeze cutters are not acceptable for cutting ductile iron pipe. Travel type cutters or rotary type abrasive saws may be used. All cut ends shall be examined for possible cracks caused by cutting.
- E. Lined and coated pipe and fittings shall be assembled and installed with approved packing or gaskets of the type recommended by the pipe manufacturer for the particular lining used.

3.03 INSTALLATION:

- A. Each pipe length shall be inspected before being laid to verify that it is not cracked. Pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be so laid as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required grade.
- B. The pipe shall be supported by compacted crushed stone. Crushed stone shall be as specified under Section 02300, EARTHWORK.
- C. The pipe shall not be driven down to grade by striking it with a shovel handle, timber, rammer, or other unyielding object. When each pipe has been properly bedded, enough of the backfill material shall be placed and compacted between the pipe and the sides of the trench to hold the pipe in correct alignment.
- D. Before a joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that inverts are matched and conform to the required line and grade.
- E. For pipe placed on crushed stone, immediately after the joint is made, the jointing area shall be filled with suitable materials so placed and compacted that the ends of either pipe will not settle under backfill load.
- F. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
- G. Branches and fittings shall be laid by the Contractor as indicated on the drawings, and/or as required by the Engineer. Open ends of pipe and branches shall be closed with DI caps secured in place with premolded gasket joints or as required by the Engineer.

- H. All pipe joints shall be made as nearly watertight as practicable. There shall be no visible leakage at the joints and there shall be no sand, silt, clay, or soil of any description entering the pipeline at the joints. Where there is evidence of water or soil entering the pipeline, connecting pipes, or structures, the defects shall be repaired to the satisfaction of the Engineer.
- I. The Contractor shall build a tight bulkhead in the pipeline where new work enters an existing sewer. This bulkhead shall remain in place until its removal is authorized by the Engineer.
- J. Care shall be taken to prevent earth, water, and other materials from entering the pipe, and when pipe-laying operations are suspended, the Contractor shall maintain a suitable stopper in the end of the pipe and at openings for manholes.
- K. As soon as possible after the pipe and manholes are completed on any street, the Contractor shall flush out the new pipeline using a rubber ball ahead of the water, and none of the flushing water or debris shall be permitted to enter any existing sewer.

3.04 PUSH ON JOINTS:

- A. Joining of push-on joint pipe shall conform to AWWA C600.
- B. If effective sealing of the joint is not attained, the joint shall be disassembled, thoroughly cleaned, a new gasket inserted and joint reassembled.

3.05 MECHANICAL JOINTS:

- A. Assembling of fittings with mechanical joint ends shall conform to AWWA C600.
- B. If effective sealing of the joint is not attained at the maximum torque indicated in the above standard, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be overstressed to tighten a leaking joint.

3.06 SLEEVE-TYPE COUPLINGS:

- A. Pipe ends shall be cleaned thoroughly prior to installation. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferable by use of a torque wrench of the appropriate size and torque for the bolts. The correct torque as indicated by a torque wrench shall not exceed 90 foot-lb.

END OF SECTION

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SECTION 02222

ABANDONMENT OF SEWERS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the abandonment of sewers through various means including furnishing, handling and installation of all concrete and masonry plugs, as shown on the Drawings and specified herein.
- B. The Contractor shall furnish all materials, tools, labor, and equipment to abandon existing sewers, combined sewers, and drains.

1.02 RELATED WORK:

- A. Section 03302, FIELD CONCRETE

1.03 REFERENCES:

The following standards form a part of this specification, as referenced:

American Society for Testing and Materials (ASTM)

ASTM C32 Specifications for Sewer and Manhole Brick (Made from Clay or shale).

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

Plan for abandoning existing pipe, showing equipment, methods and materials. The plan shall be submitted to and reviewed by the Engineer before construction.

PART 2 - PRODUCTS

2.01 PLUGS:

- A. Plugs installed at the open ends of the pipe to be abandoned shall be 12-inch thick 3,000-psi cement concrete, or 8-inch thick brick masonry as directed. The pipes to be abandoned include all sewer specified herein and as shown on the Drawings.
- B. Precast cement concrete plugs that are used shall meet the requirements for 3,000 psi concrete and shall be free of cracks and spalls. Brick masonry plugs shall be made of brick meeting the requirements of ASTM C32, for grade SS, hard brick.

- C. Mortar shall be composed of portland cement, hydrated lime, and sand, and the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for grade SS brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand. The cement concrete plug shall be covered with non-shrink grout to prevent leakage at the plug.

PART 3 - EXECUTION

3.01 INSTALLATION

A. PLUGS:

1. Existing sewers shall be plugged with 3,000 psi concrete or with brick masonry, as required by the Engineer. For non-circular pipes, the largest interior cross-sectional dimension shall govern in determining size of abandonment.
2. Plugs shall be of adequate strength to withstand the full soil and groundwater pressure but not less than 5 psi.
3. Open ends of sewer services less than 12 inches in diameter shall be plugged with a concrete plug as required by the Engineer. Such plug shall be made watertight with an application around the plug of an approved watertight compound.
4. Masonry plugs shall be at least 8-inches thick and concrete plugs shall be at least 12-inches thick. Pipes entering a manhole that are to be abandoned shall have a plug installed that is flush with the interior wall of the structure.

END OF SECTION

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SECTION 02240

DEWATERING

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section specifies designing, furnishing, installing, maintaining, operating and removing temporary dewatering systems as required to lower and control water levels and hydrostatic pressures during construction; disposing of pumped water; constructing, maintaining, observing and, except where indicated or required to remain in place, removing of equipment and instrumentation for control of the system.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01570, ENVIRONMENTAL PROTECTION
- C. Section 02252, SUPPORT OF EXCAVATION
- D. Section 02300, EARTHWORK

1.03 SYSTEM DESCRIPTION:

- A. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

1.04 QUALITY ASSURANCE:

- A. The Contractor is responsible for the adequacy of the dewatering systems.
- B. The dewatering systems shall be capable of effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of 2 feet below excavation bottom, unless otherwise required by the Engineer, so that all excavation bottoms are firm and dry.
- C. The dewatering system shall be capable of maintaining a dry and stable subgrade until the structures, pipes and appurtenances to be built therein have been completed to the extent that they will not be floated or otherwise damaged.
- D. The dewatering system and excavation support (see Section 02252, SUPPORT OF EXCAVATION) shall be designed so that lowering of the groundwater level outside the excavation does not adversely affect adjacent structures, utilities or wells.

1.05 SUBMITTALS:

- A. In accordance with Section 01330, Contractor shall submit a plan indicating how it intends to control the discharge from any dewatering operations on the project, whether it is discharge of groundwater from excavations or stormwater runoff during the life of the project.

PART 2 - PRODUCTS: NOT APPLICABLE

PART 3 - EXECUTION

3.01 DEWATERING OPERATIONS:

- A. All water pumped or drained from the work shall be disposed of in a manner that will not result in undue interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures and utilities. Suitable temporary pipes, flumes or channels shall be provided for water that may flow along or across the site of the work. All disposal of pumped water shall conform to the provisions of Section 01570 ENVIRONMENTAL PROTECTION and Section 00890 PERMITS.
- B. Dewatering facilities shall be located where they will not interfere with utilities and construction work to be done by others.
- C. Dewatering procedures to be used shall be as described below:
 - 1. Crushed stone shall encapsulate the suction end of the pump to aid in minimizing the amount of silt discharged.
 - 2. For dewatering operations with relatively minor flows, pump discharges shall be directed into hay bale sedimentation traps lined with filter fabric. Water is to be filtered through the hay bales and filter fabric prior to being allowed to seep out into its natural watercourse.
 - 3. For dewatering operations with larger flows, pump discharges shall be into a steel dewatering basin. Steel baffle plates shall be used to slow water velocities to increase the contact time and allow adequate settlement of sediment prior to discharge into waterways.
 - 4. Where indicated on the contract drawings or in conditions of excess silt suspended in the discharge water, silt control bags shall be utilized in catch basins.
- D. The Contractor shall be responsible for repair of any damage caused by his dewatering operations, at no cost to the Owner.

END OF SECTION

SECTION 02252

SUPPORT OF EXCAVATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section of the specification covers wood sheeting and bracing for support of excavations. The requirements of this section shall also apply, as appropriate, to other methods of excavation support and underpinning which the Contractor elects to use to complete the work.
- B. The Contractor shall furnish and place timber sheeting of the kinds and dimensions required, complying with these specifications, where indicated on the drawings or required by the Engineer.

1.02 RELATED WORK:

- A. Section 02240, DEWATERING.
- B. Section 02300, EARTHWORK.

1.03 QUALITY ASSURANCE:

- A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Safety and Department of Labor, Division of Occupational Safety "Excavation & Trench Safety Regulation (520 CMR 14.00)" and "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.)." Contractors shall be familiar with the requirements of these regulations.
- B. The excavation support system shall be of sufficient strength and be provided with adequate bracing to support all loads to which it will be subjected. The excavation support system shall be designed to prevent any movement of earth that would diminish the width of the excavation or damage or endanger adjacent structures.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Timber sheeting shall be sound spruce, pine, or hemlock, planed on one side and either tongue and grooved or splined. Timber sheeting shall not be less than nominal 2-inches thick.
- B. Timber and steel used for bracing shall be of such size and strength as required in the excavation support design. Timber or steel used for bracing shall be new or undamaged

used material which does not contain splices, cutouts, patches, or other alterations which would impair its integrity or strength.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Work shall not be started until all materials and equipment necessary for their construction are either on the site of the work or satisfactorily available for immediate use as required.
- B. The sheeting shall be securely and satisfactorily braced to withstand all pressures to which it may be subjected and be sufficiently tight to minimize lowering of the groundwater level outside the excavation, as required in Section 02240, DEWATERING.
- C. The sheeting shall be driven by approved means to the design elevation. No sheeting may be left so as to create a possible hazard to safety of the public or a hindrance to traffic of any kind.
- D. If boulders or very dense soils are encountered, making it impractical to drive a section to the desired depth, the section shall, as required, be cut off.
- E. The sheeting shall be left in place where indicated on the drawings or required by the Engineer in writing. At all other locations, the sheeting may be left in place or salvaged at the option of the Contractor. Steel or wood sheeting permanently left in place shall be cut off at a depth of not less than two feet below finish grade unless otherwise required.
- F. All cut-off will become the property of the Contractor and shall be removed by him from the site.
- G. Responsibility for the satisfactory construction and maintenance of the excavation support system, complete in place, shall rest with the Contractor. Any work done, including incidental construction, which is not acceptable for the intended purpose shall be either repaired or removed and reconstructed by the Contractor at his expense.
- H. The Contractor shall be solely responsible for repairing all damage associated with installation, performance, and removal of the excavation support system.

END OF SECTION

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SECTION 02300

EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01570, ENVIRONMENTAL PROTECTION
- D. Section 02240, DEWATERING
- E. Section 02252, SUPPORT OF EXCAVATION
- F. Section 02324, ROCK EXCAVATION AND DISPOSAL
- G. Section 02745, PAVING
- H. Section 02920, LOAMING AND SEEDING

1.03 REFERENCES:

American Society for Testing and Materials (ASTM)

ASTM	C131	Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM	C136	Method for Sieve Analysis of Fine and Coarse Aggregates.
ASTM	C330	Specification for Lightweight Aggregate for Structural Concrete.
ASTM	D1556	Test Method for Density of Soil in Place by the Sand Cone Method.

ASTM D1557 Test Methods for Moisture-density Relations of Soils and Soil Aggregate Mixtures Using Ten-pound (10 Lb.) Hammer and Eighteen-inch (18") Drop.

ASTM D2922 Test Methods for Density of Soil and Soil-aggregate in Place by Nuclear Methods (Shallow Depth).

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges.

Code of Massachusetts Regulations (CMR) 310.40.0032 Contaminated Media and Contaminated Debris

Code of Massachusetts Regulations (CMR) 520 CMR 14.00 Excavation & Trench Safety Regulation

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Samples of all materials proposed for the project shall be submitted to the Engineer for review. Size of the samples shall be as approved by the Engineer.

1.05 PROTECTION OF EXISTING PROPERTY:

- A. The work shall be executed in such manner as to prevent any damage to facilities at the site and adjacent property and existing improvements, such as but not limited to streets, curbs, paving, service utility lines, structures, monuments, bench marks, observation wells, and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout and other hazards created by earthwork operations.
- B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at its own expense, make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations. The Contractor shall replace, at his own cost, existing benchmarks, observation wells, monuments, and other reference points, which are disturbed or destroyed.
- C. Buried drainage structures and pipes, observation wells and piezometers, including those which project less than eighteen inches (18") above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment, and shall be maintained at all times until completion of project.

1.06 DRAINAGE:

- A. The Contractor shall provide, at its own expense, adequate drainage facilities to complete all work items in an acceptable manner. Drainage shall be done in a manner so that runoff will not adversely affect construction procedures or cause excessive disturbance of underlying natural ground or abutting properties.

1.07 FROST PROTECTION AND SNOW REMOVAL:

- A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.
- B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. GRAVEL BORROW:

Gravel Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.03.0, Type b.

B. CRUSHED STONE:

Crushed stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.

C. SAND BORROW:

Sand Borrow shall satisfy the requirements listed in MassDOT Specification Section M1.04.0.

D. PEASTONE:

Peastone shall be smooth, hard, naturally occurring, rounded stone meeting the following gradation requirements:

Passing 5/8 inch square sieve opening	-	100%
Passing No. 8 sieve opening	-	0%

E. BACKFILL MATERIALS:

1. Class B Backfill:

Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
3-inch	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

F. STATE HIGHWAY TRENCH BACKFILL:

When shown on the plans, Controlled Density Fill (CDF) shall be used to backfill trenches. The CDF shall satisfy the requirements listed in MassDOT Specification Section M4.08.0.

G. PROCESSED GRAVEL:

1. Processed gravel shall satisfy the requirements listed in MassDOT Specification Section M1.03.1.
2. Processed gravel shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.
3. The gradation shall meet the following requirements:

<u>Sieve Designation</u>	<u>Percentage Passing</u>
3-in.	100
1 1/2-in.	70-100
3/4-in.	50-85
No. 4	30-60
No. 200	0-10

4. The approved source of bank-run gravel material shall be processed by mechanical means. The equipment for producing crushed gravel shall be of adequate size with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

PART 3 - EXECUTION

3.01 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION:

- A. Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures.
- B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with a minimum 12-inch layer of compacted crushed stone wrapped all around in non-woven filter fabric. Costs of removal and replacement shall be borne by the Contractor.
- C. The Contractor shall place a minimum of 12-inch layer of special bedding materials and crushed stone wrapped in filter fabric over the natural underlying soil to stabilize areas which may become disturbed as a result of rain, surface water runoff or groundwater seepage pressures, all at no additional cost to the Owner. The Contractor also has the option of drying materials in-place and compacting to specified densities.

3.02 EXCAVATION:

A. GENERAL:

1. The Contractor shall perform all work of any nature and description required to accomplish the work as shown on the Drawings and as specified.
2. Excavations, unless otherwise required by the Engineer, shall be carried only to the depths and limits shown on the Drawings. If unauthorized excavation is carried out below required subgrade and/or beyond minimum lateral limits shown on Drawings, it shall be backfilled with gravel borrow and compacted at the Contractor's expense as specified below, except as otherwise indicated. Excavations shall be kept in dry and good conditions at all times, and all voids shall be filled to the satisfaction of the Engineer.
3. In all excavation areas, the Contractor shall strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, the Contractor shall first cut pavement as specified in paragraph 3.02 B.1 of this

specification, strip pavement and pavement subbase separately from underlying soils. All excavated materials shall be stockpiled separately from each other within the limits of work.

4. The Contractor shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the Contractor's chosen method of dewatering and which will allow visual observation of the bottom and backfill in the dry.
5. The Contractor shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as required by the Engineer. Unsuitable material includes topsoil, loam, peat, other organic materials, snow, ice, and trash. Unless specified elsewhere or otherwise required by the Engineer, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted special bedding materials or crushed stone wrapped all around in non-woven filter fabric.

B. TRENCHES:

1. Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.
2. The Contractor shall satisfy all dewatering requirements specified in Section 02240 DEWATERING, before performing trench excavations.
3. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.
4. Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.
5. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.
6. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.
7. If, in the opinion of the Engineer, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures,

the Contractor shall remove such disturbed subgrade to a minimum of 12-inches and replace with crushed stone wrapped in filter fabric. Cost of removal and replacement shall be borne by the Contractor.

8. The Contractor shall obtain a trench permit from the municipality where the trench is located prior to making any excavations of trenches (any subsurface excavation greater than three (3) feet in depth and fifteen (15) feet or less between soil walls as measured from the bottom).
9. All trenches required to be permitted must be attended, covered, barricaded, or backfilled. Covers must be road plates at least ¾-inch thick or equivalent, barricades must be fences at least 6-feet high with no openings greater than 4-inches between vertical supports and all horizontal supports required to be located on the trench-side of the fencing.

C. EXCAVATION NEAR EXISTING STRUCTURES:

1. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.
2. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.
3. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.03 BACKFILL PLACEMENT AND COMPACTION:

A. GENERAL:

1. Prior to backfilling, the Contractor shall compact the exposed natural subgrade to the densities as specified herein.
2. After approval of subgrade by the Engineer, the Contractor shall backfill areas to required contours and elevations with specified materials.
3. The Contractor shall place and compact materials to the specified density in continuous horizontal layers, not to exceed nine (9) inches in uncompacted lifts. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C. The minimum degree of compaction for fill placed shall be as follows:

<u>Location</u>	<u>Percent of Maximum Density</u>
Below pipe centerline	95
Above pipe centerline	92
Below pavement (upper 3 ft.)	95
Embankments	95
Below pipe in embankments	95
Adjacent to structures	92
Below structures	95

4. The Engineer reserves the right to test backfill for conformance to the specifications and Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated by the Engineer, engaged and paid for by the Owner. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.
5. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.
6. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.
7. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.

B. TRENCHES:

1. Bedding as detailed and specified shall be furnished and installed beneath the pipeline prior to placement of the pipeline. A minimum bedding thickness shall be maintained between the pipe and undisturbed material, as shown on the Drawings.
2. As soon as practicable after pipes have been laid, backfilling shall be started.
3. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of

pipe. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

4. Class B backfill shall be placed from the top of the select backfill to the specified material at grade (loam, pavement subbase, etc.). Fill compaction shall meet the density requirements of this specification.
5. Water Jetting:
 - a. Water jetting may be used when the backfill material contains less than 10 percent passing the number 200 sieve, but shall be used only if approved by the Engineer.
 - b. Contractor shall submit a detailed plan describing the procedures he intends to use for water jetting to the Engineer for approval prior to any water jetting taking place.
 - c. Compaction of backfill placed by water jetting shall conform to the requirements of this specification.
6. If the materials above the trench bottom are unsuitable for backfill, the Contractor shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.
7. Should the Engineer order crushed stone for utility supports or for other purposes, the Contractor shall furnish and install the crushed stone as directed.
8. In shoulders of streets and road, the top 12-inch layer of trench backfill shall consist of processed gravel for sub-base, satisfying the requirements listed in MassDOT standard specification M1.03.1.
9. Trenches in state highways or when shown on the plans shall be backfilled with Controlled Density Fill, in accordance with the state highway permit included in Section 00890, PERMITS.

C. BACKFILLING UNDER BUILDINGS AND FOUNDATIONS:

Material to be used as structural fill under structures shall be special bedding material or gravel borrow, as shown on the Drawings or as required by the Engineer. Where gravel borrow fill is required to support proposed footings, walls, slabs, and other structures, the material shall be placed in a manner accepted by the Engineer. Compaction of each lift shall meet the density requirements of this specification.

D. BACKFILLING ADJACENT TO STRUCTURES:

1. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.
2. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.
3. Where backfill is to be placed on only one side of a structural wall, only hand-operated roller or plate compactors shall be used within a lateral distance of five feet (5') of the wall for walls less than fifteen feet (15') high and within ten feet (10') of the wall for walls more than fifteen feet (15') high.

3.04 DISPOSAL OF SURPLUS MATERIALS:

- A. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.
- B. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations, and in accordance with arrangements made by him. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.
- C. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.
- D. The Contractor shall comply with Massachusetts regulations (310 CMR 40.0032) that govern the removal and disposal of surplus excavated materials. Materials, including contaminated soils, having concentrations of oil or hazardous materials less than an otherwise Reportable Concentration and that are not a hazardous waste, may not be disposed of at locations where concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and /or hazardous materials present in the soil being disposed or reused.

END OF SECTION

SECTION 02324

ROCK EXCAVATION AND DISPOSAL

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall excavate rock, if encountered, to the lines and grades indicated on the drawings or as required, shall dispose of the excavated material, and shall furnish the required material as specified in Section 02300 EARTHWORK for backfill in place of the excavated rock.

1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK
- C. Section 03302, FIELD CONCRETE

1.03 DEFINITIONS:

- A. The word "rock," wherever used as the name of the excavated material or material to be excavated, shall mean only boulders and pieces of concrete or masonry exceeding three (3) cubic yards in volume, or solid ledge rock which, in the opinion of the Engineer, requires for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrated rock which can be removed by normal earth excavation methods, no loose, shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation, will be measured or allowed as "rock."
- B. The word "earth," wherever used as the name of an excavated material, or material to be excavated shall mean all kinds of material other than rock as above defined.

1.04 QUALITY ASSURANCE:

- A. The Contractor shall conform to all municipal ordinances and state and federal laws relating to the transportation, storage, handling, and use of explosives. In the event that any of the above mentioned laws, ordinances, or regulations require a licensed blaster to perform or supervise the work of blasting, said licensed blaster shall, at all times, have his license on the work site and shall permit examination thereof by the Engineer or other officials having jurisdiction.
- B. The Contractor shall procure all permits required for blasting.

1.05 SUBMITTALS:

- A. At least two weeks before beginning blasting operations, the Contractor shall submit to the Engineer for record the following data:
 - 1. Name of Contractor or Subcontractor responsible for blasting and monitoring operations and license number.
 - 2. Name, affiliation, and license number of the person or persons who will be directly responsible for designing each blast, supervising the loading of the shot, and firing it.
- B. Copies of all permits required for blasting.
- C. Results of pre-blast survey.
- D. When blasting is in progress, daily reports on blasting operations and blast monitoring results.

1.06 DELIVERY/STORAGE AND HANDLING:

Delivery, storage and handling of explosives shall conform to all federal, state and local regulations and permits.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.01 PREPARATION/PRE-BLAST SURVEY

If required, the pre-blast survey shall be conducted in accordance with state regulations and/or local permit requirements.

3.02 EXCAVATION:

- A. The Contractor shall excavate rock to the lines and grades indicated on the drawings or as required by the Engineer. The excavated rock shall be removed and disposed of by the Contractor as specified for surplus excavated materials under Section 02300, EARTHWORK.
- B. Work damaged by blasting shall be repaired or replaced at the Contractor's expense.
- C. If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled, by and at the expense of the Contractor, as specified below:

1. In pipe trenches, excess excavation shall be filled with the required material and compacted in the same manner as specified for the material in the zone around the pipe under Section 02300 EARTHWORK.
 2. In excavations for structures, excess excavation in the rock beneath foundations shall be filled with concrete which shall have a minimum 28-day compressive strength of 3000 psi. Other excess excavation shall be filled with Class B backfill compacted to a minimum of 92 percent density (ASTM D1557 Method C) as specified under Section 02300, EARTHWORK.
 3. If the rock below normal depth is shattered due to drilling or blasting operations of the Contractor, and the Engineer considers such shattered rock to be unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled with concrete as required, except that in pipe trenches crushed stone may be used for backfill, if approved. All such removal and backfilling shall be done by and at the expense of the Contractor.
- D. When required by the Engineer, the Contractor shall remove all dirt and loose rock from designated areas and shall clean the surface of the rock thoroughly to determine whether seams or other defects exist.
- E. When concrete is to be placed on rock, the rock shall be free of all vegetation, dirt, sand, clay, boulders, scale, excessively cracked rock, loose fragments, water, ice, snow, and other objectionable substances.

3.03 VIBRATION AND AIR BLAST MONITORING:

- A. The Contractor shall measure air blast and vibration levels of blasting operations to assure compliance with all applicable regulations and local permits.
- B. Records of each day's air blast and vibration measurements shall be submitted to the Engineer in writing no later than the start of the next day's work. Records shall include, as a minimum:
- Identification of instrument
 - Name of observer
 - Name of interpreter
 - Distance and direction of recording station from the area of detonation
 - Date and exact time of reading
 - Type of ground at recording station

- Peak particle velocity for all components as well as resultant for all frequencies of vibrations
- Duration of motion with a velocity in excess of one thousandth of an inch per second
- A copy of the photographic record of seismograph readings
- Peak air blast level.

3.04 BLASTING RECORDS:

The Contractor shall prepare and submit to the Engineer daily blast reports, including logs of each blast. Reports shall be submitted to the Engineer no later than the start of the next day's work. However, during each day of blasting, the Contractor shall review and shall provide access for the Engineer to review the data from that day's blasting. Reports after each blast shall include at least the following information for each blast:

- Date, time, and location of blast
- Permit number and expiration date
- Amount and type of explosives used by weight and number of cartridges
- Total number of delays used and number of holes used for each delay
- On a diagram of the blast pattern, indicate total number and depth of holes, maximum charge per delay, maximum charge per hole, and corresponding delay number
- An evaluation of the blast indicating areas of significant overbreak, unusual results, and any recommended adjustments for the next blast.

3.05 POST BLASTING INSPECTIONS:

The Contractor shall examine any properties, structures, and conditions where complaints of damage have been received or damage claims have been filed. Advance notice shall be given to all interested parties so that the parties may be present during the final examination. Records of the final examination shall be signed and distributed to the owner of the property, the head of the local fire department, and the Engineer.

END OF SECTION

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SECTION 02427

POST CONSTRUCTION FLOW ISOLATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all materials, equipment, and labor required to conduct flow isolation on individual sewer reaches.

1.02 RELATED WORK:

- A. Section 01330, SUBMITTALS
- B. Section 01575, HANDLING EXISTING FLOWS

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

1. The Owner shall provide the Contractor with a Microsoft Excel Table with all manhole-to-manhole information pre-entered. The table will have blank fields to record each flow isolation reading. The Contractor shall complete the table with the data collected during the flow isolation procedure. Any observed infiltration from manholes shall be noted in the Table and shall not be included in the measured manhole-to-manhole value.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.01 FLOW ISOLATION:

- A. Flow isolation shall be conducted during the one-year warranty re-test by the Contractor on all 8-inch to 15-inch diameter sewer reaches that are rehabilitated during the project. Flow isolation shall only be completed on a pipe segment following completion of warranty re-test (and related repairs) on that pipe segment. Readings shall be recorded one manhole-to-manhole segment at a time, unless otherwise required by the Engineer.
- B. Individual manhole to manhole sewers shall be flow isolated by plugging flow at the upstream manhole and taking weir measurements at the downstream manhole using portable, precalibrated weirs.
- C. Flow isolation shall be performed between the hours of 12:00AM and 6:00AM during periods of high ground water and dry weather. The Engineer will determine if the groundwater and weather conditions are appropriate to conduct flow isolation.

- D. The manhole numbering system as indicated on the contract drawings shall be used to identify the manhole-to-manhole reaches that are flow isolated.

END OF SECTION

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SECTION 02428

CURED-IN-PLACE PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers installation of cured-in-place pipe as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 00331, TELEVISION AND MANHOLE INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 00890, PERMITS
- C. Section 01014, SCOPE AND SEQUENCE OF WORK
- D. Section 01330, SUBMITTALS
- E. Section 01331, DOCUMENTATION
- F. Section 01575, HANDLING EXISTING FLOWS
- G. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

ASTM F1743 Standard Practice for Rehabilitation of Existing Pipelines and Conduits
by Pull-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe
(CIPP)

The National Association of Sewer Service Companies (NASSCO)

Performance Specification Guideline for the Installation of Cured-in-Place Pipe (CIPP)

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, installation of cured-in-place pipe shall be carried out in accordance with ASTM F1216, Section 7.
- B. Curing of liner tube using hot water or steam shall be acceptable.
- C. The Contractor shall design all cured-in-place liners assuming partially deteriorated pipe conditions and a groundwater height above the crown of the pipe equal to one-half (50%) of the distance between the ground surface and the invert of the sanitary sewer to be rehabilitated unless otherwise noted below.
- D. The Contractor shall design all cured-in-place structural liners assuming fully deteriorated pipe conditions and a groundwater height above the crown of the pipe equal to one-half (50%) of the distance between the ground surface and the invert of the sanitary sewer to be rehabilitated unless otherwise noted below.
- E. The Contractor may propose alternative cured-in-place processes and/or products for review and approval by the Engineer.
- F. The location, length, and approximate interior dimensions of the cured-in-place pipe to be installed are as shown on the drawings.
- G. The Contractor shall provide MSDS for all chemicals used in the lining process.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330
SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit the following:
 - 1. Qualifications of the firm/personnel who will perform the Work.
 - 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 - 3. Description of the system, equipment and material proposed for the cured-in-place pipe.

4. Manufacturer's warranty.
- B. Prior to beginning the work, the Contractor shall submit, a written plan for contacting homeowners whose service connections may be affected due to the installation of liner. Such plan is subject to approval by the Engineer and the Owner.
- C. The Contractor shall submit the following information for each inversion within 21 days following completion of the liner installation. The information shall also be included on external hard drives as described in Section 01331, DOCUMENTATION.
- Pre-inversion television inspection logs and videos
 - Liner order sheet describing the material ordered
 - Service connection reinstatement sign-off sheet
 - Thermo couple log kept during inversion process
 - Post-inversion television inspection logs and videos
 - Material testing results

Information should be organized by inversion and two (2) copies shall be delivered.

1.07 WARRANTY:

The cured-in-place pipe shall be warranted against infiltration and defects for one (1) year from the date the project is accepted by the Owner. Defects shall include, but not be limited to, dry spots; lifts; wrinkles; fins; delaminations; pinholes (with or without infiltration); mineral deposits; staining; and infiltration. Defects shall also include reinstated non-active service connections and reinstated connections specifically identified on the drawings to not be reinstated.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Materials used for the cured-in-place pipe shall meet the requirements of ASTM F1216.
- B. Cured-in-place pipe shall be as manufactured by Insituform Technologies, National Liner, Cure-Line, or approved equal.
- C. Hydrophylic rubber gaskets shall swell to a minimum of 120% of its dry size when in contact with water and shall have a maximum swell size of 6 millimeters high. Gaskets must be adhered to the host pipe to ensure proper installation by either an adhesive sealant or mechanical fastener. Gaskets, fasteners and adhesives shall be as manufactured by Hydrotite, Adeka, LMK Technologies or approved equal.
- D. Pre-liners shall be a reinforced plastic tube to fit the existing pipeline and shall be continuous from manhole to manhole.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION and shall not be measured separately for payment.

3.02 FLOW CONTROL:

Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 WATER FOR CONSTRUCTION PURPOSES:

Availability of water for construction purposes shall be in accordance with Section 01140, SPECIAL PROVISIONS.

3.04 NOTIFICATION:

- A. The Contractor shall affix, using tape, a written notice to the door of each home that has sewer service through the pipe being lined one week prior to the lining operation and again one day before the lining operation. A notice shall also be distributed following service connection reinstatement stating that the service connection has been restored to service.
- B. The written notice must be approved by the Engineer prior to its distribution. Notices shall be printed on orange or salmon colored paper.
- C. The Contractor shall set up reusable message boards, provided by the Engineer, each morning prior to the start of the lining operation for each lining location scheduled for that day. The reusable message boards shall be set up a minimum of 500-feet outside the limits of work. The Contractor is responsible for maintaining the message boards. The Contractor shall promptly remove the message boards following the completion of work in the area.
- D. If notices are not distributed in a timely manner, or if houses are not properly noticed, the Contractor will not be permitted to perform the work. The work can only be performed once notices are properly distributed as outlined above.
- E. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to the work. The distribution and maintenance of reusable message boards by the Contractor shall be considered incidental to the work.

3.05 INSTALLATION:

- A. Each sewer shall be television inspected prior to the installation of the cured-in-place liner. The inspection shall be performed in “dry-pipe” conditions with no flow in the pipe. The pipe shall be clean and free of all obstructions prior to installation of the liner.
- B. Prior to installation of the cured-in-place pipe the Contractor shall install a hydrophilic rubber gasket on the inside of each pipe where it meets a manhole such that the hydrophilic rubber gasket is between the host pipe and the cured-in-place pipe. The annular space shall be made watertight at the ends of the liner in the manholes.
- C. The Contractor shall make television inspection camera available for confirming service connections to be reinstated. At the Engineer’s discretion, the Contractor shall dye test service connections to confirm that each service connection that should be reinstated is included on the attached Service Connection Reinstatement Certification Form. Contractor shall not reinstate inactive service connections. Contractor shall make reasonable efforts to confirm if a service is active, including review of available tie cards with the Resident Representative (Resident Representatives shall obtain available tie cards) and dye testing/television inspection of properties as required. No additional payment will be made for television inspection of mainline or service line from mainline to property in conjunction with dye testing of service connections.
- D. The Contractor shall install a pre-liner or grout infiltration sources if required to install the cured-in-place pipe. A pre-liner shall be required for pull-in-place installations of cured-in-place pipe.
- E. Installation of the cured-in-place pipe shall be in accordance with ASTM F1216, Section 7. Pull-in-Place installation of the cured-in-place pipe shall be in accordance with ASTM F1743, Section 6.
- F. After the liner has been cured in place, the Contractor shall reinstate and brush all active service connections as required by the Engineer. Branch connections to buildings shall be reinstated to a minimum of 95% of the inside diameter of the existing service connection without excavation, utilizing a remotely controlled cutting and brushing device, monitored by a video TV camera. No additional payment will be made for excavations for the purpose of reinstating connections and the contractor will be responsible for all cost and liability associated with such excavation and restoration work.
- G. The service connections to be reinstated for each inversion will be listed on the attached form (Service Connection Reinstatement Certification Form) and will be signed by an authorized representative of the Contractor.
- H. All reinstated service connections shall be sealed with grout in accordance with Section 02443, SERVICE CONNECTION REHABILITATION. The Contractor shall make certain that the annular space between the host pipe and the cured-in-place pipe is fully sealed with grout.

- I. Each sewer segment shall be television inspected after the liner installation and service grouting have been completed. The inspection shall be performed in “dry-pipe” conditions with no flow in the pipe. Post rehabilitation television inspection shall be performed prior to removing any sewer bypass equipment. Post rehabilitation television inspection shall be considered incidental to the lining process and shall not be measured separately for payment.

3.06 TESTING REQUIREMENTS:

- A. Cured-in-place pipe samples shall be prepared and tested by the Contractor in accordance with ASTM F1216 Section 8.1 unless otherwise stated in this section.
- B. The Contractor shall obtain samples for each pipe inversion.
- C. If field conditions or pipe shape prevent the Contractor from obtaining the samples as specified in ASTM F1216 Section 8.1 the samples shall be taken as required by the Engineer.
- D. An independent testing laboratory shall test the cured-in-place pipe samples and the results are to be sent directly to the Engineers Resident Project Representative within 21 calendar days following the completion of each inversion.
- E. The cost of obtaining the samples and testing shall be the sole responsibility of the Contractor and shall be considered incidental to the lining process.
- F. Inversions where the cured-in-place pipe samples that do not meet the requirements of ASTM D790 and D638 as indicated in ASTM F1216 Section 8 will be televised by the Contractor, as required by the Engineer, at no additional cost to the Owner, for review by the Engineer. Liner deemed unacceptable by the Engineer will be removed and replaced at no additional cost to the Owner.

3.07 FIELD TESTING/INSPECTION:

- A. Prior to expiration of the warranty period, during periods of high groundwater, and at a time to be approved by the Engineer, the Contractor shall clean and television inspect each of the cured-in-place pipes in accordance with Section 02440, SEWER CLEANING AND INSPECTION. The contractor shall repair any defects found in the cured-in-place pipe. Defects shall include, but not be limited to, dry spots; lifts; wrinkles; fins; delaminations; pinholes (with or without infiltration); mineral deposits; staining; and infiltration. Defects shall also include reinstated non-active service connections and reinstated connections specifically identified on the drawings to not be reinstated. Removal and replacement of cured-in-place pipe with defects shall be performed if required by the ENGINEER. Defects shall be repaired by cured-in-place pipe or short liners, as required by the ENGINEER. Short liners shall be a minimum of four (4) linear feet per defect location. The Contractor shall reseal the annular space between the sewer main and the cured-in-place pipe at manhole locations and service connections until there are no visible leaks through television inspection.

- B. All inspecting, resealing, cured-in-place lining, short lining, or other repairs within the warranty period shall be provided at no additional cost to the Owner and as required by the ENGINEER.

SERVICE CONNECTION REINSTATEMENT CERTIFICATION FORM

The Contractor shall review sewer tie cards, television inspection tapes, and perform dye tests as necessary to determine which service connections should be reinstated following installation of a Cured-in-Place Liner. Details regarding the location of each service connection that will be reinstated, including Manhole-to-Manhole reach, stationing, and clock position shall be recorded on this form.

Service Connections to be Reinstated (Clock Position)

Inversion # _____	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____
	MH _____ to MH _____	_____

The Contractor shall be responsible for reinstatement of **all active** service connections following Cured-in-Place Lining. If active service connections are found, prior to the project being complete, not to have been reinstated, the Contractor shall reinstate them within one (1) calendar day of notification, at his sole expense. If active service connections are found, at any future date, not to have been reinstated, the Contractor shall reinstate them within three (3) calendar days of notification, at his sole expense.

Contractor	_____	_____
	Signature	Date

	Print Name	

END OF SECTION

SECTION 02435

SEWER MANHOLE REHABILITATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the rehabilitation of sewer manholes as called for herein and on the drawings. It is the intent of this specification to provide for the waterproofing, sealing, and structural enhancement of existing manholes by chemical grout exterior sealing of sewer manhole inverts, walls and corbels; and by application of a uniform cementitious layer of high-quality mortar. Additional manhole rehabilitation related items include manhole root treatment, install manhole inflow dish, install manhole frame and cover, replace manhole chimney above grade and install bolted and gasketed manhole frame and covers, install internal drop connection, install plug in manhole A004-91, install plug in manhole A007-30, install plug in manhole A009-1, manhole grouting to stop leaks, and build manhole bench and invert.
- B. The work shall include: elimination of infiltration by external chemical grout sealing; removal and patching of loose and/or unsound material; cleaning and preparation of surfaces; repair of invert, bench, and walls; and chemical grout sealing of the invert, bench, walls, and pipe connections; and spray application of a cementitious mix to form a liner. Other repairs shall be completed as indicated on the drawings and described herein.
- C. The contractor shall furnish all equipment, material and labor required to perform all manhole rehabilitations described in this specification.
- D. External grouting of inverts, bench, walls, corbel, and pipe connections shall be performed prior to application of cementitious mix.
- E. Manhole inspection logs are included in Appendix A for reference.

1.02 RELATED WORK:

- A. Section 00331, TELEVISION AND MANHOLE INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS

F. Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Performance Specification Guideline for Manhole Rehabilitation

American Society for Testing and Materials (ASTM)

ASTM C32	Sewer and Manhole Brick
ASTM C94	Ready-Mix Concrete
ASTM C109	Comprehensive Strength
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
ASTM C267	Chemical Resistance
ASTM C596	Shrinkage
ASTM C666, Method A	Freeze/Thaw Resistance
ASTM D4414	Standard Practice for Measurement of Wet Film Thickness for Organic Coatings
ASTM 543	Resistance of Plastics to Chemical Reagents
ASTM 638	Tensile Properties of Plastic
ASTM 695	Comprehensive Properties of Rigid Plastics
ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics
ASTM C923	Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes

1.05 CEMENTITIOUS LINING SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, sewer manhole sealing shall be carried out in accordance with the current edition of the Performance Specification Guideline for Manhole Rehabilitation (NASSCO).
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.

- C. The locations of the cementitious lining work to be completed are as shown on the drawings.
- 1.07 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:
- A. Prior to beginning the work, submit the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Provide at least five (5) references of different projects in which at least 50 manholes have been rehabilitated by the firm within the past three (3) years.
 - 3. Description of the system, equipment and material with MSDS Data Sheets proposed for sewer manhole rehabilitation.
 - 4. Description of the system proposed for bypass pumping during the procedures to be carried out.
 - 5. Manufacturer's warranty
 - B. Refer to Section 01331, DOCUMENTATION, for required documentation to be submitted.
- 1.08 WARRANTY:
- A. The manhole rehabilitation work performed shall be warrantied against infiltration and faulty workmanship and materials for a period of one (1) year after the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 REHABILITATION MATERIALS:

All products used for lining, sealing, patching, and cleaning shall be environmentally safe. The contractor shall submit MSDS Data Sheets for all materials used.

2.02 SEALING OF INVERT, STOPPING ACTIVE LEAKS AND EXTERIOR CHEMICAL SEALING:

The contractor shall use a chemical grout that is environmentally safe for the sealing of sewers. The chemical grout shall be in accordance with Part 2, Products, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).

2.03 PATCHING MIX:

A quick-setting cementitious material shall be used as a patching mix and is to be mixed and applied according to the manufacturer's recommendation and shall have the following minimum requirements.

Compressive Strength	ASTM C-109	6 hr 1,400 psi
Shrinkage	ASTM C-596	0% AT 90% Relative Humidity

2.04 INFILTRATION CONTROL MIX:

A rapid-setting cementitious product specifically for leak control shall be used to stop water infiltration and shall be mixed and applied according to the manufacturer's recommendations and shall have the following minimum requirements.

Compressive Strength	ASTM C-109	1 hr 600 psi
Compressive Strength	ASTM C-109	24 hr 1,800 psi

2.05 LINER MIX:

- A. The cementitious liner mix shall be used to form a structural enhancing monolithic liner covering all interior manhole surfaces and shall have the following minimum requirements at 28 days:

Compressive Strength	ASTM C-109	6,000 psi
Shrinkage	ASTM C-596	0%, 90% humidity
Freeze/Thaw Resistance	ASTM C-666	No visible damage after 100 cycles

- B. The liner mix shall be applied in one monolithic layer.

2.06 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; Portland cement to hydrated lime to sand.

- D. Cement shall be Type II Portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. Sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.07 CONCRETE:

- A. Cement shall be domestic Portland cement conforming to ASTM C150, Type II.
- B. Fine aggregate shall be washed natural sand conforming to ASTM C33.
- C. Coarse aggregate shall be well graded crushed stone conforming to ASTM C33, size No. 67.
- D. No admixtures shall be used unless approved by the Engineer in writing.

2.08 WATER:

Water used in mixing shall be potable.

2.09 DELIVERY, STORAGE, AND HANDLING:

- A. Materials shall be delivered to the site in the Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. All materials shall be stored properly and in accordance with Manufacturer's instructions.

PART 3 - EXECUTION

3.01 SAMPLING AND TESTING OF LINER:

- A. The Owner reserves the right to test all materials.
- B. Products that fail to meet the requirements of these specifications shall not be incorporated in the work.

3.02 SURFACE PROTECTION:

- A. During progress of work, where appearance is important, adjacent areas or grounds which may be permanently discolored, stained, or otherwise damaged by dust and rebound, shall be adequately protected and, if contacted, shall be cleaned by early scraping, brushing or washing, as the surroundings permit.

- B. No street markings shall be removed or covered throughout the progress of work.

3.03 MANHOLE CHEMICAL ROOT TREATMENT:

The Contractor shall provide manhole chemical root treatment where indicated on the drawings. The chemical root treatment shall be in accordance with Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.

3.04 EXISTING FLOWS:

The Contractor shall divert flows as required for the work and in accordance with the requirements specified in Section 01575, HANDLING EXISTING FLOWS.

3.05 CEMENTITIOUS LINING:

A. Preparation

1. Remove all foreign material from the manhole wall and bench using a high-pressure water spray (minimum 5,000 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with quick-setting patching mix. Surfaces to be repaired shall be clean and free of loose materials. Additional surface preparation shall be as recommended by the manufacturer of the materials to be applied.
2. Leaks shall be stopped using a chemical grout, which shall be applied as per the manufacturer's recommendations. Leaks may require weep holes drilled at the manhole base to localize the infiltration during the application, after which the weep holes shall be sealed with a chemical grout and plugged with the quick-setting infiltration control mix prior to the final liner application. Areas with evidence of previous leakage (e.g., mineral deposits) shall also be grouted.
3. All pipe connections in brick and block manholes shall be grouted regardless of whether they are leaking or have signs of previous leakage. Grout ports shall be located near the pipe connections to ensure the sealing material is injected at the manhole/pipe connections. Grout ports shall also be located and drilled in the bench and invert for all brick and block manholes as necessary to seal the manhole base.

B. Invert Sealing

1. The Contractor shall carry out all work as described in the Performance Specification Guideline for Manhole Rehabilitation, Section 3.2C (NASSCO) using sealing materials and procedures accepted by the Engineer.
2. A minimum of four (4) grout ports shall be located and drilled in the manhole bench and invert of brick and block manholes as necessary to seal the invert and manhole base.

3. A quick setting patch mix shall be troweled uniformly not to exceed ½-inch, onto the damaged invert extended out onto the base of the manhole sufficiently to tie into the structurally enhanced monolithic liner to be applied.

C. Interior Sealing

1. Interior lining of the manholes shall be conducted only after all other manhole rehabilitations have been completed.
2. Unless otherwise indicated herein, the Contractor shall carry out all work as described in the Performance Specification Guideline for Manhole Rehabilitation, Section 3.2 (NASSCO) using lining materials and procedures accepted by the Engineer.
3. Preparation, as described in section 3.05A, shall be completed prior to the placement of the cementitious liner.
4. Sealant shall not be placed on a frozen surface or during freezing weather. Sealant shall not be placed when it is anticipated that the temperature during the following 24 hours will drop below 32 degrees, Fahrenheit.
5. Pipes and/or service connections shall be temporarily plugged prior to the application of the cementitious manhole interior liner. A flash coat of the liner material shall be applied three (3) inches into each service connection. Temporary plugs shall be removed once the liner has cured sufficiently to prevent erosion of the new liner.
6. Thickness shall be verified with a wet gauge at random points of the new interior surfaces as required by the Engineer. Minimum thickness of one-half (½) inch is required.
7. Application shall be with low velocity, continuous flow equipment to prevent the adverse effects of rebound. A smooth trowel finish shall be applied.
8. The Contractor shall prohibit debris from entering the invert by either covering the invert or plugging during application.

D. Digital Photographs

1. The Contractor shall take a digital photograph of the interior of each manhole, before and after rehabilitation, in JPEG format. Filenames shall contain subarea and manhole designations (e.g. "A004-19"). Digital photographs shall have a minimum resolution of 10 megapixels.

3.06 FURNISH AND INSTALL MANHOLE INFLOW DISH:

Furnish and install Southwestern Packing & Seals High Density Ethylene Hexene-1 Copolymer "Rainstopper" or approved equal at manholes as indicated on the plans.

3.07 FURNISH AND INSTALL MANHOLE FRAME AND COVER:

- A. Contractor shall excavate, remove, and dispose of existing frames and covers. The Contractor shall furnish and install new frames and covers at these locations. Manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by EJ, No. 2110A/Z; Neenah Foundry Co. R1720; Quality Products Water Products, Style 40; or approved equal.
- B. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.
- C. Area surrounding the frame shall be paved with Class I Bituminous Concrete, Type I-1, minimum 4 inches thick, to match existing road surface, in accordance with Section 02745, PAVING.

3.08 FURNISH AND INSTALL BOLTED AND GASKETED MANHOLE FRAME AND COVER:

- A. Contractor shall remove and dispose of existing frames and covers. Contractor shall furnish and install bolted and gasketed manhole frame and cover at manholes as indicated on the plans. Bolted and gasketed manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by EJ Prescott type L-9 (Massachusetts Casting) or approved equal.
- B. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.

3.09 REPLACE CHIMNEY ABOVE GRADE AND FURNISH AND INSTALL BOLTED AND GASKETED MANHOLE FRAME AND COVER:

- A. Replace Chimney Above Grade and Install Bolted and Gasketed Manhole Frame and Cover

1. Contractor shall excavate, remove, and dispose of existing manhole chimney (above grade) and manhole frame and cover (including debris, deteriorated brick, concrete, block, mortar) shall be removed and disposed of.
2. Contractor shall install brick courses to raise manhole frame and cover two (2) feet above existing grade. The bolted and gasketed manhole frame and cover shall be secured on top of the new masonry chimney section creating a watertight seal.
3. The exterior of the structure exposed above grade shall be covered with a minimum 2-inch coating of the LINER MIX. The liner mix shall be applied as described in Section 3.05 C, Interior Sealing.
4. The interior of the structure shall be coated, sealed, and paid for in accordance with Section 3.05, CEMENTITIOUS LINING.
5. Contractor shall furnish and install bolted and gasketed manhole frame and cover at manholes as indicated on the plans. Bolted and gasketed manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by EJ Prescott type L-9 (Massachusetts Casting) or approved equal.
6. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.

B. Install External Chimney Seal

1. The exterior of the structure shall be sealed with a heat shrinkable sleeve manhole encapsulation system.
2. The manhole encapsulation system shall be installed from the manhole frame joint to one (1) foot below the frame. The sleeve shall overlap the manhole frame.
3. Prior to installation of the manhole encapsulation system, the contractor shall prepare surfaces in accordance with the manufacturer's instructions. The Contractor must ensure surfaces are clean, dry, and free of frost, surface rust, foreign objects, sharp edges and projections that could damage the sleeve. All voids shall be filled with quick-setting patching mix.
4. The contractor shall install the manhole encapsulation system in accordance with the manufacturer's instructions.

5. Contractor shall furnish and install Canusa-CPS WrapidSeal Manhole Encapsulation System or approved equal.

3.10 INSTALL INTERNAL DROP CONNECTION:

- A. Internal drop connections shall be installed as required by the Engineer.
- B. The internal drop connection shall consist of an inside drop bowl and SDR 35 PVC drop pipe. Connection from drop bowl to drop pipe shall be by flexible external pipe connector. All components shall be installed as recommended by the manufacturer.
- C. A PVC elbow shall be installed at the base of the drop pipe to provide a smooth transition into channel flow.
- D. Inside drop bowl and drop pipe shall be secured in place using stainless steel clamping brackets, using a minimum of two (2) brackets and a maximum spacing of four (4) feet.
- E. Inside drop connection components shall be manufactured by RELINER/Duran, Inc. or approved equal.
- F. Existing external drop connection shall be abandoned in the manhole in accordance with Specification Section 02222, ABANDONMENT OF SEWERS.

3.11 MANHOLE GROUTING TO STOP LEAKS:

- A. The Contractor shall drill grout ports at all leaks. Chemical sealing material shall be pumped through the grout ports to seal the exterior of the manhole. Areas with evidence of previous leakage (e.g., mineral deposits) shall also be grouted. Grout ports shall be plugged with the quick-setting infiltration control mix following completing of grout installation.
- B. The Contractor shall prohibit debris from entering the invert by either covering the invert.
- C. The chemical sealing material used shall be as described in chemical sealing (grouting) materials of the NASSCO Standards Specification.
- D. The Contractor shall be aware of the potentially close proximity of grout ports to underdrain piping. The Contractor shall take care in making sure grout is not pumped into the underdrain during this process.

3.12 INSTALL PLUGS IN MANHOLE A004-91, A007-30, and A009-1

- A. The upstream 8-inch diameter sewer pipe in manholes A004-91 and A007-30 shall be plugged with cement concrete or brick masonry in accordance with Section 02222, ABANDONMENT OF SEWERS, as required by the Engineer.

- B. The upstream 18-inch diameter sewer pipe in manhole A009-1 shall be plugged with cement concrete or brick masonry in accordance with Section 02222, ABANDONMENT OF SEWERS, as required by the Engineer.

3.13 BUILD MANHOLE INVERT AND BENCH:

- A. Existing manhole bench and invert (including debris, deteriorated brick, block, and mortar) shall be removed from the bottom of the manhole and disposed of before the bench and invert are rebuilt.
- B. Bricks shall be moistened by suitable means, as required, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
- C. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as required.
- D. Channels and shelves shall be constructed of brick and concrete as shown on the Drawings. The brick lined channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Brick surfaces exposed to sewage flow shall be constructed with a nominal 2-inch by 8-inch face exposed (i.e. bricks on edge).
- E. The brick bench and invert shall conform accurately to the size of the manhole and adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.
- F. Bench and invert shall be constructed to allow television inspection camera and rehabilitation equipment to be inserted into the adjacent sewers.

3.14 REPAIR MANHOLE CHIMNEY (EXTERIOR) ABOVE GRADE, PER MANHOLE:

- A. Preparation
 - 1. Remove all foreign material from the exterior manhole chimney using a high-pressure water spray (minimum 5,000 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Replace missing or loose bricks. Fill any large voids with quick-setting patching mix. Surfaces to be repaired shall be clean and free of loose materials. Additional surface preparation shall be as recommended by the manufacturer of the materials to be applied.
- B. Exterior Sealing
 - 1. Exterior lining of the manholes shall be conducted only after all other manhole rehabilitations have been completed.

2. Unless otherwise indicated herein, the Contractor shall carry out all work as described in the Performance Specification Guideline for Manhole Rehabilitation, Section 3.2 (NASSCO) using lining materials and procedures accepted by the Engineer.
3. Preparation, as described in section 3.14A, shall be completed prior to the placement of the cementitious liner.
4. Sealant shall not be placed on a frozen surface or during freezing weather. Sealant shall not be placed when it is anticipated that the temperature during the following 24 hours will drop below 32 degrees, Fahrenheit.
5. Thickness shall be verified with a wet gauge at random points of the new interior surfaces as required by the Engineer. Minimum thickness of 2-inch is required.
6. Application shall be with low velocity, continuous flow equipment to prevent the adverse effects of rebound. A smooth trowel finish shall be applied.

3.15 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, the Contractor shall inspect each of the sewer manholes rehabilitated during this project in accordance with the Performance Specification Guideline for Manhole Rehabilitation (NASSCO) at a timetable to be approved by the Engineer. The Contractor shall repair any defects found until there are no visible leaks.
- B. All inspecting, testing, and reworking within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

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SECTION 02436

CURED-IN-PLACE LATERAL LINER

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers installation of cured-in-place lateral liners as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01330, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than two (2) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than two (2) years of experience in providing cured-in-place services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

The National Association of Sewer Service Companies (NASSCO)
Recommended Specifications for Sewer Collection System Rehabilitation
(Current Edition).

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, installation of cured-in-place lateral liners shall be carried out in accordance with ASTM F1216, Section 7.
- B. Curing of liner tube using ambient-temperature air, hot water, or steam shall be acceptable.
- C. The Contractor shall design all cured-in-place lateral liners assuming partially deteriorated pipe conditions and a groundwater height above the crown of the pipe equal to one-half (50%) of the distance between the ground surface and the invert of the lateral (at its connection to the mainline) to be rehabilitated unless otherwise noted below.
- D. Lateral liners shall be a one-piece joint-less polyester felt tube that will create a watertight seal at the mainline interface and extend continuously over the entire length of the lateral liner. Cured-in-place lateral liners in mainline pipes 20-inch diameter and smaller shall include a full wrap at the mainline.
- E. Termination of the lateral liner shall be at the property line. Lateral lining shall be accomplished without a cleanout when possible. No additional payment will be made for the installation of a cleanout. Minimum liner length shall be five (5) feet from the connection at the mainline.
- F. The Contractor may propose alternative cured-in-place processes and/or products for review and approval by the Engineer.
- G. The location of the cured-in-place lateral liners to be installed are as shown on the drawings.
- H. The Contractor shall provide MSDS for all chemicals used in the lining process.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit the following:
 - 1. Qualifications of the firm/personnel who will perform the Work.
 - 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 - 3. Description of the system, equipment and material proposed for the cured-in-place lateral liner.
 - 4. Manufacturer's warranty.

- B. Prior to beginning the work, the Contractor shall submit, a written plan for contacting homeowners whose service connections will be affected due to the installation of the liner. Such plan is subject to approval by the Engineer and the Owner.
- C. The Contractor shall submit the following information for each inversion within 21 days following completion of the liner installation.
 - Pre-inversion television inspection logs and video files (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
 - Liner order sheet describing the material ordered
 - Thermo couple log kept during inversion process (if relevant)
 - Post-inversion television inspection logs and video files (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
 - Material testing results

Information should be organized by mainline sewer segment and stationing and two (2) copies shall be delivered.

1.07 WARRANTY:

The cured-in-place lateral liner shall be warranted against infiltration and faulty workmanship and materials for one (1) year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Materials used for the cured-in-place lateral liner shall meet the requirements of ASTM F1216.
- B. Cured-in-place lateral liners shall be manufactured by Layne Inliner, LLC or approved equal.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

- A. Cleaning and inspection of the lateral shall be accomplished from the mainline pipe.
- B. The lateral shall be cleaned to the property line to ensure the lateral is ready for lining. The Contractor shall verify, prior to liner installation, that all debris has been removed from the lateral.

- C. The interior of the lateral shall be carefully inspected to determine the location of any conditions which may prevent proper installation of the lateral liner.

3.02 FLOW CONTROL:

Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 WATER FOR CONSTRUCTION PURPOSES:

Availability of water for construction purposes shall be in accordance with Section 01140, SPECIAL PROVISIONS.

3.04 NOTIFICATION:

- A. The Contractor shall affix a written notice to the door of each home that has sewer service through the lateral being lined one week prior to the lining operation and again one day before the lining operation. A notice shall also be distributed following lateral liner installation stating that the service connection has been restored to service.
- B. The written notice must be approved by the Engineer prior to its distribution.
- C. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to the lining operation.

3.05 INSTALLATION:

- A. Each lateral shall be television inspected prior to the installation of the lateral liner. The inspection shall be performed in “dry-pipe” conditions with no flow in the pipe. The pipe shall be clean and free of all obstructions prior to installation of the liner.
- B. Installation of the cured-in-place lateral liner shall be in accordance with ASTM F1216, Section 7.
- C. No additional payment will be made for excavations for the purpose of reinstating connections or repairing improperly installed liners and the contractor will be responsible for all cost and liability associated with such excavation and restoration work.
- D. The Contractor shall make certain that the connection between the mainline pipe and the lateral liner is watertight.
- E. Each lateral shall be television inspected after the liner installation has been completed. The inspection shall be performed in “dry-pipe” conditions with no flow in the pipe. Post rehabilitation television inspection shall be performed prior to removing any sewer

bypass equipment. Post rehabilitation television inspection shall be considered incidental to the lining process and shall not be measured separately for payment.

3.06 TESTING REQUIREMENTS:

- A. Cured-in-place pipe samples shall be prepared and tested by the Contractor in accordance with ASTM F1216 Section 8.1 unless otherwise stated in this section.
- B. The Contractor shall obtain samples for all liner inversions, as required by the Engineer.
- C. An independent testing laboratory shall test the cured-in-place lateral liner samples and the results are to be sent directly to the Engineers Resident Project Representative within 21 calendar days following the completion of each inversion.
- D. The cost of obtaining the samples and testing shall be the sole responsibility of the Contractor and shall be considered incidental to the lining process.
- E. Inversions where the cured-in-place lateral liner samples that do not meet the requirements of ASTM D790 and D638 as indicated in ASTM 1216 Section 8 will be televised by the Contractor, as required by the Engineer, at no additional cost to the Owner, for review by the Engineer. Liners deemed unacceptable by the Engineer will be removed and replaced at no additional cost to the Owner.

3.07 FIELD TESTING/INSPECTION:

- A. Prior to expiration of the warranty period, during periods of high groundwater, and at a time to be approved by the Engineer, the Contractor shall clean and television inspect each of the cured-in-place lateral liners. The contractor shall repair any defects found in the cured-in-place lateral liners.
- B. All inspecting and resealing or relining within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

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SECTION 02437

SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers chemical root treatment of sewer lines and manholes as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 00331, TELEVISION AND MANHOLE INSPECTION REPORTS BY THE OWNER
- B. Section 00890, PERMITS
- C. Section 01014, SCOPE AND SEQUENCE OF WORK
- D. Section 01330, SUBMITTALS
- E. Section 01331, DOCUMENTATION
- F. Section 01575, HANDLING EXISTING FLOWS
- G. Section 02435, SEWER MANHOLE REHABILITATION
- H. Section 02440, SEWER CLEANING AND INSPECTION

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Sewer Line Chemical Root Control – Technical Specifications (Duke’s Root Control)
Foaming Root Control Herbicide – Technical Specifications (Vaporooter)

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, chemical root treatment of the specified lengths of pipe and manholes shall be carried out in accordance with Foaming Root Control Herbicide – Technical Specifications (Vaporooter) of the NASSCO Specification Guidelines.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Description of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 - 3. Description of the system, equipment and material proposed for root treatment and cleaning of the pipe and manholes, including MSDS Data Sheets for all chemicals intended to be used.
 - 4. Manufacturer's warranty.
 - 5. Copy of MWRA Root Control Request Permit in accordance with Section 00890, PERMITS.
- B. Refer to Section 01331, DOCUMENTATION, for required documentation to be submitted.

1.07 WARRANTY:

- A. The Contractor shall provide a written guarantee that meets or exceeds any claims or warranties made by the manufacturer in published advertising. As a minimum, the Contractor shall guarantee that, prior to scheduled cleaning, virtually all root tissue present in the sewer pipe will be dead or unable to sustain life.

PART 2 - PRODUCTS

2.01 ROOT TREATMENT MATERIALS:

- A. The chemical root treatment material shall be EPA registered and labeled for use in sewer lines and acceptable to the state agencies having jurisdiction over its use. The Contractor shall submit a specimen product label of the material to be used in chemical root treatment to the Engineer. The chemical root treatment material shall not permanently affect parts of trees distant from the treated roots.

- B. Materials shall meet the requirements of the Foaming Root Control Herbicide – Technical Specifications (Vaporooter) of the NASSCO Specification Guidelines.

PART 3 - EXECUTION

3.01 ROOT TREATMENT:

- A. The Contractor shall carry out all preparatory work, including flow control, and apply root treatment as described in the Foaming Root Control Herbicide – Technical Specifications (Vaporooter) of the NASSCO Specification Guidelines, using treatment materials accepted by the Engineer.

3.02 ROOT CLEANING:

- A. Root cleaning shall be carried out under Section 02440, SEWER CLEANING AND INSPECTION.

END OF SECTION

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SECTION 02440

SEWER CLEANING AND INSPECTION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers cleaning and inspection of pipelines as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 00331, TELEVISION AND MANHOLE INSPECTION REPORTS PROVIDED BY THE OWNER
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS
- F. Section 02428, CURED-IN-PLACE PIPE
- G. Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT
- H. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints,
Laterals and Lateral Connections (Using the Packer Method with Solution Grouts)

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Prior to beginning work, submit the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Description of system proposed for handling existing flows during the various procedures to be carried out.
 - 3. Description of the system and equipment proposed for cleaning the pipe.
 - 4. Description of the equipment and system proposed for inspecting the pipe after cleaning.
- B. Refer to Section 01331, DOCUMENTATION for required documentation to be submitted.

PART 2 - PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.01 PIPE CLEANING:

- A. Chemical root treatment, where required, shall be applied under Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT before the cleaning operation is carried out. Sufficient time shall be allowed between the two operations as described in SEWER LINE CHEMICAL ROOT TREATMENT (FOAMING METHOD) of the NASSCO Standard Specifications.
- B. The Contractor may elect to use either high velocity jet, or mechanically powered equipment, as described in the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts). Selection of equipment shall be based upon field conditions such as access to manholes, quantity of debris, size of sewer, depth of flow, etc.
- C. All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be disposed of in accordance with all applicable regulations and in a method acceptable to the Owner. Pipe cleaning shall be performed in advance of pipe television inspection.
- D. The Contractor shall be responsible for the legal disposal of all debris removed from the sewers during the cleaning operation including any costs incurred. The Contractor shall not expect the Owner to provide a dump site.

- E. Acceptance by the Engineer of the cleaning results will be based on the results of television inspection. If the results are unsatisfactory, the Contractor shall repeat the cleaning until accepted by the Engineer at no additional cost to the Owner.

3.02 PIPE INSPECTION:

- A. Pipe shall be visually inspected by means of closed-circuit television. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture, with minimal reflective glare, for the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 400 line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer.
 - 1. Refer to Section 01331, DOCUMENTATION, in regard to external hard drives to be given to the Owner upon completion of project and before the project is accepted by the Owner.
- B. The camera shall have a remote controlled, pan and tilt type lens and lighting system capable of turning perpendicular to the direction of flow and rotating 360 degrees while inside the pipe. The camera shall be able to view a minimum service connection length of 4 feet in order to determine whether the connection is active or inactive.
- C. Electronic video equipment shall be capable of displaying and recording during the entire inspection, as a minimum, the following data for each sewer reach videotaped:
 - 1. Project identification
 - 2. Date recorded
 - 3. Sewer reach identification (street location, MH to MH)
 - 4. Footage counter
- D. The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper identification of the sewer's condition. Manual winches, power winches, television cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation the television camera will not pass through the entire sewer section, the Contractor shall re-set his equipment in a manner so that the inspection can be performed from the opposite manhole.
- E. Flow control shall be in accordance with Section 01575, HANDLING OF EXISTING FLOWS.
- F. Standing water within a sagging pipe shall be removed so that the pipe can be adequately television inspected. A minimum of 80% of the pipe shall be visible before television inspection.

- G. Removal of obstruction caused by protruding taps shall be in accordance with Section 02443, SERVICE CONNECTION REHABILITATION.

END OF SECTION

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SECTION 02442

POINT REPAIR OF GRAVITY SEWERS (OPEN-CUT)

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the point repair of gravity sewers using open cut construction methods. The Work includes furnishing all equipment, material and labor required to point repair a sewer pipe section as described herein.
- B. A point repair shall be identified as a repair made at a specified location on a sanitary sewer. The point repairs are identified on the drawings; see the television inspection reports for additional information.

1.02 RELATED WORK:

- A. Section 01575, HANDLING EXISTING FLOWS
- B. Section 01740, CLEANING UP
- C. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- D. Section 02252, SUPPORT OF EXCAVATION
- E. Section 02300, EARTHWORK
- F. Section 02745, PAVING
- G. Section 02920, LOAMING and SEEDING

1.03 QUALITY ASSURANCE:

The Work described herein shall be performed by a company with not less than two years of experience in providing the required services, employing experienced supervisory personnel.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO) Specifications Guidelines for Sewer Collection System Maintenance & Rehabilitation.

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

Prior to beginning the Work, submit the following:

1. Qualifications of the firm/personnel who will perform the Work.
2. Description of system proposed for handling existing flows, if necessary.
3. Description of the system, equipment and material proposed, including the source and name of manufacturer.
4. Specifications and Data Sheets of all materials to be used, including a list of applicable ASTM standards.
5. Material and structural details of the point repair method proposed, including typical cross-sections and strength calculations.
6. Prior to beginning the work, the Contractor shall submit, a written plan contacting homeowners in close proximity to excavations. Such plan is subject approval by the Engineer and Owner.

PART 2 - PRODUCTS

2.01 GENERAL:

All workmanship and materials used for making point repairs shall be of the highest quality. The materials shall be the products of a manufacturer actively engaged in research, development and manufacturing of said materials.

2.02 REPAIR PIPE:

The repair pipe shall be POLYVINYL CHLORIDE GRAVITY PIPE as specified in Section 02085. The inside diameter of the replacement pipe size shall be the same as the existing pipe.

2.03 JOINT MATERIALS:

When connecting together joints of plain-end spigot pipe, suitable adaptors shall be used for joining dissimilar pipe materials. The adapters shall be Fernco couplings, or approved equal. All materials shall pass the strength and chemical requirements of current ASTM requirements. Adapters and methods of connecting pipes shall be approved by the Engineer. The Contractor shall submit to the Engineer descriptive literature and materials on the adaptors and connection method he proposes to use.

2.04 BUILDING CONNECTIONS:

1. Any building connection replaced during a point repair shall conform to pipe manufacturer's recommendations and specifications and applicable ASTM specifications, for furnishing and installing the building connection. The connection materials shall be similar to the connecting sewer.
2. When connecting a PVC sewer service to a cured-in-place pipe, suitable adaptors shall be used. The adapters shall be Inserta Tee or approved equal. All materials shall pass the strength and chemical requirements or current ASTM requirements. Adapters and methods of connecting pipes shall be approved by the Engineer. The Contractor shall submit to the Engineer descriptive literature and materials on the adaptors and connection method he proposes to use.

2.05 SEALING OPEN JOINTS:

Any open joint to be sealed during a point repair shall be yarned, wiped and encased with concrete. The encasement shall be centered on the joint, have a minimum thickness of six (6) inches of concrete, and have a minimum length equal to the pipe diameter, but not less than twelve (12) inches. Any alternative method for sealing open joints shall be submitted to the Engineer for approval.

PART 3 - EXECUTION

3.01 SAFETY:

The Contractor shall perform all work in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements regarding confined space entry.

3.02 NOTIFICATION:

- A. The Contractor shall notify residents in proximity to excavations prior to the start of work. Notices shall be distributed no later than the Friday before the work is scheduled. The Engineer will accompany the Contractor during noticing. The Contractor shall affix, using tape, a written notice to the door of each home to ensure that the notice will not blow away. The Contractor shall take a photo of every distributed notice to document that the notice was properly distributed. If the Engineer is unavailable at the time of noticing, the Contractor must submit photos of each notice issued.
- B. The written notice must be approved by the Engineer and the Newton Police Department prior to its distribution. Notices shall be printed on orange or salmon colored paper. Where applicable, the Contractor shall add information about site restoration.
- C. On short and dead-end streets, the Contractor shall notice all houses on the street.

- D. On long streets, the Contractor is required to over-notice. Over-noticing shall include at a minimum, any part of the street where equipment will be parked or temporarily stockpiled, or where a resident will be disturbed by noise and/or vibration from the work. The Contractor shall coordinate with the Engineer regarding limits for over-noticing per location.
- E. The Contractor shall set up reusable message boards, provided by the Engineer, a minimum of two (2) days prior to performing work in the area. The reusable message boards shall be set up a minimum of 500-feet outside the limits of work. The Contractor is responsible for maintaining the message boards. The Contractor shall promptly remove the message boards following the completion of work in the area.
- F. If notices are not distributed in a timely manner, or if houses are not properly noticed, the Contractor will not be permitted to perform the work. The work can only be performed once notices are properly distributed as outlined above.
- G. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to the work. The distribution and maintenance of reusable message boards by the Contractor shall be considered incidental to the work.

3.03 POINT REPAIR METHOD:

The method by which the point repair shall be made shall include all supervision, labor, equipment and materials necessary to perform and successfully complete the following items of work:

1. Excavate a trench deep enough to uncover the gravity sewer line and wide enough and long enough to work in, in accordance with the latest OSHA requirements.
2. Remove any existing fences, base material, storm sewers, water mains, and other items that interfere with the repair made at each specific point, and replace the fences, base material, storm sewers, water mains, and other removed items in the same or better condition than found, as determined by the Engineer.
3. Replace and reshape the bottom of the trench so that the grade of the pipe replaced will match that required for the existing sewer. Any material replaced in the bottom of the trench shall be tamped so as to prevent sags in the sewer due to settlement of trench material. If the material in the bottom of the trench is not stable, the Contractor shall stabilize the trench bottom by placing suitable materials at the request of the Engineer.
4. Repair and replace the section of damaged sewer identified in Appendix A herein. The damaged section of pipe shall be removed and a replacement section of PVC pipe shall be spliced in its place, using Fernco couplings at each end of the splice.

5. Repair and replace any service wye or tee encountered within the required point repair, or any service wye or tee connection or service line judged to be a source of infiltration/inflow by the Engineer. All service lines broken by the Contractor shall be replaced by the Contractor at his expense.
6. Seal open joints exposed within the pipe excavation, where the barrel of the pipe is still satisfactory but the joints are not. Any roots in open joints shall be removed before sealing. Determination as to whether or not roots exist shall be made by the Engineer. The materials to use when sealing open joints are listed in subsection 2.05.
7. Connect all newly laid sewer pipe to existing pipe, and main sewer lines to services, so that no possible source of infiltration/inflow (a leak) may be created. When applicable, the main sewer shall be cut so that a smooth plain-end spigot exists at both ends of the trench and connected, as specified in subsection 2.03. The materials used to make the tie-ins shall be properly sized as specified in section 2.01. Any sewer broken by the Contractor shall be replaced at the Contractors expense. All such occurrences shall be pointed out to the Engineer.
8. Backfill the excavation, and replace the trench pavement as specified in Section 02745, so that the finished elevation will match the natural ground elevation and no ponding will occur after the backfilled material has settled.
9. Clean up the area as specified in Section 01740 CLEANING UP.
10. Prior to connecting to a sewer service, the existing sewer service shall be televised to the building using a color “push” camera as described in Specifications Section 02530, BUILDING CONENCTIONS AND DROP CONNECTIONS.

3.04 REPLACE SEWER SERVICE:

The method by which the sewer service is replaced shall include all supervision, labor, equipment and materials necessary to perform and successfully complete the following items of work:

1. The Contractor shall replace the sewer service with 6-inch diameter PVC in accordance with Specifications Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.
2. The Contractor shall replace the mainline section of sewer pipe (and underdrain pipe if relevant) with PVC pipe on each end of the installed PVC wye, a minimum repair length of four (4) feet, unless the mainline is cured-in-place pipe and shall connect to the existing mainline pipe (and underdrain pipe if relevant) using Fernco couplings, as described in Section 3.03 above. The mainline section of sewer pipe (and underdrain if relevant) shall be replaced with the same diameter pipe that is currently in place.

3.05 INSTALL SEWER MANHOLE COMPLETE:

The method by which the sewer manhole is installed shall include all supervision, labor, equipment and materials necessary to perform and successfully complete the following items of work:

1. The Contractor shall replace the existing stub or lamphole structures with new sewer manholes in accordance with Section 02631 PRECAST MANHOLES.

3.06 ABANDONMENT:

- A. If a decision is made by the Engineer in the field that a point repair will not satisfactorily correct the problem, or if the Contractor excavates at the required location and does not find the source of the problem, the Engineer shall verify the condition, declare the point repair to be abandoned and the excavation shall be backfilled.
- B. At such time as the point repair has been declared abandoned, the Engineer shall determine how to proceed or whether to reclassify the sewer for further investigation.

3.07 FIELD JUDGEMENTS:

At any time during a point repair, the Engineer shall make field judgements which shall govern the point repair process until such time that the specifications will again prevail. Field judgements shall include the following situations and any other questionable situation that may arise:

1. Determination of the length of sewer pipe to repair.
2. Determination of method of payment for additional work outside the original point repair area.
3. Determination of dewatering requirements.
4. Determination of abandonment.
5. By-pass pumping of sewage.
6. Determination of the amount of asphalt, concrete driveway, curb or sidewalk, or any other surface feature to be replaced.

3.08 BY-PASS PUMPING:

On all point repairs, the normal flow of sewage shall be re-routed by by-pass pumping so as not to interrupt the flow of sewage to the treatment plant. By-pass pumping shall be as specified in Section 01575 HANDLING OF EXISTING FLOWS.

3.09 RESTORATION:

- A. The Contractor shall replace all streets, roadways, sidewalks, and driveways which may be removed, disturbed, or damaged in connection with his operation under this Contract. The Contractor shall reconstruct same to the original lines and grades and in such a manner as to leave all such surfaces in fully as good or better condition than that which existed prior to his operations. The re-use of materials removed in making excavations will be permitted in the manner described, provided said materials are in good condition and are acceptable to the Engineer.
- B. In easements and other unpaved areas, the Contractor shall return the area as close as is practicable to its original condition to the satisfaction of the Engineer, at no additional cost to the Owner.

3.10 INSPECTION:

- A. Prior to the end of the warranty period, the section of pipe where the point repair is located shall be television inspected for defects in accordance with Section 02440, SEWER CLEANING AND INSPECTION.

END OF SECTION

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SECTION 02443

SERVICE CONNECTION REHABILITATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the rehabilitation of service connections, including cutting of protruding services, television inspection and testing of services, and grouting of services as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 00331, TELEVISION AND MANHOLE INSPECTION LOGS
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS
- F. Section 02428, CURED-IN-PLACE PIPE

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workmen and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts)

American Society of Testing and Materials (ASTM)

ASTM F2454 Standard Practice for Sealing Lateral Connections and Lines from the Mainline Sewer Systems by the Lateral Packer Method, Using Chemical Grouting

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, service connection rehabilitation shall be carried out in accordance with Lateral Connection Sealing from the Mainline by Packer Injection Grouting, Section 3.10, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- C. The location of the service connection rehabilitations are indicated on the drawings.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 - 3. Description of the system, equipment and material proposed for the service connection rehabilitations.
 - 4. Manufacturer's warranty.
 - 5. Submit MSDS Data Sheets for proposed chemicals to be used.
- B. Refer to Section 01331, DOCUMENTATION, for documentation required to be submitted.

1.07 WARRANTY:

- A. The service connection rehabilitations shall be warrantied against infiltration and faulty workmanship and materials for one year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 CHEMICAL GROUT:

- A. The Contractor shall use chemical grout which is environmentally safe for the sealing of sewers. The chemical sealing materials shall be used in accordance with Part 2, Products, of the latest edition of NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts). All other products used for sealing, patching and cleaning of sewers shall also be environmentally safe.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

- A. Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION.

3.02 FLOW CONTROL:

- A. Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 CUTTING OF PROTRUDING SERVICE CONNECTIONS:

- A. The Contractor shall cut protruding service connections where called for on the drawings. The protruding services shall be cut flush with the wall of the sewer, using either a lateral cutter or grinder.
- B. After the protruding services are cut, the service connections shall be grouted in accordance with paragraph 3.06 of this Section. No additional payment shall be made for grouting service connections.

3.04 EQUIPMENT TESTING:

- A. The Contractor shall perform an above ground demonstration test in a test cylinder with the same diameter as the proposed pipe being tested to simulate a pipe leak. The setup shall have a valve and pressure gauge to simulate leaks and monitor pressure. The tests shall be performed in accordance with ASTM F2454, Standard Practice for Sealing Lateral Connections and Lines from the Mainline Sewer Systems by the Lateral Packer Method, Using Chemical Grouting, Section 11.3.3, Initial Testing.
- B. The pressure displayed by the testing equipment shall be within ± 0.5 psi of the gauge pressure to pass successfully. The void pressure should drop to within ± 0.5 psi of the pre-test pressure displayed by the testing equipment after the pressure is released to pass successfully. Test pressures shall be between 7 and 10 psi.

- C. If the demonstration test cannot be performed successfully, the Contractor shall repair or modify the equipment and perform the test again until the results are satisfactory to the Engineer
- D. The Contractor shall perform the demonstration test for each chemical sealing unit prior to the equipment being used on the Project. Additional tests may be required by the Engineer at various times during the Project.

3.05 TELEVISION INSPECTION AND TESTING OF SERVICE CONNECTIONS:

- A. The Contractor shall television inspect and test service connections where called for on the drawings. Television inspection of services shall utilize a pan and tilt camera which shall inspect a minimum of 4 feet of the service connection from the main sewer.
- B. Pressure Testing: Air testing is accomplished by isolating the area to be tested with the packer and applying positive pressure into the isolated VOID area. VOID area shall include a minimum 3 feet of service connection pipe.
- C. Pressure testing shall be carried out in accordance with Section 3.7, Lateral Connection Testing Procedure, of the latest edition of NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).
- D. Pressure testing shall be equal to 0.5 psi per vertical foot of pipe depth plus 2 psi; however, test pressure shall not exceed 10 psi. Once the designated pressure in the isolated void is displayed on the meter of the control panel, the application of air pressure will be stopped and a 15 second waiting period will commence. If the void pressure drop is greater than 2.0 psi within 15 seconds, the lateral shall be considered to have failed the air test.
- E. The television inspection and testing equipment shall be capable of inspecting and testing 4-inch, 5-inch and 6-inch diameter service connections.
- F. If the service fails the pressure test, the service shall be grouted in accordance with paragraph 3.06 of this Section and retested.

3.06 GROUTING OF SERVICE CONNECTIONS:

- A. The Contractor shall grout service connections where indicated on the drawings or when a service fails the pressure test, as described in paragraph 3.05 of this Section. The Contractor shall grout all service connections reinstated as described in Section 02428, CURED-IN-PLACE PIPE regardless of the results of the pressure test. Grouting of service connections shall be carried out in accordance with Section 3.10, Lateral Connection Sealing from the Mainline by Packer Injection Grouting, of the NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).

- B. When pumping grout commences, operate the pump until a minimum back pressure of 8 psi is achieved.
- C. The grouting equipment shall be capable of grouting 4-inch, 5-inch and 6-inch diameter service connections.
- D. The chemical sealing materials shall be as described in Part 2, Products of the latest edition of NASSCO Suggested Standard Specification for Pressure Testing and Grouting of Sewer Joints, Laterals and Lateral Connections (Using the Packer Method with Solution Grouts).
- E. If a service connection becomes clogged with grout, the Contractor shall clear the grout from the lateral. This work shall be done at no additional cost to the Owner.

3.07 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, an initial test sample of approximately 10% of the original service connection rehabilitation work will be selected and approved by the Engineer. The test sample will consist of sewers from throughout the project area that are representative of the sealing work originally performed. The Contractor shall television inspect and test all previously grouted service connections within the initial test sample as specified in paragraph 3.05 of this Section. Any service connections failing the re-test shall be re-grouted as specified in paragraph 3.06 of this Section. If the failure rate in the initial test sample is less than 10%, the work will be considered satisfactory and no further testing will be required.
- B. If the failure rate in the initial test sample equals or exceeds 10%, an additional 15% test sample will be selected and approved by the Engineer. If the failure rate in the additional test sample is less than 10%, the work will be considered satisfactory and no further testing will be required. No previously tested service connection can be included in the additional test sample.
- C. If the failure rate in the additional test sample equals or exceeds 10%, the Contractor shall television inspect and test 100% of the service connections.
- D. Any remaining service connection rehabilitation work not television inspected and tested as part of a test sample shall be television inspected. The Contractor shall repair any defects found and shall re-grout the services until there are no visible leaks through television inspection.
- E. Television inspecting, testing, and re-grouting of service connections shall be performed prior to the expiration of the warranty period, during periods of high groundwater and at a time to be approved by the Engineer.
- F. All inspecting, re-testing, and re-grouting shall be provided at no additional cost to the Owner and shall be completed within the warranty re-test period.

END OF SECTION

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SECTION 02518

TRACER TAPE

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers the furnishing, handling and installation of tracer tape, as called for on the drawings.

1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Manufacturer's literature on the materials, colors and printing specified herein, shall be submitted to the Engineer for review.
- B. Tape samples shall also be submitted to the Engineer for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Tracer tape shall be by Reef Industries, Houston, TX; Empire Level, Mukwonago, WI; Pro-Line Safety Products Co., W. Chicago, IL; or approved equal.

2.02 TRACER TAPE:

- A. Tracer tape shall be at least 3-inches wide.
- B. Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers. The metallic tracer tape shall be a minimum 5-mil thick and must be locatable at a depth of 18-inches with ordinary pipe locaters.
- C. Tracer tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.
- D. The tape shall bear the wording: "BURIED DRAIN LINE BELOW" (with "DRAIN" replaced by "WATER", "SEWER", "ELECTRICAL", "GAS", "TELEPHONE", or "CHEMICAL" as appropriate), continuously repeated every 30-inches to identify the pipe.
- E. Tape colors shall be as follows, as recommended by the American Public Works Association (APWA):

Electric	Red
Gas & Oil	Yellow
Communications	Orange

Water	Blue
Sewer & Drain	Green
Chemical	Red (not APWA)

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Tracer tape shall be installed directly above the pipe or conduit it is to identify, approximately 12-inches below the proposed ground surface.
- B. The Contractor shall follow the manufacturer's recommendations for installation of the tape, as approved by the Engineer.

END OF SECTION

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SECTION 02530

BUILDING CONNECTIONS AND
DROP CONNECTIONS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers furnishing of all materials and labor to construct building sewer connections and drop connections as indicated on the Drawings, and as herein specified.
- B. Final location of building connections shall be determined in the field by the Engineer.

1.02 RELATED WORK:

- A. Section 01331, DOCUMENTATION
- B. Section 01575, HANDLING EXISTING FLOWS
- C. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- D. Section 02300, EARTHWORK
- E. Section 02324, ROCK EXCAVATION AND DISPOSAL
- F. Section 02518, TRACER TAPE
- G. Section 02531, SEWER CHIMNEYS
- H. Section 02533, CONNECTIONS TO EXISTING STRUCTURES
- I. Section 02631, PRECAST MANHOLES
- J. Section 03302, FIELD CONCRETE

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330
SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Shop drawings and manufacturers literature of the materials of this section shall be submitted to the Engineer for review.
- B. Shop drawings of any special connections, including the proposed adapters for service connections, shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Pipe and fittings for drop connections and for gravity building connections shall be as specified under Section 02085 POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS. Adaptors shall be as recommended by the pipe manufacturer.
- B. Concrete for encasement shall be as specified in Section 03302 FIELD CONCRETE.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Building Connections

- 1. Building connections shall be installed using the same construction and pipe joining techniques as specified in Section 02085 POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS.

B. Existing Active Building Connection Replacement

- 1. The Contractor shall affix a written notice to the door of each home that has sewer service to be disconnected and reinstated 48-hours prior to disconnection of the service and again the day of disconnection. A completion notice shall also be distributed following reconnection of the sewer service.
- 2. The written notice must include an approximation of the time that the service will be bypass pumped and the notice be approved by the Engineer prior to its distribution. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to construction.
- 3. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575 HANDLING EXISTING FLOWS.
- 4. Once the new mainline is available for connection, the existing service pipeline shall be removed at or near the property line and replaced as described below.
- 5. Building connections shall be installed using the same construction and pipe joining techniques as specified in Section 02085 POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS.
- 6. In general, new connections shall be carried to the existing building connection at or near the property line. Final connection between the new and existing piping shall be made. If no existing service is present, the end of the new connection pipe shall be closed with PVC stoppers jointed in place to ensure against infiltration into the sewer line.

7. Where building connection changes line and grade, a cleanout shall be installed as required by the Engineer.
8. Prior to connecting to the new sewer service, the existing sewer service shall be televised (starting at the property line upstream to the building) using a color “push” camera. The condition of the service shall be documented in the same manner as a mainline sewer and in accordance with section 02440, SEWER CLEANING AND INSPECTION. Documentation shall be in accordance with section 01331, DOCUMENTATION. Each video shall be labeled with the street address of inspected sewer service.

B. DROP CONNECTIONS:

1. When the invert of a pipe entering a manhole is 24 inches or more above the invert of the lowest pipe leaving the manhole, it shall be connected to the manhole with an outside drop section. The manhole shall be constructed in the normal manner except that a straight-through clean-out pipe shall be connected through the manhole wall.
2. The drop pipe shall be the same diameter, material, and class as the sewer pipe entering the manhole, unless otherwise noted in the drawings. After installation of the outside drop section and pipe connections into the manhole, the entire vertical, outside assembly shall be encased in concrete, as shown on the drawings, using concrete with strength of at least 3000 psi.

END OF SECTION

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SECTION 02531

SEWER CHIMNEYS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing all equipment, materials and labor to provide and install sewer chimneys as shown on the Drawings and described herein. Final locations of the chimneys shall be as determined in the field by the Engineer.

1.02 RELATED WORK:

- A. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- B. Section 02089, DUCTILE IRON PIPE AND FITTINGS FOR SEWERS
- C. Section 02300, EARTHWORK
- D. Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS

1.03 SYSTEM DESCRIPTION:

The sewer chimney shall be designed and installed such that it provides a direct positive connection from the mainline pipe to the building connection, will withstand the required pressure tests after backfilling, and will not be adversely affected by local settlement after completion and acceptance by the Owner. Ductile iron tees shall be used in the mainline at each location of the chimney as indicated in the detailed drawings.

1.04 REFERENCES:

- A. The following standards form a part of these specifications, as referenced:

American Society for Testing & Materials (ASTM)

- | | | |
|------|-------|--|
| ASTM | D1557 | Test for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb. Rammer and 18-inch Drop. |
| ASTM | D3034 | Specification for Type PSM Poly (Vinyl-Chloride) (PVC) Sewer Pipe and Fittings. |

American Water Works Association (AWWA)

- | | | |
|------|------|---|
| AWWA | C900 | Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch, for Water Distribution. |
|------|------|---|

AWWA C110 Ductile -Iron and Gray-Iron Fittings

AWWA C151 Ductile-Iron Pipe

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330
SUBMITTALS, SUBMIT THE FOLLOWING:

Shop drawings and manufacturers literature of the materials of this section shall be submitted to the Engineer for review.

PART 2 - PRODUCT

2.01 CHIMNEYS:

- A. Chimneys shall consist of a DI push on tee and minimum 6-inch PVC pipe extending vertically from the mainline pipe to the local building connection elevation. The pipe and fittings shall be SDR 35 or heavier. A wye shall be placed at the top of the riser and a PVC plug cleanout shall be provided at the top of the fitting for future cleaning of the chimney.
- B. The riser pipe shall be protected during installation with an 18-inch diameter ABS ribbed pipe section or equivalent encasement, as shown on the Drawings or approved by the Engineer, to prevent damage to the pipe or movement of the pipe during the backfilling operation. The encasement shall be supported independently of the mainline pipe at the base.
- C. If the Contractor decides to replace the PVC pipe with DI Pipe, it will be permitted at no additional cost to the Owner.
- D. Building connection piping from the chimney to the property line shall be in accordance with Section, 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Unless otherwise indicated, at locations designated by the Engineer to receive sewer chimneys, crushed stone shall be placed and compacted in maximum 6-inch lifts from the bottom of the trench to the top of the mainline pipe.
- B. The Contractor shall install the sewer chimney piping and then backfill carefully to avoid dislocating or damaging the chimney piping.
- C. The completed chimney shall be tested with and subject to the same test requirements as the sewer main to which it is attached.

END OF SECTION

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SECTION 02533

CONNECTIONS TO EXISTING STRUCTURES

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall furnish materials, tools, labor and equipment to cut suitable openings into the existing sewer manholes, make connections to existing sewers and all other work necessary to direct the existing sewage flow as indicated on the drawings and as herein specified.

1.02 RELATED WORK:

Section 02631, PRECAST MANHOLES

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF THE GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Prior to start of work, submit details of the methods proposed for doing the work and for maintaining the sewage flow as herein specified.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. The Contractor shall provide temporary plugs or provide other suitable means for maintaining the new sewer free of sewage flow until such time as it can be inspected and tested for leakage.
- B. Connections to the new sewer shall be made when required by the Engineer and only after the new pipeline has been inspected and has successfully passed the leakage test.
- C. The Contractor shall modify each existing structure for installation of the necessary piping, but in so doing shall confine the cutting to the smallest amount possible consistent with the work to be done.
- D. All new piping connected to existing structures shall be encased in concrete in a manner satisfactory to the Engineer.
- E. All work shall be done with the proper tools and by careful workmen competent to do work.

- F. The Contractor shall cut, reshape and fill the existing manhole tables and plug existing outlets as indicated on the drawings and as required by the Engineer, to accommodate the new connections. Reshaped manhole invert channels shall be smoothly shaped to permit the flow of sewage. Manhole invert channels shall be reconstructed as specified under Section 02631, PRECAST MANHOLES.

END OF SECTION

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SECTION 02631

PRECAST MANHOLES

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all precast manholes complete, including, but not limited to, bases, walls, cones, mortar, inverts, frames and covers.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02745, PAVING
- C. Section 03302, FIELD CONCRETE

1.03 SYSTEM DESCRIPTION:

- A. Precast sections shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as required by the Engineer.
- B. All manholes shall have concrete bases. Concrete bases shall be precast unless otherwise specified. Invert channels shall be formed of brick and mortar upon the base.
- C. Riser and cone sections shall be precast concrete.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM A48	Gray Iron Castings
ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
ASTM C478	Precast Reinforced Concrete Manhole Sections

ASTM C923 Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes

ASTM C1244 Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M198 Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

Occupational Safety and Health Administration

OSHA 29 CFR 1910.27 Fall Prevention Protection

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Manufacturer's literature of the materials of this section.
- B. Test reports as required by the Engineer.

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE SECTIONS:

- A. All precast concrete sections shall conform to ASTM C478 with the following exceptions and additional requirements:
 - 1. The wall thickness of precast sections shall be as designated on the drawings, meeting the following minimum requirements:

<u>Section Diameter (Inches)</u>	<u>Minimum Wall Thickness (Inches)</u>
48	5
60	6

- 2. Type II cement shall be used except as otherwise approved.
- 3. Sections shall be steam cured and shall not be shipped until at least five days after having been cast.
- 4. Minimum compressive strength of concrete shall be 4000 psi at 28 days.
- 5. No more than two lift holes may be cast or drilled in each section.

6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of each precast section.
 7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
 8. Circumferential steel reinforcement in walls and bases shall be a minimum of 0.12 sq. in./lin. ft. for 4-foot diameter sections and 0.15 sq. in./lin. ft. for 5- and 6-foot diameter sections. Reinforcing shall extend into tongue and groove.
- B. Conical reducing sections shall have a wall thickness not less than 5-inches at the bottom and wall thickness of 8-inches at the top. Conical sections shall taper from a minimum of 48-inches diameter to 24 or 30-inches diameter at the top, as shown on the drawings.
 - C. Except where insufficient depth of cover dictates the use of a shorter base, bases shall be a minimum of 4 feet in height.
 - D. Slab top sections and flat riser sections (Grade Rings) shall conform to the contract drawings, with particular attention focused upon the reinforcing steel and be designed to meet or exceed an HS-20 Loading requirement.
 - E. The tops of the bases shall be suitably shaped by means of accurate ring forms to receive the riser sections.
 - F. Precast sections shall be manufactured to contain wall openings of the minimum size to receive the ends of the pipes, such openings being accurately set to conform with line and grade of the sewer or drain. Subsequent cutting or tampering in the field, for the purpose of creating new openings or altering existing openings, will not be permitted except as required by the Engineer.
 - G. The exterior surfaces of all precast manhole bases, walls, and cones shall be given a minimum of one shop coat of bituminous dampproofing.
 - H. The Engineer reserves the right to reject any unsatisfactory precast section and the rejected unit shall be tagged and removed from the job site immediately.
 - I. The Engineer may also require the testing of concrete sections as outlined under Physical Requirements in ASTM C478 with the Contractor bearing all testing costs.

2.02 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.

- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as required by the Engineer and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; Portland cement to hydrated lime to sand.
- D. Cement shall be Type II Portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. The sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.03 FRAMES, GRATES, COVERS AND STEPS:

- A. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
- B. All castings shall be thoroughly cleaned and may be subject to a careful hammer inspection at the Engineer's discretion.
- C. Castings shall be ASTM A48 Class 30B or better.
- D. The surface of the manhole covers shall have a diamond pattern with the cast words "WATER," "DRAIN" or "SEWER," whichever is appropriate.
- E. Manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by EJ No. 2110 (formerly LK110A); Neenah Foundry Co. R1720; Quality Water Products, Style 40; or approved equal.
- F. Manhole steps shall conform to ASTM C478 requirements and shall be fabricated of either extruded aluminum or steel reinforced plastic. Steps shall be uniformly spaced at a maximum of 12-inches unless otherwise shown on the drawings.

2.04 SEWER MANHOLE ACCESSORIES:

- A. Gasket materials shall be top grade (100% solids, vulcanized) butyl rubber and shall meet or exceed AASHTO M-198.

- B. Couplings at the manhole-pipe interface shall be made with a rubber seal system (with or without stainless steel straps) meeting the requirements of ASTM C923 and recommended for this type of connection.
- C. Stubs installed as specified and indicated on the drawings shall be short pieces of the same class pipe as that entering the manhole and shall have either stoppers or end caps as shown on the drawings. Stoppers or end caps shall be especially designed for that application.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. PRECAST SECTIONS:

1. Precast bases shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300 EARTHWORK, at least 6-inches thick, but shall vary to the depth necessary to reach sound undisturbed earth.
2. Precast reinforced concrete sections shall be set vertical and with sections in true alignment.
3. Butyl rubber joint sealant shall be installed between each concrete section. Catch basin sections do not require joint sealant if so indicated on the drawings.
4. All holes in sections used for handling the sections shall be thoroughly plugged with mortar. Mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

B. BRICK WORK:

1. Bricks shall be moistened by suitable means, as required, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
2. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
3. The brick inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.

C. CASTINGS:

1. Cast iron frames and covers shall be as specified. The frames and covers shall be set by the Contractor to conform accurately to the grade of the finished pavement, existing ground surface, or as indicated on the drawings. Frames shall be adjusted to meet the street surface.
2. Cast iron manhole frames and covers not located in paved areas shall be set 6-inches above finished grade, at a height as required by the Engineer, or as indicated on the drawings. The top of the cone shall be built up with a minimum of 1 course and a maximum of 5 courses of brick and mortar used as headers for adjustment to final grade.
3. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.
4. Covers shall be left in place in the frames, for safety reasons, except while work is being performed.

D. ACCESSORIES:

1. Accessories shall be installed in accordance with manufacturer's instructions.
2. Stubs shall be set accurately to the dimensions indicated on the drawings. Stubs shall be sealed with suitable watertight plugs.

3.02 LEAKAGE TESTS:

- A. Leakage tests shall be made by the Contractor and observed by the Engineer on each manhole. The test shall be by vacuum or by water exfiltration as described below:

B. VACUUM TEST:

1. The vacuum test shall be conducted in accordance with ASTM C1244. Test results will be judged by the length of time it takes for the applied vacuum to drop from 10 inches of mercury to 9 inches. If the time is less than that listed in Table 1 of ASTM C1244, the manhole will have failed the test. Test times from Table 1 are excerpted below.

TABLE 1

Minimum Test Times for Various Manhole Diameters

<u>Depth (Feet)</u>	<u>Diameter (Inches)</u>		
	48	60	72
	<u>Times (Seconds)</u>		
0-12	30	39	49
12-16	40	52	67
16-20	50	65	81
20-24	59	78	97
26-30	74	98	121

2. If the manhole fails the initial test, the Contractor shall locate the leaks and make proper repairs. Leaks may be filled with a wet slurry of accepted quick setting material. If the manhole should again fail the vacuum test, additional repairs shall be made, and the manhole water tested as specified below.

3.03 CLEANING:

All new manholes shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

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SECTION 02745

PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall furnish all labor, materials and equipment and shall replace the pavements as indicated on the drawings and as herein specified.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01562, DUST CONTROL
- C. Section 02300, EARTHWORK
- D. Section 02631, PRECAST MANHOLES

1.03 SYSTEM DESCRIPTION:

A. GENERAL

The types of pavement systems to be utilized on this project are as follows:

TYPE 1. PERMANENT TRENCH PAVEMENT

PAVEMENT SCHEDULE

B. PAVEMENT TYPE A (Requires Controlled Density Fill)

Areas shall be paved with a minimum of 6-inches pavement thickness, to match existing pavement thickness. As soon as practical, after the installation of individual pipeline segments, the contractor shall install permanent binder course trench pavement, minimum 6-inches thick. Maximum pavement thickness per course shall not exceed 2-inches. The permanent binder course trench pavement shall be maintained a minimum of 90 days prior to cold planing. The trench (plus 12-inch cutback on all sides) is to be cold planed to remove 2-inches of the pavement. The areas shall then be overlaid with a permanent top course pavement, 2-inches thick. Cold planing and permanent pavement shall be performed only with the approval of the Engineer.

C. PAVEMENT TYPE B

Areas shall be paved with a minimum of 4-inches pavement thickness, to match existing pavement thickness. As soon as practical, after the installation of individual pipeline segments, the contractor shall install permanent binder course trench pavement, minimum 4-inches thick. Maximum pavement thickness per course shall not exceed 2-inches. The permanent binder course trench pavement shall be maintained a minimum of 90 days prior to cold planing. The trench (plus 12-inch cutback on all sides) is to be cold planed to remove 2-inches of the pavement. The areas shall then be overlaid with a permanent top course pavement, 2-inches thick. Cold planing and permanent pavement shall be performed only with the approval of the Engineer.

1.04 REFERENCES

The following standards form a part of these specifications and indicate the minimum standards required:

American Society for Testing and Materials (ASTM)

ASTM D1557 Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 Pound Rammer and 18-Inch Drop

Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges

MassDOT 403	Reclaimed Base Course
MassDOT 405	Gravel Base Course
MassDOT 420	Hot Mix Asphalt Base Course
MassDOT 460	Hot Mix Asphalt Pavement
MassDOT 476	Cement Concrete Pavement
MassDOT 860	Reflectorized Pavement Markings

Federal Specifications

SS-S-1401 Sealants, Joint, Non-Jet-Fuel-Resistant, Hot Applied, for Portland Cement and Asphalt Concrete Pavement

AASHTO Standard Specifications for Materials and Methods of Sampling and Testing

1.05 SUBMITTALS: IN ACCORDANCE WITH SECTION 01330, SUBMITTALS, SUBMIT THE FOLLOWING:

Complete job mix formula shall be submitted to the Engineer at least two weeks before any of the work of this section is to begin.

PART 2 - PRODUCTS

2.01 GRAVEL SUBBASE:

- A. Gravel subbase shall consist of inert material that is hard durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials.
- B. Gradation requirements for gravel subbase shall be as specified in Section 02300, EARTHWORK for Gravel Borrow.

2.02 RECLAIMED SUBBASE:

- A. Reclaimed subbase shall consist of crushed asphalt pavement, crushed cement concrete, and gravel borrow (as specified in paragraph 2.02) uniformly pre-mixed.
- B. Reclaimed subbase mixtures shall be within the composition limits in accordance with MassDOT M1.11.0, with constituents that conform to Table A, below.
- C. The approved source of reclaimed pavement borrow material shall be processed by mechanical means. The equipment for producing crushed material shall be of adequate size and with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner as to minimize segregation of particle sizes. All reclaimed pavement borrow material shall come from approved stockpiles.

2.03 HOT MIX ASPHALT PAVEMENT:

- A. Pavements shall consist of hot mix asphalt.
- B. Pavement mixtures shall be within the composition limits of base courses, binder courses, top courses and surface treatment, in accordance with MassDOT M3.11.03, with constituents that conform to Table A, below.

TABLE A
PERCENT BY MASS PASSING SIEVE DESIGNATION

Standard Sieves (in.)	Reclaimed Subbase	Base Course	Binder Course	Top Course	Mod. Top Course	Surface Treat.
3 in	100					
2 in		100				
1-1/2 in	70-100					
1 in		57-87	100		100	
3/4 in	50-85		80-100		95-100	
5/8 in				100		
1/2 in		40-65	55-75	95-100	79-100	
3/8 in				80-100	68-88	100
No.4	30-60	20-45	28-50	50-76	48-68	80-100
No.8		15-33	20-38	37-49	33-46	64-85
No.16				26-40	20-40	46-68
No.30		8-17	8-22	17-29	14-30	26-50
No.50	8-24	4-12	5-15	10-21	9-21	13-31
No.100				5-16	6-16	7-17
No.200	0-10	0-4	0-5	2-7	2-6	3-8
Binder		4-5	4.5-5.5	5.6-7.0	5.1-6	7-8

Percentages shown for aggregate sizes are stated as proportional percentages of total aggregate for the mix.

Unless authorized by the Engineer, no Job-Mix Formula will be approved which specifies:

- More than 45% passing No. 8 for Top and Dense Binder Courses
- More than 38% passing No. 8 for Modified Top Course
- More than 55% passing No. 8 for Dense Mix
- Less than 4% passing No. 200 for Top Course.
- Less than 6% bitumen for Top Course.

- C. The joint sealant shall be a hot poured rubberized emulsified asphalt sealant meeting the requirements of FS SS-S-1401.
- D. The tack coat shall be an asphalt emulsion, RS-1 if required, conforming to MassDOT Section M3.03.0.

2.04 SEAL COAT:

- A. Seal coats shall be within the composition limits for protective seal coat emulsion in accordance with MassDOT M3.03.3.

- B. Silica sand when blended with seal coat emulsion shall be No. 30 silica sand.

2.05 PAVEMENT MARKINGS:

- A. Pavement markings shall conform to the requirements of MassDOT 860.
- B. The mixture of the marking material shall be within the composition limits for reflectorized pavement markings as described in the MassDOT Specifications as follows:
 - 1. Thermoplastic reflectorized pavement markings - M7.01.03/04.
 - 2. Fast drying traffic paint - M7.01.10/11.
- C. Application of the glass beads to be used as reflector material on the striping shall conform to Sections 860.62 and M7.03.07 of the MassDOT Specifications.

2.06 PAINT FOR PARKING LOTS

- A. Paint for parking lot lines shall conform to Federal Specification TT-P-115-E Type 1. Paint shall be 11-3 PPG Industries, Pittsburgh, PA or approved equal.

PART 3 - EXECUTION

3.01 GENERAL:

Paving courses required for the project shall be as shown on the drawings and as specified herein. Pavement thicknesses specified are measured in compacted inches. If a pavement course thickness exceeds 2-1/2 compacted inches, the course shall be installed in multiple lifts with each lift not exceeding 2-1/2 compacted inches in thickness.

3.02 GRAVEL SUBBASE:

- A. The gravel subbase to be placed under pavement shall consist of 12-inches of gravel evenly spread and thoroughly compacted.
- B. The gravel shall be spread in layers not more than 4-inches thick, compacted measure. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by ASTM D1557 Method C at optimum moisture content.

3.03 RECLAIMED SUBBASE:

- A. The reclaimed borrow material to be placed under the pavement shall consist of 12-inches of reclaimed borrow material evenly spread and thoroughly compacted.
- B. The reclaimed borrow material shall be spread and compacted in layers not exceeding 4-inches thick, compacted measure, except the last layer of reclaimed pavement borrow material shall be 2-inches thick, compacted measure. All layers shall be compacted to not

less than 95 percent of the maximum dry density of the material as determined by ASTM D1557 Method C at optimum moisture content.

3.04 PERMANENT BITUMINOUS PAVEMENT:

- A. The bituminous paving mixture, equipment, methods of mixing and placing, and the precautions to be observed as to weather, condition of base, etc., shall be in accordance with MassDOT 460.
- B. BASE COURSE AND BINDER COURSE PAVEMENT:
 - 1. Immediately prior to installing the base and/or binder course, the trimmed edges shall be made stable and unyielding, free of loose or broken pieces and all edges shall be thoroughly broomed clean. Contact surfaces of trench sides, curbs, manholes, catch basins, or other appurtenant structures in the pavement shall be painted thoroughly with a uniform coating of asphalt emulsion (tack coat), just before any mixture is placed against them.
 - 2. The binder course shall be repaired as necessary to maintain the surface of the pavement until placement of the permanent overlay. If required, the Contractor shall place a leveling course before placing the permanent overlay.
- C. TOP COURSE OR SURFACE TREATMENT PAVEMENT (PERMANENT OVERLAY):
 - 1. Top course or surface treatment shall be placed over the trench or full width as shown on the drawings or as specified.
 - 2. Prior to placement of the top course or surface treatment, the entire surface over which the top course or surface treatment is to be placed shall be broom cleaned and tack coated.
 - 3. Top course or surface treatment pavement placed over trenches may be feathered to meet existing paved surfaces, if approved by the Engineer.
 - 4. Prior to placing full width top course or surface treatment pavements, keyways shall be cut in all intersecting streets.

3.05 COLD PLANING:

- A. The Contractor shall remove bituminous concrete pavement by use of an approved "cold planer" equipment to a depth sufficient to apply an overlay of 2-inches of bituminous concrete pavement. Existing pavement shall be removed to a depth of 2-inches.
- B. The equipment shall be capable of accurately and automatically establishing profile grades along each edge of the machine by referencing from the existing pavement by means of a

ski or matching shoe from an independent grade control and shall have an automatic system for controlling cross slope at a given rate.

- C. The machine shall be equipped with an integral loading means to immediately remove material being cut from the surface of the roadway and discharge cuttings into a truck, all in one operation. All planing machinery shall be equipped with dust-control devices to prevent any dust produced in the cutting operation from escaping into the air.
- D. The bituminous surfaces being planed and profiled shall be removed to a depth, width, grade and cross section required by the Engineer. Loose material resulting from the operation shall be the property of the Owner unless otherwise required by the Engineer.
- E. The planed surface shall provide a smooth riding surface free from severe gouges, continuous grooves, ridges, oil film and other imperfections of workmanship and shall have a uniform surface appearance exclusive of broken or cracked underlying pavement.
- F. All existing pavement around castings shall be removed with hand cold planing equipment or by the use of hand tools if necessary. Any castings damaged or disturbed shall be removed and replaced as required by the Engineer, at the Contractor's expense.

3.06 PAVEMENT PLACEMENT:

- A. Unless otherwise permitted by the Engineer for particular conditions, only machine methods of placing the pavement shall be used. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture true to line, grade, width and crown. The mixtures shall be placed and compacted only at such times as to permit proper inspection and checking by the Engineer.
- B. After the paving mixtures have been properly spread, initial and intermediate compaction shall be obtained by the use of steel wheel rollers having a weight of not less than 240 pounds per inch width of tread.
- C. Final rolling of the top course or surface treatment pavement shall be performed by a steel wheel roller weighing not less than 285 pounds per inch width of tread at a mix temperature and time sufficient to allow for final smoothing of the surface and thorough compaction.
- D. Immediately after placement of top course or surface treatment pavement, all joints between the existing and new top course or surface treatment pavements shall be sealed with hot poured rubberized asphalt joint sealant.
- E. Where there is no backing for the edges of the curb-to-curb pavement, the Contractor shall provide a gravel transition. The gravel transition shall be installed immediately after the pavement is placed, shall be feathered and extend a minimum of 18-inches, and shall be compacted using the same equipment as for pavement compaction. The gravel shall be uniformly graded material with a maximum size of 3/8- to 1/2-inch.

- F. When required by the Engineer, the Contractor shall furnish and install additional paving to provide satisfactory transition for driveways and walkways impacted by a new curb-to-curb pavement installation. The transition installation will be considered incidental to the curb-to-curb pavement installation.

3.07 ADDITIONAL PAVING:

- A. If the Engineer determines that the existing bituminous concrete pavement on local streets is thicker than the permanent pavement specified herein, the Contractor may be required to install hot mix asphalt to obtain the depth of the existing pavement.
- B. If for the installation of full width paving, the Engineer determines that the existing road surface requires additional leveling pavement, then the Contractor shall install additional hot mix asphalt to bring the section to proper line and cross section. Additional paving required to restore the proper line and cross section of binder course installed by the Contractor which has become rough and uneven shall be furnished and installed at the expense of the Contractor.

3.08 PARKING LOTS AND DRIVEWAYS:

- A. Pavement shall consist of a 2-inch binder course and a 1-1/2-inch top course on a 12-inch gravel sub-base. All thicknesses are compacted thicknesses.
- B. Adjacent concrete work, slate work, sidewalks, structures, etc., shall be protected from stain and damage during the entire operation. Damaged or stained areas shall be replaced or repaired to equal their original condition.
- C. All joints between binder and top course shall be staggered a minimum of 6-inches.
- D. After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has cooled and hardened sufficiently to prevent distortion and loss of fines, and in no case in less than 6 hours.
- E. Smoothness of all areas of the finished surface shall not vary more than 1/4-inch when tested with a 16 foot straight-edge, applied both parallel to and at right angles to the centerline of the paved area. At building entrances, curbs, and other locations where an essentially flush transition is required, pavement elevation tolerance shall not exceed plus or minus 1/8-inch. Irregularities exceeding these amounts, or which retain water on the surface, shall be corrected by removing the defective work and replacing or repairing it to the satisfaction of the Engineer.
- F. The surface area to be seal coated, as shown on the drawings, shall be swept and air cleaned. The first coat shall be applied with eight (8) pounds of #30 silica sand blended with each gallon of emulsion applied at a rate of 0.15 gallons per square yard. The second coat shall be a straight sealer applied at the rate of 0.1 gallons per square yard.

- G. The Contractor shall prepare the pavement surface for painting lines according to the recommendations of the paint manufacturer. Applied markings shall have clean-cut edges, true and smooth alignment and uniform film thickness of 15 mils, +/- 1.0. The Contractor shall be responsible for removing, to the satisfaction of the Engineer, tracing marks, and spilled paint applied in an unauthorized area.

3.09 RAISING AND ADJUSTING CASTINGS:

- A. In areas of permanent top course paving, existing municipally-owned catch basin and manhole castings and valve boxes shall be raised to the proper grade where required by the Engineer.
- B. Castings owned by private utilities shall be raised by their own forces. The Contractor shall be responsible for coordinating this work.
- C. The method of adjusting these castings shall be as follows: Cut around catch basin or manhole castings a minimum of 8-inches from casting. Excavate and if required rebuild up to 12-inches of masonry below the bottom of the casting. Backfill with suitable material and compact to bottom of casting. Place high, early strength cement or bituminous concrete collar, as directed, to approximately 1½-inches below the raised casting grade. Masonry work shall conform to Section 02631, PRECAST MANHOLES.
- D. In some areas, raising of castings may not be required. Where required by the Engineer, castings not to be raised shall have at least 12-inches of bituminous concrete pavement chipped and removed around the casting. New bituminous concrete pavement shall be placed and compacted around such castings to approximately 1-1/2-inches below the top of the casting. The overlay course shall then be sloped down to the level of the casting.
- E. The method of raising valve boxes shall be as follows: Cut around valve box a minimum of 8-inches from valve box. Excavate as required and raise the valve box. Pour high early strength cement or bituminous concrete collar, as directed, to approximately 1-1/2-inches below the top of the valve box.
- F. Castings which need to be raised or adjusted to complete permanent curb to curb paving shall be done immediately prior to paving.

3.10 PAVEMENT MARKINGS:

- A. The Contractor shall replace all pavement markings removed or covered-over in carrying out the work, and as required by the Engineer, no sooner than 48 hours after completion of permanent pavement. The markings shall be 4-inches wide, white or yellow, single or double lines as required.
- B. When required by the Engineer, the Contractor shall provide temporary markings at no additional cost to the Owner.

3.11 PAVEMENT REPAIR:

- A. If required in the contract or if permanent pavement becomes rough or uneven, permanent pavement patches and trenches shall be repaired and brought to grade utilizing "infrared" paving methods following completion of the construction.
- B. The Contractor performing the work shall use care to avoid overheating the pavement being repaired.
- C. Pavement repair shall extend a minimum of 6-inches beyond all edges of the pavement patch to assure adequate bonding at the pavement joints.

END OF SECTION

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SECTION 02771

CURBING

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers furnishing and installation of granite curb, hot mix asphalt curb and precast parking curb, where required, as shown on the Drawings and herein specified.
- B. This section also covers replacement of curbing removed during construction.

1.02 RELATED WORK:

- A. Required earthwork is specified under Section 02300 EARTHWORK.
- B. Section 02745, PAVING.
- C. Section 02775, SIDEWALK CONSTRUCTION AND REPLACEMENT

1.03 REFERENCES:

The following standards form a part of these specifications, as referenced:

Massachusetts Department of Transportation (MassDOT) Standard Specifications for
Highways and Bridges

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

Shop drawings, showing dimensions of typical curb sections.

PART 2 - PRODUCTS

2.01 GRANITE CURBING:

- A. Granite curbing shall be Type VAI conforming to Subsection M9.04.1 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges.
- B. Special shapes and corners shall be supplied as required.

2.02 GRANITE EDGING:

- A. Granite edging shall be Type SB conforming to Subsection M9.04.2 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges.

- B. Special shapes and corners shall be supplied as required.

2.03 HOT MIX ASPHALT CURB

Curb shall conform to Subsection M3.11.6 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges.

2.04 PRECAST PARKING LOT CURB:

- A. Precast parking lot curb shall be formed with concrete rated at 3500 psi at 28 days.
- B. The manufacturer shall maintain at the manufacturing site a record of material used and their sources, and a copy of concrete mix designs.
- C. Precast parking lot curb shall be the Standard Precast Bumper Curb as manufactured by Durastone Co., Lincoln, RI, or approved equal.

PART 3 - EXECUTION

3.01 GRANITE CURBING:

- A. Removal and resetting and/or removal and replacing of granite curbing shall be in accordance with Section 580 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges. The curbing shall have a 7-inch reveal unless otherwise required by the Engineer.
- B. Except as modified herein or on the drawings, installation of curbing shall conform to Section 500 of the MassDOT Standard Specifications for Highways and Bridges.
- C. Excavation shall be made to the bottom of the 6-inch gravel base below the curbing, the trench being sufficiently wide to permit thorough tamping. The base shall be compacted to a firm, even surface and shall be approved by the Engineer.
- D. The curbing shall be set on edge and settled into place with a heavy wooden hand-rammer, to the line and grade required, straight and true for the full depth. The joints of the stone curbing shall be pointed with mortar for the full depth of the curbing. At approximately 50-foot intervals, a 1/2-inch joint shall not be filled with mortar but left free for expansion. The ends of the stone curbing at driveways and intersections shall be cut at a bevel or rounded as required by the Engineer.
- E. The trench for the stone curbing shall be backfilled with approved material; the first layer to be 4-inches in depth, thoroughly rammed; the other layers to be more than 6-inches in depth and thoroughly rammed until the trench is filled.
- F. Where indicated on the plans, or as required, drainage openings shall be made through the curbing at the elevations and of the size required.

3.02 GRANITE EDGING:

- A. Except as modified herein and on the drawings, installation of granite edging shall conform to Section 500 of MassDOT Standard Specifications for Highways and Bridges.
- B. The cement concrete base shall be placed on a well-tamped sub-base acceptable to the Engineer, and shall be constructed of 3000 psi concrete, minimum, as shown on the drawings.
- C. The edging shall be set to the proper lines and grades on the concrete base and on a well-tamped sloping gravel surface.

3.03 HOT MIX ASPHALT CURB:

- A. Replacement of hot mix asphalt curbs shall be in accordance with Section 500 of the latest edition of the MassDOT Standard Specification for Highways and Bridges and all amendments thereto. The curbing shall have a 6-inch reveal unless otherwise required by the Engineer.
- B. Unless modified herein, installation shall conform to Section 501.64 of the MassDOT Standard Specifications for Highways and Bridges.
- C. When indicated on the plans, or as directed, drainage openings shall be made through the curb at the elevations and of the size required.

3.04 PRECAST PARKING LOT CURBING:

- A. Precast parking lot curbing shall be furnished and installed as indicated on the drawings.
- B. Any units, which are cracked, chipped, spalled, or otherwise damaged, shall be removed and replaced with units meeting the specified requirements.

END OF SECTION

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SECTION 02775

SIDEWALK CONSTRUCTION AND REPLACEMENT

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall furnish all labor, materials, equipment, and incidentals required to restore gravel sidewalks and/or construct new or replacement hot mix asphalt or cement concrete sidewalks where required or where existing sidewalks are disturbed by the Contractor, as shown on the drawings and described herein. The Contractor shall also furnish all materials and install pedestrian curb ramps where shown on the drawings or as required by the Engineer.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02771, CURBING

1.03 REFERENCES:

The following standards form a part of these specifications, as referenced:

Massachusetts Department of Transportation (MassDOT)
Standard Specifications for Highways and Bridges

Section 701 Cement Concrete Sidewalks, Pedestrian Curb Ramps and Driveways

Section 702 Hot Mix Asphalt Sidewalks and Driveways

Code of Massachusetts Regulations (CMR)

521 CMR 24 Ramps

1.04 SUBMITTALS:

- A. In accordance with Section 01330 SUBMITTALS, the Contractor shall submit shop drawings and/or materials specifications for each component of the work to be performed under this section of the Specifications.

1.05 SYSTEM DESCRIPTION:

A. GRAVEL SIDEWALKS:

Gravel sidewalks shall be restored to a condition at least equal to that existing immediately before the work was started.

B. HOT MIX ASPHALT AND CEMENT CONCRETE SIDEWALKS AND PEDESTRIAN CURB RAMPS:

1. Except as otherwise indicated, hot mix asphalt and cement concrete sidewalks and pedestrian curb ramps shall be constructed in accordance with the requirements of Sections 701 and 702 of the latest edition of the MassDOT Standard Specifications for Highways and Bridges, and all amendments thereto.
2. Pedestrian curb ramps shall be installed in new sidewalks at intersections in accordance with 521 CMR 24 and Mass DOT Section 701. When curbs or sidewalks are constructed or reconstructed on one side of the street, curb cuts shall also be installed on the opposite sides of the street, where there is a pedestrian path of travel. Curb cuts shall be located within the crosswalk and/or the pedestrian path of travel.

C. Water boxes, manhole frames, and all other castings shall be carefully set to the proposed finished grade.

D. Sidewalks shall not be less than 48-inches in width, excluding curbing. An unobstructed path of travel shall be provided which is at least 36-inches clear, excluding curbing.

PART 2 - PRODUCTS

2.01 HOT MIX ASPHALT SIDEWALKS :

- A. Sidewalks shall consist of hot mix asphalt.
- B. Hot mix asphalt shall conform to the requirements of MassDOT M3.11.6.

2.02 CEMENT CONCRETE SIDEWALKS AND PEDESTRIAN CURB RAMPS:

- A. Cement concrete sidewalks shall be constructed with air entrained Cement Concrete with a minimum compressive strength of 4000 psi at 28 days.
- B. Cement concrete shall conform to the requirements of MassDOT M4.02.

PART 3 - EXECUTION:

3.01 HOT MIX ASPHALT SIDEWALKS:

- A. The subgrade for the sidewalks shall be shaped parallel to the proposed surface of the sidewalks and shall be thoroughly rolled and tamped. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard for a gravel foundation to be placed upon it.
- B. The hot mix asphalt sidewalk shall be a minimum of 2½ compacted inches thick, laid in two equal courses. The sidewalk pitch shall be 3/16-inch per foot of width or shall match the existing sidewalk.

3.02. CEMENT CONCRETE SIDEWALKS AND PEDESTRIAN CURB RAMPS:

- A. Concrete for sidewalks and pedestrian curb ramps shall be a minimum of 4-inches thick. At driveways, the sidewalks shall be 6-inches thick.
- B. The subgrade for the walk or driveway shall be shaped to a true surface conforming to the proposed slope of the walk, thoroughly rolled at optimum moisture content and tamped with a power roller weighing not less than one ton and not more than 5 tons. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard.
- C. After the subgrade has been prepared as hereinbefore specified, a subbase of gravel borrow at optimum moisture content shall be placed, thoroughly rolled by a power roller, and tamped. The gravel borrow shall be a minimum of 8-inches in thickness.
- D. The forms for sidewalks shall be smooth, free from warp, strong enough to resist springing out of shape, and deep enough to conform to the thickness of the proposed walk. All mortar or dirt shall be completely removed from forms that have been previously used. The forms shall be well staked, thoroughly braced, and set to the established lines with their upper edge conforming to the grade of the finished walk. The finished walk shall have sufficient pitch from the outside to the edge of the walk to provide for surface drainage. This pitch shall be ¼-inch per foot unless otherwise required by the Engineer. Before the concrete is placed, the subbase for sidewalks shall be thoroughly dampened until it is moist throughout but without puddles of water.
- E. Concrete shall be conveyed from the place of mixing to the place of deposit in such a manner that no mortar will be lost, and the composition of the mix shall be uniform, showing neither excess nor lack of mortar in any one place. The consistency shall be such that water will float to the surface under heavy tamping. The concrete shall be placed as close to its final position as practicable and thoroughly consolidated, with precautions taken not to overwork it while it is still plastic. The concrete shall be thoroughly spaded along the forms or screeds to eliminate voids and honeycombs at the edges. Retempering of concrete will not be permitted.

- F. Concrete shall be placed in alternate slabs not exceeding 30 feet in length. Slabs shall be separated by transverse preformed expansion joint filler ½-inch thick. The surface of all concrete sidewalks shall be uniformly scored into block units of not more than 40 square feet. The depth of the scoring shall be at least one quarter of the thickness of the sidewalk.
- G. When concrete sidewalks are constructed adjacent to curbing, building foundations, retaining walls, light pole bases or fixed structures, ½-inch thick premolded joint filler shall be used between the newly constructed sidewalk and the structure.
- H. Finishing of the concrete surface shall be done by experienced and competent cement finishers as soon as is practicable. Finishing shall be delayed until all bleed water and water sheen has left the surface and the concrete has begun to stiffen. The concrete surface shall be finished as directed with a steel trowel or wood float to give a smooth, uniform, and attractive surface finish and uniformly scored into block units or areas of not more than 36 square feet. Following this, the Contractor shall draw a nylon push broom lightly over the surface to produce a non-slip surface. Application of neat cement to the surface to hasten hardening is prohibited.
- I. The Contractor shall protect the newly placed concrete surface against vandalism and marking or defacing and must stand ready to replace any blocks which, in the opinion of the Engineer, are excessively marked or defaced, at no additional cost to the Owner. When completed the walks shall be kept moist and protected from traffic and weather for at least 3 days.
- J. Adequate protection shall be provided where temperatures of 40°F or lower occur during placing of concrete and during the early curing period. The minimum temperature of fresh concrete after placing and for the first 3 days shall be maintained above 55°F. In addition to the above requirements, an additional 3 days of protection from freezing shall be maintained.

END OF SECTION

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SECTION 02920

LOAMING AND SEEDING

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers all labor, materials, and equipment necessary to do all loaming, seeding and related work as indicated on the drawings and as herein specified. All lawns disturbed by the Contractor's operations shall be repaired as herein specified.

1.02 RELATED WORK: N/A

1.03 QUALITY ASSURANCE:

- A. For a particular source of loam, the Engineer may require the Contractor to send approximately 10 pounds of loam to an approved testing laboratory and have the following tests conducted:

1. Organic concentration
2. pH
3. Nitrogen concentration
4. Phosphorous concentration
5. Potash concentration

- B. These tests shall be at the Contractor's expense. Test results, with soil conditioning and fertilizing recommendations, shall be forwarded to the Engineer.

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Information detailing the seed mixes, fertilizers, mulch material, slope protection material (if required) and origin of loam.
- B. Test results.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. LOAM:

1. Loam shall be a natural, fertile, friable soil, typical of productive soils in the vicinity, obtained from naturally well-drained areas, neither excessively acid nor alkaline, and containing no substances harmful to grass growth. Loam shall not be delivered to the

site in frozen or muddy condition and shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter.

2. The loam shall contain not less than 4 percent nor more than 20 percent organic matter as determined by the loss of weight by ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F.

B. LIME:

Lime shall be standard commercial ground limestone containing at least 50 percent total oxides (calcium oxide and magnesium oxide), and 50 percent of the material must pass through a No. 100 mesh sieve with 98 percent passing a No. 2 mesh sieve.

C. FERTILIZER:

Fertilizer shall be commercial fertilizer, 10-10-10 fertilizer mixture containing at least 40 percent of organic nitrogen. It shall be delivered to the site in the original sealed containers, each showing the manufacturer's guaranteed analysis. Fertilizer shall be stored so that when used it will be dry and free flowing. No fertilizer shall be used which has not been marketed in accordance with State and Federal Laws, relating to fertilizers.

D. MULCH:

1. Materials to be used in mulching shall conform to the following requirements:
2. Straw Mulch - Straw Mulch shall consist of stalks or stems of grain after threshing.
3. Wood Fibre Mulch - Wood Fibre Mulch shall consist of wood fibre produced from clean, whole uncooked wood, formed into resilient bundles having a high degree of internal friction and shall be dry when delivered to the project.

E. SEED:

1. Seed shall be of an approved mixture, the previous year's crop, clean, high in germinating value, a perennial variety, and low in weed seed. Seed shall be obtained from a reliable seed company and shall be accompanied by certificates relative to mixture purity and germinating value.
2. Grass seed for lawn areas shall conform to the following requirements:

	Proportion by Weight	Germination Purity	Purity Minimum
Chewing's Fescue	30%	70%	97%
Kentucky 31 Fescue	30%	90%	98%
Kentucky Blue Grass	20%	80%	85%
Domestic Rye Grass	20%	90%	98%

Grass seed for cross-country areas, slopes and other areas not normally mowed shall conform to the following requirements:

	Proportion by Weight	Germination Minimum	Purity Minimum
Creeping Red Fescue	50%	85%	95%
Kentucky 31	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

F. TEMPORARY COVER CROP:

1. Temporary cover crop shall conform to the following requirements:

	% Weight	Germination Minimum
Winter Rye	80 min.	85%
Red Fescue (creeping)	4 min.	80%
Perennial Rye Grass	3 min.	90%
Red Clover	3 min.	90%
Other Crop Grass	0.5 max.	
Noxious Weed Seed	0.5 max.	
Inert Matter	1.0 max.	

G. SLOPE EROSION PROTECTION:

1. Erosion control blanket shall be 100% degradable plastic mesh with 100% degradable straw or straw/coconut fill. Fill shall be held together by degradable fastening. Weight shall be 0.50 lb/sq. yd. Erosion control blankets shall be applied parallel to direction of water flow. The erosion control blankets shall be by North American Green, Evansville, IN or approved equal. For slopes 2:1 or greater, Model SC150 shall be used. For slopes less than 2:1, Model S150 shall be used.
2. Six-inch wire staples shall be placed according to manufacturers recommendations to anchor the mesh material. Staples shall be designed to decompose.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION:

- A. After approval of rough grading, loam shall be placed on areas affected by the Contractor's operations. Loam shall be at least 6-inches compacted thickness.

- B. Lime shall be applied to bring the pH to 6.5 or, without a soil test, at the rate of 2-3 tons of lime per acre.
- C. Fertilizer shall be applied according to the soil test, or without a soil test, at the rate of 1000 pounds per acre.
- D. Loam shall be worked a minimum of 3-inches deep, thoroughly incorporating the lime and fertilizer into the soil. The loam shall then be raked until the surface is finely pulverized and smooth and compacted with rollers, weighing not over 100 pounds per linear foot of tread, to an even surface conforming to the prescribed lines and grades. Minimum depth shall be 6-inches after completion.

3.02 SEEDING:

- A. Seeding shall be done when weather conditions are approved as suitable, in the periods between April 1 and May 30 or August 15 to October 1, unless otherwise approved.
- B. If there is a delay in seeding, during which weeds grow or soil is washed out, the Contractor shall remove the weeds or replace the soil before sowing the seed, without additional compensation. Immediately before seeding is begun, the soil shall be lightly raked.
- C. Seed shall be sown at the approved rate, on a calm day by machine.
- D. One half the seed shall be sown in one direction and the other half at right angles. Seed shall be raked lightly into the soil to a depth of 1/4-inch and rolled with a roller weighing not more than 100 pounds per linear foot of tread.
- E. The surface shall be kept moist by a fine spray until the grass shows uniform germination over the entire area. Wherever poor germination occurs in areas larger than 3 sq. ft., the Contractor shall reseed, roll, and water as necessary to obtain proper germination.
- F. The Contractor shall water, weed, cut and otherwise maintain and protect seeded areas as necessary to produce a dense, healthy growth of perennial lawn grass.
- G. If there is insufficient time in the planting season to complete the fertilizing and seeding, permanent seeding may be left until the following planting season, at the option of the Contractor or as required by the Engineer. In that event, a temporary cover crop shall be sown. This cover crop shall be cut and watered as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into the soil, the area shall be fertilized and the permanent seed crop shall be sown as specified.

3.03 PLACING MULCH:

- A. Straw Mulch shall be loosely spread to a uniform depth over all areas designated on the plans, at the rate of 4-1/2 tons per acre, or as otherwise required.

- B. Straw Mulch may be applied by mechanical apparatus, if in the judgment of the Engineer the apparatus spreads the mulch uniformly and forms a suitable mat to control slope erosion. The apparatus shall be capable of spreading at least 80 percent of the hay or straw in lengths of 6-inches or more, otherwise it shall be spread by hand without additional compensation.
- C. Wood Fibre Mulch shall be uniformly spread over certain selected seeded areas at the minimum rate of 1,400 pounds per acre unless otherwise required. It shall be placed by spraying from an approved spraying machine having pressure sufficient to cover the entire area in one operation.

3.04 SEEDING AND MULCHING BY SPRAY MACHINE:

- A. The application of lime, fertilizer, grass seed and mulch may be accomplished in one operation by the use of an approved spraying machine. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of lime, fertilizer, grass seed and mulch shall be equal to the specified quantities.
- B. A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of limestone, fertilizer, grass seed and mulch per 100 gallons of water.
- C. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above. If the results of the spray operation are unsatisfactory, the Contractor will be required to abandon this method and to apply the lime, fertilizer, grass seed and mulch by other methods.

3.05 INSPECTION AND ACCEPTANCE:

At the beginning of the planting season following that in which the permanent grass crop is sown, the seeded areas will be inspected. Any section not showing dense, vigorous growth at that time shall be promptly reseeded by the Contractor at his own expense. The seeded areas shall be watered, weeded, cut and otherwise maintained by the Contractor until the end of that planting season, when they will be accepted if the sections show dense, vigorous growth.

END OF SECTION

SECTION 03302

FIELD CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers concrete and all related items necessary to place and finish the concrete work.
- B. Concrete thrust, and anchor blocks, to be provided at all water main bends, tees, plugs and wyes and at other locations required by the Engineer shall be installed in accordance with the details shown on the drawings and as specified in this section.
- C. Concrete encasement for piping with shallow cover and for encasement of telephone, and electrical duct bank when specified shall be installed in accordance with the details shown on the drawings and as specified in this section.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK

1.03 REFERENCES:

- A. The following standards form a part of this specification:

American Concrete Institute (ACI)

- ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
- ACI 305 Recommended Practice for Hot Weather Concreting
- ACI 306 Recommended Practice for Cold Weather Concreting
- ACI SP-66 ACI Detailing Manual
- ACI 318 Building Code Requirements for Reinforced Concrete

American Society for Testing and Materials (ASTM)

- ASTM A615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- ASTM C33 Concrete Aggregates
- ASTM C94 Ready-Mixed Concrete

ASTM C143 Test for Slump of Portland Cement Concrete

ASTM C150 Portland Cement

ASTM C260 Air Entraining Admixtures for Concrete

ASTM C494 Chemical Admixtures for Concrete

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01330 SUBMITTALS, SUBMIT THE FOLLOWING:

Statement of materials constituting the design of mixes for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the Contract.

PART 2 - PRODUCTS

2.01 CONCRETE:

- A. All concrete, reinforced or non-reinforced shall have a 28 day compressive strength of 3000 psi unless otherwise noted on the design drawings. A minimum of 5.5 sacks of cement per cubic yard and a maximum water cement ratio of 6.9 gallons per sack shall be used.
- B. Concrete shall conform to ASTM C94. The Contractor shall be responsible for the design of the concrete mixtures. Slump shall be a maximum of 4-inches and a minimum of 2-inches, determined in accordance with ASTM C143.
- C. Admixtures shall be as specified in subsection 2.05. No additional admixtures shall be used unless approved by the Engineer.
- D. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.

2.02 CEMENT:

The cement shall be an approved brand of American manufactured Portland Cement, Type II conforming to the applicable requirements of ASTM C150.

2.03 AGGREGATES

- A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.
- B. Maximum size aggregate shall be 3/4-inch.

2.04 ADMIXTURES:

- A. All concrete (unless otherwise directed) shall contain an air entraining agent. Air entrained concrete shall have air content by volume of 4 to 8 percent for 3/4-inch aggregate.
- B. Air entraining agent shall be in accordance with ASTM C260 and shall be Darex AEA, as manufactured by W.R. Grace & Company; Placewel (air entraining Type), as manufactured by Johns Manville; Sika AER as manufactured by Sika Chemical Company; or an approved equal product.
- C. Water reducing agent shall be WRDA, as manufactured by W.R. Grace & Company; Placewel (non-air entraining Type), as manufactured by Johns Manville; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.
- D. Water reducing agent-retarder shall be "Daratard," as manufactured by W.R. Grace & Company; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.

2.05 WATER:

- A. Water for concrete shall be potable, free of deleterious amounts of oil, acid, alkali, organic matter and other deleterious substances.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or the material which would tend to reduce the bond.
- B. Earth, concrete, masonry, or other water permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed.
- C. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

3.02 THRUST AND ANCHOR BLOCKS:

- A. Minimum bearing areas for thrust blocks and dimensions of anchor blocks shall be as shown on the drawings.
- B. Concrete for thrust and anchor blocks shall be placed against undisturbed earth, and wooden side forms shall be used to provide satisfactory lines and dimensions. Felt roofing paper shall be placed to protect joints. No concrete shall be placed so as to cover joints, bolts or nuts, or to interfere with the removal of the joints.

3.03 FILL CONCRETE:

- A. Fill concrete shall be placed in those locations as indicated on the design drawings. Fill concrete shall consist of materials as previously specified, with a minimum 28-day compressive strength of 3000 psi.
- B. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before grout has dried or set.
- C. Fill concrete shall be brought to lines and grades as shown on the design drawings.

3.04 CONCRETE PLACING DURING COLD WEATHER:

- A. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when temperature is below 40°F, or is expected to fall to below 40°F, within 73 hours, and the concrete after placing shall be protected by covering, heat, or both.
- B. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

3.05 CONCRETE PLACING DURING HOT WEATHER:

- A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing, shall be sprinkled with cold water. The Contractor shall make every effort to minimize delays, which will result in excessive mixing of the concrete after arrival on the job.
- B. During periods of excessively hot weather (90°F or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement, will not be acceptable, and will be rejected.

3.06 FIELD QUALITY CONTROL:

- A. Concrete inspection and testing shall be performed by the Engineer or by an inspection laboratory, designated by the Engineer, engaged and paid for by the Owner. Testing equipment shall be supplied by the laboratory, and the preparation of samples and all testing shall be performed by the laboratory personnel. Full assistance and cooperation, concrete for samples, and such auxiliary personnel and equipment as needed shall be provided by the Contractor.
- B. At least 4 standard compression test cylinders shall be made and tested and 1 slump test from each day's placement of concrete. A minimum of four compression test cylinders shall be made and tested for each 100 cubic yards of each type and design strength of concrete placed. One cylinder shall be tested at 7 days, and two at 28 days. The fourth cylinder from each set shall be kept until the 28 day test report on the second and third cylinders in the same set has been received. If the average compressive strength of the two 28 day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days. If job experience indicates additional cylinder tests or other tests are required for proper control or determination of concrete quality, such tests shall be made.
- C. The Engineer shall have the right to reject concrete represented by low strength tests. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected shall be final.

END OF SECTION

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APPENDIX A
TELEVISION INSPECTION AND MANHOLE
INSPECTION REPORTS

(SEE ATTACHED FLASH DRIVE)