

# **INVITATION FOR BIDS**

**(IFB # 16-48)**

## **Cedar Street Sewer Separation**

**Bid Opening: 11:00 AM, Wednesday, February 3, 2016**



**CITY OF SOMERVILLE, MASSACHUSETTS**

**Joseph A. Curtatone, Mayor**

Purchasing Department  
Angela M. Allen, Purchasing Director

Charles Quigley  
Department of Engineering  
City of Somerville  
93 Highland Avenue  
Somerville, MA 02143  
PH: 617-625-6600 x5410  
FX: 617-625-0722

# **CEDAR STREET SEWER SEPARATION**

## **TABLE OF CONTENTS**

### **Invitation for Bid Documents**

#### **PART 1: BID INVITATION**

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##### Section 1: Pages:

00020 Invitation for Bid

##### Section 2:

00200 Instructions to Bidders

##### Section 3: Bid Submission Documents:

(See Enclosed Submission Packet)

00300 Form for General Bid

00315 Unit Price Form

00316 Add/Alternate Price Form

00320 Somerville Living Wage Form

00330 Acknowledgement of Notice to Bidders

00335 Quality Requirements Form

00340 Certificate of Non-Collusion & Tax Compliance Statement

00350 Certificate of Signature Authority

00360 Signature Form

00370 Reference Form

00380 Bid Bond

00385 Wage Rates Compliance Form

##### Section 4: Other Bid Documents

00410 Division of Labor and Industries Prevailing Wage Rates

00420 Division of Labor and Industries Statement of Compliance

00430 General Terms and Conditions

#### **PART 2: SAMPLE CONSTRUCTION CONTRACT**

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##### a. Sample Contract

- Appendix A - Scope of Work (including Technical Specifications)\*
- Appendix B – Contractor's Bid Price; Form for General Bid ,
- Appendix C – General Terms and Conditions\*
- Appendix D – Insurance Requirements
- Appendix E – Wage Rates and Living Wage (From Bid Book)
- Appendix F – Certificate of Good Standing (for corporations) and Certificate of Authority
- Appendix G – Procurement documentation (Advertisements and Notice to Bidders)
- Appendix H – Statement of Management
- Appendix I – Performance Bond and Payment Bond, if contract over \$2000

\*Appendix to be included in contract by reference

## **PART 3: TECHNICAL SPECIFICATIONS**

### **DIVISION 1 - General Requirements**

<b>DESCRIPTION</b>	<b>SECTION NO.</b>
Scope and Sequence of Work	01014
Control of Work and Materials	01110
Special Provisions	01140
Price Adjustments	01250
Attachment A – MASSDOT Documents 00811-00814	01250
Measurement and Payment	01270
Submittals	01330
Documentation	01331
Health and Safety Plan	01380
Temporary Bypass Pumping System	01535
Signage (Traffic Control)	01550
Portable Changeable Message Sign	01551
Construction Zone Safety Plan	01552
Uniformed Officer for Temporary Traffic Control	01553
Dust Control	01562
Existing Fences	01564
Environmental Protection	01570
Handling Existing Flows	01575
Rodent Control	01577
Cleaning Up	01740

### **DIVISION 2 – SITE WORK**

<b>DESCRIPTION</b>	<b>SECTION NO.</b>
Roadway Special Provisions (MDOT)	02000
Ductile Iron Pipe and Fittings for Water Mains	02080
Polyvinyl Chloride Gravity Pipe and Fittings (SDR-35)	02085
Ductile Iron Pipe and Fittings for Sewers	02089
Excavation and Stockpiling of Contaminated Material	02113
Transportation and Disposal of Contaminated Material	02130
Abandonment of Water Mains	02221
Abandonment of Sewers and Drains	02222
Dewatering	02240
Support of Excavation	02252
Earthwork	02300
Rock Excavation and Disposal	02324
Bentonite Dams	02347
Cured-in-Place Pipe	02428
Cementitious Lining of Manholes	02439

Sewer Cleaning and Inspection	02440
Service Connection Rehabilitation	02443
Temporary Service Pipe	02511
Insulation for Pipelines	02513
Hydrants and Valves	02514
Service Connections	02515
Connections to Existing Water Mains	02516
Tracer Tape	02518
Building Connections and Drop Connections	02530
Sewer Chimneys	02531
Connections to Existing Structures	02533
Reconstruction of Existing Sewers and Drains	02534
Precast Vaults	02536
Build Manhole Invert	02630
Precast Manholes and Catch Basins	02631
Reinforced Concrete Pipe	02633

### **DIVISION 3 – CONCRETE**

<b>DESCRIPTION</b>	<b>SECTION NO.</b>
Field Concrete	03302

### **ATTACHMENTS/APPENDICES TO THE TECHNICAL SPECIFICATIONS**

<b><i>ATTACHMENT A</i></b>	Discharge Request for CIPP Lining Process
<b><i>APPENDIX A</i></b>	Elm Street Television Inspection Logs & Video
<b><i>APPENDIX B</i></b>	Geotechnical Investigations and Recommendations
<b><i>APPENDIX C</i></b>	Environmental Probe Logs

**END OF SECTION**

**PART 1 SECTION 00020:  
CITY OF SOMERVILLE MASSACHUSETTS  
INVITATION TO BID  
CEDAR STREET SEWER SEPARATION  
Bid No. 16-48**

**Enclosed you will find an invitation to bid for:**

**CEDAR STREET SEWER SEPARATION  
Cedar St. Somerville, MA.**

Plans and specifications will be available from 8:30 AM to 4:30 PM, Monday through Wednesday, 8:30 AM to 7:30 PM on Thursday, and 8:30 AM to 12:00 Noon, Fridays, at the Purchasing Department, 1<sup>st</sup> Floor, City Hall, 93 Highland Avenue, Somerville, MA 02143 from **Wednesday, January 6, 2016.**

When submitting bid, please identify the bid item and number clearly. All bids must be sealed and delivered to Purchasing Department, City of Somerville, 93 Highland Ave., Somerville, MA 02143, **no later than 11:00AM, on Wednesday, February 3, 2016.** Please mark the outside of all bid envelopes with the following:

**“Bid #16-48, Cedar Street Sewer Separation”** on the bid envelope.

**BIDS SUBMITTED MUST BE AN ORIGINAL.**

**The completion of the following forms is necessary for consideration of a potential contract award. When submitting bid documents, please retain the order of documents as provided below:**

- 1) Form for General Bid**
- 2) Unit Price Form**
- 3) Somerville Living Wage Form**
- 4) Acknowledgement of Notice to Bidders**
- 5) Quality Requirements Form**
- 6) Certificate of Non-Collusion & Tax Compliance**
- 7) Certificate of Signature Authority**
- 8) Signature Form complete when submitting your bid.**
- 9) Reference Form**
- 10) 5% Bid Deposit**
- 11) Wages, Statement of Compliance Form**

**NOTE: If Vendor is incorporated an updated “CERTIFICATE OF GOOD STANDING” from the Commonwealth of Massachusetts will be needed for the awarded vendor only.**

**CITY HALL HOURS HAVE BEEN CHANGED. WE ARE OPEN UNTIL 7:30 P.M. ON THURSDAYS AND CLOSE ON FRIDAYS AT 12:30 P.M.**

**Please review and return with your sealed bids as sent. Also, ensure that all forms are completed and that your bid response is submitted as requested.**

**Your cooperation is greatly appreciated.**

**PART 1, SECTION 2:  
INSTRUCTIONS TO BIDDERS**

**(Chapter 30:39M or 30B:5 – Construction- Competitive Sealed Bids)**

**1. NAME OF PROJECT**

**CEDAR STREET SEWER SEPARATION**

**2. AWARDING AUTHORITY**

The City of Somerville (City), acting by and through the Purchasing Department, invites sealed bids for the Cedar Street Sewer Separation, in accordance with contract documents.

**DPW-Engineering Contact:**

Charles Quigley  
Dept. of Engineering  
City of Somerville  
93 Highland Avenue  
Somerville, MA 02143  
Phone (617) 625-6600 x5410  
Fax: (617) 625-0722

**3. ENGINEER:**

**Weston & Sampson Engineers, Inc.**

**Five Centennial Drive  
Peabody, Massachusetts  
01960-7985  
978-532-1900**

**Contact:** David Elmer  
elmerd@wseinc.com

**4. LOCATION OF PROJECT**

Cedar Street Somerville, MA

**5. BRIEF DESCRIPTION OF WORK (see plans and specifications for more details):**

Construction documents for this project have been prepared by Weston & Sampson Engineers, Inc. who will act as the agent of the City, and could potentially oversee construction to ensure conformity to construction drawings, specifications, and standards. The City's Engineering Department is responsible for project management, and will also interact with the General Contractor during construction.

The approximate scope of the Cedar Street sewer separation project will include, but is not necessarily limited to: 3,111 linear feet of 15-inch to 48-inch RCP drain; 1,912 linear feet of 8-inch to 12-inch PVC sewer; 1,380 linear feet of 6-inch PVC building connections; 25 precast manholes; 31 precast catch basins; 1,051 linear feet of 8-inch to 12-inch cured-in place pipe; 3,010 linear feet of 6-inch to 12-inch DI water mains; 6 Hydrants; 1,482 linear feet of water service connections; traffic signal replacement; full width road reconstruction including sidewalk replacement; and , other related tasks

## **6. ESTIMATED CONSTRUCTION COST OF THE PROJECT**

The estimated cost for the project is \$ 6,000,000.00

## **7. PROJECT SCHEDULE:**

Estimated Construction Start:            April 1, 2016

Date of Substantial Completion:       November 15, 2017

Date of Final Completion:               July 1, 2018

100% completion of all work.

Bidders are instructed to the dates of: Substantial Completion and Final Completion. For the purpose of meeting these deadlines, the City may be prepared to authorize extended work hours beyond those prescribed by City ordinance, to include work on Sundays with the prior permission of the City.

Contractor submission of all paperwork required for the Construction Contract, including but not limited to insurance certificates, performance and payment bonds, a certificate of good standing from the Secretary of Corporations, and signature pages shall be submitted to the Purchasing Director no later than 5 working days from award of the contract.

The successful bidder shall be required to submit a preliminary construction schedule within 10 days of the established date of award of the Contract and a more detailed Gantt-type construction schedule within 15 days of the established award of the contract, which shows the dates of substantial and final completion.

## **8. GOVERNING LAW**

Massachusetts General Laws, c. 30, §39M.

## **9. SALES TAX EXEMPTION**

Materials, equipment, and supplies for this project are exempt from sales tax in accordance with M.G.L. Chapter 64H, Section 6 (d). The city will furnish the successful bidder with its sales tax exemption number.

## **10. PERMIT FEES**

**(Contractor responsible obtaining permits/City of Somerville permit fees waived)**

DPW permits to obstruct or excavate the public streets and/or sidewalks; ISD building code permits; and Traffic and Parking permits; are waived by the City of Somerville. However, license fees are not waived by the City of Somerville. The Contractor shall pay all license fees (e.g., drain layer's license fee). The City of Somerville Traffic and Parking Department must be contacted directly for all required permits. The vendor must also provide the City of Somerville Traffic and Parking Department with a traffic management plan, prior to the start of all work

If water usage is required in the commitment of this project, the Contractor needs to contact the DPW Water Dept., and make arrangements for a water meter. There will be a charge for the water meter and the water usage.

The Contractor is responsible for obtaining NSTAR work orders and for all costs and fees associated with NSTAR.

Permits to excavate the public way cannot be issued until the applicant has notified the appropriate utility companies, as required by Massachusetts General Laws, Chapter 370 of the Acts of 1963. The applicant must either: 1) obtain written receipts from the affected utilities, and provide copies of same to the owner; or 2) utilize the Dig-Safe System for the required notifications, and also submit written notifications for those utilities not participating in the Dig-Safe System. Written notifications must state that utility companies have been notified and the contractor cleared to begin work.

The following utility companies must be notified in writing:

M.B.T.A. Engineering and Maintenance Division 617-722-5454  
Attn: Mr. William Bregoli, Chief Engineer  
500 Arborway  
Jamaica Plain, MA 02130

M.W.R.A. Sewer Division 617-242-6000  
100 First Avenue  
Charlestown Navy Yard  
Boston, MA 02129

M.W.R.A. Water Division 617-242-6000  
100 First Avenue



Charlestown Navy Yard  
Boston, MA 02129

The following utility companies must be notified in writing or through Dig-Safe;

Algonquin Gas Transmission Corp. 617-254-4050  
Attn: Mr. James Grasso  
Manager of Land and Public Relations  
1284 Soldiers Field Road  
Brighton, MA 02135

Verizon 781-290-5154  
Attn: Mr. Jim Warren  
460 Totten Pond Road  
Waltham, MA 02154

Boston Edison 617-541-5730  
Attn: Mr. William Lemos  
Right of Way  
1165 Massachusetts Avenue  
Dorchester, MA 02125

Boston Gas Company 617-323-9210  
Attn: Mr. Dennis Peri  
201 Rivermoor Street  
West Roxbury, MA 02132

N-Star Electric 617-497-1236, x4195  
Attn: Mr. Wendell Berthelson  
46 Blackstone Street  
Somerville, MA 02139

N-Star Steam 617-225-4568  
Attn: Mr. Thomas Connelly  
Supervisor of Maintenance  
265 First Street  
Somerville, MA 02142

N-Star Gas 617-369-5591  
Attn: Mr. Steve Richmond  
303 Third Street  
Somerville, MA 02142

A T & T Broadband 981-658-0400, x2210  
Attn: Mr. Rich Ferrucci

760 Main Street  
Malden, MA 01887

Somerville Public Works Department  
One Franey Road  
Somerville, MA 02145

617-625-6600, x5200

Somerville Fire Department  
266 Broadway  
Somerville, MA 02143

617-625-6600, x8100

Dig-Safe

1-800-322-4844

The contractor shall have all utilities marked out along the course of this work by such means as the Engineer shall approve and shall preserve such marked locations until the work has progressed to the point where the encountered utility is fully exposed and protected as required. It shall be the contractor's responsibility to notify utilities at least 48 hours prior to the start of any excavation.

The contractor is responsible for contacting any other utilities that are not listed herein.

#### 11. MINIMUM QUALIFICATION CRITERIA

<ul style="list-style-type: none"><li>• Has the contractor been established in this specified field for at least 5 years?</li></ul>
<ul style="list-style-type: none"><li>• Has the contractor successfully completed a minimum of three (3) similar Municipal projects within the past six (6) years?</li></ul>
<ul style="list-style-type: none"><li>• Has the Contractor included a Health and Safety Plan Form with their bid documents?</li></ul>
<ul style="list-style-type: none"><li>• Can the contractor certify that all employees to be provided, have successfully completed at least 10 hours of OSHA approved training in Construction Safety and Health?</li></ul>

All questions regarding the project and this Invitation to Bid should be in writing, submitted to Alex Nosnik, Asst. Purchasing Director, Purchasing Department, Somerville City Hall, First Floor, 93 Highland Avenue, Somerville, Massachusetts, 02143. Questions may be submitted either by mail or email to [anosnik@somervillema.gov](mailto:anosnik@somervillema.gov). Questions must be submitted in writing **by 12:30 pm, Thursday, January 21, 2016**; they will be answered in writing (via addendum) to all holders of the bid proposals. Bidders must submit e-mail address (preferred) or a fax number with their inquiries. If any bidders contact any other person or department outside of Purchasing with inquiries, they may be disqualified from the bidding process.

**Key Dates**

IFB Released		Wednesday, January 6, 2016
Deadline for Questions	12:30 PM	Thursday, January 21, 2016
Bids Due and Opened	11:00 AM	Wednesday, February 3, 2016
Anticipated Contract Award		February 10, 2016
Anticipated Notice to Proceed		March 1, 2016
Commencement of Work		April 1, 2016
Substantial Completion Date		November 15, 2017
Final Completion Date		July 1, 2018

**12. BID SUBMISSION TIME AND PLACE OF BID OPENING**

Sealed bids (clearly identified as a bid and endorsed with the name and address of the bidder) must be received at the Purchasing Department, First floor, City Hall, 93 Highland Avenue, Somerville, MA, 02143 on or before **11:00 AM, Wednesday, February 3, 2016**, at which time they will be publicly opened and read aloud. In the event City Hall is closed, the deadline shall be 11:00 a.m. on the next day City Hall is open for business.

ADDITIONAL REQUIREMENTS: PLEASE READ CAREFULLY, FAILURE TO MEET THESE REQUIREMENTS COULD RESULT IN REJECTION OF A BID.

**13. BID SUBMISSION REQUIREMENTS****Bid Signature**

A bid must be signed as follows: 1) if the bidder is an individual, by her/him personally; 2) if the bidder is a partnership, by the name of the partnership, followed by the signature of each general partner; and 3) if the bidder is a corporation, by the authorized officer, whose signature must be a person named on the Corporate Secretary's Certificate of Authority.

### Changes and Addenda

If any changes are made to this IFB, an addendum will be issued. Addenda will be emailed to all bidders on record as having picked up the IFB. No changes may be made to the bid documents, except as authorized in an addendum from the Purchasing Department.

### Modification or Withdrawal of Bids, Mistakes, and Minor Informalities

A bidder may correct, modify, or withdraw a bid by written notice received by the City of Somerville prior to the time and date set for the bid opening. Bid modifications must be submitted in a sealed envelope clearly labeled "Modification No.\_\_\_\_" to the address listed in part one of this section. Each modification must be numbered in sequence, and must reference the original IFB.

After the bid opening, a bidder may not change any provision of the bid in a manner prejudicial to the interests of the City or fair competition. Minor informalities will be waived or the bidder will be allowed to correct them. If a mistake and the intended correct bid are clearly evident on the face of the bid document, the mistake will be corrected to reflect the intended correct bid, and the bidder will be notified in writing; the bidder may not withdraw the bid. A bidder may withdraw a bid if a mistake is clearly evident on the face of the bid document, but the intended correct bid is not similarly evident.

### Right to Cancel/Reject Bids

The City of Somerville may cancel this IFB, or reject any and all bids, if the City determines that cancellation serves the best interests of the City; or that such rejection of bids is in the public interest.

### Bid Prices to Remain Firm

All bid prices submitted in response to this IFB must remain firm for 60 days following the bid opening.

### Unbalanced Bids

The City reserves the right to reject unbalanced, front loaded, and conditional bids.

### Documents to be Submitted as part of Bid

The following documents must be submitted with the complete signed bid package:

Form for General Bid (Section 00300)

Unit Price Form (Section 00315)

Somerville Living Wage Form (Section 00320)

Acknowledgement of Notice to Bidders (Section 00330)

Quality Requirements Form (Section 00335)

Certificate of Non-Collusion and Tax Compliance (Section 00340)

Certificate of Signature Authority (Section 00350)

Signature Form (Section 00360)

Reference Form (Section 00370)

Bid bond (Section 00380)

Wage Compliance Form (Section 00385)

Schedule of Values. Bidders do NOT need to include a Schedule of Values with their bid package. The successful bidder will be required to submit a refined and detailed schedule of values for review and approval by the design professional prior to signing the construction contract.

5% Statutory Bid Guaranty. All bids shall be accompanied by a bid bond or bank certified check or bank treasurer's check in the amount of 5% of the bid price, which shall become the property of the City of Somerville if the bid is accepted and the bidder neglects or refuses to comply with the terms of the bid.

For successful bidder: Certificate of Good Standing: If the bidder is a corporation, a Certificate of Good Standing should accompany the signed contract. Certificate available online at: <http://corp.sec.state.ma.us/CorpWeb/Certificates/CertificateOrderForm.aspx> or call Tel: (617) 727-9640 for more information.

#### **14. PREVAILING WAGE RATE REQUIREMENTS**

The contractor shall pay Mass. Prevailing Wage Rates. The applicable prevailing wage rates are attached as part of this bid package and will be included as Appendix J in the contract. A signed Compliance Form must be included with the bid package (form included).

- (a) The Contractor shall pay Mass. Prevailing Wage Rates set forth in Appendix J. Notwithstanding anything to the contrary, the City may, in its sole discretion withhold payment unless the City has in its possession payroll records that are complete, accurate, and current as of the date of said application for payment.
- (b) The Contractor shall:
- (1) Pay wages at least once a week;
  - (2) Submit payroll information on a weekly basis in a format approved by the City, numbered in numerical sequence and signed by the Contractor (including forms for weeks when the Contractor is not on the Project Site, in which case there shall be a notation to the effect "no work this payroll period" and a date anticipated for resuming work).

- (c) The Contractor shall submit to the City within the first week of construction:
- (1) A list of apprenticeship programs with which the Contractor is affiliated;
  - (2) The number of apprentices that will be employed by the Contractor on the Project;
  - (3) A list of the Contractor's employee fringe benefits;
  - (4) A copy of each project schedule, including the anticipated commencement date for each Subcontractor; and
  - (5) A list of each Subcontractor's suppliers and material men.
- (d) The Contractor shall include language similar to the above in all subcontracts.

## **15. SAMPLE CONSTRUCTION CONTRACT**

The successful bidder shall execute with the City of Somerville a Public Works Contract ("Contract") in substantially the same form as the sample contract included in this bid package. In addition to the items submitted with the bid, the contract includes certain other documents which may be executed by the Bidder selected as contractor and which are included as Appendices to the Sample Construction Contract (see Part 2) include:

Appendix F: Certificate of Authority (for corporations if the contract is signed by anyone other than the President, there must be a current Certificate of Vote signed by the corporate clerk or secretary stating who is authorized to sign contracts on the Corporations behalf)

Appendix D: Insurance Certificates— evidencing minimum coverage as follows:  
General Liability - \$2,000,000 per occurrence, \$2,000,000 aggregate  
Automobile Liability: \$1,000,000 per occurrence, \$1,000,000 aggregate  
Workman's Compensation: statutory coverage

**Certificates must stipulate "City of Somerville" as a certificate holder and as an additional insured for general liability.**

Appendix F: Certificate of Good Standing: Certificate available online at <http://corp.sec.state.ma.us/CorpWeb/Certificates/CertificateOrderForm.aspx> or call Tel: (617) 727-9640 for more information.

Appendix H: Statement of Management (for contracts over \$100,000.00)

Appendix I: Performance and Payment Bonds for 100% of the contract sum

All paperwork required for the contract shall be completed and delivered to the Purchasing Department no later than five (5) working days after the Award of the Contract.

## **ITEMS OF SPECIAL CONSIDERATION**

The Contractor's attention is specifically drawn to the following items of special consideration relative to this project, most of which are also addressed in the Technical Specifications.

- a. The Contractor must provide police details at the Contractor's expense.
- b. All new Handicapped Accessible ramps must meet the most current state ADA and City of Somerville standards.
- c. The Contractor must obtain all street and sidewalk permits as necessary.

#### **19. RESERVATION OF RIGHTS**

The City reserves the right to extend the deadline for submission of bids, to waive minor informalities, and to reject any and all bids, if in its sole judgment, the best interests of the City of Somerville would be served by doing so.

#### **20. RULE FOR AWARD**

A contract will be awarded to the lowest responsible and eligible bidder. All required bid documents must be provided to be deemed responsible and eligible.

#### **21. MAINTENANCE MANUAL AND AS-BUILT DRAWING REQUIREMENTS**

Upon Final Completion of all construction, the contractor shall submit: two complete copies of a maintenance manual, and two copies of an as-built drawing set, with two compact disc (CD) copies of the as-built drawings.

The City will not issue the final check for retainage until the submittal and approval of the maintenance manual and as-built drawings.

- 1) The Maintenance Manual shall be in the form of a three ring binder, organized and tabbed into appropriate sections, and shall include the following items:
  - A letter from the contractor stating the period of warranty for all parts, materials, and workmanship, from the date of Final Completion;
  - A letter from the contractor stating the period of warranty for the irrigation system;
  - All product information, product directions, and warranties;
  - Copies of City permits with signatures of inspectors;
  - Contact information for all subcontractors including email addresses; and,
  - A record of all submittals and dates of approvals.
- 2) As-Built drawing shall be a complete and accurate record that incorporate any and all changes to the construction plan set issued at the time of contract initiation. As-built drawings shall be clearly marked and annotated and shall include but not be limited to: all field changes, change orders, and supplemental drawing provided by the engineer.
- 3) The Compact Discs shall include an electronic copy of all as-built drawings.

## **PART 1 SECTION 3**

# **Cedar Street Sewer Separation**

**(IFB # 16-48)**

## **BID SUBMISSION DOCUMENTS**

**BIDDERS NAME:** \_\_\_\_\_

This Bid Submission includes the following:

- \_\_\_\_\_ Form for General Bid
- \_\_\_\_\_ Unit Price Form
- \_\_\_\_\_ Somerville Living Wage Form
- \_\_\_\_\_ Acknowledgement of Notice to Bidders
- \_\_\_\_\_ Quality Requirements
- \_\_\_\_\_ Certificate of Non-Collusion and Tax Compliance
- \_\_\_\_\_ Certificate of Signature Authority
- \_\_\_\_\_ Signature Form
- \_\_\_\_\_ Reference Form
- \_\_\_\_\_ 5% Statutory Bid Bond or Guaranty
- \_\_\_\_\_ Wage Rate Compliance Forms
- \_\_\_\_\_ Vendor Certification



**Part 1 Section 00300: FORM FOR GENERAL BID  
FOR CONSTRUCTION CONTRACT**

To the Awarding Authority:

- A. The undersigned proposes to furnish all labor and materials required for:

**Cedar Street Sewer Separation**

in accordance with the accompanying plans and specifications prepared by

**Weston & Sampson Engineers, Inc.**

Five Centennial Drive  
Peabody, Massachusetts  
01960-7985  
978-532-1900

Contact: David Elmer  
elmerd@wseinc.com

specified below, subject to additions and deductions according to the terms of the specifications.

- B. **This bid includes addenda #1**\_\_\_\_\_, **#2** \_\_\_\_\_, **#3** \_\_\_\_\_, **#4** \_\_\_\_\_.

- C. **The proposed contract price is:**

\$\_\_\_\_\_.

(total bid in figures)

\_\_\_\_\_DOLLARS  
(total bid in words)

- D. The bidder understands that the project construction cost estimate provided by the city is inclusive of all the work described in this form.
- E. The Undersigned Bidder agrees that, if it is selected as general contractor, it will within five working 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, including furnishing a 100% performance bond and a 100% labor and materials or payment bond, each of a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the Awarding Authority and each in the sum of the contract price,

Cedar Street Sewer Separation  
00300 - 12

the premiums for which are to be paid by the general contractor and are included in the contract price; and, in addition, furnishing a certificate of good standing and insurance certificates as required by the bid documents.

- F. The Undersigned Bidder hereby certifies that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Project and that it will comply fully with all laws and regulations applicable to this Award, including applicable provisions of MGL Chapter 30, ss. 39M et seq.
- G. The Undersigned Bidder 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 certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

- H. The Undersigned Bidder certifies under the penalties of perjury that:

(1) Pursuant to M.G.L. c. 62C, §49A, to the best of the signatories knowledge and belief, that the Undersigned Bidder is in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support, as well as paid all contributions and payments in lieu of contributions pursuant to MGL 151A, §19A(b), and

(2) the Federal Employer Identification Number (EIN) of the Bidder is:

#\_\_\_\_\_, and that it is in compliance with all federal, state, and local laws regarding taxation.

- I. The Undersigned Bidder certifies under penalties of perjury that the Bidder is not presently debarred from doing federal or state public construction work, that the Bidder has not had its low bid rejected by any municipality in the previous two years, except

---

in which case the reasons for rejection were as follows:

---

- J. The Undersigned Bidder has submitted the information on the Reference Form:
- (00370-1), requesting three references for municipal projects completed during the previous six (6) years. The Undersigned Bidder understands that the contractor and subcontractors will be required to pay prevailing wages to laborers and mechanics, and that if the Undersigned's bid is significantly below the

average bid, the Awarding Authority may require the Bidder to substantiate that the bid is based on payment of wages at prevailing rates.

M. The Undersigned Bidder certifies that it can achieve substantial completion by:

\_\_\_\_\_ and achieve Final Completion

by\_\_\_\_\_.

N. Unit Price Form

1. Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those required by the Contract Documents, by authorization of the City, unit prices listed on the attached "Unit Price Form" shall at the option of the City be the basis of payment to the Contractor or credit to the City, for such increase or decrease in the work. The unit prices shall represent the exact net amount per unit to be paid the Contractor (in the case of addition or increase) or to be refunded the City (in the case of decrease). Contractually noted adjustments will be allowed for overhead, profit, insurance or other direct or indirect expenses of the Contractor or Subcontractors.
2. The unit prices shall include cost of fuel, all labor, materials, equipment, overhead, profit, insurance, etc. to cover the finished work of the several kinds called for. Changes shall be processed in accordance with the provisions of the General Conditions governing changes in the work.

Executed this\_\_\_\_\_ day of \_\_\_\_\_, 2016.

On behalf of :

\_\_\_\_\_  
(Undersigned Bidder Business Name)

\_\_\_\_\_

\_\_\_\_\_  
(Business Address) and (Telephone)

By:

---

(Name and Address of Person Signing Bid)

---

(Title of Person Signing bid)

---

(Signature)

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
<b>ROADWAY RECONSTRUCTION ITEMS</b>			
102.51	13 EA	Individual tree protection	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
102.52	2 EA	Remove & reset tree	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
103.	12 EA	Tree removed - diameter under 24 inches	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
104.	4 EA	Tree removed - diameter 24 inches and over	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
120.1	2,610 CY	Unclassified excavation	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
129.	1,250 SY	Pavement milling	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
151.	2,320 CY	Gravel borrow	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
153.	190 CY	Controlled density fill - Excavatable	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
170.	8,350 SY	Fine grading and compacting	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
402.	310 CY	Dense graded crushed stone for sub-base	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
403.	5,600 SY	Reclaimed pavement for base course and/or sub-base	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
403.1	420 TON	Crushed stone for blending	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
420.	1,250 TON	HMA base course	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
440.	5,600 LBS	Calcium chloride for roadway dust control	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
443.	20 MGL	Water for roadway dust control	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.



<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
450.21	970 TON	HMA surface course - modified top	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
451.	1,150 TON	HMA for patching	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
452.	610 GAL	Asphalt emulsion for tack coat	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
464.5	3,800 FT	Hot poured rubberized asphalt sealer	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
472.	83 TON	Hot mix asphalt for miscellaneous work	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
482.3	650 FT	Sawing asphalt pavement	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
482.4	110 FT	Sawing concrete pavement	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
504.	100 FT	Granite curbType VA3 - straight	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
504.1	3 FT	Granite curb Type VA3 - curved	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
509.	830 FT	Granite transition curb for wheelchair ramps - straight	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
509.1	230 FT	Granite transition curb fror wheelchair ramps - curved	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
514.	14 EA	Granite curb inlet - straight	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
580.	2,010 FT	Curb removed and reset	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
670.	49 FT	Fence removed and reset	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
697.1	64 EA	Silt sack	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
701.	1,310 SY	Cement concrete sidewalk	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
701.2	240 SY	Cement concrete sidewalk wheelchair ramps	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
703.	70 TON	Hot mix asphalt driveway	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
705.1	2 SY	Flagstone walk removed and reset	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
715.1	1 EA	Mailbox removed and reset	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
751.	2 CY	Loam borrow	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
765.	15 SY	Seeding	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
776.	5 EA	Karpick Red Maple	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
804.3	250 FT	3-inch electrical conduit Type NM - Plastic (UL)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
813.81	1 EA	Service connection (underground)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
815.1	1 LS	Traffic control signal - Summer Street	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
816.80	1 LS	Traffic control signal removed & stacked	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
832.	35 SF	Warning-regulatory and route marker - alum. Panel (Type A)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
847.1	5 EA	Sign support and route marker w/breakaway post assembly - steel	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
851.1	340 DAY	Traffic cones for traffic management	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
852.	150 SF	Safety signing for traffic management	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
853.1	2 EA	Portable breakaway barricade - Type III	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.



<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
854.016	2,000 FT	Temporary paving markings - 6-inch (painted)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
856.	340 DAY	Arrow board	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
856.12	140 DAY	Portable changeable message sign	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
859.	3,400 DRUM-	Reflectorized drum	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
864.041	120 SF	Pavement arrows and legends reflectorized white (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
868.04	1,950 FT	4 inch reflectorized white line (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
868.06	3,170 FT	6 inch reflectorized white line (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
868.12	710 FT	12 inch reflectorized white line (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
868.3	55 SF	Bicycle symbol white (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
869.06	100 FT	6 inch reflectorized yellow line (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
869.1	9,000 SF	Green paint for bike lanes (epoxy)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
874.2	28 EA	Traffic sign removed and reset	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
874.21	1 EA	Miscellaneous sign removed and reset	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

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\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

UTILITY ITEMS			
<b>1</b>	<b>DRAINS COMPLETE IN PLACE</b>		
1a	200 LF	15-inch Class IV RCP drains	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1b	87 LF	18-inch Class IV RCP drains	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1c	30 LF	21-inch Class IV RCP drains	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
1d	32 LF	36-inch Class IV RCP drains, 5' to 10' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1e	254 LF	36-inch Class IV RCP drains, >10' to 15' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1f	244 LF	42-inch DI drains	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1g	805 LF	48-inch Class IV RCP drains, 5' to 10' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
1h	1,459 LF	48-inch Class IV RCP drains, >10' to 16' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
1i	575 LF	12-inch catch basin lateral	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>2</b>		<b>SEWERS COMPLETE IN PLACE</b>	
2a	153 LF	8-inch PVC pipe	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
2b	35 LF	8-inch DI pipe	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
2c	273 LF	12-inch PVC pipe, 5' to 10' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
2d	503 LF	12-inch PVC pipe, >10' to 15' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
2e	948 LF	12-inch PVC pipe, >15' to 20' deep	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.



Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
<b>3</b>		<b>BUILDING CONNECTION SYSTEMS</b>	
3a	62 EA	12X6 wye or tee branches	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
3b	1 EA	8X6 wye or tee branches	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
3c	165 VF	Chimney	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
3d	1,380 LF	6-inch building connections	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
3e	84 EA	Push camera inspection of existing building connection	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
3f	46 EA	Dye testing of existing building connection	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
3g	19 EA	Relocate Elm Street sewer service to separate sewer	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
<b>4</b>		<b>MANHOLES AND CATCH BASINS</b>	
4a	14 EA	4' diameter precast concrete manhole base	\$ _____
		_____	
		and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4b	183 VF	4' diameter precast concrete manhole walls & cones	\$ _____
		_____	
		and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4c	3 EA	6' diameter precast concrete manhole base	\$ _____
		_____	
		and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
4d	34 VF	6' diameter precast concrete manhole walls & cones	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4e	2 EA	8' diameter precast concrete manhole base	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4f	17 VF	8' diameter precast concrete manhole walls & cones	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4g	1 EA	10' diameter precast concrete manhole base	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
4h	13 VF	10' diameter precast concrete manhole walls & cones	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4i	2 EA	4' tee precast concrete manhole base	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4j	27 VF	4' tee precast concrete manhole walls & cones	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4k	3 VF	7' x 7' precast box manhole base	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
4l	25 VF	7' x 7' precast box manhole walls and top slab	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4m	1 LS	Furnish & install 14' x 8' precast concrete vault complete	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4n	5 EA	Precast concrete catch basin (TYPE A) with single frame & cascade grate	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4o	15 EA	Precast concrete catch basin (TYPE A) with double frame & cascade grate	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
4p	4 EA	Precast concrete catch basin (TYPE B) with single frame & cascade grate	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4q	7 EA	Precast concrete catch basin (TYPE B) with double frame & cascade grate	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4r	21 EA	Furnish & install manhole frame and cover	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4s	4 EA	Furnish & install bolted & gasketed watertight frame and cover	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
4t	3 EA	Abandon manhole or catch basin	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
4u	42 VF	Cementitious lining of manholes	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>5</b>		<b>CLEANING AND INSPECTION OF SEWERS</b>	
5a	910 LF	Cleaning and inspection of 8-inch to 12-inch sewers	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.



Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
<b>6</b>		<b>CURED-IN-PLACE PIPE</b>	
6a	213 LF	8-inch cured-in-place pipe	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
6b	838 LF	12-inch cured-in-place pipe	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
6c	10 EA	Grout reinstated service connections	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>7</b>		<b>WATER MAINS AND FITTINGS</b>	
7a	35 LF	6-inch ductile iron pipe & fittings	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	
7b	482 LF	8-inch ductile iron pipe & fittings	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	
7c	2,493 LF	12-inch ductile iron pipe & fittings	\$ _____
		_____	
		and (dollars)	
		_____	
		(cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
7d	2,000 LBS	Additional fittings	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>8</b>		<b>POLYETHYLENE ENCASEMENT</b>	
8a	3,010 LF	Polyethylene encasement	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>9</b>		<b>HYDRANTS AND VALVES</b>	
9a	6 EA	Hydrant assembly	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
9b	6 EA	Remove existing hydrant	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
9c	1 EA	6-inch gate valve	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
9d	7 EA	8-inch gate valve	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
9e	11 EA	12-inch gate valve	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
9f	1 LS	Furnish & Install Check Valve Manhole	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>10</b>		<b>WATER SERVICE CONNECTIONS</b>	
10a	77 EA	3/4" corporation stops	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
10b	77 EA	3/4" curb stops	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
10c	1,482 LF	3/4" copper piping and fittings	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>11</b>		<b>TEMPORARY SERVICE PIPING</b>	
11a	2,382 LF	2-inch temporary service main	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
11b	1,742 LF	4-inch temporary service main	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>12</b>		<b>MISCELLANEOUS EARTHWORK</b>	
12a	12,900 CY	Excavation and backfill of unsuitable material above normal grade	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
12b	600 CY	Excavation and backfill of unsuitable material below normal grade	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
12c	490 TON	Removal and disposal of Group A contaminated Material	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
12d	120 TON	Removal and off-site treatment/recycling of Group B contaminated material	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
12e	500 CY	Test pits	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
12f	50 CY	Bentonite clay dams	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
12g	100 CY	Additional crushed stone	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.



<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
12h	100 CY	Additional concrete encasement	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>13</b>		<b>ROCK EXCAVATION AND DISPOSAL</b>	
13a	575 CY	Rock excavation and disposal (min)	<u>\$57,500.00</u>
		One hundred _____	
		and _____ (dollars)	
		Zero _____	
		_____ (cents)	
		(\$ 100.00 _____ )	
13b	575 CY	Rock excavation and disposal (add'l)	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sum Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
<b>14</b>		<b>SEWER, WATER, AND DRAIN RECONSTRUCTION</b>	
14a	18 EA	Sewer, water, and drain reconstruction within trench limits	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>15</b>		<b>TEMPORARY BYPASS PUMPING SYSTEM</b>	
15a	1 LS	Temporary bypass pumping system	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	
<b>16</b>		<b>RODENT CONTROL</b>	
16a	1 LS	Rodent control, lump sum	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

<b>Item No.</b>	<b>Estimated Quantity*</b>	<b>Bid Description Unit or Lump Sump Price Bid in Both Words and Figures</b>	<b>Total in Figure</b>
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### MOBILIZATION & PRICE ADJUSTMENTS

#### 17 MOBILIZATION

17a	1 LS	Mobilization	\$ _____
		_____ and _____ (dollars)	
		_____ (cents)	
		(\$ _____ )	

#### 18 PRICE ADJUSTMENTS

18a	3,702 GALLONS	Price Adjustment for Diesel fuel used in excavation and borrow work, where price variance is five (5) percent or greater	\$703.38
		Zero	
		_____ and _____ (dollars)	
		Nineteen	
		_____ (cents)	
		(\$ 0.19 _____ )	
18b	2,931 GALLONS	Price Adjustment for Gasoline used in excavation and borrow work, where price variance is five (5) percent or greater	\$527.58
		Zero	
		_____ and _____ (dollars)	
		Eighteen	
		_____ (cents)	
		(\$ 0.18 _____ )	

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

Item No.	Estimated Quantity*	Bid Description Unit or Lump Sump Price Bid in Both Words and Figures	Total in Figure
18c	9,773 GALLONS	Price Adjustment for Diesel fuel used in surfacing work (paving), where price variance is five (5) percent or greater Zero and (dollars) Nineteen (cents) (\$ 0.19 )	<u>\$1,856.87</u>
18d	185 TONS	Price Adjustment for Liquid Asphalt used in hot mix asphalt mixtures, where price variance is five (5) percent or greater Forty Five and (dollars) Zero (cents) (\$ 45.00 )	<u>\$8,325.00</u>

**TOTAL AMOUNT OF BID**

The computed contract price for all Items inclusive is:

\_\_\_\_\_ Dollars and  
\_\_\_\_\_ Cents (\$\_\_\_\_\_).

\*Quantity assumed for comparison of bids.

\*\*The unit price in Item 13a is the minimum allowed for rock excavation and disposal. The bidder may add to the minimum in Item 13b.

**Part 1, Section 3: BID SUBMISSION DOCUMENTS**

Form: \_\_\_\_\_  
Contract Number: \_\_\_\_\_

CITY OF SOMERVILLE

Rev. 08/01/12



**Non-Collusion Form and Tax Compliance Certification**

**Instructions:** Complete each part of this two-part form and sign and date where indicated below.

**A. NON-COLLUSION FORM**

I, the undersigned, hereby certify under penalties of perjury that this bid or proposal has been made 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 of individuals.

**Signature:** \_\_\_\_\_  
(Individual Submitted Bid or Proposal)  
Duly Authorized

**Name of Business or Entity:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**B. TAX COMPLIANCE CERTIFICATION**

Pursuant to M.G.L. c. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support, as well as paid all contributions and payments in lieu of contributions pursuant to MGL 151A, §19A(b).

**Signature:** \_\_\_\_\_  
(Duly Authorized Representative of Vendor)

**Name of Business or Entity:** \_\_\_\_\_

**Social Security Number or Federal Tax ID#:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Print**

Online at: [www.somervillema.gov/purchasing](http://www.somervillema.gov/purchasing)

Page 1 of 1

**Part 1 Section 3: BID SUBMISSION DOCUMENTS**

**NOTICE TO BIDDERS  
BID #16-48**

All bids must be in accordance with terms and conditions set forth herein as stated.

- SECTION A. Sealed bids for: **Cedar Street Sewer Separation**. The bids will be received at the office of the Purchasing Director, Somerville City Hall, 93 Highland Avenue, Somerville, MA. 02143 no later than **Wednesday, February 3, 2016 at 11:00 A.M.** at which time and place they will be publicly opened and read.
- SECTION B. Forms of price bid, specifications and terms of contract can be obtained at the Purchasing Department office on or after **Wednesday, January 6, 2016.**
- SECTION C. Bid envelopes shall be clearly marked as follows: **"Bid No: 16-48, Bid for Cedar Street Sewer Separation."**
- SECTION D. If **awarded** vendor is a Corporation, vendor must comply with request for "Certificate of Good Standing". See attached instructions.
- SECTION E. **INSURANCE: Awarded Vendor** must comply with insurance requirements as stated in the bid package.
- SECTION F. Living Wage - see Somerville Living Wage Form (00320)  
Prevailing Wage Rates – and Compliance Form
- SECTION G. The requirements in Section **E or F** will be waived if the words "Non-Applicable" (N/A) are inserted in the space designated.
- SECTION H. The copy of the bid deposited with the City will be accompanied by a bid guarantee in the amount of 5% of the proposed bid amount. A Bid bond, Certified Check, Treasurer's Check, or Cashier's Check made payable to the City must be submitted with each bid. Said bid guarantee will become the property of the City of Somerville if the proposal is accepted and the bidder either neglects or refuses to comply with the terms of the proposal. Bid guarantee will be returned within 30 days to all unsuccessful bidders.
- SECTION I. A Performance Bond and a Payment Bond in the amount of 100% of the total contract price will be required by the City.

**Part 1 Section 3: BID SUBMISSION DOCUMENTS**

SECTION J. The Purchasing Director reserves the right to accept or reject any or all bids, to waive any minor informalities, if in her sole judgment, the best interest of the City of Somerville would be served by so doing.

SECTION K. The City reserves the right to cancel a contract, if awarded bidder does not respond to all necessary documents and required signature forms within ten (10) working days of receipt of contract.

SECTION L. The Vendor must certify that all employees to be provided have successfully completed at least ten (10) hours of OSHA approved training in Construction Safety and Health.

Signature: \_\_\_\_\_

Company: \_\_\_\_\_

By: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_ Tel. No: \_\_\_\_\_ Fax: \_\_\_\_\_

Applicable to Corporations:

I hereby attest that the signatory to this bid has the authority to sign and submit bids for the Corporation.

ATTEST: \_\_\_\_\_  
Secretary



**Certificate of Authority  
(Limited Liability Companies Only)**

**Instructions:** Complete this form and sign and date where indicated below.

1. I, the undersigned, being a member or manager of

\_\_\_\_\_,  
(Complete Name of Limited Liability Company)

a limited liability company (LLC) hereby certify as to the contents of this form for the purpose of contracting with the City of Somerville.

2. The LLC is organized under the laws of the state of: \_\_\_\_\_.

3. The LLC is managed by (**check one**) a     Manager or by its     Members.

4. I hereby certify that each of the following individual(s) is:

- a member/manager of the LLC;
- duly authorized to execute and deliver this contract, agreement, and/or other legally binding documents relating to any contract and/or agreement on behalf of the LLC;
- duly authorized to do and perform all acts and things necessary or appropriate to carry out the terms of this contract or agreement on behalf of the LLC; and
- that no resolution, vote, or other document or action is necessary to establish such authority.

<u>Name</u>	<u>Title</u>

5. **Signature:**\_\_\_\_\_

**Printed Name:** \_\_\_\_\_

**Printed Title:**\_\_\_\_\_

**Date:** \_\_\_\_\_





## **Certificate of Authority (Corporations Only)**

**Instructions:** Complete this form and sign and date where indicated below.

1. I hereby certify that I, the undersigned, am the duly elected Clerk/Secretary of

\_\_\_\_\_  
**(Insert Full Name of Corporation)**

2. I hereby certify that the following individual \_\_\_\_\_  
**(Insert the Name of Officer who Signed the Contract and Bonds)**

is the duly elected \_\_\_\_\_ of said Corporation.  
**(Insert the Title of the Officer in Line 2)**

3. I hereby certify that on \_\_\_\_\_  
**(Insert Date: Must be on or before Date Officer Signed Contract/Bonds)**

at a duly authorized meeting of the Board of Directors of said corporation, at which a quorum was present, it was voted that

\_\_\_\_\_  
**(Insert Name of Officer from Line 2) (Insert Title of Officer from Line 2)**

of this corporation be and hereby is authorized to make, enter into, execute, and deliver 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.

4. **ATTEST:**

**Signature:** \_\_\_\_\_  
**(Clerk or Secretary)**

**AFFIX CORPORATE SEAL HERE**

**Printed Name:** \_\_\_\_\_

**Printed Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_  
**(Date Must Be on or after Date Officer Signed Contract/Bonds)**

Form:\_\_\_\_\_  
Contract Number:\_\_\_\_\_

CITY OF SOMERVILLE

Rev. 11/14/2014



## **OSHA GENERAL CONTRACTOR CERTIFICATION FORM**

**Pursuant to Chapter 306 of the Acts of 2004  
An Act Relative to the Health and Safety on Construction Projects**

### **GENERAL CONTRACTOR'S CERTIFICATION – BID FORM**

I, the undersigned, hereby certify under penalties of perjury that I, and all subcontractors who are not filed sub-bidders, shall:

(1) that I am 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 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 Occupational Safety and Health Administration that is at least 10 hours in duration.

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 of individuals.

**Signature:** \_\_\_\_\_  
**(Individual Submitting Bid)**  
**Duly Authorized**

**Name of Business or Entity:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**RETURN THIS FORM WITH YOUR BID**

**Part 1, Section 3: BID SUBMISSION DOCUMENTS**

**QUALITY REQUIREMENTS**

Please respond to the following questions. A negative response to any of the first four questions will automatically disqualify the Bidder. A negative response to the fifth question about SOMWBA will not disqualify the Bidder.

	Yes	No
Has the contractor been established in this specified field for at least 5 years?		
Has the contractor successfully completed a minimum of three (3) similar Municipal projects within the past six (6) years?		
Has the Contractor included a Health and Safety Plan Form with their bid documents?		
Can the contractor certify that all employees to be provided, have successfully completed at least 10 hours of OSHA approved training in Construction Safety and Health?		
<b><i>Optional:</i></b> Vendor: Are you a State Office for Minority and Women Owned Business Assistance (SOMWBA) certified minority- or woman-owned business?		



## **SOMERVILLE LIVING WAGE ORDINANCE CERTIFICATION FORM**

### **CITY OF SOMERVILLE CODE OF ORDINANCES SECTION 2-397 et seq<sup>1</sup>.**

**Instructions:** This form shall be included in all Invitations for Bids and Requests for Proposals which involve the furnishing of labor, time or effort (with no end product other than reports) by vendors contracting or subcontracting with the City of Somerville, where the contract price meets or exceeds the following dollar threshold: \$10,000. If the undersigned is selected, this form will be attached to the contract or subcontract and the certifications made herein shall be incorporated as part of such contract or subcontract. **Complete this form and sign and date where indicated below on page 2.**

**Purpose:** The purpose of this form is to ensure that such vendors pay a “Living Wage” (defined below) to all covered employees (i.e., all employees except individuals in a city, state or federally funded youth program). In the case of bids, the City will award the contract to the lowest responsive and responsible bidder paying a Living Wage. In the case of RFP’s, the City will select the most advantageous proposal from a responsive and responsible offeror paying a Living Wage. In neither case, however, shall the City be under any obligation to select a bid or proposal that exceeds the funds available for the contract.

**Definition of “Living Wage”:** For this contract or subcontract, as of **7/1/2015** “Living Wage” shall be deemed to be an hourly wage of no less than **\$12.24** per hour. From time to time, the Living Wage may be upwardly adjusted and amendments, if any, to the contract or subcontract may require the payment of a higher hourly rate if a higher rate is then in effect.

### **CERTIFICATIONS**

1. The undersigned shall pay no less than the Living Wage to all covered employees who directly expend their time on the contract or subcontract with the City of Somerville.
2. The undersigned shall post a notice, (copy enclosed), to be furnished by the contracting City Department, informing covered employees of the protections and obligations provided for in the Somerville Living Wage Ordinance, and that for assistance and information, including copies of the Ordinance, employees should contact the contracting City Department. Such notice shall be posted in each location where services are performed by covered employees, in a conspicuous place where notices to employees are customarily posted.
3. The undersigned shall maintain payrolls for all covered employees and basic records relating hereto and shall preserve them for a period of three years. The records shall contain the name and address of each employee, the number of hours worked, the gross wages, a copy of the social

---

<sup>1</sup>Copies of the Ordinance are available upon request to the Purchasing Department.

security returns, and evidence of payment thereof and such other data as may be required by the contracting City Department from time to time.

4. The undersigned shall submit payroll records to the City upon request and, if the City receives information of possible noncompliance with the provisions the Somerville Living Wage Ordinance, the undersigned shall permit City representatives to observe work being performed at the work site, to interview employees, and to examine the books and records relating to the payrolls being investigated to determine payment of wages.

5. The undersigned shall not fund wage increases required by the Somerville Living Wage Ordinance by reducing the health insurance benefits of any of its employees.

6. The undersigned agrees that the penalties and relief set forth in the Somerville Living Wage Ordinance shall be in addition to the rights and remedies set forth in the contract and/or subcontract.

**CERTIFIED BY:**

**Signature:** \_\_\_\_\_  
(Duly Authorized Representative of Vendor)

**Title:** \_\_\_\_\_

**Name of Vendor:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**INSTRUCTIONS: PLEASE POST**

**NOTICE TO ALL EMPLOYEES  
REGARDING PAYMENT OF LIVING WAGE**

Under the Somerville, Massachusetts' Living Wage Ordinance (Ordinance No. 1999-1), any person or entity who has entered into a contract with the City of Somerville is required to pay its employees who are involved in providing services to the City of Somerville no less than a "Living Wage".

The Living Wage as of **7/1/2015** is **\$12.24** per hour. The only employees who are not covered by the Living Wage Ordinance are individuals in a Youth Program. "Youth Program" as defined in the Ordinance, "means any city, state or federally funded program which employs youth, as defined by city, state or federal guidelines, during the summer, or as part of a school to work program, or in any other related seasonal or part-time program."

For assistance and information regarding the protections and obligations provided for in the Living Wage Ordinance and/or a copy of the Living Wage Ordinance, all employees should contact the City of Somerville's Purchasing Department directly.



## CITY OF SOMERVILLE, MASSACHUSETTS

**JOSEPH A. CURTATONE**  
**MAYOR**

### Vendor Certification

The vendor certifies that it has provided the City of Somerville with an accurate tax identification number (TIN). In the event that the City is fined by the IRS for an incorrect TIN provided by the vendor, the vendor agrees to reimburse the City for the amount of the fine.

---

TIN

---

Signature

---

Printed Name of Person signing

---

Company

---

Date



Somerville City Hall • 93 Highland Avenue • Somerville, Massachusetts 02143  
(617) 625-6600, Ext. 3400 • TTY: (617) 666-0001 • Fax: (617) 625-1344  
[www.somervillema.gov](http://www.somervillema.gov)



**Part 1, Section 3: BID SUBMISSION DOCUMENTS**

**CITY OF SOMERVILLE**

**SIGNATURE FORM**

NAME OF COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE #: \_\_\_\_\_ FAX #: \_\_\_\_\_

DATE: \_\_\_\_\_ EMAIL: \_\_\_\_\_

SIGNATURE OF AUTHORIZED CONTRACTING OFFICIAL:

\_\_\_\_\_

TITLE: \_\_\_\_\_

RESIDENCE: \_\_\_\_\_

IF COMPANY IS A PARTNERSHIP:

FULL NAME AND RESIDENCE OF EACH PARTNER:

\_\_\_\_\_

\_\_\_\_\_

IF COMPANY IS A CORPORATION:

THE CORPORATE NAME IS: \_\_\_\_\_

THE CORPORATION IS ORGANIZED UNDER THE LAWS OF: \_\_\_\_\_

THE PRESIDENT IS: \_\_\_\_\_

THE TREASURER IS: \_\_\_\_\_

THE CLERK/SECRETARY OR ASSISTANT CLERK/SECRETARY WHO WILL EXECUTE THE  
CONTRACT AND SIGN THE CERTIFICATE OF AUTHORITY IS:

\_\_\_\_\_

NAME OF CORPORATION THAT WILL APPEAR ON A POTENTIAL CONTRACTUAL  
AGREEMENT IF DIFFERENT FROM ABOVE: \_\_\_\_\_.

NAME AND TITLE OF PERSON WHO WILL BE THE PRINCIPAL SIGNATORY ON THE  
CONTRACT IF OTHER THAN THE PRESIDENT:

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_



**Part 1, Section 3: BID SUBMISSION DOCUMENTS**

**REFERENCE FORM**

Bidder:\_\_\_\_\_

IFB Title: **IFB# 16-48 Cedar Street Sewer Separation**

Bidder must provide references from three municipalities for similar municipal projects completed during the previous six (6) years.

Reference:\_\_\_\_\_ Contact:\_\_\_\_\_

Address:\_\_\_\_\_ Phone:\_\_\_\_\_

\_\_\_\_\_ Fax:\_\_\_\_\_

Description and date(s) of supplies or services provided:\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Reference:\_\_\_\_\_ Contact:\_\_\_\_\_

Address:\_\_\_\_\_ Phone:\_\_\_\_\_

\_\_\_\_\_ Fax:\_\_\_\_\_

Description and date(s) of supplies or services provided:\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Reference:\_\_\_\_\_ Contact:\_\_\_\_\_

Address:\_\_\_\_\_ Phone:\_\_\_\_\_

\_\_\_\_\_ Fax:\_\_\_\_\_

Description and date(s) of supplies or services provided:\_\_\_\_\_

\_\_\_\_\_

## 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. For every week in which an apprentice is employed, a photocopy of the apprentice's identification card must be attached to the payroll report. 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 awarding authority directly, 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

\_\_\_\_\_, 20\_\_\_\_\_

I, \_\_\_\_\_,  
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by  
\_\_\_\_\_ on the \_\_\_\_\_

(Contractor, subcontractor or public body)

(Building or project)

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

Signature \_\_\_\_\_

Title \_\_\_\_\_

# 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.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.	
2 Business name/disregarded entity name, if different from above	
3 Check appropriate box for federal tax classification; check only <b>one</b> of the following seven boxes: <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <b>Note.</b> For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner. <input type="checkbox"/> Other (see instructions) ▶ _____	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ <i>(Applies to accounts maintained outside the U.S.)</i>
5 Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
6 City, state, and ZIP code	
7 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 generally 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 instructions for line 1 and 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:

- 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
- 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
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**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 3.

Sign Here	Signature of U.S. person ▶	Date ▶
-----------	----------------------------	--------

## General Instructions

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

**Future developments.** Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at [www.irs.gov/fw9](http://www.irs.gov/fw9).

## Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)

- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

*If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.*

By signing the filled-out form, you:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
- Certify that you are not subject to backup withholding, or
- 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, and
- Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

## INSURANCE SPECIFICATIONS

### INSURANCE REQUIREMENTS FOR AWARDED VENDOR ONLY:

Prior to commencing performance of any work or supplying materials or equipment covered by these specifications, the contractor shall furnish to the Office of the Purchasing Director a Certificate of Insurance evidencing the following:

#### A. GENERAL LIABILITY - Comprehensive Form

Bodily Injury Liability.....\$ One Million

Property Damage Liability.....\$ One Million

#### B. COVERAGE FOR PAYMENT OF WORKER'S COMPENSATION BENEFIT PURSUANT TO CHAPTER 152 OF THE MASSACHUSETTS GENERAL LAWS IN THE AMOUNT AS LISTED BELOW:

WORKER'S COMPENSATION.....\$ Statutory

EMPLOYERS' LIABILITY.....\$ Statutory

#### C. AUTOMOBILE LIABILITY INSURANCE AS LISTED BELOW:

BODILY INJURY LIABILITY.....\$ STATUTORY

1. A contract will not be executed unless a certificate (s) of insurance evidencing above-described coverage is attached.
2. Failure to have the above-described coverage in effect during the entire period of the contract shall be deemed to be a breach of the contract.
3. All applicable insurance policies shall read:  
**"CITY OF SOMERVILLE" as a certificate holder and as an additional insured** for general liability only along with a description of operation in the space provided on the certificate.

#### Certificate Should Be Made Out To:

**City Of Somerville  
Purchasing Department  
93 Highland Avenue  
Somerville, Ma. 02143**

**Note: If your insurance expires during the life of this contract, you shall be responsible to submit a new certificate(s) covering the period of the contract. No payment will be made on a contract with an expired insurance certificate.**



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No. Ext):	FAX (A/C, No):
INSURED	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	NAIC #	
	INSURER A :	
	INSURER B :	
	INSURER C :	
INSURER D :		
INSURER E :		
INSURER F :		

**COVERAGES****CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	<b>GENERAL LIABILITY</b>						EACH OCCURRENCE \$
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence) \$
	<input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR						MED EXP (Any one person) \$
							PERSONAL & ADV INJURY \$
							GENERAL AGGREGATE \$
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG \$
	<input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						\$
	<b>AUTOMOBILE LIABILITY</b>						COMBINED SINGLE LIMIT (Ea accident) \$
	<input type="checkbox"/> ANY AUTO						BODILY INJURY (Per person) \$
	<input type="checkbox"/> ALL OWNED AUTOS						BODILY INJURY (Per accident) \$
	<input type="checkbox"/> HIRED AUTOS						PROPERTY DAMAGE (Per accident) \$
							\$
	<b>UMBRELLA LIAB</b>						EACH OCCURRENCE \$
	<input type="checkbox"/> EXCESS LIAB						AGGREGATE \$
	<input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$						\$
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b>						WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER <input type="checkbox"/>
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	Y / N <input type="checkbox"/>	N / A				E.L. EACH ACCIDENT \$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE \$
							E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

DESCRIPTION OF PROJECT, SOLICITATION NUMBER AND THAT THE CITY OF SOMERVILLE IS A CERTIFICATE HOLDER AND ADDITIONAL INSURED

**CERTIFICATE HOLDER****CANCELLATION**

CERTIFICATES SHOULD BE MADE OUT TO:

CITY OF SOMERVILLE  
c/o PURCHASING DEPARTMENT  
93 HIGHLAND AVE  
SOMERVILLE, MA 02143

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

## **CERTIFICATE OF GOOD STANDING**

TO: Vendor

FROM: Purchasing Department

RE: **CERTIFICATE OF GOOD STANDING**

The **Awarded Vendor** must comply with our request for a **CURRENT “Certificate of Good Standing”**.

If you require information on how to obtain the “Certificate of Good Standing” or Certificate of Registration (Foreign Corporations) from the Commonwealth of Massachusetts, please call the Secretary of State’s Office at (617) 727-2850 (Press #1) located at One (1) Ashburton Place, 17<sup>th</sup> Floor, Boston, MA 02133 or you may access their web site at:  
<http://corp.sec.state.ma.us/CorpWeb/Certificates/CertificateOrderForm.aspx>

If your company is incorporated outside of Massachusetts and therefore is a “foreign corporation”, but is registered to do business in Massachusetts, please comply with our request for the Certificate of Registration from the Commonwealth of Massachusetts. If your company is a foreign corporation, but is not registered to do business in Massachusetts, please provide the Certificate of Good Standing from your state of incorporation.

Please note that without the above certificate (s), the City of Somerville cannot execute your contract.

### **IMPORTANT NOTICE**

Requests for Certificates of Good Standing by mail may take a substantial amount of time. A certificate may be obtained immediately in person at the Secretary’s Office at the address above. Also, at this time, the Secretary of State’s Office may not have your current annual report recorded. If this is the case, and you are therefore unable to obtain the Certificate of Good Standing, please forward a copy of your annual report filing fee check with your signed contracts. Please forward your original Certificate of Good Standing to the Purchasing Department upon receipt.

Thank You,

Purchasing Director

**BID BOND OR GUARANTY**

***BIDDER TO INSERT HERE***

**Prevailing Wage Rates  
Payroll Submission Forms**



# MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM



Company's Name:		Address:		Phone No.:		Payroll No.:																	
Employer's Signature:		Title:		Contract No.:		Tax Payer ID No.																	
Awarding Authority's Name:		Public Works Project Name:		Public Works Project Location:		Min. Wage Rate Sheet No.																	
General / Prime Contractor's Name:		Subcontractor's Name:		"Employer" Hourly Fringe Benefit Contributions																			
Employee Name & Complete Address	Employee is OSHA 10 Certified (?)	Work Classification	Appr. Rate (%)	Worked							Hours		Project Hours (A)	Hourly Base Wage (B)	Health & Welfare Insurance (C)	ERISA Pension Plan (D)	Supp. Unemp. (E)	Total Hourly Prev. Wage (F)	(A x F)		Check No. (H)		
				Su.	Mo.	Tu.	We.	Th.	Fr.	Sa.	All Other Hours	Total Gross Wages (G)							Project Gross Wages				
	<input type="checkbox"/>																						
	<input type="checkbox"/>																						
	<input type="checkbox"/>																						
	<input type="checkbox"/>																						
	<input type="checkbox"/>																						
	<input type="checkbox"/>																						
	<input type="checkbox"/>																						

**NOTE:** Pursuant to MGL Ch. 149 s.27B, every contractor and subcontractor is required to submit a "true and accurate" copy of their weekly payroll records directly to the awarding authority. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.



CHARLES D. BAKER  
Governor

KARYN E. POLITO  
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

RONALD L. WALKER, II  
Secretary

WILLIAM D MCKINNEY  
Director

Awarding Authority: City of Somerville

Contract Number: City/Town: SOMERVILLE

Description of Work: IFB 16-48, Cedar Street Sewer Separation

Job Location: 93 Highland Ave, Somerville, MA 02413

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 Division of Apprentice Standards (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. **If an apprentice rate is not listed on the prevailing wage schedule for the trade in which an apprentice is registered with the DAS, the apprentice 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.

Issue Date: 12/30/2015

Wage Request Number: 20151230-004

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Construction</b>						
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/01/2015	\$32.75	\$10.41	\$10.08	\$0.00	\$53.24
	06/01/2016	\$33.25	\$10.41	\$10.08	\$0.00	\$53.74
	08/01/2016	\$33.25	\$10.91	\$10.08	\$0.00	\$54.24
	12/01/2016	\$33.25	\$10.91	\$10.89	\$0.00	\$55.05
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/01/2015	\$32.82	\$10.41	\$10.08	\$0.00	\$53.31
	06/01/2016	\$33.32	\$10.41	\$10.08	\$0.00	\$53.81
	08/01/2016	\$33.32	\$10.91	\$10.08	\$0.00	\$54.31
	12/01/2016	\$33.32	\$10.91	\$10.89	\$0.00	\$55.12
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/01/2015	\$32.94	\$10.41	\$10.08	\$0.00	\$53.43
	06/01/2016	\$33.44	\$10.41	\$10.08	\$0.00	\$53.93
	08/01/2016	\$33.44	\$10.91	\$10.08	\$0.00	\$54.43
	12/01/2016	\$33.44	\$10.91	\$10.89	\$0.00	\$55.24
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$88.29	\$9.80	\$19.23	\$0.00	\$117.32
AIR TRACK OPERATOR LABORERS - ZONE 1	12/01/2015	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	06/01/2016	\$36.85	\$7.45	\$13.55	\$0.00	\$57.85
	12/01/2016	\$37.85	\$7.45	\$13.55	\$0.00	\$58.85
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	12/01/2015	\$34.38	\$10.40	\$5.95	\$0.00	\$50.73
ASPHALT RAKER LABORERS - ZONE 1	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE OPERATING ENGINEERS LOCAL 4	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATING ENGINEERS LOCAL 4	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER LABORERS - ZONE 1	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER LABORERS - ZONE 1	12/01/2015	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	06/01/2016	\$36.85	\$7.45	\$13.55	\$0.00	\$57.85
	12/01/2016	\$37.85	\$7.45	\$13.55	\$0.00	\$58.85
For apprentice rates see "Apprentice- LABORER"						

Issue Date: 12/30/2015

Wage Request Number: 20151230-004

Page 2 of 35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2015	\$40.32	\$6.97	\$16.21	\$0.00	\$63.50
	01/01/2016	\$41.62	\$6.97	\$16.21	\$0.00	\$64.80
	01/01/2017	\$42.92	\$6.97	\$16.21	\$0.00	\$66.10
Apprentice - <i>BOILERMAKER - Local 29</i>						
Effective Date - 01/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$26.21	\$6.97	\$10.54	\$0.00	\$43.72
2	65	\$26.21	\$6.97	\$10.54	\$0.00	\$43.72
3	70	\$28.22	\$6.97	\$11.35	\$0.00	\$46.54
4	75	\$30.24	\$6.97	\$12.16	\$0.00	\$49.37
5	80	\$32.26	\$6.97	\$12.97	\$0.00	\$52.20
6	85	\$34.27	\$6.97	\$13.78	\$0.00	\$55.02
7	90	\$36.29	\$6.97	\$14.59	\$0.00	\$57.85
8	95	\$38.30	\$6.97	\$15.40	\$0.00	\$60.67
Effective Date - 01/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$27.05	\$6.97	\$10.54	\$0.00	\$44.56
2	65	\$27.05	\$6.97	\$10.54	\$0.00	\$44.56
3	70	\$29.13	\$6.97	\$11.35	\$0.00	\$47.45
4	75	\$31.22	\$6.97	\$12.16	\$0.00	\$50.35
5	80	\$33.30	\$6.97	\$12.97	\$0.00	\$53.24
6	85	\$35.38	\$6.97	\$13.78	\$0.00	\$56.13
7	90	\$37.46	\$6.97	\$14.59	\$0.00	\$59.02
8	95	\$39.54	\$6.97	\$15.40	\$0.00	\$61.91
Notes:						
Apprentice to Journeyworker Ratio:1:5						
BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (BOSTON)</i>	08/01/2015	\$49.86	\$10.18	\$18.57	\$0.00	\$78.61
	02/01/2016	\$49.86	\$10.18	\$19.14	\$0.00	\$79.18
	08/01/2016	\$50.76	\$10.18	\$19.22	\$0.00	\$80.16
	02/01/2017	\$51.33	\$10.18	\$19.22	\$0.00	\$80.73

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - <i>BRICK/PLASTER/CEMENT MASON - Local 3 Boston</i>						
Effective Date - 08/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.93	\$10.18	\$18.57	\$0.00	\$53.68
2	60	\$29.92	\$10.18	\$18.57	\$0.00	\$58.67
3	70	\$34.90	\$10.18	\$18.57	\$0.00	\$63.65
4	80	\$39.89	\$10.18	\$18.57	\$0.00	\$68.64
5	90	\$44.87	\$10.18	\$18.57	\$0.00	\$73.62
Effective Date - 02/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.93	\$10.18	\$19.14	\$0.00	\$54.25
2	60	\$29.92	\$10.18	\$19.14	\$0.00	\$59.24
3	70	\$34.90	\$10.18	\$19.14	\$0.00	\$64.22
4	80	\$39.89	\$10.18	\$19.14	\$0.00	\$69.21
5	90	\$44.87	\$10.18	\$19.14	\$0.00	\$74.19
Notes:						
Apprentice to Journeyworker Ratio:1:5						
BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2015	\$36.45	\$7.45	\$13.75	\$0.00	\$57.65
	06/01/2016	\$37.20	\$7.45	\$13.75	\$0.00	\$58.40
	12/01/2016	\$38.20	\$7.45	\$13.75	\$0.00	\$59.40
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2015	\$35.30	\$7.45	\$13.75	\$0.00	\$56.50
	06/01/2016	\$36.05	\$7.45	\$13.75	\$0.00	\$57.25
	12/01/2016	\$37.05	\$7.45	\$13.75	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2015	\$35.30	\$7.45	\$13.75	\$0.00	\$56.50
	06/01/2016	\$36.05	\$7.45	\$13.75	\$0.00	\$57.25
	12/01/2016	\$37.05	\$7.45	\$13.75	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS-ZONE 1 (Metro Boston)</i>	03/01/2015	\$42.30	\$9.80	\$16.48	\$0.00	\$68.58

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - CARPENTER - Zone 1 Metro Boston</b>						
<b>Effective Date - 03/01/2015</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.15	\$9.80	\$1.63	\$0.00	\$32.58
2	60	\$25.38	\$9.80	\$1.63	\$0.00	\$36.81
3	70	\$29.61	\$9.80	\$11.59	\$0.00	\$51.00
4	75	\$31.73	\$9.80	\$11.59	\$0.00	\$53.12
5	80	\$33.84	\$9.80	\$13.22	\$0.00	\$56.86
6	80	\$33.84	\$9.80	\$13.22	\$0.00	\$56.86
7	90	\$38.07	\$9.80	\$14.85	\$0.00	\$62.72
8	90	\$38.07	\$9.80	\$14.85	\$0.00	\$62.72
<b>Notes:</b>						
<b>Apprentice to Journeyworker Ratio:1:5</b>						
<b>CEMENT MASONRY/PLASTERING</b>						
<i>BRICKLAYERS LOCAL 3 (BOSTON)</i>						
	07/01/2015	\$45.82	\$10.90	\$18.71	\$1.30	\$76.73
	01/01/2016	\$46.44	\$10.90	\$18.71	\$1.30	\$77.35
<b>Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Boston)</b>						
<b>Effective Date - 07/01/2015</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.91	\$10.90	\$12.21	\$0.00	\$46.02
2	60	\$27.49	\$10.90	\$13.71	\$1.30	\$53.40
3	65	\$29.78	\$10.90	\$14.71	\$1.30	\$56.69
4	70	\$32.07	\$10.90	\$15.71	\$1.30	\$59.98
5	75	\$34.37	\$10.90	\$16.71	\$1.30	\$63.28
6	80	\$36.66	\$10.90	\$17.71	\$1.30	\$66.57
7	90	\$41.24	\$10.90	\$18.71	\$1.30	\$72.15
<b>Effective Date - 01/01/2016</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.22	\$10.90	\$12.21	\$0.00	\$46.33
2	60	\$27.86	\$10.90	\$13.71	\$1.30	\$53.77
3	65	\$30.19	\$10.90	\$14.71	\$1.30	\$57.10
4	70	\$32.51	\$10.90	\$15.71	\$1.30	\$60.42
5	75	\$34.83	\$10.90	\$16.71	\$1.30	\$63.74
6	80	\$37.15	\$10.90	\$17.71	\$1.30	\$67.06
7	90	\$41.80	\$10.90	\$18.71	\$1.30	\$72.71
<b>Notes:</b>						
Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.						
<b>Apprentice to Journeyworker Ratio:1:3</b>						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>CHAIN SAW OPERATOR</b>						
<i>LABORERS - ZONE 1</i>						
	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
<b>CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES</b>						
<i>OPERATING ENGINEERS LOCAL 4</i>						
	12/01/2015	\$44.73	\$10.00	\$14.90	\$0.00	\$69.63
	06/01/2016	\$45.48	\$10.00	\$14.90	\$0.00	\$70.38
	12/01/2016	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	06/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
	12/01/2017	\$48.73	\$10.00	\$14.90	\$0.00	\$73.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
<b>COMPRESSOR OPERATOR</b>						
<i>OPERATING ENGINEERS LOCAL 4</i>						
	12/01/2015	\$30.13	\$10.00	\$14.90	\$0.00	\$55.03
	06/01/2016	\$30.65	\$10.00	\$14.90	\$0.00	\$55.55
	12/01/2016	\$31.52	\$10.00	\$14.90	\$0.00	\$56.42
	06/01/2017	\$32.21	\$10.00	\$14.90	\$0.00	\$57.11
	12/01/2017	\$32.90	\$10.00	\$14.90	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
<b>DELEADER (BRIDGE)</b>						
<i>PAINTERS LOCAL 35 - ZONE 1</i>						
	07/01/2015	\$48.56	\$7.85	\$16.10	\$0.00	\$72.51
	01/01/2016	\$49.51	\$7.85	\$16.10	\$0.00	\$73.46
	07/01/2016	\$50.46	\$7.85	\$16.10	\$0.00	\$74.41
	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PAINTER Local 35 - BRIDGES/TANKS						
Effective Date - 07/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.28	\$7.85	\$0.00	\$0.00	\$32.13
2	55	\$26.71	\$7.85	\$3.66	\$0.00	\$38.22
3	60	\$29.14	\$7.85	\$3.99	\$0.00	\$40.98
4	65	\$31.56	\$7.85	\$4.32	\$0.00	\$43.73
5	70	\$33.99	\$7.85	\$14.11	\$0.00	\$55.95
6	75	\$36.42	\$7.85	\$14.44	\$0.00	\$58.71
7	80	\$38.85	\$7.85	\$14.77	\$0.00	\$61.47
8	90	\$43.70	\$7.85	\$15.44	\$0.00	\$66.99
Effective Date - 01/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.76	\$7.85	\$0.00	\$0.00	\$32.61
2	55	\$27.23	\$7.85	\$3.66	\$0.00	\$38.74
3	60	\$29.71	\$7.85	\$3.99	\$0.00	\$41.55
4	65	\$32.18	\$7.85	\$4.32	\$0.00	\$44.35
5	70	\$34.66	\$7.85	\$14.11	\$0.00	\$56.62
6	75	\$37.13	\$7.85	\$14.44	\$0.00	\$59.42
7	80	\$39.61	\$7.85	\$14.77	\$0.00	\$62.23
8	90	\$44.56	\$7.85	\$15.44	\$0.00	\$67.85
Notes:						
Steps are 750 hrs.						
Apprentice to Journeyworker Ratio:1:1						
DEMO: ADZEMAN LABORERS - ZONE 1	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 1	12/01/2015	\$36.50	\$7.45	\$13.55	\$0.00	\$57.50
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS LABORERS - ZONE 1	12/01/2015	\$36.25	\$7.45	\$13.55	\$0.00	\$57.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1	12/01/2015	\$36.50	\$7.45	\$13.55	\$0.00	\$57.50
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1	12/01/2015	\$36.25	\$7.45	\$13.55	\$0.00	\$57.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER LABORERS - ZONE 1	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$58.86	\$9.80	\$19.23	\$0.00	\$87.89
DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$63.06	\$9.80	\$19.23	\$0.00	\$92.09
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$88.23	\$9.80	\$19.23	\$0.00	\$117.26
DRAWBRIDGE OPERATOR (Construction) ELECTRICIANS LOCAL 103	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN ELECTRICIANS LOCAL 103	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103

Effective Date - 09/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.27	\$13.00	\$0.55	\$0.00	\$31.82
2	40	\$18.27	\$13.00	\$0.55	\$0.00	\$31.82
3	45	\$20.55	\$13.00	\$11.86	\$0.00	\$45.41
4	45	\$20.55	\$13.00	\$11.86	\$0.00	\$45.41
5	50	\$22.84	\$13.00	\$12.23	\$0.00	\$48.07
6	55	\$25.12	\$13.00	\$12.58	\$0.00	\$50.70
7	60	\$27.40	\$13.00	\$12.95	\$0.00	\$53.35
8	65	\$29.69	\$13.00	\$13.32	\$0.00	\$56.01
9	70	\$31.97	\$13.00	\$13.69	\$0.00	\$58.66
10	75	\$34.25	\$13.00	\$14.06	\$0.00	\$61.31

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.47	\$13.00	\$0.55	\$0.00	\$32.02
2	40	\$18.47	\$13.00	\$0.55	\$0.00	\$32.02
3	45	\$20.78	\$13.00	\$11.84	\$0.00	\$45.62
4	45	\$20.78	\$13.00	\$11.84	\$0.00	\$45.62
5	50	\$23.09	\$13.00	\$12.71	\$0.00	\$48.80
6	55	\$25.39	\$13.00	\$13.07	\$0.00	\$51.46
7	60	\$27.70	\$13.00	\$13.39	\$0.00	\$54.09
8	65	\$30.01	\$13.00	\$13.81	\$0.00	\$56.82
9	70	\$32.32	\$13.00	\$14.18	\$0.00	\$59.50
10	75	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18

Notes :

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

Apprentice to Journeyworker Ratio:2:3\*\*\*

ELEVATOR CONSTRUCTOR	01/01/2015	\$53.30	\$13.58	\$14.21	\$0.00	\$81.09
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2016	\$54.53	\$14.43	\$14.96	\$0.00	\$83.92
	01/01/2017	\$55.86	\$15.28	\$15.71	\$0.00	\$86.85

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.65	\$13.58	\$0.00	\$0.00	\$40.23
2	55	\$29.32	\$13.58	\$14.21	\$0.00	\$57.11
3	65	\$34.65	\$13.58	\$14.21	\$0.00	\$62.44
4	70	\$37.31	\$13.58	\$14.21	\$0.00	\$65.10
5	80	\$42.64	\$13.58	\$14.21	\$0.00	\$70.43

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.27	\$14.43	\$0.00	\$0.00	\$41.70
2	55	\$29.99	\$14.43	\$14.96	\$0.00	\$59.38
3	65	\$35.44	\$14.43	\$14.96	\$0.00	\$64.83
4	70	\$38.17	\$14.43	\$14.96	\$0.00	\$67.56
5	80	\$43.62	\$14.43	\$14.96	\$0.00	\$73.01

Notes:

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER	01/01/2015	\$37.31	\$13.58	\$14.21	\$0.00	\$65.10
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2016	\$38.17	\$14.43	\$14.96	\$0.00	\$67.56
	01/01/2017	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
LABORERS - ZONE 1	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	11/01/2015	\$40.49	\$10.00	\$14.55	\$0.00	\$65.04
OPERATING ENGINEERS LOCAL 4	05/01/2016	\$41.38	\$10.00	\$14.55	\$0.00	\$65.93
	11/01/2016	\$41.97	\$10.00	\$14.55	\$0.00	\$66.52
	05/01/2017	\$42.85	\$10.00	\$14.55	\$0.00	\$67.40
	11/01/2017	\$43.58	\$10.00	\$14.55	\$0.00	\$68.13
	05/01/2018	\$44.29	\$10.00	\$14.55	\$0.00	\$68.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY	11/01/2015	\$41.93	\$10.00	\$14.55	\$0.00	\$66.48
OPERATING ENGINEERS LOCAL 4	05/01/2016	\$42.82	\$10.00	\$14.55	\$0.00	\$67.37
	11/01/2016	\$43.42	\$10.00	\$14.55	\$0.00	\$67.97
	05/01/2017	\$44.31	\$10.00	\$14.55	\$0.00	\$68.86
	11/01/2017	\$45.04	\$10.00	\$14.55	\$0.00	\$69.59
	05/01/2018	\$45.76	\$10.00	\$14.55	\$0.00	\$70.31
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2015	\$21.71	\$10.00	\$14.55	\$0.00	\$46.26
	05/01/2016	\$22.23	\$10.00	\$14.55	\$0.00	\$46.78
	11/01/2016	\$22.58	\$10.00	\$14.55	\$0.00	\$47.13
	05/01/2017	\$23.11	\$10.00	\$14.55	\$0.00	\$47.66
	11/01/2017	\$23.53	\$10.00	\$14.55	\$0.00	\$48.08
	05/01/2018	\$23.96	\$10.00	\$14.55	\$0.00	\$48.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$34.25	\$13.00	\$14.06	\$0.00	\$61.31
	03/01/2016	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$36.34	\$10.00	\$14.90	\$0.00	\$61.24
	06/01/2016	\$36.96	\$10.00	\$14.90	\$0.00	\$61.86
	12/01/2016	\$38.00	\$10.00	\$14.90	\$0.00	\$62.90
	06/01/2017	\$38.84	\$10.00	\$14.90	\$0.00	\$63.74
	12/01/2017	\$39.67	\$10.00	\$14.90	\$0.00	\$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 1</i>	12/01/2015	\$20.50	\$7.45	\$13.55	\$0.00	\$41.50
	06/01/2016	\$20.50	\$7.45	\$13.55	\$0.00	\$41.50
	12/01/2016	\$20.50	\$7.45	\$13.55	\$0.00	\$41.50
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	09/01/2015	\$41.59	\$9.80	\$17.53	\$0.00	\$68.92

Apprentice - FLOORCOVERER - Local 2168 Zone 1

Effective Date - 09/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.80	\$9.80	\$1.79	\$0.00	\$32.39
2	55	\$22.87	\$9.80	\$1.79	\$0.00	\$34.46
3	60	\$24.95	\$9.80	\$12.16	\$0.00	\$46.91
4	65	\$27.03	\$9.80	\$12.16	\$0.00	\$48.99
5	70	\$29.11	\$9.80	\$13.95	\$0.00	\$52.86
6	75	\$31.19	\$9.80	\$13.95	\$0.00	\$54.94
7	80	\$33.27	\$9.80	\$15.74	\$0.00	\$58.81
8	85	\$35.35	\$9.80	\$15.74	\$0.00	\$60.89

Notes:  
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$30.13	\$10.00	\$14.90	\$0.00	\$55.03
	06/01/2016	\$30.65	\$10.00	\$14.90	\$0.00	\$55.55
	12/01/2016	\$31.52	\$10.00	\$14.90	\$0.00	\$56.42
	06/01/2017	\$32.21	\$10.00	\$14.90	\$0.00	\$57.11
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 1)</i>	12/01/2017	\$32.90	\$10.00	\$14.90	\$0.00	\$57.80
	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					
	07/01/2015	\$43.85	\$7.85	\$16.10	\$0.00	\$67.80
	01/01/2016	\$44.80	\$7.85	\$16.10	\$0.00	\$68.75
	07/01/2016	\$45.75	\$7.85	\$16.10	\$0.00	\$69.70
	01/01/2017	\$46.70	\$7.85	\$16.10	\$0.00	\$70.65

Apprentice - GLAZIER - Local 35 Zone 1

Effective Date - 07/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.93	\$7.85	\$0.00	\$0.00	\$29.78
2	55	\$24.12	\$7.85	\$3.66	\$0.00	\$35.63
3	60	\$26.31	\$7.85	\$3.99	\$0.00	\$38.15
4	65	\$28.50	\$7.85	\$4.32	\$0.00	\$40.67
5	70	\$30.70	\$7.85	\$14.11	\$0.00	\$52.66
6	75	\$32.89	\$7.85	\$14.44	\$0.00	\$55.18
7	80	\$35.08	\$7.85	\$14.77	\$0.00	\$57.70
8	90	\$39.47	\$7.85	\$15.44	\$0.00	\$62.76

Effective Date - 01/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.40	\$7.85	\$0.00	\$0.00	\$30.25
2	55	\$24.64	\$7.85	\$3.66	\$0.00	\$36.15
3	60	\$26.88	\$7.85	\$3.99	\$0.00	\$38.72
4	65	\$29.12	\$7.85	\$4.32	\$0.00	\$41.29
5	70	\$31.36	\$7.85	\$14.11	\$0.00	\$53.32
6	75	\$33.60	\$7.85	\$14.44	\$0.00	\$55.89
7	80	\$35.84	\$7.85	\$14.77	\$0.00	\$58.46
8	90	\$40.32	\$7.85	\$15.44	\$0.00	\$63.61

Notes:  
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HOISTING ENGINEER/CRANES/GRADALLS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63

**Apprentice - OPERATING ENGINEERS - Local 4**

**Effective Date -** 12/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$24.05	\$10.00	\$0.00	\$0.00	\$34.05
2	60	\$26.24	\$10.00	\$14.90	\$0.00	\$51.14
3	65	\$28.42	\$10.00	\$14.90	\$0.00	\$53.32
4	70	\$30.61	\$10.00	\$14.90	\$0.00	\$55.51
5	75	\$32.80	\$10.00	\$14.90	\$0.00	\$57.70
6	80	\$34.98	\$10.00	\$14.90	\$0.00	\$59.88
7	85	\$37.17	\$10.00	\$14.90	\$0.00	\$62.07
8	90	\$39.36	\$10.00	\$14.90	\$0.00	\$64.26

**Effective Date -** 06/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$24.46	\$10.00	\$0.00	\$0.00	\$34.46
2	60	\$26.69	\$10.00	\$14.90	\$0.00	\$51.59
3	65	\$28.91	\$10.00	\$14.90	\$0.00	\$53.81
4	70	\$31.14	\$10.00	\$14.90	\$0.00	\$56.04
5	75	\$33.36	\$10.00	\$14.90	\$0.00	\$58.26
6	80	\$35.58	\$10.00	\$14.90	\$0.00	\$60.48
7	85	\$37.81	\$10.00	\$14.90	\$0.00	\$62.71
8	90	\$40.03	\$10.00	\$14.90	\$0.00	\$64.93

**Notes:**

**Apprentice to Journeyworker Ratio:1:6**

HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	08/01/2015	\$43.31	\$10.20	\$21.48	\$2.25	\$77.24
	02/01/2016	\$44.31	\$10.20	\$21.48	\$2.25	\$78.24
	08/01/2016	\$45.46	\$10.20	\$21.48	\$2.25	\$79.39
	02/01/2017	\$46.56	\$10.20	\$21.48	\$2.25	\$80.49
	08/01/2017	\$47.66	\$10.20	\$21.48	\$2.25	\$81.59
	02/01/2018	\$48.81	\$10.20	\$21.48	\$2.25	\$82.74

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 103</i>	09/01/2015	\$45.67	\$13.00	\$15.89	\$0.00	\$74.56
	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	08/01/2015	\$43.31	\$10.20	\$21.48	\$2.25	\$77.24
	02/01/2016	\$44.31	\$10.20	\$21.48	\$2.25	\$78.24
	08/01/2016	\$45.46	\$10.20	\$21.48	\$2.25	\$79.39
	02/01/2017	\$46.56	\$10.20	\$21.48	\$2.25	\$80.49
	08/01/2017	\$47.66	\$10.20	\$21.48	\$2.25	\$81.59
	02/01/2018	\$48.81	\$10.20	\$21.48	\$2.25	\$82.74

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	09/01/2015	\$49.69	\$9.70	\$16.89	\$0.00	\$76.28
	03/01/2016	\$50.69	\$9.70	\$16.89	\$0.00	\$77.28
	09/01/2016	\$51.69	\$9.70	\$16.89	\$0.00	\$78.28
	03/01/2017	\$52.69	\$9.70	\$16.89	\$0.00	\$79.28

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	09/01/2015	\$49.69	\$9.70	\$16.89	\$0.00	\$76.28
	03/01/2016	\$50.69	\$9.70	\$16.89	\$0.00	\$77.28
	09/01/2016	\$51.69	\$9.70	\$16.89	\$0.00	\$78.28
	03/01/2017	\$52.69	\$9.70	\$16.89	\$0.00	\$79.28

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	12/01/2015	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	06/01/2016	\$36.85	\$7.45	\$13.55	\$0.00	\$57.85
	12/01/2016	\$37.85	\$7.45	\$13.55	\$0.00	\$58.85

For apprentice rates see "Apprentice- LABORER"

INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2015	\$43.81	\$11.50	\$13.80	\$0.00	\$69.11
	09/01/2016	\$45.81	\$11.50	\$13.80	\$0.00	\$71.11
	09/01/2017	\$47.81	\$11.50	\$13.80	\$0.00	\$73.11
	09/01/2018	\$50.06	\$11.50	\$13.80	\$0.00	\$75.36
	09/01/2019	\$52.56	\$11.50	\$13.80	\$0.00	\$77.86

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

**Effective Date -** 09/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.91	\$11.50	\$10.05	\$0.00	\$43.46
2	60	\$26.29	\$11.50	\$10.80	\$0.00	\$48.59
3	70	\$30.67	\$11.50	\$11.55	\$0.00	\$53.72
4	80	\$35.05	\$11.50	\$12.30	\$0.00	\$58.85

**Effective Date -** 09/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.91	\$11.50	\$10.05	\$0.00	\$44.46
2	60	\$27.49	\$11.50	\$10.80	\$0.00	\$49.79
3	70	\$32.07	\$11.50	\$11.55	\$0.00	\$55.12
4	80	\$36.65	\$11.50	\$12.30	\$0.00	\$60.45

**Notes:**

Steps are 1 year

**Apprentice to Journeyworker Ratio:1:4**



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	09/16/2015	\$42.40	\$7.80	\$20.85	\$0.00	\$71.05
	03/16/2016	\$43.40	\$7.80	\$20.85	\$0.00	\$72.05
	09/16/2016	\$44.05	\$7.80	\$20.85	\$0.00	\$72.70
	03/16/2017	\$44.65	\$7.80	\$20.85	\$0.00	\$73.30

**Apprentice - IRONWORKER - Local 7 Boston**

Effective Date - 09/16/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$25.44	\$7.80	\$20.85	\$0.00	\$54.09
2	70	\$29.68	\$7.80	\$20.85	\$0.00	\$58.33
3	75	\$31.80	\$7.80	\$20.85	\$0.00	\$60.45
4	80	\$33.92	\$7.80	\$20.85	\$0.00	\$62.57
5	85	\$36.04	\$7.80	\$20.85	\$0.00	\$64.69
6	90	\$38.16	\$7.80	\$20.85	\$0.00	\$66.81

Effective Date - 03/16/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.04	\$7.80	\$20.85	\$0.00	\$54.69
2	70	\$30.38	\$7.80	\$20.85	\$0.00	\$59.03
3	75	\$32.55	\$7.80	\$20.85	\$0.00	\$61.20
4	80	\$34.72	\$7.80	\$20.85	\$0.00	\$63.37
5	85	\$36.89	\$7.80	\$20.85	\$0.00	\$65.54
6	90	\$39.06	\$7.80	\$20.85	\$0.00	\$67.71

<b>Notes:</b>
** Structural 1:6; Ornamental 1:4

**Apprentice to Journeyworker Ratio:\*\***

JACKHAMMER & PAVING BREAKER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
LABORER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.35	\$7.45	\$13.55	\$0.00	\$56.35
	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - LABORER - Zone 1</b>						
Effective Date - 12/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.21	\$7.45	\$13.55	\$0.00	\$42.21
2	70	\$24.75	\$7.45	\$13.55	\$0.00	\$45.75
3	80	\$28.28	\$7.45	\$13.55	\$0.00	\$49.28
4	90	\$31.82	\$7.45	\$13.55	\$0.00	\$52.82

Effective Date - 06/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.66	\$7.45	\$13.55	\$0.00	\$42.66
2	70	\$25.27	\$7.45	\$13.55	\$0.00	\$46.27
3	80	\$28.88	\$7.45	\$13.55	\$0.00	\$49.88
4	90	\$32.49	\$7.45	\$13.55	\$0.00	\$53.49

<b>Notes:</b>

**Apprentice to Journeyworker Ratio:1:5**

LABORER: CARPENTER TENDER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.35	\$7.45	\$13.55	\$0.00	\$56.35
	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.35	\$7.45	\$13.55	\$0.00	\$56.35
	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
	For apprentice rates see "Apprentice- LABORER"					
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.35	\$7.45	\$13.55	\$0.00	\$56.35
	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.35	\$7.45	\$13.55	\$0.00	\$56.35
	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	08/01/2015	\$38.08	\$10.18	\$17.25	\$0.00	\$65.51
	02/01/2016	\$38.08	\$10.18	\$17.70	\$0.00	\$65.96
	08/01/2016	\$38.78	\$10.18	\$17.78	\$0.00	\$66.74
	02/01/2017	\$39.24	\$10.18	\$17.78	\$0.00	\$67.20
Apprentice - <i>MARBLE &amp; TILE FINISHER - Local 3 Marble &amp; Tile</i>						
Effective Date - 08/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.04	\$10.18	\$17.25	\$0.00	\$46.47
2	60	\$22.85	\$10.18	\$17.25	\$0.00	\$50.28
3	70	\$26.66	\$10.18	\$17.25	\$0.00	\$54.09
4	80	\$30.46	\$10.18	\$17.25	\$0.00	\$57.89
5	90	\$34.27	\$10.18	\$17.25	\$0.00	\$61.70
Effective Date - 02/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.04	\$10.18	\$17.70	\$0.00	\$46.92
2	60	\$22.85	\$10.18	\$17.70	\$0.00	\$50.73
3	70	\$26.66	\$10.18	\$17.70	\$0.00	\$54.54
4	80	\$30.46	\$10.18	\$17.70	\$0.00	\$58.34
5	90	\$34.27	\$10.18	\$17.70	\$0.00	\$62.15
Notes:						
Apprentice to Journeyworker Ratio:1:3						
MARBLE MASONS,TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE &amp; TILE</i>	08/01/2015	\$49.90	\$10.18	\$18.57	\$0.00	\$78.65
	02/01/2016	\$49.90	\$10.18	\$19.14	\$0.00	\$79.22
	08/01/2016	\$50.80	\$10.18	\$19.22	\$0.00	\$80.20
	02/01/2017	\$51.37	\$10.18	\$19.22	\$0.00	\$80.77

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - <i>MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble &amp; Tile</i>						
Effective Date - 08/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.95	\$10.18	\$18.57	\$0.00	\$53.70
2	60	\$29.94	\$10.18	\$18.57	\$0.00	\$58.69
3	70	\$34.93	\$10.18	\$18.57	\$0.00	\$63.68
4	80	\$39.92	\$10.18	\$18.57	\$0.00	\$68.67
5	90	\$44.91	\$10.18	\$18.57	\$0.00	\$73.66
Effective Date - 02/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.95	\$10.18	\$19.14	\$0.00	\$54.27
2	60	\$29.94	\$10.18	\$19.14	\$0.00	\$59.26
3	70	\$34.93	\$10.18	\$19.14	\$0.00	\$64.25
4	80	\$39.92	\$10.18	\$19.14	\$0.00	\$69.24
5	90	\$44.91	\$10.18	\$19.14	\$0.00	\$74.23
Notes:						
Apprentice to Journeyworker Ratio:1:5						
MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	04/01/2015	\$37.64	\$9.80	\$16.21	\$0.00	\$63.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
<b>Apprentice -   MILLWRIGHT - Local 1121 Zone 1</b>							
<b>Effective Date -   04/01/2015</b>							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	55	\$20.70	\$9.80	\$4.48	\$0.00	\$34.98	
2	65	\$24.47	\$9.80	\$13.36	\$0.00	\$47.63	
3	75	\$28.23	\$9.80	\$14.18	\$0.00	\$52.21	
4	85	\$31.99	\$9.80	\$14.99	\$0.00	\$56.78	
<div>Notes:</div>							
Steps are 2,000 hours							
<b>Apprentice to Journeyworker Ratio:1:5</b>							
<b>MORTAR MIXER</b>							
<i>LABORERS - ZONE 1</i>							
		12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
		06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
		12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"							
<b>OILER (OTHER THAN TRUCK CRANES,GRADALLS)</b>							
<i>OPERATING ENGINEERS LOCAL 4</i>							
		12/01/2015	\$22.27	\$10.00	\$14.90	\$0.00	\$47.17
		06/01/2016	\$22.66	\$10.00	\$14.90	\$0.00	\$47.56
		12/01/2016	\$23.31	\$10.00	\$14.90	\$0.00	\$48.21
		06/01/2017	\$23.82	\$10.00	\$14.90	\$0.00	\$48.72
		12/01/2017	\$24.34	\$10.00	\$14.90	\$0.00	\$49.24
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
<b>OILER (TRUCK CRANES, GRADALLS)</b>							
<i>OPERATING ENGINEERS LOCAL 4</i>							
		12/01/2015	\$26.08	\$10.00	\$14.90	\$0.00	\$50.98
		06/01/2016	\$26.54	\$10.00	\$14.90	\$0.00	\$51.44
		12/01/2016	\$27.29	\$10.00	\$14.90	\$0.00	\$52.19
		06/01/2017	\$27.89	\$10.00	\$14.90	\$0.00	\$52.79
		12/01/2017	\$28.50	\$10.00	\$14.90	\$0.00	\$53.40
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
<b>OTHER POWER DRIVEN EQUIPMENT - CLASS II</b>							
<i>OPERATING ENGINEERS LOCAL 4</i>							
		12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
		06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
		12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
		06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
		12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
<b>PAINTER (BRIDGES/TANKS)</b>							
<i>PAINTERS LOCAL 35 - ZONE 1</i>							
		07/01/2015	\$48.56	\$7.85	\$16.10	\$0.00	\$72.51
		01/01/2016	\$49.51	\$7.85	\$16.10	\$0.00	\$73.46
		07/01/2016	\$50.46	\$7.85	\$16.10	\$0.00	\$74.41
		01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - PAINTER Local 35 - BRIDGES/TANKS							
Effective Date - 07/01/2015							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$24.28	\$7.85	\$0.00	\$0.00	\$32.13	
2	55	\$26.71	\$7.85	\$3.66	\$0.00	\$38.22	
3	60	\$29.14	\$7.85	\$3.99	\$0.00	\$40.98	
4	65	\$31.56	\$7.85	\$4.32	\$0.00	\$43.73	
5	70	\$33.99	\$7.85	\$14.11	\$0.00	\$55.95	
6	75	\$36.42	\$7.85	\$14.44	\$0.00	\$58.71	
7	80	\$38.85	\$7.85	\$14.77	\$0.00	\$61.47	
8	90	\$43.70	\$7.85	\$15.44	\$0.00	\$66.99	
Effective Date - 01/01/2016							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$24.76	\$7.85	\$0.00	\$0.00	\$32.61	
2	55	\$27.23	\$7.85	\$3.66	\$0.00	\$38.74	
3	60	\$29.71	\$7.85	\$3.99	\$0.00	\$41.55	
4	65	\$32.18	\$7.85	\$4.32	\$0.00	\$44.35	
5	70	\$34.66	\$7.85	\$14.11	\$0.00	\$56.62	
6	75	\$37.13	\$7.85	\$14.44	\$0.00	\$59.42	
7	80	\$39.61	\$7.85	\$14.77	\$0.00	\$62.23	
8	90	\$44.56	\$7.85	\$15.44	\$0.00	\$67.85	
<div>Notes:</div> <div>Steps are 750 hrs.</div>							
Apprentice to Journeyworker Ratio:1:1							
PAINTER (SPRAY OR SANDBLAST, NEW) *		07/01/2015	\$45.25	\$7.85	\$16.10	\$0.00	\$69.20
* If 30% or more of surfaces to be painted are new construction,		01/01/2016	\$46.20	\$7.85	\$16.10	\$0.00	\$70.15
NEW paint rate shall be used.PAINTERS LOCAL 35 - ZONE 1		07/01/2016	\$47.15	\$7.85	\$16.10	\$0.00	\$71.10
		01/01/2017	\$48.10	\$7.85	\$16.10	\$0.00	\$72.05

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 1 - Spray/Sandblast - New

Effective Date - 07/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.63	\$7.85	\$0.00	\$0.00	\$30.48
2	55	\$24.89	\$7.85	\$3.66	\$0.00	\$36.40
3	60	\$27.15	\$7.85	\$3.99	\$0.00	\$38.99
4	65	\$29.41	\$7.85	\$4.32	\$0.00	\$41.58
5	70	\$31.68	\$7.85	\$14.11	\$0.00	\$53.64
6	75	\$33.94	\$7.85	\$14.44	\$0.00	\$56.23
7	80	\$36.20	\$7.85	\$14.77	\$0.00	\$58.82
8	90	\$40.73	\$7.85	\$15.44	\$0.00	\$64.02

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.10	\$7.85	\$0.00	\$0.00	\$30.95
2	55	\$25.41	\$7.85	\$3.66	\$0.00	\$36.92
3	60	\$27.72	\$7.85	\$3.99	\$0.00	\$39.56
4	65	\$30.03	\$7.85	\$4.32	\$0.00	\$42.20
5	70	\$32.34	\$7.85	\$14.11	\$0.00	\$54.30
6	75	\$34.65	\$7.85	\$14.44	\$0.00	\$56.94
7	80	\$36.96	\$7.85	\$14.77	\$0.00	\$59.58
8	90	\$41.58	\$7.85	\$15.44	\$0.00	\$64.87

Notes: Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) PAINTERS LOCAL 35 - ZONE 1	07/01/2015	\$43.31	\$7.85	\$16.10	\$0.00	\$67.26
	01/01/2016	\$44.26	\$7.85	\$16.10	\$0.00	\$68.21
	07/01/2016	\$45.21	\$7.85	\$16.10	\$0.00	\$69.16
	01/01/2017	\$46.16	\$7.85	\$16.10	\$0.00	\$70.11

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 1 - Spray/Sandblast - Repaint

Effective Date - 07/01/2015						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.66	\$7.85	\$0.00	\$0.00	\$29.51
2	55	\$23.82	\$7.85	\$3.66	\$0.00	\$35.33
3	60	\$25.99	\$7.85	\$3.99	\$0.00	\$37.83
4	65	\$28.15	\$7.85	\$4.32	\$0.00	\$40.32
5	70	\$30.32	\$7.85	\$14.11	\$0.00	\$52.28
6	75	\$32.48	\$7.85	\$14.44	\$0.00	\$54.77
7	80	\$34.65	\$7.85	\$14.77	\$0.00	\$57.27
8	90	\$38.98	\$7.85	\$15.44	\$0.00	\$62.27

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.13	\$7.85	\$0.00	\$0.00	\$29.98
2	55	\$24.34	\$7.85	\$3.66	\$0.00	\$35.85
3	60	\$26.56	\$7.85	\$3.99	\$0.00	\$38.40
4	65	\$28.77	\$7.85	\$4.32	\$0.00	\$40.94
5	70	\$30.98	\$7.85	\$14.11	\$0.00	\$52.94
6	75	\$33.20	\$7.85	\$14.44	\$0.00	\$55.49
7	80	\$35.41	\$7.85	\$14.77	\$0.00	\$58.03
8	90	\$39.83	\$7.85	\$15.44	\$0.00	\$63.12

Notes: Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) LABORERS - ZONE 1	12/01/2015	\$35.35	\$7.45	\$13.55	\$0.00	\$56.35
	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
For Apprentice rates see "Apprentice- LABORER"						
PAINTER / TAPER (BRUSH, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.PAINTERS LOCAL 35 - ZONE 1	07/01/2015	\$43.85	\$7.85	\$16.10	\$0.00	\$67.80
	01/01/2016	\$44.80	\$7.85	\$16.10	\$0.00	\$68.75
	07/01/2016	\$45.75	\$7.85	\$16.10	\$0.00	\$69.70
	01/01/2017	\$46.70	\$7.85	\$16.10	\$0.00	\$70.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - PAINTER - Local 35 Zone 1 - BRUSH NEW							
Effective Date - 07/01/2015							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$21.93	\$7.85	\$0.00	\$0.00	\$29.78	
2	55	\$24.12	\$7.85	\$3.66	\$0.00	\$35.63	
3	60	\$26.31	\$7.85	\$3.99	\$0.00	\$38.15	
4	65	\$28.50	\$7.85	\$4.32	\$0.00	\$40.67	
5	70	\$30.70	\$7.85	\$14.11	\$0.00	\$52.66	
6	75	\$32.89	\$7.85	\$14.44	\$0.00	\$55.18	
7	80	\$35.08	\$7.85	\$14.77	\$0.00	\$57.70	
8	90	\$39.47	\$7.85	\$15.44	\$0.00	\$62.76	
Effective Date - 01/01/2016							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$22.40	\$7.85	\$0.00	\$0.00	\$30.25	
2	55	\$24.64	\$7.85	\$3.66	\$0.00	\$36.15	
3	60	\$26.88	\$7.85	\$3.99	\$0.00	\$38.72	
4	65	\$29.12	\$7.85	\$4.32	\$0.00	\$41.29	
5	70	\$31.36	\$7.85	\$14.11	\$0.00	\$53.32	
6	75	\$33.60	\$7.85	\$14.44	\$0.00	\$55.89	
7	80	\$35.84	\$7.85	\$14.77	\$0.00	\$58.46	
8	90	\$40.32	\$7.85	\$15.44	\$0.00	\$63.61	
Notes: Steps are 750 hrs.							
Apprentice to Journeyworker Ratio:1:1							
PAINTER / TAPER (BRUSH, REPAINT)		07/01/2015	\$41.91	\$7.85	\$16.10	\$0.00	\$65.86
PAINTERS LOCAL 35 - ZONE 1		01/01/2016	\$42.86	\$7.85	\$16.10	\$0.00	\$66.81
		07/01/2016	\$43.81	\$7.85	\$16.10	\$0.00	\$67.76
		01/01/2017	\$44.76	\$7.85	\$16.10	\$0.00	\$68.71

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - PAINTER Local 35 Zone 1 - BRUSH REPAINT							
Effective Date - 07/01/2015							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$20.96	\$7.85	\$0.00	\$0.00	\$28.81	
2	55	\$23.05	\$7.85	\$3.66	\$0.00	\$34.56	
3	60	\$25.15	\$7.85	\$3.99	\$0.00	\$36.99	
4	65	\$27.24	\$7.85	\$4.32	\$0.00	\$39.41	
5	70	\$29.34	\$7.85	\$14.11	\$0.00	\$51.30	
6	75	\$31.43	\$7.85	\$14.44	\$0.00	\$53.72	
7	80	\$33.53	\$7.85	\$14.77	\$0.00	\$56.15	
8	90	\$37.72	\$7.85	\$15.44	\$0.00	\$61.01	
Effective Date - 01/01/2016							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$21.43	\$7.85	\$0.00	\$0.00	\$29.28	
2	55	\$23.57	\$7.85	\$3.66	\$0.00	\$35.08	
3	60	\$25.72	\$7.85	\$3.99	\$0.00	\$37.56	
4	65	\$27.86	\$7.85	\$4.32	\$0.00	\$40.03	
5	70	\$30.00	\$7.85	\$14.11	\$0.00	\$51.96	
6	75	\$32.15	\$7.85	\$14.44	\$0.00	\$54.44	
7	80	\$34.29	\$7.85	\$14.77	\$0.00	\$56.91	
8	90	\$38.57	\$7.85	\$15.44	\$0.00	\$61.86	
Notes:							
Steps are 750 hrs.							
Apprentice to Journeyworker Ratio:1:1							
PANEL & PICKUP TRUCKS DRIVER		12/01/2015	\$32.58	\$10.41	\$10.08	\$0.00	\$53.07
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A		06/01/2016	\$33.08	\$10.41	\$10.08	\$0.00	\$53.57
		08/01/2016	\$33.08	\$10.91	\$10.08	\$0.00	\$54.07
		12/01/2016	\$33.08	\$10.91	\$10.89	\$0.00	\$54.88
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)		08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
PILE DRIVER LOCAL 56 (ZONE 1)							
PILE DRIVER		08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
PILE DRIVER LOCAL 56 (ZONE 1)							

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - PILE DRIVER - Local 56 Zone 1</b>						
<b>Effective Date -</b>	08/01/2015					
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.02	\$9.80	\$19.23	\$0.00	\$50.05
2	60	\$25.22	\$9.80	\$19.23	\$0.00	\$54.25
3	70	\$29.43	\$9.80	\$19.23	\$0.00	\$58.46
4	75	\$31.53	\$9.80	\$19.23	\$0.00	\$60.56
5	80	\$33.63	\$9.80	\$19.23	\$0.00	\$62.66
6	80	\$33.63	\$9.80	\$19.23	\$0.00	\$62.66
7	90	\$37.84	\$9.80	\$19.23	\$0.00	\$66.87
8	90	\$37.84	\$9.80	\$19.23	\$0.00	\$66.87
<b>Notes:</b>						
<b>Apprentice to Journeyworker Ratio:1:3</b>						
PIPEFITTER & STEAMFITTER <i>PIPEFITTERS LOCAL 537</i>	09/01/2015	\$49.69	\$9.70	\$16.89	\$0.00	\$76.28
	03/01/2016	\$50.69	\$9.70	\$16.89	\$0.00	\$77.28
	09/01/2016	\$51.69	\$9.70	\$16.89	\$0.00	\$78.28
	03/01/2017	\$52.69	\$9.70	\$16.89	\$0.00	\$79.28
<b>Apprentice - PIPEFITTER - Local 537</b>						
<b>Effective Date -</b>	09/01/2015					
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.88	\$9.70	\$7.50	\$0.00	\$37.08
2	45	\$22.36	\$9.70	\$16.89	\$0.00	\$48.95
3	60	\$29.81	\$9.70	\$16.89	\$0.00	\$56.40
4	70	\$34.78	\$9.70	\$16.89	\$0.00	\$61.37
5	80	\$39.75	\$9.70	\$16.89	\$0.00	\$66.34
<b>Effective Date -</b> 03/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.28	\$9.70	\$7.50	\$0.00	\$37.48
2	45	\$22.81	\$9.70	\$16.89	\$0.00	\$49.40
3	60	\$30.41	\$9.70	\$16.89	\$0.00	\$57.00
4	70	\$35.48	\$9.70	\$16.89	\$0.00	\$62.07
5	80	\$40.55	\$9.70	\$16.89	\$0.00	\$67.14
<b>Notes:</b>						
** 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)						
<b>Apprentice to Journeyworker Ratio:**</b>						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
PLUMBERS & GASFITTERS <i>PLUMBERS &amp; GASFITTERS LOCAL 12</i>	09/01/2015	\$50.46	\$10.82	\$15.14	\$0.00	\$76.42
	03/01/2016	\$51.61	\$10.82	\$15.14	\$0.00	\$77.57
	09/01/2016	\$52.66	\$10.82	\$15.14	\$0.00	\$78.62
	03/01/2017	\$53.66	\$10.82	\$15.14	\$0.00	\$79.62
<b>Apprentice - PLUMBER/GASFITTER - Local 12</b>						
<b>Effective Date -</b>	09/01/2015					
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$17.66	\$10.82	\$5.63	\$0.00	\$34.11
2	40	\$20.18	\$10.82	\$6.37	\$0.00	\$37.37
3	55	\$27.75	\$10.82	\$8.56	\$0.00	\$47.13
4	65	\$32.80	\$10.82	\$10.03	\$0.00	\$53.65
5	75	\$37.85	\$10.82	\$11.48	\$0.00	\$60.15
<b>Effective Date -</b> 03/01/2016						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$18.06	\$10.82	\$5.61	\$0.00	\$34.49
2	40	\$20.64	\$10.82	\$6.36	\$0.00	\$37.82
3	55	\$28.39	\$10.82	\$8.56	\$0.00	\$47.77
4	65	\$33.55	\$10.82	\$10.02	\$0.00	\$54.39
5	75	\$38.71	\$10.82	\$11.48	\$0.00	\$61.01
<b>Notes:</b>						
** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr Step4 with lic\$56.90 Step5 with lic\$63.40						
<b>Apprentice to Journeyworker Ratio:**</b>						
PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	09/01/2015	\$49.69	\$9.70	\$16.89	\$0.00	\$76.28
	03/01/2016	\$50.69	\$9.70	\$16.89	\$0.00	\$77.28
	09/01/2016	\$51.69	\$9.70	\$16.89	\$0.00	\$78.28
	03/01/2017	\$52.69	\$9.70	\$16.89	\$0.00	\$79.28
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	12/01/2015	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	06/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
	12/01/2016	\$38.10	\$7.45	\$13.55	\$0.00	\$59.10
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$30.13	\$10.00	\$14.90	\$0.00	\$55.03
	06/01/2016	\$30.65	\$10.00	\$14.90	\$0.00	\$55.55
	12/01/2016	\$31.52	\$10.00	\$14.90	\$0.00	\$56.42
	06/01/2017	\$32.21	\$10.00	\$14.90	\$0.00	\$57.11
	12/01/2017	\$32.90	\$10.00	\$14.90	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY MIX CONCRETE DRIVERS after 4/30/10 (Drivers Hired After 4/30/2010) <i>TEAMSTERS LOCAL 25a</i>	07/01/2015	\$27.88	\$7.98	\$8.92	\$0.00	\$44.78
	05/01/2016	\$28.03	\$7.98	\$9.31	\$0.00	\$45.32
	07/01/2016	\$28.03	\$8.23	\$9.31	\$0.00	\$45.57
	05/01/2017	\$28.18	\$8.23	\$9.72	\$0.00	\$46.13
	07/01/2017	\$28.18	\$8.48	\$9.72	\$0.00	\$46.38
READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 25a</i>	07/01/2015	\$31.14	\$7.98	\$8.92	\$0.00	\$48.04
	05/01/2016	\$31.29	\$7.98	\$9.31	\$0.00	\$48.58
	07/01/2016	\$31.29	\$8.23	\$9.31	\$0.00	\$48.83
	05/01/2017	\$31.44	\$8.23	\$9.72	\$0.00	\$49.39
	07/01/2017	\$31.44	\$8.48	\$9.72	\$0.00	\$49.64
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RESIDENTIAL WOOD FRAME (All Other Work) <i>CARPENTERS -ZONE 1 (Residential Wood)</i>	04/01/2011	\$37.25	\$8.67	\$15.51	\$0.00	\$61.43
	05/01/2011	\$27.49	\$6.34	\$6.23	\$0.00	\$40.06
** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement. <i>CARPENTERS -ZONE 1 (Residential Wood)</i> As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - CARPENTER (Residential Wood Frame) - Zone 1</b>						
<b>Effective Date - 05/01/2011</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.49	\$6.34	\$0.00	\$0.00	\$22.83
2	60	\$16.49	\$6.34	\$6.23	\$0.00	\$29.06
3	65	\$17.87	\$6.34	\$6.23	\$0.00	\$30.44
4	70	\$19.24	\$6.34	\$6.23	\$0.00	\$31.81
5	75	\$20.62	\$6.34	\$6.23	\$0.00	\$33.19
6	80	\$21.99	\$6.34	\$6.23	\$0.00	\$34.56
7	85	\$23.37	\$6.34	\$6.23	\$0.00	\$35.94
8	90	\$24.74	\$6.34	\$6.23	\$0.00	\$37.31
<b>Notes:</b>						
<b>Apprentice to Journeyworker Ratio:1:5</b>						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofing &Roofer Dampproofg) <i>ROOFERS LOCAL 33</i>	08/01/2015	\$40.11	\$11.00	\$12.00	\$0.00	\$63.11
	02/01/2016	\$41.01	\$11.00	\$12.00	\$0.00	\$64.01

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - ROOFER - Local 33</b>						
<b>Effective Date - 08/01/2015</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.06	\$11.00	\$3.38	\$0.00	\$34.44
2	60	\$24.07	\$11.00	\$12.00	\$0.00	\$47.07
3	65	\$26.07	\$11.00	\$12.00	\$0.00	\$49.07
4	75	\$30.08	\$11.00	\$12.00	\$0.00	\$53.08
5	85	\$34.09	\$11.00	\$12.00	\$0.00	\$57.09
<b>Effective Date - 02/01/2016</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.51	\$11.00	\$3.38	\$0.00	\$34.89
2	60	\$24.61	\$11.00	\$12.00	\$0.00	\$47.61
3	65	\$26.66	\$11.00	\$12.00	\$0.00	\$49.66
4	75	\$30.76	\$11.00	\$12.00	\$0.00	\$53.76
5	85	\$34.86	\$11.00	\$12.00	\$0.00	\$57.86
<div> <b>Notes:</b> ** 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. </div>						
<b>Apprentice to Journeyworker Ratio:**</b>						
ROOFER SLATE / TILE / PRECAST CONCRETE						
<i>ROOFERS LOCAL 33</i>						
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER						
<i>SHEETMETAL WORKERS LOCAL 17 - A</i>						
	08/01/2015	\$43.31	\$10.20	\$21.48	\$2.25	\$77.24
	02/01/2016	\$44.31	\$10.20	\$21.48	\$2.25	\$78.24
	08/01/2016	\$45.46	\$10.20	\$21.48	\$2.25	\$79.39
	02/01/2017	\$46.56	\$10.20	\$21.48	\$2.25	\$80.49
	08/01/2017	\$47.66	\$10.20	\$21.48	\$2.25	\$81.59
	02/01/2018	\$48.81	\$10.20	\$21.48	\$2.25	\$82.74

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Apprentice - SHEET METAL WORKER - Local 17-A</b>						
<b>Effective Date - 08/01/2015</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.32	\$10.20	\$4.90	\$0.00	\$32.42
2	40	\$17.32	\$10.20	\$4.90	\$0.00	\$32.42
3	45	\$19.49	\$10.20	\$9.59	\$1.18	\$40.46
4	45	\$19.49	\$10.20	\$9.59	\$1.18	\$40.46
5	50	\$21.66	\$10.20	\$10.45	\$1.27	\$43.58
6	50	\$21.66	\$10.20	\$10.70	\$1.28	\$43.84
7	60	\$25.99	\$10.20	\$12.17	\$1.45	\$49.81
8	65	\$28.15	\$10.20	\$13.04	\$1.54	\$52.93
9	75	\$32.48	\$10.20	\$14.76	\$1.72	\$59.16
10	85	\$36.81	\$10.20	\$15.98	\$1.89	\$64.88
<b>Effective Date - 02/01/2016</b>						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.72	\$10.20	\$4.90	\$0.00	\$32.82
2	40	\$17.72	\$10.20	\$4.90	\$0.00	\$32.82
3	45	\$19.94	\$10.20	\$9.59	\$1.19	\$40.92
4	45	\$19.94	\$10.20	\$9.59	\$1.19	\$40.92
5	50	\$22.16	\$10.20	\$10.45	\$1.28	\$44.09
6	50	\$22.16	\$10.20	\$10.70	\$1.29	\$44.35
7	60	\$26.59	\$10.20	\$12.17	\$1.47	\$50.43
8	65	\$28.80	\$10.20	\$13.04	\$1.56	\$53.60
9	75	\$33.23	\$10.20	\$14.76	\$1.75	\$59.94
10	85	\$37.66	\$10.20	\$15.98	\$1.92	\$65.76
<div> <b>Notes:</b>  Steps are 6 mos. </div>						
<b>Apprentice to Journeyworker Ratio:1:4</b>						

SIGN ERECTOR	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
<i>PAINTERS LOCAL 35 - ZONE 1</i>						



Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SIGN ERECTOR - Local 35 Zone 1

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

Notes:

Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/01/2015	\$33.04	\$10.41	\$10.08	\$0.00	\$53.53
	06/01/2016	\$33.54	\$10.41	\$10.08	\$0.00	\$54.03
	08/01/2016	\$33.54	\$10.91	\$10.08	\$0.00	\$54.53
	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/01/2015	\$33.33	\$10.41	\$10.08	\$0.00	\$53.82
	06/01/2016	\$33.83	\$10.41	\$10.08	\$0.00	\$54.32
	08/01/2016	\$33.83	\$10.91	\$10.08	\$0.00	\$54.82
	12/01/2016	\$33.83	\$10.91	\$10.89	\$0.00	\$55.63
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	10/01/2015	\$54.83	\$8.42	\$15.65	\$0.00	\$78.90
	01/01/2016	\$54.43	\$8.67	\$15.80	\$0.00	\$78.90
	03/01/2016	\$55.43	\$8.67	\$15.80	\$0.00	\$79.90
	10/01/2016	\$56.58	\$8.67	\$15.80	\$0.00	\$81.05
	03/01/2017	\$57.58	\$8.67	\$15.80	\$0.00	\$82.05

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 10/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.19	\$8.42	\$8.40	\$0.00	\$36.01
2	40	\$21.93	\$8.42	\$8.40	\$0.00	\$38.75
3	45	\$24.67	\$8.42	\$8.40	\$0.00	\$41.49
4	50	\$27.42	\$8.42	\$8.40	\$0.00	\$44.24
5	55	\$30.16	\$8.42	\$8.40	\$0.00	\$46.98
6	60	\$32.90	\$8.42	\$8.40	\$0.00	\$49.72
7	65	\$35.64	\$8.42	\$8.40	\$0.00	\$52.46
8	70	\$38.38	\$8.42	\$8.40	\$0.00	\$55.20
9	75	\$41.12	\$8.42	\$8.40	\$0.00	\$57.94
10	80	\$43.86	\$8.42	\$8.40	\$0.00	\$60.68

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.05	\$8.67	\$8.55	\$0.00	\$36.27
2	40	\$21.77	\$8.67	\$8.55	\$0.00	\$38.99
3	45	\$24.49	\$8.67	\$8.55	\$0.00	\$41.71
4	50	\$27.22	\$8.67	\$8.55	\$0.00	\$44.44
5	55	\$29.94	\$8.67	\$8.55	\$0.00	\$47.16
6	60	\$32.66	\$8.67	\$8.55	\$0.00	\$49.88
7	65	\$35.38	\$8.67	\$8.55	\$0.00	\$52.60
8	70	\$38.10	\$8.67	\$8.55	\$0.00	\$55.32
9	75	\$40.82	\$8.67	\$8.55	\$0.00	\$58.04
10	80	\$43.54	\$8.67	\$8.55	\$0.00	\$60.76

Notes: Apprentice entered prior 9/30/10:

40/45/50/55/60/65/70/75/80/85

Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR OPERATING ENGINEERS LOCAL 4	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN OPERATING ENGINEERS LOCAL 4	12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
	06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
	12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
	06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
	12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN ELECTRICIANS LOCAL 103	09/01/2015	\$34.25	\$13.00	\$14.06	\$0.00	\$61.31
	03/01/2016	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103							
Effective Date - 09/01/2015							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	40	\$13.70	\$13.00	\$0.41	\$0.00	\$27.11	
2	40	\$13.70	\$13.00	\$0.41	\$0.00	\$27.11	
3	45	\$15.41	\$13.00	\$11.03	\$0.00	\$39.44	
4	45	\$15.41	\$13.00	\$11.03	\$0.00	\$39.44	
5	50	\$17.13	\$13.00	\$11.30	\$0.00	\$41.43	
6	55	\$18.84	\$13.00	\$11.58	\$0.00	\$43.42	
7	60	\$20.55	\$13.00	\$11.86	\$0.00	\$45.41	
8	65	\$22.26	\$13.00	\$12.13	\$0.00	\$47.39	
9	70	\$23.98	\$13.00	\$12.41	\$0.00	\$49.39	
10	75	\$25.69	\$13.00	\$12.68	\$0.00	\$51.37	
Effective Date - 03/01/2016							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	40	\$13.85	\$13.00	\$0.42	\$0.00	\$27.27	
2	40	\$13.85	\$13.00	\$0.42	\$0.00	\$27.27	
3	45	\$15.58	\$13.00	\$11.52	\$0.00	\$40.10	
4	45	\$15.58	\$13.00	\$11.52	\$0.00	\$40.10	
5	50	\$17.32	\$13.00	\$11.79	\$0.00	\$42.11	
6	55	\$19.05	\$13.00	\$12.06	\$0.00	\$44.11	
7	60	\$20.78	\$13.00	\$12.34	\$0.00	\$46.12	
8	65	\$22.51	\$13.00	\$12.62	\$0.00	\$48.13	
9	70	\$24.24	\$13.00	\$12.90	\$0.00	\$50.14	
10	75	\$25.97	\$13.00	\$13.17	\$0.00	\$52.14	
Notes:							
Apprentice to Journeyworker Ratio:1:1							
TERRAZZO FINISHERS		08/01/2015	\$48.80	\$10.18	\$18.57	\$0.00	\$77.55
BRICKLAYERS LOCAL 3 - MARBLE & TILE		02/01/2016	\$48.80	\$10.18	\$19.14	\$0.00	\$78.12
		08/01/2016	\$49.70	\$10.18	\$19.22	\$0.00	\$79.10
		02/01/2017	\$50.27	\$10.18	\$19.22	\$0.00	\$79.67

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile							
Effective Date - 08/01/2015							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$24.40	\$10.18	\$18.57	\$0.00	\$53.15	
2	60	\$29.28	\$10.18	\$18.57	\$0.00	\$58.03	
3	70	\$34.16	\$10.18	\$18.57	\$0.00	\$62.91	
4	80	\$39.04	\$10.18	\$18.57	\$0.00	\$67.79	
5	90	\$43.92	\$10.18	\$18.57	\$0.00	\$72.67	
Effective Date - 02/01/2016							
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
1	50	\$24.40	\$10.18	\$19.14	\$0.00	\$53.72	
2	60	\$29.28	\$10.18	\$19.14	\$0.00	\$58.60	
3	70	\$34.16	\$10.18	\$19.14	\$0.00	\$63.48	
4	80	\$39.04	\$10.18	\$19.14	\$0.00	\$68.36	
5	90	\$43.92	\$10.18	\$19.14	\$0.00	\$73.24	
Notes:							
Apprentice to Journeyworker Ratio:1:3							
TEST BORING DRILLER		12/01/2015	\$36.70	\$7.45	\$13.75	\$0.00	\$57.90
LABORERS - FOUNDATION AND MARINE		06/01/2016	\$37.45	\$7.45	\$13.75	\$0.00	\$58.65
		12/01/2016	\$38.45	\$7.45	\$13.75	\$0.00	\$59.65
For apprentice rates see "Apprentice- LABORER"							
TEST BORING DRILLER HELPER		12/01/2015	\$35.42	\$7.45	\$13.75	\$0.00	\$56.62
LABORERS - FOUNDATION AND MARINE		06/01/2016	\$36.17	\$7.45	\$13.75	\$0.00	\$57.37
		12/01/2016	\$37.17	\$7.45	\$13.75	\$0.00	\$58.37
For apprentice rates see "Apprentice- LABORER"							
TEST BORING LABORER		12/01/2015	\$35.30	\$7.45	\$13.75	\$0.00	\$56.50
LABORERS - FOUNDATION AND MARINE		06/01/2016	\$36.05	\$7.45	\$13.75	\$0.00	\$57.25
		12/01/2016	\$37.05	\$7.45	\$13.75	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"							
TRACTORS/PORTABLE STEAM GENERATORS		12/01/2015	\$43.31	\$10.00	\$14.90	\$0.00	\$68.21
OPERATING ENGINEERS LOCAL 4		06/01/2016	\$44.06	\$10.00	\$14.90	\$0.00	\$68.96
		12/01/2016	\$45.29	\$10.00	\$14.90	\$0.00	\$70.19
		06/01/2017	\$46.28	\$10.00	\$14.90	\$0.00	\$71.18
		12/01/2017	\$47.27	\$10.00	\$14.90	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT		12/01/2015	\$33.62	\$10.41	\$10.08	\$0.00	\$54.11
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A		06/01/2016	\$34.12	\$10.41	\$10.08	\$0.00	\$54.61
		08/01/2016	\$34.12	\$10.91	\$10.08	\$0.00	\$55.11
		12/01/2016	\$34.12	\$10.91	\$10.89	\$0.00	\$55.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2015	\$47.58	\$7.45	\$14.15	\$0.00	\$69.18
	06/01/2016	\$48.33	\$7.45	\$14.15	\$0.00	\$69.93
	12/01/2016	\$49.33	\$7.45	\$14.15	\$0.00	\$70.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2015	\$49.58	\$7.45	\$14.15	\$0.00	\$71.18
	06/01/2016	\$50.33	\$7.45	\$14.15	\$0.00	\$71.93
	12/01/2016	\$51.33	\$7.45	\$14.15	\$0.00	\$72.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2015	\$39.65	\$7.45	\$14.15	\$0.00	\$61.25
	06/01/2016	\$40.40	\$7.45	\$14.15	\$0.00	\$62.00
	12/01/2016	\$41.40	\$7.45	\$14.15	\$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2015	\$41.65	\$7.45	\$14.15	\$0.00	\$63.25
	06/01/2016	\$42.40	\$7.45	\$14.15	\$0.00	\$64.00
	12/01/2016	\$43.40	\$7.45	\$14.15	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2015	\$33.04	\$10.41	\$10.08	\$0.00	\$53.53
	06/01/2016	\$33.54	\$10.41	\$10.08	\$0.00	\$54.03
	08/01/2016	\$33.54	\$10.91	\$10.08	\$0.00	\$54.53
	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.60	\$7.45	\$13.55	\$0.00	\$56.60
	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2015	\$43.73	\$10.00	\$14.90	\$0.00	\$68.63
	06/01/2016	\$44.48	\$10.00	\$14.90	\$0.00	\$69.38
	12/01/2016	\$45.73	\$10.00	\$14.90	\$0.00	\$70.63
	06/01/2017	\$46.73	\$10.00	\$14.90	\$0.00	\$71.63
	12/01/2017	\$47.73	\$10.00	\$14.90	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS &amp; GASFITTERS LOCAL 12</i>	09/01/2015	\$50.46	\$10.82	\$15.14	\$0.00	\$76.42
	03/01/2016	\$51.61	\$10.82	\$15.14	\$0.00	\$77.57
	09/01/2016	\$52.66	\$10.82	\$15.14	\$0.00	\$78.62
	03/01/2017	\$53.66	\$10.82	\$15.14	\$0.00	\$79.62
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.

## **Division of Labor and Industries Statement of Compliance**

## 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. For every week in which an apprentice is employed, a photocopy of the apprentice's identification card must be attached to the payroll report. 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 awarding authority directly, 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

\_\_\_\_\_, 20\_\_\_\_

I, \_\_\_\_\_,  
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by  
\_\_\_\_\_ on the \_\_\_\_\_

(Contractor, subcontractor or public body)

(Building or project)

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

Signature \_\_\_\_\_

Title \_\_\_\_\_

## **GENERAL TERMS & CONDITIONS**

## General Conditions

### GENERAL TERMS AND CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, RECONSTRUCTION, ALTERATION, REMODELING, OR REPAIR OF ANY PUBLIC BUILDING OR PUBLIC WORK IN THE CITY OF SOMERVILLE

TABLE OF CONTENTS	Page
Article 1	DEFINITIONS .....2
Article 2	ABOUT THE CONTRACT DOCUMENTS .....6
Article 3	THE CITY .....10
Article 4	THE DESIGN PROFESSIONAL .....12
Article 5	THE CONTRACTOR .....15
Article 6	SUBCONTRACTORS .....34
Article 7	PERFORMANCE AND PAYMENT BONDS .....35
Article 8	INSURANCE REQUIREMENTS .....36
Article 9	TESTS AND INSPECTIONS .....38
Article 10	UNCOVERING AND CORRECTING WORK .....39
Article 11	CHANGES IN THE WORK .....40
Article 12	CHANGE IN THE CONTRACT TIME .....44
Article 13	PAYMENTS .....47
Article 14	SUBSTANTIAL COMPLETION .....54
Article 15	GUARANTEES AND WARRANTIES .....56
Article 16	CLAIMS .....57
Article 17	EMERGENCIES .....62
Article 18	TERMINATION OR SUSPENSION OF THE CONTRACT .....62
Article 19	AMERICANS WITH DISABILITIES ACT .....63
Article 20	WRITTEN NOTICE TO THE PARTIES .....64
Article 21	MISCELLANEOUS PROVISIONS .....64

### GENERAL TERMS AND CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, RECONSTRUCTION, INSTALLATION,

**DEMOLITION, MAINTENANCE, OR REPAIR OF ANY  
PUBLIC BUILDING OR PUBLIC WORK  
IN THE CITY OF SOMERVILLE**

**ARTICLE 1: DEFINITIONS**

**1.1. In General.**

**1.1.1. Well-known meanings.** When words or phrases that have a well-known technical, or construction industry, or trade meaning are used in the Contract Documents, such words or phrases shall be interpreted in accordance with that meaning, unless otherwise stated.

**1.1.2. Capitalization.** The words and terms defined in this Article are capitalized in these General Terms and Conditions of the Contract. Other capitalized words may refer to a specific document found in the Contract Documents.

**1.1.3. Persons.** Whenever the word person or persons is used, it includes, unless otherwise stated, entity or entities, respectively, including, but not limited to, corporations, partnerships, and joint venturers.

**1.1.4. Singular and Plural.** The following terms have the meanings indicated which are applicable to both the singular and the plural thereof.

**1.2. Definitions.**

**1.2.1. Agreement.** The Agreement is the written document between the **City** and the **Contractor** which is titled: Agreement between the City of Somerville and the Contractor, which is the executed portion of the Contract, and which forms a part of the Contract. The Agreement also includes all documents required to be attached thereto, including, but not limited to, the performance bond, the labor and materials or payment bonds, certificates of insurance, and all Modifications of the Agreement.

**1.2.2. Change Order.** A Change Order is a document which is signed by the **Contractor**, the **Design Professional**, and the **City**; which is directed to the **Contractor**; which authorizes the **Contractor** to make an addition to, a deletion from or a revision in the Work, or an adjustment in the Contract Sum or in the Contract Time; and which is issued on or after the date of the Agreement between the **Contractor** and the **City**.

**1.2.3. City.** The **City** refers to the City of Somerville, which is the owner of the Project and is the public awarding authority with whom the **Contractor** has entered into the Contract and for whom the Work is to be provided.

**1.2.4. Claim.** A Claim is a dispute, demand, or assertion by one of the parties arising out of or relating to the Contract for which such party is seeking relief.



**1.2.5. Contract.** The Contract consists of all the Contract Documents. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification to the Contract signed by both parties.

**1.2.6. Contract Documents.** The Contract Documents consist of the Agreement; the notice of award of the Contract; the Notice to Proceed; the entire Project Manual; Change Orders; Construction Change Directives; the **Contractor's** Bid and all accompanying documents; and the **Design Professional's** written interpretations and clarifications issued on or after the issuance of the Notice to Proceed. Shop Drawing submittals and reports or drawings utilized by the **Design Professional** in preparing the Contract Documents are not Contract Documents.

**1.2.7. Contractor.** The **Contractor** is the person who is awarded the Contract for the Project herein pursuant to M.G.L. c. 149, §44A or M.G.L. c. 39, §39M; and is identified in the Agreement as such. The term "**Contractor**" is intended to include the **Contractor** as well as its authorized representative(s).

**1.2.8. Contract Sum.** The Contract Sum is the total amount stated in the Agreement payable by the **City** to the **Contractor** for the completion of the Work in accordance with the Contract Documents.

**1.2.9. Contract Time.** Unless otherwise provided, the Contract Time is the number of days allotted in the Contract Documents or the dates stated in the Agreement, including authorized adjustments, for Substantial Completion. We usually put a contract end date that is beyond the date of substantial completion.

**1.2.10. Coordination Drawings.** Coordination Drawings are those drawings, which are prepared by the **Contractor** or a Subcontractor that show the exact alignment, physical locations, and configuration of the mechanical, electrical, and fire protection installations.

**1.2.11. Day.** The term "day" shall mean calendar day unless otherwise stated.

**1.2.12. Design Professional.** The **Design Professional** is the person lawfully licensed to practice architecture, engineering, or landscape architecture and has been selected by the **City** to administer the Contract. The term "**Design Professional**," while referred to in the singular, means the **Design Professional** and/or the **Design Professional's** representative. For the purposes of this project, **Design Professional** shall mean the firm of Weston Sampson Engineers and appropriate consultants.

**1.2.13. Field Order.** A Field Order is a written order issued by the **Design Professional** which orders minor changes in the Work, but which does not involve a change in the Contract Sum or the Contract Time.

**1.2.14. Final Completion.** Final Completion is the point in time when the Design Professional finds that the Work has been fully completed in accordance with the Contract Documents. Final Completion shall be no later than thirty (30) days after Substantial Completion.

**1.2.15. General Requirements.** General Requirements refer to Sections of Division 1 of the Specifications.

**1.2.16. Modification.** A Modification is a written instrument that amends the Contract after execution of the Agreement.

**1.2.17. Notice to Proceed.** A Notice to Proceed is a written notice given by the **City**, or the **Design Professional**, to the **Contractor** fixing the date on which the Contract Time will begin to run and on which the **Contractor** shall start to perform its obligations under the Contract Documents.

**1.2.18. Plans.** The Plans are the drawings which are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location, dimensions, scope, extent, and character of the Work to be furnished and performed by the **Contractor** and which have been prepared or approved by the **Design Professional**.

**1.2.19. Product Data.** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the **Contractor** to illustrate materials or equipment for some portion of the Work. Product Data are not considered part of the Contract Documents.

**1.2.20. Project.** The Project is the total Work to be provided under the Contract Documents and may be the whole or a part as indicated elsewhere in the Contract Documents and may include construction by the **City** or by separate contractors. The Project is the Work described in the invitation to bid (advertisement) and Specifications and illustrated by the Plans, including any Modifications.

**1.2.21. Project Manual.** The Project Manual is the entire set of bidding documents which includes, but is not limited to, the invitation to bid (advertisement), the instructions to bidders, all of the forms, the wage rates, all City and state requirements, the General Terms and Conditions of the Contract, any supplementary conditions thereto, the Plans, the Specifications, and all addenda.

**1.2.22. Proposed Change Order.** A Proposed Change Order is a Change Order that has been submitted by the **Contractor** to the **Design Professional**, is under review, and has not been approved by the **City**.

**1.2.23. Samples.** Samples are physical examples of materials, equipment, or

workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged. Samples are not considered part of the Contract Documents.

**1.2.24. Shop Drawings.** Shop Drawings are all drawings, diagrams, illustrations, schedules, and other information that are specifically prepared or assembled by or for the **Contractor** and submitted by the **Contractor** to illustrate some portion of the Work. Shop Drawings are not considered part of the Contract Documents.

**1.2.25. Site.** The Site is the location of the Project and of the Work.

**1.2.26. Specifications.** Specifications are those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

**1.2.27. Subcontractor.** A Subcontractor is a person who contracts directly with the **Contractor**, unless otherwise stated.

**1.2.28. Submittals.** Submittals are those Shop Drawings, Product Data, Samples, or any other required document that are provided to the Design Professional for review and approval.

**1.2.29. Substantial Completion.** Substantial Completion means that the Work has been completed and the Site or the facility is opened for full and intended public use, except for minor incomplete or unsatisfactory items that do not materially impair the usefulness of the Work. The **Design Professional** shall decide what constitutes “minor,” “incomplete,” “unsatisfactory,” and “materially” and the **Design Professional's** decision shall be final.

**1.2.30. Sub-subcontractor.** A Sub-subcontractor is a person who has contracted directly with a Subcontractor.

**1.2.31. Supplier.** A Supplier is a manufacturer, fabricator, distributor, material person, or vendor having a direct contract with the Contractor or with any Subcontractor to furnish materials or equipment to be incorporated into the Work by the Contractor or any Subcontractor.

**1.2.32. Work.** Work refers to the services and the entire completed construction or the various separately identifiable parts thereof required by the Contract Documents, including all labor, materials, and equipment furnished, furnished and incorporated into the Project, or to be provided by the **Contractor** to fulfill the **Contractor's** obligations. The Work may constitute the whole or a part of the Project.

**1.2.33. Construction Change Directive.** A **Construction Change** Directive is a written directive to the **Contractor** ordering an addition to, a deletion from, or a revision to the Work issued on or after the date of the Agreement, signed by the **City**, and recommended by the **Design Professional**.

## **ARTICLE 2: ABOUT THE CONTRACT DOCUMENTS**

### **2.1. Priority/Conflict.**

**2.1.1. Priority Among Contract Documents.** In the event of conflict among the Contract Documents, the Contract Documents shall be construed according to the following priorities:

Highest Priority:	Modifications
Second Priority:	Agreement
Third Priority:	Addenda-later date to take precedence
Fourth Priority:	Supplementary General Conditions
Fifth Priority:	General Conditions
Sixth Priority:	Plans and Specifications

**2.1.1.1.** If there is a conflict between the Plans and Specifications, the figured dimensions shall govern over the scaled dimensions. Detailed Plans shall govern over the general Plans. Larger scale Plans shall take precedence over smaller scale Plans. Plans shall govern over Shop Drawings. Whenever notes, specifications, dimensions, details, or schedules in the Specifications or in the Plans, or between the Specifications and the Plans, or in all other instances not specifically noted above, the **Contractor** shall provide, unless otherwise directed by a Modification of the Contract, the better quality or greater quantity of Work at no increase in the Contract Sum or in the Contract Time.

**2.1.1.2.** Compliance with these priority conditions shall not justify any changes in the Work or any increase in the Contract Sum or Contract Time, unless any such compliance results in Work that may not be reasonably inferred from the Contract Documents as being required to produce the intended result as determined by the **Design Professional**.

**2.1.2. Review of the Contract Documents and Field Conditions and Discovery of Conflict, Error, Ambiguity, or Discrepancy.** Before starting the Work, and during the progress thereof, the **Contractor** shall carefully study and compare the Contract Documents with each other and with the information furnished by the **City** pursuant to Article 3 and shall at once report to the **Design Professional** any error, inconsistency, or omission the **Contractor** may discover. Any necessary change shall be ordered as provided in Article 11, subject to the requirements of any other provisions of the Contract Documents. The **Contractor** shall not proceed with the Work affected thereby (except in an emergency) until

a Modification has been issued. If the **Contractor** proceeds with the Work having discovered such errors, inconsistencies, or omissions contrary to the provisions contained herein, or if by reasonable study of the Contract Documents the **Contractor** could have discovered such, the **Contractor** shall bear all costs arising therefrom. The **Contractor** shall be liable to the **City** for failure to report any conflict, error, ambiguity, or discrepancy of which it knew or should have known.

**2.1.3. Field Measurements.** The **Contractor** shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the **Contractor** with the Contract Documents before commencing activities. Errors, inconsistencies, or omissions discovered shall be reported to the **Design Professional** at once.

**2.1.4. Statutory Provisions.** The **City** and the **Contractor** recognize that other rights duties and obligations with respect to public construction contracts are provided for by statute, notwithstanding the fact that they may not be provided for in the Contract Documents. In case of conflict between the statutory provisions and other provisions of the Contract Documents and the provisions of any applicable statute, the statutory provisions shall govern.

**2.1.5. Voided or Unlawful Provisions.** In the event any provision in the Contract is voided or deemed unlawful, such provision shall be deleted without affecting the remainder of the Contract.

## **2.2. Execution.**

**2.2.1.** Execution of the Agreement by the **Contractor** is a representation that the **Contractor** has visited the Site, become familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

## **2.3. Intent.**

**2.3.1. Entire Agreement.** The Contract Documents comprise the entire agreement between the **City** and the **Contractor** concerning the Work. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the **Contractor**. The Contract Documents are complementary; what is required by one shall be as binding as if required by all. Performance by the **Contractor** shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. All Work mentioned or indicated in the Contract Documents shall be performed by the **Contractor** as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

**2.3.2. Statutory Provisions.** Each and every provision of law, code, and regulation, required by law to be inserted in these Contract Documents shall be deemed to be inserted

herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

**2.3.3. Functionally Complete Project.** It is the intent of the Contract Documents to describe a functionally complete Project. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the **Contractor**. Any Work, materials, or equipment that may be reasonably inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed by the **Contractor** whether or not specifically called for in the Contract Documents.

**2.3.4. Indications or Notations.** All indications or notations which apply to one of a number of similar situations, materials, or processes shall be deemed to apply to all such situations, materials, or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

**2.3.5. Standards or Quality of Materials or Workmanship.** Where no explicit quality or standards for materials or workmanship are established for Work, such Work is to be of good quality for the intended use and consistent with the quality of the surrounding Work and of the construction of the Project generally.

**2.3.6. Manufactured Products.** All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's written or printed directions and instructions unless otherwise indicated in the Contract Documents.

**2.3.7. Mechanical, Electrical, and Fire Protection Plans.** The mechanical, electrical, and fire protection Plans are diagrammatic only and are not intended to show the alignment, physical locations, or configurations of such Work. Such Work shall be installed without additional cost to the **City** to clear all obstructions, permit proper clearances for the Work of other trades, and present an orderly appearance where exposed. Prior to beginning such Work, the **Contractor** shall prepare Coordination Drawings and demonstrate to the **Design Professional's** satisfaction that the installations will comply with the preceding sentence. The **Contractor** shall be solely liable and responsible for any costs and/or delays resulting from the **Contractor's** failure to prepare such Coordination Drawings.

**2.3.8. Locations of Fixtures and Outlets.** Exact locations of fixtures and outlets shall be obtained from the **Design Professional** as provided in Article 5 before the Work is roughed in. Work installed without such information from the **Design Professional** shall be relocated at the **Contractor's** expense.

**2.3.9. Tests.** When test boring or soil test information are included with the Contract

Documents or otherwise made available to the **Contractor** and such test boring or soil test information was obtained by the **City** for use by the **Design Professional** in the design of the Project or Work, the **City** does not hold out such information to the **Contractor** as an accurate or approximate indication of subsurface conditions, and no claim for extra cost of extension of time resulting from a reliance by the **Contractor** on such information shall be allowed except as otherwise provided herein. Any such reports are not part of the Contract Documents.

**2.3.10. Joining Work.** Where the Work is to fit with existing conditions or work to be performed by others, the **Contractor** shall fully and completely join the Work with such conditions or work, unless otherwise specified.

**2.4. Organization.**

**2.4.1.** Except as provided in M.G.L. c. 149, §44F, the organization of the Specifications into divisions, sections, and articles, and the arrangement of Plans shall not control the **Contractor** in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**2.5. References.**

**2.5.1.** Where codes, manuals, specifications, standards, requirements and publications of public and private bodies are referred to in the Contract Documents whether specifically or by implication, references shall be understood to be to the latest revision prior to the date of receiving bids, except where otherwise indicated. Where statutes are referred to in the Contract Documents whether specifically or by implication, references shall be understood to be to the latest revision.

**2.5.2.** References herein to particular paragraphs or Articles are solely to facilitate finding additional information with regard to the specific matters and are not to be construed in any way as limiting the possible paragraphs and Articles in which such matters may be found elsewhere in this document.

**2.6. Reuse of Design Professional's Written Instruments.**

**2.6.1.** Neither the **Contractor** nor any Subcontractor or Supplier shall have or acquire any title to or ownership rights in any of the Plans, Specifications, or other documents prepared by the **Design Professional** and shall not reuse any of such Plans, Specifications, or other documents without prior written consent of the **City** and the **Design Professional**.

**2.7. Written Material of the Contractor.**

**2.7.1.** All written material prepared or collected by the **Contractor** in the course of completing the Work shall be the exclusive property of the **City** and shall not be used by the **Contractor** for any purpose other than the purpose of this Contract.

**2.8. Modifying Words.**

**2.8.1.** In the interest of simplicity, modifying words such as “all” and “any” may be omitted, but the fact that such words may be absent from one sentence and appear in another is not intended to affect the interpretation of either statement.

**2.9. Use of Certain Words and Terms.**

**2.9.1.** Whenever in the Contract Documents the terms “as ordered,” “as directed,” “as required,” “as allowed,” “as approved,” or terms of like effect or import are used, or the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the **City** or of the **Design Professional** as to the Work, it is intended that such requirement, direction, review, or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise).

**2.9.2.** The use of any such term or adjective shall not be effective to change the duties and responsibilities of the **City** or the **Design Professional** from those assigned in the Contract Documents or to assign any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

**2.9.3.** When the words “Contractor,” “Subcontractor,” “Sub-subcontractor,” and “Supplier” are used, they are intended to include their employees and agents, unless otherwise specified.

**2.10. Modification of the Contract Documents.**

**2.10.1. Major Modifications.** Major Modifications may affect the Contract Sum or the Contract Time. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways, all of which must contain a written endorsement by the **City**:

- 2.10.1.1.** a formal written amendment;
- 2.10.1.2.** a Change Order;
- 2.10.1.3.** a **Construction Change Directive**; or
- 2.10.1.4.** the **Design Professional's** written interpretation, clarification, or decision.

**2.10.2. Minor Modifications.** Minor modifications do not affect the Contract Sum or the Contract Time. The requirements of the Contract Documents may be supplemented and minor variations and deviations of the Work may be authorized in one or more of the following ways:



2.10.2.1. a Field Order; or

2.10.2.2. the **Design Professional's** approval of a Shop Drawing or Sample.

## ARTICLE 3: THE CITY

### 3.1. Signatory.

3.1.1. All documents which require a signature or an endorsement by the **City** must be signed by the Mayor in order to be deemed ratified by the **City**.

### 3.2. Requirements to Provide Documents.

3.2.1. To the extent they are available, the **City** shall furnish surveys describing physical characteristics, legal limitations, and utility locations for the site of the Project, and a legal description of the Site.

3.2.2. The **City** shall obtain and pay for necessary approvals, easements, assessments, and charges that are customarily secured prior to the execution of the Contract.

3.2.3. The **City** shall furnish information or services required of the **City** hereunder with reasonable promptness after receipt from the **Contractor** of a written request for such information or services.

3.2.4. The **City** shall provide the **Contractor**, at no charge, such copies of the Project Manual as are reasonably necessary for the execution of the Work.

### 3.3. Clerk of the Works.

3.3.1. The **City** may engage a Clerk of the Works for this Project, in which case the **City** shall, upon request of the **Contractor**, provide the **Contractor** with a written statement of the duties, responsibilities, and limitations of authority of such Clerk of the Works. Except as expressly set forth in such written statement, the Clerk of the Works shall have no authority to approve Work, to approve Change Orders, or to exercise any of the power and authority of the **City** or the **Design Professional**. The Clerk of the Works shall observe the **Contractor's** operations and construction activities for compliance with the Plans and Specifications. The Clerk of the Works shall have access to all areas of the Project at all times. The **Contractor** shall fully cooperate with the Clerk of the Works in the performance of the Clerk's duties.

### 3.4. City's Right to Perform Construction and to Award Separate Contracts.

3.4.1. The **City** reserves the right to perform construction or operations at the Site with its own forces or others. If the **Contractor** claims that a delay or additional cost is involved because of such action by the **City**, the **Contractor** shall make such Claim as provided elsewhere in the Contract Documents.

3.4.2. When the separate contracts are awarded for different portions of the Project or

other construction or operations on the site, the term “**Contractor**” in the Contract Documents in each case shall mean the **Contractor** who executes each separate City-Contractor Agreement.

**3.4.3.** The **City** shall provide for coordination of the activities of the **City's** own forces and of each separate contractor with the Work of the **Contractor**, who shall cooperate with them. The **Contractor** shall afford each other person access to the Site and shall properly coordinate its Work with that of the persons performing other work. The **Contractor** shall participate with other separate contractors and the **City** in reviewing their construction schedules when directed to do so. The **Contractor** shall make any revisions to the construction schedules deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the **Contractor**, separate contractors, and the **City** until subsequently revised.

**3.5. Limitations on the City's Responsibilities.**

**3.5.1.** The **City** shall not supervise, direct, or have control or authority over, nor be responsible for the **Contractor's** means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of the **Contractor** to comply with laws, codes and regulations applicable to the furnishing or performance of the Work. The **City** will not be responsible for the **Contractor's** failure to perform or furnish the Work in accordance with the Contract Documents. The **City** is not responsible for the acts or omissions of the **Contractor**, any Subcontractor, Supplier, or anyone for whose acts the **Contractor**, any Subcontractor or Suppliers may be liable.

**3.5.2.** The **City's** authority to review any of the **Contractor's** progress schedules, or its decision to raise or not to raise any objections about such schedules shall not impose on the **City** any responsibility for the timing, planning, scheduling, or execution of the Work, nor in any way give rise to any duty or responsibility on the part of the **City** to exercise this authority for the benefit of the **Contractor**, any Subcontractor or Supplier or any other party.

**3.5.3.** The **City's** decision to raise or not to raise objections with regard to any aspects of the **Contractor's** insurance shall in no way give rise to any duty or responsibility on the part of the **City** to or for the benefit of the **Contractor**, any Subcontractor, any Supplier, or any other party.

**3.6. Reservation of Rights.**

**3.6.1.** The **City** reserves the right to correct at any time any error in any progress payment that may have been made.

**3.6.2.** Should defective Work be discovered subsequent to final payment, the **City** reserves the right to make a claim and recover all costs and professional fees associated therewith, including the cost of removing and/or replacing the defective Work.

**3.7. Waivers.**

**3.7.1.** All waivers by the **City** are valid only to the extent that they are signed by the **City**. Any such waivers pertain only to the specific matter contained in the waiver and not to any similar, subsequent matters.

## **ARTICLE 4: THE DESIGN PROFESSIONAL**

### **4.1. City's Representative.**

**4.1.1.** The **Design Professional** is the **City's** representative (1) during construction, (2) until final payment is due, and (3) with the **City's** concurrence, from time to time during the correction period described in Article 10. The **Design Professional** will advise and consult with the **City**. The **Design Professional** will have authority to act on behalf of the **City** only to the extent provided in the Contract Documents, unless otherwise modified by a written instrument in accordance with other provisions of the Contract.

**4.1.2.** The duties, responsibilities, and the limitations of authority of the **Design Professional** as the **City's** representative during construction are set forth in the Contract Documents and shall not be extended without the written consent of the **City** and the **Design Professional**.

### **4.2. Administration of the Contract.**

**4.2.1.** The **Design Professional** will provide administration of the Contract as described in the Contract Documents, unless the **City** has engaged a construction manager.

### **4.3. Visits to the Site.**

**4.3.1.** The **Design Professional** will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents. However, the **Design Professional** will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of on-site observations as an architect, engineer, or landscape architect, the **Design Professional** will keep the **City** informed of progress of the Work in writing and will endeavor to guard the **City** against defects and deficiencies in the Work.

### **4.4. Communications Facilitating Contract Administration.**

**4.4.1.** Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the **City** and the **Contractor** shall endeavor to communicate through the **Design Professional**. Communications by and with the **Design Professional's** consultants shall be through the **Design Professional**. Communications by and with Subcontractors and Suppliers shall be through the **Contractor**. Communications by and with **City** employees and separate contractors shall be through the **City**.

**4.4.2.** When it deems it necessary or expedient, the **City** may communicate directly with the **Contractor**, any Subcontractors, Suppliers, or consultants.

**4.5. Certification of Applications for Payment.**

**4.5.1.** Based on the **Design Professional's** observations and evaluations of the **Contractor's** applications for payment, the **Design Professional** will review and certify the amounts due the **Contractor** and will issue certificates for payment in such amounts.

**4.6. Rejection of Work.**

**4.6.1.** The **Design Professional** will have authority to reject or disapprove Work (1) that does not conform to the Contract Documents; (2) that the **Design Professional** believes to be defective; and (3) that the **Design Professional** believes will not produce a completed Project conforming to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Whenever the **Design Professional** considers it necessary or advisable for implementation of the intent of the Contract Documents, the **Design Professional** will have authority to require additional inspection or testing of the Work in accordance with Article 9, whether or not such Work is fabricated, installed, or completed. However, neither this authority of the **Design Professional** nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the **Design Professional** to the **Contractor**, Subcontractors, Suppliers, or other persons performing portions of the Work.

**4.7. Review of Submittals.**

**4.7.1.** The **Design Professional** will review or take other appropriate action upon the **Contractor's** submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents and only to the extent that the **Design Professional** believes desirable to protect the **City's** interest. The **Design Professional's** action will be taken with reasonable promptness, while allowing sufficient time in the **Design Professional's** professional judgment to permit adequate review, taking into account the time periods set forth in the latest schedule prepared by the **Contractor** and approved by the **Design Professional**. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the **Contractor** as required by the Contract Documents. The **Design Professional's** review of the **Contractor's** submittals shall not relieve the **Contractor** of the obligations under Article 5. The **Design Professional's** review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The **Design Professional's** approval of a specific item shall not indicate approval of an assembly of which the item is a component. After the rejection of the second resubmittal of any one Submittal, the **Contractor** shall bear the cost of the review of each subsequent resubmittal.

**4.8. Preparation of Change Orders and Construction Change Directives.**

**4.8.1.** The **Design Professional** will prepare Change Orders and **Construction Change Directives** and may authorize minor Modifications in the Work as provided in Article 11.

**4.9. Inspections.**

**4.9.1.** The **Design Professional** will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; will receive and forward to the **City** for the **City's** review and records written warranties and related documents required by the Contract and assembled by the **Contractor**; and will issue a final certificate for payment upon the **Contractor's** compliance with all of the requirements of the Contract Documents.

**4.10. Interpretations, Clarifications, and Decisions.**

**4.10.1.** The **Design Professional** will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of either the **City** or the **Contractor**. The **Design Professional's** response to such requests will be made with reasonable promptness and within the time set forth in the Agreement between the **City** and the **Design Professional**. Any such written interpretations, clarifications, and decisions shall be binding on the **Contractor**.

**4.10.2.** Interpretations, clarifications, and decisions of the **Design Professional** will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. The **Design Professional** will not be liable to the **Contractor**, any Subcontractor, or Supplier for results of interpretations, clarifications, or decisions so rendered in good faith.

**4.10.3.** The **Design Professional** may, as the **Design Professional** judges desirable, issue additional drawings or instructions indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be effected by a Field Order or other notice to the **Contractor**, and provided such drawings or instructions are reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such additional drawings or instructions without any additional cost or an extension of the Contract Time.

**4.10.4.** The **Design Professional's** decisions on matters relating to aesthetic effect must be consistent with the **City's** and will be final.

**4.11. Limitation on the Design Professional's Responsibilities.**

**4.11.1.** Neither the **Design Professional's** authority to act under the provisions of the Contract Documents nor any decision made by the **Design Professional** in good faith to exercise or not to exercise such authority shall give rise to any duty or responsibility of the **Design Professional** to the **Contractor**, any Subcontractor, any Supplier, any surety for any of them or any other person.

**4.11.2.** The **Design Professional** will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the **Contractor's** responsibility as provided in Article 5.

The **Design Professional** will not be responsible for the **Contractor's** failure to carry out the Work in accordance with the Contract Documents. The **Design Professional** will not have control over or charge of and will not be responsible for acts or omissions of the **Contractor**, Subcontractors, Suppliers, or of any other persons performing portions of the Work.

## ARTICLE 5: THE CONTRACTOR

### 5.1. Relationship with the City.

**5.1.1.** The **Contractor** is an independent contractor and not an employee of the **City**. The **Contractor** is engaged by virtue of the Contract to perform only those services contained therein. The **Contractor** is not authorized to contract on behalf of the **City** or to incur any liability on the part of the **City**.

### 5.2. Code of Conduct.

**5.2.1.** M.G.L. c. 268A establishes standards of conduct for officials and employees of the **City**. The **Contractor** shall familiarize itself with the statute and act accordingly.

### 5.3. Quality Assurance.

**5.3.1.** The **Contractor** shall be responsible for ensuring that it, all Subcontractors, Suppliers, and all persons employed to do the Work under the Contract Documents perform in a professional manner, provide a high quality of service and Work, and perform in accordance with the Contract Documents.

### 5.4. Supervision.

**5.4.1. Competence and Efficiency.** The **Contractor** shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills, attention and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

**5.4.2. Construction Means, Methods, Techniques, Etc.** The **Contractor** shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract. Where the Contract Documents refer to particular construction means, methods, techniques, sequences, or procedures or indicate or imply that such are to be used in the Work, such mention is intended only to indicate that the operations of the **Contractor** shall be such as to produce at least the quality of Work implied by the operations described. The actual determination of whether or not the described operations may be safely and suitably employed on the Work shall be the responsibility of the **Contractor**, who shall notify the **Design Professional** in writing, prior to implementation, of the actual means, methods, techniques, sequences, or procedures which will be employed on the Work, if these differ from those mentioned in the Contract Documents. All loss, damage, liability or cost of correcting defective work arising from the employment of any construction means, methods, techniques, sequences, or procedures shall be

borne by the **Contractor**, notwithstanding that such construction means, methods, techniques, sequences, or procedures are referred to, indicated or implied by the Contract Documents, unless the **Contractor** has given timely notice to the **City** and the **Design Professional** in writing that such means, methods, techniques, sequences, or procedures are not safe or suitable, and the **City** has then instructed the **Contractor** in writing to proceed at the **City's** risk.

**5.4.3. Variance between the Contract Documents and Statutes, Ordinances, Codes, Rules, and Regulations.** The **Contractor** shall promptly notify the **Design Professional** and the **City** in writing of any variances between the Contract Documents and statutes, ordinances, codes, rules, and regulations. If the **Contractor**, without written notice to the **Design Professional** and the **City**, performs Work knowing that it is contrary to statutes, ordinances, codes, rules, and regulations, the **Contractor** shall assume full responsibility for such Work and shall bear the costs associated therewith, i.e., replacement, repairs, removal, and fines.

**5.4.4. Acts and Omissions.** The **Contractor** shall be responsible to the **City** for the acts and omissions of all persons performing or supplying the Work.

**5.4.5. Inspections.** The **Contractor** shall be responsible for inspection of portions of Work already performed under this Contract to determine whether such portions are in proper condition to receive subsequent Work.

## **5.5. Personnel.**

**5.5.1. Suitability.** The **Contractor** shall provide competent, properly licensed and/or certified, suitably qualified, and reliable personnel to perform the Work required by the Contract Documents. The **Contractor** shall enforce strict discipline and maintain good order at the site at all times. The **Contractor** shall not employ any Subcontractor, Supplier, or other person, whether initially or as a substitute, against whom the **City** may have reasonable objection. Acceptance of any Subcontractor or other person by the **City** shall not constitute a waiver of any right of the **City** to reject defective Work.

**5.5.2. Sexual Harassment.** Sexual harassment is an unlawful practice under M.G.L. c. 151B. The **Contractor**, Subcontractors, and all other persons responsible for any portion of the Work shall refrain from engaging in sexual harassment. The **Contractor** shall be responsible for any acts of sexual harassment committed by any persons responsible for any portion of the Work. The **Contractor** shall take appropriate action against any such individuals.

**5.5.3. Weapons and Illegal Drugs.** No weapons or illegal drugs are permitted on the Site. It is the responsibility of the **Contractor** to ensure that no weapons or illegal drugs are brought to the Site.

**5.5.4. Maximum Work Day and Work Week.** (*Reference: M.G.L. c. 149, §§30 and 34;*) No laborer, worker, mechanic, foreperson or inspector working within this Commonwealth in the employ of the **Contractor**, Subcontractor or other person doing or contracting to do the

whole or part of the work contemplated by the Contract, shall be required or permitted to work more than eight (8) hours in any one day or more than forty-eight (48) hours in any one week, or more than six (6) days in any one week, except in cases of emergency.

**5.5.5. Lodging.** (*Reference:* M.G.L. c. 149, §25;). Every employee under this Contract shall lodge, board and trade where and with whom he or she elects, and neither the **Contractor** nor its agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person.

**5.5.6. Wage Rates.** (*Reference:* M.G.L. c. 149, §27). Mechanics and apprentices, teamsters, chauffeurs and laborers performing Work shall be paid no less than the minimum rate of wages included in the bid documents and the Project Manual and which are made part of the Contract. They shall continue to be the minimum rate of wages for said employees during the life of the Contract. The **Contractor** shall keep a legible copy of the wage rates posted in a conspicuous place at the site during the life of the Contract. These rates of wages shall include payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans as provided in M.G.L. c. 149, §26;, and such payments shall be considered as payments to persons under M.G.L. c. 149, §27 performing work as therein provided. If the **Contractor** does not make payments to a health and welfare plan, a pension plan and a supplementary unemployment benefit plan, where such payments are included in the rates of wages, the **Contractor** shall pay the amount of said payments directly to each employee engaged in the Work. If the **Contractor** pays less than the rate of wages, including payments to health and welfare funds and pension funds, or the equivalent payments in wages to any person performing Work within the classifications as determined by the Commissioner of Labor and Industries, and if the **Contractor** takes or receives for its own use or the use of any other person, as a rebate, refund or gratuity, or in any other guise, any part or portion of the wages, including payments to health and welfare funds and pension funds, or the equivalent payment in wages, paid to such person for Work done or service rendered on the Project, the **Contractor** will be subject to the penalties set forth in M.G.L. c. 149, §27. Notwithstanding the foregoing and the requirements of 5.5.7.1 and 5.5.7.2 below, if the Contract is federally funded, federal labor standards apply, including Davis Bacon minimum wage rates and payroll reporting requirements. See the "Federal Requirements" section at the end of these contract documents.

**5.5.7. Payroll Records of Employees.** (*Reference:* M.G.L. c. 149, §27B;). The **Contractor** and all Subcontractors who are subject to M.G.L. c. 149, §§27 and 27A shall keep a true and accurate record of all mechanics and apprentices, teamsters, chauffeurs, and laborers performing Work showing the name, address and occupational classification of each such employee, the hours worked by and the wages paid to all such employees. The **Contractor** and the Subcontractors shall submit a copy of said record to the **City** on a weekly basis.

**5.5.7.1.** (*Reference:* M.G.L. c. 149, §27B;). The **Contractor** and all Subcontractors who are subject to M.G.L. c. 149, §§27 and 27A shall preserve their payroll records for a period of three (3) years from the date of completion of the Contract.



**5.5.7.2.** (Reference: M.G.L. c. 149, §27B). The **Contractor** and all Subcontractors who are subject to M.G.L. c. 149, §§27 and 27A shall furnish to the Commissioner of Labor and Industries and the **City** within fifteen (15) days after completion of their portion of the Work a statement executed by the **Contractor** or Subcontractor or by any authorized officer or employee of the **Contractor** or Subcontractor who supervises the payment of wages in the form found in M.G.L. c.149, §27B.

**5.6. Superintendence.**

**5.6.1. Employment of a Superintendent.** The **Contractor** shall employ a competent, properly licensed superintendent, reasonably acceptable to the **City**, and necessary assistants who shall be in attendance at the Site full time during the progress of the Work until the date of Substantial Completion and for such additional time thereafter as the **Design Professional** or the **City** may determine to be necessary for the expeditious completion of the Work, including final completion. If continually in the employ of the Contractor, the same Superintendent shall be assigned to this project.

**5.6.2. Removal/Replacement of a Superintendent.** The **Contractor** shall remove the superintendent if requested to do so in writing by the **City** and shall promptly replace such superintendent with a competent person reasonably acceptable to the **City**. The superintendent shall represent the **Contractor**, and communications given to the superintendent shall be as binding as if given to the **Contractor**. The **Contractor** shall not replace the superintendent without written notice to the **City** and the **Design Professional**.

**5.6.3. Registered Professional Engineer or Registered Land Surveyor.** The **Contractor** shall retain a competent Registered Professional Engineer or Registered Land Surveyor, acceptable to the **Engineer**, who shall establish the exterior lines and required elevations of all buildings and structures to be erected on the site and shall establish sufficient lines and grades for the construction of associated Work such as, but not limited to, roads, utilities, and site grading. The Engineer or Land Surveyor shall certify as to the actual location of the constructed facilities in relation to property lines, building lines, easements, and other restrictive boundaries.

**5.6.4. Building Grades, Lines, Etc.;** The **Contractor** shall establish the building grades; lines; levels; and column, wall and partition lines required by the various Subcontractors in laying out their Work.

**5.6.5. Coordination and Supervision.** The **Contractor** shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The **Contractor** and all Subcontractors shall at all times afford each trade, any separate contractor, or the **City**, every reasonable opportunity for the installation of Work and the storage of materials.

**5.6.6. Job Meetings.** There shall be job meetings held on a weekly basis, or more often if required by the **City**. The **Contractor** shall arrange for and attend weekly job meetings with the **Design Professional** and such other persons as the **Design Professional** may from time to time wish to have present. The **Contractor** shall be represented by a principal, project manager, general superintendent or other authorized main office representative, as well as by the **Contractor's** own superintendent. An authorized representative of any Subcontractor or Sub-subcontractor shall attend such meetings if the representative's presence is requested by the **Design Professional**. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, Change Orders, time schedules and workforce power. Any notices required under the Contract may be served on such representatives.

**5.7. Materials, Labor, Equipment, Etc.**

**5.7.1. Provision of.** Unless otherwise provided in the Contract Documents, the **Contractor** shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the Work.

**5.7.2. Quality and Use of.** All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by the **Design Professional**, the **Contractor** shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

**5.7.3. Discrepancies or Defects.** If the **Contractor** is unable to perform its Work because of discrepancies or defects in the work of the **City's** own forces or of a separate contractor, the **Contractor** shall immediately notify the **Design Professional** and the **City** in writing of the conditions that render unable to so perform. Failure to notify the **Design Professional** constitutes an acknowledgment and acceptance of the other work as being fit and proper for integration with the **Contractor's** Work except for latent or non-apparent defects and deficiencies in the other work.

**5.8. Contractor's Management and Financial Statement Requirements. (Reference: M.G.L. c. 30, §39R)**

**5.8.1.** The words defined herein shall have the meaning stated below whenever they appear in this Paragraph:

**5.8.1.1.** "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to M.G.L. c.149, §44A-H or M.G.L. c. 30, §39M, inclusive.

**5.8.1.2.** “Contract” means any contract awarded or executed pursuant to M.G.L. c. 149, §44A-H or M.G.L. c. 30, §39M, which is for an amount or estimate amount that exceed the dollar amount set forth in M.G.L. c. 30, §39R.

**5.8.1.3.** “Records” means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

**5.8.1.4.** “Independent Certified Public Accountant” means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant’s independence shall not be confined to the relationships existing in connection with the filing of reports with the **City**.

**5.8.1.5.** “Audit,” when used in regard to financial statement, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

**5.8.1.6.** “Accountant’s Report,” when used in regard to financial statements, means a document in which an independent certified accountant indicates the scope of the audit which s/he has made and sets forth his/her opinion regarding the financial statements taken as a whole with listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefore shall be stated. An accountant’s report shall include as part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

**5.8.1.7.** “Management,” when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

**5.8.1.8.** Accounting terms, unless otherwise defined herein shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

**5.8.2.** The Contractor shall make, and keep for at least six (6) years after final payment, books, Records, and accounts that in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

**5.8.3.** Until the expiration of six (6) years after final payment, the Office of the Inspector General, and the Deputy Commissioner of the Division of Capital Asset Management shall have the right to examine any books, documents, papers or Records of the Contractor or of its Subcontractors that directly pertain to, and involve transactions relating to, the Contractor or its Subcontractors.

**5.8.4.** The Contractor shall describe any change in the method of maintaining Records or recording transactions which materially affect any statements filed with the **City**, including in its description the date of the change and reasons therefore, and shall accompany said description with a letter from the Contractor's Independent Certified Public Accountant approving or otherwise commenting on the changes.

**5.8.5.** The Contractor shall file a Statement of Management on internal accounting controls as set forth below prior to the execution of the Contract.

**5.8.6.** The Contractor shall file prior to the execution of the contract and shall continue to file annually, an Audited Financial Statement for the most recent completed fiscal year as set forth below.

**5.8.7.** The Contractor shall file with the **City** a Statement of Management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

**5.8.7.1.** transactions are executed in accordance with Management's general and specific authorization;

**5.8.7.2.** transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles, and to maintain accountability for assets;

**5.8.7.3.** access to assets is permitted only in accordance with Management's general or specific authorization; and

**5.8.7.4.** the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any difference.

**5.8.7.5.** The Contractor shall also file with the **City** a statement prepared and signed by an Independent Certified Public Accountant stating that s/he has examined

the Statement of Management on internal accounting controls, and expressing an opinion as to:

**5.8.7.5.1.** whether the representation of Management in response to this paragraph and paragraphs 5.8.2. through 5.8.6 above are consistent with the result of Management's evaluation of the system of internal accounting controls; and

**5.8.7.5.2.** whether such representations of Management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

**5.8.8.** The Contractor shall annually file with the Commissioner of the Division of Capital Asset Management during the term of the contract a financial statement prepared by an Independent Certified Public Accountant on the basis of an Audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the **City** upon request.

**5.9. Taxes.**

**5.9.1** The **Contractor** shall pay all sales, consumer, use, and other similar taxes for the Work or portions thereof which are provided by the **Contractor** which are legally enacted when bids are received, whether or not yet effective or merely scheduled to go into effect. However, the **Contractor** shall not pay, and the **City** shall not reimburse or pay the **Contractor** for, any sales taxes for building supplies or materials for which an exemption is provided in M.G.L. c. 64H, §6(f). The **City's** tax exemption number to be used by the **Contractor** in this regard is E04-600-1414.

**5.10. Permits, Licenses, and Fees.**

**5.10.1** Unless otherwise provided, the **Contractor** shall obtain and pay the fees for all permits, licenses, and inspections that are necessary for the proper execution and completion of the Work and which are customarily secured after execution of the Contract and which are legally required. All fees for permits, and inspections required by any **City** department shall be waived. Fees for licenses (e.g. drainlayer's license) are not waived. In addition the contractor shall pay for water meters and water usage. The contractor is responsible for obtaining NSTAR work orders and paying all costs and fees associated with NSTAR work.

**5.11. Notices Required By Statutes, Ordinances, Codes, Rules, Regulations, and Orders of the City.**

**5.11.1** The **Contractor** shall give notices required by statutes, ordinances, codes, rules, regulations, and orders of the **City** bearing on performance of the Work.

**5.12. Additional Information from Design Professional.**

**5.12.1.** The **Contractor** shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Article 4.

**5.12.2.** The **Contractor** shall give the **Design Professional** timely notice of any additional Plans, Specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work.

**5.12.3.** The **Contractor** shall not proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional drawings or instructions from the **Design Professional** as provided in the previous Paragraph. If the **Contractor** proceeds with such Work without obtaining further drawings, Specifications, or instructions, the **Contractor** shall correct Work incorrectly done at the **Contractor's** own expense.

**5.13. “Or equal.”**

**5.13.1. Requirements for Substitutions.** (*Reference:* M.G.L. c. 30, §39M(b).) Where products or materials are prescribed by manufacturer name, trade name, or catalog reference, the words “or approved equal” shall be understood to follow. An item shall be considered equal to the item so named or described if, in the opinion of the **Design Professional**:

**5.13.1.1.** it is at least equal in quality, durability, appearance, strength, and design;

**5.13.1.2.** it performs at least equally the function imposed by the general design for the Work;

**5.13.1.3.** it conforms substantially, even with deviations, to the detailed requirements for the items as indicated by the Specifications.

**5.13.2. Net Savings.** No proposed substitution will be permitted unless the **Contractor** certifies that the proposed substitution will yield a net savings to the **City** and will not extend the Contract Time.

**5.13.3. Contractor’s Expense.** Any structural or mechanical changes made necessary to accommodate substituted equipment under this paragraph (including but not limited to engineering fees) shall be at the expense of the **Contractor** or **Subcontractor** responsible for the Work item.

**5.13.3.1.** Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the **Contractor**, notwithstanding approval or acceptance of such substitution by the **City** or the **Design Professional**, unless such substitution was made at the written request or direction of the **City** or the **Design Professional**.

**5.13.3.2.** All data to be provided by the **Contractor** in support of any proposed “or equal” or substitute item will be at the **Contractor's** expense.

**5.13.4. Meeting Requirements.** The **Contractor** shall be responsible for determining that all materials furnished for the Work meet all requirements of the Contract Documents. The **Design Professional** may require the **Contractor** to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the **Design Professional**, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at the **Contractor's** expense. This provision shall not require the **Contractor** to pay for periodic testing of different batches of the same material, unless such testing is specifically required by the Contract Documents to be performed at the **Contractor's** expense.

**5.13.5. Named Manufacturer's Product.** In all cases in which a manufacturer's name, trade name, or other proprietary designation is used in connection with materials or articles to be furnished under this Contract, whether or not the phrase "or equal" is used after such name, the **Contractor** shall furnish the product of the name manufacturer(s) without substitution, unless a written request for a substitute has been submitted by the **Contractor** and approved in writing by the **Design Professional** as provided in the following paragraph.

**5.13.6. Deviations.** If the **Contractor** proposes to use a material which while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, the **Contractor** shall inform the **Design Professional** in writing of the nature of such deviations at the time the material is submitted for approval and shall request written approval of the deviation from the requirements of the Contract Documents.

**5.13.7. Rejection of Deviations.** In requesting approval of deviations or substitutions, the **Contractor** shall provide, upon request, evidence leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that otherwise attainable. If, in the opinion of the **Design Professional**, the evidence presented by the **Contractor** does not provide a sufficient basis for such reasonable certainty, the **Design Professional** may reject such substitution or deviation without further investigation.

**5.13.8. Consistent Character and Quality of Design.** The Contract Documents are intended to produce a building of consistent character and quality of design. All components of the building including visible items of mechanical and electrical equipment have been selected to have a coordinated design in relation to the overall appearance of the Project. The **Design Professional** shall judge the design and appearance of proposed substitutes on the basis of their suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The **Design Professional** will not approve as equal to materials specified proposed substitutes that, in the **Design Professional's** opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the Project. In order to permit coordinated design of color and finishes the **Contractor** shall, if required by the **Design Professional**, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the **City**.

**5.13.9. Warranty.** The warranties provided herein shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise prescribed by law.

**5.13.10. Design Professional's Approval.** The **Design Professional** will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed, or utilized without the **Design Professional's** prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. The **City** may require the **Contractor** to furnish at the **Contractor's** expense a special performance guarantee or other surety with respect to any "or equal" or substitute. The **Design Professional** will record the time required by the **Design Professional** and its consultants in evaluating substitutes proposed or submitted by the **Contractor** and in making changes in the Contract Documents (or in the provisions of any other direct contract with the **City** for work on the Project) occasioned thereby. Whether or not the **Design Professional** accepts a substitute item so proposed or submitted by the **Contractor**, the **Contractor** shall reimburse the **City** for the charges of the **Design Professional** and its consultants for evaluating each such proposed substitute item.

**5.14. Substitute Construction Methods or Procedures.**

**5.14.1** If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, the **Contractor** may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to the **Design Professional**. The **Contractor** shall submit sufficient information to allow the **Design Professional**, in the **Design Professional's** sole discretion, to determine whether the substitute proposed is equivalent to that expressly called for by the Contract Documents.

**5.15. Contractor's Progress Schedule.**

**5.15.1. Before Starting Construction.** Within ten (10) days after the date of the Notice to Proceed, the **Contractor** shall submit to the **Design Professional** for review:

**5.15.1.1.** a preliminary progress schedule indicating the times (number of days or dates) for starting and completing the various stages of the Work;

**5.15.1.2.** a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and

**5.15.1.3.** a refined schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Sum and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.



**5.15.2. Review of Progress Schedule.** At least ten (10) days prior to the commencement of construction, the **Design Professional**, the **Contractor**, and any other appropriate persons will meet to review and discuss the acceptability to the **Design Professional** of the progress schedule. The **Contractor** will have an additional ten (10) days to make corrections and adjustments and to complete and resubmit the schedule. No progress payment shall be made to the **Contractor** until the schedule is submitted to and found acceptable by the **Design Professional** as provided below.

**5.15.3. Acceptability of Progress Schedule.** The progress schedule will be acceptable to the **Design Professional** if, according to the **Design Professional**, it provides an orderly progression of the Work to completion within any specified time frame, but such acceptance will neither impose on the **Design Professional** responsibility for the sequencing, scheduling, or progress of the Work nor interfere with or relieve the **Contractor** from the **Contractor's** full responsibility therefore. The **Contractor's** schedule of Submittals must be acceptable to the **Design Professional** in providing a workable arrangement for reviewing and processing the required Submittals. The **Contractor's** schedule of values must be acceptable to the **Design Professional** as to form and substance.

**5.15.4. Sepia and Copies.** After the **Design Professional** has approved the schedule, the **Contractor** shall submit to the **Design Professional** one (1) sepia and four (4) copies bearing the **Contractor's** stamp of approval as a representation to the **City** that the **Contractor** has determined or verified all data on that progress schedule and that the **Contractor**, the Subcontractors and Suppliers have reviewed and coordinated the sequences in that progress schedule with the requirements of the Work.

**5.15.5. Adjustment of Schedule.** The **Contractor** shall adhere to the established progress schedule which may be adjusted from time to time as follows: the **Contractor** shall submit to the **Design Professional** for acceptance proposed adjustments in the progress schedule that will not change the Contract Time. Such adjustments will conform generally to the progress schedule then in effect and will comply with any provisions of the requirements applicable thereto.

**5.15.6. During Construction.** The **Contractor** shall submit monthly progress schedules to the **Design Professional**. The schedules shall stay current with the **Contractor's** approach to the Work remaining.

**5.15.7. Schedule of Submittals.** The **Contractor** shall prepare and keep current, for the **Design Professional's** approval, a schedule of Submittals that is coordinated with the **Contractor's** construction schedule and allows the **Design Professional** reasonable time to review Submittals.

## **5.16. Project Coordination.**

**5.16.1. In General.** The **Contractor** shall be responsible for the proper coordination of

Cedar Street Sewer Separation

00430

the Work of all of the trades.

**5.16.2. Coordination with Subcontractors.** The **Contractor** shall coordinate the work of each Subcontractor with the Work of every other Subcontractor whose Work affects the other.

**5.16.3. Coordination with the City's Own Forces or Separate Contractors.** The **Contractor** shall coordinate its operations with those of the **City's** own forces or separate contractors. The **Contractor** shall provide the **City's** own forces and separate contractors a reasonable opportunity for the handling, unloading and storage of their materials and equipment and execution of their work. The **Contractor** shall connect and coordinate its Work with theirs.

**5.16.4. Coordination with Utility Companies.** The **Contractor** shall coordinate its operations with all the appropriate utility companies to assure that the utilities required on the Project are available and functioning properly pursuant to the requirements of the Contract Documents.

**5.17. Project Photographs.**

**5.17.1. In General.** The **Contractor** shall take, at its own expense, interior and exterior photographs at the site, from different vantages as directed by the **Design Professional** or the **City**, before beginning any Work and thereafter, at a minimum, on the first work day of each month until final completion of the Work, including final Site photos. Photos shall be taken of any Work that will be buried or concealed while the Work is still exposed. The photographs shall be taken by a skilled commercial photographer. The number of photographs required shall be at the discretion of the **City** or the **Design Professional**. One aerial photo shall be required a) prior to commencement of the work and b) at the completion of the work. See Section 01320 – Construction Progress Documentation.

**5.17.2. Prints and Digital Media.** Within fourteen (14) days after the photographs have been taken, the **Contractor** shall cause prints to be made and delivered to the **City** and the **Design Professional**. All photographs shall be 8" x 10". Each print shall state the date of the photograph, the name of the Project, the description of the view and the name and address of the photographer. The **City** shall receive one glossy print of each photo as well as all prints in digital form on compact disc. The **Design Professional** shall receive one glossy print.

**5.17.3. Failure to Comply.** Should the **Contractor** fail to adhere to any requirement set forth in the previous two paragraphs, the **City** may have the photographs taken at the **Contractor's** expense or receive a set-off against the **Contractor's** next application for payment.

**5.18. Record Documents and Samples at the Site.**

**5.18.1** The **Contractor** shall maintain in a safe place at the site one record copy of all Plans, Specifications, Modifications, Change Orders, **Construction Change** Directives, Field Orders and written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to the **Design Professional**

for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered by the **Contractor** to the **Design Professional** for the **City**.

**5.19. Submittals.**

**5.19.1. Purpose.** The purpose of Submittals is to demonstrate for those portions of the Work for which Submittals are required the way the **Contractor** proposes to conform to the information given and the design concept expressed in the Contract Documents.

**5.19.2. Submittal Procedure.** Within ten (10) days from the Notice to Proceed, the **Contractor** shall submit to the **Design Professional** a completed Submittals schedule. The **Contractor** shall review, approve, and submit to the **Design Professional** Submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the **City** or of separate contractors. Submittals made by the **Contractor** that are not required by the Contract Documents may be returned without action. The schedules shall be updated and resubmitted each month. All Submittals will be identified as the **Design Professional** may require and in the number specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show the **Design Professional** the materials and equipment that the **Contractor** proposes to provide and to enable the **Design Professional** to review the information for the limited purposes stated below.

**5.19.3. Samples.** The **Contractor** shall also submit Samples to the **Design Professional** for review and approval in accordance with said accepted schedule of Submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as the **Design Professional** may require to enable the **Design Professional** to review the Submittal for the limited purposed stated below. The numbers of each Sample to be submitted will be as specified in the Specifications. Unless otherwise specified in the Specifications, three (3) specimens of each Sample shall be submitted.

**5.19.3.1.** The Samples shall be of sufficient size to permit proper evaluation of material. Where variations in color or other characteristics are to be expected, samples showing the minimum range of variation shall be submitted. Materials exceeding the range of variation of the approved Samples will not be approved on the Work.

**5.19.3.2.** All costs associated with delivery of Samples will be paid by the **Contractor**.

**5.19.4. Contractor's Verifications.** Before submitting each Submittal, the **Contractor** shall have determined and verified:

**5.19.4.1.** all field measurements, quantities, dimensions specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

**5.19.4.2.** all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

**5.19.4.3.** all information relative to the **Contractor's** sole responsibilities in respect of means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto.

**5.19.5. Contractor's Representations.** By approving and providing Submittals, the **Contractor** thereby represents that the **Contractor** has determined and verified all dimensions, quantities, field dimensions, relations to existing Work, coordination with Work to be installed later, coordination with information on previously accepted Submittals and verification of compliance with all the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the **Contractor**. In reviewing Submittals, the **Design Professional** shall be entitled to rely upon the **Contractor's** representation that such information is correct and accurate.

**5.19.6. Coordination.** The **Contractor** shall also have reviewed and coordinated each Submittal with other Submittals and with the requirements of the Work and the Contract Documents.

**5.19.7. Stamp or Specific Written Indication.** Each Submittal will bear a stamp or specific written indication that the **Contractor** has satisfied the **Contractor's** obligations under the Contract Documents with respect to the **Contractor's** review and approval of that Submittal.

**5.19.8. Written Notice of Variations.** At the time of each Submittal, the **Contractor** shall give the **Design Professional** specific written notice of such variations, if any, that the Submittal may have from the requirements of the Contract Documents. Such notice is to be in a written communication separate from the Submittal. Moreover, the **Contractor** shall make a specific notation on each Submittal to the **Design Professional** for review and approval of each such variation.

**5.19.9. Review and Approval by the Design Professional.** The **Contractor** shall perform no portion of the Work requiring a Submittal until the respective Submittal has been approved by the **Design Professional**. Such Work shall be in accordance with approved Submittals.

**5.19.9.1.** The **Design Professional** will review and approve Submittals in accordance with the schedule of Submittals accepted by the **Design Professional** as required above. The **Design Professional's** review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. The **Design Professional's** review and approval will not extend to means, method, technique, sequences, or procedures of construction

(except where a particular means, method, technique, sequences or procedures of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

**5.19.10. Deviations.** The **Contractor** shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the **Design Professional's** approval of Submittals unless the **Contractor** has specifically informed the **Design Professional** in writing of such deviation at the time of Submittal and the **Design Professional** has given written approval to the specific deviation. The **Contractor** shall not be relieved of responsibility for errors or omissions in Submittals by the **Design Professional's** approval thereof.

**5.19.11. Revisions.** The **Contractor** shall make corrections required by the **Design Professional** and shall return the required number of corrected copies of Submittals and submit as required new Submittals for review and approval. The **Contractor** shall direct specific attention, in writing or on resubmitted Submittals, to revisions other than those requested by the **Design Professional** on previous Submittals. Unless such written notice has been given, the **Design Professional's** approval of a resubmitted Submittal shall not constitute approval of any changes not requested on the prior Submittal.

**5.19.12. Related Work.** Where a Submittal is required by the Contract Documents or the schedule of Submittals accepted by the **Design Professional**, any related Work performed prior to the **Design Professional's** review and approval of the pertinent Submittal will be at the sole expense and responsibility of the **Contractor**.

**5.19.13. Informational Submittals.** Informational Submittals upon which the **Design Professional** is not expected to take responsive action may be so identified in the Contract Documents.

**5.19.14. Certification.** When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the **City** shall be entitled to rely upon such certifications, and neither the **City** nor the **Design Professional** shall be expected to make any independent examination with respect thereto.

**5.20. Continuing the Work.**

**5.20.1.** The **Contractor** shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the **City**. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as otherwise provided herein or as the **City** and the **Contractor** may agree in writing.

**5.21. Use of Site; Access to Work.**

**5.21.1.** The right of possession of the premises and the improvements made thereon by the **Contractor** shall remain at all times in the **City**. The **Contractor's** right to entry and use

thereof arises solely from the permission granted by the **City** under the Contract Documents. The **Contractor** shall confine the **Contractor's** apparatus, the storage of materials, and the operations of the **Contractor's** workers to limits indicated by law, ordinance, the Contract Documents and permits and/or directions of the **Design Professional** and shall not unreasonably encumber the premises with the **Contractor's** materials. The **City** shall not be liable to the **Contractor**, the Subcontractors, Suppliers, or anyone else with respect to the conditions of the premises, except for a condition caused directly and solely by the negligence of the **City**.

**5.21.2.** At all times, the **City** and the **Design Professional** shall have access to the Work.

## **5.22. Protection of Persons and Property.**

**5.22.1. In General.** The **Contractor** shall be responsible for initiating, maintaining, and supervising all health and safety precautions and programs in connection with the performance of the Contract. The **Contractor** is responsible for the implementation of all Federal, State, and local health and safety requirements.

**5.22.2.** The **Contractor** shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

**5.22.2.1.** employees on the site and other persons who may be affected thereby;

**5.22.2.2.** the Work, materials, and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the **Contractor**, Subcontractors, or Sub-subcontractors;

**5.22.2.3.** other property at the site or adjacent or in close proximity thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and

**5.22.2.4.** any other property of the **City**, whether or not forming part of the Work, located at the site or adjacent thereto in areas to which the **Contractor** has access.

**5.22.3. Notices and Compliance.** The **Contractor** shall give notices and comply in all other respects with applicable laws, ordinances, rules, regulations, codes, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss. The **Contractor** shall notify owners of adjacent and nearby properties of underground facilities and utility owners when prosecution of the Work may affect them and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

**5.22.4. Erection and Maintenance of Safeguards.** The **Contractor** shall erect and maintain, as required by existing conditions and the terms of the Contract, reasonable safeguards

for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent and nearby sites and utilities.

**5.22.5. Hazardous Materials and Equipment.** When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the **Contractor** shall exercise utmost care and carry on such activities under the supervision of properly qualified personnel.

**5.22.6. Damage to Property.** The **Contractor** shall promptly remedy damage and loss to property referred to above. If the damage or loss is due in whole or in part to the **Contractor's** failure to take the precautions required herein, the **Contractor** shall bear the cost, subject to any reimbursement to which the **Contractor** is entitled under property insurance required by the Contract Documents. The **Contractor** shall be fully and solely responsible for all Work and other operations carried out on adjacent properties. The insurance required under Article 8 shall cover such Work or operations, and the **Contractor** shall indemnify and defend the **City**, the **Design Professional**, and the owners of such adjacent or nearby properties from and against all claims, suits, losses, or costs arising out of such Work or operations.

**5.22.7. Fire Protection Equipment and Services.** The **Contractor** shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits shall be kept orderly and clean and all combustible rubbish shall be promptly removed from the site.

**5.22.8. Protection of Excavations, Trenches, etc.** The **Contractor** shall at all times protect excavations, trenches, buildings and materials from rain water, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin and shall remove promptly any accumulation of water. The **Contractor** shall provide and operate all pumps, piping, and other equipment necessary to this end.

**5.22.9. Snow and Ice Removal.** The **Contractor** shall remove snow and ice that might result in damage or delay.

**5.22.10. Safety Representative.** The **Contractor** shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

**5.22.11. Weather Protection.** (*Reference: M.G.L. c. 149, §44F(1).*) The **Contractor** shall install weather protection and furnish adequate heat in the protected area from November 1 through March 31.

**5.22.12. Security.** The **Contractor** shall provide, within the Contract Sum, a  
Cedar Street Sewer Separation  
00430

sufficient number of security personnel at the Site at all times when the **Contractor's** personnel are not present, from commencement of the Work until Substantial Completion to assure that the Site, the facility, and the Work, and all materials and equipment stored at the Site are fully and completely protected against loss or damage due to vandalism, theft, or malicious mischief. If the **Contractor** elects, in addition, to use guard dogs for this purpose, each dog shall at all times be accompanied by an adult handler. If the **Contractor** fails to comply with the requirements of this paragraph, then the **City** may provide appropriate security and charge the cost thereof to the **Contractor**. The **City's** provision of such security, or failure to do so, shall not relieve the **Contractor** of its responsibility to pay for loss or damage due to vandalism, theft, or malicious mischief at the Site.

**5.22.13. Hazard Communication Programs.** The **Contractor** shall be responsible for coordinating any exchange of material safety data sheets or other hazard communications information required to be made available to or exchanged between or among employers at the site in accordance with laws, codes and regulations.

**5.22.14. Noise Pollution Control.** The **Contractor** shall comply with all applicable provisions of Somerville Municipal Code §9-109.



**5.23. Cutting and Patching.**

**5.23.1. In General.** Unless otherwise provided in the Contract Documents, the **Contractor** shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly, including the work of the City or of separate contractors.

**5.23.2. Damage to Work of City or of Separate Contractor.** The **Contractor** shall not damage or endanger a portion of the Work or fully or partially completed construction of the **City** or separate contractors by cutting, patching, or otherwise altering such construction, or by excavation. The **Contractor** shall not cut or otherwise alter such construction by the **City** or a separate contractor except with prior written consent of the **City** and of such separate contractor; such consent shall not be unreasonably withheld. The **Contractor** shall not unreasonably withhold from the **City** or a separate contractor the **Contractor's** consent to cutting or otherwise altering the Work.

**5.23.3. Damage Caused by Contractor.** Should the **Contractor** cause damage to the work or property of any separate contractor at the Site, or should any claim arising out of the **Contractor's** performance of Work at the Site be made by any separate contractor against the **Contractor**, the **City**, the **Design Professional**, or any of the **Design Professional's** consultants, the **Contractor** shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law. The **Contractor** shall, to the fullest extent permitted by laws and regulations, indemnify and hold harmless the **City**, the **Design Professional**, and the **Design Professional's** consultants from and against all claims, damages, losses and expenses (including, but not limited to, fees of the Design Professional, the Design Professional's consultants, attorneys, and other professionals, and court and arbitration or mediation costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against the **City**, the **Design Professional**, or any of the **Design Professional's** consultants, to the extent based on a claim arising out of the **Contractor's** performance of the Work. Should a separate contractor cause damage to the Work or property of the **Contractor** or should the performance of work by any separate contractor at the site give rise to any other claim, the **Contractor** shall not institute any action, legal or equitable, against the **City**, the **Design Professional**, or any of the **Design Professional's** consultants, or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from the **City**, the **Design Professional**, or any of the **Design Professional's** consultants, on account of any such damage or claim. If the **Contractor** delays at any time in performing or furnishing Work by any act or neglect of a separate contractor and the City and the Contractor are unable to agree as to the extent of any adjustment in the Contract Time attributable thereto, the **Contractor** may make a claim for an extension of time in accordance with Article 16. An extension of the Contract Time shall be the **Contractor's** exclusive remedy with respect to the **City**, the **Design Professional**, and the **Design Professional's** consultants, for any delay, disruption, interference, or hindrance caused by any separate contractor.

## **5.24. Cleaning Up.**

**5.24.1.** During the progress of the Work, the **Contractor** shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract or other debris. At the completion of the Work, the **Contractor** shall remove from and about the Project all waste materials, rubbish, and debris, and the **Contractor's** tools, construction equipment, machinery, and surplus materials. Surplus materials to be provided to the **City** by specifications shall be stored in a clean, safe and secure area as directed by the **City**. The **Contractor** shall leave the site clean and ready for occupancy by the **City** at Substantial Completion of the Work. Immediately prior to the **Design Professional's** inspection for Substantial Completion, the **Contractor** shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned, waxed and buffed. Woodwork shall be dusted and cleaned. Sash, fixtures and equipment shall be thoroughly cleaned. Stains, spots, dust, marks and smears shall be removed from all surfaces. Hardware and all metal surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the **Contractor** at the **Contractor's** expense. The **Contractor** shall restore to original condition all property not designated for alteration by the Contract Documents.

**5.24.2.** If the **Contractor** fails to clean up as provided herein, the **City** may do so and charge the cost thereof to the **Contractor**.

## **5.25. Royalties and Patents.**

**5.25.1** The **Contractor** shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. To the fullest extent permitted by law, the **Contractor** shall indemnify and hold harmless the **City** and the **Design Professional** from and against all claims, costs, losses, and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, product, or device not specified in the Contract Documents.

## **5.26. Contractor's Obligation to Perform.**

**5.26.1.** The **Contractor's** obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of the **Contractor's** obligation to perform the Work in accordance with the Contract Documents:

**5.26.1.1.** observations by the **Design Professional**;

**5.26.1.2.** recommendation of any progress or final payment by the **Design Professional**;

**5.26.1.3.** the issuance of a certificate of Substantial Completion or any payment by the **City** to the **Contractor** under the Contract Documents;

**5.26.1.4.** use or occupancy of the Work, Project, or Site, or any part thereof, by the **City**;

**5.26.1.5.** any acceptance by the **City** or any failure to do so;

**5.26.1.6.** any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptance by the **Design Professional**;

**5.26.1.7.** any inspection, test, or approval by others; or

**5.26.1.8.** any correction of defective Work by the **City**.

**5.27. Indemnification; and Covenant Not To Sue.**

**5.27.1.** To the fullest extent permitted by law, the **Contractor** shall assume the defense of, indemnify and hold harmless the **City**, the **Design Professional**, the **Design Professional's** consultants, and agents and employees of any of them, from and against claims, damages, losses, and expenses, including, but not limited, to attorneys' fee, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting there from, caused in whole or in part by alleged negligent acts or omissions of the **Contractor**, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this paragraph.

**5.27.2.** In claims against any person or entity indemnified under the foregoing paragraph by an employee of the **Contractor**, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under the foregoing paragraph shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the **Contractor** or a Subcontractor under Workers' Compensation laws, disability benefit acts or other employee benefit acts.

**5.27.3.** The obligations of the **Contractor** in this Article shall not extend to the liability of the **Design Professional**, the **Design Professional's** consultants, and agents or employees of any of them arising out of (1) the preparation of maps, Plans, opinions, reports, surveys, Change Orders, designs, or Specifications, or (2) directions or instructions given by the **Design Professional**, the **Design Professional's** consultants and agents or employees of any of them, provided such instructions or directions are the primary cause of the injury or damage.

**5.27.4.** The **Contractor**, or any successor, assign, or subrogee of the **Contractor** agrees

not to bring any civil suit, action, or other proceeding in law, equity or arbitration against the **Design Professional**, or the officers, employees, agents, or consultants of the **Design Professional**, for the enforcement of any action which the **Contractor** may have arising out of or in any manner connected with the Work. The **Contractor** shall assure that this covenant not to sue is contained in all subcontracts and sub-subcontracts of every tier and shall assure its enforcement. The **Design Professional**, its officers, employees, agents, and consultants are intended third-party beneficiaries of this covenant not to sue, and are entitled to enforce this covenant in law or equity.

**5.28. Survival of Obligations.**

**5.28.1** All representations, indemnifications, warranties, and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Contract.

**ARTICLE 6: SUBCONTRACTORS**

**6.1 Use of Subcontractors.**

**6.1.1** The **Contractor** shall use the Subcontractors named in the **Contractor's Bid**.

**6.2 Substitution of Subcontractors.**

**6.2.1** The **Contractor** shall not substitute another Subcontractor therefore without notice to the **City** and the **City's** prior written consent of such substitution.

**6.3 Names of Subcontractors.**

**6.3.1** Upon execution of the Contract with the **City**, the **Contractor** shall provide in writing to the **City**, through the **Design Professional**, the names, addresses, telephone numbers, and fax numbers of all persons proposed for each principal portion of the Work.

**6.4. Objections to Subcontractors.**

**6.4.1** The **Contractor** shall not use any Subcontractor against whom the **City** has a reasonable objection. The **Contractor** shall not be required to contract with any person or entity against whom it has a reasonable objection.

**6.5. Form of the Subcontract.**

**6.5.1** All Work performed by a Subcontractor shall be through an appropriate subcontract. The form of subcontract shall be submitted to the **City's Law Department** for its approval, which shall not be unreasonably withheld or delayed.

**6.6. Content of the Subcontract.**

**6.6.1.** In addition to all statutorily mandated provisions and provisions required elsewhere in the Contract Documents, each subcontract shall expressly provide that:

**6.6.1.1.** Each subcontract agreement for a portion of the Work is assigned by the **Contractor** to the **City** provided that:

Cedar Street Sewer Separation  
00430

**6.6.1.1.1.** the assignment is effective only after termination of the Contract by the **City** or the **Contractor** and only for those subcontract agreements which the **City** accepts by notifying the Subcontractor in writing; and

**6.6.1.1.2.** the assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

**6.6.1.2.** Each Subcontractor is bound by the requirements of the Contract Documents for the express benefit of the **City**.

**6.6.1.3.** Each Subcontractor shall assume toward the **Contractor** all the obligations that the **Contractor** assumes toward the **City** and the **Design Professional**, unless otherwise provided by law.

## **ARTICLE 7: PERFORMANCE AND PAYMENT BONDS**

### **7.1. Form of Bonds.**

**7.1.1** The performance and labor and material or payment bonds shall be in the form required by the **City**, copies of which are included in the Project Manual. The **City** reserves the right to reject any bond that does not conform to the **City's** requirements.

### **7.2. Furnished by the Contractor.** (*Reference: M.G.L. c. 30, §39M(c);, M.G.L. c. 149, §29).*

**7.2.1** The **Contractor** shall furnish a performance bond and a labor and materials or payment bond, each with a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the **City** and each in the sum of the Contract Sum, the premiums for which are to be paid by the **Contractor** and are included in the Contract Sum. The bonds shall remain in effect until final payment is made. The sum of the performance bond shall increase each time the Contract Sum is increased as a result of a Change Order.

### **7.3. Submission to the City.**

**7.3.1** The **Contractor** must submit the performance and a labor and materials or payment bonds to the **City** upon the **Contractor's** execution of the Agreement.

## **ARTICLE 8: INSURANCE REQUIREMENTS**

### **8.1 Insurance Certificates.**

**8.1.1** Prior to starting work on this project, the contractor shall deposit with the **City**, certificates from insurers clearly stating that the required insurance policies have been issued to the **Contractor** and will remain in effect during the time period required to complete this contract. ACCORD forms will not be accepted. The certificates must be in a form satisfactory to the **City**. The insurance shall include all major divisions of coverage, and shall be on a comprehensive general basis including: Premises and Operations (including X-C-U), Owners and Contractors Protective, Products and Completed Operations, Owned, Non-owned or Hired

and/or Leased Motor Vehicles. Such insurance shall be written for not less than any limits of liability, required by law or the following limits, whichever are greater.

**8.2 Minimum Coverages.** The **Contractor** shall possess and maintain throughout the contract period/project, insurance in the kinds and amounts as provided in Appendix D. The **Contractor** may purchase and maintain excess liability insurance in the in the umbrella form in order to satisfy the limits of liability required for the insurance to be purchased and maintained in accordance with the required requirements set forth above (in addition to the umbrella limits required). Evidence of such excess liability shall be delivered to the **City** in the form of a certificate and the certificate indicating the policy numbers and limits of liability of all underlying insurance.

**8.3 Additional Insured.** The **City** shall be named as an additional insured on each certificate, and the certificate must have the endorsement of the insurance agency.

**8.4 Notice.** Each certificate shall contain a notation that the insurer will give 30 days notice to the **City** prior to cancellation, change or non-renewal of policy.

**8.5 Carrier Rating.** Insurance carriers MUST have an A.M. Best rating of "A" or better.

**8.6 Material Breach.** Failure of the contractor to provide and continue in force such insurance shall be deemed a material breach of contract and shall operate as immediate termination thereof.

## ARTICLE 9: TESTS AND INSPECTIONS

### 9.1. Access.

**9.1.1** The **City**, the **Design Professional**, and all other persons designated by the **City** shall have access to the Work at reasonable times for observing, inspecting, and testing. The **Contractor** shall provide them with proper and safe conditions for such access and advise them of the **Contractor's** site safety procedures and programs so that they may comply therewith as applicable.

### 9.2. Tests and Inspections.

**9.2.1.** The **Contractor** shall give the **Design Professional** timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

**9.2.2.** Unless otherwise provided, the **Contractor** shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the **City**, or with the appropriate public authority and shall bear all related costs of tests, inspections, and approvals. If the laws or regulations of any public body having jurisdiction require any Work or part thereof specifically to be inspected, tested, or approved by an employee or other representative of such public body, the **Contractor** shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection

therewith and furnish the **Design Professional** with the required certificates of inspection, testing, or approval.

**9.2.3.** The **Contractor** shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for the **Design Professional's** acceptance of materials or equipment to be incorporated into the Work, or of materials, mix designs, or equipment submitted for approval prior to the **Contractor's** purchase thereof for incorporation into the Work.

**9.2.4.** If any Work that is to be inspected, tested, or approved is covered by the **Contractor**, Subcontractor, or Sub-subcontractor without the prior written consent of the **Design Professional**, it must be uncovered for observation, inspection, testing, or approval, if requested by the **Design Professional**. The **Contractor** must recover the Work at its own expense.

**9.2.5.** The **Contractor** shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the **Design Professional** in the **Design Professional's** administration of the Contract or by tests, inspections, or approvals required or performed by persons other than the **Contractor**.

## **ARTICLE 10**

### **UNCOVERING AND CORRECTING WORK**

#### **10.1. Uncovering Work.**

**10.1.1.** If a portion of the Work is covered contrary to the **Design Professional's** request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the **Design Professional**, be uncovered for the **Design Professional's** observation and be replaced, both at the **Contractor's** expense and without change in the Contract Time.

**10.1.2.** If a portion of the Work has been covered which the **Design Professional** has not specifically requested to observe prior to its being covered, the **Design Professional** may request to see such Work, and it shall be uncovered by the **Contractor**. If it is found that such Work is in accordance with the Contract Documents, costs of uncovering and replacing shall, by appropriate Change Order, be charged to the **City**. If it is found that such Work is defective or not in accordance with the Contract Documents, the **Contractor** shall pay all claims, costs, losses, and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection, and testing and of satisfactory replacement of reconstruction (including, but not limited to, all costs of repair or replacement of work of others); and the **City** shall be entitled to an appropriate decrease in the Contract Sum. The **City** may take such decrease by reducing the then current application for payment accordingly or subsequent applications, if necessary, until the decrease is paid in full.

#### **10.2. Correcting Work.**

**10.2.1.** The **Contractor** shall promptly correct Work rejected by the **Design Professional**

or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or completed. The **Contractor** shall bear all costs of correcting such rejected Work including additional testing and inspections and compensation for the **Design Professional's** services and expenses made necessary thereby and any cost, loss, or damages to the **City** resulting from such failure or defect.

**10.2.2.** If, within one (1) year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established in Article 15, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the **City** to do so, unless the **City** has previously given the **Contractor** a written acceptance of such condition. This period of one (1) year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation to correct under this paragraph shall survive acceptance of the Work under the Contract and termination of the Contract. The **City** shall give such notice promptly after discovery of the condition.

**10.2.3.** The **Contractor** shall correct, remove, or replace portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the **Contractor** nor accepted by the **City**.

**10.2.4.** If the **Contractor** fails within a reasonable time to correct nonconforming Work, or to remove and replace rejected Work, or fails to perform the Work in accordance with the Contract Documents, the **City** may correct it in accordance with the provisions herein. If the **Contractor** does not proceed with correction, removal, or replacement of such nonconforming Work within seven (7) days from the date of written notice from the **Design Professional**, the **City** may correct it and store any salvageable materials or equipment at the **Contractor's** expense. If the **Contractor** does not pay costs of any such removal and storage within ten (10) days after written notice, the **City** may upon ten (10) additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the **Contractor**, including compensation for the **Design Professional's** services and expenses made necessary thereby. If such proceeds of sale do not cover all the costs that the **Contractor** should have born, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the **Contractor** are not sufficient to cover such amount, the **Contractor** shall pay the difference to the **City**.

**10.2.5.** The **Contractor** shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the **City** or separate contractors caused by the **Contractor's** correction or removal of Work which is not in accordance with the requirements of the Contract Documents.



**10.2.6.** Nothing contained in this paragraph shall be construed to establish a period of limitation with respect to other obligations that the **Contractor** might have under the Contract Documents. Establishment of the time period of one (1) year as described in the above paragraph related only to the specific obligation of the **Contractor** to correct the Work and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced nor to the time within which proceedings may be commenced to establish the **Contractor's** liability with respect to the **Contractor's** obligations other than specifically to correct the Work.

### **10.3. Acceptance of Nonconforming Work.**

**10.3.1** If, instead of requiring correction or removal and replacement of defective or nonconforming Work, the **City** prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the **City** may do so instead of requiring its removal and correction, in which case the **Contractor** shall pay all claims, costs, losses, and damages attributable to the **City's** evaluation of and determination to accept such defective or nonconforming Work. The Contract Sum will be reduced as appropriate. Such adjustment shall be effected whether or not final payment has been made.

## **ARTICLE 11: CHANGES IN THE WORK**

### **11.1. In General.**

**11.1.1.** The Contract Sum constitutes the total compensation (subject to authorized adjustments) payable to the **Contractor** for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the **Contractor** shall be at the **Contractor's** expense without any change in the Contract Sum.

**11.1.2.** Without invalidating the Contract and without notice to any surety, the **City** may, at any time or from time to time, order additions to, deletions from, or revisions in the Work. Such additions, deletions, or revisions will be authorized by a Change Order, a Modification or a **Construction Change Directive**. Upon receipt of any such document, the **Contractor** shall promptly proceed with the Work involved that will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

**11.1.3.** The **Contractor** shall not be entitled to an increase in the Contract Sum or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified, or supplemented, except as otherwise provided herein.

### **11.2. Change Orders.**

**11.2.1.** (*Reference: M.G.L. c. 30, §39I*). The **Contractor** shall perform all the Work required by this Contract in conformity with the Plans and Specifications contained herein. No willful and substantial deviation from said Plans and Specifications shall be made unless authorized in writing by the **City** and the **Design Professional** in charge of the Work who is duly authorized by the **City** to approve such deviations. In order to avoid delays in the prosecution of the Work required by such Contract, such deviation from the Plans or Specifications may be

authorized by a written order of the **City** or the **Design Professional** so authorized to approve such deviation. Within thirty (30) days thereafter, such written order shall be confirmed by a certificate of the **City** stating: (1) If such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures, or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefore; (2) that the specified deviation does not materially injure the Project as a whole; (3) that either the work substituted for the Work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the **City** and the **Contractor** and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the **City**.

**11.3. Construction Change Directive.**

**11.3.1.** A **Construction Change** Directive shall be used in the absence of total agreement on the terms of a Change Order.

**11.3.2.** Upon request of the **City** or the **Design Professional**, the **Contractor** shall without cost to the **City** submit to the **Design Professional** in such form as the **Design Professional** may require, an accurate written estimate of the cost of any proposed extra work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the **Design Professional**. If required by the **Design Professional**, in order to establish the exact cost of new Work added or of previously required Work omitted, the **Contractor** shall obtain and furnish to the **Design Professional** bona fide proposals from recognized Suppliers for furnishing any material included in such Work. Such estimates shall be furnished promptly so as to occasion no delay in the Work, and shall be furnished at the **Contractor's** expense.

**11.3.3.** The **Contractor** shall state in the estimate any extension of time required for the completion of the Work if the change or extra Work is ordered. The **Contractor** shall document, through a critical path analysis, or some other clearly delineated explanation, how the proposed change affects other aspects of the Work, and why it would require an extension of time. The **Contractor** shall promptly revise and resubmit such estimate if the **Design Professional** determines that it is not in compliance with the requirements of this Article, or that it contains errors of fact or mathematical errors.

**11.3.4.** If the **Construction Change** Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods, as selected by the **City**, selection of which does not require the consent of the **Contractor**:

**11.3.4.1.** by unit prices stated in the Contract Documents or otherwise mutually agreed upon; or

**11.3.4.2.** by Cost and Percentages estimated by the **Contractor** as provided

Cedar Street Sewer Separation  
00430

herein and accepted by the **City**, whereupon the **Contractor's** estimate shall become a fixed price which shall not be changed by any variation in the actual cost of executing the Work covered by the change; or

**11.3.4.3.** by actual Cost determined after the Work covered by the change is completed, plus Percentage; or

**11.3.4.4.** by submission to arbitration or a court, which shall determine the fair value of the Work covered by the change.

**11.3.5.** “Cost” shall mean the estimated or actual net increase or decrease in cost to the **Contractor**, Subcontractor, or Sub-subcontractor for performing the Work covered by the change, including actual payments for materials, equipment rentals, expendable items, wages, and associated benefits to the workers and to supervisors employed full time at the Site, insurance, bonds, and other provable direct costs, but not including any administrative, accounting or expediting costs, or other indirect or overhead costs, or any wages or benefits of supervisory personnel not assigned full time to the Site, or any amount for profit or fee to the **Contractor**, Subcontractor, or Sub-subcontractor.

**11.3.6.** “Percentage” shall mean an allowance to be added to or subtracted from the Cost in lieu of overhead and profit and of any other expense that is not included in the Cost of the Work covered by the change, as defined above. Percentage for a Sub-subcontractor shall be 8% of any net increase or decrease of Cost of any Work performed by the Sub-subcontractor’s own forces plus 4% of any net increase or decrease in Cost of any Work performed for the Sub-subcontractor by lower tier Sub-subcontractors. Percentage for a Subcontractor shall be 12% of any net increase or decrease of Cost of any Work performed by the Subcontractor’s own forces plus 4% of the Cost of Work performed by Sub-subcontractors. Percentage for the **Contractor** shall be 15% of any net increase or decrease of Cost of any Work performed by the **Contractor's** own forces plus 5% of any net increase or decrease in the Cost for all other Work covered by the change. When the **Contractor** is also performing Work as a Subcontractor or Sub-subcontractor, the **Contractor** shall only be entitled to a total of no more than 15% of any net increase or decrease of Cost of any Work.

**11.3.7.** When in the reasonable judgment of the **Design Professional** a series of **Construction Change** Directives or Change Orders effect a single change, Percentage shall be calculated on the cumulative net increase or decrease in Cost, if any.

**11.3.8.** If unit prices are stated in the Contract Documents or are subsequently agreed upon, and if quantities originally contemplated are so changed in a Proposed Change Order or **Construction Change** Directive that the application of such unit prices to quantities of Work proposed will cause substantial inequity to the **City** or the **Contractor**, the applicable unit prices shall be equitably adjusted.

**11.3.9.** If the **City** elects to determine the Cost of the Work as provided in method

(11.3.4.1) using unit prices stated in the Contract Documents or subsequently agreed upon, the unit prices shall be subject to the prior paragraph. Notwithstanding the inclusion of unit prices in the Contract Documents, it shall be the **City's** option to require the Cost of any given change to be determined by one of the other methods stated in 11.3.4. If the **City** elected to determine the Cost of the change by unit prices and the nature of the work is such that its extent cannot readily be measured after the completion of such work or any subsequent Work, the **Contractor** shall keep daily records, available at all times to the **Design Professional** for inspection, of the actual quantities of such Work put in place, and delivery receipts or other adequate evidence, acceptable to the **Design Professional**, indicating the quantities of materials delivered to the Site for use in such unit price Work, and distinguishing such from other similar material delivered for use in Work include in the base Contract Sum. If so required by the **Design Professional**, materials for use in unit price Work shall be stored apart from all other materials on the Project.

**11.3.10.** If the **City** elects to determine the Cost of the Work as provided in methods 11.3.4.3. or 11.3.4.4. or if the method of determining the Cost has not been established before the Work is begun, the **Contractor** shall keep detailed daily records of labor and material costs applicable to the Work.

**11.3.11.** Upon receipt of a **Construction Change Directive**, the **Contractor** shall promptly proceed with the change in the Work involved and advise the **Design Professional** in writing of the **Contractor's** agreement or disagreement with the method, if any, provided in the **Construction Change Directive** for determining the proposed adjustment in the Contract Time.

**11.3.12.** A **Construction Change Directive** signed by the **Contractor** indicates the agreement of the **Contractor** therewith, including adjustment in the Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**11.3.13.** If the **Design Professional** and the **Contractor** do not agree with the adjustment in the Contract Time or the method for determining it, the adjustment or the method shall be referred to the **Design Professional** for determination.

#### **11.4. Minor Changes in the Work.**

**11.4.1.** The **Design Professional** has the authority to order minor changes in the Work. "Minor changes" as used in this paragraph mean changes which are so insignificant as to not affect the Contract Sum or the Contract Time and which are not inconsistent with the intent of the Contract Documents. Any minor change shall be committed to a written order which shall be binding on both the **City** and the **Contractor** and which shall be promptly carried out by the **Contractor**.

**11.5. Certificate of Appropriations.** (*Reference: M.G.L. c. 44, §31C;*). This Contract shall not be deemed to have been made until the **City's** auditor has certified thereon that an appropriation in the amount of this Contract is available therefor and that an officer or agent of the **City** has

been authorized to execute said Contract and approve all requisitions and change orders. No order to the **Contractor** for a change in or addition to the Work, whether in the form of a drawing, plan, detail or any other written instruction, unless it is an order which the **Contractor** is willing to perform without any increase to the Contract price, shall be deemed to be given until the auditor has certified thereon that an appropriation in the amount of such order is available therefore; but such certificate shall not be construed as an admission by the **City** of its liability to pay for such work. The certificate of the auditor that an appropriation in the amount of this Contract or in the amount of such order is available shall bar any defense by the **City** on the grounds of insufficient appropriation.

## **ARTICLE 12: CHANGE IN THE CONTRACT TIME**

### **12.1. Date of Commencement.**

**12.1.1** The date of commencement of the Work is the date established in the Notice to Proceed. The date shall not be postponed by the failure to act of the **Contractor** or persons or entities for whom the **Contractor** is responsible.

### **12.2. Progress and Completion.**

**12.2.1.** Time is of the essence; all time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the **Contractor** confirms that the Contract Time is a reasonable period for performing the Work.

**12.2.2.** The **Contractor** shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

**12.2.3.** Within five (5) working days of award of contract, the **Contractor** shall submit to the **Design Professional** a progress schedule showing for each class of Work included in the schedule of values, the percentage of completion to be obtained and the total dollar value of Work to be completed as of the first of each month until Substantial Completion. All calculations shall be on the basis of Work in place, but may include, at the **Design Professional's** discretion, the value of materials delivered but not in place.

**12.2.4.** The progress schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation (including adequate time for submission and review of submittals), and leading to a reasonable certainty of Substantial Completion by the date established in the Agreement. The progress schedule will be reviewed by the **Design Professional** for compliance with the requirements of this Article and will be accepted by the **Design Professional** or returned to the **Contractor** for revision and resubmittal. Unless specifically required by law, no payment under this Contract shall be due until the progress schedule has been approved by the **Design Professional**. The **Design Professional's** review of the progress schedule shall not impose any duty on the **Design Professional** or the **City** with respect to the timing, planning, scheduling, or execution of the Work. In particular, if the **Contractor** proposes a progress schedule indicating a date of Substantial Completion which is earlier than the Contract Time, the **Contractor** shall not be entitled to additional payment or compensation of any kind if, for any reason, the full Contract Time is required to achieve

Substantial Completion of the Work.

**12.2.5.** If in any Application for Payment, the total value of the completed Work in place, as certified by the **Design Professional**, is less than 90% of the total value of the Work in place estimated in the progress schedule, the **City** may, at the **City's** option, require the **Contractor** to accelerate the progress of the Work without cost to the **City** by increasing the workforce or hours of Work or by other reasonable means approved by the **Design Professional**.

**12.2.6.** If each of three successive applications, as certified by the **Design Professional**, indicate that the actual Work completed is less than 90% of the values estimated in the progress schedule to be completed by the respective dates, the **City** may at the **City's** option, treat the **Contractor's** delinquency as a default justifying the action permitted under Article 18.

**12.2.7.** If the **Design Professional** has determined that the **Contractor** should be permitted to extend the time for completion as provided below, the calendar dates in the progress schedule shall be adjusted accordingly to retain their same relationship to the adjusted date of Substantial Completion, and the dollar value of the Work to be completed as of the first of each month shall be adjusted pro rata.

**12.2.8.** If the **Contractor** fails to submit any application for payment in any month, the **Design Professional** shall, for the purpose of this evaluation of progress, certify separately to the actual value of the Work in place completed as of the first of the month to the best of the **Design Professional's** knowledge.

**12.2.9.** Nothing herein shall limit the **City's** right to liquidated or other damages for delays by the **Contractor** or to any other remedy which the **City** may be entitled or may possess under other provisions of the Contract Documents or by law.

**12.3. Delays and Extensions of Time.**

**12.3.1.** If the **Contractor** is delayed at any time in the progress of the Work by an act or neglect of the **City** or the **Design Professional**, or of an employee of either, or of a separate contractor employed by the **City**, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes (except weather) beyond the **Contractor's** control, or by delay authorized by the **City**, or by other causes which the **Design Professional** determines may justify delay, then the Contract Time shall be extended by Change Order or **Construction Change Directive** for such reasonable time as the **Design Professional** may determine.

**12.3.2.** Claims relating to time shall be made in accordance with applicable provisions of Article 16.

**12.3.3.** No claim for extension of time shall be allowed on account of failure of the **Design Professional** to furnish Plans, Specifications or instructions or to return Shop Drawings or Samples until fifteen (15) days after receipt by the **Design Professional** by registered or

certified mail of written demand for such instructions, Plans, Specifications, or Samples, and then not unless such claim is reasonable.

**12.3.4.** No extensions of time shall be granted because of seasonal or abnormal variations in temperature, humidity or precipitation, which conditions shall be wholly at the risk of the **Contractor**, whether occurring within the time originally scheduled for completion or within the period of any extension granted. There shall be no increase in the Contract Sum on account of any additional costs of operations or conditions resulting therefrom.

**12.3.5.** The **Contractor** hereby agrees that the **Contractor** shall have no claim for damages of any kind against the **City** or the **Design Professional** on account of any delay in the commencement of the Work and/or any hindrance, delay, or suspension of any portion of the Work, whether such delay is caused by the **City**, the **Design Professional**, or otherwise, except as and to the extent expressly provided under M.G.L. c. 30, §39O, in the case of written orders by the **City**. The **Contractor** acknowledges that the **Contractor's** sole remedy for any such delay and/or suspension will be an extension of time as provided in this Article.

**12.3.6.** (*Reference: M.G.L. c. 30, §39O;*). (a) The **City** may order the **Contractor** in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the **City**, provided however that if there is a suspension, delay, or interruption for fifteen (15) days or more due to a failure of the **City** to act within the time specified in this Contract, the **City** shall make an adjustment in the Contract prices for any increase in the cost of performance of this Contract under this provision for any suspension, delay, interruption, or failure to act to the extent that such is due to any cause for which this Contract provides for an equitable adjustment of the Contract price under any other Contract provisions.

(b) The **Contractor** must submit the amount of a claim under provision (a) to the **City** in writing as soon as practicable after the end of the suspension, delay, interruption, or failure to act and, in any event, not later than the date of final payment under this Contract and, except for costs due to a suspension order, the **City** shall not approve any costs in the claim incurred more than twenty (20) days before the **Contractor** notified the **City** in writing of the act or a failure to act involved in the Claim.

In the event a suspension, delay, interruption, or failure to act of the **City** increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the **Contractor** for payment for an increase in the cost of its performance as provisions (a) and (b) give the **Contractor** against the **City**, but nothing in provisions (a) and (b) shall in any way change, modify, or alter any other rights which the **Contractor** or the Subcontractor may have against each other.

## **12.4. Liquidated Damages.**

**12.4.1.** If the **Contractor** shall fail to achieve Substantial Completion within the Contract

Time, it shall be liable to pay the **City** the daily amount specified in the Agreement, not as a penalty, but as a fixed and agreed upon damages for breach of contract. The said amount is fixed and agreed upon because of the difficulty of ascertaining the **City's** actual damages. It is mutually understood that the said amount is a reasonable approximation or estimate thereof as of the date of the Agreement. The **City** may elect to withhold said amount from periodic or final payments due to the **Contractor**, in addition to retainage and other back charges.

## **12.5. Changes in the Contract Time.**

**12.5.1. In Writing.** The Contract Time may only be changed by a Change Order or a Modification. Any claim for an adjustment of the Contract Time shall be based on a written notice delivered to the party making the claim to the other party and to the **Design Professional** promptly (but in no event later than seven (7) days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty (30) days after such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the **Design Professional** in accordance with Article 16. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph.

**12.5.2. Early Completion.** The Contract Time shall not be changed due to a delay in the **Contractor's** early completion date.

## **ARTICLE 13: PAYMENTS**

### **13.1. Schedule of Values.**

**13.1.1.** The **Contractor** shall submit to the **Design Professional** a schedule of values which shall subdivide the Work into its component parts and shall include quantities, direct craft labor worker hours, labor cost and material/equipment cost. Labor cost shall include an appropriate amount of construction equipment costs, supplemental costs, administrative expenses, contingencies, and profit. The **Contractor** shall prepare the schedule of values in such form and supported by such data to substantiate its accuracy as the **Design Professional** may require and shall be revised if later found by the **Design Professional** to be inaccurate. This schedule, unless objected to by the **Design Professional**, shall be used as a basis for reviewing the **Contractor's** applications for payment.

### **13.2. Content and Submission of Applications for Payment.**

**13.2.1.** At least ten (10) days before the date established for each progress payment, the **Contractor** shall submit to the **Design Professional** six (6) copies of an itemized application for payment for Work completed in accordance with the schedule of values. Such application shall be in a form or format established or approved by the **Design Professional** and shall be supported by documentation substantiating the **Contractor's** right to payment.

**13.2.2.** When **Construction Change** Directives have set forth an adjustment to the  
Cedar Street Sewer Separation  
00430



Contract Sum but have not yet been included in Change Orders, the value established by the **City** may be included in the application.

**13.2.3.** Applications covering Work of Subcontractors or Suppliers shall not include requests for payments of amounts the **Contractor** does not intend to pay to a Subcontractor or Supplier because of a dispute or other reason. The **Contractor** shall not be paid for any Work performed by a Subcontractor unless and until the **City** receives for that Subcontractor a certificate of insurance that conforms to the requirements of the Contract Documents .

**13.2.4.** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the Site for subsequent incorporation in the Work. If approved in advance by the **City**, payment may similarly be made for materials and equipment suitably stored off the Site at a location agreed upon in writing. Payment for materials and equipment stored on or off the Site shall be conditioned upon the application for payment being accompanied by a bill of sale, an invoice, or other documentation warranting that the **City** has received the materials and equipment free and clear of all liens, claims, security interests, or encumbrances, hereinafter collectively referred to as “liens,” and evidence that the materials and equipment are covered by appropriate insurance and other arrangements to protect the **City’s** interest therein.

**13.2.5.** Each application for payment or periodic estimate requesting payment shall be accompanied by, at the **City's** option, a certificate from each Subcontractor stating that the Subcontractor has been paid all amounts due the Subcontractor on the basis of the previous periodic payment to the **Contractor**, or else stating the amount not so paid and the reason for the discrepancy. In the event of any such discrepancy, the **Contractor** shall furnish the **Contractor's** own written explanation to the **City** through the **Design Professional**. Such waiver or certificate shall be in a form acceptable to the **City**.

### **13.3. False Applications for Payment.**

**13.3.1.** (*Reference: M.G.L. c. 266, §§67B*). Any person who makes or presents to any claim upon or against any employee or department of the **City**, knowing such claim to be false, fictitious, or fraudulent shall be punished by a fine or not ore than ten thousand dollars (\$10,000) or by imprisonment in the state prison for not more than five (5) years, or in the house of correction for not more than two and one-half years, or both.

### **13.4. Review of Applications for Payment.**

**13.4.1.** The **Design Professional** shall review each application for payment and will reject any application that (1) is not accompanied by the required documentation or (2) contains errors, mathematical or otherwise.

**13.4.2.** Within five (5) business days after receipt of an application for payment, the **Design Professional** will either (1) return the application to the **Contractor** with a written explanation as to why it was rejected or (2) issue to the **City** a certificate for payment, with a copy to the **Contractor**, for such amount as the **Design Professional** determines is properly due.

In the event an application is returned to the **Contractor**, the date of receipt of the application shall be the date of receipt of the corrected application.

**13.4.3.** The **Design Professional** or the **City** may make changes to any application submitted by the **Contractor**.

**13.4.4.** By recommending any payment, the **Design Professional** will not thereby be deemed to have represented that: (1) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to the **Design Professional** in the Contract Documents or (2) that there may not be other matters or issues between the parties that might entitle the **Contractor** to be paid additionally by the **City** or entitle the **City** to withhold payment to the **Contractor**. The **Design Professional's** approval of the application for payment and the accompanying documentation shall indicate that to the best of the **Design Professional's** knowledge, information, and belief, the Work has progressed to the point indicated by the **Contractor**, and that the quality of the Work is in accordance with the Contract Documents, subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests specified in the Contract Documents, final determination of quantities and classifications for unit price work and any other qualifications so stated.

**13.4.5.** The **Design Professional's** recommendation of any payment shall not mean that the **Design Professional** is responsible for the **Contractor's** means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the **Contractor** to comply with laws and regulations applicable to the furnishing or performance of Work, or for any failure of the **Contractor** to perform or furnish Work in accordance with the Contract Documents.

**13.4.6.** No certificate given or payment made shall be evidence of the performance of this Contract, either wholly or in part and no payment, whether made upon the final certificate or otherwise, shall be construed as an acceptance of defective work or materials.

**13.5. Decisions to Withhold Certification.**

**13.5.1.** The **Design Professional** may refuse to recommend the whole or any part of any payment if, in the **Design Professional's** opinion, it would be incorrect to make the representations to the **City** referred to above.

**13.5.2.** If the **Contractor** and the **Design Professional** cannot agree on a revised amount, the **Design Professional** will promptly approve a certificate for payment for the amount for which the **Design Professional** is able to make such representations to the **City**. The **Design Professional** may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a certificate for payment previously issued, to such extent as may be necessary in the **Design Professional's** opinion to protect the **City** from loss because of:

**13.5.2.1.** defective Work not remedied;

**13.5.2.2.** third party claims filed or reasonable evidence indicating probable filing of such claims;

**13.5.2.3.** failure of the **Contractor** to make payments properly to Subcontractors or for labor, materials or equipment;

**13.5.2.4.** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

**13.5.2.5.** damage to the **City** or another contractor;

**13.5.2.6.** reasonable evidence that the Work will not be completed within the Contract Time, and that retainage currently held by the **City** would not be adequate to cover actual or liquidated damage for the anticipated delay;

**13.5.2.7.** persistent failure to carry out the Work in accordance with the Contract Documents; or

**13.5.2.8.** failure of mechanical trade or electrical trade subcontractors to comply with mandatory requirements for maintaining record drawings. The **Contractor** shall check record drawings each month. Written confirmation that the record drawings are current will be required by the **Design Professional** before approval of the **Contractor's** monthly payment requisition.

**13.5.3.** When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

## **13.6. Progress Payments.**

**13.6.1.** After the **Design Professional** has issued a certificate for payment, the **City** shall make payment in the manner and within the time provided in the Contract Documents.

**13.6.2.** (*Reference: M.G.L. c. 30, §39G;*). The **City** shall pay the amount due pursuant to any periodic, Substantial Completion or final estimate within thirty-five (35) days after receipt of written acceptance for such estimate from the **Contractor**. In the case of periodic payments, the **City** may deduct from its payment a retention based on its estimate of the fair value of its claims against the **Contractor**, a retention for direct payments to Subcontractors based on demands for same in accordance with M.G.L. c. 30, §39F; and a retention to secure satisfactory performance of the contractual work, not exceeding five percent (5%) of the approved amount of any periodic payment, and the same right to retention shall apply to bonded Subcontractors entitled to direct

payment under M.G.L. c. 30, §39F; provided, that a five percent (5%) value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

**13.6.3.** No periodic, Substantial Completion or final estimate or acceptance or payment thereof shall bar the **Contractor** from reserving all rights to dispute the quantity and amount of, or the failure of the **City** to approve a quantity and amount of, all or part of any Work item or extra Work item.

### **13.7. Final Payment.**

**13.7.1.** After final inspection and after the **Contractor** has completed all the required corrections to the satisfaction of the **Design Professional** and the **City** and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, bonds, certificates, or other evidence of insurance, certificates of inspection, marked-up record documents, and all other documents called for in the Contract Documents, as well as any surplus materials requested by the **City**, the **Contractor** may make an application for final payment as provided below.

**13.7.2.** (*Reference: M.G.L. c. 30, §39G;*). Within thirty (30) days after receipt by the **City** of a notice from the **Contractor** stating that all of the Work required by the Contract has been completed, the **City** shall prepare and forthwith send to the **Contractor** for acceptance a final estimate for the quantity and price of the Work done and all retainage on the Work less all payments made to date, unless the **City's** inspection shows that Work required by the Contract remains incomplete or unsatisfactory, or that documentation required by the Contract has not been completed.

**13.7.3.** The making and acceptance of final payment will constitute a waiver of all claims by the **Contractor** against the **City** other than those previously made in writing and still unsettled.

### **13.8. Payments to Subcontractors.**

**13.8.1.** Neither the **City** nor the **Design Professional** shall have an obligation to pay or see to the payment of money to a Subcontractor, Sub-subcontractor, or Supplier except as may otherwise be required by law.

**13.8.2.** (*Reference: M.G.L. c. 30, §39F;*) (1)(a) Forthwith after the **Contractor** receives payment on account of a periodic estimate, the **Contractor** shall pay to each Subcontractor the amount paid for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the **Contractor**.

(b) Not later than the sixty-fifth day after each Subcontractor substantially completes its Work in accordance with the Plans and Specifications, the entire balance

due under the subcontract, less amounts retained by the **City** as the estimated cost of completing the incomplete and unsatisfactory items of Work, shall be due the Subcontractor; and the **City** shall pay that amount to the **Contractor**. The **Contractor** shall forthwith pay to the Subcontractor the full amount received from the **City** less any amount specified in any court proceeding barring such payment and also less any amount claimed due from the Subcontractor by the **Contractor**.

(c) Each payment made by the **City** to the **Contractor** pursuant to paragraphs (a) and (b) of M.G.L. c. 30, §39F(1);, for the labor performed and the materials furnished by a Subcontractor shall be made to the **Contractor** for the account of that Subcontractor; and the **City** shall take reasonable steps to compel the **Contractor** to make each such payment to each such Subcontractor. If the **City** has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the **Contractor** or which is to be include in a payment to the **Contractor** for payment to the Subcontractor as provided in paragraphs (a) and (b) of M.G.L. c. 30, §39F(1), the **City** shall act upon the demand as provided in M.G.L. c. 30, §39F.

(d) If, within seventy (70) days after the Subcontractor has substantially completed the subcontract Work, the Subcontractor has not received from the **Contractor** the balance due under the subcontract including any amount due for extra labor and materials furnished to the **Contractor**, less any amount retained by the **City** as the estimated cost of completing the incomplete and unsatisfactory items of Work, the Subcontractor may demand direct payment of that balance from the **City**. The demand shall be by a sworn statement delivered to or sent by certified mail to the **City**, and a copy shall be delivered to or sent by certified mail to the **Contractor** at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract Work. [The demand letter shall indicate the certified mail number assigned by the postal service or the date of delivery to the **Contractor**.] Any demand made after substantial completion of the subcontract Work shall be valid even if delivered or mailed prior to the seventieth day after the Subcontractor has substantially completed the subcontract Work. Within ten (10) days after the Subcontractor has delivered or so mailed the demand to the **City** and delivered or so mailed a copy to the **Contractor**, the **Contractor** may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the **City**, and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the **Contractor** and of the amount due for each claim made by the **Contractor** against the Subcontractor.

(e) Within fifteen (15) days after receipt of the demand by the **City**, but in no event prior to the seventieth day after substantial completion of the subcontract Work, the **City** shall make direct payment to the Subcontractor of the balance due under the

subcontract, including any amount due for extra labor and materials furnished to the **Contractor**, less any amount (i) retained by the **City** as the estimated cost of completing the incomplete or unsatisfactory items of Work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the **Contractor** in the sworn reply; provided that the **City** 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 the previous paragraph. The **City** shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this paragraph.

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

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

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

(i) If the Subcontractor does not receive payment as provided in paragraph (a) or if the **Contractor** does not submit a periodic estimate for the value of the labor or materials performed or furnished by the Subcontractor and the Subcontractor does not receive payment for same when due less the deductions provided for in paragraph (a), the Subcontractor may demand direct payment by following the procedure in paragraph (d) and the **Contractor** may file a sworn reply as provided in that same paragraph. A demand made after the first day of the month following that for which the Subcontractor performed or furnished the labor and materials for which the Subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the **Contractor**. Thereafter the **City** shall proceed as provided in

paragraphs (e), (f), (g), and (h). “Subcontractor” as used in this paragraph (1)(i) shall mean a person approved by the **City** in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the **Contractor**.

(2) Any assignment by a Subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of M.G.L. c. 149, §29; shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the **City** or which are on deposit pursuant to paragraph (g) shall be subordinate to the rights of all Subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) A **Contractor** or a Subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in herein by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A Subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in paragraph (f) by a petition in equity in the superior court against the **City** and the **Contractor** shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. M.G.L. c. 231, §§59 and 59B shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to §§59 and 59B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any Subcontractor with the petition of one or more Subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will present unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a Subcontractor filing a demand for direct payment for which no funds due the **Contractor** are available for direct payment shall have a right to file a petition in court of equity against the **City** claiming a demand for direct payment is premature, and such Subcontractor must file the petition before the **City** has made a direct payment to the Subcontractor and has made a deposit of the disputed portion as provided in part (iii) of paragraph (e) and in paragraph (f).

(4) In any petition to collect any claim for which a Subcontractor has filed a demand for direct payment the court shall, upon motion of the **Contractor**, reduce by the amount of any deposit of a disputed amount by the **City** as provided in part (iii) of paragraph (e) and in paragraph (f) any amount held under a trustee writ or pursuant to a restraining order or injunction.

## ARTICLE 14: SUBSTANTIAL COMPLETION

### 14.1. Substantial Completion.

**14.1.1.** Upon Substantial Completion of the Work, the **Contractor** shall present in writing to the **City** its certification that the Work has been substantially completed and include in its certification (1) a list of items to be completed or corrected, (2) all special warranties required by the Contract Documents, endorsed by the **Contractor** and in a form reasonably acceptable to the **Design Professional** and (3) the permits and certificates referred to in 13.7.1., or elsewhere. The failure to include any item on the list mentioned in the preceding sentence does not alter the responsibility of the **Contractor** to complete all Work in accordance with the Contract Documents. When the **Design Professional** on the basis of an inspection determines that the Work or designed portion thereof is substantially complete and the other conditions have been met, the **Design Professional** will then prepare a certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the **City** and the **Contractor** for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the **Contractor** shall complete the items listed therein. The certificate of Substantial Completion shall be submitted to the **City** and the **Contractor** for their written acceptance of the responsibilities assigned to them in such certificate.

**14.1.2.** Within twenty-one (21) days after receipt of the certification from the **Contractor**, the **City** shall present to the **Contractor** either a written declaration that the Work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the Contract sufficient to demonstrate that the Work has not been substantially completed. The **City** may include with such list a notice setting forth a reasonable time within which the **Contractor** must achieve Substantial Completion of the Work. If the **City** fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the **Contractor's** certification within the twenty-one (21) day period, the **Contractor's** certification shall take effect as the **City's** declaration that the Work has been substantially completed.

### 14.2. Partial Use or Occupancy of the Premises.

**14.2.1.** The **City** may occupy or use any completed or partially completed portion of the Work at any stage. Such partial occupancy or use may begin whether or not the portion is substantially complete, provided that the respective responsibilities of the **City** and the **Contractor** with respect to payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work, insurance, correction of the Work, and warranties shall be established by agreement of the **City** and the **Contractor** or, absent such agreement, shall be determined by the **Design Professional** subject to the right of either party to contest such determination as provided in Article 16.

**14.2.2.** Immediately prior to such partial occupancy or use, the **City**, the **Contractor** and the **Design Professional** shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**14.2.3.** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the



Contract Documents.

**14.2.4.** (*Reference:* M.G.L. c. 30, §39G;). Within sixty-five (65) days after the effective date of a declaration of Substantial Completion, the **City** shall prepare and send to the **Contractor** for acceptance a Substantial Completion estimate for the quantity and price of the Work done and all but one percent (1%) retainage on that Work, including the quantity, price and all but one percent (1%) retainage for the undisputed part of each item and extra work item in dispute, but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory items and less the total periodic payments made to date for the Work. The **City** shall also deduct from the Substantial Completion estimate an amount equal to the sum of all demands for direct payment filed by Subcontractors and not yet paid to Subcontractors or deposited in joint accounts pursuant to M.G.L. c. 30, §39F.

**14.2.5.** (*Reference:* M.G.L. c. 30, §39G). If the **City** fails to prepare and send to the **Contractor** any Substantial Completion estimate required by the provisions herein on or before the date specified, the **City** shall pay to the **Contractor** interest on the amount which would have been due to the **Contractor** pursuant to such Substantial Completion estimate at the rate of three (3) percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the **City** sends that Substantial Completion estimate to the **Contractor** for acceptance or to the date of payment therefor, whichever occurs first. The **City** shall include the amount of such interest in the Substantial Completion estimate.

**14.2.6.** (*Reference:* M.G.L. c. 30, §39G). Within fifteen (15) days after the effective date of the declaration of Substantial Completion, the **City** shall send to the **Contractor** by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory items, and unless delayed by causes beyond its control, the **Contractor** shall complete all such items within forty-five (45) days after the receipt of such list or before the date for final payment and acceptance, whichever is later. If the **Contractor** fails to complete such Work within such time, the **City** may, subsequent to seven (7) days' written notice to the **Contractor** by certified mail, return receipt requested, terminate the Contract and complete the incomplete or unsatisfactory items and charge the cost of same to the **Contractor**.

**14.3. Final Inspection.**

**14.3.1.** Upon written notice from the **Contractor** that the entire Work or an agreed portion thereof is complete, the **Design Professional** will make a final inspection with the **City** and the **Contractor** and will notify the **Contractor** in writing of all particulars which this inspection reveals that the Work is incomplete or defective. The **Contractor** shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

**ARTICLE 15: GUARANTEES AND WARRANTIES**

**15.1. In General.**

**15.1.1.** All guarantees and warranties specifically called for by the Specifications shall expressly run to the benefit of the **City**.

**15.2. Warranties.**

**15.2.1.** Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof, unless otherwise provided in the certificate of Substantial Completion.

**15.2.2.** The **Contractor** warrants that the materials and equipment furnished under the Contract will be new and of recent manufacture unless otherwise specified, and that all Work will be of good quality, free from faults and defects, and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The **Contractor's** warranty excludes remedy for damage or defect caused by abuse, Modifications not executed by the **Contractor**, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the **Design Professional**, the **Contractor** shall furnish satisfactory evidence as to the kind and quality of material and equipment.

**15.2.3.** The **Contractor** warrants that title to all Work covered by an application for payment will pass to the **City** either by incorporation in the construction or upon the receipt of payment by the **Contractor**, whichever occurs first, free and clear of all liens. The **Contractor** further agrees that the submission of any application for payment shall conclusively be deemed to waive all liens with respect to said Work to which the **Contractor** may then be entitled, provided that such waiver of the lien rights shall not waive the **Contractor's** right to payment for such Work.

**15.2.4.** The **Contractor** warrants and guarantees that title to all Work, materials, and equipment covered by any application for payment, whether incorporated in the Project or not, will pass to the **City** no later than the time of payment free and clear of all liens.

**15.2.5.** No materials or supplies for the Work shall be purchased by the **Contractor** or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The **Contractor** warrants that it has good title to all materials and supplies used by it in the Work, free from all liens.

**15.2.6.** The **Contractor** shall indemnify and hold the **City** harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. The **Contractor** shall at the **City's** request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the **Contractor** fails to do so, then the **City** may, after having served written notice on the **Contractor** either pay unpaid bills, of which the **City** has written notice, direct, or withhold from the **Contractor's** unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the **Contractor** shall be resumed, in accordance with the terms of this

Contract, but in no event shall the provisions of this sentence be construed to impose any obligations on the **City** to either the **Contractor** or its surety. In paying any unpaid bills of the **Contractor**, the **City** shall be deemed the agent of the **Contractor** and any payment so made by the **City** shall be considered as payment made under the Contract by the **City** to the **Contractor** and the **City** shall not be liable to the **Contractor** for any such payment made in good faith.

### **15.3. Extended Warranties and Guarantees.**

**15.3.1.** Any defective Work that is either corrected or replaced will be warranted and guaranteed for a period of three (3) years from the date of such correction or replacement.

## **ARTICLE 16: CLAIMS**

### **16.1. In General.**

**16.1.1. Written Notice.** A Claim must be made by written notice to the other party.

**16.1.2. Content of Notice.** The notice must include all written supporting data.

**16.1.3. Burden of Proof.** The party making the Claim must substantiate the Claim.

### **16.2. Time Limits on Claims.**

**16.2.1.** Unless otherwise provided, all Claims must be made within twenty-one (21) days after the occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Any change or addition to a previously made Claim shall be made by a written notice within the twenty-one-day period in order to be valid.

### **16.3. Continuing Contract Performance.**

**16.3.1.** Pending final resolution of a Claim including arbitration, unless otherwise agreed in writing, the **Contractor** shall proceed diligently with performance of the Contract and the **City** shall continue to make payments in accordance with the Contract Documents.

### **16.4. Types of Claims.**

**16.4.1. Claims for Differing Subsurface or Latent Physical Conditions.** (*Reference: M.G.L. c. 30, §39N;*). If, during the progress of the Work, the **Contractor** or the **City** discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the Plans or indicated in the Contract Documents, either the **Contractor** or the **City** may request an equitable adjustment in the Contract Sum of the Contract applying to Work affected by the differing Site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a **Contractor**, or upon its own initiative, the **City** shall make an investigation of such physical conditions, and if they differ substantially or materially from those shown on the Plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Plans and Contract

Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, the **City** shall make an equitable adjustment in the Contract Sum and the Contract shall be modified in writing accordingly.

**16.4.2. Claims for Additional Cost.** If the **Contractor** claims that any acts or omissions of the **City** or the **Design Professional**, including any instructions or orders, whether oral, written, by drawings, or otherwise, involve extra cost or time, and the **Contractor** has not received a written acknowledgment by the **City** or the **Design Professional** that extra payment will be made or time extended on account thereof, the **Contractor** shall promptly so notify the **Design Professional** in writing of such Claim and shall proceed with the Work relating to such Claim and all rights of both parties with respect to such Claim shall be deemed to have been reserved. No Claim by the **Contractor** on account of such acts, omissions, instructions, or orders shall be valid unless the **Contractor** has so notified the **Design Professional** before proceeding.

**16.4.2.1.** Under no circumstances shall a Claim be made for additional cost where adverse weather conditions are the basis for the Claim.

**16.4.3. Claims for Additional Time.** If the **Contractor** wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The **Contractor** shall have the burden of demonstrating the effect of the claimed delay on the Contract Time and shall furnish the **Design Professional** with such documentation relating thereto as the **Design Professional** may reasonably require. Under no circumstances shall the **Contractor** make a Claim for an increase in the Contract Time due to a change in the **Contractor's** early completion date. If the increase in the Contract Time extends beyond the Contract Time established by the **City**, only the time that so extends beyond the Contract Time shall be reviewed and considered. In the case of a continuing delay, only one Claim is necessary.

**16.4.3.1.** Under no circumstances shall a Claim be made for additional time where adverse weather conditions are the basis for the Claim.

**16.4.4. Claims for Injury to Person or Damage to Property.** Should either party to the Contract suffer injury to person or damage to property because of any error, omission, or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, a Claim will be made in writing to the other party within twenty-one (21) days of the occurrence of the act giving rise to the injury or damage.

## **16.5. Review of Claims.**

**16.5.1. Initial Referral.** All Claims, the bases of which arise prior to final payment or the earlier termination of the Contract, shall be referred initially to the **Design Professional** for action as provided herein.

**16.5.2. Time Period and Action.** The **Design Professional** shall review Claims and shall

do one of the following within fourteen (14) days of receipt of the Claim:

**16.5.2.1.** defer any action with respect to all or any part of a Claim for the purpose of requesting and receiving additional information from either party;

**16.5.2.2.** decline in writing to render a decision for any reason which it deems appropriate (including, but not limited to, the fact that the Claim involves allegations of fault on the part of the **Design Professional**); or

**16.5.2.3.** render a decision on all or a part of the Claim.

**16.5.3.** If the **Design Professional** requests additional information, the **Design Professional** shall take action with respect to the Claim no later than fourteen (14) days after receipt of the additional information. The **Design Professional** shall notify the parties in writing of its disposition of such Claim. If the **Design Professional** renders a decision or declines to render a decision, either party may proceed in accordance with paragraph 16.7.

## **16.6. Decisions.**

**16.6.1. Decisions by the City or the Design Professional.** (*Reference:* M.G.L. c. 30, §39P;). In every case in which this Contract requires the **City**, any official, or its **Design Professional** to make a decision on interpretation of the Specifications, approval of equipment, material or any other approval, or progress of the Work, the decision shall be made promptly and, in any event, no later than fourteen (14) days after the written submission for decision; but if such decision requires extended investigation and study, the **City**, the official, or the **Design Professional** shall, within fourteen (14) days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made.

**16.6.2. When Decision of the Design Professional is Final and Binding.** The decision of the **Design Professional** shall be final and binding on the parties, unless a party files suit or a demand for arbitration within thirty (30) days after the date of the decision.

**16.6.3. When Decision of the Design Professional is Not Final and Binding.** (*Reference:* M.G.L. c. 30, §39J). Notwithstanding any contrary provision of this Contract, no decision by the **City** or by the **Design Professional** on a dispute, whether of fact or of law, arising under said Contract shall be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, arbitrarily, is unsupported by substantial evidence, or is based upon error of law.

**16.6.4. Resolved Claims.** If a Claim is resolved, the **Design Professional** shall obtain or prepare the appropriate documentation and provide the **City** and the **Contractor** with a copy of same.

## **16.7. Arbitration.**

**16.7.1. Controversies and Claims Subject to Arbitration.** Any controversy or Claim arising out of or related to the Contract, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator or arbitrators may be entered in any court having jurisdiction thereof, except controversies or Claims relating to aesthetic effect, subject to the provisions of paragraph 16.7.7. In any such arbitration in which the amount stated in the demand is \$100,000 or less, the American Arbitration Association shall appoint a single arbitrator in accordance with such Rules, who shall be a lawyer. In any such arbitration in which the amount stated in the demand is in excess of \$100,000, the demand shall include the name of an arbitrator appointed by the claimant. The respondent shall appoint a second arbitrator and shall notify the claimant in writing of such appointment within thirty (30) days of receipt of the demand, failing which the matter shall be decided by the arbitrator named in the claimant's demand. Within thirty (30) days after the claimant's receipt of notice of the appointment of the second arbitrator, the two arbitrators shall appoint a neutral arbitrator and shall notify the parties in writing of such appointment, failing which either party may apply to the American Arbitration Association to appoint such neutral arbitrator. If such neutral arbitrator is appointed by the American Arbitration Association, he or she shall be a lawyer.

**16.7.2. Rules for Arbitration.** If the neutral arbitrator is appointed by the American Arbitration Association, the said Association shall administer the arbitration and its Construction Industry Arbitration Rules shall govern all aspects of the proceeding including the enforcement of any award. If the neutral arbitrator is not appointed by the American Arbitration Association, then the panel of arbitrators shall act as the administrator of the arbitration but the Construction Industry Arbitration Rules of the Association shall nonetheless govern all aspects of the proceeding, including the enforcement of any award, provided however that the arbitration panel shall have all of the powers and duties conferred on the Association pursuant to said rules. In addition, the following rules shall govern the selection of arbitrators and the proceedings:

**16.7.2.1.** Neither party may appoint as arbitrator an employee or an owner of that party, nor the parent, spouse, or child of an employee or owner of that party.

**16.7.2.2.** After the neutral arbitrator has been appointed, neither party may engage in *ex parte* communication with any arbitrator.

**16.7.3. When Arbitration May Be Demanded.** Demand for arbitration of any Claim, the basis of which arises prior to final payment or the earlier termination of the Contract may not be made before the earlier of (1) the date on which the **Design Professional** has rendered a written decision on the Claim or has notified the parties in writing that such decision will not be rendered or (2) forty-five (45) days following receipt by the **Design Professional** of a written request for a decision sent by registered or certified mail to both the **Design Professional** and the other party to this Contract.

**16.7.3.1.** In no event shall a demand for arbitration be made after the date  
Cedar Street Sewer Separation  
00430

when the institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations.

**16.7.4. Limitation on Consolidation or Joinder.** No arbitration arising out of or relating to the Contract Documents shall include, by consolidation or joinder or in any other manner, the **Design Professional**, the **Design Professional's** employees or consultants, except by written consent containing specific reference to the Contract and signed by the **Design Professional**, the **City**, the **Contractor**, and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the **City**, the **Contractor**, a separate contractor, and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the **City**, the **Contractor**, or a separate contractor shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a dispute not described therein or with a person or entity so named or described herein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Contract shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**16.7.5. Claims and Timely Assertion of Claims.** A party who files a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. When a party fails to include a Claim through oversight, inadvertence, or excusable neglect, or when a Claim has matured or been acquired subsequently, the arbitrator or arbitrators may permit amendment.

**16.7.6. Award Final.** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

**16.7.7. The City's Reservation of Rights.** Notwithstanding any provision contained in this Article 16 or elsewhere in the Contract Documents, the **City** reserves the following rights in connection with Claims between the **City** and the **Contractor**, which rights may be exercised by the **City** unilaterally, in the **City's** sole discretion, and without the consent of the **Contractor**:

**16.7.7.1.** the right to institute legal action against the **Contractor** in any court of competent jurisdiction in lieu of demanding arbitration, in which case the dispute or disputes which are the subject of such action shall be decided by such court, and not by arbitration;

**16.7.7.2.** the right to obtain from any court of competent jurisdiction a stay of any arbitration instituted by the **Contractor**, provided that the application for such stay is made before the appointment of the neutral arbitrator in such arbitration, in which case the dispute or disputes which are the subject of such arbitration shall be decided by such court and not by arbitration;

**16.7.7.3.** the right to require the **Contractor** to join as a party in any arbitration between the **City** and the **Design Professional** relating to the Project, in which case the **Contractor** agrees to be bound by the decision of the arbitrator or arbitrators in such arbitration.

**16.7.8.** In case the **City** elects to proceed in accordance with 16.7.7.1. or 16.7.7.2. above, the word “litigation” shall be deemed to replace the word “arbitration” wherever the latter word appears in the Contract Documents.

## **ARTICLE 17: EMERGENCIES**

**17.1.** In an emergency affecting the health and safety of persons or property, the **Contractor** shall act to prevent threatened damage, injury, or loss.

**17.2.** In emergencies affecting the health, safety, or protection of persons, the Work or property at the Site or adjacent thereto, the **Contractor**, without special instruction or authorization from the **City** or the **Design Professional**, is obligated to act to prevent threatened damage, injury, or loss. The **Contractor** shall give the **Design Professional** prompt written notice if the **Contractor** believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the **Design Professional** determines that a change in the Contract Documents is required because of the action taken by the **Contractor** in response to such an emergency, a **Construction Change** Directive or Change Order will be issued to document the consequences of such action.

## **ARTICLE 18: TERMINATION OR SUSPENSION OF THE CONTRACT**

### **18.1. Suspension by the City.**

**18.1.1.** At any time and without cause, the **City** may suspend the Work or any portion thereof for a period of not more than ninety (90) days by notice in writing to the **Contractor** and the **Design Professional** that will fix the date on which Work will be resumed. The **Contractor** shall resume Work on the date so fixed. The **Contractor** shall be allowed an adjustment in the Contract Sum or an extension of the Contract Time, or both, directly attributable to any such suspension if the **Contractor** makes an approved Claim therefor.

**18.1.2.** If the Work is defective, if the **Contractor** fails to provide a sufficient number of skilled workers or suitable materials or equipment, or if the **Contractor** defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the **City** to begin and prosecute correction of such default or neglect with diligence and promptness, the **City** may correct such deficiencies, without prejudice to other remedies the **City** may have. In such case, an appropriate **Construction Change** Directive shall be issued deducting from payments then or thereafter due to the **Contractor** the cost of correcting such deficiencies including compensation for the **Design Professional's** additional services and expenses made necessary by such default, neglect, or failure and any and all direct, indirect, or consequential costs associated with the order to stop the



Work. If such payments then or thereafter due the **Contractor** are not sufficient to cover such amounts, the **Contractor** shall immediately pay the difference to the **City**. The **Contractor** shall remain responsible for maintaining progress and shall not be entitled to any increase in the Contract Time or the Contract Sum.

## **18.2. Termination by the Contractor.**

**18.2.1.** If, through no act or fault of the **Contractor**, a Subcontractor, or a Sub-subcontractor, the Work is suspended for a period of more than ninety (90) days by the **City**, or under an order of court or other public authority, or the **Design Professional** fails to act on any application for payment within thirty (30) days after it is submitted in proper form and content or the **City** fails for thirty (30) days to pay the **Contractor** any sum finally determined to be due, then the **Contractor** may terminate the Contract upon seven (7) days' written notice to the **City**, provided that the **City** does not remedy such suspension or failure within that time.

## **18.3. Termination by the City.**

**18.3.1.** If the **Contractor** is adjudged a bankrupt, or if the **Contractor** makes a general assignment for the benefit of the **Contractor's** creditors, or if a receiver is appointed on account of the **Contractor's** insolvency, or if the **Contractor** persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if the **Contractor** fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction or disregards an instruction, order, or decision of the **Design Professional**, or otherwise is guilty of substantial violation of any provision of the Contract, then the **Contractor** shall be in default, and the **City** may, without prejudice to any other right or remedy and upon written notice to the **Contractor**, take possession of all materials, tools, appliances, equipment, construction equipment and machinery and vehicles, offices and other facilities on the Project Site, and all materials intended for the Work, wherever stored, and, seven (7) days after such notice, may terminate the employment of the **Contractor**, accept assignment of any or all subcontracts pursuant to Paragraph \_\_, and finish the Work by whatever method the **City** may deem expedient. The **City** shall be entitled to collect from the **Contractor** all direct, indirect, and consequential damages suffered by the **City** on account of the **Contractor's** default, including without limitation additional services and expenses of the **Design Professional** made necessary thereby. The **City** shall be entitled to hold all amounts due to the **Contractor** at the date of termination until all of the **City's** damages have been established, and to apply such amounts to such damages.

**18.3.2.** (*Reference: Somerville Municipal Code Chapter 2.117, Section 2.117.110C*). In the event the **Contractor** or any of its agents or employees violates any provision of Somerville Municipal Code Chapter 2.117 that is applicable to **City** contractors in connection with the awarding, administration, or performance of the Contract, the **City** may terminate the Contract.

## **ARTICLE 19: AMERICANS WITH DISABILITIES ACT; (42 U.S. 12131)**

**19.1.** On July 26, 1994, the Americans with Disabilities Act ("the Act") became effective for

Cedar Street Sewer Separation

00430

employers of fifteen or more employees.

**19.2.** The Act protects against discrimination on the basis of “disability,” which is defined as a physical or mental impairment that substantially limits at least one “major life activity;” or discrimination against an individual who has a record of such impairment; or discrimination against an individual being regarded - even if inaccurately - as having such impairment. The Act also expressly prohibits job discrimination that is based on any individual’s relationship or association with a disabled person.

**19.3.** If the **Contractor** is subject to the Act, it must comply with its provisions.

## **ARTICLE 20: WRITTEN NOTICE TO THE PARTIES**

### **20.1. In General.**

**20.1.1.** All written communications from the **Design Professional** to the **Contractor** shall be copied to the **City**. All written communications from the **Contractor** to the **Design Professional** shall be copied to the **City**. All written communications from the **Contractor** to the **City** shall be copied to the **Design Professional**.

### **20.2. Addresses.**

**20.2.1. To the City.** Written notice to the **City** shall be sent or hand-delivered to:

Purchasing Director  
City of Somerville  
93 Highland Avenue  
Somerville, MA 02143

City Solicitor  
Law Department  
93 Highland Avenue  
Somerville, MA 02143

Executive Director  
Office of Strategic Planning & Community Development 93  
Highland Avenue  
Somerville, MA 02143

**20.2.2. To the Contractor.** Both the address given on the bid form upon which the Agreement is founded and the **Contractor's** office at or near the Site of the Work are hereby designated as places to either of which notices, letters, and other communications to the **Contractor** shall be certified, mailed, or delivered. Delivery of any notice, letter, or other communication to the **Contractor** at or depositing same in a postpaid wrapper directed to either place shall be deemed sufficient service thereof upon the **Contractor**. Written notice shall be deemed to have been duly served on the **Contractor** if it is sent or hand-delivered to any member or officer of the **Contractor**. The date of said service shall be the date of such delivery

or mailing. The address may be changed at any time by an instrument in writing, executed and acknowledged by the **Contractor** and delivered to the **City** and to the **Design Professional**. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon the **Contractor** personally. Moreover, any notice, letter, or other communication required under the Contract may be served on the **Contractor's** representative at job meetings. The **Contractor** shall provide the **City** with its change of address seven (7) days prior to its effective date.

**20.2.3. To the Design Professional.** Written notice to the **Design Professional** shall be sent or hand-delivered to the address appearing on the Project Manual. Written notice shall be deemed to have been duly served on the **Design Professional** if it is sent or hand-delivered to any member or officer of the **Design Professional**.

## **ARTICLE 21: MISCELLANEOUS PROVISIONS**

### **21.1. Governing Law.**

**21.1.1.** This Contract shall be governed by the laws of the Commonwealth of Massachusetts.

### **21.2. Venue.**

**21.2.1.** Venue for any court action or proceeding shall be Middlesex County in the Commonwealth of Massachusetts only. The **Contractor**, all Subcontractors, and Suppliers waive any and all jurisdictional and venue defenses.

### **21.3. Successors and Assigns.**

**21.3.1.** The **Contractor** shall not assign, in whole or in part, its rights and obligations under the Contract Documents without prior written consent of the **City**. An assignment without the prior written consent of the **City** shall not relieve the **Contractor** of its obligations thereunder.

**21.3.2.** The **City** and the **Contractor** respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents.

### **21.4. Statutory Limitation Period.**

**21.4.1.** It is expressly agreed that the obligations of the **Contractor** hereunder arise out of contractual duties, and that the failure of the **Contractor** to comply with the requirements of the Contract Documents shall constitute a breach of contract, not a tort, for the purpose of applicable statutes of limitations and repose. Any cause of action which the **City** may have on account of such failure shall be deemed to accrue only when the **City** has obtained actual knowledge of such failure, not before.

**21.5. Rights and Remedies.**

**21.5.1.** Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

**21.5.2.** No action or failure to act by the **City**, the **Design Professional**, or the **Contractor** shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

# **PART 2 - SAMPLE CONSTRUCTION CONTRACT**

## **IMPORTANT INFORMATION REGARDING CERTIFICATE OF GOOD STANDING**

- Sample Contract
- Certificate of Authority
- Appendix A – Scope of Work (including Technical Specifications)
- Appendix B – Contractor's Bid Price; Form for General Bid (From Bid Book)
- Appendix C – General Terms and Conditions
- Appendix D – Insurance Requirements
- Appendix E – Wage Rates and Living Wage (From Bid Book)
- Appendix F – Certificate of Good Standing (for corporations; from Bid Book)
- Appendix G – Procurement documentation (Advertisements and Notice to Bidders)
- Appendix H – Statement of Management
- Appendix I – Performance Bond and Payment Bond, if contract over \$2000

## S A M P L E C O N T R A C T

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**CONTRACT NUMBER**


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**A-  
PURCHASE ORDER # AND AMOUNT**


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**BID NUMBER**


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**OSPCD  
ISSUING DEPARTMENT**


---

**FUNDING DEPARTMENT (Division)**


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**CONTRACT PERIOD**

CITY OF SOMERVILLE  
MAYOR'S OFFICE OF STRATEGIC PLANNING AND COMMUNITY DEVELOPMENT

**PUBLIC CONSTRUCTION CONTRACT****FOR: Cedar Street Sewer Separation**

**CONTRACTOR:** Vendor  
Address  
Townname, Ma

**ACCORDING TO SPECIFICATIONS CONTAINED HEREIN**

Sample Contract

**CITY OF SOMERVILLE  
OWNER-CONTRACTOR PUBLIC CONSTRUCTION AGREEMENT**

AGREEMENT made this --- day of \_\_\_\_\_, by and between the City of Somerville, a Massachusetts municipal corporation, acting by and through its Purchasing Department, with a usual address of 93 Highland Ave., Somerville, MA 02143 ("City", "Owner" or "Awarding Authority") and the following General Contractor ("Contractor" or "General Contractor"):

**GENERAL CONTRACTOR:**

Name:

Address:

Telephone:

Fax:

E-Mail:

PROJECT: ADA Ramps (12) at Four Locations

The work consists of the construction of twelve (12) Wheelchair Ramps to Massachusetts Architectural Access Board (AAB) standards (521 MR 21.00, effective January 27, 2006); hiring a design professional to verify that all AAB requirements have been fulfilled; and resetting crosswalk signs. Substantial completion of work shall be by September 1, 2009.

**PROJECT MANAGER:**

Name: Brad Rawson

Address: City Hall, 3<sup>rd</sup> floor, 93 Highland Avenue, Somerville, MA 02143

Telephone: 617-625-6600, x.2545 Fax: 617-625-0722

E-Mail: afranzen@somervillema.gov

**DESIGN PROFESSIONAL:**Name: **Parsons Brinckerhoff, Inc. LLC**Address: **75 Arlington St.  
Cambridge, MA 02141**

Contact: Rachel J. Burckardt

Phone: 614-426-7330

Burckardt@pbworld.com

Profession: Architect [ ] Landscape Architect [ ] Engineer [X]

**FUNDING SOURCE:** Federal [ ] State [ ] City [X]

THIS CONTRACT IS A:

X Public Works Contract estimated to cost more than \$10,000 subject to the bidding requirements of G.L. c. 30, § 39M

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

- Public Building Contract estimated to cost under \$10,000, subject to the price quote requirements of G.L. c. 149 §44A (2)(A)
- Public Building Contract estimated to cost more than \$10,000 but less than \$25,000, subject to the written response requirements of G.L. c. 149, §44A(2)(B) of the General Laws
- Public Building Contract estimated to cost more than \$25,000 but less than \$100,000, subject to the bidding requirements of G.L. c. 149, §44A(2)(C) and G.L. c. 30, § 39M
- Public Building Contract estimated to cost more than \$100,000, subject to the bidding requirements of G.L. c. 149, §44A(D).

Section 1: CONTRACT DOCUMENTS/APPENDICES

The Contract Documents consist of this Agreement; the notice of award of the Contract; the Notice to Proceed; the entire Project Manual; Change Orders; Construction Change Directives; the Contractor's Bid and all accompanying documents; and the Design Professional's written interpretations and clarifications issued on or after the issuance of the Notice to Proceed. Shop Drawing submittals and reports or drawings utilized by the Design Professional in preparing the Contract Documents are not Contract Documents.

The following Appendices are hereby incorporated by reference as part of this Agreement.

- X Certificate of Authority
- \* Appendix A - Scope of Services - Misc. Bid Documents: includes a brief description of the Project, the Plans and Technical Specifications (Plans on File) and Addenda issued during the bid process
- X Appendix B - Contractor's Bid Price; Form for General Bid
- X\*\* Appendix C - General Conditions
- X\*\* Appendix D - Insurance Requirements with Contractor's Insurance Certificate(s)
- X Appendix E - Wage Rates; Living Wage
- X Appendix F - Certificate of Good Standing (for corporations)
- X Appendix G - Procurement Documentation (includes Advertisement; Notice to Bidders)

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

- X Appendix H - Statement of Management (over \$100,000)
- X Appendix I - Performance Bond and Payment Bond, if contract is over \$2,000
- X Appendix J - Section 3 Requirements
- X Appendix K – Laws Applicable to Federally Funded Contracts

- X = Attached
- \* = Included in the Project Manual and incorporated herein by reference
- \*\* = Attached and also duplicated in the Project Manual

Section 2: THE CONTRACTOR'S WORK.

The Contractor's "Work" refers to the services and the entire completed construction or the various separately identifiable parts thereof required by the Contract Documents, including all labor, materials, and equipment furnished, furnished and incorporated into the Project, or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

Section 3: PROJECT DATES.

- (a) Contract Period:
- (b) Date of Commencement of Work: The Date of Commencement of the Work shall be stipulated by a written Notice to Proceed given by the City to the Contractor.
- (c) Date of Substantial Completion: The Contractor shall achieve Substantial Completion of the Work on or before \_\_\_\_\_ or --- calendar days after the Date of Commencement of the Work, time being of the essence. Substantial Completion means that the Work has been completed and the Site or the facility is opened for full and intended public use, except for minor incomplete or unsatisfactory items that do not materially impair the usefulness of the Work. The Design Professional shall decide what constitutes "minor," "incomplete," "unsatisfactory," and "materially" and the Design Professional's decision shall be final.

- (d) Date of Final Completion:  
**The Date of Final Completion shall be \_\_\_\_\_.**

Section 4. CONTRACT SUM/LIQUIDATED DAMAGES

- (a) Contract Sum: The Contract Sum shall be \$\_\_\_\_\_.

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

(b) Liquidated Damages: The Contractor and the City agree to a Liquidated Damages sum of \$250.00 per calendar day.

SIGNATURE PAGE FOLLOWS

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

IN WITNESS WHEREOF, the City and the Contractor have executed this Contract as a sealed instrument as of the date first written above.

CITY OF SOMERVILLE

I hereby certify that an unencumbered balance of \$ \_\_\_\_\_ is available for this Contract and I further certify that the sum of \$ \_\_\_\_\_ is hereby encumbered against the appropriate account for the purposes of this contract.

\_\_\_\_\_  
Edward Bean, City Auditor

\_\_\_\_\_  
Joseph A. Curtatone  
Mayor

\_\_\_\_\_  
Michael F. Glavin, OSPCD  
Executive Director

\_\_\_\_\_  
Angela M. Allen, Purchasing Director

Approved as to form:

\_\_\_\_\_  
Francis X. Wright, Jr., City Solicitor

VENDOR:

\_\_\_\_\_  
Signature of Authorized Agent of Vendor

Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Vendor Address: \_\_\_\_\_

Federal Tax ID: # \_\_\_\_\_

FOR CORPORATIONS ONLY:

\_\_\_\_\_  
Clerk's Signature

\_\_\_\_\_  
Clerk's Name

Sample Contract



**SAMPLE CERTIFICATE OF AUTHORITY**

\_\_, 2014.  
(Contract Date)

At a meeting of the directors of \_\_\_\_ duly  
(Name of Corporation)

called and held at \_\_\_\_ on \_\_, 2010.  
(Address) (Date)

which a quorum was present and acting, it was voted that \_\_\_\_\_  
(Name)

the \_\_ of this corporation is hereby authorized and empowered to  
(Office)

make, enter into, sign, seal and deliver on behalf of this corporation a contract for

\_\_\_\_\_ with the City of Somerville, Mayor's (Describe Service)

Office of Strategic Planning and Community Development. I do hereby certify that the above

is a true and correct copy of the record that said vote has not been amended or repealed and is in

full force and in effect at of this date, and that \_\_ is duly elected  
(Name)

\_\_\_\_ of this corporation.  
(Office)

\_\_\_\_\_  
(Clerk) (Secretary) of the Corporation

Attest:

(Affix Corporation Seal Here)

Sample Contract

**APPENDIX A**  
**Scope of Services – Miscellaneous Bid Documents**

Includes a brief description of the project  
The Plans and Technical Specifications (Plans on File)  
And all addenda issued during the bid process.

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

**APPENDIX B**  
**Contractor's Bid Price - Form for General Bid**  
**(From Bid Book)**

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

**APPENDIX C**  
**General Conditions**  
**(From Bid Book)**

Sample Contract

## APPENDIX D INSURANCE REQUIREMENTS

Sample Contract

### APPENDIX D - INSURANCE REQUIREMENTS INSURANCE SPECIFICATIONS

#### INSURANCE REQUIREMENTS FOR AWARDED VENDOR ONLY:

Prior to commencing performance of any work or supplying materials or equipment covered by these specifications, the contractor shall furnish to the Office of the Purchasing Director a Certificate of Insurance evidencing the following:

#### A. GENERAL LIABILITY - Comprehensive Form

Bodily Injury Liability.....\$ Two Million  
Property Damage Liability.....\$ Two Million

#### B. COVERAGE FOR PAYMENT OF WORKER'S COMPENSATION BENEFIT PURSUANT TO CHAPTER 152 OF THE MASSACHUSETTS GENERAL LAWS IN THE AMOUNT AS LISTED BELOW:

WORKER'S COMPENSATION.....\$ Statutory  
EMPLOYERS' LIABILITY.....\$ Statutory

#### C. AUTOMOBILE LIABILITY INSURANCE AS LISTED BELOW:

AGGREGATE.....\$ One Million

1. A contract will not be executed unless a certificate (s) of insurance evidencing above-described coverage is attached.
2. Failure to have the above-described coverage in effect during the entire period of the contract shall be deemed to be a breach of the contract.
3. All applicable insurance policies shall read:  
**"CITY OF SOMERVILLE" as a certificate holder and as an additional insured** for general liability only along with a description of operation in the space provided on the certificate.

**Certificate Should Be Made Out To:**  
**City Of Somerville**  
**Purchasing Department**  
**93 Highland Avenue**  
**Somerville, Ma. 02143**

**Note: If your insurance expires during the life of this contract, you shall be responsible to submit a new certificate(s) covering the period of the contract. No payment will be made on a contract with an expired insurance certificate.**

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

**APPENDIX E  
PREVAILING WAGE RATES  
AND LIVING WAGE FORM**

Sample Contract

Part 1, Section 4: OTHER BID DOCUMENTS

**DAVIS BACON AND PREVAILING WAGE RATES**

*INSERT MANUALLY*

Sample Contract



**SOMERVILLE LIVING WAGE ORDINANCE CERTIFICATION FORM**  
**CITY OF SOMERVILLE CODE OF ORDINANCES SECTION 2-397 et seq<sup>2</sup>**

**Instructions:** This form shall be included in all Invitations for Bids and Requests for Proposals which involve the furnishing of labor, time or effort (with no end product other than reports) by vendors contracting or subcontracting with the City of Somerville, where the contract price meets or exceeds the following dollar threshold: \$10,000. If the undersigned is selected, this form will be attached to the contract or subcontract and the certifications made herein shall be incorporated as part of such contract or subcontract. **Complete this form and sign and date where indicated below on page 2.**

**Purpose:** The purpose of this form is to ensure that such vendors pay a "Living Wage" (defined below) to all covered employees (i.e., all employees except individuals in a city, state or federally funded youth program). In the case of bids, the City will award the contract to the lowest responsive and responsible bidder paying a Living Wage. In the case of RFP's, the City will select the most advantageous proposal from a responsive and responsible offeror paying a Living Wage. In neither case, however, shall the City be under any obligation to select a bid or proposal that exceeds the funds available for the contract.

**Definition of "Living Wage":** For this contract or subcontract, as of 7/1/2013 "Living Wage" shall be deemed to be an hourly wage of no less than \$11.89 per hour. From time to time, the Living Wage may be upwardly adjusted and amendments, if any, to the contract or subcontract may require the payment of a higher hourly rate if a higher rate is then in effect.

**CERTIFICATIONS**

1. The undersigned shall pay no less than the Living Wage to all covered employees who directly expend their time on the contract or subcontract with the City of Somerville.
2. The undersigned shall post a notice, (copy enclosed), to be furnished by the contracting City Department, informing covered employees of the protections and obligations provided for in the Somerville Living Wage Ordinance, and that for assistance and information, including copies of the Ordinance, employees should contact the contracting City Department. Such notice shall be posted in each location where services are performed by covered employees, in a conspicuous place where notices to employees are customarily posted.
3. The undersigned shall maintain payrolls for all covered employees and basic records relating hereto and shall preserve them for a period of three years. The records shall contain the name and

<sup>2</sup>Copies of the Ordinance are available upon request to the Purchasing Department.

Sample Contract

address of each employee, the number of hours worked, the gross wages, a copy of the social security returns, and evidence of payment thereof and such other data as may be required by the contracting City Department from time to time.

4. The undersigned shall submit payroll records to the City upon request and, if the City receives information of possible noncompliance with the provisions the Somerville Living Wage Ordinance, the undersigned shall permit City representatives to observe work being performed at the work site, to interview employees, and to examine the books and records relating to the payrolls being investigated to determine payment of wages.

5. The undersigned shall not fund wage increases required by the Somerville Living Wage Ordinance by reducing the health insurance benefits of any of its employees.

6. The undersigned agrees that the penalties and relief set forth in the Somerville Living Wage Ordinance shall be in addition to the rights and remedies set forth in the contract and/or subcontract.

**CERTIFIED BY:**

**Signature:** \_\_\_\_\_  
**(Duly Authorized Representative of Vendor)**

**Title:** \_\_\_\_\_

**Name of Vendor:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Sample Contract

**INSTRUCTIONS: PLEASE POST**

**NOTICE TO ALL EMPLOYEES  
REGARDING PAYMENT OF LIVING WAGE**

Under the Somerville, Massachusetts' Living Wage Ordinance (Ordinance No. 1999-1), any person or entity who has entered into a contract with the City of Somerville is required to pay its employees who are involved in providing services to the City of Somerville no less than a "Living Wage".

The Living Wage as of **7/1/2013** is **\$11.89** per hour. The only employees who are not covered by the Living Wage Ordinance are individuals in a Youth Program. "Youth Program" as defined in the Ordinance, "means any city, state or federally funded program which employs youth, as defined by city, state or federal guidelines, during the summer, or as part of a school to work program, or in any other related seasonal or part-time program."

For assistance and information regarding the protections and obligations provided for in the Living Wage Ordinance and/or a copy of the Living Wage Ordinance, all employees should contact the City of Somerville's Purchasing Department directly.

Sample Contract

**APPENDIX F  
CERTIFICATE OF GOOD STANDING  
(FOR CORPORATIONS)**

**INSERT DOCUMENT FROM BID BOOK HERE**

Certificate of Good Standing: If the bidder is a corporation, a Certificate of Good Standing should accompany the bid. Certificate of Good Standing available online at: [http://corp.sec.state.ma.us/corp/Certificates/Certificate\\_Request.asp](http://corp.sec.state.ma.us/corp/Certificates/Certificate_Request.asp) or call Tel: (617) 727-9640 for more information.

Sample Contract

## CERTIFICATE OF GOOD STANDING

TO: Vendor

FROM: Purchasing Department

RE: **CERTIFICATE OF GOOD STANDING**

The **Awarded Vendor** must comply with our request for a **CURRENT “Certificate of Good Standing”**.

If you require information on how to obtain the “Certificate of Good Standing” or Certificate of Registration (Foreign Corporations) from the Commonwealth of Massachusetts, please call the Secretary of State’s Office at (617) 727-2850 (Press #1) located at One (1) Ashburton Place, 17<sup>th</sup> Floor, Boston, MA 02133 or you may access their web site at: [www.MA.GOV/SEC/COR](http://www.MA.GOV/SEC/COR)

If your company is incorporated outside of Massachusetts and therefore is a “foreign corporation”, but is registered to do business in Massachusetts, please comply with our request for the Certificate of Registration from the Commonwealth of Massachusetts. If your company is a foreign corporation, but is not registered to do business in Massachusetts, please provide the Certificate of Good Standing from your state of incorporation.

Please note that without the above certificate (s), the City of Somerville cannot execute your contract.

## IMPORTANT NOTICE

Requests for Certificates of Good Standing by mail may take a substantial amount of time. A certificate may be obtained immediately in person at the Secretary’s Office at the address above. Also, at this time, the Secretary of State’s Office may not have your current annual report recorded. If this is the case, and you are therefore unable to obtain the Certificate of Good Standing, please forward a copy of your annual report filing fee check with your signed contracts. Please forward your original Certificate of Good Standing to the Purchasing Department upon receipt.

Thank You,

Purchasing Director

Sample Contract

## APPENDIX G PROCUREMENT DOCUMENTATION

*ADVERTISEMENTS, NOTICE TO BIDDERS, ETC.*

Sample Contract

**APPENDIX H**  
**STATEMENT OF MANAGEMENT**  
**FOR CONTRACTS OVER \$100,000**

**STATEMENT OF MANAGEMENT**

In accordance with M.G.L. Chapter 30, Section 39R, the undersigned successful bidder states that its system of internal accounting controls and that of its subsidiaries reasonably assure (1) that transactions are executed in accordance with management's general and specific authorization; (2) that transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles, and to maintain accountability for assets; (3) that access to assets is permitted only in accordance with management's general or specific authorization, and (4) that the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Executed this \_\_\_\_\_ day of \_\_\_\_\_ 2014

On behalf of \_\_\_\_\_  
(Successful bidder name)

\_\_\_\_\_  
(Address and telephone of successful bidder)

\_\_\_\_\_  
(Name and title of person signing statement)

By: \_\_\_\_\_  
(Signature)

**CERTIFIED PUBLIC ACCOUNTANT STATEMENT**

In accordance with M.G.L. 30, Section 39R I, \_\_\_\_\_  
a certified public accountant, state that I have examined the above Statement of Management on internal accounting controls, and that in my opinion (1) the representations of management are consistent with the result of management's evaluation of the system of internal accounting controls; and (2) that such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the above referenced successful bidder's financial statements.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Business name, address and telephone number)

Sample Contract

**APPENDIX I**  
**PERFORMANCE BOND AND PAYMENT BOND**  
**FOR CONTRACTS OVER \$2000**

Sample Contract



**PERFORMANCE BOND**

We, the undersigned,

\_\_\_\_\_,  
(Name of Contractor)

\_\_\_\_\_,  
(Address of Contractor)

\_\_\_\_\_, hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_,  
(Name of Surety)

\_\_\_\_\_, (Address of Surety)

hereinafter called Surety, are held and firmly bound unto CITY OF SOMERVILLE, 93

Highland Avenue Avenue, Somerville, MA 02139, hereinafter called Owner, in the penal

sum of \_\_ Dollars

(\$\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made. We hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of this obligation is such that the Principal entered into a certain contract with the Owner, dated the \_\_day of \_\_, 20\_\_, a copy of which is attached hereto and made a part hereof, for the project known as Cedar Street Sewer Separation and the Principal and Surety bind themselves to the Owner for the performance of the contract.

Now, therefore, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with

Sample Contract

or without notice to the Surety and during the guaranty period set forth in the contract, and if it shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by a reason of failure to do so, and shall reimburse and repay the Owner all outlay and expenses which the Owner may incur in making good any default, then this obligation shall be void; otherwise, this bond shall remain in full force and effect; provided, further, that the said Surety for value received hereby agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder of the specifications accompanying the same shall in any wise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications. Provided, further, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed on this \_\_ day of \_\_, 2014.

CONTRACTOR AS PRINCIPAL

SURETY

\_\_\_\_\_  
(Signature)  
Name and Title:

\_\_\_\_\_  
(Signature)  
Name and Title:

SEAL

SEAL

Sample Contract

Payment Bond

We, the undersigned,

\_\_\_\_\_,  
(Name of Contractor)

\_\_\_\_\_,  
(Address of Contractor)

\_\_\_\_\_, hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_,  
(Name of Surety)

\_\_\_\_\_, (Address of Surety)

hereinafter called Surety, are held and firmly bound unto CITY OF SOMERVILLE, 93  
Highland Avenue, Somerville, MA 02139, hereinafter called Owner, in the penal sum of  
Dollars  
(\$\_\_) in lawful money of the United States, for the payment of which sum well and truly to be  
made. We hereby jointly and severally bind ourselves, our heirs, executors, administrators,  
successors, and assigns.

The condition of this obligation is such that the Principal entered into a certain  
contract with the Owner, dated the \_\_day of \_\_, 20\_\_, a copy of which is attached hereto and  
made a part hereof, for the project known as Cedar Street Sewer Separation.

Now, therefore, if the Principal shall promptly make payment to all persons, firms,  
subcontractors, and corporations furnishing materials for or performing labor in the  
prosecution of the work provided for in such contract, and any authorized extension or  
modification thereof, including all amounts due for materials used in connection with the

work, and all insurance premiums on said work, and for all labor, performed in such work  
whether by subcontractor or otherwise, then this obligation shall be void; otherwise this bond  
is remain in full force and effect. Provided, further, that the said Surety for value received  
hereby agrees that no change, extension of time, alteration or addition to the terms of the  
contract or to the work to be performed thereunder of the Specifications accompanying the  
same shall in any wise affect its obligation on this Bond, and it does hereby waive notice of  
any such change, extension of time, alteration or addition to the terms of the contract or to  
the work or to the specifications.

Provided, further, that no final settlement between the Owner and the Contractor shall  
abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.  
IN WITNESS WHEREOF, this instrument is executed on this \_\_day of \_\_, 2014.

CONTRACTOR AS PRINCIPAL                      SURETY

-----  
(Signature)    (Signature)  
Name and Title:                                      Name and Title:

SEAL    SEAL

## MEETING OF THE BOARD OF DIRECTORS

### CERTIFICATE OF AUTHORITY

\_\_20

At a meeting of the Directors of the  
\_\_\_\_duly called and held at \_\_on the day of \_\_20\_\_, at which a quorum was present and  
acting, it was

#### VOTED THAT

the \_\_of this corporation is hereby authorized and empowered to make, enter into, sign, seal  
and deliver, in behalf of this corporation, a Contract for Cedar Street Sewer Separationwith  
the City of Somerville, and performance and payment bonds (each in the full amount of the  
Contract) in connection with such Contract.

I DO HEREBY CERTIFY that the above is a true and correct copy of the record, that  
said vote has not been amended or repealed and is in full force and effect on this date, and  
that \_\_is duly elected of this corporation.

ATTEST:

\_\_\_\_\_

Clerk or Secretary of the Corporation

(Affix Corporate Seal Here)

Sample Contract

Sample Contract

Part 3: TECHNICAL SPECIFICATIONS

**CEDAR STREET SEWER SEPARATION**

**TABLE OF CONTENTS**

Invitation for Bid Documents

**PART 1: BID INVITATION**

---

Section 1: Pages:

00020 Invitation to Bid

Section 2:

00200 Instructions to Bidders

Section 3: Bid Submission Documents:

(See Enclosed Submission Packet)

00300 Form for General Bid

00315 Unit Price Form

00320 Somerville Living Wage Form

00330 Acknowledgement of Notice to Bidders

00335 Quality Requirements Form

00340 Certificate of Non-Collusion & Tax Compliance Statement

00350 Certificate of Signature Authority

00360 Signature Form

00370 Reference Form

00380 Bid Bond

00385 Wage Rates Compliance Form

Section 4: Other Bid Documents

00410 Division of Labor and Industries Prevailing Wage Rates

00420 Division of Labor and Industries Statement of Compliance

00430 General Term and Conditions

**PART 2: SAMPLE CONSTRUCTION CONTRACT**

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a. Sample Contract

- Appendix A - Scope of Work (including Technical Specifications)\*
- Appendix B – Contractor’s Bid Price; Form for General Bid
- Appendix C – General Terms and Conditions\*
- Appendix D – Insurance Requirements
- Appendix E – Wage Rates and Living Wage (From Bid Book)
- Appendix F – Certificate of Good Standing (for corporations) and Certificate of Authority
- Appendix G – Procurement documentation (Advertisements and Notice to Bidders)
- Appendix H – Statement of Management
- Appendix I – Performance Bond and Payment Bond, if contract over \$2000

\*Appendix to be included in contract by reference

**END OF SECTION**

Sample Contract

## TABLE OF CONTENTS

<b><u>Division</u></b>	<b><u>Section Number</u></b>
<b>0 BIDDING AND CONTRACT REQUIREMENTS</b>	
TV Inspection Logs and Video Provided by the Owner	00331
Permits	00890
Attachment A – Discharge Request for CIPP Lining Process	00890
<b>1 GENERAL REQUIREMENTS</b>	
Scope and Sequence of Work	01014
Control of Work and Materials	01110
Special Provisions	01140
Price Adjustments	01250
Attachment A – MASSDOT Documents 00811-00814	01250
Measurement and Payment	01270
Submittals	01330
Documentation	01331
Health and Safety Plan	01380
Temporary Bypass Pumping System	01535
Signage (Traffic Control)	01550
Portable Changeable Message Sign	01551
Construction Zone Safety Plan	01552
Uniformed Officer for Temporary Traffic Control	01553
Dust Control	01562
Existing Fences	01564
Environmental Protection	01570
Handling Existing Flows	01575
Rodent Control	01577
Cleaning Up	01740
<b>2 SITE WORK</b>	
Roadway Special Provisions (MDOT)	02000
Ductile Iron Pipe and Fittings for Water Mains	02080
Polyvinyl Chloride Gravity Pipe and Fittings (SDR-35)	02085
Ductile Iron Pipe and Fittings for Sewers	02089
Excavation and Stockpiling of Contaminated Material	02113
Transportation and Disposal of Contaminated Material	02130
Abandonment of Water Mains	02221
Abandonment of Sewers and Drains	02222
Dewatering	02240
Support of Excavation	02252
Earthwork	02300

<b><u>Division</u></b>	<b>Section Number</b>
Rock Excavation and Disposal	02324
Bentonite Dams	02347
Cured-in-Place Pipe	02428
Cementitious Lining of Manholes	02439
Sewer Cleaning and Inspection	02440
Service Connection Rehabilitation	02443
Temporary Service Pipe	02511
Insulation for Pipelines	02513
Hydrants and Valves	02514
Service Connections	02515
Connections to Existing Water Mains	02516
Tracer Tape	02518
Building Connections and Drop Connections	02530
Sewer Chimneys	02531
Connections to Existing Structures	02533
Reconstruction of Existing Sewers and Drains	02534
Precast Vaults	02536
Build Manhole Invert	02630
Precast Manholes and Catch Basins	02631
Reinforced Concrete Pipe	02633

### **3 CONCRETE**

Field Concrete	03302
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### **APPENDICES**

Elm Street Television Inspection Logs & Video	Appendix A
Geotechnical Investigations and Recommendations	Appendix B
Environmental Probe Logs	Appendix C

### **END OF SECTION**

## SECTION 00331

### TV INSPECTION LOGS AND VIDEO PROVIDED BY THE OWNER

#### PART I - GENERAL

##### 1.01 PURPOSE:

###### A. PURPOSE OF LOGS AND REPORTS:

1. The purpose of the TV Inspection Logs and Video 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 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 Logs 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 LOGS:

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. Videos of what was encountered at the time of the inspection are included in Appendix A. Contractors may, after obtaining Owner's permission, carry out additional pipeline inspection, at no expense to the Owner.
2. TV Inspection Logs 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 logs. Information presented in the inspection logs, 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 logs 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.

## PART II – MATERIALS – NOT APPLICABLE

## PART III. EXECUTION

### 3.01 EXECUTION:

- A. TV Inspection Logs and Video 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 Logs 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 Logs or other data shown on the drawings or presented in the Contract Documents.

### END OF SECTION

Z:\Shared-Projects\Somerville\2130636 - Cedar Street Sewer Separation\Specifications\DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS\00331-TV INSPECTION LOGS AND MH INSPECTION REPORTS PROVIDED BY THE OWNER.docx



## 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
- D. Section 02240, DEWATERING
- F. Section 02300, EARTHWORK

##### 1.03 GENERAL REQUIREMENTS:

- A. The Contractor shall obtain and pay for all required permits listed below.

<u>Permits by Owner</u>	<u>Status</u>
Street Opening Permit	*
Trench Permit (520 CMR 14.00)(eff. date 3/1/09)	*
NPDES Construction General Permit	*
*Contractor shall prepare permit application and obtain the permit after contract is awarded, bearing all expenses. Owner will pay for and/or waive the permit application fee, if applicable.	

## 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/order of conditions, 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

Z:\Shared-Projects\Somerville\2130636 - Cedar Street Sewer Separation\Specifications\DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS\00890 PERMITS.docx



# 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: \_\_\_\_\_

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Facsimile No.: \_\_\_\_\_

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## 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 (Provide name in Attachment A of the MWRA Municipal Discharge Permit)	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)
<b>Curing water</b>	<hr/> <hr/>
<b>Cooling water</b>	<hr/> <hr/>
<b>Rinsing water</b>	<hr/> <hr/>
<b>Pre-cleaning water</b>	<hr/> <hr/>
<b>Post-cleaning water</b>	<hr/> <hr/>
<b>Other</b> <i>(Describe)</i> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/>
<b>Other</b> <i>(Describe)</i> <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.

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

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> ) _____ _____		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.

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

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

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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.

## SECTION 01014

### SCOPE AND SEQUENCE OF WORK

#### PART 1 – GENERAL

##### 1.01 WORK INCLUDED:

- A. The approximate scope of work includes but is not necessarily limited to: 3,111 linear feet of 15-inch to 48-inch RCP drain; 1,912 linear feet of 8-inch to 12-inch PVC sewer; 1,380 linear feet of 6-inch PVC building connections; 25 precast manholes; 31 precast catch basins; 1,051 linear feet of 8-inch to 12-inch cured-in-place pipe; 3,010 linear feet of 6-inch to 12-inch DI water mains; 6 Hydrants; 1,482 linear feet of water service connections; traffic signal replacement; full width road reconstruction including sidewalk replacement; and other related tasks.

##### 1.02 RELATED WORK:

- A. SECTION 01110 – CONTROL OF WORK AND MATERIALS

#### PART 2 - PRODUCTS (NOT APPLICABLE)

#### PART 3 - EXECUTION

##### 3.01 GENERAL:

- 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 the work shall be coordinated with the Owner and Engineer.
- B. The Construction Sequence Requirements shall be used by the Contractor to form a complete schedule for the project, which shall be coordinated with the Owner and Engineer. Prior to performing any work at the site, the Contractor shall submit a detailed plan to the Engineer for review. The plan shall describe the proposed sequence, methods, and timing of the work.

##### 3.02 CONSTRUCTION SEQUENCING REQUIREMENTS:

- A. Eversource Gas is currently replacing/relocating the 12-inch cast iron low pressure gas main on Cedar Street between Elm Street and Highland Avenue. No construction shall commence until the gas main relocation project is complete.
- B. Contractor may perform sewer investigations on Elm Street while the gas main relocation project is ongoing, including cleaning and television inspection of sewers



and dye testing of building connections, to determine which service connections will be relocated to the separate sewers.

- C. Test pits (as noted on the Contract Drawings) shall be performed prior to the start of any mainline replacement or building connection replacement.
- D. Cedar Street shall be closed to all traffic (excluding emergency vehicles) in sections 24-hours per day/7 days per week. Construction shall be performed in three (3) phases:
  - 1. Phase 1 – Cedar Street closed between Elm Street and Sartwell Avenue
  - 2. Phase 2 – Cedar Street closed between Sartwell Avenue and Summer Street
  - 3. Phase 3 – Cedar Street closed between Summer Street and Highland Avenue

The Contractor shall complete all work (including mainline replacement, building connection replacement, and other related tasks), excluding final road reconstruction, in the each construction phase before any work will be permitted to begin in the subsequent construction phase.

The construction phases are described in the TRAFFIC MANAGEMENT PLAN – DETOUR PLAN, included in the Contract Drawings.

- E. The Contractor shall coordinate temporary relocation and re-installation of the buried RCN conduit on Cedar Street between Aberdeen Road and Highland Avenue with Alex Ortiz, RCN Construction Manager (781) 652-8956.
- F. Cured-in-place pipe shall be installed after all excavation work is complete.
- G. Cured-in-place lining in a segment of sewer (manhole to manhole) shall be completed prior to grouting of service connections required in that segment.
- H. Cured-in-place lining shall be completed prior to any cementitious or exterior grouting in adjacent manholes.
- I. Final paving, sidewalk reconstruction, and surface restoration shall be performed after of all utility replacement work is complete.

#### END OF SECTION

Z:\Shared-Projects\Somerville\2130636 - Cedar Street Sewer Separation\Specifications\DIVISION 1 - GENERAL REQUIREMENTS\01014 SCOPE AND SEQUENCE OF WORK.docx

## 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 his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him 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 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 his 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 steel plates of adequate strength to carry traffic shall be used.

### 3.03 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. Police details shall be billed directly the OWNER.
- C. The Contractor shall at his 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. He 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 his responsibilities for protection of persons and property under the terms of the Contract.

### 3.04 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 his expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

3.05 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, he shall remove and (unless otherwise specified) promptly restore them in accordance with Section 01564 EXISTING FENCES.
- D. On paved surfaces outside of the work limits 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.

3.06 MAINTENANCE OF FLOW:

- A. The Contractor shall at his 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, he 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 his operations as described in Section 01740, CLEANING UP.

### 3.07 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 his employees, as determined by the Engineer, occurring previous to the final payment.

### 3.08 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.

### 3.09 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.)." Contractors shall be familiar with the requirements of these regulations.

### 3.10 SITE INVESTIGATION:

The Contractor acknowledges that he has satisfied himself 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 himself with available information will not relieve him 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.

3.11 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.

3.12 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 48-hours prior to disconnection of the service and again the day of disconnection.
- C. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575 HANDLING EXISTING FLOWS and in Section 01535 TEMPORARY BYPASS PUMPING SYSTEM.
- 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

All roadway/traffic related work done under this contract shall be in conformance with the, Massachusetts Highway Department Standard Specifications for Highways and Bridges, dated 1988, as amended, the Supplemental Specifications dated June 15, 2012, 2006 Massachusetts Highway Department Project Development and Design Guide. The Standard Special Provisions dated October 19, 2012, the 2012 Construction Standard Details, the 2009 Manual on Uniform Traffic Control Devices, with Massachusetts Amendments, the 1990 Standard Drawings for Signs and Supports. The 1968 Standard Drawings for Traffic Signals and Highway Lighting, the latest edition of American Standard of Nursery Stock, the Plans detail sheets the Special Provisions and all amendments will govern. Only items not specifically covered under these documents will have Special Provisions listed in Div 2, Section 02000.

#### 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. If no water is available, the Contractor shall supply water at no additional cost to the Owner.

##### 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.
- C. The Contractor shall coordinate all work involving utilities and shall satisfy himself as to the existing conditions of the areas in which he is to perform his work. He shall conduct and arrange his 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 his own work as well as that of any subcontractors. He 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 his bid on completing the proposed work by the completion date stipulated in Section 00300, FORM OF GENERAL BID/FORM FOR GENERAL BID.

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:

- A. 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 his 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 CONNECTIONS TO EXISTING WATER SYSTEMS:

- A. The Owner will, upon 24-hour notice from the Contractor, assist the Contractor by locating and opening or closing any and all valves required for draining or admitting water to the various sections of the water main as required to perform the proposed work. No damages shall be claimed by the Contractor for delays in dewatering pipelines nor shall any damages be claimed because of water leaking through closed valves after dewatering is completed.
- B. Connections to the existing distribution system shall be made with the mains under pressure unless the lines can be temporarily taken out of service as approved by the Owner.
- C. The Contractor will be required to make test excavations to ascertain that the proposed position of the connections will be clear of joints, fittings, or other obstructions.

- D. If any failure occurs in connection to existing mains, service shall be restored in the shortest possible time, the Contractor working around the clock, if necessary. He shall cooperate with the Owner in notifying the consumers or supplying emergency water. If required by Owner, the Contractor shall make connections to water mains during night hours, on Sunday or at other times of off-peak demand for water.

3.12 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.

3.13 VISUAL RECORDING:

Before beginning construction, the Contractor shall make a color DVD recording along the entire work length. One complete recording, for the entire project length, shall be furnished to the Engineer prior to the start of the work. The visual recording shall be identified by street name, as applicable, and station.

3.14 HOURS OF CONSTRUCTION ACTIVITY:

- A. The Contractor shall conduct all construction activity Monday through Friday between the following hours:

1. Elm Street – 7:00 a.m. and 7:00 p.m.
2. Cedar Street Phase 1 – 8:30 a.m. and 7:00 p.m.
3. Cedar Street Phase 2 & 3 – 7:00 a.m. and 7:00 p.m.

No work shall be done on this contract on Saturday, Sunday, a State or Federal holiday or on the day before or the day after a long weekend that involves a holiday without prior approval by the Engineer. Night work shall only be by City's prior approval.

- B. 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.

3.15 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.

### 3.16 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

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## 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 February 2, 2009
  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 for Contracts Bid on or After April 5, 2011, dated May 11, 2011
  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.

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 "New Asphalt Period Price Method" shall be used to determine price adjustments.
- 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 A

MASSDOT DOCUMENTS 00811-00814

DOCUMENT 00811  
SPECIAL PROVISIONS  
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES  
ENGLISH UNITS  
Revised: 02/02/2009

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

The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment 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 at the time of bid by the Department by using the same method as for the determination of the Period Price detailed below.

**Period Price**

Please note that, starting December 15, 2008, two sets of period prices will be posted each month on the MassHighway website at <http://www.mhd.state.ma.us/>. They will be labeled "New Asphalt Period Price Method" and "Old Asphalt Period Price Method".

**New Asphalt Period Price Method**

The "New Asphalt Period Price Method" is for contracts bid after December 15, 2008 and will show the Period Price of liquid asphalt for each monthly period as determined by MassHighway 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. MassHighway will post this Period Price on this website within two (2) business days following their receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted MassHighway the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

**Old Asphalt Period Price Method**

The "Old Asphalt Period Price Method" Period Price will be for contracts bid on or before December 15, 2008 and will contain liquid asphalt prices as determined by the old or previous method. These prices will continue to be posted on MassHighway's website until all contracts using the "Old Asphalt Period Price Method" Period Price have been closed.

**New and Old Asphalt Period Price Methods**

The paragraphs below apply to both the New and the Old Asphalt Period Price Methods.

The Contract Price of the hot mix asphalt mixture 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 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.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of tons of hot mix asphalt mixtures placed during each monthly period times the liquid asphalt content percentage times the variance in price between Base Price and Period Price of liquid asphalt.

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 \*\*\*\*\*

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](http://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 \*\*\*\*\*

MassDOT Highway Division

DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

FOR CONTRACTS BID ON OR AFTER APRIL 5, 2011

ENGLISH UNITS

May 11, 2011

This provision applies to projects containing a price adjustment for structural steel and reinforcing steel as stipulated in the Notice to Contractors section of the Bid Documents. It applies to all structural steel as defined below and all reinforcing steel 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 structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings, and unfabricated reinforcing steel bars.

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 subject to a price adjustment by the index factor calculated as shown below under Example of a Period Price Calculation.

Price adjustments will not include 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 Notice to Contractors section of the Bid Documents.

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 calculated based on the purchase date of the steel (Period Price Date) using 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. Bureau of Labor Statistics (BLS) 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 =  $\$0.82/\text{Pound} \times 0.950 = \$0.78/\text{Pound}$

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://www.bls.gov/PPI/>

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.

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END OF DOCUMENT

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.

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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 UTILITY ITEMS and TRAFFIC MANAGEMENT & MISCELLANEOUS sections the FORM OF GENERAL BID.
- B. The measurement and payment for work to be done under items listed in the ROADWAY RECONSTRUCTION ITEMS section of the FORM OF GENERAL BID is described in Section 02000 ROADWAY SPECIAL PROVISIONS. All roadway/traffic related work done under this contract shall be in conformance with the, Massachusetts Highway Department Standard Specifications for Highways and Bridges, dated 1988, as amended, the Supplemental Specifications dated June 15, 2012, 2006 Massachusetts Highway Department Project Development and Design Guide. The Standard Special Provisions dated October 19, 2012, the 2012 Construction Standard Details, the 2009 Manual on Uniform Traffic Control Devices, with Massachusetts Amendments, the 1990 Standard Drawings for Signs and Supports. The 1968 Standard Drawings for Traffic Signals and Highway Lighting, the latest edition of American Standard of Nursery Stock, the Plans detail sheets the Special Provisions and all amendments will govern.
- C. All work performed as described in these contract documents will be paid for under one or more of the items listed in the FORM OF GENERAL BID. 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.
- D. Each unit or lump-sum price stated in the FORM OF GENERAL BID shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications, including cleanup.
- E. The payment items listed herein and in the FORM OF GENERAL BID 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.
- F. 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.

- G. 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.
- H. 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.
- I. The price for all pipe items for sewers, wyes, tees, building connections, chimneys, pressure sewers, force mains, fittings, valves, 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 DRAINS COMPLETE IN PLACE:

##### A. CLASS IV DRAINS

- 1. The length of drains to be paid for under the appropriate subdivisions of this item shall be measured by the linear foot along the completed drains, including wyes and tees, from centerline of manhole to centerline of manhole. Measurement of depth of drain shall be the vertical distance from the existing ground surface to the invert of the drain.
- 2. The unit prices under the appropriate subdivisions of this item shall constitute full compensation for constructing the drains, complete in place, as indicated on the drawings and as specified, including furnishing and installing pipe and fittings, removal and disposal of existing manholes and pipes in the proposed drain alignment; excavation, transportation and disposal of surplus Impacted material, dewatering, backfill, bedding, select material, clearing, grubbing, testing, removal of sidewalks and curbing and all work incidental thereto and not specifically included for payment under other items.
- 3. The work under this section shall be paid at the contract unit price under Items 1a, 1b, 1c, 1d, 1e, 1f, 1g, and 1h.

##### B. 12-INCH CATCH BASIN LEADERS

- 1. The length of catch basin leaders to be paid for under this item shall be measured by the linear foot along the completed leader, from the outside edge of the catch basin wall to the edge of mainline pipe or outside edge of manhole.
- 2. The unit for this item shall constitute full compensation for constructing the catch basin leader, complete in place, as indicated on the drawings and as specified, including furnishing and installing PVC or DI pipe and fittings, removal and disposal of existing pipes in the proposed catch basin leader alignment; connection to mainline with Inserta Tee or connection to manhole as specified,



excavation, transportation and disposal of surplus Impacted material, dewatering, backfill, bedding, select material, clearing, grubbing, testing, removal of sidewalks and curbing and all work incidental thereto and not specifically included for payment under other items.

3. The work under this section shall be paid at the contract unit price under Item 1i.

#### 1.03 SEWERS COMPLETE IN PLACE:

- A. 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, from centerline of manhole to centerline of manhole. Measurement of depth of sewer shall be the vertical distance from the existing ground surface to the invert of the sewer.
- B. 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 furnishing and installing pipe and fittings, removal and disposal of existing manholes and pipes in the proposed sewer alignment excavation, transportation and disposal of surplus Impacted material, dewatering, backfill, bedding, select material, clearing, grubbing, testing, removal of sidewalks and curbing and all work incidental thereto and not specifically included for payment under other items.
- C. The work under this section shall be paid at the contract unit price under Items 2a, 2b, 2c, 2d, and 2e.

#### 1.04 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 all work incidental thereto and not specifically included for payment under other items.
3. The work under this section shall be paid at the contract unit price under Items 3a and 3b.

##### 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. Minimum vertical height

of chimney that will be measured for payment will be three (3) vertical feet for chimneys encased with ABS pipe or Sonotube and crushed stone.

2. The contract unit price under the appropriate subdivisions of this item shall constitute full compensation for constructing the chimney, including excavation and backfill, the 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 section shall be paid at the contract unit price under Item 3c.

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 Building Connections." The unit price under this Item shall include excavation, transportation and disposal of surplus Impacted material, dewatering, backfill, PVC or DI pipe, crushed stone and select backfill; furnishing and installing pipe, fittings, detectable tracer tape; and incidentals necessary to construct the building connections as shown on the drawings and/or as specified.
3. The work under this section shall be paid at the contract unit price under Item 3d.

D. PUSH CAMERA INSPECTION OF EXISTING BUILDING CONNECTION:

1. The unit price this item shall be measured for payment per sewer service connection television inspected.
2. The unit price for this item shall include all labor, equipment, and materials required to perform television inspection of existing sewer service connections from the property line to the building, during sewer service replacement.
3. The work under this section shall be paid at the contract unit price under Item 3e.

E. DYE TESTING OF EXISTING SERVICE CONNECTION:

1. The unit price for this item shall be measured for payment per sewer service connection dye tested.
2. The unit price for this item shall include all labor, equipment, and materials required to perform dye testing of existing sewer service connections on Elm Street, including any television inspection required to confirm the dye source, to determine whether the service is active or abandoned.

3. The work under this section shall be paid at the contract unit price under Item 3f.

F. RELOCATE ELM STREET SEWER SERVICE TO SEPARATE SEWER:

1. The unit price for this item shall be measured for payment per sewer service relocation.
2. The unit price for this item shall include all labor, equipment, and materials required to relocate the sewer service from the existing combined sewer on Elm Street to the existing separate sewer located in the sidewalk on each side of Elm Street.
3. The work under this section shall be paid at the contract unit price under Item 3g.

1.05 MANHOLES AND CATCH BASINS:

- A. Unless otherwise provided for, the work shall be measured per unit of completed work under the appropriate subdivisions of the item "Manholes and Catch Basins."

B. BASES:

1. Bases shall be measured per base installed in place.
2. The unit price for this item shall include excavation, crushed stone bedding, and backfill; transportation and disposal of surplus Impacted material, dewatering, removal and disposal of existing manhole structure; furnishing and installing base, invert channels, steps, gaskets, sealants, connections and couplings; and all incidental work necessary to complete the precast concrete base as shown on the drawings and as specified herein.
3. The work under this section shall be paid at the contract unit price under Items 4a, 4c, 4e, 4g, 4i, and 4k.

C. WALLS AND CONES:

1. Walls and cones (or top slab) shall be measured per vertical foot installed in place. Measurement shall be based on the vertical distance from the invert of the pipeline to the top of the completed frame at finished grade.
2. Walls and cones shall be paid at the contract unit prices under the item "Precast Concrete Walls and Cones." The unit price for this item shall include excavation and backfill; transportation and disposal of surplus Impacted material, dewatering, furnishing and installing walls, connections, cones, gaskets, seals, steps, and bricks and grout to grade; and all incidentals necessary to complete the precast concrete walls and cones as shown on the drawings and specified herein.

3. The work under this section shall be paid at the contract unit price under Items 4b, 4d, 4f, 4h, 4j, and 4l.

**D. FURNISH & INSTALL 14' X 8' PRECAST CONCRETE VAULT COMPLETE:**

1. 14'x8' precast concrete vault complete shall be measured per vault installed in place.
2. The unit price for this item shall include excavation, crushed stone bedding, and backfill; transportation and disposal of surplus Impacted material, dewatering, removal and disposal of existing manhole structures and pipes, furnishing and installing base, walls, roof slab, brick invert channels, steps, gaskets, seals, sealants, connections, couplings, concrete and bricks and grout to grade; and all incidental work necessary to complete the precast concrete vault as shown on the drawings and as specified herein.
3. The unit price for this item shall include furnishing and installing manhole frames and covers, and grouting the frame to the brick courses.
4. The work under this section shall be paid at the contract unit price under Item 4m.

**E. FURNISH & INSTALL PRECAST CONCRETE CATCH BASIN (TYPE A):**

1. The unit price for this item shall include excavation, crushed stone bedding, and backfill; transportation and disposal of surplus Impacted material, dewatering; removal and disposal of existing catch basin structures, delivery of existing catch basin frame and grate to the DPW storage yard at 257 Fisher Street, Somerville, MA 02038, furnishing and installing base, walls, top slab, gaskets, sealants, hood, connections and couplings; curb inlets, installation of frame and cascade grate, and all incidental work necessary to complete the precast concrete catch basin (Type A) as shown on the drawings and as specified herein.
2. The work under this section shall be paid at the contract unit price under Items 4n and 4o.

**F. FURNISH & INSTALL PRECAST CONCRETE CATCH BASIN (TYPE B):**

1. The unit price for this item shall include excavation, crushed stone bedding, and backfill; transportation and disposal of surplus Impacted material, dewatering; removal and disposal of existing catch basin structures, delivery of existing catch basin frame and grate to the DPW storage yard at 257 Fisher Street, Somerville, MA 02038, furnishing and installing base, walls, top slab, precast concrete gutter inlet, manhole frame and cover, ductile iron pipe, gaskets, sealants, hood, connections and couplings; curb inlets, installation of frame and cascade grate, and all incidental work necessary to complete the precast concrete catch basin (Type B) as shown on the drawings and as specified herein.

2. The work under this section shall be paid at the contract unit price under Items 4p and 4q.

G. FURNISH & INSTALL MANHOLE FRAME AND COVER:

1. The work of this section shall be measured per manhole frame and cover installed.
2. The unit price for this item shall include removal and delivery of existing frame and cover to the DPW storage yard at 257 Fisher Street, Somerville, MA 02038, furnishing and installing the frame and cover, and grouting the frame to the brick courses.
3. The work under this section shall be paid at the contract unit price under Item 4r.

H. FURNISH & INSTALL BOLTED & GASKETED WATERTIGHT MANHOLE FRAME AND COVER:

1. The work of this section shall be measured per bolted and gasketed watertight manhole frame and cover installed.
2. The unit price for this item shall include removal and delivery of existing frame and cover to the DPW storage yard at 257 Fisher Street, Somerville, MA 02038, furnishing and installing the bolted and gasketed watertight frame and cover and grouting the frame to the brick courses.
3. The work under this section shall be paid at the contract unit price under Item 4s.

I. ABANDON MANHOLE OR CATCH BASIN:

1. This item shall be paid for each manhole or catch basin, located outside of the proposed drain, sewer, or catch basin trench, to be abandoned as indicated on the plans or required by the Engineer, in accordance with the specifications.
2. The unit price for this item shall include removal and delivery of existing manhole frame and cover or catch basin frame and grate to the DPW storage yard at 257 Fisher Street, Somerville, MA 02038, plugging of existing connections, and abandoning of structure in accordance with the specifications.
3. The work under this section shall be paid at the contract unit price under Item 4t.

J. 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 typically 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 02439, CEMENTITIOUS LINING OF MANHOLES. 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 4u.

#### 1.06 CLEANING AND TELEVISION INSPECTION OF SEWERS:

##### A. Cleaning and Inspection of 8-inch to 12-inch 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, CLEANING AND INSPECTION OF SEWERS. Verification of adequate cleaning shall be made by television inspection.
3. The television inspection work, digital video disks (DVD), 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.
4. The work under this section shall be paid at the contract unit price under Item 5a.

#### 1.07 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. 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. Reinstatement of service connections shall be considered incidental to the work and shall not be measured separately for payment.

5. Television inspection of relined sewer pipes shall be considered incidental to the work and shall not be measured separately for payment.
  6. The work shall be paid for at the contract unit price under Items 6a and 6b
- 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 6c.
- 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.

1.08 WATER MAINS AND FITTINGS:

- A. Water mains, including all fittings noted on plans, compacted select backfill (as shown in the watermain trench detail), dewatering, couplings, joint and thrust restraints, and concrete backing, shall be measured per linear foot of water main installed, and shall be paid at the contract unit prices under the subdivisions of the item "Water Mains and Fittings."
- B. Measurement shall not include valves. The laying length of all valves shall be taken as 12 inches and, for each valve; this length shall be subtracted from the length of pipe measured.
- C. All fittings used to provide clearance beneath existing utilities or hydrant laterals shall be measured and paid for under the item "Additional Fittings".
- D. Additional fittings required but not noted on the plans shall be measured per pound and paid under the item "Additional Fittings." The weight of fittings up through 64-inch size shall be measured as compact ductile iron fittings (body weight only).
- E. Ten percent of the payment for the subdivisions of the item "Water Mains and Fittings" shall be withheld until the pipeline has satisfactorily passed the pressure test and disinfection requirements.
- F. The cost of making connections to existing water mains shall be considered incidental to the project.

- G. The work shall be paid for at the contract unit price under Items 7a, 7b, 7c, and 7d.

1.09 POLYETHYLENE ENCASEMENT:

- A. Polyethylene encasement for underground pipelines shall be measured per linear foot of polyethylene encasement furnished and installed and shall be paid at the contract unit price under the item "Polyethylene Encasement."
- B. The work shall be paid for at the contract unit price under Item 8a.

1.10 HYDRANTS AND VALVES:

A. HYDRANT ASSEMBLY

1. The unit price for the appropriate subdivision of this item shall be measured for payment per hydrant assembly installed.
2. The contract unit price per hydrant assembly installed shall constitute full compensation for supplying all material, labor, tools, and equipment required to install the hydrant assembly as indicated on the drawings or as specified. Installation of the hydrant assembly includes excavation and backfill, hydrant, paint, fittings, ductile iron pipe, gate valve, valve box, tee connection to existing main, all work incidental thereto and not specifically included for payment under other items.
3. The work shall be paid for at the contract unit price under Item 9a.

B. REMOVE EXISTING HYDRANT

1. The unit price for the appropriate subdivision of this item shall be measured for payment per hydrant removed and disposed.
2. The contract unit price per hydrant removed shall constitute full compensation for supplying all material, labor, tools, and equipment required to remove the existing hydrant and deliver existing hydrant to the DPW storage yard at 257 Fisher Street, Somerville, MA 02038, as indicated on the drawings or as specified.
3. The work shall be paid for at the contract unit price under Item 9b.

C. GATE VALVE

1. Valves shall be paid at the contract price under the subdivisions of the item "Hydrants and Valves."
2. The cost of making connections to existing mains, and the cost of joint restraints, couplings and concrete backing shall be considered incidental to the cost of the project.



3. The cost of providing valve boxes shall be considered incidental to the project.
4. The cost of removing abandoned valves and/or valve boxes shall be considered incidental to the project.
5. The work shall be paid for at the contract unit price under Items 9c, 9d, and 9e.

D. FURNISH & INSTALL CHECK VALVE MANHOLE:

1. The lump sum price for this item shall include excavation, crushed stone bedding, and backfill; dewatering; removal and disposal of existing check valve and manhole, furnishing and installing base, walls, top slab, frame and cover, gaskets, sealants, connections and couplings, check valve, ductile iron pipe, pipe supports, and all incidental work necessary to complete the check valve manhole as shown on the drawings and as specified herein.
2. The work under this section shall be paid at the contract lump sum price under Item 9f.

1.11 WATER SERVICE CONNECTIONS:

- A. Service piping, including couplings, shall be measured per linear foot completed.
- B. Corporation stops, including saddles if required, shall be measured per unit completed.
- C. Curb stops, including curb boxes and couplings, if required, shall be measured per unit completed.
- D. The work under this section shall be paid at the contract unit price under Items 10a, 10b, and 10c

1.12 TEMPORARY SERVICE PIPING:

- A. Temporary water service piping shall be measured per linear foot completed as shown on the plans or as required by the Engineer and shall be paid at the contract unit price under the subdivisions of the item "Temporary Service Piping." Payment shall include paving, cutting trenches for road crossings, driveway crossings, connections to existing water mains and services, reconnection of existing services, temporary hydrants and valves, disinfection of temporary water service pipe, providing any tools requested by the local Fire Department for the operation of temporary hydrants and all incidental work associated with installing and maintaining temporary water main for the duration of the project.
- B. Individual above ground connections to houses shall not be separately measured for payment, but shall be considered incidental to the installation of the temporary water service piping.

- C. Measurement for payment of temporary service piping shall stop at a distance of 40 feet from the last building on terminal pipe runs.
- D. The work under this section shall be paid at the contract unit price under Items 11a and 11b.

1.13 MISCELLANEOUS EARTHWORK:

A. EXCAVATION AND BACKFILL OF UNSUITABLE MATERIAL 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 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 excluding materials noted in Item 1.13-A-3 above, as specified in Section 02300 of the Contract Documents.
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 12a.

B. EARTH EXCAVATION AND BACKFILL OF UNSUITABLE MATERIAL 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 12b.

**C. REMOVAL AND DISPOSAL OF GROUP A CONTAMINATED MATERIAL:**

1. The quantity of Group A contaminated material (as defined in Section 02130 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL) for removal and disposal to be paid for under this Item shall be the number of tons of contaminated Group A material removed and disposed.
2. The unit price for this item constitutes full compensation to provide removal of Group A contaminated material, complete, as described in and required by the Contract Documents including, but not limited to; furnishing all labor, material, tools, and equipment required to handle, stockpile, characterize for disposal, load and legally haul by licensed common carrier, and dispose of excavated Group A material. Contract price shall also include moving and storing contaminated soils on site. The work shall include disposal at a licensed disposal site.
3. The work under this section shall be paid at the contract unit price under Item 12c.

**D. REMOVAL AND OFF-SITE TREATMENT/RECYCLING OF GROUP B CONTAMINATED MATERIAL:**

1. The quantity of Group B contaminated material (as defined in Section 02130 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL) for removal and disposal to be paid for under this Item shall be the number of tons of contaminated Group B material removed for off-site treatment/recycling.
2. The unit price for this item constitutes full compensation to provide removal of Group B contaminated material, complete, as described in and required by the Contract Documents including, but not limited to; furnishing all labor, material, tools, and equipment required to handle, stockpile, characterize for disposal, load and legally haul by licensed common carrier for off-site treatment/recycling of

excavated Group B material. Contract price shall also include moving and storing contaminated soils on site. The work shall include recycling at a licensed treatment/recycling facility.

3. The work under this section shall be paid at the contract unit price under Item 12d.

E. 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 section shall be paid at the contract unit price under Item 12e.

F. BENTONITE CLAY DAMS:

1. The number of bentonite clay dams shall be measured per cubic yard of bentonite clay dam constructed in place, as shown on the drawings or as required by the Engineer.
2. The unit price for this item shall constitute full compensation for furnishing and installing bentonite clay dams complete in place as specified and all work incidental thereto and not specifically included for payment under other items.
3. The work under this section shall be paid at the contract unit price under Item 12f.

G. ADDITIONAL CRUSHED STONE:

1. Additional crushed stone ordered by the Engineer shall be measured in place per cubic yard installed.
2. Additional crushed stone shall be paid at the contract price for work completed and shall constitute full compensation for furnishing and placing crushed stone.
3. The work under this section shall be paid at the contract unit price under Item 12g.

H. ADDITIONAL CONCRETE ENCASEMENT:

1. Fill concrete used for encasement of pipelines as required by the Engineer shall be measured per cubic yard of fill concrete used for encasements or other miscellaneous uses.

2. Fill concrete shall be paid at the unit price for concrete encasement and shall constitute full compensation for furnishing and placing fill concrete.
3. Fill concrete for thrust blocks for water mains shall be incidental to the construction of these pipelines and shall not be included or paid under this item.
4. The work under this section shall be paid at the contract unit price under Item 12h.

1.14 ROCK EXCAVATION AND DISPOSAL:

- A. 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.
- B. 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 C below. The unit price established by the Engineer under Item Number 13a is the minimum unit price to be used for rock excavation. The unit price to be inserted by the Contractor in his bid under Item Number 13b is intended to reflect the Contractor's additional costs for performing the rock excavation, should he decide that the minimum unit price in Item Number 13a is insufficient compensation.
- C. Payment limits for rock excavation in trenches containing one pipe shall be as defined on the drawings. When two or more pipes are installed parallel to one another and the trench payment limits overlap, rock excavation in the overlap section will only be paid once.
- D. 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.
- E. Payment for this item includes rock excavation and disposal, furnishing and installing gravel borrow in its place, and providing all required documentation.
- F. 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.
- G. 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.

1.15 SEWER, WATER, AND DRAIN RECONSTRUCTION:

- A. Reconstruction of sewers, water mains, and drains shall be measured per sewer, water main, or drain reconstructed and shall be paid at the contract unit price under the item "Sewer, Water, and Drain Reconstruction."
- B. Only pipe which is not shown on the drawings nor located for the Contractor in the field shall be considered for payment.
- C. 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.
- D. The work under this section shall be paid at the contract unit price under Item 14a.

1.16 TEMPORARY BYPASS PUMPING SYSTEM

- A. The lump sum price for this item shall constitute full compensation for the temporary bypass pumping system design, installation, removal, and operation to handle existing sewer and drain flows. The temporary bypass pumping system shall be designed in accordance with Section 01535, TEMPORARY BYPASS PUMPING SYSTEM and Section 01575, HANDLING EXISTING FLOWS.
- B. The work under this section shall be paid at the contract lump sum price under Item 15a.

1.17 RODENT CONTROL:

- A. Rodent control shall be measured as a lump sum and paid for under the item "Rodent Control".
- B. The work of this section shall be paid for work completed, at the contract lump sum price under Item 16a.

1.18 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 five (5%) percent of the total of Roadway Reconstruction Items and Utility Items.
- B. The work of this section shall be paid for work completed, at the contract lump sum price under Item 17a.

1.19 NPDES STORMWATER POLLUTION PLAN:

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

1.20 HEALTH AND SAFETY PLAN:

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

1.21 CLEARING AND GRUBBING:

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

1.22 SUPPORT OF EXCAVATION:

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

1.23 TRACER TAPE:

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

1.24 LANDSCAPING:

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

1.25 LOAMING AND SEEDING:

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

1.26 FIELD CONCRETE:

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

1.27 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

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

1.28 PRICE ADJUSTMENTS MANDATED BY MGL CHAPTER 30, SECTION 38A

- A. Price adjustments for certain payment items shall be as described in Specification Section 01250 PRICE ADJUSTMENTS.

- B. The work of this section shall be paid for work completed, at the unit price under Items 18a, 18b, 18c, and 18d.

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 either electronically or hard copy.

##### 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 HARD COPY SUBMITTALS:

- A. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer, by mail (to Weston & Sampson Engineers, attention: CSD), six (6) copies each of shop or working drawings required as noted in the specifications, of equipment, structural details and materials fabricated especially for this Contract.
- B. 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 of the Owner, Project, Contractor and building, equipment or structure.

3.04 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 under subsection 6.17 Shop Drawings and Samples; D. Submittal Procedures, Paragraph 3 of the 1996 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.
- H. Two copies of the shop and working drawings and/or catalog cuts will be returned to the Contractor. The Contractor shall furnish additional copies of such drawings or catalog cuts when he needs more than two copies or when so requested.

### 3.05 SAMPLES:

- A. Samples specified in individual Sections include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

- B. The number of samples submitted shall be as specified. Submittal and processing of samples shall follow the procedures outlined for shop and working drawings unless the specifications call for a field submittal or mock-up.
- C. Acceptance of samples will be acknowledged via a copy of the transmittal noting status. When samples are not acceptable, prompt resubmittal will be required.

END OF SECTION

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EXHIBIT 1 TO SECTION 01330 SUBMITTALS

SHOP DRAWING TRANSMITTAL FORM

## Shop Drawing Transmittal

**Weston&Sampson**  
ENGINEERS, INC.

### Instructions for Preparing Transmittal

No action will be taken on any item unless accompanied by this form.  
Type or print all entries.

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).

NO. of COPIES: Usually 6 or as directed/specified.

CONTRACT DRAWING REFERENCE: Contract drawing number(s) showing details of document(s) being submitted.

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.

Contractor to retain last copy. Submit original with two pink and two yellow copies.

THIS SECTION TO BE COMPLETED BY CONTRACTOR									
TRANSM. NO.	SPEC. SECT. NO.	DATE / /	CONTRACTOR'S JOB NO.	W&S JOB NO.					
PROJECT NAME & CONTRACT NO.			LOCATION						
T O			F R O M (CONTRACTOR)						
Attention: CSD Weston & Sampson Engineers, Inc. 5 Centennial Drive Peabody, MA 01960-7985									
ITEM NO.	DESCRIPTION	SOURCE	DRAWING NO. CATALOG NO. BROCHURE, ETC.	NO. OF COPIES	CONTRACT DRAWING REF.	BY W&S			
1						ACTION CODE	REVIEWED BY		
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.

SPECIAL INSTRUCTIONS: \_\_\_\_\_

(FOR CONTRACTOR)  
SIGNATURE & TITLE: \_\_\_\_\_

THIS SECTION TO BE COMPLETED BY W&S

Weston&Sampson ENGINEERS, INC.		
ACTION CODE	FIELD OFFICE	DATE / /
	REC'D BY	DATE / /
1. NO EXCEPTIONS TAKEN	a. INSTALLATION SHALL PROCEED ONLY WHEN ACTION CODE IS 1 or 2.	BY _____ DATE / /
2. MAKE CORRECTIONS NOTED	b. ACTION CODED 3 SHALL BE RESUBMITTED WITHIN TIME LIMIT SET IN CONTRACT.	
3. AMEND AND RESUBMIT	c. REVIEW DOES NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY OF COMPLIANCE WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS.	
4. REJECTED - SEE REMARKS		
5. ACKNOWLEDGMENT		

**Please! BEAR DOWN WHEN HANDWRITING — THIS IS A 6 COPY FORM & THE LAST COPY IS YOURS!**

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 02428, CURED-IN-PLACE PIPE
- B. Section 02440, SEWER CLEANING AND INSPECTION
- C. Section 02439, CEMENTITIOUS LINING OF MANHOLES
- D. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 DOCUMENTATION:

- A. The Contractor shall maintain printed television inspection logs of sewer segments, for each sewer line segment 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. Digital Video Disc (DVD) number and 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-1 format and shall include accompanying audio. Inspections shall be recorded one at a time, with each segment recorded as a separate file on the DVD. The Contractor shall provide two (2) original and labeled copies of each DVD to the Owner, at no additional cost, as requested by the Engineer during the Project. All DVD's shall have a typed label listing DVD number, date work was performed, Engineer: Weston & Sampson Engineers, Inc., Owner: City of Somerville, Massachusetts, and Contractor name. 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 four (4) megapixels.
- G. 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 2.0 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. "AR-059"
- Each manhole rehabilitation log as a separate PDF file
  - Filenames shall contain sub-area and manhole designations e.g. "AR-049"

- **Cleaning and Inspection of Sewers**

- Television Inspection MPEG-1 Files
  - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. "AR-050 to AR-049 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. "AR-050 to AR-049 Downstream."



- **Cured-in-Place Pipe – Organized per Inversion**
  - Pre-inversion Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “AR-050 to AR-049 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. “AR-050 to AR-049 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-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “AR-050 to AR-049 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. “AR-050 to AR-049 Downstream.”
  - Each material testing results report as a separate PDF file
- **Service Connection Test and Grout**
  - Television Inspection MPEG-1 Files
    - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “AR-050 to AR-049 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. “AR-050 to AR-049 Downstream.”

## PART 2 – PRODUCTS

Not Used.

## PART 3 – EXECUTION

Not Used.

END OF SECTION

## SECTION 01380

### HEALTH AND SAFETY PLAN

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. Prior to the start of work on the site, Contractor shall prepare and submit a site-specific health and safety plan that includes consideration of all known and potential hazards at the site. Work may not proceed at the project site until the Contractor's health and safety plan has been received and reviewed by the Engineer.

##### 1.02 REFERENCES:

- A. OSHA 29 CFR 1910.120

##### 1.03 RELATED WORK:

- A. Section 02113, EXCAVATION AND STOCKPILING OF CONTAMINATED MATERIAL
- B. Section 02130, TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

#### PART 2 – PRODUCTS

##### 2.01 HEALTH AND SAFETY PLAN:

- A. The health and safety plan shall include, but not necessarily be limited to the following:
  - 1. Identification of Contractor's Site Safety Officer.
  - 2. Identification of Hazards and Risks Associated with Project.
  - 3. Contractor's Standard Operating Procedures, Including Personnel Training and Field Orientation.
  - 4. Respiratory Protection Training Requirements.
  - 5. Levels of Protection and Selection of Equipment Procedures.
  - 6. Type of Medical Surveillance Program.
  - 7. Personal Hygiene Requirements and Guidelines.
  - 8. Zone Delineation of the Project Site.

9. Site Security and Entry Control Procedures.
10. Field Monitoring of Site Contaminants.
11. Contingency and Emergency Procedures.
12. Listing of Emergency Contacts.

### PART 3 - EXECUTION

#### 3.01 PERSONAL PROTECTIVE EQUIPMENT:

- A. The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the Contractor and the standards set forth in the Contractor's health and safety plan. The Engineer may conduct duplicate air monitoring for quality control purposes. Modified Level D protection shall be the minimum requirement for all on-site personnel.

END OF SECTION

Z:\Shared-Projects\Somerville\2130636 - Cedar Street Sewer Separation\Specifications\DIVISION 1 - GENERAL REQUIREMENTS\01380 HEALTH AND SAFETY PLAN.docx

## SECTION 01535

### TEMPORARY BYPASS PUMPING SYSTEM

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section includes furnishing of all materials, labor, equipment, power, and maintenance, to implement a temporary pumping system for the purpose of diverting existing sewer and combined sewer flows around the work area for the duration of the project.
- B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor firm who can demonstrate to the Engineer that it has the required expertise in the design and operation of temporary bypass pumping systems. The vendor firm shall provide at least five references of projects similar in size and complexity to this project that have been performed by the firm within the past three years.
- C. The by-pass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

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

- A. The Contractor shall submit a detailed description of the proposed pumping system stamped by a Professional Engineer in the State of Massachusetts and submit it and the vendor's references.
- B. The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing sewer and combined sewer flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these contract documents. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.
- C. The plan shall include but not be limited to the following:
  - 1. Staging areas for pumps;
  - 2. Flow diversion method and types of materials;

3. Number, size, material, location and method of installation of suction piping;
4. Number, size, material, method of installation and location of discharge piping;
5. Bypass pump sizes, capacity, number of each size to be on site and the related power requirements;
6. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted);
7. Standby power generator size, location;
8. Downstream discharge plan;
9. Method of protecting suction and discharge areas from erosion and damage;
10. Thrust and restraint block sizes and locations;
11. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
12. Method of noise control for each pump and/or generator, with external dB valve.
13. Any temporary pipe supports and anchoring required;
14. Design plans and computation for access to bypass pumping locations indicated on the drawings;
15. Calculations for selection of bypass pumping pipe size;
16. Schedule for installation of and maintenance of bypass pumping lines;
17. Plan indicating proposed location of bypass pumping lines.

1.03 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK

PART 2 - MATERIALS

2.01 EQUIPMENT:

- A. All pumps used shall be centrifugal, end suction, fully automatic self-priming units that do not require the use of foot-valves, diaphragm pumps, isolation valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods to accommodate the cyclical nature of bypass flows. The pumps shall not be hydraulic submersible type.

- B. All pumps shall be Godwin Dri-prime Automatic Self-priming Pumps (CD, DPC, or HL Series) as manufactured by Godwin Pumps of America, Inc., (609) 467-3636, (301) 390-3806, or approved equal.
- C. The Contractor shall provide the necessary stop/start controls for each pump.
- D. The Contractor shall include one stand-by pump system (including suction and discharge piping) of each size to be maintained on site.
- E. Additional back-up pumps shall be on-line, isolated from the primary system by a valve.
- F. Discharge Piping - in order to prevent the accidental spillage of flows, all temporary discharge systems shall be constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum "Irrigation" type piping or glued PVC pipe be allowed. Discharge hoses will only be allowed in short sections and with the specific permission of the Engineer.
- G. Allowable piping materials will be Godwin "QD" steel pipe (Godwin Pumps of America, Inc.), or fused, high-density polyethylene pipe as manufactured by Phillips Driscopipe, Inc., or approved equal.

## 2.02 SYSTEM DESCRIPTION:

### A. DESIGN REQUIREMENTS:

1. The Contractor shall be aware that the existing storm drain and sanitary sewer systems are combined systems and rapid increases in flow will occur during and after a wet weather event. The 10-year storm event produces flow rates up to 125 CFS on Cedar Street and 174 CFS on Elm Street. The existing drain and sewer systems shall be reconnected to the proposed drain and sewer system at the end of each workday and as required to effectively handle wet weather flows.
2. Bypass pumping systems shall have sufficient capacity to pump a peak dry weather flow of 0.3 MGD (0.5 CFS). The Contractor shall provide all pipeline, plugs, pumps of adequate size to handle peak flow, and discharge piping to ensure that the total flow can be safely diverted around the area of work. Bypass pumping system will be required to operate 24 hours per day.
3. The Contractor shall have adequate standby power and pumping equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.
4. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work

area as necessary for satisfactory performance of work.

**B. PERFORMANCE REQUIREMENTS:**

1. It is essential for the protection of the public safety and private property that there be no interruption in the flow throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewer and combined sewer flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the proposed sewer and drain downstream of his work.
2. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the sewer and combined sewer flow past the work area. The Contractor will not be permitted to stop or impede the flows under any circumstances.
4. The Contractor shall maintain flow around the work area in a manner that will not cause surcharging and that will protect public and private property from damage and flooding.
5. The Contractor shall protect water resources, wetlands and other natural resources.
6. The Contractor shall be responsible to meet noise requirements (73dbA @ 30'). All diesel driven primary and standby pumps shall be sound attenuated. The use of Critical Silenced Canopy Pumps or acoustical Whisper Pac enclosures for sound attenuation is required.

**PART 3 - EXECUTION**

**3.01 FIELD QUALITY CONTROL AND MAINTENANCE.**

- A. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Engineer shall be given 24 hours notice prior to testing.
- B. Contractor shall inspect bypass pumping system every two hours to ensure that the system is working correctly.
- C. The Contractor shall insure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.

- D. Spare parts for pumps and piping shall be kept on site as required.
- E. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

### 3.02 PRECAUTIONS:

- A. Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his by pass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the Owner and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.
- B. During all bypass pumping operation, the Contractor shall protect the work area and all local utilities from damage inflicted by any equipment. The Contractor shall be responsible for all physical damage to public and private property caused by human or mechanical failure.

### 3.03 INSTALLATION AND REMOVAL:

- A. The Contractor shall construct temporary bypass pumping structures only at the access locations indicated on the drawings and may be required to provide adequate suction conduit.
- B. Diverting or blocking of sewer and combined sewer flows shall incorporate primary and secondary devices. When diversion or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C. The Contractor shall exercise caution and comply with OSHA requirements when working in the presence of gases, combustible or oxygen-deficient atmospheres, and confined spaces.
- D. Except as specifically permitted, the installation of the bypass pipelines is prohibited in all salt marsh/wetland areas. The pipeline must be located off streets and sidewalks and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining any approvals from the Owner for placement of the temporary pipeline within public ways.

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 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.

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.

##### 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

#### 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 consists 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 either Flip Disk, LED or a combination of both Flip Disk and LED (Hybrid).
2. Size - The message board shall have a minimum height of 74-inches, maximum height 80-inches and a minimum width of 98-inches, maximum width of 115-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 characters with 1 to 9 characters per line.
5. Visibility and Viewing Angle - The sign shall be visible from a minimum distance of 900 feet with a viewing angle of no less than 30 degrees. The sign shall be either internally or externally illuminated for nighttime visibility.

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. 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.
- B. For work under this contract, Contractor shall provide up to 140 unit days of message sign operation, with possibly up to five (5) sign units operating for 28 days simultaneously, as required by the Engineer.

C. Three (3) weeks prior to the start of work, the Contractor shall provide changeable message signs at the locations below, notifying public of upcoming work. The message shall be approved by the Somerville Traffic Department.

1. Cedar Street at Broadway
2. Highland Avenue at Lowell Street
3. Highland Avenue at Willow Avenue
4. Elm Street at Willow Avenue
5. Somerville Avenue at Lowell Street

END OF SECTION

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## 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 utilized on this project as required and as indicated on the Traffic Management Plan included in the construction drawings.
- 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).
  - 2. Contact police department and municipality to inform them the scheduled police detail has failed to show up at the project site and request another police detail.

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 local jurisdiction'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. The Owner shall directly pay for police details.

##### 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 24 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, complete.

#### 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

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## 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 the Conservation Commissions' Orders of Conditions as well as 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
- G. Section 02347, BENTONITE DAMS

##### 1.03 SUBMITTALS:

- A. The Contractor shall submit for approval six sets of 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 SILT FENCE:

- A. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a 22-foot wide, continuous length support netting, and stapled to preweathered oak posts installed as shown on the drawings. The oak posts shall be 1½-inches by 1½-inches (Minimum Dimension) by 48 inches and shall be tapered. The support netting shall be industrial strength polypropylene. The bottom edge of the sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall conform to the following properties:

<b>Property</b>	<b>Value</b>	<b>Test Method</b>
1. Grab Strength (lbs.)	124	ASTM D-4632
2. Elongation (%)	15%	ASTM D-4632
3. Puncture Strength (lbs.)	65	ASTM D-4833
4. Burst Strength (psi)	300	ASTM D-3786
5. Trapezoid Tear (lbs.)	60	ASTM D-4533
6. Equivalent Opening Size (U.S. Sieve)	No. 30	ASTM D-4571
7. Permittivity (sec <sup>-1</sup> )	0.10	ASTM D-4491
8. Water Flow Rate (gal/min/sf.)	10	ASTM D-4491
9. UV Resistance (%)	70	ASTM D-4355

- B. The silt fence shall be Mirafi Envirofence manufactured by Mirafi, Inc. or approved equal.

### 2.02 STRAW BALES:

- A. Straw bales shall consist of certified seed free stems of agricultural grain and cereal crops and shall be free of grasses and legumes. Standard bales shall be 14-inches high, 18- inches wide and 36- to 40-inches long tied with polypropylene twine and weigh within 5 percent of 7 lbs. per cubic ft.

### 2.03 STRAW WATTLES:

- A. Straw wattles shall be AEC Premier Straw Wattles, as manufactured by American Excelsior Company, Arlington, TX (1-866-9FIBERS), or approved equal.
- B. The wattles will be placed in a shallow trench (2-3 inches deep) and staked in the ground using wooden stakes. The wooden stakes will be placed at a minimum depth of 24-inches into the ground.

### 2.04 SILT CURTAIN:

- A. The silt curtain shall be a Type-1-Silt-Barrier consisting of 18-ounce vinyl fabric skirt with a 6-inch marine quality floatation device. The skirt shall be ballasted to hang vertical in the water column by a minimum 3/16-inch galvanized chain. The silt

curtain shall extend into the water as shown on the drawings. If necessary, join adjacent ends of the silt curtain by connecting the reinforcing grommets and shackling ballast lines.

### 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 Contract Documents. 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 PROTECTING AND MINIMIZING EXPOSED AREAS:

- A. The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.
- B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive



to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

### 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 hay 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 of under the provisions of Section 02230, CLEARING AND GRUBBING.

- 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 CLEARING AND GRUBBING:

- A. The Contractor shall clear and grub only on the Owner's land or the Owner's easements, and only the area required for construction operations, as approved by the Engineer. Removal of mature trees (4 inches or greater DBH) will not be allowed on temporary easements.
- B. The Contractor shall not remove trees in the Owner's temporary easements without permission of the Engineer.

### 3.08 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 hay, 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.

### 3.09 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.

### 3.10 SEPARATION AND REPLACEMENT OF TOPSOIL:

- A. Topsoil shall be carefully removed from cross-country areas where excavations are to be made, and separately stored to be used again as directed. The topsoil shall be stored in an area acceptable to the Engineer and adequate measures shall be employed to prevent erosion of said material.

### 3.11 BALED HAY:

- A. To trap sediment and to prevent sediment from clogging drainage systems, baled hay 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.

### 3.12 ERECTION AND MAINTENANCE OF SILT FENCE:

- A. Where indicated on the drawings or where required by the Engineer, the Contractor shall erect and maintain a temporary silt fence. In areas designated as wetlands, the Contractor shall line the limits of the construction easement with a silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.

### 3.13 SURFACE RESTORATION OF CROSS COUNTRY AREAS:

- A. Plantings detailed in Section 02921 shall be conducted when construction of the pipeline has been completed within the areas designated. A one-year guarantee of maintenance will be required on these plantings to ensure that they establish in the area.

### 3.14 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. Catch basin sediment traps shall be securely installed under the catch basin grate. Care shall be taken to keep the geotextile fabric 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. Catch basin sediment traps shall be by West Coast Spill Supplies; or approved equal.

### 3.15 STRAW WATTLES:

- A. The wattles will be placed in a shallow trench (2-3 inches deep) and staked in the ground using wooden stakes. The wooden stakes will be placed at a minimum depth of 24-inches into the ground.

END OF SECTION

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## SECTION 01575

### HANDLING EXISTING FLOWS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers all materials, equipment, and labor required to handle existing sanitary and combined sewage flows and installation and maintenance of all temporary connections, plugs, and by-pass pumping. Upon completion of the sewer and drain, all temporary plugs and connections shall be removed flows transferred to the new pipes. Plug, fill, and abandon existing pipes and manholes as shown on the drawings or as specified herein.
- B. The Contractor shall be aware that the existing storm drain and sanitary sewer systems are combined systems and rapid increases in flow will occur during and after a wet weather event. The 10-year storm event produces flow rates up to 125 CFS on Cedar Street and 174 CFS on Elm Street. The existing drain and sewer systems shall be reconnected to the proposed drain and sewer system at the end of each workday and as required to effectively handle wet weather flows.

##### 1.02 RELATED WORK:

Section 01330, SUBMITTALS

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

Six sets of complete, checked shop drawings, showing equipment, method of by-passing, and the method of transferring flows from the existing system to the new system.

#### PART 2 - PRODUCTS - NOT APPLICABLE

#### PART 3 - EXECUTION

##### 3.01 MAINTAINING EXISTING FLOWS:

- A. The Contractor shall maintain all flows in the existing sewer and drain systems. The existing drain and sewer systems shall be reconnected to the proposed drain and sewer system at the end of each workday and during all wet weather events.
- 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.
- D. 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

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## SECTION 01577

### RODENT CONTROL

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This section specifies requirements for rodent control activities by the Contractor at all work and laydown (or staging) areas in connection with this Contract.
- B. The Contractor shall retain the services of a licensed rodent exterminator to conduct an inspection of the work and laydown areas and report on the presence of rodents and take any necessary measures to eliminate existing rodent populations prior to start of work.

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

- A. Within ten days after Notice to Proceed, submit to the Engineer a written description of rodent control measures to be used and the areas to be included in the program.
- B. Provide the name and background of the licensed rodent exterminator retained to provide any necessary rodent eradication measures prior to start of work.

#### PART 2 - PRODUCTS

##### 2.01 CONTAINERS:

Use metal or heavy-duty plastic refuse containers with tight-fitting lids for disposal of all garbage, or trash associated with food. These containers shall not have openings that allow access by rodents.

#### PART 3 - EXECUTION

##### 3.01 WORK AND LAYDOWN AREAS WITHIN THE CONTRACT AREA:

- A. Before mobilization begins, obtain written verification from the rodent exterminator that rodent populations have been effectively controlled in areas to be occupied.
- B. Following site clearing and before demolition, excavation, or construction, inspect work and laydown areas and remove all remaining trash, debris, and weeds.
- C. Maintain work and laydown areas free of trash, garbage, weeds, and debris. Provide and enforce proper use of refuse containers to ensure that rodents and other pests are not harbored or attracted.

- D. Designate specific locations as lunch and coffee break areas to prevent random disposal of garbage and trash. Keep those areas free of litter and garbage, and provide refuse containers as described in 2.01 of this section. Keep refuse containers upright with their lids shut tight.
- E. Have all refuse containers emptied daily to maintain site sanitation.
- F. Notify the Engineer within 24 hours whenever rodents (rats or mice) or signs of rodent activity (burrows or droppings) are observed in work or laydown areas. Take appropriate action to locate and control the rodents.

### 3.02 LAYDOWN AREAS OUTSIDE THE CONTRACT AREA:

- A. Implement pest control at all laydown areas that are not areas of this Contract, but that are used by the Contractor in connection with this Contract. Undertake rodent control at least two weeks prior to use of the area and with time to ensure that the site is free of rodent populations (rats and mice) prior to site occupancy. Maintain the site free of rodents throughout the duration of its use.
- B. Clear laydown areas of trash, debris, and weeds prior to occupancy. Initiate those actions only after rodent populations have been effectively controlled.
- C. Maintain laydown areas free of trash, garbage, weeds, and debris. Provide and enforce proper use of refuse containers to ensure that rodents and other pests are not harbored or attracted.
- D. Dispose of all garbage or trash associated with food in refuse containers with tight-fitting lids as described in 2.01 of this Section. Have refuse containers emptied daily to maintain site sanitation.

### END OF SECTION

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## SECTION 01740

### CLEANING UP

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of his 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 00700 GENERAL CONDITIONS
- B. Section 01110 CONTROL OF WORK AND MATERIALS
- C. Section 01140 SPECIAL PROVISIONS
- D. Section 01570 ENVIRONMENTAL PROTECTION

#### PART 2 - PRODUCTS

Not applicable

#### PART 3 - EXECUTION

##### 2.01 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.

## 2.02 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.

## 2.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

- A. On or before completion of the work, the Contractor shall, unless otherwise specifically directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he 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 his operations in a neat and satisfactory condition.

## 2.04 RESTORATION OF DAMAGED PROPERTY:

- A. The Contractor shall restore or replace, when and as directed, any property damaged by his 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.

## 2.05 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 02000**

### **ROADWAY SPECIAL PROVISIONS CEDAR STREET SEWER SEPARATION PROJECT SOMERVILLE, MA**

#### **SCOPE OF WORK**

The approximate scope of work includes but is not necessarily limited to the installation of: 2,794 linear feet of 36-inch to 48-inch RCP drain; 1,951 linear feet of 8-inch to 12-inch PVC sewer; 1,374 linear feet of 6-inch PVC building connections; 24 precast manholes; 31 precast catch basins; 1,051 linear feet of 8-inch to 12-inch cured-in-place pipe; 2,827 linear feet of 8-inch to 12-inch DI water mains; 6 Hydrants; 1,353 linear feet of water service connections; traffic signal replacement; full width road reconstruction including sidewalk replacement; and other related tasks.

*All roadway/traffic related work done under this contract shall be in conformance with the, Massachusetts Highway Department Standard Specifications for Highways and Bridges, dated 1988, as amended, the Supplemental Specifications dated June 15, 2012, 2006 Massachusetts Highway Department Project Development and Design Guide. The Standard Special Provisions dated October 19, 2012, the 2012 Construction Standard Details, the 2009 Manual on Uniform Traffic Control Devices, with Massachusetts Amendments, the 1990 Standard Drawings for Signs and Supports. The 1968 Standard Drawings for Traffic Signals and Highway Lighting, the latest edition of American Standard of Nursery Stock, the Plans detail sheets the Special Provisions and all amendments will govern.*

#### **WORK SCHEDULE**

The Contractor shall conduct all construction activity Monday through Friday between the following hours:

1. Elm Street – 7:00 a.m. and 7:00 p.m.
2. Cedar Street Phase 1 – 8:30 a.m. and 7:00 p.m.
3. Cedar Street Phase 2 & 3 – 7:00 a.m. and 7:00 p.m.

No work shall be done on this contract on Saturday, Sunday, a State or Federal holiday or on the day before or the day after a long weekend that involves a holiday without prior approval by the Engineer. Night work shall only be by City's prior approval.

#### **PUBLIC SAFETY AND CONVENIENCE** (Supplementing Subsection 7.09)

The Contractor shall provide necessary access for fire apparatus and other emergency vehicles through the work zones to abutting properties at all times. Sidewalks should be accessible for pedestrians at all times.

Sweeping and cleaning of surfaces beyond the limits of the project to clean up material caused by spillage or vehicular tracking during the various phases of the work shall be considered as

incidental to the work being performed under the Contract and there will be no additional compensation.

#### **NOTICE TO OWNERS OF UTILITIES** (Supplementing Subsection 7.13)

Before commencing work on service connections, the Contractor shall be responsible for contacting the Electric Company servicing the area to obtain construction requirements, standards, and to give adequate notice of commencement of work. The Contractor's attention is further directed to the requirements of Work in the Immediate Vicinity of Certain Underground Structures and Poles herein included in these Special Provisions.

The Contractor shall make his own investigation to assure that no damage to existing structures, drainage lines, traffic signal conduits, and other utilities will occur as a result of his operations.

The Contractor shall notify "Mass. DIG SAFE" and procure a DIG SAFE number of each location prior to disturbing ground in any way.

"DIG-SAFE" Call Center: Telephone 1-800-344-7233

#### **PROTECTION OF UTILITIES AND PROPERTY** (Supplementing Subsection 7.13)

The Contractor, in constructing or installing facilities alongside or near sanitary sewers, storm drains, water or gas pipes, electric or telephone conduits, poles, sidewalks, walls, vaults or other structures shall, at his expense, sustain them securely in place, cooperating with the officers and agents of the various utility companies and municipal departments which control them, so that the services of these structures shall be maintained. The Contractor shall also be responsible for the repair or replacement, at his own expense, of any damage to such structures caused by his acts or neglect, and shall leave them in the same condition as they existed prior to commencement of the work. In case of damage to utilities, the Contractor shall promptly notify the utility owner and shall, if requested by the Engineer, furnish labor and equipment to work temporarily under the utility owner's direction in providing access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the City or by the utility owner that suffers the loss. The cost of such repairs shall be borne by the Contractor, without compensation therefore.

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

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

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this section, shall be

considered included in the prices paid for the various Contract items of work and no additional compensation will be allowed therefore.

## **WORK IN THE IMMEDIATE VICINITY OF CERTAIN UNDERGROUND STRUCTURES AND UTILITY POLES**

Before starting work at existing manholes, the Contractor shall test for gas and blow out the manholes.

## **PROVISIONS FOR TRAVEL AND PROSECUTION OF THE WORK** (Supplementing Subsection 8.03)

Before starting any work under this Contract, the Contractor shall prepare, and submit to the Engineer for approval, a plan (based on the Contract traffic management plans) that indicates the traffic routing proposed by the Contractor during the various stages and time periods of the work and the temporary barricades, signs, drums and other traffic control devices to be employed during each stage and time period of the work to maintain traffic and access to abutting properties.

Particular care shall be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety. Traffic control devices required only during working hour operations shall be removed at the end of each working day.

Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.

## **DISPOSAL OF SURPLUS MATERIALS**

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

## **MATERIALS AND EQUIPMENT REMOVED AND STACKED**

All materials scheduled to be removed and stacked shall be delivered to the DPW maintenance facility or storage yard located at 257 Fisher Street Somerville, MA 02038. If the Engineer determines that any part of the stacked materials is unsuitable for re-use, or if the City decides to abandon part or all of such materials, said materials shall become the property of the Contractor and he shall dispose of them outside and away from the limits of the project, without additional compensation.

## **PROPERTY ACCESS**

The Contractor shall provide and maintain access at all times to all properties abutting the work. Final pavement installation on the public ways shall be performed after all other work is finished. The Contractor may be required to install temporary measures (i.e. wood planking bridges) across excavated areas of sidewalk to allow safe access to buildings and/or storefronts. Such measures will require approval from the City of Somerville and the Engineer prior to installation and are considered incidental to the contract.

## **CONCRETE FOUNDATIONS**

Concrete foundations of items to be removed, if not interfering with the proposed construction, may be abandoned in place with written acceptance of the Engineer. Foundations left in place under the roadway surface shall be removed to a depth of three feet (3') below the finished grade; all other foundations left in place shall be removed to a depth of six inches (6") below the finished grade. The top six inches (6") shall be restored to match the existing grade with materials similar in kind to the adjacent materials.

## **TREE REMOVAL**

Existing trees shown on the plans or required by the Engineer to be removed that are smaller than 9- inches in diameter shall be considered incidental to the project. The Contractor shall coordinate with the City of Somerville Tree Warden prior to marking or removal of any trees within the project limits and will not mark or remove any tree within the project limits without approval from the City of Somerville.

## **BOUNDS**

The Contractor shall exercise due care when working around all bounds which are to remain. Should any damage to a bound result from the actions of the Contractor, it shall be replaced and/or realigned by the Contractor as required by the Engineer. No further compensation will be due the Contractor for the materials and labor required to reestablish the bound in its proper orientation. All bounds, including new bounds as shown on the plans, and bounds replaced or realigned shall be installed by a Land Surveyor registered in the Commonwealth of Massachusetts.

Bounds shown on the plans to be removed shall be carefully removed and delivered and stacked at the City DPW maintenance facility or storage yard located at 257 Fisher Street Somerville, MA 02038 unless otherwise required. The cost of this work shall be considered incidental to the project.

## **EXISTING BRICK OR FLAGSTONE WALKS**

The Contractor will be required to reset or relay existing brick or flagstone property access walks. This work will be considered incidental to the project and will include all materials, equipment, tools and labor to complete the work including new bricks as shown on the plans or as directed by the Engineer.

**ITEM 102.51****INDIVIDUAL TREE PROTECTIONS****EACH****GENERAL**

The purpose of this item is to prevent damage to branches, stems and root systems of existing individual trees to remain and to ensure their survival. Provisions under this item include steps to minimize soil and root disturbance and to construct protection measures for trees close to construction areas.

The work under this item shall conform to the relevant provisions of Sections 101 and 771 and the following:

**Examination of Conditions**

The Contractor shall be solely responsible for judging the full extent of the work requirements, including, but not necessarily limited to any equipment and materials necessary for providing tree protection.

Prior to any construction activities, the Contractor and Arborist shall walk the site with the Engineer and City Tree Warden to identify which trees will require protection and to determine approved measures. The Arborist shall make recommendations as to appropriate methods to trees. The Engineer will have final decision as to trees and methods.

The Contractor is responsible for the protection of all existing trees and plants within and immediately adjacent to the construction area that are not designated to be removed for the length of the construction period.

Incidental to the cost of these items, the Contractor shall retain the services of a certified arborist, who shall make recommendations as to the specific appropriate treatment of trees within or near the work zone.

**SUBMITTALS**

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

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

**MATERIALS**

Fence and temporary fence posts shall be subject to the approval of the Engineer.

Staking for individual tree protection fencing shall be steel posts or 2x4-inch stock as required and approved by the Engineer.

Wood chips shall conform to provisions of Wood Chip Mulch under Materials Section M6.04.3.

Trunk protection shall be 2x4-inch cladding, at least 8 feet in length, clad together with wire. Trunk protection shall include burlap.

Incidental to these items, the Contractor shall provide water for maintaining plants in the construction area that will have exposed root systems for any period during construction.

## CONSTRUCTION METHODS

To the extent possible, to avoid soil compaction within the root zone, construction activities including, but not limited to, vehicle movement, excavation, embankment, staging and storage of materials or equipment shall not occur underneath the canopy (drip line) of trees to remain. Where these activities will occur within 10 Feet of the canopy of trees, the Contractor shall provide Individual Tree Protection as specified herein.

### Tree Fencing and Armoring

For individual tree protection, the Contractor shall set posts and fencing at the limits of the tree canopy. Where construction activities closer to the trees are unavoidable, the Contractor shall tie branches out of the way and place wood chips to a depth of 6-inches on the ground to protect the root systems. The Contractor shall wrap the area of the trunk of the tree with burlap prior to armoring with 2x4-inch cladding. Cladding for tree trunks shall extend from the base of the tree to at least 8 feet from the base.

Where excavation within canopy is unavoidable, the Contractor shall use equipment and methods that shall minimize damage to the tree roots, per recommendations of the Certified Arborist. Such methods may require root pruning prior to, as well as during, any excavation activities.

All fencing, trunk protection, branch protection, and woodchips shall be maintained throughout the duration of the contract. Protective fencing shall be repaired and woodchip mulch replaced as necessary during the duration of the contract at no additional cost.

### Cutting and Pruning

Some pruning of roots and branches may be a necessary part of construction. Pruning will be performed on the same side of the tree that roots have been severed.

The Contractor shall retain the services of a Massachusetts State Certified Arborist to oversee any cutting of limbs, stem or roots of existing trees. All cuts shall be clean and executed with an approved tool. Under no circumstances shall excavation in the tree protection area be made with mechanical equipment that might damage the existing root systems.



Any tree root area exposed by construction shall be covered and watered immediately. Exposed tree roots shall be protected by dampened burlap at all times until they can be covered with soil.

#### Watering

Water each tree within the construction area where work is in progress twice per week until the surrounding soil of each tree is saturated for the duration of construction activities.

#### Removal of Protection

After all other construction activities are complete, but prior to final seeding, wood chips, temporary fencing, branch protection, and trunk protection materials shall be removed and disposed off site by the Contractor at no additional cost.

#### Tree Damage

The Contractor shall be held responsible for the health and survival of the existing trees in the immediate vicinity of the of the construction area. Damage that, in the Engineer's opinion, can be remedied by corrective measures shall be repaired immediately. Broken limbs shall be pruned according to industry standards. Wounds shall not be painted. Trees or shrubs that are damaged irreparably shall, at the Engineer's discretion, be replaced per the requirements of Division I of these Special Provisions. Cost of replacement trees shall be borne by the Contractor.

#### BASIS OF PAYMENT

Where the plans show specific, individual trees to remain and where grading or other disturbance is shown within the drip line of these trees or where the Engineer determines that an individual tree must be protected, these trees shall be protected and paid for under ITEM 102.51, Individual Tree Protection.

Item payment shall be scheduled throughout the length of contract: 30 percent of value shall be paid upon installation, 30 percent approximately halfway through the contract, and the remainder to be paid at the end of the contract after completion of construction operations that would disturb plants and after the protection materials have been removed and properly disposed of off-site by the Contractor.

Compensation for Individual Tree Protection will be paid for at the contract unit price PER EACH under Item 102.51. This shall include full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work, including the services of a certified arborist, water and fertilizer, and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract.

Cost of wood chips, as required, shall be incidental to these items.

<b><u>ITEM 120.1</u></b>	<b><u>UNCLASSIFIED EXCAVATION</u></b>	<b><u>CUBIC YARDS</u></b>
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Work under this item shall conform to Section 100 of the Standard Specification and the following:

Unclassified Excavation shall include the removal of tree pits, fences, drain pipe, brick walk, concrete walk, HMA walk and any other items to be removed not covered under other items of work.

<b><u>ITEM 153.</u></b>	<b><u>CONTROLLED DENSITY FILL (EXCAVATABLE)</u></b>	<b><u>CUBIC YARDS</u></b>
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Work under this item shall conform to Section 150 of the Standard Specification and the following:

Controlled Density Fill (CDF) –Excavatable – shall be placed in trench/utility areas crossing roadway areas. CDF shall conform to the provisions of M4.08.0 for Type 2E CDF.

Item 153. will be measured and paid for at the contract unit price per Cubic Yard, which price shall include all labor, materials, and finishing, along with all incidental costs required to complete the work.

<b><u>ITEM 403.</u></b>	<b><u>RECLAIMED PAVEMENT FOR BASE COURSE AND/OR SUB BASE</u></b>
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		<u>SQUARE YARD</u>
<u>ITEM 482.3</u>	<u>SAWING ASPHALT PAVEMENT</u>	<u>FEET</u>
<u>ITEM 482.4</u>	<u>SAWING CONCRETE PAVEMENT</u>	<u>FEET</u>

The work under these items shall conform to the relevant provisions of Section 400 of the Standard Specifications and the following:

Reclaimed Pavement for Base Course and/or Sub-base shall be in close conformity with the Standard Specifications. In addition, the removal of reclaimed material to an offsite stockpile while utility work is being performed and before the roadway base is graded and compacted is incidental to the item.

The work shall include the sawing of existing asphalt or concrete pavement where shown on the plans, and as required by the Engineer.

Equipment used to sawcut the existing pavement shall be approved by the Engineer prior to commencing work.

The existing pavement shall be sawcut through its full depth, or to the elevation of the abutting proposed pavement subgrade, whichever is lesser, at all joints between existing and proposed pavements, and at all utility trenches through existing pavement to remain, to provide a uniform, vertical surface for the proposed pavement joint with the existing pavement. Sawcut edges that become broken, ragged or undermined as a result of the Contractor's operations shall be re-cut prior to the placement of abutting proposed pavement at no additional cost to the Owner. Sawcut

surfaces in hot mix asphalt shall be sprayed or painted with a uniform, thin coat of RS-1 asphalt emulsion immediately before placement of bituminous concrete material against the surfaces.

Reclaimed Pavement for Base Course and/or Sub-base shall be measured and paid for at the contract Unit Price per Square Yard and include all compensation for lowering and plating of utility castings, crushing, pulverizing, blending, spreading, grading, sawcutting the existing pavement, compacting, blending with aggregate, moving the processed material from one location to another within the project and any incurred costs resulting from the Contractors decision to process off site. For this project the removal and stockpiling of reclaimed material off site to allow for utility construction activities and cost for trucking same material between locations will be considered incidental to the cost and no additional compensation will be allowed for this operation.

Sawing Asphalt Pavement and Sawing Concrete Pavement will be measured for payment by the foot on the pavement surface complete in place. Sawing Asphalt Pavement and Sawing Concrete Pavement will be paid for at the Contract unit price per foot, which price shall include all labor, materials, equipment, and incidental costs required to complete the work including asphalt emulsion.

**ITEM 580. CURB REMOVED AND RESET FOOT**

The work under this item shall conform to the relevant provisions of Section 580 of the Standard Specifications and the following:

All existing curbing to be removed and reset shall be cleaned and sand blasted to create a clean consistent finish, free from oil, grease, paint or other deleterious materials.

Measurement and payment for item 580. shall be at the contract unit price per FOOT and include removal, cleaning, sandblasting and resetting of existing curb to the lines and grades indicated on the contract drawings.

**ITEM 705.1 FLAGSTONE WALK REMOVED AND RESET SQUARE YARD**

The work under these items shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following:

Flagstone walks that may need to be adjusted by removal and replacement shall be done with a minimum of disruption and be replaced on a cement concrete base in the same location as existing and to the adjusted grades as indicated on the plans. New flagstone shall be utilized for replacement of broken flagstones under item 705.1.

Payment for items 705.1 shall be paid for at the contract unit price, complete in place, per Square Yard.

**ITEM 715.1 MAIL BOX REMOVED AND RESET EACH**

The work under this item shall conform to the relevant provisions of Section 700 of the Standard Specifications and the following:

This item includes removing, temporary stacking and resetting of mail boxes as shown on the plans and as required by the Engineer, including attachment to the proposed cement concrete sidewalk.

**ITEM 776. KARPRICK RED MAPLE 3.5 INCH CALIPER EACH**

The work under this item shall conform to the relevant provisions of Section 771 of the Standard Specifications and the following:

For the above items the Contractor shall provide and install plant material of genus, species, variety, size and quantities in locations as indicated on the contract plans. The work of this section includes, but is not limited to, the following:

- A. Purchasing and transporting plant material to construction sites
- B. Removal and resetting of existing young, recently planted trees
- C. Installation of plant material
- D. Plant care during 60-day Maintenance Period and one-year Establishment Period
- E. Replacement of defective or dead plants at End of Maintenance Period
- F. Replacement of defective or dead plants at End of Establishment Period

Cooperation By Contractor (Supplementing Subsection 5.05)

The Landscape Contractor shall have five years continuous experience and expertise in management, handling and installation of ornamental plant material in large scale landscape construction projects. Site foreman shall have at least five years experience and shall be on-site during all times of plant installation.

Samples and Submittals

Plant Material: At least 180 days prior to anticipated planting, the Contractor shall submit a confirmation of availability for all plants on the list, accompanied by nursery sources. When the specified types and sizes of plants are not available, substitutions may be made upon request by the Contractor, if approved in writing by the Engineer. Substitutions proposed by the Contractor shall have equivalent overall form, height, and horticultural characteristics and must be approved in writing by the Engineer prior to tagging. At least 30 days prior to planting, the Contractor shall submit a schedule for tagging material to the Engineer.

For all other materials, at least 30 days prior to ordering, the Contractor shall submit to the Engineer material specifications and (where applicable) installation instructions attesting that the following materials meet the requirements specified. No materials shall be ordered until submittals have been approved by the Engineer. Delivered materials shall match the samples.

All material samples shall include supplier's literature and certification that material meets specifications. Submittals, including samples, material specifications, and installation specifications are as follows

Soil wetting agent: Submit two pound sample with supplier specifications and certification.

Fungal mycorrhizae: Submit sample with supplier specifications and certification.

Loam: The Contractor shall submit two 10 pound samples of loam to be used as backfill per the requirements of Section 751 of the Standard Specifications, accompanied by laboratory certified test results per the requirements of Section 751.

Backfill Mix: The contractor shall submit a 10 pound representative sample of existing soil, which shall then be mixed with loam and tested according to the requirements specified herein. Mixing shall be done in the presence of the Engineer.

Water: Submit a watering schedule, including sources of water, methods of irrigation, and any incidental work required to provide water for the plants.

Testing Methods: The Contractor shall submit to the Engineer for his inspection and approval, equipment and methods for testing soil moisture and soil pH.

The Contractor shall provide to the Engineer two new functioning moisture gauges, including instructions for use and batteries if required, for his use during the duration of the Contract. The meters shall be hand held, and shall be capable of measuring moisture at a depth of 6-inches. The scale shall be sufficient to determine moist, dry, or wet soil. The meters shall be regularly checked for calibration against watered loam, and shall be replaced if found faulty at no additional cost.

In addition, the Contractor shall provide to the Engineer one copy of the "American Standard for Nursery Stock," ANSI Z-60.1, latest edition, published by American Association of Nurserymen (AAN) for the duration of this Contract.

#### References and Standards

The following standards shall apply to the Work of this Section.

ASNS: "American Standard for Nursery Stock," ANSI Z-60.1, latest edition, published by American Association of Nurserymen (AAN).

Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses. Michael Dirr. Stipes Publishing Company, latest edition.

#### Examination of Conditions

The Contractor shall be responsible for judging the full extent of work requirements involved. This responsibility includes, but is not limited to, the following: transportation, purchase, temporary storage and maintenance of plants; plant re-handling prior to final installation; removal and off-site disposal of existing loam determined by the Engineer to be unacceptable; purchase, transport, and supply of loam.

## Plant Materials

The Contractor shall furnish all plants as shown on the plans, unless otherwise required in writing by the Engineer. All plants shall be nursery grown.

All plants shall be legibly tagged with the botanical name. Only plant stock grown within hardiness Zones 1 through 6a, as established by the USDA Plant Hardiness Zone Map, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 6a or harder conditions. Plants not so certified will not be accepted.

All plants shall be typical of their species or variety in growth habit. Plant sizes, habit, rootballs, and containers shall be in accordance with the American Standard for Nursery Stock (ASNS), Standards of the American Association of Nurserymen (AAN) as a minimum requirement for acceptance.

All plants must be moved with the root systems in soil. Balled and burlapped plants shall be wrapped with untreated 8 ounce burlap, firmly held in place by a stout cord. Wire containers shall be of sufficient size to allow root development for the plant size, per ASNS requirements. Plants prepared with plastic or other non-biodegradable wrappings will not be accepted. Rootballs shall remain intact during all operations. No plant will be accepted if the rootball has been badly cracked or broken prior to, or during, the process of planting. Rootballs shall be moist upon arrival and shall be kept moist until installation. All balled and burlapped plants that cannot be planted at once must be heeled in by setting them in the ground, covering the rootballs with soil, and watering them adequately.

Container-grown stock shall have been grown in the container long enough for the root system to have developed sufficiently to hold its soil together firmly. No plants shall be loose in the container. Container-grown plants shall not be pot bound, with spiraling roots or roots growing densely against the sides of the container. Score or butterfly cut rootball of all container-grown plants prior to planting.

Each plant shall have plenty of fibrous roots, healthy buds, and shall be free of disease or insect pests, eggs or larvae. All plant parts shall show active green cambium when cut. They shall be densely foliated when in leaf.

The trunk of each tree shall be free from sun scald, frost cracks, or wounds resulting from abrasions, fire or other causes. Pruning wounds shall be no larger than 2-inches and shall show vigorous scar tissue. No trees with double-leaders or twin-heads will be acceptable without the written approval of the Engineer. No plant material from cold storage will be accepted. In regards to shrubs, no single stemmed or thin plants will be accepted. The side branches must be generous and well-twigged, and the plant as a whole must be well-branched to the ground. The plants must be in a vigorous condition, free from dead wood, bruises or other root or branch injuries.

## Loam Borrow

Loam borrow, sometimes referred to as loam, for planting soil mix shall be in accordance with the requirements of Standard 751 of the Standard Specifications.

## Soil Amendments

Soil amendments, including ground limestone, sulfur, gypsum, and organic materials, shall meet the requirement of Loam Borrow, as described herein.

## Planting Soil Mix

Planting soil for backfill shall be a mixture of equal parts approved loam and excavated material. Mixed material shall be pH tested by the Contractor in the presence of the Engineer, and adjusted according to particular planting applications, using lime or sulfur as required. For plants that require an acid soil, such as ericaceous plants and broad-leaved evergreens, planting soil shall have a true pH of 4.5 to 5.5. Planting soil for all other plants shall have a true pH value of 6.0 to 6.5. Proposed soil amendments shall be submitted to the Engineer for approval prior to application.

## Bark Mulch

Bark mulch shall be shredded pine bark aged a minimum of six (6) months. The mulch shall be dark brown in color, free of chunks and pieces of wood thicker than 1/4-inches and shall not contain, in the judgement of the Engineer, an excess of fine particles. Unless otherwise specified in these special provisions, bark mulch shall be incidental to the cost of the planting items. Do not use wood chips.

## Water

The Contractor shall be responsible for furnishing his own supply of water to the site at no extra cost. All plants injured or damaged due to the lack of water, or due to the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

## Soil Wetting Agent

Soil Wetting Agent shall be a synthetic, non-toxic acrylic polyacrylamide or natural soluble plant extract. Application rates shall be per manufacturer's recommendations.

## Fungal Mycorrhizae

Each plant shall be planted with fungal mycorrhizae. Mycorrhizae shall include at least three species of vesicular arbuscular (endomycchorizal ) fungi as well as ectomycorrhizal fungi. Mycorrhizae shall be shipped in individual dosage packets.

Furnishing and planting of plant material shall include, but is not limited to, the following: digging of the pits and plant beds; amendment of loam as required to produce planting soil mix; provision

of soil additives for pH requirements of specific plants; provision of soil wetting agents; provision of mycorrhizal fungi; furnishing the plants as specified; plant installation; watering and maintenance.

#### Seasons for Planting

Spring:           Deciduous materials - March 21 through May 1  
                  Evergreen materials - April 15 through June 1

Fall:             Deciduous materials - Oct. 1 through Dec. 1  
                  Evergreen materials - Aug. 15 through October 15

Requests for exceptions to this schedule shall be submitted in writing to the Engineer for his approval.

#### Plant Tagging and Approval

The Contractor shall locate, secure, tag, and ship plant material in a sufficiently timely manner to ensure minimal substitution and storage of plants.

Plants shall be tagged at least one month prior to the expected planting date. The Contractor shall be responsible for tagging the material at the nursery and providing a representative. The Contractor shall request that the Engineer provide a representative to approve tagged stock to be planted under this Section. Contractor shall tag or allow the nursery to tag material for approval of the Engineer's representative. In the event that satisfactory material cannot be located, the Contractor shall be responsible for any necessary travel and overnight accommodations for the Engineer's representative during the period of time required to locate, select, and approve plant material.

All trees and a representative sample of each shrub species on the Plant List shall be tagged by the Contractor at the nursery and approved by the Engineer or his representative, prior to digging, for conformity to specification requirements as to quality, size, and variety. Cost of replacement of materials rejected by the Engineer at the site shall be borne by the Contractor.

Approval of tagged material at the nursery shall not prevent the right of inspection and rejection upon delivery at the site or during the progress of the work.

Tree trunks shall be protected during shipping by a heavy walled cardboard sleeve or other suitable material. Plants shall either be shipped in enclosed trucks or all surfaces, leaves and branches shall be wrapped to prevent damage.

#### Plant Delivery and Installation

Locations for all plants shall be approved by the Engineer before any plant pits or plant beds are excavated.



The Contractor shall locate all underground utilities within 10 feet of the proposed planting pits and notify the Engineer of any conflicts prior to digging plant pits.

The Contractor shall notify the Engineer 3 working days prior to the proposed arrival of plant material on the site. All plants shall be planted within 5 days of arrival on site or shall be rejected by the Engineer. Plants stored on site shall be shaded from direct sunlight at all times and shall not be stored on paved surfaces. Plants stored on site shall be watered daily.

## Planting

Prior to the installation of any plant material, the Contractor shall dig test pits to determine percolation rates. Percolation of less than 1-inch per hour shall require corrective measures as recommended by the Contractor and approved by the Engineer.

Plant pits shall be excavated as shown on plans and the sides scarified to prevent glazed soils.

Trees and shrubs shall be placed as shown on the plans, with the root crown exposed above finished grade. After placement of balled and burlapped plants and prior to backfilling, remove all rope, wire baskets and burlap from the root balls. For container material, remove pots just before planting, and loosen the perimeter roots and soil before placement. Handle plants carefully to prevent damaging roots or stems.

Add soil wetting agent and mycorrhizal fungi per manufacturer specifications. After planting, the Contractor shall submit wetting agent and fungi dose packets to the Engineer to certify installation of material.

Prepare planting soil mix as specified above to depths as shown on the drawings. Place backfill mix in layers of not more than 6-inches, and water each layer sufficiently to settle soil before the next layer is put in place. Backfill mix shall meet finished grade after settlement. Shape edge of planting pit to form a saucer for holding water and place mulch as shown in the plans. Do not cover the stem flare of the plants with mulch.

Water plants immediately following planting as necessary to thoroughly moisten rootball and planting soil.

Plants shall not be wrapped after installation. Wounds shall not be painted. Trees shall not be staked unless wind or other local conditions require the additional protection. Staking and guying shall be as required and shall be incidental to tree installation. If guying is required, use cloth tape rather than wire. The Contractor shall be responsible for removing all staking and guying materials at the end of the Maintenance Period.

Daffodils shall be placed at depths per manufacturer's directions. Bulbs shall be planted with narrow tip end pointing up. All bulbs shall be planted in groups of at least 4 plants and shall be in a random pattern unless otherwise noted on plans. Bulbs shall be installed in the fall.

## Plant Care

Contractor shall provide plant care for the duration of the Maintenance and Establishment periods.

Adequate watering is essential to plant care. During the 60 day Maintenance Period, plants shall be inspected for watering needs at least twice each week using moisture meters supplied by the Contractor. In addition, during the portion of the Establishment period occurring between May 1 and October 1, the plants shall be inspected weekly using moisture meters.

Plant care shall consist of keeping the plants in a healthy growing condition. Plant care shall include watering, weeding, pruning, re-mulching, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.

Trees and shrubs shall be pruned, if necessary, following planting and in accordance with the American Nurserymen's Association Standards for Class I, fine pruning, to preserve the natural character of the plant. All dead wood or suckers and all broken or badly bruised branches shall be removed. Do not cut leaders. The Engineer shall determine if plants require pruning, or should be rejected. All pruning work shall be done by a Massachusetts Certified Arborist.

Any decline in the condition of new plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturists to inspect plant materials and to identify problems and recommend corrective procedures. The Engineer shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the Engineer.

Absolutely no debris may be left on the site. The Contractor shall repair any damage to site as required by the Engineer, at no additional cost.

### Maintenance Period: 60 Days

The Maintenance Period shall begin immediately after each plant is planted and shall continue for a minimum of 60 days following the completion of all planting installations, or until the Conditional Acceptance of all planting work, whichever is a longer period of time.

At the end of the Maintenance Period, the Contractor will request inspection by the Engineer at least 10 days before the anticipated date of inspection.

At the time of inspection, if the plant materials and workmanship are acceptable to the Engineer, the Engineer shall issue a written Certificate of Conditional Acceptance to the Contractor. The date of the inspection shall establish the end of the Maintenance Period and the commencement of the required one year establishment period for planting work.

If in the Engineer's opinion, plant materials and/or workmanship is deficient, acceptance will not be granted, and the Maintenance Period for all the plants shall be extended until plant replacements are made or other deficiencies are corrected. All dead and unsatisfactory plants shall be removed promptly from the project. Replacement plants shall conform in all respects to the Specifications for the original plants and shall be planted in the same manner.

Establishment Period: One Year

The purpose of the Establishment Period is to nurture plants through at least one full growing season and one full winter. All plants shall be inspected by the Engineer one year after Conditional Acceptance and shall be alive and in satisfactory growth at the end of that time. The Contractor is responsible for arranging inspection early enough in the season to allow adequate time to procure and install replacement material.

At the end of the Establishment Period, each plant shall show healthy growth on at least 75 percent of its terminal stems, as determined by the Engineer. Determination of healthy growth shall include, but is not necessarily limited to, viable leaves (in season) and terminal buds, as well as live cambium. Plants found to be unacceptable shall be removed promptly from the site and replaced immediately or during the next normal planting season, as permitted by the specifications.

Planted areas shall be free of weeds and debris, and plantings shall be re-mulched as necessary.

The Engineer will inspect the replacement planting work upon the request of the Contractor. Request for inspection shall be received by the Engineer at least ten days before the anticipated date of inspection.

Stakes and guying, if any, shall be removed from all plants before Final Acceptance.

Upon acceptance of the work of replacement planting, the Engineer shall issue a written Certificate of Final Acceptance for all plants installed under this Section to the Contractor.

#### MEASUREMENT AND PAYMENT

ITEMS listed above will be measured PER EACH. Payment will not be approved until satisfactory completion of the Maintenance Period. The Contract unit prices paid shall be full compensation for providing materials, equipment, labor, and incidentals to provide plant pit excavation, soil preparation, soil amendments, planting mix preparation, loam for planting mix, soil wetting agents, mycorrhizal fungi planting, plant protection, bark mulch (including placement), watering, maintenance, disposal of unsuitable soils, and all other incidentals required for furnishing and installing the plantings in accordance with the drawings, and as required by the Engineer.

#### **ITEM 813.81**                      **SERVICE CONNECTION (UNDERGROUND)**                      **EACH**

The work under this item shall conform to the relevant provision of Section 813 of the Standard Specifications and the following:

Service connections shown on the plans are approximate only. The Contractor shall determine exact locations from the servicing utility, arrange to complete the service connections, and be responsible for all charges incidental thereto.

A 100-ampere meter socket approved by the servicing utility company shall be furnished and installed at a location determined by the City that will be installed by the serving utility company.

Item 813.81 will be measured and paid for at the contract unit price per each, which price shall include all labor, materials, excavation, backfill, compaction and finishing, along with all necessary components including (but not limited to) conduit riser, conduit from power source to load center, wire from power source to load center, labor, tools and incidental costs required to complete the work. The cost of meeting with and coordinating with the utility company is also incidental to this item.

**ITEM 815.1 TRAFFIC CONTROL SIGNAL – SUMMER STREET LUMP SUM**

The work under this item shall be in accordance with the provisions of Section 800 and 900 of the STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES WITH THE LATEST REVISIONS AND THE LATEST DETAIL STANDARD DRAWINGS FOR TYPE II MAST ARM AND FOUNDATION and the following Special Provisions. The work for these items shall be performed as follows:

The work to be done under this item consists of the installation of new traffic signal equipment as shown on the plans. The equipment to be furnished and installed at the intersections listed below includes vehicle detectors, signal posts, signal heads, and foundations, pull boxes, conduit, wire and cable, an emergency preemption system and all other equipment, materials and incidental materials and costs necessary to furnish, install and program a complete and functioning traffic control system as specified and as shown in the contract documents.

All uprights, cabinets and other above ground signal equipment shall be finished black with polyester powder paint applied after a seven stage pretreatment process to ensure maximum durability.

The intersection location identified on the plans: Cedar Street @ Summer Street

A list of major items and/or work required is included on the contract plans.

**SERVICE CONNECTIONS**

Service connections shown on the plans are approximate only. The Contractor shall determine exact locations from the servicing utility, arrange to complete the service connections, and be responsible for all charges incidental thereto.

A 100-ampere meter socket approved by the servicing utility company shall be furnished and installed on the side of the control cabinet by the serving utility company.

A 3-inch PVC Conduit shall be installed from the controller cabinet to the utility pole, or manhole, which will supply electrical service to the controller cabinet. This conduit shall be encased in concrete where crossing roadways and/or driveways.

## FLASHING OPERATION

Changes from automatic flashing to stop-and-go operation and from stop-and-go to automatic flashing operation shall occur as set forth in Section 4D-12 of the MUTCD.

## TRAFFIC SIGNAL EQUIPMENT

The traffic signal controller unit (CU), malfunction management unit (MMU) and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the National Electrical Manufacturers Association (NEMA) Standard No. TS 2-1998, Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements.

## TRAFFIC SIGNAL CONTROLLER

Controllers shall conform to Section 3, "Controller Units" of NEMA TS 2, "Traffic Controller Assemblies". The controller unit shall meet all applicable requirements of the NEMA Standard Publication No. TS 1 and the MassDOT Standard Specifications. The controllers should be supplied in a TS 2 Type 1 configuration as required in the list of major traffic signal items included on the plans. Controllers shall utilize an input/output interface conforming to Section 3.3.1 of the NEMA TS 2 Standard for all input/output functions with the backpanel terminals and facilities, the malfunction management unit, detector rack assemblies and auxiliary devices.

The controller shall utilize an interface conforming to Subsection 3.3 of the NEMA TS 2 Standard. The controller unit shall utilize an input/output interface conforming to the requirements of part of Paragraph 3.3.1 for all input/output functions with the Malfunction Management Unit (MMU) and Paragraph 3.3.5 for input/output functions with the Terminal Facilities (TF) and auxiliary devices.

The controller unit shall be a keyboard-entry menu-driven unit and conform to the Standard Specifications, with internal time base coordination, emergency preemption, and programmatic capability. The controller shall be complete with a module, including modem card and physical connector, to support closed loop communication.

## MALFUNCTION MANAGEMENT UNITS

The malfunction management units (MMU) shall comply with Section 4 of the NEMA TS 2 standard. The MMU shall be capable of operating as either a Type 16 with 16 channels (8 vehicle, 4 pedestrian, 4 overlap) or a Type 12 with 12 channels (8 vehicle, 4 overlap). The MMU's supplied shall be configured to operate as Type 16 units.

The MMU's in either the Type 16 or Type 12 configuration shall be capable of operating in a NEMA TS 2 Type 2 cabinet, a NEMA TS 2 Type 1 cabinet, or a NEMA TS 1 cabinet without loss of functionality. The MMU shall be connected directly to the controller unit to support enhanced MMU monitoring of controller operations.

## BUS INTERFACE UNIT

The Controller Cabinet will be equipped with a Bus Interface Unit (BIU). The BIU shall comply with Section 8 of the NEMA TS 2 Standard.

The BIU shall be fully interchangeable with any other manufacturer's unit and interchangeable in a NEMA TS 2 Type 1 cabinet assembly.

The BIU shall perform the interface function port 1 at the controller unit, the malfunction management unit, the loop detector rack assembly and the backpanel terminal and facilities.

At a minimum, two LED indicators shall be provided on the BIU front panel. One indicator shall serve a dual use; as a power on indication and as a diagnostic indicator for proper operation of the device. The second indicator shall serve as a transmit indicator illuminating each time data is transmitted.

The controller cabinet shall include a minimum of two (2) spare BIU's.

## LOOP DETECTION

Wire loop detectors shall be installed in the roadway for vehicle detection. In advance of the loop detector installation, the Contractor shall mark, on site, the loop detectors with any changes required by field conditions such as manholes. The loop detector layout shall be inspected and approved by the Engineer before the loop detectors are installed.

Loop wire shall be encased in a protected plastic tubing of PVC or polyethylene plastic, IMSA 51-5,0.25 inch outside diameter, and the wire may have cross-linked polyethylene insulation or it may have THHN/THWN insulation.

Splicing insulator shall be an approved re-enterable rigid body splice kit with a non-hardening sealing compound compatible with the wire insulation.

**Splice and Connection:** Splicing and connection shall be made in the pull box nearest the roadway loop sensor but not exceeding four loops per pull box. All loops included in a detector group as shown on the plans shall be spliced in a single pull box. Each lead and lead-in connector shall be stripped back and spliced using a pressure type wire connector applied with a crimping tool. Multiple loop sensors shall be identified as detailed on the plans.

Lead-in splicing shall be staggered to prevent contact with each other. Each crimped splice shall be soldered and insulated. The insulation material shall be heat-shrunked polyolefin. The shielded lead-in cable outer jacket and shield shall be stripped back sufficiently to ensure that the shield cannot come into contact with the spliced conductors. Follow the instructions of the kit manufacturer for this procedure when installing the re-enterable splice kit.

**NOTE WELL:** *The above splice shall be done on the day of the loop wire installation to prevent the entrance of any moisture into the plastic tubing.*

The lead-in conductors shall be connected to the appropriate terminals in the controller cabinet, by using crimped or soldered terminal ends. The heat source for soldering shall be electrical not exceeding 30W capacity.

**Testing of Loops:** The following test procedure shall be performed in the presence of the Engineer and a representative from the City of Somerville wiring before and after the loop sensor is sealed in the pavement as detailed below. The cost of equipment, labor, and materials to perform such testing and similar re-testing following repairs, replacement, or adjustment of any detector within the project area shall be included in the contract unit price for this Item.

After installation of wire loop sensors in the roadway and installation of shielded lead-in connecting the loop sensors to the controller cabinet, each loop sensor and lead-in combination shall be tested (at the controller cabinet) for proper installation. The resistance from lead to lead of the same loop shall not exceed three (3) ohms per one thousand (1000) feet as measured by a high quality meter suitable for measurements of low resistance in the range of 1 to 6 ohms.

A megohm meter test at 500 volts DC shall be made between the two leads of a loop/lead-in combination temporarily spliced together, but otherwise disconnected from all terminals, and the shield drain wire and the earth ground connection. These resistances shall be at least one hundred (100) megohms.

A megohm meter test at 500 volts DC shall be made between lead-in shield and the earth ground rod. This resistance shall be at least one hundred (100) megohms.

The meter used for these tests shall be checked for calibration each day of use by using a resistor block of  $\pm 5\%$  resistors simulating loads of 1 megohm, 20 megohm and 100 megohms. The observed meter reading shall be  $\pm 10\%$  of the nominal resistor load.

If any loop sensor and lead-in combination fails to pass any one of the four (4) tests, it shall be repaired and then re-tested on two occasions at least two (2) weeks apart and then shall pass on each re-test occasion. If the loop sensor lead-in combination does not pass all these re-tests, a new loop sensor and/or lead-in shall be installed, and shall pass these tests, at no additional cost.

After the above tests have been satisfactorily completed, all loop sensor/shielded lead-in inductance shall be measured and a written report of the results shall be filed with the Engineer and a copy stored with the "box prints" at the intersection.

## LOAD SWITCHES

Load switches shall comply with Subsection 6.2 of the NEMA TS 2 Standard. All load switches shall utilize optically isolated encapsulated modular solid-state relays. Discrete components on circuit boards are not acceptable.

Load switch indicator lights shall be LED-type and wired on the input side of the device.

Note: The controller cabinet assembly shall be initially supplied with a full complement of load switches to accommodate each available position of the backpanel.

## FLASHER

Flashers shall comply with Subsection 6.3 of the NEMA TS 2 Standard and be equipped with two output indicator lights which will show flashing power out to the cabinet assembly.

## FLASH TRANSFER RELAYS

Flash transfer relays shall comply with Subsection 6.4 of the NEMA TS 2 Standard.

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

Note: The controller cabinet assembly shall be initially supplied with a full compliment of flash transfer relays to accommodate each available position of the backpanel.

## TRAFFIC CONTROLLER CABINET

The controller cabinets shall conform to the NEMA TS 2 Type 1 Standards, Section 7. Cabinet size shall be as indicated on the plans and as shown below. It should be noted that approximate cabinet dimensions are in inches.

<u>Item Number</u>	<u>NEMA TS 2 Cabinet Type</u>	<u>Cabinet Size (Nominal) (HxWxD*)</u>	<u>Back Panel</u>	<u>Mounting</u>	<u>Malfunction Management Unit</u>
-	6	52x44x28	12-Position	Ground	16 Channel

\* Approximate cabinet dimensions are provided in inches.

Note: The control cabinet shall be initially wired with a “D” harness. All wires for this harness shall be properly terminated on the back panel.

The cabinet shall also be wired with a normally closed switch connected to a user defined input to the controller for remote monitoring of the control cabinets’ door open status.

The following requirements are applicable to each signalized location and are designed for effective use of a laptop computer in conjunction with traffic signal controllers. These requirements are also designed to permit all engineers, electricians and technicians (including those who are disabled but ambulatory) to work in the cabinet in a safe, effective and comfortable manner. To this extent, the following meets applicable ADA requirements.



1. Adjust the control cabinet height by use of a cabinet extender, adjust the placement of cabinet shelves, adjust the height of the cabinet foundation or provide any combination of these three items so that the top of the LCD or other visual display window of both the local controller and the master controller is no more than 48-inches above finished grade in front of the cabinet. The top of the cabinet door opening shall be at least 5-feet 8-inches above finished grade. Any technical provision, plan detail, standard specification or standard drawing to the contrary shall not apply to the extent that it may conflict with this viewing height requirement.
2. Furnish and install one slide-out/slide-in shelf or swing-out/swing-in shelf appropriate for the size and load of a laptop computer. This moveable shelf shall support the bottom of the laptop computer at a height between 3-feet 4-inches and 3-feet 8-inches above finished grade in front of the cabinet.
3. Furnish and install a paved pad in front of the control cabinet. This pad may be of bituminous concrete or cement concrete, built in accordance with the sidewalk specification applicable to this project, approximately level, approximately 1-inch above the surrounding unpaved surface, or at even grade with the adjacent surface if paved. This pad shall abut the front of the cabinet, and project at least 1-foot to each side of the cabinet and at least 3-feet in front. No pad is required if the front of the cabinet immediately abuts an existing or proposed paved sidewalk or other paved surface.
4. Both the firmware and software version in each timer unit shall be the same throughout the project, and shall be the latest version available on the market. In addition, the Contractor shall promptly furnish to the Owner and install all upgraded versions of both firmware and software through the last day of the inspection period, guarantee period or warranty period, whichever date is later.
5. The Contractor shall furnish one cable with each new timer unit to connect a controller timing mechanism to a laptop computer. This cable shall have a termination at one end to match the controller. It shall have a termination on the other end to match the type of serial port found on laptop computers, usually DB9. This cable shall be wired to provide serial RS232C communication between the controller and the computer.
6. Payment for the work described above shall be deemed to be incidental to and included in the prices bid for various items of traffic signal work, and no additional payment shall be made for the work described above.

## BACKPLATES

Louvered backplates shall be provided on all signal heads as noted on the plans. The top, bottom and sides of all backplates shall measure from five to six inches in width. No louvers shall be closer than ½-inch from the inner edge of the backplate panel. Louver orientation shall be vertical on sides and horizontal on top and bottom.

Backplates shall have a dull black finish on the side oriented with the signal face. The back side of the backplate shall match the color of the signal housing.

Retro reflective borders shall be provided on all backplates. The borders shall be constructed from a 2-inch yellow retro reflective adhesive sheeting border on the entire outer perimeter of the backplate panels. Retro reflective sheeting type shall be yellow, Type III or Type IV. The retro reflective border shall be placed no closer than ½-inch from all louvers. No sheeting is allowed over any louvered areas.

## PEDESTRIAN SIGNAL HEADS, INDICATIONS AND APPURTENANCES

### General Description

The Audible-Tactile Pedestrian Signal System shall consist of all electronic control equipment, mounting hardware, pushbuttons and signs, which are designed to provide both a pushbutton with a raised vibrating tactile arrow on the button, along with a variety of audible sounds for different pedestrian signal functions.

### Design Compliance

1. The system shall meet the functionality requirements of MUTCD 2009-CAMUTCD 2011-4E.
2. The system shall meet NEMA TS 2 Section 2.1 Temperature and Humidity (salt-fog) requirements.
3. The system shall meet NEMA TS 2 Section 2.1 Transient voltage Protection requirements.
4. The system shall meet NEMA TS 2 Section 2.1 Mechanical Shock and Vibration requirements.
5. The system shall meet IEC 61000-4-4, IEC 61000-4-5 Transient Suppression requirements.
6. The system shall meet FCC Title 47, Part 15, Class A Electronic Noise requirements.
7. The Push Button Station (PBS) Enclosure shall meet NEMA 250 – Type 4X Enclosure requirements.
8. The system shall meet NEMA TS 4 – electric Reliability requirements (applicable portions of Section 8)

### Functional Requirements

1. The system shall be able to set to vibrate a tactile arrow button during the WALK interval following a button push and/or every time the walk comes up.
2. The system shall have the field-selectable function known as “Locating Tone”. This means that during the FLASHING DON’T WALK and the DON’T WALK intervals, the systems shall provide a locating tone that emanates from Pedestrian Push Button Station. The system shall provide at least three different sounds to choose from.
3. The system shall have the field selectable function known as “Extended Push Activation”. Defined as audible WALK message shall only be activated and audible during WALK interval if the pedestrian call button is depressed continually beyond a field selectable minimum period of time (from .5 seconds to 6 seconds). Also, for the following walk phase, the volumes will be increased to play at a settable minimum volume level.
4. The system shall have the field selectable function known as “Informational Message”. This means that a custom message giving the location of the street to cross and the

intersection (or other information) will be localized only when the button is depressed for a minimum field selectable time.

5. The APS shall provide a “Wait” message that plays once the button is activated and repeats until the walk cycle initiates. This message must have the field selectable option of OFF or repeating every 4, 6, 8, or 10 second intervals.
6. The system shall have standard “Travel Direction” options that can be selected at the time of installation with either a vendor supplied wireless hand-held Configurator device or Windows XP/7 PC-based Laptop software program.
7. The system shall have at least five field selectable WALK sound options including a cuckoo, a chirp, a MUTCD rapid tick or user-defined custom voice message.
8. The system shall provide three pedestrian-clearance sound choices including audible countdown (field selectable). The audible countdown shall represent the time remaining during the pedestrian clearance interval. Timing is automatically adjusted to CLEARANCE INTERVAL timing red from traffic controller associated pedestrian phase output.
9. LOCATE tone and “Walk”, “Pedestrian Clearance” audible features shall have independent assignable minimum and maximum volume limits.
10. The system shall utilize an interval ambient sensing microphone located within the pedestrian pushbutton (PPB) station in a non-visible, environmentally protected housing.
11. All sound levels shall adjust automatically via the interval PPB audible feedback microphone; in response to ambient noise measurements over 60 dB range with additional software-based volume control to adjust the sound level at ambient, 5dB or 10 dB over ambient, to a maximum of 100dB.
12. The system shall have an independent ambient adjustment setting for the locate tone that allows the locate tone volume to be set to play below the ambient noise level.
13. The APS shall utilize high quality digital audio technology, utilizing a minimum 12-bit sample at a 16 Hz sample rate. The audio amplifier must have total harmonic distortion (THP) of less than 3% at 75dB.
14. The firmware and voice messages shall be upgradable via a PC standard USB port at the PBS. There shall be no requirement for the IC chips or module hardware to be removed or exchanged in order to complete a firmware update.
15. Use of field replaceable fuses is unacceptable. All fuses and overload protection circuits shall be solid state, and self-resetting in the event of overload.
16. All field selectable options shall be set and adjusted using vendor supplied infrared remote programmer or Laptop USB port, without use of potentiometer or hardware adjustments. All USB adjustments shall include a Windows XP/7/Vista PC-based program with password security.
17. The system shall work with the vendor windows XP/7/Vista PC-based program to allow time of day (TOD), week, month and holiday programming, with a minimum of 4 TOD alternate programs.
18. The system shall have an event tracking log, accessible via the vendor’s Windows XP/7/Vista PC-based program, to allow downloading of the time stamped event data.
19. The system shall operate with the vendor’s Windows XP/7/Vista PC-based software program to record and upload cumulative pedestrian count and call data.

## TESTING OF GROUNDING SYSTEM

The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer in accordance with the Standard Specifications.

## EMERGENCY VEHICLE PREEMPTION

The emergency vehicle preemption control system shall consist of a data-encoded phase selector to be installed within the traffic control cabinet. This unit will serve to validate, identify, classify and record the signal from the optical detectors located on support structures at the intersection. Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans.

The optical detectors shall be single input, single output units used to control one approach.

The phase selector shall be a rack-mounted plug-in four channel, dual priority device. The phase selector shall plug into a shelf-mounted single card slot chassis. Programming the phase selector shall be via a PC-based computer utilizing unit specific software. One copy of software, on 8cm or 12cm CD shall be supplied and licensed to the City of Somerville. A hard copy of final programming data shall be left in the control cabinet. The CONTRACTOR shall supply a complete set of interface cables for phase selector to laptop connection.

The CONTRACTOR shall install a confirmation strobe at the traffic signal location as shown on the plans. The confirmation strobe shall serve to validate to the driver of the emergency vehicle that the traffic signal has recognized the preemption call and will initiate the proper preemption sequence. The confirmation strobe shall be a white lens.

The CONTRACTOR shall be responsible for the proper programming of the phase selector, orientation of the optical detectors, and all other work necessary to provide a complete and operating emergency vehicle preemption system. The CONTRACTOR may be required to field adjust the location of the optical detectors in the presence of the Engineer and the City of Somerville Department of Public Works Engineering Division to properly detect preemption calls from approaching vehicles.

## SIGNAL POLES AND FOUNDATIONS

Signal poles and foundations shall be fabricated and constructed in conformance with the plans.

Signal poles shall be Type 2 Black Painted Steel with shoe bases.

Signal pole foundations, the standard signal pole foundation shall be modified to a concrete cored foundation.

Signal pole foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is not impaired.

## POSTS AND BASES

Signal posts and bases shall be in accordance with MassDOT Standards.

## SIGNAL HEADS

Signal heads shall be rigid mounted on mast arms, with the bottom of all signals at the same height. All traffic signal lenses shall be 12-inches in diameter unless otherwise noted on the plans. Louvered backplates shall be 5-inches provided on all signal heads as noted on the plans. All signal heads shall be equipped with light emitting diode (L.E.D.) 12" modules as noted on the plans.

Signal heads shall be made of aluminum. Signal heads shall be painted black in accordance with MassDOT standards with cut tunnel visors unless otherwise noted on the major items list on the plans.

### Red, Yellow, and Green LED Vehicle Signal Modules

Any equipment that has been type-tested and approved according to section 815.21 of the Standard Specifications prior to the date of award of this contract will be considered as meeting these specifications.

All Red, Yellow and Green LED signal housings with the exception of optically-programmed and fiberoptic housings shall conform to the following:

All Red and Green LED signal modules shall conform to "Interim LED Purchase Specification of the Institute of Transportation Engineers, Vehicle Traffic Control Signal Heads – Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules", July 1998, or most current version, Institute of Transportation Engineers (ITE), 525 School Street, SW, Suite 410, Washington, DC, 20024-2797.

Yellow LED signal modules shall conform to the above specifications with the exception that yellow modules shall meet maintained Minimum Luminous Intensity values of Table 1, Section 4 of the above referenced ITE specification of compliant green signal modules at 25oC at 120 volts AC, throughout the useful life based on normal use in traffic signal operation over the operating temperature range.

All signal modules shall conform to the following: (in the case of a conflict, the following special provision shall overrule.)

An independent laboratory shall certify that the LED signal module complies with Section 6 Quality Assurance of the above stated ITE LED Purchase Specification.

LED signal modules must be type-tested and approved by MassDOT according to the requirements of Subsection 815.21 of the Standard Specifications for Highways and Bridges.

On the backside of the LED module there shall be a permanently marked “up” arrow to aid in the proper orientation of the module during installation.

The manufacturer’s name, trademark, serial number and other necessary identification shall be permanently marked on the backside of the LED signal module.

#### Physical and Mechanical Requirement

LED signal modules shall fit without modifications into existing traffic signal housings conforming to “Vehicle Traffic Control Signal Heads (VTC SH) published in the Equipment and Materials Standards of the Institute of Transportation Engineers. The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation. The LED signal assembly shall conform to the applicable ASTM specifications for the materials used to fabricate the module.

Each red LED signal module shall be comprised of a smooth surfaced Red, UV stabilized polycarbonate outer shell, multiple LED light sources, a power supply and a polycarbonate back cover assembled in a gasketed or silicon sealed unit.

Each yellow LED signal module shall be comprised of a smooth surfaced Yellow, UV stabilized polycarbonate outer shell, multiple LED light sources, a power supply and a polycarbonate back cover assembled in a gasketed or silicon sealed unit.

Each green LED signal module shall be comprised of a smooth surfaced Green, UV stabilized polycarbonate outer shell, multiple LED light sources, a power supply and a polycarbonate back cover assembled in a gasketed or silicon sealed unit.

#### Optical and Light Output Requirements

The minimum luminous intensity values and light output shall be maintained within the rated input voltage of 117 Volts AC. Red and Green LED signal modules shall not be allowed to fall short of the minimum intensity values of any of the 44 measuring points of the standard when the lamp is turned on cold for measurements and after a 30 minute warm-up time period at 100% duty cycle. Yellow LED signal modules shall not be allowed to fall short of the minimum intensity values for green modules as described above, at any of the 44 measuring points of the standard.

#### Electrical

The maximum wattage for red and green 12-inch balls shall be 20 Watts and 10 Watts for the 12-inch red and green arrows. The maximum wattage for 12-inch yellow balls shall be 24 Watts and 12 Watts for the 12-inch yellow arrows.

The LED sources shall not be powered above 70% of the manufacturer’s specified rate load. This shall be clearly shown in laymen’s terms through calculations, schematics, catalog cuts, etc.

Red LED sources shall be AlInGaP (Aluminum Indium Gallium Phosphide) type shown clearly in a catalog cut or similar literature.

Yellow LED sources shall be AlInGaP (Aluminum Indium Gallium Phosphide) type shown clearly in a catalog cut or similar literature.

Green LED sources shall be InGaN (Indium Gallium Nitride) type shown clearly in a catalog cut or similar literature.

#### Warranty

The LED signal module will be replaced or repaired by the manufacturer if it exhibits a failure due to workmanship or material defects within the first 60 months of field operation.

The LED signal module will be replaced or repaired by the manufacturer if it exhibits either a greater than 40 percent light output degradation or a fall below the minimum intensity levels within the first 36 months of field operation.

#### SOFTWARE

All local controller, malfunction management unit, loop detector amplifier and emergency vehicle preemption software shall be supplied with the latest available revision. Any software upgrades released by the manufacturer shall be supplied at no charge to the City of Somerville for a period of five years after acceptance of the traffic signal installation.

#### DOCUMENTATION

Each programmable local hardware component (i.e. controller, malfunction management unit, loop detector amplifier, emergency vehicle preemption phase selector) shall be initially programmed by the Contractor based on information contained on the plans. Note: Three bound sets of hard copy programming per device shall be supplied to the City of Somerville by the CONTRACTOR.

Upon final acceptance of the signal by the CITY, the CONTRACTOR shall supply two (2) 8½"x11" or 11"x17" laminated copies of the final traffic signal design plan and sequence and timing chart. One to be given to the City of Somerville Transportation Director and one to be left in the cabinet documentation envelope mounted on the inside of the cabinet door.

#### MAINTENANCE OF TRAFFIC SIGNALS

It shall be the responsibility of the Contractor to provide all labor, equipment and material required for the maintenance of full repair of all temporary and proposed traffic control equipment within the project limits, including damage by automobile accident. The maintenance responsibility shall commence from the date the Contractor begins work on or near an existing signal and shall continue until the date when the Engineer recommends acceptance of the completed job.

For the purposes of these paragraphs, the phrase "Traffic Signal Control Equipment" is intended to include, but is not limited to: controllers, detectors, signal housings, supporting structures, cabinets, wires, conduit and all other ancillary electrical equipment used for traffic control.

#### TRAFFIC CONTROL EQUIPMENT REMOVED AND STACKED

The removal and stacking of the existing equipment marked on the plans shall conform to the relevant provisions of Subsection 815.65 and the following:

The Contractor shall remove the existing traffic signal control equipment indicated on the plans and stack for transport by Contractor's forces to the City of Somerville Department of Public Works Yard.

All traffic signal equipment shall remain the property of the City unless the Contractor is notified in writing by the Engineer to dispose of specific items. Disposal of existing equipment shall be specified in the Standard Specifications.

#### FINAL INSPECTION

The Contractor shall arrange for a final inspection of the signal system once the 30 day fine tuning and adjustment period is completed. At a minimum, representatives from the Contractor, the Design Engineer and the City shall be present.

#### COMPENSATION

Payment for all work required under this section shall be included in the LUMP SUM bid price for the project which shall include all labor, materials, equipment and any incidental cost required to complete the work with no additional compensation provided.

<b>ITEM 868.041</b>	<b>PAVEMENT ARROWS AND LEGENDS</b>	<b>SQUARE FOOT</b>
	<b><u>REFL. WHITE (EPOXY)</u></b>	
<b>ITEM 868.04</b>	<b>4 INCH REFLECTORIZED WHITE LINE (EPOXY)</b>	<b>FEET</b>
<b>ITEM 868.06</b>	<b>6 INCH REFLECTORIZED WHITE LINE (EPOXY)</b>	<b>FEET</b>
<b>ITEM 868.12</b>	<b>12 INCH REFLECTORIZED WHITE LINE (EPOXY)</b>	<b>FEET</b>
<b>ITEM 868.3</b>	<b>BICYCLE SYMBOL WHITE (EPOXY)</b>	<b>SQUARE FEET</b>
<b>ITEM 869.06</b>	<b>6 INCH REFLECTORIZED YELLOW LINE (EPOXY)</b>	<b>FEET</b>
<b>ITEM 869.1</b>	<b>GREEN PAINT FOR BIKE LANES (EPOXY)</b>	<b>SQUARE FEET</b>

The work under these items shall conform to the relevant provisions of Section 860 of the Standard Specifications and the following:

Item 868.04, 868.06, 868.12, 869.06 will be measured for payment by the linear foot of actual markings installed, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

Item 868.041, 868.3 and 869.1 will be measured for payment by the square foot of actual markings installed, which price shall include all labor, materials, equipment, and incidental costs required to complete the work.

<b>ITEM 874.2</b>	<b>TRAFFIC SIGN REMOVED AND RESET</b>	<b>EACH</b>
<b>ITEM 874.21</b>	<b>MISC TRAFFIC SIGN REMOVED AND RESET</b>	<b>EACH</b>

The work under these items shall conform to the relevant provisions of the Standard Specifications and the following:



The contractor shall take all necessary precautions not to damage any of the signs during the removal process. Any signs damaged beyond use shall be replaced by the Contractor at no cost to the City of Somerville.

All signs removed and stacked shall be delivered to the Somerville Department of Public Works Yard, Somerville, MA 02038, at no additional cost.

All signs shall be reset as required by the engineer at no additional cost.

#### Basis of Payment

Work under this Item shall be paid at the Contractor bid price, per each unit, which payment shall be considered compensation for all labor, tools, equipment and materials needed to do the work as described above.

## SECTION 02080

### DUCTILE IRON PIPE AND FITTINGS FOR WATER MAINS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers the furnishing, handling, hauling, laying, jointing, testing and disinfecting of all ductile iron pipe, including fittings and appurtenant work as indicated on the drawings and as specified.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02513, INSULATION FOR PIPELINES
- C. Section 02514, HYDRANTS AND VALVES
- D. Section 02515, WATER SERVICE CONNECTIONS
- E. Section 02516, CONNECTIONS TO EXISTING WATER MAINS

##### 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 this specification as referenced:

#### American Water Works Association (AWWA)

AWWA	C104	Cement-Mortar Lining for Ductile- Iron Pipe and Fittings
AWWA	C105	Polyethylene Encasement for Ductile Iron Pipe Systems
AWWA	C110	Ductile-Iron and Gray-Iron Fittings Water

AWWA	C111	Rubber Gasket Joints for Ductile- Iron Pressure Pipe and Fittings
AWWA	C150	Thickness Design of Ductile-Iron Pipe
AWWA	C151	Ductile-Iron Pipe, Centrifugally Cast for Water
AWWA	C153	Ductile-Iron Compact Fitting for Water Service.
AWWA	C600	Installation of Ductile-Iron Water Mains & Their Appurtenances
AWWA	C651	Disinfecting Water Mains

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

- A. Six sets of all shop drawings shall be submitted to the Engineer for review.
- B. Shop drawings shall consist 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, restrained joints, and lining and coating in accordance with specifications.

PART 2 - PRODUCTS

2.01 PIPE:

- 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.

2.02 JOINTS:

- A. Joints for ductile iron pipe shall conform to AWWA C111.
- B. Pipe and fittings shall be furnished with approved joint restraining appurtenances as specified herein, or as indicated on the drawings, to keep the piping from pulling apart under pressure.

2.03 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.

2.04 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.

2.05 LINING AND COATING:

- A. The inside of pipe and fittings shall be given a cement lining and asphaltic seal coat in accordance with AWWA C104. The thickness of the lining shall be double that specified in AWWA C104.
- 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.

2.06 FLEXIBLE COUPLINGS:

- A. The Contractor shall use solid sleeve coupling fittings for joining pipe. Sleeve-type flexible couplings may be substituted only with the approval of the Engineer.
- B. All couplings and accessories shall be of a pressure rating at least equal to that of the pipeline in which they are to be installed.
- C. 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.
- D. Sleeve-type couplings shall be made by Dresser Mfg. Div., Bradford, PA; Smith-Blair,

Inc., San Francisco, CA; Romac Industries Inc., Seattle, WA; Ford Meter Box Co., Wabash, IN; or be an approved equal.

- E. 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.

## 2.07 JOINT RESTRAINTS:

- A. Where indicated or necessary to prevent joints or sleeve couplings from pulling apart under pressure, anchoring and joint restraint methods shall be utilized. Methods shall be restrained joint systems. The number of joints to be restrained shall be determined in accordance with Table 1, as shown on the construction plans or provided by the Engineer.
- B. Restrained joint system for standard mechanical joint or push on joint pipe shall be Megalug or Coverall by EBAA Iron Sales Inc., Eastland, TX; Fast-grip joint by American Cast Iron Pipe Company, Birmingham, AL; Field Lok 350 Gasket by United States Pipe and Foundry Company, Birmingham, AL; or approved equal. Methods that rely on the use of friction clamps and/or retainer glands with set screws alone are not acceptable.
- C. Restrained joint systems for non-standard or modified joints shall be Flex-Ring or Lok-Ring by American Cast Iron Pipe Company, Birmingham, AL; TR-Flex Joint by United States Pipe and Foundry Company, Birmingham, AL; Super-Lock Joint by Clow Corporation, Bensenville, IL; Fastite Joint by Atlantic States Cast Iron Pipe Company, Philipsburg, NJ; Snap-Lok or Bolt-Lok by Griffin Pipe Products Company, Oak Brook, IL; or approved equal.
- D. Concrete thrust blocks shall be used for 6-inch, 8-inch, 10-inch, or 12-inch pipe in addition to the use of a joint restraint system. Use of concrete thrust blocks shall be installed with the minimum bearing area (in square feet) against undisturbed material in accordance with the following:

Size of Main	90° Bends, Tees, Caps and Plugs	45° Bends and Wyes	22-1/2° Bends	11-1/4° Bends
6- & 8-inch	5	4	2	2
10- & 12-inch	12	9	5	2

- E. Tie rods may only be used for 6-inch, 8-inch, 10-inch, or 12-inch pipe where use of a joint restraint system is not feasible. Bolts shall have adequate length to allow nuts on both sides of the gland. Tie bolts shall have the same diameter as the tie rods and be in accordance with the following:

Pipe Size	Tie Rod	
	Number	Diameter
6	2	1/2"
8	2	3/4"
10	2	3/4"
12	4	3/4"

- F. Location of restrained joints shall be based on Table 1, as shown on the construction plans or provided by the Engineer. All joints that occur within the restrained length listed in Table 1, for the specific application, shall be restrained. For example, for a 90° bend, 8-inch unwrapped pipe, the restrained length required is 33 feet. Therefore, all joints within 33 feet of the 90° bend must be restrained.

## 2.08 POLYETHYLENE ENCASEMENT:

Where called for on the drawings, the pipe shall be encased in polyethylene conforming to AWWA C105.

## 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. DEPTH:

1. The pipe shall be installed with a minimum of 5'-0" of cover, unless specifically indicated otherwise on the plans or required by the Engineer.
2. Where pipe is installed at less than the required cover, the Contractor shall furnish and install insulation in accordance with Section 02513, INSULATION FOR PIPELINES, or as required by the Engineer.

#### B. PIPE AND FITTINGS:

1. No defective pipe or fittings shall be laid or placed in the piping, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.
2. Each pipe and fitting shall be cleared of all debris, dirt, etc., before being laid and shall be kept clean until accepted in the complete work.
3. Pipe and fittings shall be laid accurately to the lines and grades indicated on the drawings or as required. Care shall be taken to ensure good alignment both horizontally and vertically.
4. In buried pipelines, each pipe shall have firm bearing along its entire length.
5. Castings to be encased in masonry shall be accurately set, with the bolt holes, if any, carefully aligned.
6. Immediately prior to being set, castings shall be thoroughly cleaned of all rust, scale and other foreign material.
7. Fittings shall not be used to clear beneath or above an existing structure or pipeline unless approved by the Engineer. The water main shall be brought to a depth sufficient to clear the structure or pipeline without the use of bends.

#### C. TEMPORARY PLUGS:

At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

#### D. PUSH ON JOINTS:

1. Joining of push-on joint pipe shall conform to AWWA C600.
2. If effective sealing of the joint is not attained, the joint shall be disassembled, thoroughly cleaned, a new gasket inserted and joint reassembled.
3. Deflection of alignment at a joint shall not exceed the appropriate permissible deflection as specified in AWWA C600. The tables in AWWA C600 indicate the maximum permissible deflection for 18 and 20-foot pipe lengths. Maximum permissible deflections for other lengths shall be in proportion to such lengths.

E. MECHANICAL JOINTS:

1. Assembling of fittings with mechanical joint ends shall conform to AWWA C600.
2. 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. The deflection of alignment at a joint shall not exceed the appropriate permissible deflection as specified in the following table. These values indicate the maximum permissible deflection for 18-foot lengths. Maximum permissible deflections for other lengths shall be in proportion to such lengths.

Pipe Deflection Allowances	
Maximum permissible deflection, inches	
<u>Diameter of Pipe (inches)</u>	<u>Mechanical-Joint</u>
6	27
8-12	20
16	13.5
20	11
24	9

F. RESTRAINED JOINTS:

1. Joining of restrained joint piping shall conform to the manufacturer's recommendations.
2. If effective sealing of the joint is not attained, the joint shall be disassembled, thoroughly cleaned, a new gasket inserted and joint reassembled.
3. Deflection of alignment at a joint shall not exceed the appropriate permissible deflection recommended by the manufacturer.



4. All restraining appurtenances (and tie rods) shall be coated with an approved bituminous paint after assembly. The completed joint shall be inspected and the paint repaired/touched-up as necessary.

G. SLEEVE-TYPE COUPLINGS:

1. 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.

3.04 POLYETHYLENE ENCASEMENT:

- A. The pipe to be encased shall be thoroughly cleaned of all soil and debris prior to installation of the polyethylene encasement. No soil or debris shall be allowed to enter the encasement during or after its installation.
- B. Polyethylene encasement shall be installed using Method A as described in AWWA C105, with the encasement joints coincident with pipe joints. Adhesive tape shall be used to secure the encasement.
- C. Minimum overlap of polyethylene encasement shall be 24-inches, 12 inches on each side of pipe joints.
- D. If required, two layers of polyethylene encasement shall be installed. The first layer shall be completely installed on and secured to the length of pipe before the second layer is installed.
- E. Tears, cuts and other damage shall be repaired with a piece of polyethylene covering secured with adhesive tape, when approved by the Engineer. Otherwise, the damaged length of polyethylene shall be replaced at the Contractor's expense.
- F. Care shall be taken when backfilling to avoid damage to the polyethylene encasement.
- G. Service and fitting connections shall be made by making an x-shaped cut in the polyethylene and folding back the cut film. Immediately following completion of the connection, the film shall be secured to the connection with adhesive tape and the cut area repaired. Service connections shall be wrapped with polyethylene encasement for a minimum of 3 feet from the point of connection to the encased pipe.
- H. At the junctions between wrapped and unwrapped pipe the polyethylene encasement shall be extended a minimum of 3 feet beyond the end of the pipe scheduled to be encased and the ends of the encasement securely taped so that no soil can enter the encasement.

3.05 TESTING:

- A. Prior to the hydrostatic pressure test, the piping shall be thoroughly flushed clean of all dirt, dust, oil, grease and other foreign material. This work shall be done with care to avoid damage to linings and coatings.
- B. The installed pipe shall be pressure tested in accordance with AWWA Standard C600.
- C. HYDROSTATIC PRESSURE TEST:

- 1. Unless otherwise approved, all pipelines shall be given a hydrostatic pressure test between line valves. The Contractor shall furnish and install suitable temporary testing plugs or caps; all necessary pressure pumps, pipe connections, meters, gates, and other necessary equipment; and all labor required. The Owner or Engineer shall have the privilege of using its own gauges.
- 2. Subject to approval and provided that the tests are made within a reasonable time considering the progress of the project as a whole, and the need to put the section into service, the Contractor may make the tests when desired.
- 3. Pipelines intended for buried service shall be tested after backfill and compaction of the trench.
- 4. The section of pipe to be tested shall be filled with water of approved quality and all air shall be expelled from the pipe. The Contractor shall follow established procedures for filling the pipe and expelling trapped air to avoid exposing the piping system to water-hammer. If blowoffs are not available at high points for releasing air, the Contractor shall excavate as required and install the necessary taps. If the Contractor changes the grade of pipe installation, he will be responsible for locating the taps at the correct location in the system for testing. Taps shall be installed at the beginning and end of each disinfection run. After completion of the test, if so required by the Engineer, the Contractor shall remove corporations used for testing; plug the holes; and backfill as necessary.
- 5. The section under test shall be maintained full of water at working pressure for a period of 24 hours prior to the hydrostatic pressure test being applied to stabilize the pipeline with respect to movement under pressure, water absorption by the lining, etc. The pipeline may require several cycles of pressurizing and bleeding trapped air prior to beginning the test.
- 6. When hydrants are in the pipeline test section, the hydrostatic test shall be made against the main valve in the hydrant. The hydrostatic test shall not be conducted against the branch valve.
- 7. The hydrostatic test shall consist of raising the water pressure within the test section to a pressure not less than 1.25 times the working pressure of the pipeline measured at the highest elevation along the test section and not less than 1.5 times

the working pressure of the lowest elevation of the test section. The specified test pressure shall be corrected to the elevation of the test gauge.

8. The hydrostatic test shall be of at least a 2 hour duration. The test pressure shall not vary by more than +/- 5 psi for the duration of the test. Test pressure shall be maintained within this tolerance by adding makeup water through the pressure test pump into the pipeline test section.
9. The amount of makeup water (testing allowance) added to the test section shall be accurately measured by suitable methods and shall not exceed the maximum allowable quantity of makeup water. No pipe installation will be accepted if the quantity of makeup water is greater than that determined by the following formula:

$$L = \frac{S D \sqrt{P}}{148,000}$$

Where:

L = makeup water, in gallons per hour  
S = length of test section, in feet  
D = nominal diameter of pipe, in inches  
P = average test pressure, in psi (gauge)

10. If the section fails to pass the hydrostatic pressure test, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified hydrostatic test.

### 3.06 DISINFECTION AND FLUSHING:

- A. The Contractor shall disinfect the lines carrying potable water.
- B. The Contractor shall furnish all equipment and materials necessary to do the work of disinfecting, and shall perform the work in accordance with the procedure outlined in AWWA C651 and all amendments thereto.
- C. In general, the procedure of disinfecting the main shall be to apply the chlorine through a tap in one end of the section and bleed it off through a tap at the other end.
- D. The applied dosage shall be such as to produce a chlorine concentration of not less than 10 mg/l after a contact time of not less than 24 hours.
- E. During the disinfection period, care shall be exercised to prevent contamination of water in existing mains.

- F. Any temporary connection to the mains or other facilities required to accomplish the disinfection of the mains shall be at the Contractor's expense.
- G. After treatment, the main shall be flushed with clean water until the residual chlorine concentration is less than 0.2 mg/l.
- H. Before disposing of the water used in disinfecting and flushing water mains the Contractor shall thoroughly neutralize it through the application of a reducing agent, as referenced in AWWA C651.
- I. Bacteriological sampling and testing shall be done in accordance with AWWA C651 for each main and each branch. Sampling shall be accomplished with sterile bottles treated with sodium thiosulfate, as required by Standard Methods. No hose or fire hydrants shall be used in collection of samples. A corporation stop installed on the main, with a removable copper tube gooseneck assembly, is the recommended method.
- J. Bacteriological sampling and testing shall be conducted by a state certified laboratory certified for total and fecal coliform analyses of potable water.
- K. Testing shall be done by a laboratory approved by the Engineer, in accordance with Standard Methods, and shall show the absence of coliform organisms. A standard plate count may be required at the option of the Engineer.

#### 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
- E. Section 02631, PRECAST MANHOLES AND CATCH BASINS

##### 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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of manufacturer's literature of the materials of this section shall be submitted to the Engineer for review.

## 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 clean and 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 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 02531, SEWER CHIMNEYS
- D. Section 02631, PRECAST MANHOLES AND CATCH BASINS

##### 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	C104	Cement-Mortar Lining for Ductile- Iron Pipe and Fittings for Water Flexible Elastomeric Seals
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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of manufacturer's literature of the materials of this section shall be submitted to the Engineer for review.
- B. Shop drawings shall consist 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 be given a cement lining and asphaltic seal coat in accordance with AWWA C104. The thickness of the lining shall be double that specified in AWWA C104.
- 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.
- A. 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.

#### 3.07 QUALITY ASSURANCE

1. On completion of a section of sewer, including building connections installed to the property line, the Contractor shall clean and 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 02113

### EXCAVATION AND STOCKPILING OF CONTAMINATED MATERIAL

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION:

- A. Furnish all labor, materials, equipment, and incidentals necessary to properly excavate, remove, and/or segregate contaminated soils for off-site disposal. The CONTRACTOR shall be responsible for analytical testing of soils for disposal and confirmatory purposes, as required by the disposal/recycling facility and ENGINEER.
- B. Field screening data (photoionization detector) are available from one boring/monitoring well location (P/MW-10) at the site which revealed slightly elevated concentrations of volatile organic compounds (VOCs) in soil samples collected from the groundwater interface (6-11 feet below ground surface), likely related to petroleum constituents. Based on field screening and laboratory results, soils present above the water table did not exhibit elevated concentrations of VOCs or gasoline constituents (based on extractable petroleum hydrocarbon analysis) and should be managed separately from soils removed from below the water table (as determined by the ENGINEER). Soils below the water table proximate to P/MW-10 have exhibited slightly elevated concentrations of VOCs by field screening methods, which are likely related to petroleum constituents.
- C. The Contractor shall excavate petroleum-contaminated soils within the limit of work on Cedar Street from approximately the southernmost point of the intersection of Summer Street and Cedar Street through the vicinity of monitoring well P/MW-10 to 40 feet south of the intersection of Cedar Street and Linden Avenue, or as required by the Engineer. All excavated soil shall be stockpiled on and securely covered with 20 mil polyethylene while awaiting disposal at a temporary storage location identified in the Excavated Materials Management Plan.
- D. Based on historical site data, contaminated materials may include soil and groundwater (see Section 02240 Dewatering) removed from below grade for the construction of below grade structures and utility work, and any other excavation activity associated with this contract.
- E. The CONTRACTOR may re-use excavated Impacted Material as trench backfill within the area proximate to P/MW-10. The CONTRACTOR shall preferentially use Impacted Material over Non-Impacted Material for backfilling purposes so as to minimize generation of surplus Impacted Material requiring disposal.

##### 1.02 RELATED WORK:

- A. Section 00890 – PERMITS
- B. Section 01380 – HEALTH AND SAFETY PLAN

C. Section 01562 – DUST CONTROL

D. Section 01570 – ENVIRONMENTAL PROTECTION

E. Section 02130 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

F. Section 02240 – DEWATERING

G. Section 02300 – EARTHWORK

### 1.03 SUBMITTALS:

A. Excavated Materials Management Plan (EMMP).

The EMMP shall include the following:

1. The procedures for excavating or other monitoring of contaminated soil generated during construction and/or site preparation, as required by regulations.
2. A schedule detailing the proposed sequence of contaminated soil excavation, stockpiling, and sampling.
3. The physical location, ownership information, and access agreement (if necessary) for property on which temporary soil stockpiling will occur.
3. Health and safety information and requirements for the work associated with this Section. The information and requirements shall be incorporated into the site-specific Health and Safety Plan submitted under Section 01380 - HEALTH AND SAFETY PLAN.

### 1.04 REFERENCES:

A. Massachusetts Department of Environmental Protection (DEP) Policy Number:

1. WSC-13-500, Similar Soils Provision Guidance.
2. WSC-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils.
3. WSC-94-320, Construction Activities in Contaminated Areas.
4. COMM-97-001, Reuse and Disposal of Contaminated Soils at Massachusetts Landfills.

B. Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.



- C. Toxic Substances Control Act (TSCA), 40 CFR 761.00.
- D. 310 CMR 30.0000 and the Resource Conservation and Recovery Act (RCRA), 40 CFR 148 and 268.

#### 1.05 DEFINITIONS:

- A. Contaminated Material: Soil, sediment, sand, vegetation, or debris indicated by analytical results to contain any contaminant concentrations equal to or greater than MCP reportable concentrations established by 310 CMR 40.0300 and 40.1600 or any reportable or cleanup concentration established in RCRA or TSCA.
- B. Impacted Material: Soil, sediment, sand, vegetation, or debris occurring at or below the groundwater table in the area proximate to P/MW-10, and indicated by analytical results to contain any contaminant concentrations lower than all MCP reportable concentrations established by 310 CMR 40.0300 and 40.1600 and/or otherwise exempt from notification under the MCP, and lower than any reportable or cleanup concentration established in RCRA or TSCA.
- C. Non-Impacted Material: Soil, sediment, sand, vegetation, or debris occurring above the groundwater table that is consistent with unregulated material identified during the 2013 and 2014 subsurface investigation activities conducted at the site. Additionally, any soil determined by the ENGINEER to be consistent with this definition based on current site data and via field screening at the time of excavation.

#### 1.06 QUALITY CONTROL:

- A. The work shall conform to applicable local, state, and federal regulatory agencies governing the handling of contaminated soils and hazardous materials.
- B. Best Management Practices shall take place while performing the work described in this Section.

### PART 2 – PRODUCTS

#### 2.01 GENERAL:

- A. At the expense of the CONTRACTOR, all personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection required for this work as indicated in the site-specific Health and Safety Plan and in accordance with Section 01380 – HEALTH AND SAFETY PLAN.
- B. Containers used for hauling the contaminated soil shall be constructed of steel, in good condition and designed for the intended purpose of safe, secure storage of hazardous material during loading and transport to an approved disposal facility. The containers must be containers approved by and labeled in accordance with the U.S. Department of Transportation (DOT).

- C. The containers shall be sift proof and water resistant in accordance with the U.S. DOT regulations.

## 2.02 FILL MATERIALS:

- A. Backfill material shall meet the requirements specified in Section 02300 - EARTHWORK.

## PART 3 – EXECUTION

### 3.01 GENERAL:

- A. The CONTRACTOR shall excavate and convey materials to perform site work described in this Contract.
- B. The CONTRACTOR shall segregate materials excavated during the course of the Work that are suspected to be contaminated based on existing analytical data and/or visual and olfactory appearance or other physical indications of contamination as required by the ENGINEER.

### 3.02 FIELD SCREENING

- A. The ENGINEER shall perform field screen on-site soils for the presence of gasoline constituents using a properly calibrated photo-ionization detector (PID) to be provided by the ENGINEER for the duration of excavation and confirmatory sampling activities. Field screening shall be used to determine the extent/limits of gasoline-contaminated (as determined by the ENGINEER) soil.

### 3.03 EXCAVATION AND RELOCATION OF CONTAMINATED MATERIAL:

- A. Where soils are identified on the drawings to be gasoline-contaminated, the Contractor shall excavate and place these soil materials on and under sheeting as prescribed in Section 1.01(C). The soil shall be transported to a temporary storage location designated by the CLIENT and identified in the EMMP while awaiting final disposition. The soils shall be removed from the temporary storage location within 14 days of generation in accordance with 310 CMR 40.0462(6).
- B. Contractor shall backfill excavated areas to match existing grades with Class B backfill and loam, as applicable, in accordance with Section 02300 and Section 02113.1.

### 3.04 CHARACTERIZATION:

- A. The CONTRACTOR shall be responsible for characterizing the material for the purpose of obtaining approvals from the disposal facility(ies).
  - 1. The CONTRACTOR shall perform all requested lab analyses of surplus contaminated material as required by the receiving facility.

2. The CONTRACTOR will be permitted to collect additional samples to perform additional testing of the contaminated material as required by the facility at no additional cost to the OWNER.

### 3.05 STORAGE OF EXCAVATED MATERIAL:

- A. The CONTRACTOR shall be allowed to stockpile potentially contaminated excavated material at a remote location to be designated by the CLIENT and identified in the EMMP pending approval/manifests for transport and disposal or reuse if the following conditions are met:
  1. The stockpiled contaminated material must be removed off-site as soon as possible and in all cases within 14 days from the day of its initial excavation in accordance with 310 CMR 40.0462(6).
  2. The stockpiled contaminated material shall be placed on 20-mil (minimum) polyethylene sheeting and covered with 20-mil (minimum) polyethylene sheeting or 10-mil nylon sheeting.
  3. The polyethylene sheeting shall be bermed around the edges to prevent any infiltration of stormwater or exfiltration of leachate.
  4. The base of the temporary stockpile shall be sloped to create leachate collection points. Collect and dispose of all leachate generated from the stockpiles.
- B. If any one of these conditions cannot be met, then the CONTRACTOR shall store contaminated material soil in water-tight containers at no additional cost to the OWNER pending transportation and disposal. The containers must be removed off site within 14 days from the last day of excavation/generation.

### 3.06 POST-EXCAVATION CONFIRMATORY SAMPLING AND EXCAVATION OF ADDITIONAL CONTAMINATED MATERIAL:

- A. The ENGINEER may stop the CONTRACTOR's work in a particular location at any time in order to have samples taken and analyzed. If necessary, the CONTRACTOR shall assist the ENGINEER in collecting samples. The work shall not resume in that area until approved by the ENGINEER. Stoppage of work for this reason, or until laboratory results are delivered to the ENGINEER, shall not be a cause for the CONTRACTOR to request additional compensation or an extension of time to the Contract or to other intermediate Contract deadlines.
- B. All analyses shall be provided by the CONTRACTOR at no additional cost to the OWNER with standard 5-7 day turnaround time.
- D. Submit a copy of all chemical analyses to the ENGINEER within 2 days of receipt of the laboratory report.

- E. All analyses shall be performed by a laboratory certified for such analyses by the Commonwealth of Massachusetts.
- F. The CONTRACTOR shall not backfill the excavation until the ENGINEER has given approval to do so. The CONTRACTOR shall expect at least a three (3) day period for time to confirm that the appropriate limits of excavation has been determined.

END OF SECTION

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## SECTION 02130

### TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

#### PART 1 – GENERAL

##### 1.01 DESCRIPTION:

- A. The intended purpose of the Section is to address the transport and disposal of contaminated soil that will be encountered during the course of the Work as shown on the Contract Drawings.
- B. A portion of this project is located within an area previously identified as having subsurface impacts likely related to petroleum. Field screening data (photoionization detector) are available from one boring/monitoring well location (P/MW-10) at the site located within the Cedar Street right-of way (refer to Drawing S-6 for well location and estimated area of impact) which showed slightly elevated concentrations of volatile organic compounds (VOCs) likely due to petroleum constituents.
- C. Soils located at or below the water table (approximately 6' below ground surface at this well location) within the estimated area of impact have exhibited slightly elevated concentrations of VOCs and are categorized as Impacted Material (refer to Paragraph 1.05) for the purposes of transportation and disposal as surplus material. Transportation and disposal of Impacted Material within the estimated area of impact shall be in accordance with this Section. CONTRACTOR shall include all costs associated with transportation and disposal of surplus Impacted Material as incidental to the subdivisions of ITEM 1 – DRAINS COMPLETE IN PLACE, ITEM 2 – SEWERS COMPLETE IN PLACE, ITEM 3 – BUILDING CONNECTION SYSTEMS, and ITEM 4 – MANHOLES AND CATCH BASINS (refer to Section 01270 – Measurement and Payment).
- D. Soils present above the water within the estimated area of impact did not exhibit elevated concentrations of VOCs and shall be managed separately as Non-Impacted Material. These soils shall be managed in accordance with Section 3.04 of Specification 02300 - EARTHWORK.
- E. The CONTRACTOR may re-use excavated Impacted Material as trench backfill within the estimated area of impact. The CONTRACTOR shall preferentially use Impacted Material over Non-Impacted Material for backfilling purposes so as to minimize generation of surplus Impacted Material requiring disposal.
- F. Should grossly petroleum-impacted material be encountered, it shall be categorized as Contaminated Material for disposal purposes. Excavation, handling, stockpiling, and disposal of such material shall be in accordance with this Section and Section 02130 – Transportation and Disposal of Impacted Material, and shall be paid for under Item 12c – Removal and disposal of Group A contaminated material on a per ton basis (refer to Section 01270). The CONTRACTOR shall obtain approval from the ENGINEER prior to excavation and disposal of such material.

- G. Furnish all labor, materials, equipment, and incidentals necessary to transport and dispose of contaminated materials. Work includes preparing Material Shipping Records, Bills of Lading or any other shipping manifests as required, obtaining approval from disposal facilities for disposal, and loading and hauling of excavated materials.

1.02 RELATED WORK:

- A. Section 00890 – PERMITS
- B. Section 01380 – HEALTH AND SAFETY PLAN
- C. Section 01570 – ENVIRONMENTAL PROTECTION
- D. Section 02113 – EXCAVATION AND STOCKPILING OF CONTAMINATED MATERIAL
- E. Section 02300 – EARTHWORK

1.03 SUBMITTALS:

- A. Submit to the ENGINEER, for review, and in accordance with the requirements of the general specifications, the information required by Paragraph 1.03 B., no more than 14 days after issuance of the Notice to Proceed:
- B. The CONTRACTOR shall include the following information in the Excavated Materials Management Plan (EMMP) specified in Section 02113:
  - 1. Procedures/sequence of activities related to soil transport and disposal. The information, at a minimum, shall include:
    - a. Name and address of all transporters.
    - b. Transporter identification number (USEPA or Massachusetts Department of Transportation Transporter) and expiration date.
    - c. Proof of permit, license, or authorization to transport contaminated material in all affected states.
    - d. Details of containers to be used for transporting contaminated material. Refer to Paragraph 2.01 B. of this Section.
  - 2. The CONTRACTOR shall identify each waste stream and propose an appropriate disposal facility that will accept the contaminated material. The CONTRACTOR shall submit to the ENGINEER, approvals or letters of intent and facility information for each facility proposed, within 14 days of issuance of the Notice to Proceed. For each facility, the CONTRACTOR shall submit the following information:
    - a. General Information
      - i. Facility Name

- ii. Facility Address
  - iii. Name of Contract Person
  - iv. Title of Contact Person
  - v. Telephone Number of Contact Person
  - vi. Permit Number
- b. The facility shall specify the volume of material that can be accepted from the site on a weekly and a total basis.
  - c. The facility shall provide written confirmation that they are permitted to accept and will accept the classified material of the general quality and quantity described by these Specifications.
  - d. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and management of the soils or materials specified in this contract.
  - e. The CONTRACTOR shall submit a complete list of the disposal facility's permitted allowable contaminant levels and physical characteristic requirements for contaminated material, and list any required regulatory approvals for individual waste streams.
- 3. Proof of emergency service agreement with certified emergency response contractor.
  - 4. Record keeping information as described in 3.10.

#### 1.04 REFERENCES:

The Contractor shall comply with all federal, state, and local regulations, including at a minimum the following regulations:

- A. Massachusetts Department of Environmental Protection (DEP) Policy Number:
  - 1. WSC-13-500, Similar Soils Provision Guidance.
  - 2. WSC-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils.
  - 2. WSC-94-320, Construction Activities in Contaminated Areas.
  - 3. COMM-97-001, Reuse and Disposal of Contaminated Soils at Massachusetts Landfills.
- B. Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.
- C. Toxic Substances Control Act (TSCA), 40 CFR 761.00.

- D. 310 CMR 30.0000 and the Resource Conservation Recovery Act (RCRA), 40 CFR 148 and 268.
- E. All other applicable federal, state, and local regulations.

#### 1.05 DEFINITIONS:

- A. Contaminated Material: Soil, sediment, sand, vegetation, or debris that are visibly grossly impacted by petroleum, or are indicated by analytical results to contain any contaminant concentrations equal to or greater than MCP reportable concentrations established by 310 CMR 40.0300 and 40.1600 or any reportable or cleanup concentration established in RCRA or TSCA.
- B. Impacted Material: Soil, sediment, sand, vegetation, or debris occurring at or below the groundwater table within the estimated area of impact, and indicated by analytical results to contain any contaminant concentrations lower than all MCP reportable concentrations established by 310 CMR 40.0300 and 40.1600 and/or otherwise exempt from notification under the MCP, and lower than any reportable or cleanup concentration established in RCRA or TSCA.
- C. Non-Impacted Material: Soil, sediment, sand, vegetation, or debris occurring above the groundwater table that is consistent with material identified during the September 2003 subsurface investigation activities conducted at the site. Additionally, any soil determined by the ENGINEER to be consistent with this definition based on current site data and via field screening at the time of excavation.

#### 1.06 PERMIT REQUIREMENTS:

- A. The CONTRACTOR shall obtain all Federal, State, and local permits required for the transport and disposal of contaminated soil. The CONTRACTOR shall adhere to all permit requirements.
- B. The CONTRACTOR shall document that the disposal facilities proposed have all certifications and permits as required by Federal, State, and local regulatory agencies to receive and dispose of the contaminated soil.

### PART 2 – PRODUCTS

#### 2.01 GENERAL:

- A. All CONTRACTOR personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in Section 01380, HEALTH AND SAFETY PLAN.
- B. Containers used for hauling the contaminated material shall be constructed of steel, in good condition and designed for the intended purpose of safe, secure storage of hazardous material during loading and transport to an approved facility. The containers shall have a secure cover which will prevent a release of material from truck during



transportation. The container and covers shall be approved by the ENGINEER prior to mobilization of trucks/containers. The containers must be approved by and labeled in accordance with the U.S Department of Transportation (DOT). The containers shall be sift proof and water resistant in accordance with the DOT regulations.

## 2.02 EQUIPMENT AND VEHICLE DECONTAMINATION:

- A. The CONTRACTOR shall provide an equipment and vehicle decontamination station as required in Section 01380 – HEALTH AND SAFETY PLAN.

## PART 3 – EXECUTION

### 3.01 GENERAL:

- A. Prior to excavating any soil, erosion and sediment control measures shall be implemented per section 01570. Also, the excavation area planned for removal shall be moistened with water prior to excavating to control potential dust generation. Additional dust control measures may be required throughout the course of the project.
- B. The OWNER will be the generator and will sign all manifests and DEP shipping documents. The CONTRACTOR shall prepare all shipping documents and shall submit all transportation paperwork, as required in the EMMP, to the ENGINEER for approval prior to shipment. The OWNER's LSP (the ENGINEER) shall sign all shipping documents upon final review and approval.
- C. Utilization of a Hazardous Waste Manifest shall require the use of a licensed hazardous material transporter in conformance with the Massachusetts Hazardous Material Regulations as required by 310 CMR 30.0000. An LSP Opinion is not required when using a Hazardous Waste Manifest for transporting contaminated materials.
- D. The OWNER shall have final approval over all disposal options based on the disposal characterization data.

### 3.02 DISPOSAL OF SURPLUS IMPACTED MATERIAL

- A. The CONTRACTOR shall transport surplus Impacted Material for off-site disposal or treatment at a DEP-approved in-state or out-of-state lined or unlined landfill, treatment facility, and/or receiving location permitted under the DEP Similar Soils Provision Guidance (WSC-13-500).
- B. Impacted Material shipped to a treatment/disposal/reuse facility must meet the selected facility's chemical and physical acceptance criteria. Selected facilities must be established, fully operational, appropriately insured, and be operating in compliance with all applicable local, state, and federal regulations.

- C. Impacted Material may be reused on-site as backfill where applicable and in accordance with Section 02300 – EARTHWORK or otherwise disposed off-site in accordance with the requirements of this Section at no additional cost to the OWNER.

3.03 CONTAMINATED MATERIAL WITH CONCENTRATIONS ABOVE REPORTABLE THRESHOLDS (IF ENCOUNTERED):

- A. If encountered, the CONTRACTOR shall transport Contaminated Material for off-site recycling/disposal or treatment at a DEP-approved landfill or recycling facility based on the contaminated material meeting the criteria set forth in DEP Policy COMM-97-001 for disposal at landfills, DEP Policy WSC-94-400 for recycling at licensed asphalt recycling facility, or meeting the criteria for thermal treatment at a thermal treatment processing facility, or disposal at an out-of-state facility.
- B. The CONTRACTOR shall transport the material for off-site disposal or treatment at a DEP-approved landfill or facility based on the following categories as determined from soil characterization data and receiving facility disposal criteria:
  - 1. Group A: Contaminated material which meets DEP criteria for disposal at in-state Landfills, to be used as daily cover, intermediate cover, and pre-cap contouring material. The material must not exceed the contaminant levels listed in DEP Policy #COMM-97-001.
  - 2. Group B: Contaminated material which meets the criteria set forth in DEP Policy WSC-94-400 for recycling at licensed asphalt recycling facility or meets the criteria for thermal treatment at a thermal treatment processing facility.
- C. Material under Groups A and B shall be handled using a Bill of Lading. The CONTRACTOR shall submit the proposed landfill or facility to the ENGINEER for review and approval prior to transportation of material.
- D. Contaminated material shipped to a Group A or B disposal facility must meet the selected facility's chemical and physical acceptance criteria. Selected facilities must be established, fully operational, appropriately insured, and be operating in compliance with all applicable local, state, and federal regulations.

3.04 MATERIAL CONTAINING HAZARDOUS WASTE (IF ENCOUNTERED):

- A. Group D material contain contaminants that exceed the criteria and standards listed in Paragraph 3.02, or contain a listed or characteristic hazardous waste according to the state and federal regulations listed in Paragraph 1.04 of this Section.
- B. The CONTRACTOR shall characterize the material for off-site disposal based on the following categories:
  - 1. Group D1: Soil, sediment, or vegetation containing contaminants exceeding those listed in Paragraph 3.03 and/or containing one or more listed or characteristic hazardous waste(s), as defined in 310 CMR 30.0000 and RCRA, that is NOT subject

to the RCRA Land Disposal Restriction requirements of 40 CFR 148 and 40 CFR 268.

2. Group D2: Material containing contaminants exceeding those listed in Paragraph 3.03 and/or containing one or more listed or characteristic hazardous waste(s), as defined in 310 CMR 30.0000 and RCRA, that must be treated at an off-site RCRA and TSCA approved treatment and disposal facility prior to landfilling under the RCRA Land Disposal Requirements of 40 CFR 148 and 40 CFR 268.

- C. Material transported under Group D shall be done using an EPA Uniform Hazardous Waste Manifest.
- D. Contaminated material shipped to a Group D disposal facility must meet the selected facility's chemical and physical acceptance criteria. Selected facilities must be established, fully operational, appropriately insured, and be operating in compliance with all applicable local, state, and federal regulations.

#### 3.04 WEIGHT AND MEASUREMENT:

- A. The tare and gross weight for every vehicle, container, and trailer transporting soil and/or debris for off-Site reuse, recycling, treatment or disposal shall be measured to determine the net weight.
- B. The CONTRACTOR shall provide certified tare and gross weight slips for each load received at the accepted Facility which shall be attached to each returned manifest.

#### 3.05 WASTE PROFILES AND MANIFESTS:

- A. The CONTRACTOR shall prepare and submit to the OWNER for review all waste profile applications and questionnaires, and coordinate with disposal facilities and all Federal and State Environmental Agencies. Refer to Paragraph 1.03 B.
- B. The CONTRACTOR shall prepare all Hazardous Waste Manifests, Bills of Lading and material shipping records with all applicable analytical backup, notification, and control forms. Final copies of Bills shipping documents shall be signed by the OWNER (or his designated representative) as generator following submission and approval by the ENGINEER of draft documents.
- C. The CONTRACTOR shall also provide certified tare and gross weight slips for each load received at the designated facility which shall be attached to each returned manifest.
- D. The OWNER (or his designated representative) will be designated as generator and will sign all manifests and waste profile application or questionnaires.
- E. The CONTRACTOR shall furnish all generator copies of the Hazardous Waste Manifest to the OWNER for submittal to the appropriate regulatory agencies and to retain for the OWNER's records.

- F. The CONTRACTOR shall submit to the OWNER, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of, at the selected disposal facility. The documentation shall include the following, as a minimum.
  - 1. Documentation shall be provided for each load from the site to the disposal facility, including all manifests and any other transfer documentation as applicable.
  - 2. All documentation for each load shall be tracked by the original manifest document number that was assigned by the ENGINEER at the site.
  - 3. All ORIGINAL signatures (including signatures of OWNER and disposal facility's representative) associated with shipment of any material from the site.

### 3.06 TRANSPORT OF CONTAMINATED MATERIAL:

- A. The CONTRACTOR shall not be permitted to transport contaminated materials off-site until all disposal or recycling facility documentation has been received, reviewed, and approved by the ENGINEER.
- B. The CONTRACTOR shall take all precaution and any actions necessary, at no additional cost to the OWNER, to prevent cross-contamination from transport vehicles to areas outside the "contaminated area". The CONTRACTOR shall utilize an equipment and vehicle decontamination station to clean vehicles prior to leaving the site.
- C. The CONTRACTOR shall transport contaminated materials from the site to the disposal, reuse or recycling facility in accordance with all United State Department of Transportation (DOT), USEPA, and MADEP regulations.
- D. The Hauler(s) shall be licensed in all states affected by transport.
- E. Temporary stockpiled soil must be removed from the site in accordance with applicable regulatory deadlines; however, no later than the completion date of this Contract as may be extended.

### 3.07 DISPOSAL:

- A. Dispose of contaminated materials at an approved facility in accordance with all federal, state and local regulations.
- B. The CONTRACTOR shall perform analyses on the contaminated material as necessary to fulfill any disposal testing requirements of the approved Facility.
  - 1. The CONTRACTOR shall notify the ENGINEER at least two (2) days prior to sampling and the ENGINEER must be present for all sampling activities by the CONTRACTOR.

2. The CONTRACTOR shall bear all costs incurred in sampling and analyses for those tests required by the facility.
  3. The CONTRACTOR shall submit a copy of all sampling analyses to the ENGINEER within two (2) days of receipt of the laboratory report. Analytical data shall be kept confidential, distributed to the ENGINEER and OWNER only.
- C. The CONTRACTOR shall provide to the ENGINEER copies of all weight slips, both tare and gross, for every load weighed and disposed of at the approved facility. The slips shall be tracked by the original manifest document number that was assigned by the ENGINEER at the site. The ENGINEER shall make progress payments after receipt of these weight slips.
- 3.08 LOGS, REPORTS, AND RECORDKEEPING:
- A. At a minimum, the CONTRACTOR shall maintain daily logs and reports covering the work to be performed for this Section of the Contract. The format shall be developed by the CONTRACTOR to include daily logs, weekly reports, and a phase out report. CONTRACTOR shall provide ENGINEER with copies of all logs and reports on a weekly basis.
- B. Daily Logs shall include, at a minimum, the following:
1. Date
  2. Area (site specific) of work being performed
  3. Equipment being utilized by employees
  4. Type of work performed
  5. References to/copies of manifests, bills of lading, and waste profiles
  6. Sample locations and sample identifications
  7. Details and documentation of remediation waste management
  8. Protective clothing being worn by employees
  9. Project manager signature and date
- C. Weekly Reports shall include, at a minimum, the following:
1. A summary of the work performed during the week
  2. Copies of the daily logs.
- D. Phase Out Report shall include, at a minimum, the following:
1. Summary of work performed under this Section of the Contract
  2. Copies of all manifests, bills of lading, and waste profiles
  3. Laboratory reports and plans indicating sample locations
  4. Project managers signature and date

#### END OF SECTION

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## SECTION 02221

### ABANDONMENT OF EXISTING WATER MAINS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the abandonment of existing water mains, complete.
- B. The Contractor shall abandon water mains as indicated on the drawings.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02080, DUCTILE IRON PIPE AND FITTINGS
- C. Section 03302, FIELD CONCRETE

#### PART 2 - PRODUCTS (NOT APPLICABLE)

#### PART 3 - EXECUTION

##### 3.01 ABANDONMENT OF EXISTING WATER MAINS:

- A. All water mains to be abandoned shall be physically removed and disposed of by the Contractor only when the main enters the trench limits.
- B. Sections of water mains that are not removed shall have open ends plugged with a mechanical cap to prevent the entrance of soil into the pipe after backfilling.
- C. Any water main to be abandoned shall be cut at its connection to a live main and physically disconnected. A watertight ductile iron cap with concrete backing shall be installed on the live main. If a gate valve or corporation stop exists at the connection, it shall be closed.
- D. Valve boxes shall be removed from all valves and curb stops which are on the abandoned main.
- E. Hydrants, including hydrant barrels to be abandoned shall be removed completely and delivered to the Owner's storage area. Open pipe ends remaining shall be plugged with a mechanical cap to prevent the entrance of soil into the pipe after backfilling.

#### END OF SECTION

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ABANDONMENT OF WATER MAINS.docx

## SECTION 02222

### ABANDONMENT OF SEWERS AND DRAINS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the abandonment of sewers and drains through various means including furnishing, handling and installation of all mechanical, concrete and masonry plugs and removal and disposal of manholes, 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 02058, CONTROLLED DENSITY FILL
- B. 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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

The Contractor shall submit six sets of its 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. A mechanical plug shall be installed a minimum of 12-inches into the pipe to be abandoned. The void space between the open end of the pipe and the mechanical plug shall be sealed with 3,000 psi concrete or with brick masonry, as required by the Engineer.

- 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. A mechanical plug shall be installed a minimum of 12-inches into the pipe to be abandoned. The void space between the open end of the pipe and the mechanical plug shall be sealed with 3,000 psi concrete or with brick masonry, as required by the Engineer.
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 and drain services less than 12 inches in diameter shall be plugged with the appropriate VC plugs or 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 concrete plugs shall be at least 12-inches thick. Pipes entering a manhole or catch basin that are to be abandoned shall have a plug installed that is flush with the interior wall of the structure.

#### 3.02 REMOVAL AND DISPOSAL OF MANHOLES

##### A. REMOVAL OF MANHOLES

1. Frames and covers will be removed and delivered to the place designated by the Owner.
2. After plugging the pipes to be abandoned that are entering the manhole as specified above, the Contractor shall remove the cone section of a precast manhole or the top four feet of brick in a brick manhole.



3. The Contractor shall place and compact clean fill in the void left by the removal of the manhole.
4. The ground or paved surface shall be restored in accordance with the drawings.

B. DISPOSAL OF MANHOLES

1. The Contractor shall dispose of all manhole materials that are to be removed. Unless the Owner designates a site for receiving the removed materials, the Contractor shall dispose of the materials at a site of his own choosing.

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. Work may also include the pumping and disposal of petroleum contaminated groundwater (if any) generated from construction dewatering operations in the area of the intersection of Summer Street and Cedar Street (refer to Drawing Sheet S-6), and/or on-site treatment/disposal as specified herein.

##### 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.
- B. All excavation, fill placement and compaction, and utility pipe and manhole installation efforts should occur in the-dry. Groundwater and surface water should be controlled during construction and prevented from eroding excavation sidewalls and disturbing subgrade materials. Excavations will encounter groundwater and moderate to severe caving should be expected where seepage is present in granular soils. Flowing conditions are likely where granular soils are present below the groundwater table. Dewatering will be necessary for all excavations below the groundwater table and where seepage is encountered. Existing subsurface conditions are described in the Geotechnical Investigations and Recommendations Report included in Appendix B.

Based on the findings of the reports included in Appendix B, the shallow subsurface materials in which work will be completed range from a clayey silt to a medium sand; therefore, hydraulic conductivity values are expected to range from  $10^{-5}$  to  $10^{-3}$  centimeters per second.

- C. The following approximate groundwater levels were observed at monitoring wells MW/B-4 (in front of #40 Cedar Street), MW/B-6 (in front of #75 Cedar Street), and MW/P-10 (corner of Summer and Cedar Streets):

**APPROXIMATE DEPTH TO GROUNDWATER (FT BGS)**

<u>DATE</u>	<u>MW-B-4</u>	<u>MW/B-6</u>	<u>MW/P-10</u>
1/16/14	No data	No data	5.7
12/3/2014	14.2	3.0	No data
4/6/2015	13.3	3.2	No data
6/4/2015	No data	No data	5.95
6/12/2015	14.8	3.4	No data

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. Contractor shall submit six copies of a plan indicating how they intend 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.
- B. Should the Contractor opt to dispose of petroleum-impacted groundwater generated from dewatering operations within the estimated area of impact, written confirmation shall be submitted to the ENGINEER from each of the disposal or recycling facilities indicating that they will accept impacted groundwater, and any other materials to be removed as part of this Work. Contractor shall also submit to the ENGINEER all pertinent information relating to the transport of groundwater for disposal specified

herein, within 14 days after issuance of the Notice to Proceed. The information submitted shall include as a minimum:

Name and address of any hazardous waste transporters and disposal facilities, including:

- a. United States Environmental Protection Agency (EPA) Identification Number and expiration date.
  - b. Proof of permit, license or authorization to transport and dispose of hazardous waste in all affected states.
  - c. Proof of Insurance
- C. Submit a site specific Health and Safety Plan (HASP) – CONTROL OF WORK AND MATERIALS for Level C and D. Contractor shall prepare HASP in accordance with Section 01110 – CONTROL OF WORK AND MATERIALS of the specifications.
- D. Provide a copy of all permits, completed bills of lading, and recycling, incineration certificates to the Owner, Property Owner, and Engineer.
- E. Contractor shall obtain and pay for the analysis of all ground water samples.
- F. Contractor shall provide to the Engineer copies of all liquid volume slips, for every load disposed of at the disposal or recycling facilities. The Owner will only allow progress payments after receipt of these volume slips.

#### 1.06 PERMITS:

- A. The work of this Section shall be performed in accordance with all applicable Federal, State, and local regulations, laws, codes, and ordinances governing the handling, transportation, and disposal of hazardous waste.
- B. Contractor shall obtain all local, State, and Federal permits required for the transport and disposal of all liquid and solid waste resulting from the performance of this Work.
- C. Contractor shall obtain all pertinent federal, state and local discharge permits for discharge of treated groundwater generated from dewatering operations within the DSB Area

#### 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.

### 3.02 DEWATERING OPERATIONS WITHIN THE ESTIMATED IMPACT AREA:

- A. Treatment/Discharge: For this option, dewatering effluent shall be treated in accordance with applicable State and Federal permits and regulations, by retention, to remove fine-grained sediments and allow skimming of floating petroleum, if any, and passage through two (2) liquid-phase granular activated carbon vessels constructed in series, as approved by the Engineer, or other approved equal treatment system. Monitoring of the treated effluent shall be performed by the Contractor and the laboratory analysis shall be paid by the Contractor. Treatment of effluent shall be adequate for discharge to storm drain or groundwater, in accordance with pertinent discharge permits, with all discharge parameters being met. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the Contractor.

- B. Disposal: For this option, water pumped from excavations shall be disposed of in strict compliance with pertinent federal, state, and local environmental regulations at a licensed disposal/recycling facility, in accordance with Paragraph 1.05(B).

END OF SECTION

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## 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



## SECTION 02300

### EARTHWORK

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK:

- A. Work Included: Provide labor, materials and equipment necessary to complete work of this Section, including but not limited to the following:

1. Earth excavations of all types.
2. Sheeting, shoring, and dewatering of excavations and trenches.
3. Providing, processing, placing, and compacting earth fill materials.
4. Removal, hauling, stockpiling, re-handling, and placement of materials.
5. Off-site disposal of excess or unsuitable materials.
6. Rough grading.

##### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01570, ENVIRONMENTAL PROTECTION
- D. Section 02000 ROADWAY SPECIAL PROVISIONS (MassDOT)
- E. Section 02240, DEWATERING
- F. Section 02252, SUPPORT OF EXCAVATION
- G. Section 02324, ROCK EXCAVATION AND DISPOSAL

##### 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.
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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 AND TESTING

- A. In accordance with the requirements of the General Specifications, submit the following
  1. Backfill Materials: Submit 50 pound samples for each backfill material from each proposed source including on-site materials. Samples of import fill materials shall be collected in the presence of the Engineer so that the Engineer has the opportunity to observe each import material at the source. Submit a grain size distribution curve performed in accordance with ASTM D422 and results of a moisture-density relationship in accordance with ASTM D1557 for each proposed backfill material for review by the Engineer. Additional samples and analyses shall be submitted if a change in material occurs at the import or on-site sources.
  2. Excavation, Dewatering, and Excavation Support Plans: Submit at least 21 calendar days prior to the start of the work a detailed plan for the sequence of excavation and methods to be used for excavation support and dewatering/controlling surface water in excavations. Submit engineering design calculations stamped by a Massachusetts Registered Professional Engineer and shop drawings for earth support systems to be used. Dewatering and groundwater control systems shall be designed to be coordinated with excavation support systems to keep excavations free of water and to avoid disturbance of the subgrades.

3. Filter Fabric: Submit the manufacturer's information and one square foot representative sample of the filter fabric.
4. Within one week of making field adjustments, resubmit revised working drawings as necessary to reflect changes required by field conditions.
5. Obtain required permits for discharge of dewatering effluent. Submit two copies of all permits obtained at least one week prior to system installation.

1.05 PROTECTION OF EXISTING PROPERTY:

- A. The work shall be executed in such manner as to prevent any damage to existing buildings, streets, curbs, paving, service utility lines, structures, and adjoining properties.
- B. Locate and mark underground utilities to remain in service before beginning the work. Protect all existing utilities to remain in service during the operations. Do not interrupt existing utilities except when authorized in writing by the authorities having jurisdiction unless otherwise indicated on the Contract Drawings.
- C. Provide barricades, fences, lights, signs, and other safety devices required to protect the public against injury.
- D. 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.
- E. Acceptance of any of the Contractor's plans, design calculations, and methods of construction by the Engineer shall not relieve the Contractor of the responsibility of the adequacy of the excavation lateral support system; preventing damage to existing or new structures, utilities and streets adjacent to the excavations; the safety of persons working within excavated areas and the public at large; and excavation dewatering.

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 and backfill beneath and within two feet on all sides of new structures and pipes from frost penetration when freezing temperatures are expected.

#### 1.08 EXCAVATION CLASSIFICATIONS

- A. Earth Excavation or "Excavation" consists of removing materials encountered to the subgrade elevations indicated and subsequent reuse or disposal of the materials removed. All excavation is classified as earth excavation unless it otherwise meets the classifications provided below for unauthorized excavation, or additional excavation. Rock excavation is as defined in Section 02324.
- B. Unauthorized Excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific request of the Engineer. Unauthorized excavation, as well as remedial work requested by the Engineer, shall be at the Contractor's expense.
- C. Additional Excavation includes the following:
  - 1. When excavations have reached required subgrade elevations, notify the Engineer who will review subgrade conditions.
  - 2. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and to the lateral extent as required by the Engineer. Replace excavated materials as required by the Engineer.
  - 3. Removal of unsuitable material and its replacement as required will be paid on the basis of the contract conditions relative to changes in work or as provided for under the unit rates for this classification.

### 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. This material can be used for Select Backfill and Class "B" Backfill.

##### B. DENSE GRADED CRUSHED STONE FOR SUBBASE:

Dense Graded Stone for Subbase shall satisfy the requirements in MassDOT Specification Section M2.01.7. This material can be used for Select Backfill and Class “B” Backfill.

C. TRENCH BACKFILL MATERIAL

Trench Backfill shall be excavated trench material that is granular, well graded friable soil, free from rubbish, ice, snow, tree stumps, roots, clay, organic matter, and other deleterious materials. This material can be used for Select Backfill and Class “B” Backfill and shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
4"	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

D. CRUSHED STONE:

Crushed stone shall satisfy the requirements listed in MassDOT Specification Section M2.01.0.

E. SAND BORROW (SAND):

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

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. The Contract Drawings indicate the proposed finish alignments, elevations, and grades of the work. Establish the line and grade in close conformity with the Contract Drawings. The Engineer, however, may make minor adjustments in the field as necessary due to conditions encountered.
- B. The Contractor is responsible for establishing construction phasing, means, and methods and interim grading and temporary conditions required to attain the finish product required by the Contract Documents. The Contractor is responsible for all construction, protection, movement, and maintenance of stockpiles. Establish and maintain suitable benchmarks and grade control to accurately perform the work.
- C. All excavation shall be performed in the dry. Excavation and dewatering shall be accomplished by methods, which preserve the undisturbed state of the subgrade soils.
- D. No excavation will be permitted below a line drawn downwards at 2 horizontal to 1 vertical from

the underside of the closest edge of any in-place footing or utility at a higher elevation. Plan and execute the excavation and construction sequencing accordingly.

- E. When excavations have reached the prescribed depths, the condition of the bottom of the trench or foundation bearing surface shall be inspected by the Engineer. When filling to subgrade level has been completed, the subgrade surface shall be inspected by the Engineer. After inspection the Contractor will receive approval to proceed if conditions meet project requirements.
- F. No excavated material shall be deposited or stockpiled at any time to endanger portions of new or existing structures, either by direct pressure or indirectly by overloading banks contiguous to the operation. Material, if stockpiled, shall be stored so as not to interfere with the established sequence of the construction. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling.
- G. When the plans require excavation in areas in close proximity to existing buildings, roads, structures and utilities it shall be the responsibility of the Contractor at his expense to use satisfactory means and methods to protect and maintain the stability of such roads, and structures located immediately adjacent to but outside the limits of excavations.
- H. Temporary ditches shall be made as needed to drain off surface water to avoid damaged to areas of cut or fill. Such ditches shall be maintained as required for efficient operations, at no additional cost to the Owner.
- I. Provide shoring, sheeting, and/or bracing at excavations, as required, to assure complete safety against collapse of earth at the side of excavations. Provide shoring of public utility lines where exposed in the excavations in accordance with rules and regulations of the local authorities, as no additional cost to the Owner.

### 3.02 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. If the over-excavation exceeds 18-inches, the crushed stone shall be wrapped with a non-woven geosynthetic. Costs of removal and replacement shall be borne by the Contractor.
- C. The Contractor shall place a minimum of 12-inch layer of crushed stone over the underlying firm and stable 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. If the over-excavation exceeds 18-inches, the crushed

stone shall be wrapped with a non-woven geosynthetic. The Contractor also has the option of drying materials in-place and compacting to specified densities.

### 3.03 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. In all trench excavation areas, the Contractor shall strip the pavement reclaim material and separate from the underlying subbase soils. All excavated materials shall be stockpiled separately from each other within the limits of work. **Costs associated with hauling and stockpiling reclaim pavement fill material off-site, and subsequently hauling back to the project site, shall be borne by the Contractor.**
3. 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 or dense graded stone for subbase 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.
4. Perform all excavations and of whatever materials encountered, in a manner as required to allow for placing of temporary earth support, forms, installation of pipes and other work, and to permit access for the purpose of observing the work. Excavations shall be to such widths as will give suitable space for the required work. Bottom of trenches and excavations shall be protected from frost and shall be firm, dry, and in acceptable condition to receive the work. Work shall not be placed on frozen surfaces nor shall work be placed on wet or unstable surface.
5. When excavations have reached the subscribed depths, the condition of the bottom of the trench shall be observed by the Engineer. After observation, the Contractor will receive approval to proceed if conditions meet the project requirements.
6. No excavated material shall be deposited or stockpiled at any time to endanger portions of new or existing structures, either by direct pressure or indirectly by overloading banks contiguous to the operation. Material, if stockpiled, shall be stored so as to not interfere with the established sequence of construction. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling.
7. The Contractor shall follow a construction procedure, which permits visual identification of stable subgrade soils. 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.

8. The Contractor shall excavate unsuitable materials to stable ground where encountered at proposed excavation subgrades, 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 trench backfill, gravel borrow, dense graded stone for subbase, or crushed stone.

B. TRENCHES:

1. The Contractor shall satisfy all dewatering requirements specified in Section 02240 DEWATERING, before performing trench excavations.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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 replaced with crushed stone. If the over-excavation exceeds 18-inches, the crushed stone shall be wrapped with a non-woven geosynthetic. Cost of removal and replacement shall be borne by the Contractor.
7. All trenches required to be permitted must be attended, covered, barricaded, or backfilled. Covers must be road plates at least  $\frac{3}{4}$ -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.

### 3.04 FILLING AND BACKFILLING:

#### A. SUBGRADE PREPARATION

The subgrades shall be shaped to lines, grades, and cross-sections shown on the Contract Drawings and be thoroughly compacted in accordance with the requirements of this section. These operations shall include any required reshaping and wetting to obtain proper compaction. All soft or otherwise unsuitable material shall be removed and replaced with suitable material. The resulting area, and all other low sections, holes, or depressions shall be brought to the required grade with accepted material and the entire subgrade shaped to line, grade and cross-section and thoroughly compacted.

Before surface or base materials are spread, the subgrade shall be shaped to an accurate and true surface conforming to the line and grades indicated on the Contract Drawings. All surface irregularities shall be filled with suitable material or removed and such areas recompacted until the surface is properly shaped and properly compacted.

All fills shall be placed in horizontal layers. Fill shall not be placed following the natural contours of the ground. Fill shall be placed starting in the lowest areas working up to finish grades in horizontal layers in the manner specified herein. Each layer of fill shall be benched into the existing slope in order to avoid the formation of a shear plane.

#### B. BACKFILL MATERIAL

Unless otherwise specified or directed, material used for filling and backfilling shall meet the material requirements specified herein. In general, the material used for backfilling utility trench excavations shall be material removed from the excavations provided that the reuse of these materials result in the required trench compaction and meets the requirements specified for trench backfill, gravel borrow type b, or dense graded stone for subbase. Maintain backfill material with uniform moisture content, with no visible wet or dry streaking, and at a moisture content that

allows compaction to the degree specified herein.

C. TRENCH BACKFILL

1. After the utility pipe installation has been inspected and approved, trenches shall be backfilled as soon as practicable with specified material. All trench backfilling shall be done with care.
2. Backfill material for pipe bedding shall be deposited in the trench, uniformly on both sides of the pipe, for the entire width of the trench to the springline of the pipe. The backfill material shall be placed by hand shovels, in layers not more than 6-inches thick in loose depth, and each layer shall be thoroughly and evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids.
3. The balance of backfill shall be spread in layers not exceeding 10-inches in loose depth. Each layer shall be thoroughly compacted by mechanical methods and shall contain no rock, stones or boulders larger than 4 inches in their greatest dimension.
4. All trench backfilling shall be done with special care and must be carefully placed so as not to disturb the work at any time; if necessary, a timber grillage or other suitable method shall be used to break the fall of the material. The moisture content of the backfill material shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted. Backfill within areas to receive topsoil or pavement construction shall be made to grades required to establish the proper subgrade for the placement of topsoil or pavement base courses.
5. In backfilling trenches, each layer of backfill material shall be moistened and compacted to a density at specified herein, and in such a manner as to permit the rolling and compaction of the filled trench or excavation with the adjoining earth to provide the required bearing value, so that paving of the excavated and disturbed areas, where required, can proceed immediately after backfilling is completed.
6. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened, to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.
7. During filling and backfilling operations, pipelines will be checked by the Engineer to determine whether any displacement of the pipe has occurred. If the observation of the pipelines shows poor alignment, displaced pipe or any other defects they shall be remedied in a manner satisfactory to the Engineer at no additional cost to the Owner.

3.05 COMPACTION:

- A. Compaction Requirements: The degree of compaction is expressed as a percentage of the maximum dry density of the material at maximum moisture content as determined by ASTM Test D1557, Method C. The compaction requirements are as follows:

<b>Area</b>	<b>ASTM Density Degree of Compaction</b>
Pavement base course	95%
Backfill below structures	95%
Trench Backfill within 2 ft. of pavement base course subgrade	95%
Trench Backfill from pipe up to 2 ft. below pavement base course subgrade	92%

**B. MOISTURE CONTROL**

1. Fill that is too wet for proper compaction shall be disced, harrowed, or otherwise dried to a proper moisture content to allow compaction to the required densities. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill.
2. Fill that is too dry for proper compaction shall receive water applied uniformly over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required densities.

**C. UNFAVORABLE CONDITIONS**

1. In no case shall fill be placed over material that is frozen. In no case shall frozen soil or soil material containing frost, snow, or ice be placed as backfill. No fill material shall be placed, spread, or compacted during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are specified.
2. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of the day's operations. Prior to terminating work for the day, the final layer of fill shall be rolled to eliminate wedges of soil lift by compacting equipment.

**D. COMPACTION CONTROL**

1. In-place density testing shall be made in accordance with ASTM D1556, D2922, or D2167 as work progresses to determine the degree of compaction being attained by the Contractor. Any corrective work required as a result of such tests, such as additional compaction or a decrease in the thickness of layers, shall be performed by the Contractor at no additional expense to the Owner. In-place density testing shall be made at the Contractor's expense by the geotechnical testing laboratory. Test locations shall be selected by the Engineer unless otherwise noted.

2. In-place density testing shall be performed on each lift of fill and at a minimum of 100 linear ft. of trench length.

### 3.06 DISPOSAL OF SURPLUS MATERIALS:

- A. Surplus excavated materials, which are acceptable to the Engineer, shall be used 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

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## 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, and shall dispose of the excavated material where required.

##### 1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK

##### 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 one cubic yard\* in volume, or solid bedrock 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 ROCK EXCAVATION CLASSIFICATION:

- A. Rock excavation in trenches includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42-inch wide bucket on a medium-size track-mounted hydraulic excavator, rated at not less than 90HP flywheel power and 30,000 lb. drawbar pull. Trenches in excess of 10-feet in width are classified as open excavation.
- B. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted heavy-duty hydraulic excavating equipment without drilling or ripping. Rock excavation equipment is defined as a track-mounted loader, rated at not less than 170 HP flywheel power and developing 40,000-lb. breakout force (measured in accordance with SAE J732C).

- C. Determination of rock excavation classification will be made by the Engineer. Typical materials classified as rock are boulders 3.0 cubic yards or more in volume, solid bedrock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by the Engineer. Visual observation of the completed excavation may be made by the Engineer to modify the excavation classifications. Removal of rock excavation prior to classification by the Engineer shall be considered as earth excavation unless accepted by the Engineer in writing. Such excavation will be paid on the basis of contract unit rates for this classification.
- D. Rock payment lines (if applicable) are limited to the following:
1. Two feet outside of concrete work for which forms are required.
  2. One foot outside of the vertical walls of utility structures.
  3. In pipe trenches, rock excavation depth below the pipes and maximum trench widths limits shall be as detailed on Sheet D-3 the Project Plans:
  4. Rock sloping across the width of trench shall have the top of rock established at the rock elevation over the centerline of the pipe.

#### 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. Sequence and schedule of blasting rounds, including the general method of developing the excavation, lift heights, etc.
  2. Methods of matting or covering of the blast area to prevent flyrock and excessive airblast overpressure.
  3. Written evidence of the licensing, experience and qualifications of the blasters who will be directly responsible for the blasting operations.
  4. Name and qualifications of the person(s) responsible for design and directing the blasting. The person(s) responsible shall have a minimum of 5 years of professional experience in controlled blasting operations.
  5. Name and qualifications of the person(s) responsible for monitoring and reporting blast vibrations and overpressures.
  6. Details of the audible advance signal system to be employed at the job site as a means of informing workers, Engineer, Owner, all abutters and the general public that a blast is about to occur.

7. Listing of instrumentation proposed to monitor vibrations complete with performance specifications and user's manuals supplied by the manufacturer.
  8. Recent calibration certificate(s) (within previous six months) for the proposed blast monitoring instrumentation. Calibration shall be over the required frequency response ranges specified for blast monitoring instrumentation and to a standard traceable to the National Bureau of Standards.
  9. Submit three copies of the blasting permit(s) obtained to conduct blasting on the site. Obtain and pay for all permits and licenses required to complete the work of this Section. Original permits shall be prominently displayed on the work site prior to initiating blasting operations.
  10. Pre-blast condition survey as described below.
- B. Within 24 hours following each blast, the Contractor shall submit to the Engineer, a Blast Monitoring Report. Each Blast Monitoring Report shall include the following:
1. Report of Blast Monitoring.
  2. Copy of strip chart (or other permanent record of velocity/time waveform) with calibration and monitoring record marked with the date, time and location of the blast as well as the monitoring location.
- C. In the event that the design round results in ground vibrations which exceed the blasting limit criteria specified, the Contractor shall immediately submit a revised blast design.
- D. The Contractor shall submit to the Engineer in writing all blasting complaints received by the Contractor within 24 hours of receipt. Each blast complaint report shall include the name and address of the complainant, time received, date and time of blast complained about and a description of the circumstances which led to the complaint.
- E. Review by the Engineer of material submitted by the Contractor shall not relieve the Contractor of responsibility for the accuracy, adequacy and safety of the blasting, exercising proper supervision and field judgment and producing the results within the blasting limits required by this Specification.

#### 1.06 QUALIFICATIONS

- A. Persons responsible for blasting shall be licensed blasters in the State of Massachusetts and shall have had acceptable experience in similar excavations in rock and controlled blasting techniques.

- B. Blast monitoring shall be conducted by persons trained in the use of a seismograph and records shall be analyzed and results reported by persons familiar with analyzing and reporting the frequency content of a seismograph record.

#### 1.07 PREBLAST CONDITIONS SURVEY

- A. Prior to start of earth/rock excavation or blasting work, engage the services of an independent professional engineer to conduct a pre-blast condition survey of existing structures and conditions within 500-ft of anticipated rock blasting.
  - 1. Coordinate activities, issue notices, obtain clearances and provide photographic and secretarial assistance necessary to accomplish the survey.
  - 2. Give notice in writing, to the property owner and any representative of local authorities required to be present at such survey. Notify in writing the dates on which surveys are planned so that representatives are present during the examination. Provide copies of notices to the Owner and Engineer.
- B. Observations shall be recorded of the existing conditions for buildings and other structures which might be affected.
  - 1. The survey shall consist of a description of interior and exterior conditions. Descriptions shall locate cracks, damage or other defects existing and shall include information to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks or damage exists, or for defects too complicated to describe in words, photographs shall be taken and made part of the record.
  - 2. The records of each property examined shall be signed by the representatives present and, if practicable, by the property owner, whether or not they are present at the examinations.
- C. Contractor's record of the pre-blast condition survey shall consist of written documentation and photographs of the conditions identified.
- D. Upon completion of all earth/rock excavation and blasting work, the Contractor shall make a similar examination of properties and structures where complaints of damage have been received or damage claims have been filed. Give notice to interested parties so that they may be present during the final examinations. Records of the final examination shall be signed and distributed as the original pre-construction survey.

#### 1.08 CODES, PERMITS, AND REGULATIONS

- A. The Contractor shall comply with applicable laws, rules, ordinances, and the Federal, State and local regulations governing the transportation, storage, handling, and use of explosives. All labor, materials, equipment and services necessary to



make the blasting operations comply with such requirements shall be provided at no additional cost to the Owner.

- B. The Contractor shall obtain and pay for permits and licenses required to complete the work of this Section.
- C. In case of conflict between regulations or between regulations and Specifications, the Contractor shall comply with the strictest applicable codes, regulations or Specifications.
- D. Blasting Limit Criteria - The Contractor shall limit blasting to prevent damage to any building, structure, utility or other feature near the site. The Contractor is solely responsible to determine the maximum vibration and air blast tolerable at each facility. However, in no case shall the following be exceeded.

- 1. Peak Particle Velocity (PPV) limits at ground surface at existing adjacent residential or other structures:

Maximum Peak Particle Velocity	
<u>Frequency (Hz)</u>	<u>(in. per. sec.)</u>
Over 40	2.0
30 to 40	1.5
20 to 30	1.0
Less than 20	0.5

- 2. Peak Particle Velocity (PPV) limits at ground surface adjacent to new concrete:

Distance from Blast to Concrete <u>(ft.)</u>	Age of Concrete (from Batch Time)			
	1-3 days		Over 7 days	
	<u>Max Charge</u>		<u>Max Charge</u>	
	<u>Max. PPV</u>	<u>Weight/Delay</u>	<u>Max. PPV</u>	<u>Weight/Delay</u>
	<u>(in./sec.)</u>	<u>(lb.)</u>	<u>(in./sec.)</u>	<u>(lb.)</u>
40 to 60	2.0	4.0	3.0	7.0
80 to 100	2.0	16	3.0	25
Over 150	1.25	32	2.0	50

- 3. Airblast Overpressure Limit:

- a. The Contractor shall conduct all blasting activity in such a manner that the peak airblast overpressure measured at the location of the nearest above ground, occupied structure to airblast does not exceed 0.0014 psi.

- E. Blasting shall not be permitted within 500-ft of locations where concrete has been placed in the preceding 24 hours. Blasting shall not be permitted within 25-ft of concrete structures until the concrete has attained the specified design strength.
- F. Blast Monitoring
  - 1. The Contractor shall monitor peak particle velocities and airblast overpressures using a minimum of two seismographs operated by personnel trained in their use. Locations shall be mutually agreed upon by the Engineer and Contractor.
  - 2. The Engineer may direct that additional blast monitoring be performed.
  - 3. Blast monitoring requires that time of firing be precisely known so that the seismographs can be started before firing. The Contractor shall establish a signal system which will allow records of blast vibrations to be made.
- G. Blast Monitoring Instrumentation
  - 1. Provide two (minimum) seismographs for full time use on the project during blasting which have been calibrated within the previous six months to a standard which is traceable to the National Bureau of Standards. Required characteristics of seismographs are listed below:
    - a. Measure the three mutually perpendicular components of particle velocity in directions vertical, radial and perpendicular to the vibration source.
    - b. Measure and display the maximum peak particle velocity component and air blast overpressure immediately after each blast.
    - c. Furnish a permanent record of a velocity/time waveform, on a strip chart or from magnetic tape.
    - d. Have a flat velocity frequency response with a minimum broad band of 6 Hz to 150 Hz with a tolerance equal to or better than plus or minus 10 percent.
    - e. Have a low frequency omnidirectional transducer for measuring airblast overpressure with a flat frequency response within the limits of 2 Hz to 250 Hz with a tolerance equal to or better than plus or minus 10 percent.
- H. The Contractor shall cooperate with the Engineer in permitting observation of the drilling and loading procedures, as well as in providing detailed information on blasting operations.
- I. The Contractor shall be completely responsible for all damages resulting from the blasting operations and shall, as a minimum, take whatever measures are necessary to maintain peak particle velocities within the specified limits.

Modifications to blasting and excavation methods required to meet these requirements shall be undertaken at no additional cost to the Owner.

## PART 2 - PRODUCTS - NOT APPLICABLE

## PART 3 - EXECUTION

### 3.01 PREPARATION/PRE-BLAST SURVEY

The pre-blast survey shall be conducted as described above and 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. If the rock below normal depth is disturbed due to drilling or blasting operations of the Contractor, and the Engineer considers such disturbed rock to be unfit for foundations, the disturbed rock shall be removed and the excavation shall be backfilled in the same manner as specified for the material in the zone around the pipe under Section 02300 EARTHWORK. 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 soil 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, soil, boulders, scale, excessively cracked rock, loose fragments, water, ice, snow, and other objectionable substances.

### 3.03 MINIMUM SAFETY PRECAUTIONS DURING BLASTING

- A. Clearing the Danger Area Before Blasting
  - 1. No blasting shall be permitted until all personnel and vehicles in the danger area have been removed to a place of safety. A loud, audible, warning system, devised and put in operation shall be sounded before each blast. The Contractor shall familiarize all personnel on the project, Engineer, Owner, abutters and the general public with the system. The danger area shall be patrolled before each blast to make certain that it has been completely cleared and guards shall be stationed to prevent entry until the area has been cleared by the blaster following the blast.
- B. Notify authorized representatives of all utilities which may be affected by blasting operations at least 72 hours before blasting is performed.
- C. Explosives shall be stored, handled and employed in accordance with Federal, State and local regulations.
- D. No explosives, caps, detonators or fuses shall be stored on the site during non-working hours.
- E. Blasting mats shall be used to cover all blasts in order to minimize the possibility of flyrock where sufficient soil overburden to prevent flyrock does not exist.
- F. The Contractor shall be responsible for determining any other safety requirements unique to blasting operations on this particular site so as not to endanger life, property, utility services, any existing or new construction, or any property adjacent to the site.
- G. No requirement of, or omission to require, any precautions under this Contract shall be deemed to limit or impair any responsibility or obligations assumed by the Contractor under or in connection with this Contract; and the Contractor shall at all times maintain adequate protection to safeguard the public and all persons engaged in the work and shall take such precautions as will accomplish such end, without undue interference to the public. The Contractor shall be responsible for and pay for any damage to adjacent structures, buildings, utilities and other features resulting from work executed under this Section.

### 3.04 GENERAL BLASTING PROCEDURES

- A. Blasting shall be limited to hours and days determined by the City of Somerville, unless prior written permission is received from the Engineer to blast at other times. All blasting shall be done by a state of Massachusetts licensed blaster and in coordination with the Somerville Fire Department Permit.
- B. The Contractor shall notify the Engineer at least 72 hours before blasting operations are to commence.

- C. The Contractor shall conduct blasting operations such that damage is prevented to adjacent structures, property and work and such that peak particle velocity and overpressure levels do not exceed the maximum specified limits.
- D. If rock below grade is disturbed by blasting caused by holes drilled too deep, or too heavy charges of explosives, or any other circumstance due to blasting, and if, in the opinion of the Engineer, the disturbed rock is unfit for subgrade, the rock shall be removed and the excavation backfilled in the same manner as specified for the material in the zone around the pipe under Section 02300 EARTHWORK.
- E. The Contractor shall perform all blasting required to break or fracture large boulders and bedrock to facilitate excavation to the grades required as shown on the Drawings. Should insufficiently fractured rock be encountered during excavation, the Contractor shall remove the rock using non-explosive techniques at no additional cost to the Owner.

### 3.05 SPECIAL PERIMETER CONTROL BLASTING PROCEDURES

- A. When blasting in areas where rock cuts will be exposed at ground surface, or where rock cuts are required adjacent to and below existing and/or proposed earth support systems or other structures, care shall be taken at the excavation limits to minimize overbreak and fracturing of remaining rock. Line drilling shall be used at the above locations as described below.
- B. The presence of perimeter drill hole casts will be used to judge the Contractor's perimeter control blasting procedures.
- C. If, in the judgment of the Engineer, the Contractor's perimeter control blasting procedures are causing or resulting in the absence of drill hole casts, the geometry (diameter, spacing), stemming and loading of perimeter holes and adjacent production holes shall be adjusted until results acceptable to the Engineer are obtained or the perimeter control blasting technique shall be changed.
- D. Line Drilling
  - 1. Line drilling shall consist of a minimum of 3-in diameter holes evenly spaced at two per linear foot. Drill holes shall not deviate more than 3-in from their required plane over the entire length of the hole. The line drilled holes are to be left unloaded. As the perimeter is approached with the primary blasting, the distance between the line drilled holes and the adjacent row should be about 50 percent of the normal hole spacing. The spacing of holes in the row adjacent to the perimeter holes should also be about 50 to 75 percent of the normal hole spacing. The loading of the holes in the adjacent row should be about 50 percent of the loading used in the primary holes.

### 3.06 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 02347

### BENTONITE DAMS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers bentonite dams, complete, including bentonite, sand, and equipment necessary to install the clay dams. Dams shall be installed where shown on the drawings or as indicated by the Engineer.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS:

- A. The bentonite clay shall be granular and high swelling. High swelling is defined as the ability of 2 grams of the base bentonite, when mechanically reduced to 100 mesh, to swell in water to a volume of 16 cc or greater, when added to 100 cc distilled water.
- B. The sand shall be a fine aggregate consisting of natural sand, manufactured sand or combination thereof. The sand shall be free of injurious amounts of organic impurities and shall conform to ASTM C33, Concrete Aggregate.

#### PART 3 - EXECUTION

##### 3.01 INSTALLATION:

- A. Prior to placement, the bentonite clay shall be uniformly mixed with sand at a minimum ratio of nine pounds of bentonite clay to each cubic foot of sand. The mixture shall be placed such that the entire length of the dam on either side and the bottom of the trench contacts undisturbed earth. The mixture shall be placed in 8-inch lifts, each lift being compacted to the density required for backfill as stated in Section 02300 EARTHWORK.
- B. The dams shall extend from undisturbed material at the bottom of the trench excavation to three feet below the final finished grade or as required by the Engineer. The dam shall extend the full width of the trench excavated by the Contractor and the length of the dam shall be a minimum of 1.5 feet along the laying length of the pipe.
- C. Within areas of contaminated soils or adjacent to wetland areas, install the dams at a spacing not more than fifty (50) feet apart. This spacing shall also apply to pipe gradients with over an 8 percent slope.

- D. When the watertable is above the bottom of the pipe and does not meet the criteria of 3.01 C above, the spacing shall not be more than 400 feet apart or as required by the Engineer.
- E. Dams shall be required when the pipe trench passes from one soil type to another or to ledge if the watertable is above the pipe.
- F. Refer to the contract detail drawings for the construction detail of the dams.

#### 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 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01330, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS
- E. Section 02440, SEWER CLEANING AND INSPECTION
- F. 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

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 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 line to be rehabilitated unless otherwise noted below.
- D. The Contractor may propose alternative cured-in-place processes and/or products for review and approval by the Engineer.
- E. The location, length, and approximate interior dimensions of the cured-in-place pipe to be installed are as shown on the drawings.
- F. The Contractor shall provide MSDS for all chemicals used in the lining process.

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

- A. Prior to beginning the work, submit six (6) sets of 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.
  - Pre-inversion television inspection logs and DVDs (Video files shall also be included on external hard drives as described in Section 01331,

DOCUMENTATION)

- 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 DVDs (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
- 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 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 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 have two (2) beads of material protruding from one side of the strip and shall swell to a minimum of three times its dry size when in contact with water. Flat types of gaskets shall not be accepted. Gaskets shall be a manufactured by Hydrotite or approved equal.

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 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.
- 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 sewer segment 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. Installation of the cured-in-place pipe shall be in accordance with ASTM F1216, Section 7.
- D. After the liner has been cured in place, the Contractor shall reinstate 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 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.
- E. 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.
- F. The Contractor shall make a mainline television inspection camera available for confirming service connections to be reinstated. At the Engineer’s discretion, the Contractor shall dye test service connections in order to confirm that each service connection that should be reinstated is included on the attached Service Connection

Reinstatement Certification Form. No additional payment will be made for television inspection in conjunction with dye testing of service connections.

- G. 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. No additional payment will be made for grouting service connections.
- H. 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 1216 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 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. 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. 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 and resealing or lining within the warranty period shall be provided at no additional cost to the Owner.

## 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, 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

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## SECTION 02439

### CEMENTITIOUS LINING OF MANHOLES

#### 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 sealing of sewer manhole inverts and active leaks, and by application of a uniform cementitious layer of high-quality mortar.
- B. The work shall include: the elimination of active infiltration by chemical grout sealing prior to the mix application, the removal and patching of loose and/or unsound material, cleaning surfaces, the repair and chemical grout sealing of the invert and bench, and the spray application of a cementitious mix to form a liner.
- C. The Contractor shall furnish all equipment, material and labor required to apply the cementitious mix and chemical grout seal with machinery specially designed for each application.
- D. Grouting/Sealing of inverts and active leaks shall be performed prior to application of cementitious mix.

##### 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 five (5) years of experience in providing manhole rehabilitation with a cementitious sealant and manhole sealing with a chemical grout, 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) Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

American Society for Testing and Materials (ASTM)

ASTM C 94	Ready-Mix Concrete
ASTM C109	Compressive Strength
ASTM C267	Chemical Resistance
ASTM C596	Shrinkage
ASTM C666, Method A	Freeze/Thaw Resistance
ASTM C1244	Standard Test Method for Concrete Sewer Manholes by the Negative Air pressure (Vacuum) Test

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, sewer manhole rehabilitation shall be carried out in accordance with the current edition of SEWER MANHOLE REHABILITATION, CEMENTITIOUS (As provided by the Strong Systems, Inc. for the Strong Seal System) and MANHOLE SEALING 3(3.1) [excluding Item c] of NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- C. The locations of the sewer manhole rehabilitation and invert sealing work to be completed are as indicated on the drawings.

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

- A. Prior to beginning the work, submit six (6) sets of 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.

1.07 WARRANTY:

- A. The manhole rehabilitation work performed shall be warranted 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:

- A. The Contractor shall use a spray applied cementitious based fiber reinforced liner material and chemical grout. 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 AND STOPPING ACTIVE LEAKS

- A. The Contractor shall use a chemical grout which is environmentally safe for the sealing of sewers. The chemical grout shall be in accordance with CHEMICAL SEALING (GROUTING) MATERIALS of the NASSCO Standard Specifications.

2.03 PATCHING MIX:

- A. A quick-setting cementitious material shall be used as a patching mix and is to be mixed and applied according to the manufacturers 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. A rapid-setting cementitious product specifically for leak control shall be used to stop water infiltration and shall be mixed and applied according to manufacturer's recommendations and shall have the following minimum requirements:

Compressive Strength	ASTM C-109	1 hour - 600 psi
Compressive Strength	ASTM C-109	24 hour - 1800 psi

2.05 LINER MIX:

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

Compressive Strength	ASTM C-109	6000 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 WATER:

- A. Water used in mixing shall be potable.

2.07 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. No product that fails to meet the requirements of these specifications shall be incorporated into 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 PREPARATION:

- A. All foreign material shall be removed 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. Walls shall be totally saturated with water.

- B. Leaks shall be stopped using a chemical grout and applied per 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.

#### 3.04 SEALING OF MANHOLE INVERT:

- A. The Contractor shall carry out all work as described in SEWER MANHOLE SEALING 3(3.1)D of the NASSCO Standard Specifications using sealing materials and procedures accepted by the Engineer. Grout ports shall be located in the invert and base of the manhole. The Contractor shall also ensure that sealing material is injected between pipe and manhole connections. A quick setting patch mix shall be troweled uniformly, not to exceed 1/2-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. The finished inverts shall be smooth and free of ridges.

#### 3.05 INTERIOR LINING OF MANHOLES:

- A. Interior lining of the manholes shall be conducted only after all other manhole rehabilitations have been completed.
- B. Unless otherwise indicated herein, the Contractor shall carry out all work as described in MANHOLE REHABILITATION, CEMENTITIOUS LINER (as provided by Strong Systems, Inc., for the Strong Seal System), of the NASSCO Standard Specifications using lining materials and procedures accepted by the Engineer.
- C. Preparation, as described in section 3.03, shall be completed prior to the placement of the cementitious liner.
- D. Rehabilitation material shall not be placed on a frozen surface or during freezing weather. Rehabilitation material shall not be placed when it is anticipated that the temperature during the following 24 hours will drop below 32 degrees, Fahrenheit.
- E. 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 pipe and/or service connection. Temporary plugs shall be removed once the liner has cured sufficiently to prevent erosion of the new liner.
- F. Thickness shall be verified with a wet gauge at random points of the new interior surfaces as required by the Engineer. Minimum thickness of a one-half (1/2) inch is required.

- G. Application shall be with low velocity, continuous flow equipment to prevent the adverse effects of rebound.
- H. The Contractor shall prohibit debris from entering the invert by either covering the invert or plugging during application.

3.06 EXISTING FLOWS:

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

3.07 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 MANHOLE REHABILITATION, CEMENTITIOUS (As provided by the Strong Systems, Inc. for the Strong Seal System) of the NASSCO Standard Specifications at a timetable to be approved by the Engineer. The Contractor shall repair any defects found until there are no visible leaks.
- B. If the groundwater level is not, in the opinion of the Engineer, high enough for an accurate visual inspection, the Contractor shall test a 10% sample of the original manhole rehabilitation work using exfiltration or vacuum methods as described in ASTM C-1244. The manholes in the test sample will be selected and approved by the Engineer and will consist of manholes from throughout the project area that are representative of the manhole rehabilitation work originally performed. Any manholes failing the warranty test shall be sealed and retested until the test is passed and/or the results are satisfactory to the Engineer.
- C. If the initial failure rate of tested manholes is less than 5%, the work will be considered satisfactory and no further testing will be required.
- D. If the failure rate in the initial test sample equals or exceeds 5%, an additional and equivalent test sample of the original manhole rehabilitation work shall be selected by the Engineer. Additional testing will be performed until the failure rate of less than 5% is met. No previously tested manholes can be included in a subsequent test sample.
- E. Should all of the manhole rehabilitation work fail to meet the less than 5% failure rate in each of the 10% test samples, the Contractor shall be required to repeat the inspection procedure following resealing of the structures in question.
- F. All inspecting, testing, and reworking within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

## 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 01330, SUBMITTALS
- B. Section 01331, DOCUMENTATION
- C. Section 01575, HANDLING EXISTING FLOWS
- D. Section 02428, CURED-IN-PLACE PIPE
- E. 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)

Recommended Specifications for Sewer Collection System Rehabilitation  
(Current Edition).

American Society of Testing and Materials (ASTM)

ASTM F2304 Standard Practice for Rehabilitation of Sewers Using  
Chemical Grouting

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, the pipe cleaning and inspection shall be carried out in accordance with SEWER LINE CLEANING; TELEVISION INSPECTION, MAIN SEWERS; SEWER PIPE JOINT TESTING, MAIN SEWERS; AND SEWER PIPE JOINT SEALING, MAIN SEWERS (PACKER METHOD) of NASSCO Recommended Specifications for Sewer Collection System Rehabilitation. Sewer flow control shall comply with Section 01575, HANDLING OF EXISTING FLOWS. Sealing materials shall comply with CHEMICAL SEALING (GROUTING) MATERIALS of the NASSCO Standard Specifications.
- 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  
GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning work, submit six (6) sets of 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. The Contractor may elect to use either high velocity jet, or mechanically powered equipment, as described in the NASSCO Standard Specifications.

Selection of equipment shall be based upon field conditions such as access to manholes, quantity of debris, size of sewer, depth of flow, etc.

- B. 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.
- C. 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.
- D. 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 DVD's/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, TV 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 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 01330, SUBMITTALS
- B. Section 01331, DOCUMENTATION
- C. Section 01575, HANDLING EXISTING FLOWS
- D. Section 02428, CURED-IN-PLACE PIPE
- F. 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 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)

Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

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 SEWER SEALING, FROM MAIN SEWER of the NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- 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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of 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 warranted 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

CHEMICAL SEALING (GROUTING) MATERIALS of the NASSCO Standard Specifications. All other products used for sealing, patching and cleaning of sewers shall also be environmentally safe.

- B. The chemical grout material shall be EPA registered and labeled for use in sewer lines and acceptable to the state agencies having jurisdiction over its use.

### 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 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 F 2454, 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  $\pm 0.5$  psi of the gauge pressure to pass successfully. The void pressure should drop to within  $\pm 0.5$  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
- E. 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.

#### 3.04 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 LATERAL SEWER SEALING, FROM MAIN SEWER 3 of the NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- D. The television inspection and testing equipment shall be capable of inspecting and testing 4-inch, 5-inch and 6-inch diameter service connections.
- E. If the service fails the pressure test, the service shall be grouted in accordance with paragraph 3.05 of this Section. If the service passes the pressure test, grouting is not required.

3.05 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 3.04 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 LATERAL SEWER SEALING, FROM MAIN SEWER of the NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- B. The grouting equipment shall be capable of grouting 4-inch, 5-inch and 6-inch diameter service connections.
- C. The chemical sealing materials shall be as described in chemical sealing (grouting) materials of the NASSCO Standard Specifications.
- D. 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.

3.06 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, an initial test sample of approximately 50% of the original service connection rehabilitation work will be selected and approved by the Engineer. The test sample will consist of manhole sections 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 3.04 of this Section. Any service connections failing the retest shall be regouted as specified in paragraph 3.05 of this Section.
- B. If the failure rate in the initial test sample is less than 5%, the work will be considered satisfactory and no further testing will be required.

- C. If the failure rate in the initial test sample equals or exceeds 5%, an additional and equivalent test sample will be selected and approved by the Engineer. Additional test samples will be tested and resealed as necessary until the failure rate of less than 5% is met. No previously tested service connections can be included in a subsequent warranty test sample.
- D. Should all of the original service connection rehabilitation work fail to meet the less than 5% failure rate in each of the 50% test samples, the Contractor will be required to repeat the inspection procedure.
- E. 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 regROUT the services until there are no visible leaks through television inspection.
- F. Television inspecting, testing, and regROUTing 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.
- G. All inspecting, retesting, and regROUTing within the warranty period shall be provided at no additional cost to the Owner.

#### END OF SECTION

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## SECTION 02511

### TEMPORARY WATER SERVICE

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. The Contractor shall furnish, install, maintain, and remove temporary water service pipe of the size required from which connections shall be made to all water customers. Temporary service pipe shall not be installed without prior approval of the Engineer.
- B. The Contractor shall do all excavating for connections of temporary service pipes to existing live water mains and make all such connections. The Contractor shall also furnish, install, maintain, connect, disconnect, and remove individual temporary service lines to all water customers.

##### 1.02 REFERENCES:

The following standard forms a part of this specification, as referenced:

American Water Works Association (AWWA)

AWWA C651 Disinfecting Water Mains

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

Shop drawings shall consist of manufacturer's scale drawings, cuts, or catalogs including descriptive literature. Shop drawings shall be submitted for the pipe, type of joint, fittings, couplings, and valves.

#### PART 2 - PRODUCTS

- 2.01 The temporary service pipe, hose, connections, and branches shall be of the highest quality and shall be fully adequate to withstand the pressures and all conditions of use. The temporary service shall be made of fused-joint HDPE, steel or PVC suitable for above-ground and potable water use. The installation shall be watertight.
- 2.02 Temporary service hose shall have a minimum working pressure rating of 200 pounds per square inch and meet all standards established by the National Sanitary Foundation (NSF). The hose shall be stamped with the NSF approval for potable water (NSF-61). Temporary service hose shall be by Parker Industrial Hose - NEXBRAID PW PVC Hose; or approved equal.

## PART 3 - EXECUTION

### 3.01 RESPONSIBILITIES:

- A. Before starting any work that will affect service to customers, the Contractor shall notify the Owner at least 48 hours in advance to allow the time to notify the customers accordingly.
- B. The Owner shall shut off curb stops or pull water meters on individual services after the Contractor has installed temporary services to the satisfaction of the Engineer and prior to the Contractor starting work which will affect service to customers.
- C. The Contractor shall be responsible for all repairs and maintenance required to the temporary services. The Contractor shall immediately repair and/or replace any leaking or faulty temporary service pipe as ordered by the Engineer.
- D. The work of providing suitable safety precautions to prevent any interruptions of water service during the temporary service period, including taking any steps necessary to prevent freezing, shall be the responsibility of the Contractor. If freezing does occur, the Contractor shall thaw the lines, make any necessary repairs, and promptly restore temporary service.
- E. Before placing the temporary water pipe into service, a representative from the local Fire Department shall inspect any connections to existing fire hydrants, the placement of emergency fire connections, and shall be familiar with the operation of the emergency fire connections. The Contractor shall make any adjustments to the layout of the temporary water piping and hydrants requested by the local Fire Department. The Contractor shall provide any tools required to operate the emergency fire connections to the Fire Department. The Fire Department shall be contacted at least 48 hours in advance of placing the temporary water pipe into service

### 3.02 INSTALLATION:

- A. Generally, temporary service pipe shall be laid in gutters or several feet back from the edge of pavement. At driveways, crossings over the pipe shall be made by hot-mix pavement berm, wood or rubber mat ramp or other approved method. At street intersections and road crossings, pipe shall be laid in a shallow trench covered with temporary surfacing.
- B. All service pipe shall be suitably valved to meet the approval of the Engineer. Line valves shall be located at all intersecting streets but no further than 1,000 feet apart.
- C. Suitably threaded 2-1/2-inch valved emergency fire connections shall be installed and maintained adjacent to each fire hydrant which is scheduled to be out of service. Hydrant nozzle caps shall be placed on all emergency fire connections.



- D. Temporary connections to live hydrants or water mains shall be of the same size as the temporary pipe that they feed. No restrictions or reduction in size will be allowed.
- E. All hydrants that are out of service shall be covered with burlap bags, securely held in place.
- F. The Contractor shall be responsible for all consumer connections. The connection shall be made via a temporary hose from the temporary main to a suitable location in the house; via a temporary pipe or hose from the temporary main to the meter pit, if one exists; or by making a below-ground connection at the street edge to the existing service.
- G. The Owner shall enter all private property and assist the Contractor in making or removing temporary service connections. The Contractor shall notify the Owner at least 48 hours in advance so that personnel may be available when required.
- H. All service connections shall be valved at the temporary service pipe.
- I. See Section 02000 – ROADWAY SPECIAL CONDITIONS, for both temporary and permanent paving over the temporary service pipe trench.

### 3.03 DISINFECTING AND FLUSHING:

- A. The Contractor shall disinfect the temporary mains and services carrying temporary water.
- B. The Contractor shall furnish all equipment and materials necessary to do the work of disinfecting, and shall perform the work in accordance with the procedure outlined in AWWA C651 and all amendments thereto.
- C. In general, the procedure of disinfecting the main shall be to apply the chlorine through a tap in one end of the section and bleed off through a tap at the other end.
- D. The applied dosage shall be such as to produce a chlorine concentration of not less than 10 mg/l after a contact time of not less than 24 hours.
- E. During the disinfection period, care shall be exercised to prevent contamination of water in existing mains.
- F. Any temporary connection to the mains or other facilities required to accomplish the disinfection of the mains as described below, shall be at the Contractor's expense.
- G. After treatment, the main shall be flushed with clean water until the residual chlorine concentration is less than 0.2 mg/l.
- H. The Contractor shall dispose of the water used in disinfecting and flushing in an approved manner.

- I. Bacteriological sampling and testing shall be done by the Contractor in accordance with AWWA C651 for each main and each branch. Sampling shall be accomplished with sterile bottles treated with sodium thiosulfate, as required by Standard Methods. No hose or fire hydrants shall be used in collection of samples. A corporation stop installed on the main, with a removable copper tube gooseneck assembly, is the recommended method.
- J. Testing shall be done by a laboratory approved by the Engineer, in accordance with Standard Methods, and shall show the absence of coliform organisms. A standard plate count may be required at the option of the Engineer.
- K. The Contractor shall handle all sampling and coordinating of testing of such samples through a laboratory approved by the Engineer.

END OF SECTION

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## SECTION 02513

### INSULATION FOR PIPELINES

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers the furnishing of all material, accessories, labor, and equipment necessary to insulate the pipelines where shown on the drawings and where so required by the Engineer.

##### 1.02 RELATED WORK:

- A. Section 02080, DUCTILE IRON PIPE AND FITTINGS FOR WATER MAINS
- B. Section 02300, EARTHWORK

##### 1.03 REFERENCES:

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

American Society for Testing and Materials (ASTM)

ASTM     C552     Specification for Cellular Glass Block and Pipe Thermal  
Insulation

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

- A. Manufacturer's literature of the materials of this section and installation instructions for the products being provided for the project shall be submitted to the Engineer for review.
- B. A sample of the insulation shall be submitted to the Engineer.

#### PART 2 - PRODUCTS

##### 2.01 INSULATION: DIRECT BURIED PIPE

- A. Insulation shall be cellular glass type. The insulation shall be a cellular glass product that is made specifically for thermal insulation of piping and is compatible with the piping material. Insulation shall be a minimum of 2-inches thick, unless otherwise shown on the drawings.

- B. Insulation shall be composed of all glass sealed cells having no binders or fillers. The completed product shall be rigid and impermeable, with an ultimate compressive strength of at least 90 psi. The thermal conductivity of the cellular glass shall be no higher than 0.29 BTU-in./hr • ft<sup>2</sup> • °F @ 75°F and 0.28 BTU-in./hr • ft<sup>2</sup> • °F @ 50°F.
- C. The cellular glass insulation shall comply with all requirements of ASTM C552. The cellular glass shall be fabricated in half sections whenever possible.
- D. Bands for securing the insulation to the pipe shall be 0.5 inches wide by 0.020 inches thick made of stainless steel.
- E. The jacketing for the insulation shall be one of the following methods:
  - 1. A 125 mil (3mm) thick, heat sealed high polymer asphaltic membrane with an integral glass scrim and integral 1 mil (.02mm) aluminum foil and a thin Mylar film on the surface, equal to Pittwrap Jacketing as manufactured by Pittsburgh Corning or equal.
  - 2. Mastic - asphalt cutback mastic, equal to Pittcote 300 Finish, as manufactured by Pittsburgh Corning or equal.
  - 3. Reinforcing fabric - an open mesh polyester fabric with a 6 x 5.5 mesh/inch configuration, equal to PC Fabric 79, as manufactured by Pittsburgh Corning or equal.
- F. The insulation shall be "Foamglass" with jacketing as manufactured by Pittsburgh Corning Corporation, Pittsburgh, PA, or an approved equal. A minimum of 6" layer of fine sand shall surround the insulated pipe before rock free backfill is used in the trench.
- G. The Foamglass and jacketing shall be installed per the manufacturer instructions included in the approved shop drawings.
- H. Tees, valves, and bends shall be covered with form fitting factory made sections.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION:

- A. Cellular glass shall not be applied to the piping until the piping has been wiped clean and supported so that there is adequate space to apply the full thickness of insulation and the covering completely around the pipe. The Contractor must obtain the Engineer's approval before the installation begins.
- B. Cellular glass insulation and jacketing shall be applied in accordance with the manufacturers installation procedures included in the approved shop drawings.
- C. There shall be at least three 0.50-inch wide stainless steel bands secured around each joint and these bands shall be placed not over 9 inches on center on straight sections of pipe.

- D. Tees, valves, and bends shall be covered with form fitting factory made sections.
- E. All testing of the piping system, such as hydrostatic, x-ray or other such testing, shall be accomplished prior to application of insulation.

END OF SECTION

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## SECTION 02514

### HYDRANTS AND VALVES

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This Section covers the furnishing and installation of all outside hydrants, valves and appurtenances as indicated on the drawings and as specified herein.
- B. Pipe and couplings shall be specified under the appropriate pipe sections.

##### 1.02 RELATED WORK:

- A. Section 02080, DUCTILE IRON PIPE AND FITTINGS FOR WATER MAINS
- B. Section 02300, EARTHWORK
- C. Section 02516, CONNECTIONS TO EXISTING WATER MAINS

##### 1.03 REFERENCES:

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

#### American Society for Testing and Materials (ASTM)

ASTM	A48	Gray Iron Castings
ASTM	A126	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM	A536	Ductile Iron Castings
ASTM	B62	Composition Bronze or Ounce Metal Castings
ASTM	D429	Test Method for Rubber Property Adhesion to Rigid Substrate.

#### American Water Works Association (AWWA)

AWWA	C500	Metal Seated Gate Valves For Water Supply Service
AWWA	C502	Dry-Barrel Fire Hydrants
AWWA	C504	Rubber-Seated Butterfly Valves
AWWA	C509	Resilient-Seated Gate Valves for Water Supply Service

AWWA C515 Reduced Wall, Resilient-Seated Gate Valves for Water Supply Service

AWWA C550 Protective Interior Coatings for Valves and Hydrants

Federal Specifications (FS)

FS TT-V-51F Varnish, Asphalt

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

- A. Shop drawings shall be submitted for the hydrants, valves and appurtenances indicating type of joint, and lining and coating, etc., in accordance with the specifications.
- B. Shop drawings shall consist of manufacturer's scale drawings, cuts or catalogs including descriptive literature and complete characteristics and specifications, and code requirements.
- C. Refer to Paragraph 3.01.A for Affidavit of Compliance required to be submitted.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Valves shall open right (clockwise).
- B. Hydrants shall open left (counterclockwise).
- C. Hydrants and valves shall be American made.

2.02 HYDRANTS:

- A. Hydrants shall conform to the requirements of AWWA C502. They shall be equipped with a 5-1/4-inch main valve and 6-inch mechanical joint inlet.
- B. Hydrants shall have one 4-1/2-inch pumper and two 2-1/2- inch hose connections. Threads shall be NST.
- C. Hydrant operating and nozzle cap nuts shall be of pentagonal shape and measure one and one half inches from flat to point. The height of the nut shall not be less than one inch.
- D. All internal operating parts including main valve, main valve seat, drain valve mechanism, operating rod, etc., shall be removable without excavating.

- E. Main valve seats shall be made of brass or bronze, and shall screw into a seat ring or sub-seat, which shall also be made of brass or bronze.
- F. Hydrants shall be traffic models with frangible bolts or breakaway couplings. Details of hydrant design shall meet the requirements of the Owner.
- G. For purposes of standardization, hydrants shall be Mueller Super Centurian 200; Kennedy Guardian K81D; American Darling B-84-B-5; or approved equal.

#### 2.03 HYDRANT PAINT:

- A. Hydrants shall be thoroughly cleaned and given two shop or field coats of paint in accordance with AWWA C502 and the instructions of the paint manufacturer. Paint color shall be the standard hydrant color of the Owner as follows:
  - 1. Barrel – Red
  - 2. Bonnet – White
  - 3. Nozzle Caps – White.
- B. If the hydrants are delivered with the Owner's standard color, they shall be given one matching field coat of an alkyd gloss enamel. If the hydrants are not delivered with the Owner's standard color, they shall be given two coats of an alkyd gloss enamel, colors as indicated above.
- C. Hydrant paint shall be as manufactured by Sherwin-Williams, Cleveland, OH; Tnemec Company, Inc., Kansas City, MO; or Minnesota Mining and Manufacturing Co. (3M), St. Paul, MN; or approval equal.
- D. Alkyd gloss enamel shall be 801 DTM by Sherwin-Williams, 2H-Tneme by Tnemec; or approved equal. Reflective paint shall be Scotchlite #7211 by 3M.

#### 2.04 RESILIENT SEAT GATE VALVES:

- A. Resilient seat, wedge type gate valves shall be manufactured to meet or exceed all applicable requirements of AWWA C509 or AWWA C515. All valves shall be bubble-tight at 200 psi water working pressure, tested in both directions.
- B. Valve bodies shall be of cast or ductile iron and shall have non-rising threaded bronze stems acting through a bronze stem nut. Opening nuts shall be 2-inches square and shall open as specified above. All buried valves shall have mechanical joint ends, complete with all accessories. Bolts shall be CorTen or approved equal.
- C. Stem seals shall consist of two (2) O-rings, one (1) as a dirt seal and one (1) as a pressure seal.
- D. Rubber seats shall be either bonded to or mechanically attached to the gate.



- E. All bonnet bolts, seal plate bolts, stuffing box bolts, and other bolts in contact with soil (except MJ bolts) shall be 18-8 Type 304 stainless steel or Everdur bronze.
- F. Valve wedges shall be of ductile iron with resilient seating surfaces permanently bonded to the wedges in strict accordance with ASTM D429 or attached to the face of the wedges with stainless steel screws. Each valve shall have a smooth, unobstructed water way free from sediment pockets.
- G. Valves shall have low friction, torque-reduction thrust bearings. All O-rings and gaskets shall be removable without taking the valves out of service.
- H. The torque required to open a fully closed valve under 100 PSI pressure on one side shall not exceed 100 foot pounds and the torque required to fully close a valve under the flow conditions of 10 FPS shall not exceed 100 foot pounds.
- I. An NSF 61-approved epoxy coating, which is safe for potable water, shall be applied to exterior and interior valve surfaces.
- J. Valves for horizontal applications shall have Delrin wedge covers, and be specifically designed for horizontal installation.
- K. Resilient seat gate valves shall be as manufactured by Clow Valve Co., Oskaloosa, IA; Mueller Co., Decatur, IL; American Valve and Hydrant; Birmingham, AL; Waterous Co., S. St. Paul, MN; MH Valve, Anniston, AL; Kennedy Valve, Elmira, NY; or approved equal.
- L. Post indicating valve assemblies shall have a post and indicator as an integral part of the resilient seated gate valve assembly. The unit shall be provided with a detachable crank which OPENS the valve in a clockwise direction. Shafts shall be Type 304 stainless steel. Post indicators and valves shall be UL listed, FM approved. Post indicators and valves shall be as manufactured by Pratt, Clow or approved equal.

#### 2.05 TAPPING SLEEVES AND VALVES:

- A. Tapping sleeves and valves shall consist of a split cast iron or ductile iron sleeve tee with mechanical joint ends on the main and a flange on the branch. Tapping-type gate valves shall have one flange and one mechanical joint end. The valves shall conform to the requirements hereinbefore specified for gate valves and shall be furnished with a 2-inch square operating nut. The Contractor shall be responsible for verifying the outside diameter of the pipe to be tapped.
- B. Oversized valves shall be provided as required to permit the use of full size cutters. Before backfilling, all exposed portions of bolts used to hold the two halves of the sleeve together shall be heavily coated with two coats of bituminous paint comparable to Inertol No. 66, Special Heavy. Sleeves shall be of cast iron furnished with rubber gaskets. Gaskets shall cover the entire area of flange surfaces.

- C. Stainless steel tapping sleeves are not acceptable.
- D. Tapping sleeves and valves shall be as manufactured by Clow Valve Co., Oskaloosa, IA; Mueller Co., Decatur, IL; American Valve and Hydrant, Birmingham, AL; MH Valve, Anniston, AL; Kennedy Valve, Elmira, NY; US Pipe, Chattanooga, TN; or approved equal.

#### 2.06 DAMPENED SWING CHECK VALVES:

- A. Provide swing check valves with weighted arm plus an externally mounted air cushion cylinder APCO Series 6000 as manufactured by Valve and Primer Corporation, Inc.; Golden-Anderson Figure 250-D as manufactured by GA Industries, Cranberry Township, PA, or approved equal.
- B. The dampened swing check valves shall be flanged with cast iron body, bronze seat ring and continuous stainless steel shaft connected to an external lever and weight and bronze air cushion cylinder.
- C. Valves shall be full ported and prevent reverse flow when the inlet pressure becomes less than the downstream pressure, and shall be tight seated.
- D. The disc shall be cast iron, utilizing a double clevis hinge connected to a ductile iron disc arm. The disc arm assembly shall be suspended from the stainless steel shaft.
- E. The air cushion cylinder shall be constructed of corrosion resistant material and the piston shall be totally enclosed within the cylinder (not open at one end). The cushion cylinder assembly shall be externally attached to the right side of the valve body looking downstream and be adjustable to cushion the closure of the valve. Cushioning shall be by air trapped in the cushion cylinder, which shall be fitted with a one-way adjustable control check valve to cushion disc contact to the seat at the shut-off point.

#### 2.07 INSERTION VALVES:

- A. Insertion valves shall consist of a ductile iron or ASTM A-36 steel fusion bonded epoxy coated to 10-12 mils in accordance with AWWA C-213. The valves shall conform to the requirements herein specified for gate valves and shall be furnished with a 2-inch square operating nut. The contractor shall be responsible for verifying the outside diameter of the pipe where the valve will be inserted.
- B. Before backfilling, all exposed portions of bolts used to hold the two halves of the sleeve together shall be heavily coated with two coats of bituminous paint comparable to Inertol No. 66, Special Heavy. Sleeves shall be furnished with a rubber gasket that fits 360 degrees around the pipe at each end.
- C. Insertion valves shall be as manufactured by Hydra-Stop, Inc., Blue Island, IL; Romac Industries, Inc, Seattle, Washington; or approved equal.

## 2.08 WATER LINE STOPS:

- A. Water line stop fitting body shall consist of a ductile iron or ASTM A-36 steel fusion bonded epoxy coated to 10-12 mils in accordance with AWWA C-213. The fitting shall be full encirclement, pressure retention-type split tee. The outlet of the fitting shall have locking pins built in to retain the completion plug. The contractor shall be responsible for verifying the outside diameter of the pipe where the valve will be inserted.
- B. Before backfilling, all exposed portions of bolts used to hold the two halves of the sleeve together shall be heavily coated with two coats of bituminous paint comparable to Inertol No. 66, Special Heavy. Sleeves shall be furnished with a nitrile gasket that fits 360 degrees around the pipe at each end.
- C. The completion plug shall be machined from a stress relieved carbon steel weldment. It shall contain two (2) circumferential grooves: one to receive the locking devices from line stop flange and second to contain a compressible "O" ring to seal tight under pressure. The line stop fitting shall be closed with a blind flange. Facing and drilling of the blind flange shall be compatible with that of the line stop flange.
- D. The Contractor shall provide the materials, machines, and related equipment necessary to install the line stop into an existing piping system under full operating pressure without interrupting service.
- E. Line stops shall be as manufactured by South Shore Pipeline, Hanover MA, John Hoadley & Sons, Inc. Rockland MA, Hydra-Stop, Inc., Blue Island, IL; IPSCO Paulsboro NJ; or approved equal.

## 2.09 VALVE BOXES AND EXTENSIONS:

- A. Valve boxes shall be manufactured in North America. The minimum outside diameter of the boxes shall be 5½-inches and the lengths shall be as necessary to suit the ground elevation and the depth of each valve operator, regardless of the depth of cover.
- B. When there is more than 6 feet of cover, valve operators shall have non-rising extension stems which raise the operating nut to a depth of approximately 4 feet below grade. The extension stem shall have a centering support ring at the upper end. The lower socket shall be tapped with a set screw into the valve nut to prevent the extension stem from lifting off the valve nut.
- C. Each valve shall be provided with a box which has a close fitting 7-1/4-inch diameter cover and is substantially dirt-tight. The top of the cover shall be flush with the top of the box rim. The word "WATER" shall be cast in the top of the cover.
- D. Valve boxes shall be of cast iron and of the adjustable sliding, heavy pattern type. They shall be so designed and constructed as to prevent direct transmission of traffic loads to the pipe or valve. The upper or sliding section of the box shall be provided with a

flange on the top of the section (not on the bottom) having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and to rest on the backfill. The boxes shall be adjustable through at least 6 inches vertically without reduction of lap between sections to less than 8-inches.

#### 2.10 POLYETHYLENE ENCASEMENT:

Where called for on the drawings, the pipe shall be encased in polyethylene conforming to AWWA C105.

### PART 3 - EXECUTION

#### 3.01 AFFIDAVIT OF COMPLIANCE

- A. The manufacturer shall furnish as part of the shop drawing submittal the Engineer with an affidavit stating that valve(s), hydrants conform to the applicable requirements of the applicable AWWA Standard and the Engineer's specifications, and that all tests specified therein have been performed and all test requirements have been met and the test date.
- B. A copy of the Affidavit of Compliance shall be delivered to the construction site attached to each valve and/or hydrant furnished. The Affidavit shall be attached to the valve or hydrant inside a waterproof pouch.
- C. Any valve or hydrant received without the required affidavit shall be removed from the project and replaced at no expense to the Owner.
- D. All materials shall be certified "NEW". No reconditioned or repaired materials are permitted. Any reconditioned or repaired materials furnished or installed shall be removed and replaced with new materials at no expense to the Owner.

#### 3.02 INSTALLATION:

- A. All valves shall be carefully installed and supported in their respective positions free from distortion and strain. Care shall be taken to prevent damage or injury to the valves and appurtenances during handling and installation.
- B. All material shall be carefully inspected for defects in workmanship and all debris and foreign material cleaned out of valve openings and seats. All mechanisms shall be operated to check for proper functioning, and all nuts and bolts checked for tightness.
- C. Valves and other equipment that do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.
- D. Hydrants shall be set plumb. Earth fill shall be carefully tamped around the hydrants to a distance of 4 feet on all sides of the hydrant, or to the undisturbed trench face, if less

than 4 feet. Hydrants and connecting pipe shall have at least the same depth of cover as the distributing main. Hydrants shall be set upon a layer of stone or a slab of concrete not less than 4-inches thick and 15-inches square. The side of the hydrant opposite the pipe connection shall be firmly wedged against the vertical face of the trench with a concrete thrust block, as indicated on the drawings.

- E. Broken stone shall be placed around the base of the hydrant at the location of the drain hole, and backfill around the hydrant shall be thoroughly compacted to the grade line in a satisfactory manner. Hydrants shall have the interiors cleaned of all foreign matter before installation, and shall be inspected in both the open and closed positions.
- F. The body of the hydrant shall be of sufficient length to allow the hydrant to be set at the proper elevation, as shown on the drawings. Extensions shall be furnished and installed at the Contractor's expense, when required for greater depths.
- G. Valve boxes shall be set plumb, flush with the ground or paved surface, and centered directly over the operating nut of the valves. Earth fill shall be carefully tamped around the valve boxes to a distance of 4 feet on all sides of the boxes or to the undisturbed trench face, if less than 4 feet.
- H. Valves shall be operational and accessible at all times during construction and warranty period. The Contractor shall verify proper operation of all valves in the presence of the Engineer and/or Owner following completion of the project and prior to the acceptance of Substantial Completion.

### 3.03 POLYETHYLENE ENCASEMENT:

- A. The pipe, hydrants and valves to be encased shall be thoroughly cleaned of all soil and debris prior to installation of the polyethylene encasement. No soil or debris shall be allowed to enter the encasement during or after its installation.
- B. Polyethylene encasement shall be installed using Method A as described in AWWA C105, with the encasement joints coincident with pipe joints. Adhesive tape shall be used to secure the encasement.
- C. Minimum overlap of polyethylene encasement shall be 24-inches, 12-inches on each side of pipe joints.
- D. If required, two layers of polyethylene encasement shall be installed. The first layer shall be completely installed on and secured to the length of pipe before the second layer is installed.
- E. Tears, cuts and other damage shall be repaired with a piece of polyethylene covering secured with adhesive tape, when approved by the Engineer. Otherwise, the damaged length of polyethylene shall be replaced at the Contractor's expense.

- F. Care shall be taken when backfilling to avoid damage to the polyethylene encasement.

#### END OF SECTION

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## SECTION 02515

### SERVICE CONNECTIONS (WATER SERVICES)

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This section covers the furnishing and installation of new water service connections and the repair, replacement, and/or transfer of existing water service connections as shown on the drawings, as specified herein, and as required by the Engineer.

##### 1.02 RELATED WORK:

- A. Section 02080, DUCTILE IRON PIPE AND FITTINGS
- B. Section 02000, ROADWAY SPECIAL PROVISIONS

##### 1.03 REFERENCES:

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

#### American Society for Testing and Materials (ASTM)

ASTM	B88	Seamless Copper Water Tube
ASTM	B584	Copper Alloy Sand Castings for General Applications
ASTM	D2737	Polyethylene (PE) Plastic Tubing

#### American Water Works Association (AWWA)

AWWA	C800	Water-Service Line Fittings
AWWA	C651	Disinfecting Water Mains
AWWA	C901	Polyethylene Pressure Pipe & Tubing, 1/2-inch through 3-inch for Water Service

#### Federal Specifications (FS)

FS	WW-T-799C	Tube, Copper, Seamless
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##### 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF THE GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of manufacturer's literature of the materials of this section for review.

## PART 2 - PRODUCTS

### 2.01 SERVICE PIPING:

- A. Piping for buried copper water services shall be continuous Type K annealed seamless copper water tubing conforming to ASTM B88 Standard Specification for Seamless Copper Water Tube or U.S. Federal Specification WW-T-799C for Tube, Copper, Seamless. Tubing shall be 3/4-inch diameter unless otherwise indicated.
- B. Couplings, if required, for existing to new service pipe connections shall have compression connections on the inlet and compression connections on the outlet. Couplings shall be made of brass as specified in AWWA C800. All brass components that come into contact with potable water shall be made from either CDA/UNS Brass Alloys C89520 or C89833 and shall not contain more than twenty five hundredths of one percent (0.25% or less) total lead content by weight. The lead leach limit of the coupling shall be 5 parts per billion (ppb). Couplings shall be NSF/ANSI 61 Annex F and Annex G and NSF/ANSI 372 certified by an ANSI accredited organization and shall be stamped or embossed with a mark or name indicating that the product is manufactured from a low-lead alloy, as specified above.

### 2.02 CORPORATION STOPS:

- A. Corporations stops shall be made of brass as specified in AWWA C800. All brass components that come into contact with potable water shall be made from either CDA/UNS Brass Alloys C89520 or C89833 and shall not contain more than twenty five hundredths of one percent (0.25% or less) total lead content by weight. The lead leach limit of the corporation stops shall be 5 ppb. Corporation stops shall be NSF/ANSI 61 Annex F and Annex G and NSF/ANSI 372 certified by an ANSI accredited organization and shall be stamped or embossed with a mark or name indicating that the product is manufactured from a low-lead alloy, as specified above.
- B. The inlet shall have AWWA taper thread (CC) connections and the outlet shall have compression connections.
- C. Service clamps shall be installed with all corporation stops 2-inches and larger in size and with all corporation stops installed in PVC pipe. Clamps shall be all bronze, ductile iron or stainless steel, double strap, AWWA taper thread (CC) with O-ring seal.
- D. Corporation stops shall be American made.
- E. Corporation stops shall be by Ford Meter Box Co., Inc., Wabash, IN; Mueller Co., Decatur, IL; or approved equal.

### 2.03 CURB STOPS:

- A. Curb stops shall be of brass as specified in AWWA C800. All brass components that come into contact with potable water shall be made from either CDA/UNS Brass Alloys C89520 or C89833 and shall not contain more than twenty five hundredths of one



percent (0.25% or less) total lead content by weight. The lead leach limit of the curb stops shall be 5 ppb. Curb stops shall be NSF/ANSI 61 Annex F and Annex G and NSF/ANSI 372 certified by an ANSI accredited organization and shall be stamped or embossed with a mark or name indicating that the product is manufactured from a low-lead alloy, as specified above.

- B. Curb stop shall not contain external drain port.
- C. Curb stops shall be Teflon coated ball style and the inlet and the outlet shall have compression connections.
- D. Curb stops shall be American made.
- E. Curb stops shall be by A.Y. McDonald Manufacturing. Co., Dubuque, IA; Red Hed Manufacturing Co., Lincoln, RI; Ford Meter Box Co., Inc., Wabash, IN; Mueller Co., Decatur, IL; or approved equal.

#### 2.04 CURB BOXES:

- A. The cast iron box shall be the sliding Buffalo type with Arch pattern base. Minimum inside diameter of the upper section shall be 1-1/2-inch for 3/4-inch and 1-inch curb stops and 2-inch for 1-1/2-inch and 2-inch curb stops. Curb box lid shall have brass pentagonal nut.
- B. Curb boxes shall be American made.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION:

- A. Where new water mains are being installed and existing water services are to be transferred to the new main, the Contractor shall discontinue the existing water services by shutting down the corporation stop at the old water main, unless specifically otherwise required by the Engineer. The Contractor shall take special care to minimize the interruption of existing water service.
- B. The Contractor shall tap a new corporation stop, cut the existing service piping and connect the new service piping to the old service piping using an approved coupling at a point between the main and the existing curb stop and box.
- C. Where transfers are to be made and the existing curb stop and box cannot be utilized or a new curb stop and box is required, the Contractor shall connect the new service piping to the existing service piping using an approved coupling approximately 12-inches from the curb stop on the building side of the stop.
- D. Where transfers are being made and the existing service is of lead, galvanized steel, or iron, the service shall be replaced to the curb stop and box unless otherwise required. If required, the curb stop and box shall be replaced as specified above.

- E. Curb stops and boxes shall be set plumb, flush with the ground or paved surface, and centered with the box located directly over the stop. The box shall be set on a concrete block or flat stone. Earth fill shall be carefully tamped around the boxes to a distance of 4 feet on all sides of the box or to the undisturbed face of the trench, if less than 4 feet.
- F. Curb stops shall be operational and accessible at all times during construction and warranty period. The Contractor shall verify the proper operation of all curb stops in the presence of the Engineer and/or Owner following completion of the project and prior to the acceptance of substantial completion.
- G. All services shall be installed at 5 feet 0 inches of cover unless otherwise required by the Engineer.
- H. Service connections shall be tested and disinfected in accordance with AWWA standards.

END OF SECTION

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## SECTION 02516

### CONNECTIONS TO EXISTING WATER MAINS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

- A. This section covers connections to existing water mains, complete.
- B. The Contractor shall furnish all pipe, fittings, valves, tapping machines, if required, and appurtenances. The Contractor shall do all excavation and backfill as required.

##### 1.02 RELATED WORK:

- A. Section 02080, DUCTILE IRON PIPE AND FITTINGS.
- B. Section 02511, TEMPORARY WATER SERVICE.
- C. Section 02514, HYDRANTS AND VALVES. (Tapping sleeves and valves specified)
- D. Section 03302, FIELD CONCRETE.

#### PART 2 - PRODUCTS: NOT APPLICABLE

#### PART 3 - EXECUTION

##### 3.01 CONTRACTOR OPERATIONS:

- A. The Contractor shall make all connections to the existing mains as indicated on the drawings and as herein specified.
- B. The Contractor shall develop a program for the construction and putting into service of the new work subject to the approval of the Engineer. All work involving cutting into and connecting to the existing work shall be planned so as to interfere with operation of the existing facilities for the shortest possible time and when the demands on the system best permit such interference even to the extent of working outside of normal working hours to meet these requirements.
- C. The Contractor shall have all possible preparatory work done prior to making the connection and shall provide all labor, tools, material, and equipment required to do the work in one continuous operation.
- D. The Contractor shall have no claim for additional compensation, by reason of delay or inconvenience, for adapting his operations to the needs of the Owner's water supply.

No damages shall be claimed by the Contractor for delays in dewatering pipelines nor shall any damages be claimed because of water leaking through closed valves after dewatering is completed.

- E. Under no circumstances shall any customers be without water for a period of more than 4 hours without prior approval of the Owner. Should it appear that any customer will be without water for more than 4 hours, the Contractor shall install temporary water service as specified in Section 02511, TEMPORARY WATER SERVICE where required by the Engineer.
- F. Existing pipeline that is not to be abandoned but is damaged by the Contractor during the work shall be replaced by him at his own expense in a manner approved by the Engineer.

### 3.02 TAPPING CONNECTION TO EXISTING MAINS:

- A. Tapping connections to the existing mains, where indicated on the drawings, shall be made with service pressure in the main, using tapping sleeves and valves and a suitable tapping machine.
- B. Other connections to existing mains shall be made with the main out of service, unless otherwise required by the Engineer. Such connections will not require tapping sleeves and valves but connections as indicated on the drawings.

### 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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of 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 01535, TEMPORARY BYPASS PUMPING SYSTEM
- C. Section 01575, HANDLING EXISTING FLOWS
- D. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- E. Section 02300, EARTHWORK
- F. Section 02324, ROCK EXCAVATION AND DISPOSAL
- G. Section 02518, TRACER TAPE
- H. Section 02531, SEWER CHIMNEYS
- I. Section 02533, CONNECTIONS TO EXISTING STRUCTURES
- J. Section 02631, PRECAST MANHOLES AND CATCH BASINS
- K. Section 03302, FIELD CONCRETE

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

- A. Six sets of 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. 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 and in Section 01535 TEMPORARY BYPASS PUMPING SYSTEM.
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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of 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 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 a 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 use 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 AND CATCH BASINS

##### 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 AND CATCH BASINS.

END OF SECTION

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## SECTION 02534

### RECONSTRUCTION OF EXISTING SEWERS AND DRAINS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers work required to reconstruct affected piping where proposed water mains cross existing street sewers, house sewer connections (referred to as sewers) and drains.

#### PART 2 - PRODUCTS

##### 2.01 REPLACEMENT PIPE FOR SEWERS AND DRAINS:

- A. The Contractor shall furnish all pipe, couplings, jointing materials, labor, tools and equipment necessary to reconstruct the sections of existing sewers or drains removed.
- B. The size of replacement pipe shall closely approximate the size of existing section to be replaced, allowing a watertight joint to be made while maintaining the existing invert and slope.

#### PART 3 - EXECUTION

##### 3.01 INSTALLATION:

- A. Unless field conditions or the plans require otherwise, water mains shall pass over sewers and drains, except where, in the opinion of the Engineer, suitable cover and insulation cannot be provided. In such cases water mains shall pass under sewers and drains.
- B. The vertical clear distance between water mains and sewers or drains will be no less than 18-inches, unless otherwise approved by the Engineer, or specifically indicated on the drawings. In locations where water mains shall pass over or under existing sewers or drains, the Contractor shall plan the laying of the mains such that the joints of a section of water main at least 18 feet long are equally distant from the sewer or drain.
- C. Where proposed water mains pass under existing vitrified clay sewers, and damage to the sewer line cannot be prevented, and if approved by the Engineer, the sewer line shall be reconstructed using a minimum 9-foot section of ductile iron pipe or PVC sewer pipe. The pipe shall be installed such that joints of the reconstructed sewer are at a minimum distance of 4.5 feet on either side of the proposed water main.
- D. Drains which are shown on the plans or located in the field and are damaged by the Contractor shall be replaced with identical materials at the Contractor's expense unless the Engineer agrees in writing that the Contractor was not at fault.

- E. Joints between existing pipe and replacement pipe shall be made with suitable watertight sleeves or couplings.
- F. Joints shall not be backfilled until approved for watertightness by the Engineer.
- G. Watertightness shall be determined by allowing water to flow through the repaired pipeline (street sewers, drains and house connections). If there is any visual leakage under these conditions, the pipe will not be accepted as watertight and shall be repaired at the Contractor's expense.

### 3.02 EXISTING SEWERS:

The composition, diameter, flow direction, approximate locations and depths to inverts of street sewers are indicated on the drawings, if known.

### 3.03 EXISTING DRAINS:

- A. Existing drains are assumed to be of reinforced concrete pipe, unless otherwise noted on the drawings.
- B. The diameter, flow direction and approximate locations and depths to inverts of drains are indicated on the drawings, if known.

### 3.04 DIVERSION OF SEWAGE FLOWS:

- A. During construction of the water mains under existing street sewers and replacement of required sections of street sewers, sewage flows shall be diverted away from said street sewer. This may be accomplished by plugging both ends of the street sewer at the nearest manhole and pumping the sewage from the upstream manhole to the next downstream manhole.
- B. The Contractor shall furnish all labor, materials, tools and equipment necessary to divert sewage flows from such street sewers.
- C. During construction of water mains under house sewer connections, and replacement of required section of house sewer connections, no sewage flow shall be allowed in the house sewer connections.

END OF SECTION

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## SECTION 02536

### PRECAST CONCRETE VAULT

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This section covers precast vaults complete, including, but not limited to, bases, walls, mortar, frames and covers, as shown on the Drawings and as specified herein.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02631, PRECAST MANHOLES AND CATCH BASINS
- C. Section 02080, DUCTILE IRON PIPE AND FITTINGS
- D. Section 02514, HYDRANTS AND VALVES

##### 1.03 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	A615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM	C32	Sewer and Vault Brick (Made from Clay or Shale)
ASTM	C177	Test Method for Steady - State Heat Flux Measurements and Thermal Transmission Properties by means of the Guarded-Hot-Plates
ASTM	C207	Hydrated Lime for Masonry Purposes
ASTM	C478	Precast Reinforced Concrete Vault Sections
ASTM	C923	Resilient Connectors Between Reinforced Concrete Vault Structures and Pipes

ASTM C1227 Standard Specifications for Precast Septic Tank - Watertightness. Testing

American Association of State Highway Transportation Officials (AASHTO)

AASHTO M198 Joints for Circular Concrete Sewers and Culvert Pipe Using Flexible Watertight Gaskets

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

- A. Six sets of manufacturer literature and shop drawings of the materials of this section shall be submitted to the Engineer for review. Shop drawings shall indicate locations and dimensions of proposed penetrations.
- B. Test reports as required shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS:

- 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. The frame and cover shall be the standard frame and cover as specified. The frame and cover 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.

2.02 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</u>	<u>Minimum Wall Thickness, in.</u>
Roof	8
Walls	6
Floor	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 5000 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 the barrel.
  7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
  8. Steel reinforcement shall be Grade 60 and conform to ASTM A615 with a minimum of 1-inch cover.
  9. Design loading shall be AASHTO HS-20-44.
  10. The outside surfaces of the vault shall be thoroughly sealed with bituminous coating as herein specified prior to shipping.
- B. Precast sections shall be manufactured to contain wall and roof openings of the minimum size to receive the ends of the pipes and such openings being accurately set to conform to line and grade of the pipelines. 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.
- C. The Engineer reserves the right to reject any precast section and the rejected unit shall be tagged and removed from the job site immediately.
- D. 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.

2.03 BRICK MATERIALS:

- A. The brick shall be sound, hard, and uniformly burned brick regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Brick 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.

2.04 MORTAR, CEMENT, HYDRATED LIME AND SAND:

- A. The 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.

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

#### 2.05 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 32-inch covers for 30-inch openings shall be 500 pounds minimum by East Jordan Iron Works, No. 1040; 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.
- G. All castings shall be American made.

#### 2.06 BITUMINOUS DAMPPROOFING:

- A. Liquid Asphalt Damp proofing: Non-fibrated asphalt emulsion primer coat followed by fibrated asphalt emulsion top coat for below grade wall damp proofing.

Primer coat Sonneborn Building Products - Hydrocide 600 or equal, cut 20% by volume with clean water.

Top coat Sonneborn Building Products - Hydrocide 700 Mastic, or equal.

## 2.07 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 vault -pipe interface shall be of the method detailed on the drawings. The seal system shall be rubber (with or without stainless steel straps) meeting the requirements of ASTM C923 and recommended for this type of connection. Only cast-in-place couplings shall be acceptable for new vaults furnished per this specification; couplings for core-drilled or cast-in-place openings will be rejected except for modifications to existing vaults.

## PART 3 - EXECUTION

### 3.01 INSTALLATION:

#### A. Precast Sections

- 1. The precast vault shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300 EARTHWORK, at least 6-inches thick, but to the depth necessary to reach sound undisturbed earth.
- 2. Precast reinforced concrete sections shall be set so as to be vertical and with sections in true alignment.
- 3. Butyl rubber joint sealant shall be installed between each concrete section.
- 4. All holes in sections used for their handling shall be thoroughly plugged with mortar. The 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. Brickwork

- 1. The brick 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 headers in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as required.

#### C. Castings

- 1. Frames shall be set with the tops conforming accurately to the grade on the drawings or as required by the Engineer.

2. Frames shall be set as shown on the drawings 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. Covers shall be left in place in the frames except while work is being performed on them.

D. Accessories

Accessories shall be installed in accordance with manufacturer's instructions.

3.02 LEAKAGE TESTS:

- A. Leakage tests shall be made by the Contractor and observed by the Engineer on each vault. The test shall be by vacuum as described below:
- B. Vacuum Test
  1. The vacuum test shall be conducted in accordance with ASTM C-1227. Test result will be judged by the length of time it takes for the applied vacuum to drop from 15-inches of mercury to 14½-inches. If the time is less than 2 minutes, the vault will have failed the test.
  2. If the vault 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 vault should again fail the vacuum test, additional repairs shall be made, and the vault water tested as specified below.

3.03 CLEANING:

All new vaults shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

3.04 QUALITY ASSURANCE:

1. On completion of the vault, the Contractor shall inspect the completed structure at no additional cost to the Owner.
2. The Contractor shall be responsible for the satisfactory water-tightness of the vault. Should the Engineer determine that the vault is unsatisfactory, the Contractor shall do all work to 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 02630

### BUILD MANHOLE INVERT

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers all manholes complete, including, but not limited to, bases, mortar, and inverts.

##### 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 SYSTEM DESCRIPTION:

- A. Invert channel shall be formed of brick and mortar upon the base.

##### 1.04 REFERENCES:

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

#### American Society for Testing and Materials (ASTM)

ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
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.



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

- A. Six sets of manufacturer literature of the materials of this section shall be submitted to the Engineer for review.
- B. Tests reports as required shall be submitted to the Engineer.

PART 2 – INVERT MATERIALS

2.01 The invert shall be formed of brick and mortar, as specified in this specification section.

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 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.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. INVERT BRICK WORK:

- 1. All debris shall be removed from the bottom of the manhole before the invert is constructed.
- 2. 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.

3. 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.
4. 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.

### 3.02 CLEANING:

All 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 02631

### PRECAST MANHOLES AND CATCH BASINS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers all precast manholes and catch basins 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 and catch basins 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. Catch basins shall have a 4-foot deep sump unless otherwise specified. Leaching basins shall have a bottom opening as shown on the drawings.
- D. 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 GENERAL  
SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A.      Six sets of manufacturer literature of the materials of this section shall be submitted to  
the Engineer for review.
- B.      Test reports as required shall be submitted to 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
72	7
84	8
96	9
120	10

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 East Jordan Iron Works 1047Z (frame), 1040A (cover); or approved equal.

- F. Watertight type manhole frames with 26-inch diameter covers (bolted and gasketed) shall be 4 bolt, 475 pounds minimum, and shall be East Jordan Iron Works 1047Z (frame), 1040A (cover); or approved equal.
- G. Catch basin frames with cascade grate openings and 23-7/8-inch square grates shall be 8-inches in height and 512 pounds minimum. They shall be East Jordan Iron Works 5520M8; or approved equal.
- H. Catch basin frames set against curbing shall have three flanges only.
- I. 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.
- J. All castings shall be American made.

#### 2.04 SEWER MANHOLE AND CATCH BASIN 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.
- D. Catch basin hood for 12-inch pipe shall be by East Jordan Iron Works, model 5954; or approved equal.

### 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, grates 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 and/or grates 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 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

Depth (Feet)	Diameter (Inches)		
	48	60	72
	Times (Seconds)		
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 and catch basins shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

### 3.04 QUALITY ASSURANCE:

1. On completion of a manhole or catch basin the Contractor shall inspect the completed structure at no additional cost to the Owner.
2. The Contractor shall be responsible for the satisfactory water-tightness of the manhole or catch basin. Should the Engineer determine that the structures inspected are unsatisfactory, the Contractor shall do all work to 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 02633

### REINFORCED CONCRETE PIPE

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED:

This Section covers the furnishing and installation of reinforced concrete pipe, complete.

##### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02631, PRECAST MANHOLES AND CATCH BASINS

##### 1.03 QUALITY ASSURANCE:

- A. Acceptance of pipe will be on the basis of plant load-bearing tests, material tests, and inspection of the complete product. The required tests are enumerated herein. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the Engineer, at the place of manufacture or on the work site after delivery or at both locations. The pipe will be subject to rejection at any time if it fails to meet the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. Rejected pipe shall be promptly removed from the project site by the Contractor.
- B. All tests shall be made in accordance with the latest applicable ASTM specifications, which are as follows:
  - 1. Reinforcing Steel. Mill test reports, or reports on samples taken from each shipment to the pipe manufacturer, shall be submitted for reinforcing steel to be used on this project stating that the reinforcing meets the specified requirements.
  - 2. Cement. Mill test reports shall be submitted for each shipment to the pipe manufacturer of cement to be used on this project stating that the cement meets the specified requirements. Flyash may be used as specified in ASTM C76.
  - 3. Aggregates. Test reports shall be submitted stating that the aggregates to be used on this project meet the requirements of ASTM C33 except that the requirements for gradation shall not apply. The first report shall be submitted prior to the manufacture of any pipe for this project. Additional tests and reports shall be made monthly thereafter during the production of the pipe.
  - 4. Absorption Tests. Three cores shall be taken from each pipe unit that is to be load tested. The cores shall be taken before the load-bearing tests are performed. All

cores shall be tested for absorption. Absorption results shall not exceed the requirements of ASTM C76.

5. Pipe Unit Load-Bearing Tests. A load-bearing test shall be made on one pipe unit of each size and class to be furnished and the report of the test shall be submitted before that size and class of pipe unit is delivered. An additional test will be required for each 200 units of each size and class of pipe. The load-bearing test shall be performed after the cores for the absorption tests have been taken. Each load-bearing test shall be carried to the specified load to produce the 0.01-inch crack. If the 0.01-inch crack is not formed until the specified load is reached, the pipe unit may be used in the project.

- C. The Owner may have any or all pipe units inspected or tested, or both, by a lab designated by the Owner. Such additional inspection and/or tests shall be at the Owner's expense and shall be the test results of record.
- D. All pipe units to be tested shall be selected at random by the Owner. Unless otherwise approved, all load-bearing tests on pipe units shall be made in the presence of the Owner.

#### 1.04 REFERENCES:

- A. The following standards form a part of this specification and indicate the minimum standards required:

##### American Society for Testing and Materials (ASTM)

ASTM	C33	Specification for Concrete Aggregates
ASTM	C76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM	C361	Reinforced Concrete Low-Head Pressure Pipe
ASTM	C443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM	C655	Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe
ASTM	C924	Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method

##### American Society of Civil Engineers (ASCE)

ASCE	Vol. 90	Journal of Sanitary Engineering
	No. SA2	Division
	Part 1	
	April 1964	

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

- A. Six sets of shop drawings of reinforced concrete pipe, fittings, and gaskets shall be submitted to the Engineer for review.
- B. The Contractor shall submit to the Engineer certified copies in triplicate of test results on each batch of each size and class of pipe, for the materials and for the finished pipe units as described herein. If less than 100 units of a given size and class of pipe are required, the Contractor may submit certified copies of tests made on identical pipe units produced within the past year.
- C. Design calculations and reinforcing configurations for special classes of pipe and certified copies of test results of tests itemized in Subsection 1.03 of this specification shall be submitted to the Engineer for record purposes.
- D. Before shop drawing submittals are processed, the Owner or Engineer may elect to visit and inspect the proposed concrete pipe manufacturer's plant.

1.06 DELIVERY/STORAGE

- A. Pipe sections shall not be stored on areas over newly laid pipe or other existing pipelines which might be damaged by the superimposed load. Storage of sections shall be restricted to approved areas.
- B. Prior to installation, gaskets shall at all times be stored in a location with a minimum temperature of 50°F. Any gaskets not meeting the above requirements shall be rejected and promptly removed from the site.

PART 2 - PRODUCTS

2.01 MATERIAL:

A. PIPE:

- 1. The pipe shall be reinforced concrete pipe manufactured by an established manufacturer of good reputation in the industry and in a permanent plant adapted to meet all the design requirements of the pipe.
- 2. Pipes 24-inches in diameter and smaller shall be of the bell and spigot type. Pipes larger than 24-inches may be bell and spigot or tongue and groove.
- 3. The pipe shall have an interior surface which is smooth and even, free from roughness, projections, indentations, offsets, or irregularities of any kind. Pipe shall conform to the latest requirements of ASTM C76 and shall be Wall B or Wall C for the class indicated on the drawings, and with additions and exceptions as follows:

- a. Type II cement shall be used unless otherwise approved by the Engineer. Admixtures shall not be used except with prior approval of the Engineer.
- b. Elliptical reinforcement will not be permitted. Longitudinal reinforcement shall be continuous. Reinforcement shall have a minimum cover of  $\frac{3}{4}$ -inches.
- c. Absorption shall be as specified under Quality Assurance.
- d. Concrete pipe shall be manufactured by a vibratory process such as a packerhead or Vihi process. Concrete cast in vertical forms shall be dry mix concrete consolidated by internal or external mechanical vibration or both. The vibrating equipment shall be operated at high speed (more than 5,000 rpm) and have a low amplitude. Pipes manufactured by the modified packerhead process shall have a supplementary concrete densification operation that shall assure the attainment of full bond between reinforcement and concrete and also eliminate any displacement of the reinforcement. Additional passes with the revolving packerhead or the use of additional vibrators attached to the platform or exterior forms will not be acceptable.
- e. Pipe units shall have a minimum laying length of 8 feet except as otherwise indicated or approved by the Engineer.
- f. Pipe units shall not be shipped until the concrete has reached its 28 day design strength.
- g. Mortar used for repairs shall have a minimum compressive strength of 4,000 psi at the end of 7 days and 5,000 psi at the end of 28 days for use with reinforced concrete pipe up to Class IV, and a compressive strength of 6,000 psi at the end of 7 days and 7,000 psi at the end of 28 days for use with reinforced concrete Class V pipe when tested in 3-inch by 6-inch cylinders stored in the standard manner. Only those repairs permitted by the above-mentioned ASTM C76 will be allowed.
- h. The date of manufacture, class of pipe unit, size of pipe units, consecutive number of pipe unit, and trademark of the manufacturer shall be clearly and permanently marked on the inside or outside at one end of each pipe unit.

**B. PIPE JOINTS/GASKETS:**

- 1. Pipe joints shall conform to ASTM C433. Pipe joints shall be of the rubber gasket type in which the gaskets are in compression and which will permit both longitudinal and angular movement. The ends shall be designed to confine the gasket when the joint is in its final position. Each unit of pipe shall be provided with proper ends made of concrete formed on machined rings to ensure accurate joint surfaces.

2. The gaskets sealing the joint shall be made of natural rubber, synthetic rubber, or a blend of both having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five years experience in the manufacturing of rubber gaskets for pipe joints. The gasket shall be of a solid circular cross section having a composition and texture which is resistant to common ingredients of sewerage, industrial wastes, and groundwater and which will endure permanently under the conditions likely to be imposed by this service. The gasket shall conform to Section 5, Materials and Manufacture for Gaskets, ASTM C443.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION:

- A. Pipe shall be laid to the lines and grades indicated on the drawings or given by the Engineer. Each pipe unit 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. Each pipe unit shall be handled into its position in the trench only in such manner and by such means, as the Engineer approves as satisfactory. The Contractor will be required to furnish approved devices to permit satisfactory supports of all parts of the pipe unit when it is lifted.
- C. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.
- D. Where so indicated on the drawings, the pipe shall be supported by compacted crushed stone, concrete cradle or envelope or any other bedding material as specified or as shown on the plans. Crushed stone shall be as specified under Section 02300 EARTHWORK.
- E. When each pipe unit 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.
- F. Where a concrete cradle or envelope is used, the pipe shall be laid on concrete saddles and braced, so as to provide both vertical and lateral support for the pipe while the cradle or envelope is being placed. The location, dimensions and class of concrete required for cradle or envelope are indicated on the drawings.
- G. After the pipe units are aligned in the trench and are ready to be jointed, all joint surfaces shall be cleaned. Immediately before jointing the pipe, the groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe together so that they will fit with a minimum open recess inside and outside and have tightly-sealed joints. Care shall be taken not to use such force as to wedge apart and split the groove ends. Joints shall not be "pulled" or "cramped" without approval of the Engineer.

- H. Immediately after the pipe units are put together, the position of the gasket in the joint shall be inspected using an approved feeler gage furnished by the Contractor, to be sure it is properly put together and is tight. Joints where the gasket is damaged or not properly positioned shall be pulled apart and remade using a new gasket.
- I. Details of gasket, attachment, and joint formation shall follow the directions of the manufacturers of the joint material and of the pipe, all subject to review by the Engineer.
- J. No pipe or fitting shall be permanently supported on saddles, blocking or stones.
- K. At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of earth or other materials entering the pipe has passed.

### 3.02 REPAIR OF PIPE:

Chipped, gouged or damaged pipe shall be repaired if the defects affect the structural integrity of the pipe. Surface imperfections need not be repaired. The pipe shall be repaired by an authorized representative of the pipe manufacturer following a repair procedure approved by the Engineer. The repaired pipe will be inspected by the Engineer prior to being used on the project.

### 3.03 FIELD QUALITY ASSURANCE:

1. On completion of a section of drain, the Contractor shall clean and 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 drain. 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

Z:\Shared-Projects\Somerville\2130636 - Cedar Street Sewer Separation\Specifications\DIVISION 2 - SITE CONSTRUCTION\02633 REINFORCED CONCRETE PIPE.docx



## 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
- B. Section 02080, DUCTILE IRON PIPE AND FITTINGS
- C. Section 02089, DUCTILE IRON GRAVITY PIPE AND FITTINGS FOR SEWERS

##### 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 GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six copies of the 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 REINFORCING:

Reinforcing as shown on the plans or as required by the Engineer, shall conform to ACI 318 and ASTM A615 and shall be detailed in accordance with ACI SP-66. All Steel reinforcing bars shall be grade 60.

### 2.03 CEMENT:

The cement shall be an approved brand of American manufactured Portland Cement, Type II conforming to the applicable requirements of ASTM C150.

### 2.04 AGGREGATES

- A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.
- B. Maximum size aggregate shall be 3/4-inch.

### 2.05 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.

### 2.06 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

## **APPENDIX A**

### **ELM STREET TELEVISION INSPECTION LOGS & VIDEO**

Television inspection logs and video are included for the following sewer and combined sewer segments on Elm Street:

#### 12" VC Separate Sewer (North Side of Elm Street)

- S-2 to S-1
- S-3 to S-2
- S-4 to S-3
- S-5 to S-4

#### 15" Brick Combined Sewer (Centerline of Road)

- C-4 to C-3 (Cedar Street to Linden Avenue)
- C-3 to C-2 (Linden Avenue to Somerville Avenue)

NOTE: The manhole labels on the television inspection logs and video are incorrect. The inspection log and video filename indicates the correct manhole numbering.

NEPCCO Division Heitkamp, Inc  
 99 Callender Road  
 Watertown, CT 06795  
 Phone: (860) 274-5469  
 Fax: (860) 945-3219



## PACP Sewer Report

Operator:  Surveyors Certificate No.  System Owner:  Survey Customer:  Drainage Area:  Sheet Number:

Work Order No.:  Mainline ID:  Start Date and Time:   Location (Street Name and Address):  City:  14-77-0008

Further Location Details:  Upstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:

Downstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:  Use of Sewer:  Direction:  Flow Control:  Height:

Width:  Shape:  Type:  Ln.Method:  Joint Length:  Asset Length:  Surveyed Footage:  Year Laid:  Yr Rehabilitated:  Media Label:

Purpose:  Sewer Category:  Pre Cleaning:  Date Cleaned:  Weather:  Surface:  Loc Code:  Additional Information:

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
0.0	D	0	START WITH FLOW										
0.0	D	1	AMH										SMH 10
0.0	D	16	MWL					10					
17.4	D	48	TBA				6			10			
45.2	D	105	TBA				6			10			
84.4	D	179	TBA				6			10			
151.3	D	305	TBA				6			10			
163.7	D	343	TBA				12			3			VC
233.8	D	480	TBA				6			10			

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 Watertown, CT 06795  
 Phone: (860) 274-5469



Surveyors Name	WorkOrder:	Start Date and Time:	Upstream Manhole Number	SegmentID:	Sheet Number:
MARK ROSS	14-77-0008	3/24/2014 1:59 PM	SMH 10	SMA-018	2

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
242.9	D	514	TBA				6			10			
242.9	D	526	RFL							10			@ LINER
419.0	D	862	AMH										SMH 11
419.0	D	873	STOP										



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## PACP Sewer Report

Operator:  Surveyors Certificate No.  System Owner:  Survey Customer:  Drainage Area:  Sheet Number:

Work Order No.:  Mainline ID:  Start Date and Time:   Location (Street Name and Address):  City:  14-77-0008

Further Location Details:  Upstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:

Downstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:  Use of Sewer:  Direction:  Flow Control:  Height:

Width:  Shape:  Type:  Ln.Method:  Joint Length:  Asset Length:  Surveyed Footage:  Year Laid:  Yr Rehabilitated:  Media Label:

Purpose:  Sewer Category:  Pre Cleaning:  Date Cleaned:  Weather:  Surface:  Loc Code:  Additional Information:

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
0.0	D	0	START WITH FLOW										
0.0	D	2	AMH										SMH 9
0.0	D	15	MWL					10					
9.0	D	39	TFC				6			10			
35.9	D	90	TFC				6			10			
56.5	D	130	TFC				6			10			
86.4	D	185	TFA				6			10			
113.1	D	239	TFC				6			10			
136.6	D	284	TFC				6			10			

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 Phone: (860) 274-5469



Surveyors Name: **MARK ROSS**      WorkOrder: **14-77-0008**      Start Date and Time: **3/24/2014 10:17 AM**      Upstream Manhole Number: **SMH 9**      SegmentID: **SMA-014**      Sheet Number: **2**

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
137.7	D	303	CC							6	10		
139.6	D	319	TBA				4			10			PVC
149.8	D	353	CC							8	2		
160.1	D	382	TFC				6			10			
176.8	D	418	CM							7	5		
179.6	D	440	IW							3			JOINT
182.8	D	459	IW							9			JOINT
183.8	D	474	TFC				6			10			
189.0	D	496	TFA				6			10			POSSIBLE INFILTRATION
189.9	D	520	IW							9			JOINT
199.0	D	547	IW							3			JOINT
205.2	D	570	IW							3	9		JOINTS
221.6	D	618	TFA				6			10			
239.2	D	673	MGO										POSSIBLE STEEL ROD INTRUDING INTO PIPE
242.2	D	714	TFC				6			10			
265.9	D	772	TFC				6			10			

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Surveyors Name: **MARK ROSS**      WorkOrder: **14-77-0008**      Start Date and Time: **3/24/2014 10:17 AM**      Upstream Manhole Number: **SMH 9**      SegmentID: **SMA-014**      Sheet Number: **3**

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
295.8	D	841	TFA				6			10			
301.2	D	862	TBA				6			10			
301.2	D	872	CL							10			
313.1	D	905	TFC				6			10			
339.6	D	966	TFA				6			10			
363.4	D	1021	TFC				6			10			
369.4	D	1049	TFA				6			9			
413.0	D	1182	AMH										SMH 10
413.0	D	1195	STOP										

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## PACP Sewer Report

Operator:  Surveyors Certificate No.  System Owner:  Survey Customer:  Drainage Area:  Sheet Number:

Work Order No.:  Mainline ID:  Start Date and Time:   Location (Street Name and Address):  City:  14-77-0008

Further Location Details:  Upstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:

Downstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:  Use of Sewer:  Direction:  Flow Control:  Height:

Width:  Shape:  Type:  Ln.Method:  Joint Length:  Asset Length:  Surveyed Footage:  Year Laid:  Yr Rehabilitated:  Media Label:

Purpose:  Sewer Category:  Pre Cleaning:  Date Cleaned:  Weather:  Surface:  Loc Code:  Additional Information:

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
0.0	D	0	START WITH FLOW										
0.0	D	1	AMH										SMH 8
0.0	D	15	MWL					10					
47.0	D	110	AMH										SMH 9
47.0	D	121	STOP										

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## PACP Sewer Report

Operator:  Surveyors Certificate No.  System Owner:  Survey Customer:  Drainage Area:  Sheet Number:

Work Order No.:  Mainline ID:  Start Date and Time:   Location (Street Name and Address):  City:  14-77-0008

Further Location Details:  Upstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:

Downstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:  Use of Sewer:  Direction:  Flow Control:  Height:

Width:  Shape:  Type:  Ln.Method:  Joint Length:  Asset Length:  Surveyed Footage:  Year Laid:  Yr Rehabilitated:  Media Label:

Purpose:  Sewer Category:  Pre Cleaning:  Date Cleaned:  Weather:  Surface:  Loc Code:  Additional Information:

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
0.0	D	0	START WITH FLOW										
0.0	D	2	AMH										SMH 7
0.0	D	18	MWL					5					
35.4	D	94	TFC				6			10			
59.7	D	145	TFC				6			10			
87.0	D	201	TFC				6			10			
111.1	D	283	TFC				6			10			
135.3	D	359	TFC				6			10			
162.6	D	414	TFC				6			10			

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 Phone: (860) 274-5469



Surveyors Name: **MARK ROSS**      WorkOrder: **14-77-0008**      Start Date and Time: **3/24/2014 9:54 AM**      Upstream Manhole Number: **SMH 7**      SegmentID: **SMA-012**      Sheet Number: **2**

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
162.6	D	425	RFL							10			
190.1	D	476	TFC				6			10			
204.4	D	508	TBA				6			12			CHIMNEY
217.4	D	544	TFC				6			10			
253.8	D	607	TFC				6			10			
284.5	D	663	TFC				6			10			
304.4	D	705	CL							12			
311.5	D	742	TFC				6			10			
335.5	D	788	TFC				6			10			
365.8	D	847	TFC				6			10			
369.0	D	881	AMH										SMH 8
369.0	D	893	STOP										

NEPCCO Division Heitkamp, Inc  
 99 Callender Road  
 Watertown, CT 06795  
 Phone: (860) 274-5469  
 Fax: (860) 945-3219



## PACP Sewer Report

Operator:  Surveyors Certificate No.  System Owner:  Survey Customer:  Drainage Area:  Sheet Number:

Work Order No.:  Mainline ID:  Start Date and Time:   Location (Street Name and Address):  City:  14-77-0008

Further Location Details:  Upstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:

Downstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:  Use of Sewer:  Direction:  Flow Control:  Height:

Width:  Shape:  Type:  Ln.Method:  Joint Length:  Asset Length:  Surveyed Footage:  Year Laid:  Yr Rehabilitated:  Media Label:

Purpose:  Sewer Category:  Pre Cleaning:  Date Cleaned:  Weather:  Surface:  Loc Code:  Additional Information:

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
0.0	D	0	START WITH FLOW										
0.0	D	2	AMH										CMB 9
0.0	D	17	MWL					5					
6.8	D	54	TBA				6			3			
17.6	D	92	TBA				6			2			
50.2	D	168	TBA				6			2			
100.5	D	281	TBI				6	2		10			VC
109.2	D	314	TBA				6			2			
142.2	D	432	TBI				8	3		10			PVC

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 Watertown, CT 06795  
 Phone: (860) 274-5469



Surveyors Name: **MARK ROSS**     
 WorkOrder: **14-77-0008**     
 Start Date and Time: **3/24/2014 12:34 PM**     
 Upstream Manhole Number: **CMB 9**     
 SegmentID: **SMA-017**     
 Sheet Number: **2**

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)		%	Joint	Clock At/From	Clock To	Image Ref	Remarks
198.4	D	572	TBI				6	2			10			VC
200.3	D	594	TBA				6				9			
234.4	D	686	TBA				6				9			
234.4	D	699	TBA				6				2			
239.9	D	749	TBA				6				3			
247.9	D	795	MGO											POSSIBLE SIZE CHANGE
307.5	D	1048	TBA				6				10			
315.5	D	1083	TBA				6				10			
351.8	D	1168	TBA				6				9			
354.6	D	1193	TBA				8				10			VC
356.6	D	1214	TBA				6				2			
363.7	D	1241	TBA				6				10			
398.0	D	1334	TBA				6				2			
404.2	D	1360	TBA				6				2			
409.3	D	1404	TB				8				10			VC POSSIBLY ABANDONDED
411.7	D	1449	TBA				12				9			BRICK



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 Phone: (860) 274-5469



Surveyors Name: **MARK ROSS**      WorkOrder: **14-77-0008**      Start Date and Time: **3/24/2014 12:34 PM**      Upstream Manhole Number: **CMB 9**      SegmentID: **SMA-017**      Sheet Number: **3**

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)		%	Joint	Clock At/From	Clock To	Image Ref	Remarks
424.4	D	1497	TBA				6				2			
471.3	D	1604	TBA				6				9			
484.0	D	1644	TBA				6				3			
501.8	D	1697	TBA				6				10			
537.7	D	1785	TBA				6				2			RC
557.2	D	1854	TBI				8	2			2			VC
575.3	D	1940	TBA				6				10			
578.0	D	1963	TBI				6	2			10			VC
583.4	D	2012	RPP								12	12		18" PVC RPP
594.9	D	2088	TBA				8				12			VC
615.9	D	2154	TBB				12				9			BRICK
627.0	D	2224	AMH											CMB 10
627.0	D	2234	STOP											

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## PACP Sewer Report

Operator:  Surveyors Certificate No.  System Owner:  Survey Customer:  Drainage Area:  Sheet Number:

Work Order No.:  Mainline ID:  Start Date and Time:   Location (Street Name and Address):  City:  14-77-0008

Further Location Details:  Upstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:

Downstream Manhole Number:  Depth:  Grade to Invert:  Rim to Grade:  Use of Sewer:  Direction:  Flow Control:  Height:

Width:  Shape:  Type:  Ln.Method:  Joint Length:  Asset Length:  Surveyed Footage:  Year Laid:  Yr Rehabilitated:  Media Label:

Purpose:  Sewer Category:  Pre Cleaning:  Date Cleaned:  Weather:  Surface:  Loc Code:  Additional Information:

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
0.0	D	0	START WITH FLOW										
0.0	D	2	AMH										CMB-8
0.0	D	24	MWL					10					
40.0	D	105	TBA				15			3			
41.3	D	141	TBA				8			2			RCP
88.6	D	232	TBA				6			10			VC
101.2	D	278	TBA				6			2			RCP
106.8	D	308	TBA				6			10			VC
139.0	D	374	TBA				6			10			VC

NEPCCO Division Heitkamp, Inc  
 99 Callender Road  
 Watertown, CT 06795  
 Phone: (860) 274-5469



Surveyors Name: **MARK ROSS**      WorkOrder: **14-77-0008**      Start Date and Time: **3/24/2014 12:04 PM**      Upstream Manhole Number: **CMB-8**      SegmentID: **SMA-016**      Sheet Number: **2**

Distance	Direction	Video Pointer	Group / Description	Modifier / Severity	Continuous Defect	S/M/L	Value Inches(mm)	%	Joint	Clock At/From	Clock To	Image Ref	Remarks
157.4	D	420	TBA				6			2			AC
219.9	D	549	TBA				6			9			VC
230.5	D	582	TBA				6			2			VC
271.7	D	697	TBA				6			12			RCP
288.0	D	751	TBI				6	3		10			VC
320.0	D	823	TBA				6			2			VC
356.5	D	902	TBA				6			10			VC
368.1	D	942	TBA				4			2			VC
410.0	D	1070	AMH										CMB 9
410.0	D	1082	STOP										

**APPENDIX B**  
**GEOTECHNICAL INVESTIGATIONS AND**  
**RECOMMENDATIONS REPORT**

**City of Somerville, Massachusetts  
Weston & Sampson Project No. 2130636**

December 17, 2014

Melissa Miguel, PE  
Director of Engineering  
City of Somerville – DPW  
1 Franey Road  
Somerville, MA 02145

**RE: Geotechnical Investigations and Recommendations  
Cedar Street Sewer Separation Project  
Somerville, Massachusetts**

## **INTRODUCTION**

Weston & Sampson Engineers, Inc. (Weston & Sampson) is pleased to present this report summarizing our subsurface explorations and geotechnical recommendations for the proposed Cedar Street Sewer Separation project in Somerville, Massachusetts. Our services were completed in accordance with our proposal dated October 8, 2014.

The project includes drainage improvements along Cedar Street from Elm Street to Highland Avenue as shown in the attached **Boring Location Sketch**. Proposed improvements include a new 12-inch diameter PVC sewer line, a new 48-inch HDPE drainage pipe, and associated manhole structures. We understand that proposed pipe inverts range in depth up to approximately 17.5 ft. below existing pavement grades.

We understand that bedrock was identified in at least two existing manholes and shallow groundwater is suspected in some areas based on anecdotal observations from the City and Cedar Street residents. The purpose of our geotechnical services was to explore subsurface conditions along the proposed alignment of drainage improvements and provide geotechnical recommendations for design and construction.

## **SITE OBSERVATIONS AND CONDITIONS**

### **Surface Conditions**

Cedar Street is a narrow one-way street (east to west) in a densely populated residential neighborhood. Numerous existing utilities are present along Cedar Street including overhead power and telecommunications and underground water, gas, sewer, and drainage. The street is paved with asphalt concrete pavement that is generally in fair to poor condition with frequent longitudinal and transverse cracking and isolated patching. A bike lane is present along the north side of the street and the street is lined on both sides with granite curbs and Portland cement concrete sidewalks.

Based on an assumed project datum, ground surface elevations along Cedar Street range from approximately El. 85 at Elm Street (Station 10+00) to approximately El. 115 at Highland Street. With the exception of a depression near the intersections with Hall Street and Cedar Avenue (approximately Station 23+00), grades generally rise to the east.

### **Geologic Setting**

Based on surficial geology information available from the Massachusetts Office of Geographic Information (Mass GIS), the site is mapped in an area of glacial till overlying bedrock at depths up to 50 feet. Bedrock geology at the site is mapped as Cambridge Argillite.

### **Subsurface Explorations**

Subsurface conditions in the project area were explored between November 17 and 21, 2014 by advancing ten borings (B-1 through B-10) to depths up to 32.0 feet below the existing ground surface (BGS). Borings B-1 through B-8 were completed along Cedar Street from Elm Street to Highland Avenue. Boring B-9 was completed on Hall Street approximately 150 ft. north of Cedar Street. Boring B-10 was completed on Cedar Avenue approximately 50 feet south of the intersection with Cedar Street. Approximate boring locations are shown on the attached **Boring Location Sketch**.

The borings were completed by New England Boring Contractors of Derry, NH using a truck-mounted drill rig and drive-and-wash drilling methods. Standard penetration tests (SPTs) were conducted in each boring by driving a 24 in. long by 1-3/8 in. inside diameter (2 in. outside diameter) split spoon sampler with blows from a 140 lb. winch operated safety hammer falling 30 in. per blow. Sampling intervals ranged from continuous (every 2 ft.) to every 5 ft. (standard).

Refusal on bedrock was encountered in B-5 at 9.0 ft. One 5 ft. run of NQ-size core was completed in B-5 from 9 ft. to 14 ft. Refusal on an unknown obstruction was encountered at a depth of 4 ft. in B-8. Drilling of B-8 was abandoned due to potential conflicts with underground utilities in the vicinity. Refusal is defined as no discernible casing penetration with successive hammer blows. SPT (sampler) refusal is defined as more than 100 hammer blows for less than six inches of sampler penetration.

Monitoring wells were installed in B-4 (MW-B4) and B-6 (MW-B6) to allow measurement of post-drilling static groundwater levels and future groundwater variations. Reliable groundwater measurements cannot be obtained during drilling with drive-and-wash drilling methods due to the use of water as a drilling fluid.

A Weston & Sampson geotechnical engineer monitored drilling activities in the field and prepared logs for each exploration. Subsurface conditions encountered in the explorations are described in the following sections and in the attached **Boring Logs**, which include the rock core log from B-5 and well installation logs for MW-B4 and MW-B6.

### **Subsurface Conditions**

**General** – All borings were completed in existing asphalt pavement areas and encountered 3 to 8 inches of asphalt concrete (AC) at the ground surface. The AC thickness averaged

approximately 5 inches and was underlain by a sandy roadway base material to a depth of approximately 12 inches in all borings.

In general, the pavement section (AC and base) was underlain by 5 to 10 ft. of very stiff to hard brown-gray CLAYEY SILT over stiff to hard gray SILTY CLAY to the depths explored. These conditions were especially typical from Elm Street to the intersection with Summer Street (B-1 through B-5). Exceptions to these general conditions included the following:

Between 2 ft. to 10 ft. of loose to dense SAND FILL with variable amounts of silt and gravel was encountered immediately beneath the pavement section in B-5, B-6, B-7, and B-10. The sand fill contained coal ash at B-10.

A layer of very dense gravelly SAND with some silt and little clay was encountered below 27 ft. in B-3 and below 16 ft. in B-4 to the depths explored.

Bedrock was encountered between 6.9 ft. (SPT refusal) and 9.0 ft. (casing refusal) in B-5. The rock quality designation (RQD), which is the sum of all core pieces greater than 4 inches divided by the total length of the core run, was 48 percent.

A 7- to 10-ft. thick layer of soft, dark brown ORGANIC SILT was encountered in B-6 and B-10. The organic silt was underlain by very stiff silty clay at a depth of 14 ft. in B-6 and by medium dense sand at 15 ft. in B-10.

No recovery of samples or noted blow counts in B-8 to a depth of 4 ft. Only pavement thickness was observed.

**Groundwater** – Groundwater levels were measured at 14.2 ft. BGS in MW-B4 and at 3.0 ft. BGS in MW-B6 on December 3, 2014. Wet samples were observed during drilling as noted in the attached Borings Logs, but as described above, the drilling methods used prevent accurate measurement of groundwater levels during drilling. We anticipate that groundwater levels will fluctuate with season, variations in precipitation, construction in the area, and other factors. Perched groundwater conditions could exist close to the ground surface, especially during and after extended periods of wet weather.

## **GEOTECHNICAL RECOMMENDATIONS**

### **General**

Based on our explorations and analyses, the proposed new underground utilities and associated structures can be constructed as planned following the recommendations herein. Subsurface conditions are variable along the proposed Cedar Street alignment from Elm Street to Highland Avenue. Conditions along planned invert elevations are expected to include stiff inorganic fine grained soils, bedrock, loose sand fill, and soft organic soils. The contractor will need to adjust their methods of excavation, dewatering, and excavation support to accommodate the encountered conditions including the need to extend excavations deeper to over-excavate unsuitable soils below normal trench bedding grades and replace them with suitable materials for utility and structure support.

Excavation will require full depth excavation support and dewatering prior to attempting excavation where proposed trench depths extend below groundwater levels. Caving, running

sand conditions, and the need for additional dewatering should be anticipated where excavations encounter sandy soils and fill. Design of temporary excavation support and dewatering systems should consider bottom stability and heave where more permeable layers (sand) are present below the base of the excavation.

Rock excavation will be required in some areas based on the bedrock elevation encountered in B-5 and proposed invert elevations. Soft organic soils were encountered within the depth of excavation and below planned invert depths for pipes and manhole structures. Organic soils are compressible and easily disturbed by excavation and construction activities and are not considered suitable for support of fixed gradient pipes and manhole structures. We recommend that all organic soils be over-excavated and replaced from beneath proposed pipes and manhole structures. We recommend that the project budget and schedule include contingencies for rock excavation and over-excavation and replacement of soft organic soils. Additional recommendations are provided in the following sections.

### **Excavation Support**

All excavations should be made in accordance with applicable OSHA and local safety regulations. Temporary excavation support will be required for excavation depths greater than 4 feet and where ground water seepage is present. Excavation will require excavation support to protect adjacent structures, pavements, utilities, and other improvements. We recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation. Design of the shoring system should be prepared by a Massachusetts Professional Engineer and consider both the additional depths necessary for over-excavation of organic soils and dewatering requirements.

### **Dewatering**

All excavation, fill placement and compaction, and utility pipe and manhole installation efforts should occur in-the-dry. Groundwater and surface water should be controlled during construction and prevented from eroding excavation sidewalls and disturbing subgrade materials. Excavations will encounter groundwater and moderate to severe caving should be expected where seepage is present in granular soils. Flowing conditions are likely where granular soils are present below the groundwater table. Dewatering will be necessary for all excavations below the groundwater table and where seepage is encountered.

The dewatering system should be capable of adapting to variable flows and soil conditions and be capable of lowering and maintaining the groundwater table at least 12-inches below the base of excavations. The groundwater table should be lowered prior to the start of excavation. The dewatering system should be kept operational until fill placement and compaction has been completed to a level of at least 12-inches above groundwater seepage elevations.

Similar to excavation support, the dewatering system should be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation.



### **Rock Excavation**

Rock excavation will likely be required for portions of the new pipe and some manhole structures. Excavation may be possible using conventional earthwork equipment fitted with rock ripping attachments, or with pneumatic hoe ram attachments. However, controlled rock blasting may prove to be a more appropriate method of rock removal depending on the extent of removal required and the nature of the bedrock (provided that blasting is permitted by local regulations). Controlled rock blasting is often less intrusive to abutting properties than hoe ramming or rock ripping. The latter methods of rock removal can be time intensive, and can create considerable noise, vibrations, and dust. Properly designed and executed controlled rock blasting is often less expensive, faster, and creates less noise and dust than mechanical rock excavation.

A condition survey of nearby structures and residences should be completed prior to rock excavation and/or blasting. Vibration (seismic) monitoring should be completed in conjunction with rock excavation or blasting. We can provide specific recommendations for vibration blast monitoring if necessary.

### **Subgrade Preparation, Protection, and Stabilization**

Subsurface conditions at proposed trench and manhole inverts will likely vary from stiff inorganic fine grained soils to bedrock to loose sand fill to soft organic soils depending on location. If suitable soils are encountered close to subgrade elevations, the final excavation should be completed with an excavator equipped with a smooth-edged bucket to minimum subgrade disturbance. Soils that become disturbed by the contractor's excavating and dewatering methods should be over-excavated to suitable undisturbed inorganic soils and replaced at no cost to the owner.

Loose sand and soft organic soils should be over-excavated to firm, stable, native inorganic soils. Over-excavation of these materials should be anticipated based on the conditions encountered in the explorations and included in the construction contractor's plan for excavation support and dewatering. A geotechnical engineer should observe the excavation to assess the stability of the subgrade soils and the need for over-excavation, and to help differentiate between soils below subgrade elevations that become disturbed by contractor activities and the loose sand fill and soft organic soils that should be expected based on the explorations.

Bedding material for pipes and manhole structures should be selected and installed in accordance with the manufacturers' recommendations. If soft, loose, or wet conditions are present in the base of excavations, we recommend over-excavating by 12 to 18 inches and placing stabilization material in the base of the excavation. Deeper excavation may be required as recommended above to remove disturbed and/or soft organic soils. Over-excavation backfill and stabilization material should consist of ¾-inch or 1-1/2-inch washed angular crushed stone material with less than 5 percent passing the U.S. Standard No. 200 Sieve when tested in accordance with ASTM C 117. If stabilization or over-excavation exceeds approximately 18 inches, we recommend that a geosynthetic fabric be used to separate the crushed stone from the surrounding soils. The recommended separation fabric is a non-woven geosynthetic with an AOS of a #70 US sieve and a minimum CBR puncture strength of 410 pounds (such as Mirafi

160N or approved equivalent). The crushed stone should be placed in maximum 12-inch thick lifts with each lift statically compacted until dense and well-keyed.

### **Trench Backfill Material**

Trench backfill above the pipe zone should consist of well graded, granular material with less than approximately 10 percent fines such as MassDOT M1.03.0-type B Gravel Borrow or M2.01.7 Dense-graded Crushed Stone. On-site granular materials with less than approximately 10 percent fines, a maximum particle size of less than approximately 4 inches, and that are free of debris, organics, ice, snow, and other deleterious materials could potentially be re-used as trench backfill provided they can be moisture conditioned, placed, and compacted to the minimum densities recommended below.

Trench backfill should be placed in horizontal lifts not exceeding 10 inches in loose thickness and compacted to 92 percent relative to ASTM D1557 and to 95 percent relative to ASTM D1557 within 2 feet of pavement subgrade elevations. If schedule allows, we recommend that construction of overlying hard surfaces, such as sidewalks or pavement, be delayed for at least one week after backfilling.

### **LIMITATIONS**

We have prepared this report for use by the City of Somerville, Massachusetts and the design and construction teams for this project and this site only. The information herein could be used for bidding or estimating purposes but should not be construed as a warranty of subsurface conditions. We have made observations only at the aforementioned locations and only to the stated depths. These observations do not reflect soil types, strata thicknesses, water levels or seepage that may exist between observations. We should be consulted to observe site and subgrade preparations. We should be consulted to review final design and specifications in order to see that our recommendations are suitably followed. If any changes are made to the anticipated utility locations, grading, configurations, or construction timing, our recommendations may not be applicable, and we should be consulted. We should also review contractor prepared designs for temporary excavation support, and dewatering.

The preceding recommendations should be considered preliminary, as actual soil conditions may vary. In order for our recommendations to be final, we should be retained to observe actual subsurface conditions encountered. Our observations will allow us to interpret actual conditions and adapt our recommendations if needed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty, expressed or implied, is given.

It has been a pleasure assisting you with this project and we look forward to our continued involvement. Please call if you have any questions.

Very truly yours,

WESTON & SAMPSON, INC.



Christopher J. Palmer, PE  
Team Leader



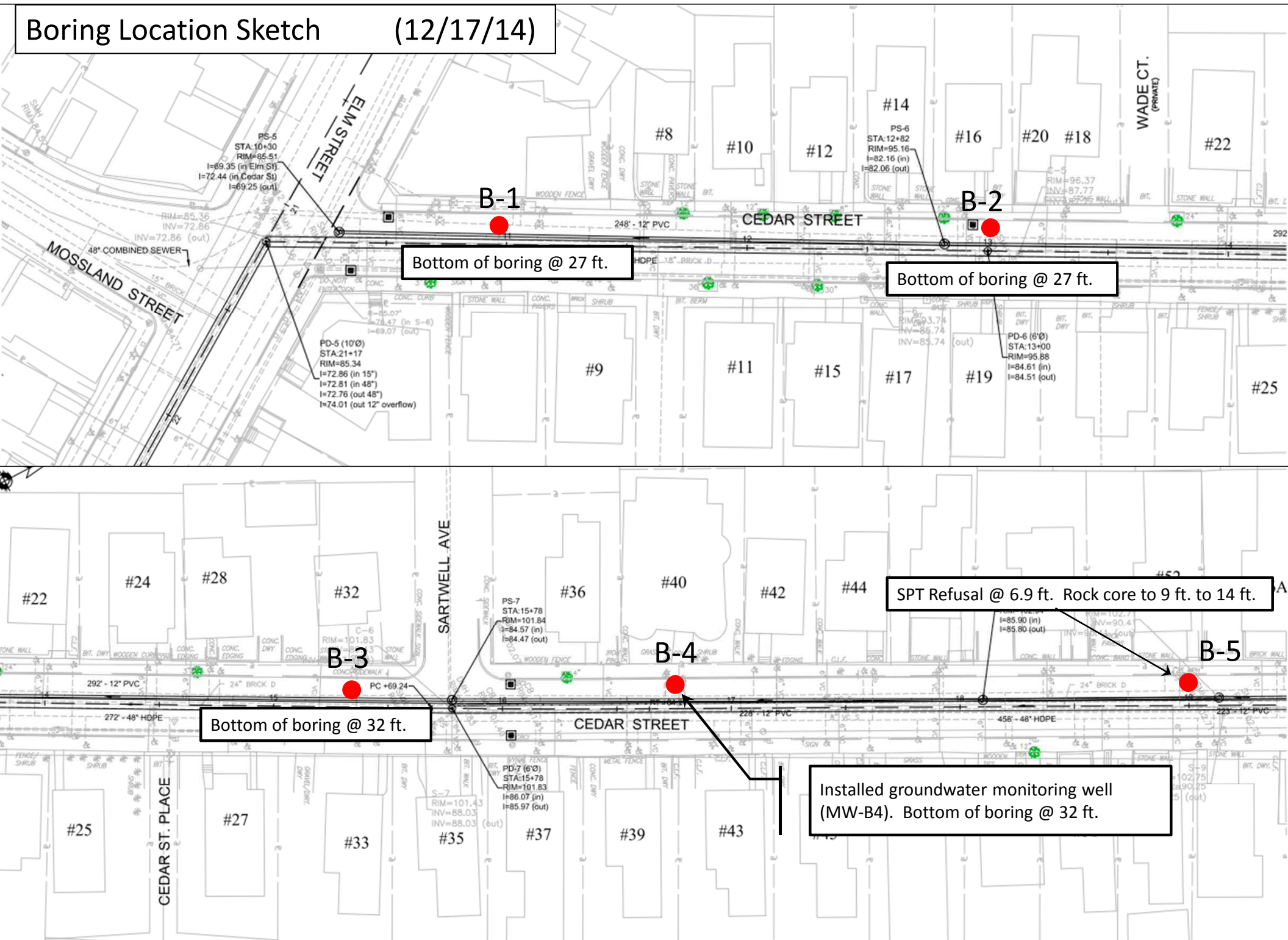
Mark P. Mitsch, PE  
Senior Associate

**Attachments:**

Boring Location Sketch (2 pages)

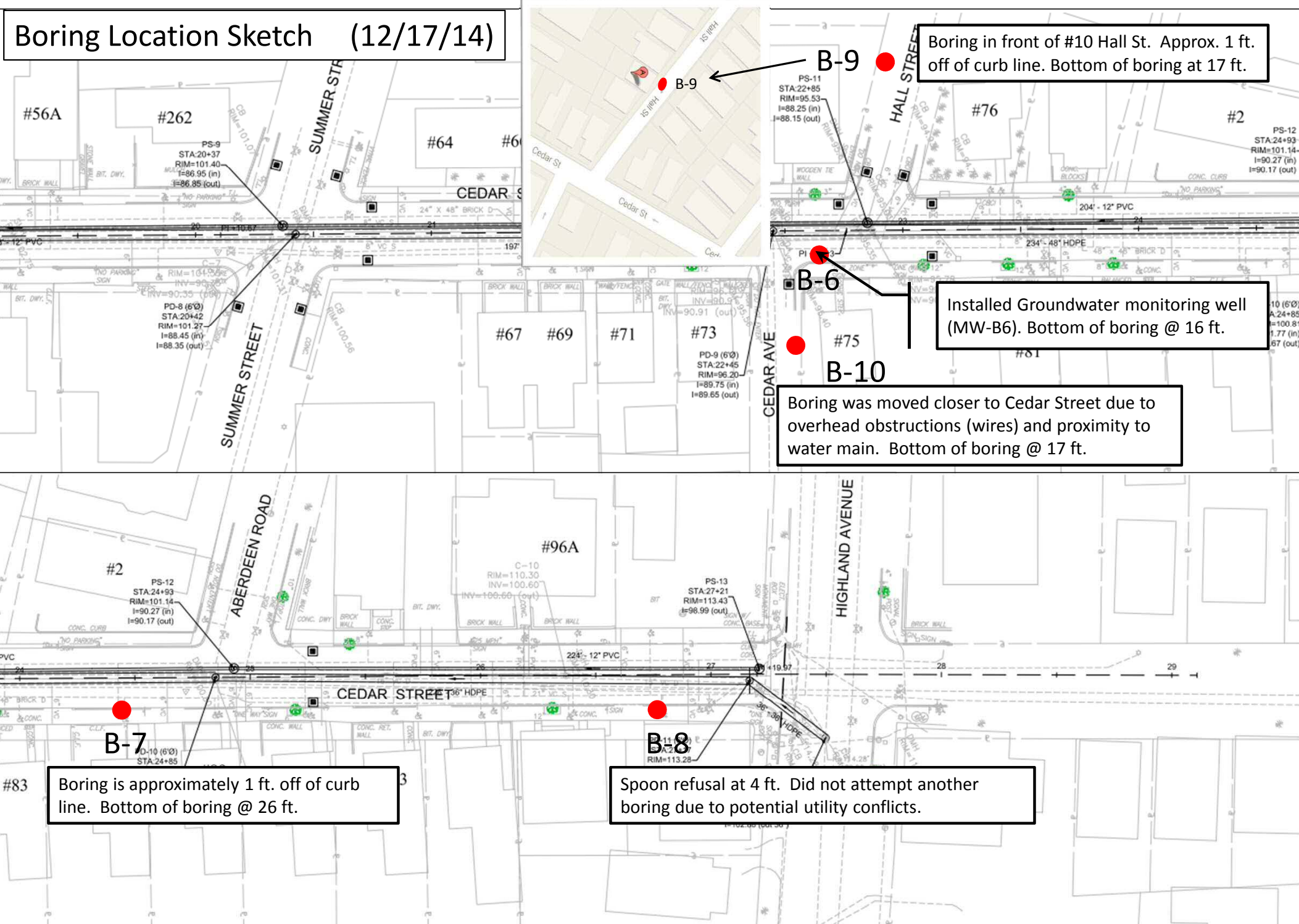
Boring, Core, and Well Installation Logs (13 pages)

# Boring Location Sketch (12/17/14)





Boring Location Sketch (12/17/14)



BORING LOCATION	See attached plan.		
GROUND SURFACE ELEV.	87.6±	DATUM	assumed
DATE START	11/20/14	DATE END	11/20/14

CASING SIZE: 4 IN. INSIDE DIAMETER.

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

[illegible]

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:

NOTES:	<p>1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.</p> <p>2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.</p>
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BORING No. B-1

BORING LOCATION	See attached plan.		
GROUND SURFACE ELEV.	95.6±	DATUM	assumed
DATE START	11/21/14	DATE END	11/21/14

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
------	------	----------	-----------	--------------------

DATE	TIME	LOCATION	EVENTS	CHANGES

[illegible][illegible]

GRANULAR SOILS		COHESIVE SOILS		NOTES:
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES:	<p>1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.</p> <p>2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.</p>
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BORING No. B-2

BORING Co.	New England Boring Contractors
FOREMAN	Mark
<b>WSE ENGINEER:</b>	TJ Blair

BORING LOCATION	See attached plan.		
GROUND SURFACE ELEV.	101.1±	DATUM	assumed
DATE START	11/20/14	DATE END	11/20/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES  
USING A 140 lb. WINCH OPERATED SAFETY HAMMER.

## GROUNDWATER READINGS

CASING: DRIVEN 4" CASING USING A 140 LB. HAMMER FALLING 30 IN. AND  
THE DRIVE AND WASH TECHNIQUE

CASING SIZE: 4 IN. INSIDE DIAMETER.

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

[illegible]

## GRANULAR SOILS

## COHESIVE SOILS

NOTES:

BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

NOTES:	<p>1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.</p> <p>2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.</p>
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BORING No.	B-3
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*When it's essential...it's Weston&Sampson.®*

PROJECT  
Cedar Street Sewer  
Separation  
Somerville, MA

REPORT OF BORING No. B-5  
SHEET 1 OF 1  
Project No. 2130636.H  
CHKD BY Christopher J. Palmer, P.E.

BORING Co. New England Boring Contractors BORING LOCATION See attached plan.  
FOREMAN Mark GROUND SURFACE ELEV. 102.6± DATUM assumed  
WSE ENGINEER: TJ Blair DATE START 11/19/14 DATE END 11/19/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES  
USING A 140 lb. WINCH OPERATED SAFETY HAMMER.  
CASING: DRIVEN 4" CASING USING A 140 LB. HAMMER FALLING 30 IN. AND  
THE DRIVE AND WASH TECHNIQUE  
CASING SIZE: 4 IN. INSIDE DIAMETER.

DEPTH (ft)	CASING (BLOWS/12")	SAMPLE				PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM
		No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"				
0							3" asphalt conc. over 9" sandy base.		PAVEMENT
		S1	14/24	1-3	13-8-8-14		Medium dense, brown, fine to coarse SAND FILL, trace silt; moist.		SAND FILL
		S2	17/24	3-5	15-18-25-30		Hard, light brown, clayey SILT; wet.		
5		S3	9/22	5-6.9	21-25-28-100/4"		Hard, light brown, clayey SILT; wet.	1	CLAYEY SILT
								2	Start rock core at 9.0 ft.
10							See attached core log.		BEDROCK
15									Core terminated at 14 ft.
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS		NOTES:
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.  
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.  
FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. B-5

# **ROCK CORING LOG**

PROJECT NAME	Cedar Street Sewer Separation			TEST BORING NO.:	B-5
LOCATION	Somerville, MA				
CLIENT	City of Somerville	PAGE NO.	1	OF	1
CONTRACTOR	New England Boring Contractors	DRILLER	Mark		
DATE START	11/19/2014	DATE FINISH	11/19/2014	DRILLING METHOD	Rotary-wash
BIT TYPE	NQ -L Series 6 Turbo	CORE DIAMETER	2 in.	DRILLING FLUID	Water
ELEVATION	102.6±	DATUM	assumed	GROUNDWATER	NA

Depth (ft.)	Sample						Description
	No.	Elev. (ft.)	Depth (ft.)	Rec/Run (in)	Dip* (°)	RQD	
5							See Boring Log B-5
10	C1	93.6±	9	55/60		48.0%	
15		88.6±	14				End of coring at 14 ft.
20							
25							
30							
35							

<b>Notes:</b> * Apparent dip angle measured along foliation/schistosity of core samples	TEST BORING NO.
	B-5
	WESTON & SAMPSON ENGINEERS, INC.

BORING Co.	New England Boring Contractors
FOREMAN	Mark
WSE ENGINEER:	TJ Blair

BORING LOCATION	See attached plan.		
GROUND SURFACE ELEV.	95.5±	DATUM	assumed
DATE START	11/18/14	DATE END	11/18/14

SAMPLER: 2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES  
USING A 140 lb. WINCH OPERATED SAFETY HAMMER.

## GROUNDWATER READINGS

CASING: DRIVEN 4" CASING USING A 140 LB. HAMMER FALLING 30 IN. AND  
THE DRIVE AND WASH TECHNIQUE

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME
12/3/2014		3.0 ft.		

CASING SIZE: 4 IN. INSIDE DIAMETER.

[illegible]

GRANULAR SOILS		COHESIVE SOILS		NOTES: 1. Groundwater monitoring well MW-B6 installed. See attached installation report.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES:	<p>1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.</p> <p>2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.</p>
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BORING No.	B-6
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<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <small>planning, permitting, design, construction, operation, maintenance</small> </div> <div style="font-size: 1.5em; font-weight: bold; color: #0070C0;">Weston&amp;Sampson®</div> </div>				<b>PROJECT</b> Cedar Street Sewer Separation Somerville, MA		<b>REPORT OF BORING No.</b> <span style="float: right;">B-7</span> <b>SHEET</b> <span style="float: right;">1 OF 1</span> <b>Project No.</b> <span style="float: right;">2130636.H</span> <b>CHKD BY</b> <span style="float: right;">Christopher J. Palmer, P.E.</span>																			
<b>BORING Co.</b> <span style="float: right;">New England Boring Contractors</span> <b>FOREMAN</b> <span style="float: right;">Mark</span> <b>WSE ENGINEER:</b> <span style="float: right;">TJ Blair</span>				<b>BORING LOCATION</b> <span style="float: right;">See attached plan.</span> <b>GROUND SURFACE ELEV.</b> <span style="float: right;">98.3±</span> <b>DATUM</b> <span style="float: right;">assumed</span> <b>DATE START</b> <span style="float: right;">11/17/14</span> <b>DATE END</b> <span style="float: right;">11/17/14</span>																					
<b>SAMPLER:</b> <span style="float: right;">2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. WINCH OPERATED SAFETY HAMMER.</span>				<b>GROUNDWATER READINGS</b>																					
<b>CASING:</b> <span style="float: right;">DRIVEN 4" CASING USING A 140 LB. HAMMER FALLING 30 IN. AND THE DRIVE AND WASH TECHNIQUE</span>				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>TIME</th> <th>WATER AT</th> <th>CASING AT</th> <th>STABILIZATION TIME</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>		DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME															
DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME																					
<b>CASING SIZE:</b> <span style="float: right;">4 IN. INSIDE DIAMETER.</span>																									
DEPTH (ft)	CASING (BLOWS/12")	SAMPLE				PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM																
0		No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"		4" asphalt conc. over 8" sandy base. M. dense, brown, fine to coarse gravelly SAND FILL, little silt; moist.		PAVEMENT																
		S1	18/24	1-3	6-10-10-15				SAND FILL																
		S2	22/24	3-5	16-20-24-26				CLAYEY SILT																
5		S3	18/24	5-7	11-11-16-20		Very stiff, brown-gray, clayey SILT; wet.		SILTY CLAY																
		S4	19/24	9-11	8-11-18-25					Very stiff, gray, silty CLAY; wet.															
10									SAND																
		S5	24/24	14-16	7-8-8-10					Very stiff, gray, silty CLAY; wet.															
15									Boring terminated at 26 ft.																
		S6	22/24	19-21	4-6-12-54					M. dense, gray, fine to coarse gravelly SAND, some silt, little clay; wet.															
20									SAND																
		S7	15/24	24-26	30-30-25-26					V. dense, gray, fine to coarse gravelly SAND, some silt, little clay; wet.															
25									Boring terminated at 26 ft.																
30									Boring terminated at 26 ft.																

GRANULAR SOILS		COHESIVE SOILS		NOTES:
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.

FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

<b>BORING No.</b>	B-7
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<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <small>planning, permitting, design, construction, operation, maintenance</small> </div> <div style="font-size: 1.5em; font-weight: bold; color: #0070C0;">Weston&amp;Sampson®</div> </div>				<b>PROJECT</b> Cedar Street Sewer Separation Somerville, MA		<b>REPORT OF BORING No.</b> <span style="float: right;">B-8</span> <b>SHEET</b> <span style="float: right;">1 OF 1</span> <b>Project No.</b> <span style="float: right;">2130636.H</span> <b>CHKD BY</b> <span style="float: right;">Christopher J. Palmer, P.E.</span>			
<b>BORING Co.</b> <span style="float: right;">New England Boring Contractors</span> <b>FOREMAN</b> <span style="float: right;">Mark</span> <b>WSE ENGINEER:</b> <span style="float: right;">TJ Blair</span>				<b>BORING LOCATION</b> <span style="float: right;">See attached plan.</span> <b>GROUND SURFACE ELEV.</b> <span style="float: right;">DATUM assumed</span> <b>DATE START</b> <span style="float: right;">11/17/14</span> <b>DATE END</b> <span style="float: right;">11/17/14</span>					
<b>SAMPLER:</b> <span style="float: right;">2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. WINCH OPERATED SAFETY HAMMER.</span>				<b>GROUNDWATER READINGS</b>					
<b>CASING:</b> <span style="float: right;">DRIVEN 4" CASING USING A 140 LB. HAMMER FALLING 30 IN. AND THE DRIVE AND WASH TECHNIQUE</span>				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME	
<b>CASING SIZE:</b> <span style="float: right;">4 IN. INSIDE DIAMETER.</span>									
DEPTH (ft)	CASING (BLOWS/12")	No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM
0							4" asphalt conc. over 8" sandy base. No sample recovery	1	<b>PAVEMENT</b>
		S1	0/24	1-3	Not recorded				No Recovery
		S3	0/12	3/4	Not recorded		No sample recovery		
									SPT refusal at 4.0 ft.
5									
10									
15									
20									
25									
30									
GRANULAR SOILS		COHESIVE SOILS		<b>NOTES:</b> 1 - SPT refusal at 4.0 ft. Boring abandoned due to presence of multiple utilities in the immediate vicinity.					
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY						
0-4	V. LOOSE	0-2	V. SOFT						
4-10	LOOSE	2-4	SOFT						
10-30	M. DENSE	4-8	M. STIFF						
30-50	DENSE	8-15	STIFF						
> 50	V. DENSE	15-30	V. STIFF						
		> 30	HARD						
<b>NOTES:</b> <div style="display: flex; justify-content: space-between;"> <div>           1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.            2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.            FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.         </div> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <b>BORING No.</b> <span style="float: right;">B-8</span> </div> </div>									

BORING LOCATION	See attached plan.		
GROUND SURFACE ELEV.		DATUM	assumed
DATE START	11/21/14	DATE END	11/21/14

CASING SIZE: 4 IN. INSIDE DIAMETER.

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GRANULAR SOILS		COHESIVE SOILS		NOTES:
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

BORING No.	B-9
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<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <small>planning, permitting, design, construction, operation, maintenance</small> </div> <div style="font-size: 1.5em; font-weight: bold; color: #0070C0;">Weston&amp;Sampson®</div> </div>				<b>PROJECT</b> Cedar Street Sewer Separation Somerville, MA		<b>REPORT OF BORING No.</b> <span style="float: right;">B-10</span> <b>SHEET</b> <span style="float: right;">1 OF 1</span> <b>Project No.</b> <span style="float: right;">2130636.H</span> <b>CHKD BY</b> <span style="float: right;">Christopher J. Palmer, P.E.</span>																					
<b>BORING Co.</b> <span style="float: right;">New England Boring Contractors</span> <b>FOREMAN</b> <span style="float: right;">Mark</span> <b>WSE ENGINEER:</b> <span style="float: right;">TJ Blair</span>				<b>BORING LOCATION</b> <span style="float: right;">See attached plan.</span> <b>GROUND SURFACE ELEV.</b> <span style="float: right;">DATUM assumed</span> <b>DATE START</b> <span style="float: right;">11/21/14</span> <b>DATE END</b> <span style="float: right;">11/21/14</span>																							
<b>SAMPLER:</b> <span style="float: right;">2 IN. OD SPLIT SPOON SAMPLER (SPT) DRIVEN 24 INCHES USING A 140 lb. WINCH OPERATED SAFETY HAMMER.</span>				<b>GROUNDWATER READINGS</b>																							
<b>CASING:</b> <span style="float: right;">DRIVEN 4" CASING USING A 140 LB. HAMMER FALLING 30 IN. AND THE DRIVE AND WASH TECHNIQUE</span>				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>TIME</th> <th>WATER AT</th> <th>CASING AT</th> <th>STABILIZATION TIME</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME															
DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME																							
<b>CASING SIZE:</b> <span style="float: right;">4 IN. INSIDE DIAMETER.</span>				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>TIME</th> <th>WATER AT</th> <th>CASING AT</th> <th>STABILIZATION TIME</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME															
DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME																							
DEPTH (ft)	CASING (BLOWS/12")	SAMPLE				PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION																		
0		No.	REC/PEN (in)	DEPTH (ft)	BLOWS/6"		5" asphalt conc. over 7" sandy base.		<b>PAVEMENT</b>																		
		S1	20/24	1-3	15-5-5-5		Loose, brown, SAND FILL with coal ash, some gravel, trace silt; moist.		<b>SAND FILL WITH COAL ASH</b>																		
		S2	12/24	3-5	9-11-16-17		M. dense, brown, SAND FILL with coal ash, some gravel, little silt; wet.																				
5		S3	0/24	5-7	4-3-2-2		No recovery.		<b>ORGANIC SILT</b>																		
		S4	20/24	7-9	2-2-2-2		Soft, dark brown, ORGANIC SILT; wet.																				
		S5	20/24	9-11	3-2-2-1		Soft, dark brown, ORGANIC SILT; wet.																				
10		S6	15/24	11-13	2-2-2-2		Soft, dark brown, ORGANIC SILT; wet.																				
		S7	17/24	13-15	3-3-3-5		Medium stiff, dark brown, ORGANIC SILT; wet.																				
		S8	24/24	15-17	5-4-8-17		Medium dense, gray, fine to medium SAND, little gravel, little silt; wet.																				
15										<b>SAND</b>																	
20											Boring terminated at 17 ft.																
25																											
30																											

GRANULAR SOILS		COHESIVE SOILS		NOTES:
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES:

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG.

FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

<b>BORING No.</b>	B-10
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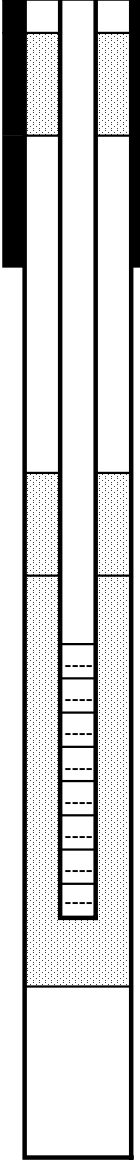
## GROUNDWATER MONITORING WELL INSTALLATION REPORT

PROJECT NAME/NO. Cedar Street Sewer Separation		MONITORING WELL NO. <b>MW-B4</b>	
LOCATION Cedar Street, Somerville, MA		ELEVATION TOP OF PVC NA DEPTH TO GROUNDWATER FROM TOP OF PVC NA	
CLIENT The City of Somerville			
CONTRACTOR NE Boring Contractors	DRILLER Mark		
OBSERVED BY TJ Blair	DATE 11/18/14		
CHECKED BY Chris J. Palmer, P.E.	DATE 11/25/14		

GROUND ELEVATION	<-----	FLUSH-MOUNTED ROADBOX	(GROUND SURFACE)
------------------	--------	-----------------------	------------------

GENERAL SOIL CONDITIONS (NOT TO SCALE)	<-----		THICKNESS OF SURFACE SEAL(S) 6 inch TYPE OF SURFACE SEAL(S) concrete  TYPE OF SURFACE CASING cast iron/aluminum ID OF SURFACE CASING 4 inch  DEPTH BOTTOM OF CASING 10 inch  ID OF RISER PIPE 2 inch TYPE OF RISER PIPE Schedule 40 PVC  TYPE OF BACKFILL AROUND RISER PIPE Sand  DEPTH TOP OF SEAL 3 ft. TYPE OF SEAL Bentonite chips DEPTH BOTTOM OF SEAL/TOP OF SAND COLUMN 4 ft.  DEPTH TOP OF SCREEN 5 ft.  TYPE OF SCREEN Schedule 40 PVC SIZE OPENINGS 10-slot ID OF SCREEN PVC  TYPE OF BACKFILL AROUND SCREEN #1 Silica Sand  DEPTH BOTTOM OF SCREEN 30 ft.  DEPTH BOTTOM OF SAND COLUMN 32 ft.  TYPE OF BACKFILL BELOW SCREEN Sand  DIAMETER OF BOREHOLE 4.25 in. DEPTH BOTTOM OF BOREHOLE 32 ft.
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<b>NOTES:</b> 1) Monitoring Well MW-B4 installed in soil boring B-4.	MONITORING WELL NO. <b>MW-B4</b> <b>WESTON &amp; SAMPSON</b> <b>ENGINEERS, INC.</b>
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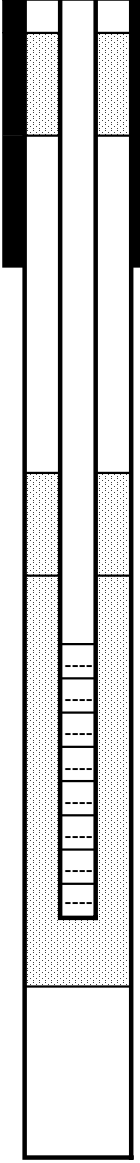
## GROUNDWATER MONITORING WELL INSTALLATION REPORT

PROJECT NAME/NO. Cedar Street Sewer Separation		MONITORING WELL NO. <b>MW-B6</b>	
LOCATION Cedar Street, Somerville, MA		ELEVATION TOP OF PVC NA DEPTH TO GROUNDWATER FROM TOP OF PVC NA	
CLIENT The City of Somerville			
CONTRACTOR NE Boring Contractors	DRILLER Mark		
OBSERVED BY TJ Blair	DATE 11/19/14		
CHECKED BY Chris J. Palmer, P.E.	DATE 11/25/14		

GROUND ELEVATION	<-----	FLUSH-MOUNTED ROADBOX	(GROUND SURFACE)
------------------	--------	-----------------------	------------------

GENERAL SOIL CONDITIONS (NOT TO SCALE)	<-----		THICKNESS OF SURFACE SEAL(S) 6 inch TYPE OF SURFACE SEAL(S) concrete  TYPE OF SURFACE CASING cast iron/aluminum ID OF SURFACE CASING 4 inch  DEPTH BOTTOM OF CASING 10 inch  ID OF RISER PIPE 2 inch TYPE OF RISER PIPE Schedule 40 PVC  TYPE OF BACKFILL AROUND RISER PIPE Sand  DEPTH TOP OF SEAL 3 ft. TYPE OF SEAL Bentonite chips DEPTH BOTTOM OF SEAL/TOP OF SAND COLUMN 4 ft.  DEPTH TOP OF SCREEN 5 ft.  TYPE OF SCREEN Schedule 40 PVC SIZE OPENINGS 10-slot ID OF SCREEN PVC  TYPE OF BACKFILL AROUND SCREEN #1 Silica Sand  DEPTH BOTTOM OF SCREEN 15 ft.  DEPTH BOTTOM OF SAND COLUMN 16 ft.  TYPE OF BACKFILL BELOW SCREEN Sand  DIAMETER OF BOREHOLE 4.25 in. DEPTH BOTTOM OF BOREHOLE 16 ft.
---	--------	--	---

<b>NOTES:</b> 1) Monitoring Well MW-B6 installed in soil boring B-6.	MONITORING WELL NO. <b>MW-B6</b> <b>WESTON &amp; SAMPSON</b> <b>ENGINEERS, INC.</b>
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**APPENDIX C**  
**ENVIRONMENTAL PROBE LOGS**

<b>Weston &amp; Sampson</b> ENGINEERS, INC.				PROJECT Elm Street		REPORT OF BORING No. <span style="float: right;">P-1</span>	
				Somerville, MA		SHEET <span style="float: right;">1 OF 1</span> Project No. <span style="float: right;">2130636</span> CHKD BY <span style="float: right;">Brian McCormack</span>	

BORING Co. <u>New England Geotech Drilling</u>		BORING LOCATION <u>See attached plan</u>	
FOREMAN <u>Hayes Rembijas</u>		GROUND SURFACE ELEV. <u>        </u> DATUM <u>        </u>	
WSE Geologist: <u>Padraic T. Kavanagh</u>		DATE START <u>12/27/2013</u>	DATE END <u>12/27/2013</u>

SAMPLER: Geoprobe Truck Rig  CASING: NA  CASING SIZE: NA <span style="float: right;">Direct Push</span>		GROUNDWATER READINGS				
		DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (bpf)	SAMPLE				PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
		No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"				
5		SS-1	NA	0-6'	NA	0	Asphalt to 6". 6" to 6' fill material with brown f-m SAND, GRAVEL, cobbles and cinder fragments.	1	Fill
10		SS-2	60/60	6-11'	NA	0	Brown f-c SAND and GRAVEL.		Silty Sand
15		SS-3	60/60	11-16'	NA	0	Brown f-c SAND and GRAVEL.	3	
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS		NOTES: 1 - Boring cleared to 6 feet with Vac Truck. Sample taken with Hand Auger  2 - Groundwater not encountered  3 - Bottom of boring at 16 feet
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES:
 

1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

	BORING No. <span style="float: right;">P-1</span>
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<b>Weston &amp; Sampson</b> ENGINEERS, INC.				PROJECT Cedar Street		REPORT OF BORING No. <u>P-10</u>			
				Somerville, MA		SHEET <u>1</u> OF <u>1</u>		Project No. <u>2130636</u>	

BORING Co. <u>New England Geotech Drilling</u>			BORING LOCATION <u>See attached plan</u>		
FOREMAN <u>Hayes Rembijas</u>			GROUND SURFACE ELEV. <u>DATUM</u>		
WSE Geologist: <u>Padraic T. Kavanagh</u>			DATE START <u>12/26/2013</u> DATE END <u>12/26/2013</u>		

SAMPLER: <u>Geoprobe Truck Rig</u>  CASING: <u>NA</u>  CASING SIZE: <u>NA</u> <u>Direct Push</u>				GROUNDWATER READINGS				
				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (bpf)	SAMPLE				PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
		No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"				
5		SS-1	NA	0-6'	NA	0	Asphalt to 6". 6" to 6' fill material with brown f-m SAND, GRAVEL, cobbles and gray fine silty SAND with trace clay.	1	Fill
10		SS-2	60/60	6-11'	NA	1193	Gray fine silty SAND with trace clay. Wet. Strong odor.	2	Silty Sand
15		SS-3	60/60	11-16'	NA	6.7	Gray fine silty SAND with trace clay. Saturated	3	
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS		NOTES:
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	1 - Boring cleared to 6 feet with Vac Truck. Sample taken with Hand Auger  2 - Groundwater encountered at approximately 6 feet  3 - One inch well set at 15 feet with 12 feet of screen. EOB at 16 feet.
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

	BORING No. <u>P-10</u>
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<b>Weston &amp; Sampson</b> ENGINEERS, INC.				PROJECT Cedar Street		REPORT OF BORING No. <u>P-11</u>				
				Somerville, MA		SHEET <u>1</u> OF <u>1</u>		Project No. <u>2130636</u> CHKD BY <u>Brian McCormack</u>		
BORING Co. <u>New England Geotech Drilling</u>				BORING LOCATION <u>See attached plan</u>						
FOREMAN <u>Hayes Rembijas</u>				GROUND SURFACE ELEV. <u>        </u> DATUM <u>        </u>						
WSE Geologist: <u>Padraic T. Kavanagh</u>				DATE START <u>12/26/2013</u>		DATE END <u>12/26/2013</u>				
SAMPLER: <u>Geoprobe Truck Rig</u>  CASING: <u>NA</u>  CASING SIZE: <u>NA</u> <u>Direct Push</u>				GROUNDWATER READINGS						
				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME		
DEPTH (feet)	CASING (bpf)	No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION		NOTES	STRATUM DESCRIPTION
5		SS-1	NA	0-6'	NA	0	Asphalt to 6". 6" to 6' fill material with brown f-m SAND, GRAVEL, cobbles and gray fine silty SAND with trace clay.		1	Fill
10		SS-2	55/60	6-11'	NA	0	Gray fine silty SAND with trace clay.			
15		SS-3	50/60	11-16'	NA	0	Gray fine silty SAND with trace clay.		3	Silty Sand
20										
25										
30										
GRANULAR SOILS		COHESIVE SOILS		NOTES: 1 - Boring cleared to 6 feet with Vac Truck. Sample taken with Hand Auger 2 - Groundwater not encountered 3 - Bottom of boring at 16 feet						
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY							
0-4	V. LOOSE	0-2	V. SOFT							
4-10	LOOSE	2-4	SOFT							
10-30	M. DENSE	4-8	M. STIFF							
30-50	DENSE	8-15	STIFF							
> 50	V. DENSE	15-30	V. STIFF							
				> 30	HARD					
NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.										
										BORING No. <u>P-11</u>

<b>Weston &amp; Sampson</b> ENGINEERS, INC.				PROJECT Cedar Street  Somerville, MA		REPORT OF BORING No. <u>P-13</u>  SHEET <u>1</u> OF <u>1</u> Project No. <u>2130636</u> CHKD BY <u>Brian McCormack</u>			
BORING Co. <u>New England Geotech Drilling</u>				BORING LOCATION <u>See attached plan</u>					
FOREMAN <u>Hayes Rembijas</u>				GROUND SURFACE ELEV. <u>DATUM</u>					
WSE Geologist: <u>Padraic T. Kavanagh</u>				DATE START <u>12/26/2013</u> DATE END <u>12/26/2013</u>					
SAMPLER: <u>Geoprobe Truck Rig</u>  CASING: <u>NA</u>  CASING SIZE: <u>NA</u> <u>Direct Push</u>				GROUNDWATER READINGS					
				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME	

DEPTH (feet)	CASING (bpf)	SAMPLE				PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
		No.	REC/PEN (in)	DEPTH (ft.)	BLOWS/6"				
5		SS-1	NA	0-3'	NA	0	Asphalt to 6". 6" to 3' fill material with brown f-m SAND, GRAVEL, cobbles and brick and clay pipe fragments.	1 3	Fill
10									
15									
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS		NOTES: 1 - Boring cleared to 3 feet with Vac Truck. Sample taken with Hand Auger  2 - Groundwater not encountered  3 - Bottom of boring at 3 feet
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	
0-4	V. LOOSE	0-2	V. SOFT	
4-10	LOOSE	2-4	SOFT	
10-30	M. DENSE	4-8	M. STIFF	
30-50	DENSE	8-15	STIFF	
> 50	V. DENSE	15-30	V. STIFF	
		> 30	HARD	

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.  
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.

BORING No. P-13