CITY OF NEWTON

PURCHASING DEPARTMENT

CONTRACT FOR PUBLIC WORKS

PROJECT MANUAL:

WASHINGTON STREET

WATER MAIN REHABILITATION

INVITATION FOR BID #13-106

Bid Opening Date: July 5, 2013 at 10:00 a.m.

JUNE 2013

Setti D. Warren, Mayor

CITY OF NEWTON
PROJECT MANUAL TABLE OF CONTENTS
WASHINGTON STREET WATER MAIN REHABILITATION

	Page #
Cover Page	1
Table of Contents	2
Part 1 - Bidding Documents, Contract Forms, and Conditions of the Contract	
1. - Invitation for Bid	3
2. - Instructions to Bidders	4-6
3. - Bid Form	7-8
▪ Instructions for Item Sheets	9
▪ Bid Item Sheets	10-24
4. - Bidder's Qualification Forms	
▪ Bidders Qualification Form and References	25-27
▪ Certificate of Non Collusion	28
▪ Debarment Letter for Contract	29
5. - Contract Forms (Informational only. Not required at time of bid submittal)	30
▪ City - Contractor Agreement	31-34
▪ Certificate of Authority - Corporate	35
▪ Certification of Tax Compliance	36
▪ Performance Bond	37
▪ Payment Bond	38
6. - General Conditions of the Contract	39-47
7. - Wage Rate Requirements	48
▪ Department of Labor Minimum Wage Rates	49-82
▪ Massachusetts Prevailing Wage Law	83
▪ Weekly Payroll Records Report & Statement of Compliance	84
▪ Weekly Payroll Report Form	85
Part 2 - General Requirements and Project Specifications	
1. - Division 1 – General Requirements	86-137
2. - Division 2 – Site work	139-205
3. - Division 3 – Concrete	206-212
4. - ATTACHMENT A – Trench Permit	213-217
5. - 9 pages of drawings may be downloaded from **www.newton.ma.gov/bids** Or picked up at the Purchasing Department, Room 204, Newton City Hall Contractors are advised to call for availability.	

CITY OF NEWTON
PURCHASING DEPARTMENT
INVITATION FOR BID #13-106

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

WASHINGTON STREET
WATER MAIN REHABILITATION

Bids will be received until: **10:00 a.m., Friday, July 5, 2013**
at the Purchasing Department, Room 204, Newton City Hall, 1000 Commonwealth Avenue, Newton, MA 02459. Immediately following the deadline for bids, all bids received within the time specified will be publicly opened and read aloud.

Contract Documents will be available on line at **www.newtonma.gov/bids** or for pickup in the Purchasing Department after **10:00 a.m., June 20, 2013.** There will be no charge for contract documents.

The work under this contract generally consists of cleaning and lining of approximately 9,500 linear feet of 12-inch diameter cast iron water main and construction of approximately 2,400 linear feet of 12-inch, 8-inch, and 6-inch ductile iron water main and associated valves, fittings, hydrants, water services, and by-pass piping on Washington Street in Newton, Massachusetts.

Time for completion of this project is on or before June 30, 2014. Time is of the essence in the performance of the work of this contract. Bidder's attention is directed to the time for completion stated in the Project Manual and the provisions regarding the assessment of liquidated damages for failure to complete the work within the time specified.

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

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

All bids are subject to the provisions of M.G.L. Chapter 30, §39M. **Wages are subject** to minimum wage rates determined by the Massachusetts Department of Labor Standards pursuant to M.G.L. c149, §26 to 27H. The schedule of wage rates applicable to this contract is included in the bidding documents. In addition, the prevailing wage schedule will be updated annually for all public construction projects lasting longer than one (1) year. You will be required to pay the rates set out in any updated prevailing wage schedule. Increases in prevailing wage schedules will not be the basis for change order requests. The successful bidder will be required to provide a Certificate of Insurance demonstrating current coverage of the type and amounts set forth in the Project Manual. The successful bidder will be required to furnish a Labor and Materials **Payment Bond and Performance Bond** both in the amount of 100% of the contract total.

All contractors are hereby notified of the TRENCH PERMIT pursuant to G.L. c.82A, section1 and 520 CMR 7.00 et seq. (as amended). Please refer to Item 1 - Mobilization and ATTACHMENT - A TRENCH PERMIT.

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

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

CITY OF NEWTON
Nicholas Read
Chief Procurement Officer
June 20, 2013

CITY OF NEWTON

DEPARTMENT OF PURCHASING

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - BIDDER'S REPRESENTATION

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

1. The Bidder has read and understands the Contract Documents and the bid is made in accordance therewith.

2. The Bidder has visited the work site and is familiar with the local conditions under which the work has to be performed.

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

ARTICLE 2 - REQUEST FOR INTERPRETATION

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

2.2 Bidders requiring clarification or interpretation of the Contract Documents shall make a written request to the *Chief Procurement Officer*, at purchasing@newtonma.gov or via facsimile (617) 796-1227. The City will only answer such requests if received Friday, June 28, 2013 at 12:00 noon.

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

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

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

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

2.7 Bidders downloading information off the internet web site are solely responsible for obtaining any addenda prior to the bid opening. If the bidder makes itself known to the Purchasing Department, at purchasing@newtonma.gov or via facsimile (617) 796-1227, it shall be placed on the bidder's list. Bidders must provide the Purchasing Department with their company's name, street address, city, state, zip, phone, fax, email address, and **INVITATION FOR BID #13-106**.

ARTICLE 3 - MBE PARTICIPATION

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

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

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

ARTICLE 4 - PREPARATION AND SUBMISSION OF BIDS

4.1 Bids shall be submitted on the "Bid Form" as appropriate, furnished by the City.

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

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

4.4 Bid Deposits shall be submitted in the amount specified in the Invitation for Bids. They shall be made payable to the City and shall be either in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreements contained in the bid.

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

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

In the event that Newton City Hall is closed on the date or at the time that bids are due, the date and time for receipt of bids shall be on the next business day following that the Newton City Hall is open.

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

* GENERAL BID FORM:

* NAME OF PROJECT AND INVITATION NUMBER

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

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

4.7 Timely delivery of a bid at the location designated shall be the full responsibility of the Bidder.

4.8 Bids shall be submitted with one **original** and one **copy.**

4.9 Be advised that a new Massachusetts law has been enacted that required all employees who work on Massachusetts public works construction sites must have no less than 10 hours of OSHA-approved safety and health training. See Chapter 306 of the Acts of 2004, which became effective July 1, 2006.

A. This requirement will apply to any general bid or sub bid submitted on or after July 1, 2006 and to any contract awarded on or after July 1, 2006.
B. This law directs the Massachusetts Attorney General to restrain the award of construction contracts to any contractor who is in violation to this requirement and to restrain the performance of these contracts by non-complying contractors.
C. The contractor and all subcontractors on this project will be required to provide certification of compliance with this requirement. Non-compliance with this law will disqualify you from bidding on public contracts.

ARTICLE 5 - ALTERNATES

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

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

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

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

ARTICLE 6 - WITHDRAWAL OF BIDS

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

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

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

ARTICLE 7 - CONTRACT AWARD

7.1 The City will award one contract to the lowest eligible and responsible Bidder within sixty (60) days, Saturdays, Sundays, and legal holidays excluded, after the opening of bids.

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

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

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

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

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

ARTICLE 8 - TAXES

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

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

END OF SECTION

CITY OF NEWTON

DEPARTMENT OF PURCHASING

BID FORM #13-106

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

WASHINGTON STREET
WATER MAIN REHABILITATION

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

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

C. The proposed contract price is:

_____DOLLARS ($ _____).
(The figure inserted above shall be the Total Price as computed on the Item Sheets at pp. 10-24 below.)

COMPANY:_____

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

- Bid Item Sheets, 15 pages
- Signed Bid Form, 2 pages
- Bidder's Qualifications and References Form; 3 pages
- Certificate of Non-Collusion, 1 page
- Debarment Letter for Contract, 1 page
- A five percent (5%) bid deposit/bid guarantee.

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

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

The undersigned certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration ("OSHA") that is at least 10 hours in duration at the time the employee begins work and who shall

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

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

Date _____

_____
(Name of General Bidder)

BY: _____

_____
(Printed Name and Title of Signatory)

_____
(Business Address)

_____
(City, State Zip)

_____/_____
(Telephone) (FAX)

_____
(E-mail Address)

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

END OF SECTION

INSTRUCTIONS FOR ITEM SHEETS

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

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

The estimated quantities shown here are based solely upon a reasonable assessment of the project parameters, thus the Contractor is advised that the actual quantities may vary substantially as field conditions may necessitate.

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 1 – Mobilization THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 2 – Sawcut Bituminous Concrete Roadways THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FEET**	**500**	**L.F.**	$_____
ITEM: 3 – Sawcut Reinforced Concrete Panels THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FEET**	**10,000**	**L.F.**	$_____
ITEM: 4 – General Excavation **THE CONTRACTOR IS TO FACTOR THE COST OF EXCAVATION INTO THE INDIVIDUAL BID PRICES AS HE DEEMS APPROPRIATE. THERE WILL BE NO SEPARATE PAYMENT FOR EXCAVATION (OR DISPOSAL COSTS)**	**NA**	**NA**	**NA**
ITEM: 5 – Test Pits THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**30**	**C.Y.**	$_____
ITEM: 6 – Excavation Below Grade THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**25**	**C.Y.**	$_____
ITEM: 7 – Rock Removal THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**20**	**C.Y.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 8 – Gravel Borrow THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**375**	**TON**	$_____
ITEM: 9 – Dense Graded Crushed Stone THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**50**	**TON**	$_____
ITEM: 10 – Sand for Water Service Pipe Bedding THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**1,300**	**TON**	$_____
ITEM: 11 - ¾" Fractured Crushed Stone THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**20**	**TON**	$_____
ITEM: 12 – Control Density Fill THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**900**	**C.Y.**	$_____
ITEM: 13 – Class B Cement Concrete for Encasement THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **CUBIC YARD**	**500**	**C.Y.**	$_____
ITEM: 14 – Dust Control (Chemical Treatment) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **POUND**	**5,000**	**LB.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 15 – Reset Existing Curb THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**500**	**L.F.**	$_____
ITEM: 16 – 4" Bituminous Concrete Type I-1 for Permanent Trench Resurfacing (Placed in Two Courses) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**415**	**TON**	$_____
ITEM: 17 – Seam and Crack Sealing (applied After the Permanent Patch Operation) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **GALLON**	**250**	**GAL.**	$_____
ITEM: 18 – 2" Bituminous Concrete Walks & Driveways (Patching Private Property) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**75**	**S.Y.**	$_____
ITEM: 19 – 3" Bituminous Concrete Walks & Driveway Aprons (Patching Public Property) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**500**	**S.Y.**	$_____
ITEM: 20 – 4" Cement Concrete Walks with Lampblack THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**200**	**S.Y.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 21– 6" Cement Concrete Driveway Aprons with Lampblack THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**25**	**S.Y.**	$_____
ITEM: 22 – Temporary Trench Pavement THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**210**	**TON**	$_____
ITEM: 23 - Cold Patch THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **TON**	**150**	**TON**	$_____
ITEM: 24 – Regrade, Loam, & Seed (Restore Loam Borders and/or Private Yards) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE YARD**	**300**	**S.Y.**	$_____
ITEM: 25 – Materials Testing THE SUM OF: ___TWELVE THOUSAND_____ DOLLARS AND___ZERO_____ CENTS (___$12,000.00_____) PER **ALLOWANCE**	**1**	**ALL.**	**$12,000.00**
ITEM: 26 – Miscellaneous Work Allowance (Engineers Discretionary Fund) THE SUM OF: ___ THIRTY THOUSAND_____ DOLLARS AND___ZERO_____ CENTS (___$30,000.00_____) PER **ALLOWANCE**	**1**	**ALL.**	**$30,000.00**

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 27 – Furnish & Mount Safety & Specialty Signboards (Less the Post System) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SQUARE FOOT**	**500**	**S.F.**	$_____
ITEM: 28 – Furnish, Establish, & Re-Establish the Post System for Mounted Signboards THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**20**	**EA.**	$_____
ITEM: 29 – Safety Controls for Construction Operations (Primary Portable Traffic Control Devices) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 30 – Allowance for Payment of Uniformed Police Officers THE SUM OF: TWO HUNDRED AND FIFTY THOUSAND_____ DOLLARS AND ZERO_____ CENTS (__$250,000.00_____) PER **ALLOWANCE**	**1**	**ALL.**	**$250,000.00**
ITEM: 31 – Vehicle Loop Detector THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**200**	**L.F.**	$_____
ITEM: 32 – Locate & Exercise Existing Water Main Gates to Determine Pre-Construction Serviceability THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**50**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 33 – Locate & Exercise Existing Hydrants to Determine Pre-Construction Serviceability THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**15**	**EA.**	$_____
ITEM: 34 – Access Pit, Removal, & Disposal of Water Gates or Hydrants that Lie Beyond the Project Limit THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**5**	**EA.**	$_____
ITEM: 35 – Access Pit, Removal, & Disposal of Obstructions Discovered During the Cleaning & Lining Operation THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**5**	**EA.**	$_____
ITEM: 36 - 6" D.I. Water Main (Class 52 Cement Lined & Dispose of Existing Pipe(s)) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**420**	**L.F.**	$_____
ITEM: 37 - 8" D.I. Water Main (Class 52 Cement Lined & Dispose of Existing Pipe(s)) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**700**	**L.F.**	$_____
ITEM: 38 - 12" D.I. Water Main (Class 52 Cement Lined & Dispose of Existing Pipe(s)) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**1,250**	**L.F.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 39 – 6" Fire Service **THE CONTRACTOR IS TO FACTOR THE COST OF FIRE SERVICES INTO THE INDIVIDUAL BID PRICES FOR 6" PIPE, VALVES AND FITTINGS AS HE DEEMS APPROPRIATE. THERE WILL BE NO SEPARATE PAYMENT FOR FIRE SERVICES (OR DISPOSAL COSTS).**	**NA**	**NA**	NA
ITEM: 40 – Clean & Cement Line Existing 12" Pipe THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**9,500**	**L.F.**	$_____
ITEM: 41– 6" Water Gate Valves with Sleeve, Box, and Cover THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**19**	**EA.**	$_____
ITEM: 42 – 8" Water Gate Valves with Sleeve, Box, and Cover THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**24**	**EA.**	$_____
ITEM: 43 – 12" Water Gate Valves with Sleeve, Box, and Cover THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**57**	**EA.**	$_____
ITEM: 44 – 6" Hydrant THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**12**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 45 – Remove and Reset Hydrant THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**3**	**EA.**	$_____
ITEM: 46 – Remove and Dispose or Stockpile Hydrant THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**9**	**EA.**	$_____
ITEM: 47 – 8" Bend THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**12**	**EA.**	$_____
ITEM: 48 – 12" Bend THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**5**	**EA.**	$_____
ITEM: 49 – 8" x 6" Reducer THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**20**	**EA.**	$_____
ITEM: 50 – 12" x 8" Reducer THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: 51 – 8" x 6" Mechanical Joint Tee THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**1**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 52 – 12" x 6" Mechanical Joint Tee THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**18**	**EA.**	$_____
ITEM: 53 – 12" x 8" Mechanical Joint Tee THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**24**	**EA.**	$_____
ITEM: 54 – 12" x 12" Mechanical Joint Tee THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**6**	**EA.**	$_____
ITEM: 55 – 6" Megalug THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**142**	**EA.**	$_____
ITEM: 56 – 8" Megalug THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**150**	**EA.**	$_____
ITEM: 57 – 12" Megalug THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**450**	**EA.**	$_____
ITEM: 58 – ¾" Diameter Threaded Steel Tie Rod Assembly (Complete in Place) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **SET**	**25**	**SET**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 59 – Class B Cement Concrete Anchorage and/or Thrust Block THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**50**	**EA.**	$_____
ITEM: 60 – 6" Mechanical Joint Solid Sleeve or Coupling THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**24**	**EA.**	$_____
ITEM: **61 – 8" Mechanical Joint Solid Sleeve or Coupling** THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**6**	**EA.**	$_____
ITEM: 62 – 12" Mechanical Joint Solid Sleeve or Coupling THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**90**	**EA.**	$_____
ITEM: 63 – 6" Cap THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: 64 – 2" Thick Preformed Pipe Insulation with Plastic Jacketing **THE SUM OF:** _____ **DOLLARS** **AND**_____ **CENTS** **($_____) PER LINEAR FOOT**	**50**	**L.F.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 65 – Test Pit to Determine Water Service Tubing Type **THE SUM OF:** **_____ DOLLARS** **AND_____ CENTS** **($_____) PER EACH**	**50**	**EA.**	$_____
ITEM: 66 – 1" Copper Water Service Tubing **THE SUM OF:** **_____ DOLLARS** **AND_____ CENTS** **($_____) PER LINEAR FOOT**	**2,350**	**L.F.**	$_____
ITEM: 67 – 1" Corporation **THE SUM OF:** **_____ DOLLARS** **AND_____ CENTS** **($_____) PER EACH**	**80**	**EA.**	$_____
ITEM: 68 – 1" Curb Stop & Box **THE SUM OF:** **_____ DOLLARS** **AND_____ CENTS** **($_____) PER EACH**	**80**	**EA.**	$_____
ITEM: 69 – Nominal 1" - 1 ½" Water Service Pipe Coupling **THE SUM OF:** **_____ DOLLARS** **AND_____ CENTS** **($_____) PER EACH**	**80**	**EA.**	$_____
ITEM: 70 – 2" Copper Water Service Tubing THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**75**	**L.F.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 71 – 2" Corporation THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: 72 – 2" Curb Stop & Box THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: 73 – 2" Water Service Pipe Coupling THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: 74 – Temporary By-Pass Piping Phase I THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 75 – Temporary By-Pass Piping – Phase II THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 74 – Temporary By-Pass Piping – Phase III THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 77 – Pressure Test, Leakage Test & Disinfection of Water Mains – Phase I THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 78 – Pressure Test, Leakage Test & Disinfection of Water Mains – Phase II THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 79 – Pressure Test, Leakage Test & Disinfection of Water Mains – Phase II THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LUMP SUM**	**1**	**L.S.**	$_____
ITEM: 80 – WATER SAMPLING (BY LABORATORY PERSONNEL) THE SUM OF: ___FIFTEEN THOUSAND_____ DOLLARS AND___ZERO_____ CENTS ($___15,000.00_____) PER **ALLOWANCE**	**1**	**ALL.**	**$15,000.00**
ITEM: 81 – Supply & Deliver Rust & Stain Remover as Required THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **(24-4 OZ.) CARTON**	**2**	**CTN.**	$_____
ITEM: 82 – Cleaning and Lining Pits THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**31**	**EA.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 83 – Additional Cleaning and Lining Pits Beyond the Scope of Work THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**5**	**EA.**	$_____
ITEM: 84 – Concrete and Rebar Removal and Disposal THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**3,000**	**L.F.**	$_____
ITEM: 85 – Mismarked Main (Cleaning and Lining Trenches Only) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **EACH**	**2**	**EA.**	$_____
ITEM: 86 – Existing Drainage Repair (All Sizes) THE SUM OF: _____ DOLLARS AND_____ CENTS ($_____) PER **LINEAR FOOT**	**200**	**L.F.**	$_____
ITEM: 87 – Silt Sacks **THE SUM OF:** _____ **DOLLARS** **AND**_____ **CENTS** **($_____) PER** **EACH**	**55**	**E.A.**	$_____
ITEM: 88 – Existing Sewer Service Repair (All Sizes) **THE SUM OF:** _____ **DOLLARS** **AND**_____ **CENTS** **($_____) PER** **EACH**	**30**	**E.A.**	$_____

ITEM DESCRIPTION & BID PRICE	Est. Qty.	Unit Measure	Total Cost
ITEM: 89 – Tree Protection **THE SUM OF:** **_____ DOLLARS** **AND_____ CENTS** **($_____) PER EACH**	**110**	**E.A.**	$_____

TOTAL BID ITEMS 1 - 89 $_____

Total Bid Items 1-89 must be placed in paragraph "C" of the bid form.

END OF SECTION

CITY OF NEWTON

BIDDER'S QUALIFICATIONS AND REFERENCES FORM

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

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

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

a. Shall not have defaulted on any contract within three years prior to the bid date.
b. Shall maintain a permanent place of business.
c. Shall have suitable financial status to meet obligations incident to the work.
d. Shall have appropriate technical experience satisfactory to the Owner in the class of work involved.
e. Shall be registered with the Secretary of State of the Commonwealth of Massachusetts to do business in Massachusetts.
f. Shall not have failed to perform satisfactorily on contracts of a similar nature.
g. Shall not have failed to complete previous contracts on time.
h. Shall have two (2) full crews with adequate personnel and equipment to perform the work expeditiously.
i. Shall have a minimum of five years experience in the construction of municipal water main contracts over ten thousand feet in length.
j. Shall have successfully completed a minimum of two municipal water main contracts similar in size and complexity to this contract within the past five years.
k. Shall have successfully completed a minimum of one municipal water main contract over two million dollars.

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

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

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

1. FIRM NAME: _____

2. WHEN ORGANIZED: _____

3 INCORPORATED? _____ YES _____ NO DATE AND STATE OF INCORPORATION: _____

4. IS YOUR BUSINESS A **MBE**? _____YES _____NO **WBE**? _____YES _____NO or **MWBE**? _____YES _____NO

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

_____

_____

_____

_____

_____

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

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

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

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

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

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

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

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____

CONTACT PERSON:_____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?:_____
(i.e., contract manager, purchasing agent, etc.)

_____

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

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

DATE: _____ BIDDER: _____

SIGNATURE: _____

PRINTED NAME: _____ TITLE: _____

END OF SECTION

CERTIFICATE OF NON-COLLUSION

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

_____
(Signature of individual)

_____
Name of Business

City of Newton

Mayor
Setti D. Warren

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

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

Date

Vendor

Re: Debarment Letter for Contract C- _____

Dear:

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

Debarment:

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

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

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

_____Signature _____Date

.

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

Sincerely,

Nicholas Read
Chief Procurement Officer

CONTRACT FORMS

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

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

CITY - CONTRACTOR AGREEMENT

CONTRACT NO. C -

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

hereinafter referred to as the CONTRACTOR.

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

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

WASHINGTON STREET
WATER MAIN REHABILITATION

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

a. This CITY-CONTRACTOR Agreement;

b. The City's Invitation For Bid #13-106 issued by the Purchasing Department;

c. The Project Manual for Washington Street Water Main Rehabilitation including the Instructions to Bidders; General Conditions; Special Conditions; MWBE/AA Requirements, Wage Rate Requirements and Wage Rate Schedule(s) including any updated prevailing wage rate schedules if applicable; The Supplementary Special Conditions; General Requirements and Project Specifications; and Drawings, if included or referenced therein;

d. Addenda Number(s)_____;

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

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

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

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

III. **PRIORITY OF DOCUMENTS.** In the event of inconsistency between the terms of this CITY -CONTRACTOR Agreement and the Project Manual, the terms of this Agreement shall prevail.

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

V. **CONTRACT TERM.** The term of this contract shall **extend from day of contract execution through June 30, 2014**. Time is of the essence in the performance of the work of this contract. Bidder's attention is directed to the time for completion stated in the Project Manual and the provisions regarding the assessment of liquidated damages for failure to complete the work within the time specified.

VI. **QUANTITIES.** The quantities specified in the Project Manual are approximate and are based on previous consumption. It is specifically understood the City does not agree to purchase any specific quantity, and purchases will be made to cover actual requirements only. The City may increase or decrease the quantity of any item specified without change in price per unit of quantity as stated in the Contractor's Bid Response.

VII. **MATERIALS.** The Contractor agrees, unless otherwise specified, that all equipment, materials and supplies furnished under this contract are to be first quality, new and unused.

VIII. **AUTHORIZATION OF AND PAYMENT FOR WORK PERFORMED.** The execution of this contract does not constitute a notice to proceed or authorization to perform work or make deliveries. No work shall be commenced or deliveries made unless authorized by a written Work Order issued by the City specifying the equipment, materials, or supplies to be delivered. The Contractor will be paid following completed delivery and acceptance of the equipment, materials, or supplies ordered in accordance with the Contract. The City will use best efforts to pay within thirty (30) days of receipt of an invoice for the delivered equipment, materials, or supplies or acceptance of same whichever date is later.

IX. **CLAIMS FOR MATERIALS OR LABOR.** In the event any claims have been filed with the City for material or labor delivered or performed pursuant to this contract, the City shall be under no obligation to make any payment until such claims are adjusted to the satisfaction of the City. Any and all liens for supplies may be paid off by the City within twenty (20) days after the filing for record as provided by law of a notice of such liens, except where the claim on which the lien is filed is being litigated by the Contractor, and in such case the City may pay the amount of any final judgment or decree on any such claim. All money paid by the City in settlement of liens and claims as aforesaid, with the costs and expenses incurred by the City in connection therewith shall be charged to the Seller, bearing interest at the rate of six percent (6%) per annum, and be deducted from the next payment falling due the Seller under the terms of this contract.

X. **UNIT PRICES.** It is agreed that the unit prices listed are maximum prices and that the City shall be entitled to take advantage of any decreasing market conditions, decreases to be governed by the manufacturers' price listing as might be generally adopted in the trade, or by the same percentage that the Seller may reduce prices to others who purchase in similar quantities and under similar conditions.

XI. **RESPONSIBILITY FOR THE WORK/INDEMNIFICATION.** In the performance of any work, including the delivery of equipment, materials or supplies, pursuant to this Contract, the Contractor shall take all responsibility for the work, and shall take all precautions for preventing injuries to persons and property in or about the work and shall defend, indemnify and hold the City harmless from all loss, cost, damage or expense arising from injuries to persons or property in or about the work. The Contractor shall be responsible for any damage, which may be caused by the failure or insufficiency of any temporary works. He shall effectively protect his work and shall be liable for all damage and loss by delay or otherwise caused by his neglect or failure so to do.

XII. **WARRANTY.** Except as may be otherwise provided in the Project Manual, the Contractor shall replace, repair or make good, without cost to the City, any defects or faults arising within one (1) year after date of acceptance of equipment, materials or supplies furnished hereunder (acceptance not to be unreasonably delayed) resulting from imperfect or defective work done or materials furnished by the Contractor.

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

XIV. **INSPECTION.** For the purposes of inspection of the equipment, materials and supplies covered by this contract, the Contractor shall give the City free access to his works and furnish every facility for properly inspecting such equipment, materials and supplies, and shall furnish full information, whenever requested, relating thereto. Approval by any inspector of the City shall not relieve the Contractor from his obligation to comply in all respects with the contract.

XV. ASSIGNMENT/SUB-CONTRACTING. The Contractor agrees that he will not sell, assign, or transfer this Contract or any part thereof or interest therein without the prior written consent of the City.

XVI. INSTALLATION. If any of the equipment, materials, and supplies covered by this contract is to be installed by either the Contractor or the City, the Contractor shall, upon request of the City, furnish a competent employee to supervise the installation without expense to the City, unless otherwise provided herein. Such supervisor, or other employees furnished by the Contractor, shall be the agents of the Contractor and not of the City, and the Contractor hereby agrees to indemnify the City and hold it harmless from and against any and all loss, costs, damage, and expense sustained as the result of negligence or other conduct on the part of such supervisor or employee.

XVII. TERMINATION. The City of Newton may, by written notice of default to the Contractor, terminate the whole or any part of this Contract or any Work Order issued pursuant thereto in any one of the following circumstances:

a. If the Contractor fails to make delivery of the equipment, goods or supplies or to perform the services within the time specified herein or any extension thereof;

b. If the Contractor fails to perform any of the other provisions of this contract or, if in the opinion of the City, Contractor so fails to make progress as to endanger performance of this contract in accordance with its terms, and in either of these two circumstances does not correct such failure within thirty (30) days (or such longer period as the City may authorize in writing) after receipt of notice from the City specifying such failure.

XVIII. GOVERNING LAW. This Contract shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts.

XIX. SEVERABILITY. The provisions of this Contract are severable. If any section, paragraph, clause or provision of this Contract shall be finally adjudicated by a court of competent jurisdiction to be invalid, the remainder of this Contract shall be unaffected by such adjudication and all of the remaining provisions of this Contract shall remain in full force and effect as though such section, paragraph, clause or provision, or any part thereof so adjudicated to be invalid, had not been included herein, unless such remaining provisions, standing alone, are incomplete and incapable of being executed in accordance with the intent of the parties to this Contract.

XX. AMENDMENTS TO THIS CONTRACT. This Contract may not be amended except in writing executed in the same manner as this CITY-CONTRACTOR Agreement.

THIS SPACE INTENTIONALLY LEFT BLANK

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

CONTRACTOR

By_____

Print Name _____

Title _____

Date _____

Affix Corporate Seal Here

Certified that additional funds are in
the following account:
36A401D – 586011 - _____

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

By_____
Comptroller of Accounts

Date_____

CITY OF NEWTON

By_____
Chief Procurement Officer

Date_____

By_____
Commissioner of Public Works

Date_____

Approved as to Legal Form and Character

By _____
Associate City Solicitor

Date _____

CONTRACT AND BONDS APPROVED

By _____
Mayor or his designee

Date_____

CERTIFICATE OF AUTHORITY - CORPORATE

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

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

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

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

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

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

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

6. ATTEST: _____
(Signature of **Clerk or Secretary**)*

AFFIX CORPORATE SEAL HERE

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

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

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

CERTIFICATION OF TAX COMPLIANCE

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

_____
**Signature of Individual
or Corporate Contractor (Mandatory)

_____
*** Contractor's Social Security Number
(Voluntary) or Federal Identification Number

Print Name:_____

By: _____
Corporate Officer
(Mandatory, if applicable)

Date: _____

Print Name:_____

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

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

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

CITY OF NEWTON, MASSACHUSETTS

PERFORMANCE BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____, as SURETY, are held and firmly bound unto the City of Newton as Obligee, in the sum of

dollars **($_____)** to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____ _, 2013 for the construction of _____ in Newton, Massachusetts.

(Project Title)

Now, the condition of this obligation is such that if the PRINCIPAL and all Sub-contractors under said contract shall well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of said contract on its part to be kept and performed during the original term of said contract and any extensions thereof that may be granted by the Obligee, with or without notice to the SURETY, and during the life and any guarantee required under the contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said contract that may hereafter be made, notice to the SURETY of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise, it shall remain in full force, virtue and effect.

In the event, that the contract is abandoned by the PRINCIPAL, or in the event that the Obligee terminates the employment of the PRINCIPAL or the authority of the PRINCIPAL to continue the work said SURETY hereby further agrees that said SURETY shall, if requested in writing by the Obligee, take such action as is necessary to complete said contract.

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ___day of _____ 2013.

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

CITY OF NEWTON, MASSACHUSETTS

PAYMENT BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____, as SURETY, are held and firmly bound unto the City of Newton as Obligee, in the sum of

dollars **($_____)** to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____ _, 2013, for the construction of _____ in Newton, Massachusetts.

(Project Title)

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

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ___day of_____2013.

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

CITY OF NEWTON

GENERAL CONDITIONS OF THE CONTRACT

FOR PUBLIC WORKS CONSTRUCTION

ARTICLE 1

Definitions

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

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

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

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

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

ARTICLE 2
Plans, Drawings, Profiles

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

Discrepancy in Plans

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

ARTICLE 3
Inspection

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

ARTICLE 4
Change in Plans and Work

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

ARTICLE 5
Time and Manner of Doing the Work

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

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

Maintenance of Travel

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

Abandonment of Work by Contractor

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

ARTICLE 6
Compensation for Work

1. Subject to the provisions of Paragraph 10 of this Article, the price named in the proposal and accepted by the City shall be paid by the City and received by the Contractor as full compensation for furnishing materials and for use of tools, forms, machinery and other implements, and for labor in moving materials and executing all the work contemplated in this contract, also for loss or damage arising from delay however occasioned, or out of the nature of the work aforesaid or from the action of the

elements, from floods, or from any unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work and for well and faithfully completing the work in the proper manner and according to the plans and specifications and requirements of the Commissioner under them.

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

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

Final and Substantial Completion

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

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

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

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

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

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

Extra Work

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

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

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

Contract Made Subject to Appropriations

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

ARTICLE 7

Liquidated Damages

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

SCHEDULE OF DEDUCTIONS

Original Contract Amount From More Than	To and Including	Daily Charge Per Calendar Day
$ 0.	$ 25,000.	$ 30.
25,000.	50,000.	50.
50,000.	100,000.	100.
500,000.	1,000,000.	150.
1,000,000.	2,000,000.	200.
2,000,000.	___	300.

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

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

to compensate said City of Newton for all additional costs incurred by it because of the failure of the Contractor fully to complete said work on or before the date of completion specified in the proposal.

ARTICLE 8
Delays and Extensions of Time

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

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

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

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

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

ARTICLE 9
Lines and Grades

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

ARTICLE 10
Public Service Pipes and Conduits

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

Protection of Existing Structures

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

interfere with the operating of the railway, and he shall be liable for any damage that may be caused by any act, omission or neglect on his part, and shall pay all expenses of every kind incidental to this work.

Changing the Location of Existing Structures

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

ARTICLE 11
Co-operation with Other Contractors

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

ARTICLE 12
Subcontracts

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

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

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

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

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

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

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority, the demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of the completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after which the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

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

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

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

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

ARTICLE 13
Responsibility for Work-Contractor's Responsibility

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

ARTICLE 14
LIGHTS--GUARDS

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

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

ARTICLE 15
Guaranty

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

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

ARTICLE 16
Defective Work and Materials

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

ARTICLE 17
Employment of Labor

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

ARTICLE 18
Laws and Regulations - Contractor to Comply with Law

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

END OF SECTION

CITY OF NEWTON

WAGE RATE REQUIREMENTS

1. GENERAL

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

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

2. WAGE RATES

A. The rate per hour to be paid to mechanics, apprentices, teamsters, chauffeurs, and laborers employed on the Work shall not be less than the rate of wages in the attached "Minimum Wage Rates" as determined by the Commissioner of Labor and Industries. The schedule of prevailing wage rates will be updated annually for all public construction projects lasting longer than one (1) year. The contractor shall pay the prevailing wage rate set out in the applicable prevailing wage rate schedule. Increases in prevailing wage rates shall not be the basis for a change order.

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

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

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

E. The Contractor and all subcontractors shall, on a weekly basis throughout the term of the contract, provide to the City of Newton certified payroll affidavits verifying compliance with M.G.L. c.149, §27, 27A and 27B.

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

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

END OF SECTION

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

DEVAL L. PATRICK
Governor
TIMOTHY P. MURRAY
Lt. Governor

JOANNE F. GOLDSTEIN
Secretary
HEATHER E. ROWE
Director

Awarding Authority: City of Newton
Contract Number: #13-106 **City/Town:** NEWTON
Description of Work: Washington Street Water Main Rehabilitation

Job Location: Various Locations

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- Awarding authorities 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.
- 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. Once a contractor has been selected by the awarding authority, the wage schedule shall be made a part of the contract for that project. The wage schedule must be posted in a conspicuous place at the work site during 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 regardless of 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 Training (DAT). Apprentices must keep his/her apprentice identification card on his/her person during all work hours on the project. If an apprentice rate is listed on the prevailing wage schedule for the trade in which an apprentice is registered with the DAT, the apprentice 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 DAT, 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. 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 directly to the awarding authority 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: 06/12/2013 **Wage Request Number:** 20130612-021

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$31.55	$8.91	$8.00	$0.00	$48.46
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$31.62	$8.91	$8.00	$0.00	$48.53
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$31.74	$8.91	$8.00	$0.00	$48.65
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$82.32	$9.80	$17.67	$0.00	$109.79
	08/01/2013	$85.47	$9.80	$17.67	$0.00	$112.94
	08/01/2014	$88.62	$9.80	$17.67	$0.00	$116.09
	08/01/2015	$91.77	$9.80	$17.67	$0.00	$119.24
AIR TRACK OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	12/01/2013	$34.55	$7.10	$12.45	$0.00	$54.10
	06/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	12/01/2014	$36.05	$7.10	$12.45	$0.00	$55.60
	06/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	12/01/2015	$37.55	$7.10	$12.45	$0.00	$57.10
	06/01/2016	$38.30	$7.10	$12.45	$0.00	$57.85
	12/01/2016	$39.30	$7.10	$12.45	$0.00	$58.85
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	06/01/2013	$29.88	$10.40	$5.95	$0.00	$46.23
	12/01/2013	$30.68	$10.40	$5.95	$0.00	$47.03
	06/01/2014	$31.58	$10.40	$5.95	$0.00	$47.93
	12/01/2014	$32.48	$10.40	$5.95	$0.00	$48.83
	06/01/2015	$33.43	$10.40	$5.95	$0.00	$49.78
	12/01/2015	$34.38	$10.40	$5.95	$0.00	$50.73
ASPHALT RAKER *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 1*	06/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	12/01/2013	$34.55	$7.10	$12.45	$0.00	$54.10
	06/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	12/01/2014	$36.05	$7.10	$12.45	$0.00	$55.60
	06/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	12/01/2015	$37.55	$7.10	$12.45	$0.00	$57.10
	06/01/2016	$38.30	$7.10	$12.45	$0.00	$57.85
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$39.30	$7.10	$12.45	$0.00	$58.85
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2010	$37.70	$6.97	$11.18	$0.00	$55.85

Apprentice - *BOILERMAKER - Local 29*
Effective Date - 01/01/2010

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$24.51	$6.97	$11.18	$0.00	$42.66
2	65	$24.51	$6.97	$11.18	$0.00	$42.66
3	70	$26.39	$6.97	$11.18	$0.00	$44.54
4	75	$28.28	$6.97	$11.18	$0.00	$46.43
5	80	$30.16	$6.97	$11.18	$0.00	$48.31
6	85	$32.05	$6.97	$11.18	$0.00	$50.20
7	90	$33.93	$6.97	$11.18	$0.00	$52.08
8	95	$35.82	$6.97	$11.18	$0.00	$53.97

Notes:

Apprentice to Journeyworker Ratio:1:5

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (NEWTON)*	02/01/2013	$47.41	$10.18	$17.83	$0.00	$75.42
	08/01/2013	$48.31	$10.18	$17.90	$0.00	$76.39
	02/01/2014	$48.87	$10.18	$17.90	$0.00	$76.95
	08/01/2014	$49.77	$10.18	$17.97	$0.00	$77.92
	02/01/2015	$50.33	$10.18	$17.97	$0.00	$78.48
	08/01/2015	$51.23	$10.18	$18.04	$0.00	$79.45
	02/01/2016	$51.80	$10.18	$18.04	$0.00	$80.02
	08/01/2016	$52.70	$10.18	$18.12	$0.00	$81.00
	02/01/2017	$53.27	$10.18	$18.12	$0.00	$81.57

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.71	$10.18	$17.83	$0.00	$51.72
2	60	$28.45	$10.18	$17.83	$0.00	$56.46
3	70	$33.19	$10.18	$17.83	$0.00	$61.20
4	80	$37.93	$10.18	$17.83	$0.00	$65.94
5	90	$42.67	$10.18	$17.83	$0.00	$70.68

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.16	$10.18	$17.90	$0.00	$52.24
2	60	$28.99	$10.18	$17.90	$0.00	$57.07
3	70	$33.82	$10.18	$17.90	$0.00	$61.90
4	80	$38.65	$10.18	$17.90	$0.00	$66.73
5	90	$43.48	$10.18	$17.90	$0.00	$71.56

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2013	$34.20	$7.10	$12.60	$0.00	$53.90
	12/01/2013	$34.95	$7.10	$12.60	$0.00	$54.65
	06/01/2014	$35.70	$7.10	$12.60	$0.00	$55.40
	12/01/2014	$36.45	$7.10	$12.60	$0.00	$56.15
	06/01/2015	$37.20	$7.10	$12.60	$0.00	$56.90
	12/01/2015	$37.95	$7.10	$12.60	$0.00	$57.65
	06/01/2016	$38.70	$7.10	$12.60	$0.00	$58.40
	12/01/2016	$39.70	$7.10	$12.60	$0.00	$59.40
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2013	$33.05	$7.10	$12.60	$0.00	$52.75
	12/01/2013	$33.80	$7.10	$12.60	$0.00	$53.50
	06/01/2014	$34.55	$7.10	$12.60	$0.00	$54.25
	12/01/2014	$35.30	$7.10	$12.60	$0.00	$55.00
	06/01/2015	$36.05	$7.10	$12.60	$0.00	$55.75
	12/01/2015	$36.80	$7.10	$12.60	$0.00	$56.50
	06/01/2016	$37.55	$7.10	$12.60	$0.00	$57.25
	12/01/2016	$38.55	$7.10	$12.60	$0.00	$58.25
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2013	$33.05	$7.10	$12.60	$0.00	$52.75
	12/01/2013	$33.80	$7.10	$12.60	$0.00	$53.50
	06/01/2014	$34.55	$7.10	$12.60	$0.00	$54.25
	12/01/2014	$35.30	$7.10	$12.60	$0.00	$55.00
	06/01/2015	$36.05	$7.10	$12.60	$0.00	$55.75
	12/01/2015	$36.80	$7.10	$12.60	$0.00	$56.50
	06/01/2016	$37.55	$7.10	$12.60	$0.00	$57.25
	12/01/2016	$38.55	$7.10	$12.60	$0.00	$58.25
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2013	$33.92	$9.80	$15.61	$0.00	$59.33
	09/01/2013	$34.53	$9.80	$15.61	$0.00	$59.94
	03/01/2014	$35.13	$9.80	$15.61	$0.00	$60.54
	09/01/2014	$35.90	$9.80	$15.61	$0.00	$61.31
	03/01/2015	$36.67	$9.80	$15.61	$0.00	$62.08

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$16.96	$9.80	$1.57	$0.00	$28.33
2	60	$20.35	$9.80	$1.57	$0.00	$31.72
3	70	$23.74	$9.80	$10.90	$0.00	$44.44
4	75	$25.44	$9.80	$10.90	$0.00	$46.14
5	80	$27.14	$9.80	$12.47	$0.00	$49.41
6	80	$27.14	$9.80	$12.47	$0.00	$49.41
7	90	$30.53	$9.80	$14.04	$0.00	$54.37
8	90	$30.53	$9.80	$14.04	$0.00	$54.37

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.27	$9.80	$1.57	$0.00	$28.64
2	60	$20.72	$9.80	$1.57	$0.00	$32.09
3	70	$24.17	$9.80	$10.90	$0.00	$44.87
4	75	$25.90	$9.80	$10.90	$0.00	$46.60
5	80	$27.62	$9.80	$12.47	$0.00	$49.89
6	80	$27.62	$9.80	$12.47	$0.00	$49.89
7	90	$31.08	$9.80	$14.04	$0.00	$54.92
8	90	$31.08	$9.80	$14.04	$0.00	$54.92

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEWTON)*	01/01/2013	$42.57	$10.65	$18.61	$1.30	$73.13
	07/01/2013	$42.74	$10.65	$18.61	$1.30	$73.30
	01/01/2014	$43.66	$10.65	$18.61	$1.30	$74.22
	07/01/2014	$44.26	$10.65	$18.61	$1.30	$74.82
	01/01/2015	$45.20	$10.65	$18.61	$1.30	$75.76
	07/01/2015	$45.78	$10.65	$18.61	$1.30	$76.34
	01/01/2016	$46.70	$10.65	$18.61	$1.30	$77.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.29	$10.65	$12.11	$1.30	$45.35
2	60	$25.54	$10.65	$13.61	$1.30	$51.10
3	65	$27.67	$10.65	$14.61	$1.30	$54.23
4	70	$29.80	$10.65	$15.61	$1.30	$57.36
5	75	$31.93	$10.65	$16.61	$1.30	$60.49
6	80	$34.06	$10.65	$17.61	$1.30	$63.62
7	90	$38.31	$10.65	$18.61	$1.30	$68.87

Effective Date - 07/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.37	$10.65	$12.11	$1.30	$45.43
2	60	$25.64	$10.65	$13.61	$1.30	$51.20
3	65	$27.78	$10.65	$14.61	$1.30	$54.34
4	70	$29.92	$10.65	$15.61	$1.30	$57.48
5	75	$32.06	$10.65	$16.61	$1.30	$60.62
6	80	$34.19	$10.65	$17.61	$1.30	$63.75
7	90	$38.47	$10.65	$18.61	$1.30	$69.03

Notes:

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

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$41.34	$10.00	$13.55	$0.00	$64.89
	12/01/2013	$42.12	$10.00	$13.55	$0.00	$65.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$28.19	$10.00	$13.55	$0.00	$51.74
	12/01/2013	$28.74	$10.00	$13.55	$0.00	$52.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2013	$45.01	$7.80	$15.60	$0.00	$68.41

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.51	$7.80	$0.00	$0.00	$30.31
2	55	$24.76	$7.80	$3.52	$0.00	$36.08
3	60	$27.01	$7.80	$3.84	$0.00	$38.65
4	65	$29.26	$7.80	$4.16	$0.00	$41.22
5	70	$31.51	$7.80	$13.68	$0.00	$52.99
6	75	$33.76	$7.80	$14.00	$0.00	$55.56
7	80	$36.01	$7.80	$14.32	$0.00	$58.13
8	90	$40.51	$7.80	$14.96	$0.00	$63.27

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 1* For apprentice rates see "Apprentice- LABORER"	12/01/2011	$31.80	$7.10	$12.45	$0.00	$51.35
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 1* For apprentice rates see "Apprentice- LABORER"	12/01/2011	$32.80	$7.10	$12.45	$0.00	$52.35
DEMO: BURNERS *LABORERS - ZONE 1* For apprentice rates see "Apprentice- LABORER"	12/01/2011	$32.55	$7.10	$12.45	$0.00	$52.10
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 1* For apprentice rates see "Apprentice- LABORER"	12/01/2011	$32.80	$7.10	$12.45	$0.00	$52.35
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 1* For apprentice rates see "Apprentice- LABORER"	12/01/2011	$32.55	$7.10	$12.45	$0.00	$52.10
DEMO: WRECKING LABORER *LABORERS - ZONE 1* For apprentice rates see "Apprentice- LABORER"	12/01/2011	$31.80	$7.10	$12.45	$0.00	$51.35
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$54.88	$9.80	$17.67	$0.00	$82.35
	08/01/2013	$56.98	$9.80	$17.67	$0.00	$84.45
	08/01/2014	$59.08	$9.80	$17.67	$0.00	$86.55
	08/01/2015	$61.18	$9.80	$17.67	$0.00	$88.65
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$54.88	$9.80	$17.67	$0.00	$82.35
	08/01/2013	$56.98	$9.80	$17.67	$0.00	$84.45
	08/01/2014	$59.08	$9.80	$17.67	$0.00	$86.55
	08/01/2015	$61.18	$9.80	$17.67	$0.00	$88.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$58.80	$9.80	$17.67	$0.00	$86.27
	08/01/2013	$61.05	$9.80	$17.67	$0.00	$88.52
	08/01/2014	$63.30	$9.80	$17.67	$0.00	$90.77
	08/01/2015	$65.55	$9.80	$17.67	$0.00	$93.02
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$82.32	$9.80	$17.67	$0.00	$109.79
	08/01/2013	$85.47	$9.80	$17.67	$0.00	$112.94
	08/01/2014	$88.62	$9.80	$17.67	$0.00	$116.09
	08/01/2015	$91.77	$9.80	$17.67	$0.00	$119.24
DRAWBRIDGE OPERATOR (Construction) *ELECTRICIANS LOCAL 103*	03/01/2013	$43.52	$13.00	$14.16	$0.00	$70.68
	09/01/2013	$44.20	$13.00	$14.18	$0.00	$71.38
	03/01/2014	$44.92	$13.00	$14.20	$0.00	$72.12
	09/01/2014	$45.60	$13.00	$14.22	$0.00	$72.82
	03/01/2015	$46.32	$13.00	$14.24	$0.00	$73.56
	09/01/2015	$47.27	$13.00	$14.27	$0.00	$74.54
For apprentice rates see "Apprentice- ELECTRICIAN"	03/01/2016	$48.23	$13.00	$14.30	$0.00	$75.53
ELECTRICIAN *ELECTRICIANS LOCAL 103*	03/01/2013	$43.52	$13.00	$14.16	$0.00	$70.68
	09/01/2013	$44.20	$13.00	$14.18	$0.00	$71.38
	03/01/2014	$44.92	$13.00	$14.20	$0.00	$72.12
	09/01/2014	$45.60	$13.00	$14.22	$0.00	$72.82
	03/01/2015	$46.32	$13.00	$14.24	$0.00	$73.56
	09/01/2015	$47.27	$13.00	$14.27	$0.00	$74.54
	03/01/2016	$48.23	$13.00	$14.30	$0.00	$75.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 103*

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.41	$13.00	$0.52	$0.00	$30.93
2	40	$17.41	$13.00	$0.52	$0.00	$30.93
3	45	$19.58	$13.00	$10.53	$0.00	$43.11
4	45	$19.58	$13.00	$10.53	$0.00	$43.11
5	50	$21.76	$13.00	$10.85	$0.00	$45.61
6	55	$23.94	$13.00	$11.19	$0.00	$48.13
7	60	$26.11	$13.00	$11.51	$0.00	$50.62
8	65	$28.29	$13.00	$11.85	$0.00	$53.14
9	70	$30.46	$13.00	$12.17	$0.00	$55.63
10	75	$32.64	$13.00	$12.51	$0.00	$58.15

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.68	$13.00	$0.53	$0.00	$31.21
2	40	$17.68	$13.00	$0.53	$0.00	$31.21
3	45	$19.89	$13.00	$10.54	$0.00	$43.43
4	45	$19.89	$13.00	$10.54	$0.00	$43.43
5	50	$22.10	$13.00	$10.86	$0.00	$45.96
6	55	$24.31	$13.00	$11.20	$0.00	$48.51
7	60	$26.52	$13.00	$11.53	$0.00	$51.05
8	65	$28.73	$13.00	$11.86	$0.00	$53.59
9	70	$30.94	$13.00	$12.19	$0.00	$56.13
10	75	$33.15	$13.00	$12.53	$0.00	$58.68

Notes: :

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

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2012	$52.45	$8.78	$6.96	$0.00	$68.19

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2012

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.23	$8.78	$0.00	$0.00	$35.01
2	55	$28.85	$8.78	$6.96	$0.00	$44.59
3	65	$34.09	$8.78	$6.96	$0.00	$49.83
4	70	$36.72	$8.78	$6.96	$0.00	$52.46
5	80	$41.96	$8.78	$6.96	$0.00	$57.70

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

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2012	$38.59	$8.78	$6.96	$0.00	$54.33
FENCE & GUARD RAIL ERECTOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2013	$38.50	$10.00	$13.02	$0.00	$61.52
	11/01/2013	$39.26	$10.00	$13.02	$0.00	$62.28
	05/01/2014	$40.03	$10.00	$13.02	$0.00	$63.05
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2013	$39.91	$10.00	$13.02	$0.00	$62.93
	11/01/2013	$40.68	$10.00	$13.02	$0.00	$63.70
	05/01/2014	$41.45	$10.00	$13.02	$0.00	$64.47
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2013	$21.17	$10.00	$13.02	$0.00	$44.19
	11/01/2013	$21.63	$10.00	$13.02	$0.00	$44.65
	05/01/2014	$22.08	$10.00	$13.02	$0.00	$45.10
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 103*	03/01/2013	$43.52	$13.00	$14.16	$0.00	$70.68
	09/01/2013	$44.20	$13.00	$14.18	$0.00	$71.38
	03/01/2014	$44.92	$13.00	$14.20	$0.00	$72.12
	09/01/2014	$45.60	$13.00	$14.22	$0.00	$72.82
	03/01/2015	$46.32	$13.00	$14.24	$0.00	$73.56
	09/01/2015	$47.27	$13.00	$14.27	$0.00	$74.54
	03/01/2016	$48.23	$13.00	$14.30	$0.00	$75.53
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING *ELECTRICIANS* *LOCAL 103*	03/01/2013	$32.64	$13.00	$12.51	$0.00	$58.15
	09/01/2013	$33.15	$13.00	$12.52	$0.00	$58.67
	03/01/2014	$33.69	$13.00	$12.54	$0.00	$59.23
	09/01/2014	$34.20	$13.00	$12.56	$0.00	$59.76
	03/01/2015	$34.74	$13.00	$12.57	$0.00	$60.31
	09/01/2015	$35.45	$13.00	$12.59	$0.00	$61.04
	03/01/2016	$36.17	$13.00	$12.62	$0.00	$61.79
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$33.73	$10.00	$13.55	$0.00	$57.28
	12/01/2013	$34.39	$10.00	$13.55	$0.00	$57.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER *LABORERS - ZONE 1*	06/01/2013	$20.50	$7.10	$12.45	$0.00	$40.05
	12/01/2013	$20.50	$7.10	$12.45	$0.00	$40.05
	06/01/2014	$20.50	$7.10	$12.45	$0.00	$40.05
	12/01/2014	$20.50	$7.10	$12.45	$0.00	$40.05
	06/01/2015	$20.50	$7.10	$12.45	$0.00	$40.05
	12/01/2015	$20.50	$7.10	$12.45	$0.00	$40.05
	06/01/2016	$20.50	$7.10	$12.45	$0.00	$40.05
	12/01/2016	$20.50	$7.10	$12.45	$0.00	$40.05
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE 1*	03/01/2013	$38.61	$9.80	$16.71	$0.00	$65.12
	09/01/2013	$38.61	$9.80	$16.71	$0.00	$65.12
	03/01/2014	$38.61	$9.80	$16.71	$0.00	$65.12

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.31	$9.80	$1.79	$0.00	$30.90
2	55	$21.24	$9.80	$1.79	$0.00	$32.83
3	60	$23.17	$9.80	$11.34	$0.00	$44.31
4	65	$25.10	$9.80	$11.34	$0.00	$46.24
5	70	$27.03	$9.80	$13.13	$0.00	$49.96
6	75	$28.96	$9.80	$13.13	$0.00	$51.89
7	80	$30.89	$9.80	$14.92	$0.00	$55.61
8	85	$32.82	$9.80	$14.92	$0.00	$57.54

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.31	$9.80	$1.79	$0.00	$30.90
2	55	$21.24	$9.80	$1.79	$0.00	$32.83
3	60	$23.17	$9.80	$11.34	$0.00	$44.31
4	65	$25.10	$9.80	$11.34	$0.00	$46.24
5	70	$27.03	$9.80	$13.13	$0.00	$49.96
6	75	$28.96	$9.80	$13.13	$0.00	$51.89
7	80	$30.89	$9.80	$14.92	$0.00	$55.61
8	85	$32.82	$9.80	$14.92	$0.00	$57.54

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$28.19	$10.00	$13.55	$0.00	$51.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$28.74	$10.00	$13.55	$0.00	$52.29
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	01/01/2013	$35.51	$7.80	$14.60	$0.00	$57.91

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 35 Zone 2*
Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.76	$7.80	$0.00	$0.00	$25.56
2	55	$19.53	$7.80	$3.25	$0.00	$30.58
3	60	$21.31	$7.80	$3.54	$0.00	$32.65
4	65	$23.08	$7.80	$3.84	$0.00	$34.72
5	70	$24.86	$7.80	$12.83	$0.00	$45.49
6	75	$26.63	$7.80	$13.13	$0.00	$47.56
7	80	$28.41	$7.80	$13.42	$0.00	$49.63
8	90	$31.96	$7.80	$14.01	$0.00	$53.77

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$22.19	$10.00	$0.00	$0.00	$32.19
2	60	$24.20	$10.00	$13.55	$0.00	$47.75
3	65	$26.22	$10.00	$13.55	$0.00	$49.77
4	70	$28.24	$10.00	$13.55	$0.00	$51.79
5	75	$30.26	$10.00	$13.55	$0.00	$53.81
6	80	$32.27	$10.00	$13.55	$0.00	$55.82
7	85	$34.29	$10.00	$13.55	$0.00	$57.84
8	90	$36.31	$10.00	$13.55	$0.00	$59.86

Effective Date - 12/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$22.62	$10.00	$0.00	$0.00	$32.62
2	60	$24.67	$10.00	$13.55	$0.00	$48.22
3	65	$26.73	$10.00	$13.55	$0.00	$50.28
4	70	$28.78	$10.00	$13.55	$0.00	$52.33
5	75	$30.84	$10.00	$13.55	$0.00	$54.39
6	80	$32.90	$10.00	$13.55	$0.00	$56.45
7	85	$34.95	$10.00	$13.55	$0.00	$58.50
8	90	$37.01	$10.00	$13.55	$0.00	$60.56

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2013	$42.32	$9.82	$18.24	$2.11	$72.49
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 103*	03/01/2013	$43.52	$13.00	$14.16	$0.00	$70.68
	09/01/2013	$44.20	$13.00	$14.18	$0.00	$71.38
	03/01/2014	$44.92	$13.00	$14.20	$0.00	$72.12
	09/01/2014	$45.60	$13.00	$14.22	$0.00	$72.82
	03/01/2015	$46.32	$13.00	$14.24	$0.00	$73.56
	09/01/2015	$47.27	$13.00	$14.27	$0.00	$74.54
	03/01/2016	$48.23	$13.00	$14.30	$0.00	$75.53
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2013	$42.32	$9.82	$18.24	$2.11	$72.49
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PIPEFITTERS LOCAL 537*	03/01/2013	$49.34	$8.75	$14.39	$0.00	$72.48
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PIPEFITTERS LOCAL 537*	03/01/2013	$49.34	$8.75	$14.39	$0.00	$72.48

Classification For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 1*	06/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	12/01/2013	$34.55	$7.10	$12.45	$0.00	$54.10
	06/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	12/01/2014	$36.05	$7.10	$12.45	$0.00	$55.60
	06/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	12/01/2015	$37.55	$7.10	$12.45	$0.00	$57.10
	06/01/2016	$38.30	$7.10	$12.45	$0.00	$57.85
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$39.30	$7.10	$12.45	$0.00	$58.85
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	09/01/2012	$41.46	$10.65	$11.50	$0.00	$63.61
	09/01/2013	$43.06	$10.65	$11.50	$0.00	$65.21
	09/01/2014	$45.06	$10.65	$11.50	$0.00	$67.21

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

Effective Date - 09/01/2012

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.73	$10.65	$8.60	$0.00	$39.98
2	60	$24.88	$10.65	$9.18	$0.00	$44.71
3	70	$29.02	$10.65	$9.76	$0.00	$49.43
4	80	$33.17	$10.65	$10.34	$0.00	$54.16

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.53	$10.65	$8.60	$0.00	$40.78
2	60	$25.84	$10.65	$9.18	$0.00	$45.67
3	70	$30.14	$10.65	$9.76	$0.00	$50.55
4	80	$34.45	$10.65	$10.34	$0.00	$55.44

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (BOSTON AREA)*	03/16/2013	$40.23	$7.70	$18.35	$0.00	$66.28

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 7 Boston*

Effective Date - 03/16/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.14	$7.70	$18.35	$0.00	$50.19
2	70	$28.16	$7.70	$18.35	$0.00	$54.21
3	75	$30.17	$7.70	$18.35	$0.00	$56.22
4	80	$32.18	$7.70	$18.35	$0.00	$58.23
5	85	$34.20	$7.70	$18.35	$0.00	$60.25
6	90	$36.21	$7.70	$18.35	$0.00	$62.26

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
LABORER *LABORERS - ZONE 1*	06/01/2013	$33.05	$7.10	$12.45	$0.00	$52.60
	12/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	06/01/2014	$34.55	$7.10	$12.45	$0.00	$54.10
	12/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	06/01/2015	$36.05	$7.10	$12.45	$0.00	$55.60
	12/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	06/01/2016	$37.55	$7.10	$12.45	$0.00	$57.10
	12/01/2016	$38.55	$7.10	$12.45	$0.00	$58.10

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 1*

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$19.83	$7.10	$12.45	$0.00	$39.38
2	70	$23.14	$7.10	$12.45	$0.00	$42.69
3	80	$26.44	$7.10	$12.45	$0.00	$45.99
4	90	$29.75	$7.10	$12.45	$0.00	$49.30

Effective Date - 12/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$20.28	$7.10	$12.45	$0.00	$39.83
2	70	$23.66	$7.10	$12.45	$0.00	$43.21
3	80	$27.04	$7.10	$12.45	$0.00	$46.59
4	90	$30.42	$7.10	$12.45	$0.00	$49.97

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 1*	06/01/2013	$33.05	$7.10	$12.45	$0.00	$52.60
	12/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	06/01/2014	$34.55	$7.10	$12.45	$0.00	$54.10
	12/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	06/01/2015	$36.05	$7.10	$12.45	$0.00	$55.60
	12/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	06/01/2016	$37.55	$7.10	$12.45	$0.00	$57.10
	12/01/2016	$38.55	$7.10	$12.45	$0.00	$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 1*	06/01/2013	$33.05	$7.10	$12.45	$0.00	$52.60
	12/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	06/01/2014	$34.55	$7.10	$12.45	$0.00	$54.10
	12/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	06/01/2015	$36.05	$7.10	$12.45	$0.00	$55.60
	12/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	06/01/2016	$37.55	$7.10	$12.45	$0.00	$57.10
	12/01/2016	$38.55	$7.10	$12.45	$0.00	$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 1*	12/01/2011	$31.80	$7.10	$12.45	$0.00	$51.35
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MASON TENDER *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 1*	06/01/2013	$33.05	$7.10	$12.45	$0.00	$52.60
	12/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	06/01/2014	$34.55	$7.10	$12.45	$0.00	$54.10
	12/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	06/01/2015	$36.05	$7.10	$12.45	$0.00	$55.60
	12/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	06/01/2016	$37.55	$7.10	$12.45	$0.00	$57.10
	12/01/2016	$38.55	$7.10	$12.45	$0.00	$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 1*	06/01/2013	$33.05	$7.10	$12.45	$0.00	$52.60
	12/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	06/01/2014	$34.55	$7.10	$12.45	$0.00	$54.10
	12/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	06/01/2015	$36.05	$7.10	$12.45	$0.00	$55.60
	12/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	06/01/2016	$37.55	$7.10	$12.45	$0.00	$57.10
	12/01/2016	$38.55	$7.10	$12.45	$0.00	$58.10
This classification applies to the wholesale removal of standing trees including all associated trimming of branches and limbs, and applies to the removal of branches at locations not on or around utility lines. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2013	$36.20	$10.18	$16.51	$0.00	$62.89
	08/01/2013	$36.91	$10.18	$16.58	$0.00	$63.67
	02/01/2014	$37.36	$10.18	$16.58	$0.00	$64.12
	08/01/2014	$38.07	$10.18	$16.65	$0.00	$64.90
	02/01/2015	$38.52	$10.18	$16.65	$0.00	$65.35
	08/01/2015	$39.23	$10.18	$16.72	$0.00	$66.13
	02/01/2016	$39.68	$10.18	$16.72	$0.00	$66.58
	08/01/2016	$40.38	$10.18	$16.80	$0.00	$67.36
	02/01/2017	$40.84	$10.18	$16.80	$0.00	$67.82

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$18.10	$10.18	$16.51	$0.00	$44.79
2	60	$21.72	$10.18	$16.51	$0.00	$48.41
3	70	$25.34	$10.18	$16.51	$0.00	$52.03
4	80	$28.96	$10.18	$16.51	$0.00	$55.65
5	90	$32.58	$10.18	$16.51	$0.00	$59.27

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$18.46	$10.18	$16.58	$0.00	$45.22
2	60	$22.15	$10.18	$16.58	$0.00	$48.91
3	70	$25.84	$10.18	$16.58	$0.00	$52.60
4	80	$29.53	$10.18	$16.58	$0.00	$56.29
5	90	$33.22	$10.18	$16.58	$0.00	$59.98

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2013	$47.45	$10.18	$17.83	$0.00	$75.46
	08/01/2013	$48.35	$10.18	$17.90	$0.00	$76.43
	02/01/2014	$48.91	$10.18	$17.90	$0.00	$76.99
	08/01/2014	$49.81	$10.18	$17.97	$0.00	$77.96
	02/01/2015	$50.37	$10.18	$17.97	$0.00	$78.52
	08/01/2015	$51.27	$10.18	$18.04	$0.00	$79.49
	02/01/2016	$51.84	$10.18	$18.04	$0.00	$80.06
	08/01/2016	$52.74	$10.18	$18.12	$0.00	$81.04
	02/01/2017	$53.31	$10.18	$18.12	$0.00	$81.61

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.73	$10.18	$17.83	$0.00	$51.74
2	60	$28.47	$10.18	$17.83	$0.00	$56.48
3	70	$33.22	$10.18	$17.83	$0.00	$61.23
4	80	$37.96	$10.18	$17.83	$0.00	$65.97
5	90	$42.71	$10.18	$17.83	$0.00	$70.72

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.18	$10.18	$17.90	$0.00	$52.26
2	60	$29.01	$10.18	$17.90	$0.00	$57.09
3	70	$33.85	$10.18	$17.90	$0.00	$61.93
4	80	$38.68	$10.18	$17.90	$0.00	$66.76
5	90	$43.52	$10.18	$17.90	$0.00	$71.60

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1) *MILLWRIGHTS LOCAL 1121 - Zone 1*	04/01/2013	$34.68	$9.80	$15.76	$0.00	$60.24
	10/01/2013	$35.45	$9.80	$15.76	$0.00	$61.01
	04/01/2014	$36.23	$9.80	$15.76	$0.00	$61.79
	10/01/2014	$37.18	$9.80	$15.76	$0.00	$62.74
	04/01/2015	$38.14	$9.80	$15.76	$0.00	$63.70

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 1*

Effective Date - 04/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$19.07	$9.80	$4.32	$0.00	$33.19
2	65	$22.54	$9.80	$13.01	$0.00	$45.35
3	75	$26.01	$9.80	$13.80	$0.00	$49.61
4	85	$29.48	$9.80	$14.58	$0.00	$53.86

Effective Date - 10/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$19.50	$9.80	$4.32	$0.00	$33.62
2	65	$23.04	$9.80	$13.01	$0.00	$45.85
3	75	$26.59	$9.80	$13.80	$0.00	$50.19
4	85	$30.13	$9.80	$14.58	$0.00	$54.51

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$21.17	$10.00	$13.55	$0.00	$44.72
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$21.59	$10.00	$13.55	$0.00	$45.14
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$24.57	$10.00	$13.55	$0.00	$48.12
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$25.06	$10.00	$13.55	$0.00	$48.61
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2013	$45.01	$7.80	$15.60	$0.00	$68.41

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*
Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.51	$7.80	$0.00	$0.00	$30.31
2	55	$24.76	$7.80	$3.52	$0.00	$36.08
3	60	$27.01	$7.80	$3.84	$0.00	$38.65
4	65	$29.26	$7.80	$4.16	$0.00	$41.22
5	70	$31.51	$7.80	$13.68	$0.00	$52.99
6	75	$33.76	$7.80	$14.00	$0.00	$55.56
7	80	$36.01	$7.80	$14.32	$0.00	$58.13
8	90	$40.51	$7.80	$14.96	$0.00	$63.27

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2013	$35.91	$7.80	$15.60	$0.00	$59.31

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 2*

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*
Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.96	$7.80	$0.00	$0.00	$25.76
2	55	$19.75	$7.80	$3.52	$0.00	$31.07
3	60	$21.55	$7.80	$3.84	$0.00	$33.19
4	65	$23.34	$7.80	$4.16	$0.00	$35.30
5	70	$25.14	$7.80	$13.68	$0.00	$46.62
6	75	$26.93	$7.80	$14.00	$0.00	$48.73
7	80	$28.73	$7.80	$14.32	$0.00	$50.85
8	90	$32.32	$7.80	$14.96	$0.00	$55.08

Notes:

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2013	$33.97	$7.80	$15.60	$0.00	$57.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*
Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$16.99	$7.80	$0.00	$0.00	$24.79
2	55	$18.68	$7.80	$3.52	$0.00	$30.00
3	60	$20.38	$7.80	$3.84	$0.00	$32.02
4	65	$22.08	$7.80	$4.16	$0.00	$34.04
5	70	$23.78	$7.80	$13.68	$0.00	$45.26
6	75	$25.48	$7.80	$14.00	$0.00	$47.28
7	80	$27.18	$7.80	$14.32	$0.00	$49.30
8	90	$30.57	$7.80	$14.96	$0.00	$53.33

Notes:

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) *LABORERS - ZONE 1*	06/01/2013	$33.05	$7.10	$12.45	$0.00	$52.60
	12/01/2013	$33.80	$7.10	$12.45	$0.00	$53.35
	06/01/2014	$34.55	$7.10	$12.45	$0.00	$54.10
	12/01/2014	$35.30	$7.10	$12.45	$0.00	$54.85
	06/01/2015	$36.05	$7.10	$12.45	$0.00	$55.60
	12/01/2015	$36.80	$7.10	$12.45	$0.00	$56.35
	06/01/2016	$37.55	$7.10	$12.45	$0.00	$57.10
	12/01/2016	$38.55	$7.10	$12.45	$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 2*	01/01/2013	$34.51	$7.80	$15.60	$0.00	$57.91

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*
Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$17.26	$7.80	$0.00	$0.00	$25.06
2	55	$18.98	$7.80	$3.52	$0.00	$30.30
3	60	$20.71	$7.80	$3.84	$0.00	$32.35
4	65	$22.43	$7.80	$4.16	$0.00	$34.39
5	70	$24.16	$7.80	$13.68	$0.00	$45.64
6	75	$25.88	$7.80	$14.00	$0.00	$47.68
7	80	$27.61	$7.80	$14.32	$0.00	$49.73
8	90	$31.06	$7.80	$14.96	$0.00	$53.82

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2013	$32.57	$7.80	$15.60	$0.00	$55.97

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

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$16.29	$7.80	$0.00	$0.00	$24.09
2	55	$17.91	$7.80	$3.52	$0.00	$29.23
3	60	$19.54	$7.80	$3.84	$0.00	$31.18
4	65	$21.17	$7.80	$4.16	$0.00	$33.13
5	70	$22.80	$7.80	$13.68	$0.00	$44.28
6	75	$24.43	$7.80	$14.00	$0.00	$46.23
7	80	$26.06	$7.80	$14.32	$0.00	$48.18
8	90	$29.31	$7.80	$14.96	$0.00	$52.07

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$31.38	$8.91	$8.00	$0.00	$48.29
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$39.20	$9.80	$17.67	$0.00	$66.67
	08/01/2013	$40.70	$9.80	$17.67	$0.00	$68.17
	08/01/2014	$42.20	$9.80	$17.67	$0.00	$69.67
	08/01/2015	$43.70	$9.80	$17.67	$0.00	$71.17
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2012	$39.20	$9.80	$17.67	$0.00	$66.67
	08/01/2013	$40.70	$9.80	$17.67	$0.00	$68.17
	08/01/2014	$42.20	$9.80	$17.67	$0.00	$69.67
	08/01/2015	$43.70	$9.80	$17.67	$0.00	$71.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2012

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.60	$9.80	$17.67	$0.00	$47.07
2	60	$23.52	$9.80	$17.67	$0.00	$50.99
3	70	$27.44	$9.80	$17.67	$0.00	$54.91
4	75	$29.40	$9.80	$17.67	$0.00	$56.87
5	80	$31.36	$9.80	$17.67	$0.00	$58.83
6	80	$31.36	$9.80	$17.67	$0.00	$58.83
7	90	$35.28	$9.80	$17.67	$0.00	$62.75
8	90	$35.28	$9.80	$17.67	$0.00	$62.75

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.35	$9.80	$17.67	$0.00	$47.82
2	60	$24.42	$9.80	$17.67	$0.00	$51.89
3	70	$28.49	$9.80	$17.67	$0.00	$55.96
4	75	$30.53	$9.80	$17.67	$0.00	$58.00
5	80	$32.56	$9.80	$17.67	$0.00	$60.03
6	80	$32.56	$9.80	$17.67	$0.00	$60.03
7	90	$36.63	$9.80	$17.67	$0.00	$64.10
8	90	$36.63	$9.80	$17.67	$0.00	$64.10

Notes:

Apprentice to Journeyworker Ratio:1:3

PIPEFITTER & STEAMFITTER *PIPEFITTERS LOCAL 537*	03/01/2013	$49.34	$8.75	$14.39	$0.00	$72.48

Apprentice - *PIPEFITTER - Local 537*

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$19.74	$8.75	$6.50	$0.00	$34.99
2	45	$22.20	$8.75	$14.39	$0.00	$45.34
3	60	$29.60	$8.75	$14.39	$0.00	$52.74
4	70	$34.54	$8.75	$14.39	$0.00	$57.68
5	80	$39.47	$8.75	$14.39	$0.00	$62.61

Notes:

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

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
PLUMBERS & GASFITTERS *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2013	$49.31	$9.32	$13.29	$0.00	$71.92

Apprentice - *PLUMBER/GASFITTER - Local 12*

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$17.26	$9.32	$4.97	$0.00	$31.55
2	40	$19.72	$9.32	$5.61	$0.00	$34.65
3	55	$27.12	$9.32	$7.53	$0.00	$43.97
4	65	$32.05	$9.32	$8.81	$0.00	$50.18
5	75	$36.98	$9.32	$10.09	$0.00	$56.39

Notes:
** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic$53.29 Step5 with lic$59.49

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) *PIPEFITTERS LOCAL 537*	03/01/2013	$49.34	$8.75	$14.39	$0.00	$72.48
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER *LABORERS - ZONE 1*	06/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	12/01/2013	$34.80	$7.10	$12.45	$0.00	$54.35
	06/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	12/01/2014	$36.30	$7.10	$12.45	$0.00	$55.85
	06/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	12/01/2015	$37.80	$7.10	$12.45	$0.00	$57.35
	06/01/2016	$38.55	$7.10	$12.45	$0.00	$58.10
	12/01/2016	$39.55	$7.10	$12.45	$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 *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$28.19	$10.00	$13.55	$0.00	$51.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$28.74	$10.00	$13.55	$0.00	$52.29
READY-MIX CONCRETE DRIVER *TEAMSTERS LOCAL 25b*	05/01/2011	$28.03	$7.75	$5.91	$0.00	$41.69
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
RESIDENTIAL WOOD FRAME (All Other Work) *CARPENTERS -ZONE 2 (Residential Wood)*	04/01/2011	$24.24	$8.67	$15.51	$0.00	$48.42
RESIDENTIAL WOOD FRAME CARPENTER ** ** 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.*CARPENTERS -ZONE 2 (Residential Wood)* As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.	05/01/2011	$24.24	$6.34	$6.23	$0.00	$36.81
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg) *ROOFERS LOCAL 33*	02/01/2013	$37.41	$10.50	$10.70	$0.00	$58.61

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ROOFER - Local 33*
Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$18.71	$10.50	$3.38	$0.00	$32.59
2	60	$22.45	$10.50	$10.70	$0.00	$43.65
3	65	$24.32	$10.50	$10.70	$0.00	$45.52
4	75	$28.06	$10.50	$10.70	$0.00	$49.26
5	85	$31.80	$10.50	$10.70	$0.00	$53.00

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	02/01/2013	$37.66	$10.50	$10.70	$0.00	$58.86

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2013	$42.32	$9.82	$18.24	$2.11	$72.49

Apprentice - *SHEET METAL WORKER - Local 17-A*
Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$16.93	$9.82	$4.00	$0.00	$30.75
2	40	$16.93	$9.82	$4.00	$0.00	$30.75
3	45	$19.04	$9.82	$8.00	$1.11	$37.97
4	45	$19.04	$9.82	$8.00	$1.11	$37.97
5	50	$21.16	$9.82	$8.75	$1.19	$40.92
6	50	$21.16	$9.82	$9.00	$1.20	$41.18
7	60	$25.39	$9.82	$10.24	$1.36	$46.81
8	65	$27.51	$9.82	$10.99	$1.45	$49.77
9	75	$31.74	$9.82	$12.49	$1.62	$55.67
10	85	$35.97	$9.82	$13.49	$1.78	$61.06

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR *PAINTERS LOCAL 35 - ZONE 2*	06/01/2013	$25.81	$7.07	$7.05	$0.00	$39.93

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SIGN ERECTOR - Local 35 Zone 2*
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*	12/01/2012	$31.84	$8.91	$8.00	$0.00	$48.75
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$32.13	$8.91	$8.00	$0.00	$49.04
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section A)*	03/01/2013	$52.58	$8.42	$12.60	$0.00	$73.60

Apprentice - *SPRINKLER FITTER - Local 550*
Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$18.40	$8.42	$8.00	$0.00	$34.82
2	40	$21.03	$8.42	$8.00	$0.00	$37.45
3	45	$23.66	$8.42	$8.00	$0.00	$40.08
4	50	$26.29	$8.42	$8.00	$0.00	$42.71
5	55	$28.92	$8.42	$8.00	$0.00	$45.34
6	60	$31.55	$8.42	$8.00	$0.00	$47.97
7	65	$34.18	$8.42	$8.00	$0.00	$50.60
8	70	$36.81	$8.42	$8.00	$0.00	$53.23
9	75	$39.44	$8.42	$8.00	$0.00	$55.86
10	80	$42.06	$8.42	$8.00	$0.00	$58.48

Notes:
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:1

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Issue Date: 06/12/2013 **Wage Request Number:** 20130612-021 **Page 30 of 34**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 103*	03/01/2013	$32.64	$13.00	$12.51	$0.00	$58.15
	09/01/2013	$33.15	$13.00	$12.52	$0.00	$58.67
	03/01/2014	$33.69	$13.00	$12.54	$0.00	$59.23
	09/01/2014	$34.20	$13.00	$12.56	$0.00	$59.76
	03/01/2015	$34.74	$13.00	$12.57	$0.00	$60.31
	09/01/2015	$35.45	$13.00	$12.59	$0.00	$61.04
	03/01/2016	$36.17	$13.00	$12.62	$0.00	$61.79

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 103*

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$13.06	$13.00	$0.39	$0.00	$26.45
2	40	$13.06	$13.00	$0.39	$0.00	$26.45
3	45	$14.69	$13.00	$10.77	$0.00	$38.46
4	45	$14.69	$13.00	$10.77	$0.00	$38.46
5	50	$16.32	$13.00	$11.02	$0.00	$40.34
6	55	$17.95	$13.00	$11.27	$0.00	$42.22
7	60	$19.58	$13.00	$11.52	$0.00	$44.10
8	65	$21.22	$13.00	$11.77	$0.00	$45.99
9	70	$22.85	$13.00	$12.02	$0.00	$47.87
10	75	$24.48	$13.00	$12.26	$0.00	$49.74

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$13.26	$13.00	$0.40	$0.00	$26.66
2	40	$13.26	$13.00	$0.40	$0.00	$26.66
3	45	$14.92	$13.00	$9.79	$0.00	$37.71
4	45	$14.92	$13.00	$9.79	$0.00	$37.71
5	50	$16.58	$13.00	$10.04	$0.00	$39.62
6	55	$18.23	$13.00	$10.29	$0.00	$41.52
7	60	$19.89	$13.00	$10.54	$0.00	$43.43
8	65	$21.55	$13.00	$10.79	$0.00	$45.34
9	70	$23.21	$13.00	$11.04	$0.00	$47.25
10	75	$24.86	$13.00	$11.29	$0.00	$49.15

Notes:

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2013	$46.35	$10.18	$17.83	$0.00	$74.36
	08/01/2013	$47.25	$10.18	$17.90	$0.00	$75.33
	02/01/2014	$47.81	$10.18	$17.90	$0.00	$75.89
	08/01/2014	$48.71	$10.18	$17.97	$0.00	$76.86
	02/01/2015	$49.27	$10.18	$17.97	$0.00	$77.42
	08/01/2015	$50.17	$10.18	$18.04	$0.00	$78.39
	02/01/2016	$50.74	$10.18	$18.04	$0.00	$78.96
	08/01/2016	$51.64	$10.18	$18.12	$0.00	$79.94
	02/01/2017	$52.21	$10.18	$18.12	$0.00	$80.51

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

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.18	$10.18	$17.83	$0.00	$51.19
2	60	$27.81	$10.18	$17.83	$0.00	$55.82
3	70	$32.45	$10.18	$17.83	$0.00	$60.46
4	80	$37.08	$10.18	$17.83	$0.00	$65.09
5	90	$41.72	$10.18	$17.83	$0.00	$69.73

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.63	$10.18	$17.90	$0.00	$51.71
2	60	$28.35	$10.18	$17.90	$0.00	$56.43
3	70	$33.08	$10.18	$17.90	$0.00	$61.16
4	80	$37.80	$10.18	$17.90	$0.00	$65.88
5	90	$42.53	$10.18	$17.90	$0.00	$70.61

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2013	$34.45	$7.10	$12.60	$0.00	$54.15
	12/01/2013	$35.20	$7.10	$12.60	$0.00	$54.90
	06/01/2014	$35.95	$7.10	$12.60	$0.00	$55.65
	12/01/2014	$36.70	$7.10	$12.60	$0.00	$56.40
	06/01/2015	$37.45	$7.10	$12.60	$0.00	$57.15
	12/01/2015	$38.20	$7.10	$12.60	$0.00	$57.90
	06/01/2016	$38.95	$7.10	$12.60	$0.00	$58.65
	12/01/2016	$39.95	$7.10	$12.60	$0.00	$59.65

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2013	$33.17	$7.10	$12.60	$0.00	$52.87
	12/01/2013	$33.92	$7.10	$12.60	$0.00	$53.62
	06/01/2014	$34.67	$7.10	$12.60	$0.00	$54.37
	12/01/2014	$35.42	$7.10	$12.60	$0.00	$55.12
	06/01/2015	$36.17	$7.10	$12.60	$0.00	$55.87
	12/01/2015	$36.92	$7.10	$12.60	$0.00	$56.62
	06/01/2016	$37.67	$7.10	$12.60	$0.00	$57.37
	12/01/2016	$38.67	$7.10	$12.60	$0.00	$58.37
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2013	$33.05	$7.10	$12.60	$0.00	$52.75
	12/01/2013	$33.80	$7.10	$12.60	$0.00	$53.50
	06/01/2014	$34.55	$7.10	$12.60	$0.00	$54.25
	12/01/2014	$35.30	$7.10	$12.60	$0.00	$55.00
	06/01/2015	$36.05	$7.10	$12.60	$0.00	$55.75
	12/01/2015	$36.80	$7.10	$12.60	$0.00	$56.50
	06/01/2016	$37.55	$7.10	$12.60	$0.00	$57.25
	12/01/2016	$38.55	$7.10	$12.60	$0.00	$58.25
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$39.96	$10.00	$13.55	$0.00	$63.51
	12/01/2013	$40.74	$10.00	$13.55	$0.00	$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$32.42	$9.07	$8.00	$0.00	$49.49
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	06/01/2013	$45.33	$7.10	$13.00	$0.00	$65.43
	12/01/2013	$46.08	$7.10	$13.00	$0.00	$66.18
	06/01/2014	$46.83	$7.10	$13.00	$0.00	$66.93
	12/01/2014	$47.58	$7.10	$13.00	$0.00	$67.68
	06/01/2015	$48.33	$7.10	$13.00	$0.00	$68.43
	12/01/2015	$49.08	$7.10	$13.00	$0.00	$69.18
	06/01/2016	$49.83	$7.10	$13.00	$0.00	$69.93
	12/01/2016	$50.83	$7.10	$13.00	$0.00	$70.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2013	$47.33	$7.10	$13.00	$0.00	$67.43
	12/01/2013	$48.08	$7.10	$13.00	$0.00	$68.18
	06/01/2014	$48.83	$7.10	$13.00	$0.00	$68.93
	12/01/2014	$49.58	$7.10	$13.00	$0.00	$69.68
	06/01/2015	$50.33	$7.10	$13.00	$0.00	$70.43
	12/01/2015	$51.08	$7.10	$13.00	$0.00	$71.18
	06/01/2016	$51.83	$7.10	$13.00	$0.00	$71.93
	12/01/2016	$52.83	$7.10	$13.00	$0.00	$72.93
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2013	$37.40	$7.10	$13.00	$0.00	$57.50
	12/01/2013	$38.15	$7.10	$13.00	$0.00	$58.25
	06/01/2014	$38.90	$7.10	$13.00	$0.00	$59.00
	12/01/2014	$39.65	$7.10	$13.00	$0.00	$59.75
	06/01/2015	$40.40	$7.10	$13.00	$0.00	$60.50
	12/01/2015	$41.15	$7.10	$13.00	$0.00	$61.25
	06/01/2016	$41.90	$7.10	$13.00	$0.00	$62.00
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$42.90	$7.10	$13.00	$0.00	$63.00
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2013	$39.40	$7.10	$13.00	$0.00	$59.50
	12/01/2013	$40.15	$7.10	$13.00	$0.00	$60.25
	06/01/2014	$40.90	$7.10	$13.00	$0.00	$61.00
	12/01/2014	$41.65	$7.10	$13.00	$0.00	$61.75
	06/01/2015	$42.40	$7.10	$13.00	$0.00	$62.50
	12/01/2015	$43.15	$7.10	$13.00	$0.00	$63.25
	06/01/2016	$43.90	$7.10	$13.00	$0.00	$64.00
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$44.90	$7.10	$13.00	$0.00	$65.00
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	12/01/2012	$31.84	$8.91	$8.00	$0.00	$48.75
WAGON DRILL OPERATOR *LABORERS - ZONE 1*	06/01/2013	$33.30	$7.10	$12.45	$0.00	$52.85
	12/01/2013	$34.05	$7.10	$12.45	$0.00	$53.60
	06/01/2014	$34.80	$7.10	$12.45	$0.00	$54.35
	12/01/2014	$35.55	$7.10	$12.45	$0.00	$55.10
	06/01/2015	$36.30	$7.10	$12.45	$0.00	$55.85
	12/01/2015	$37.05	$7.10	$12.45	$0.00	$56.60
	06/01/2016	$37.80	$7.10	$12.45	$0.00	$57.35
For apprentice rates see "Apprentice- LABORER"	12/01/2016	$38.80	$7.10	$12.45	$0.00	$58.35
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2013	$40.34	$10.00	$13.55	$0.00	$63.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	$41.12	$10.00	$13.55	$0.00	$64.67
WATER METER INSTALLER *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2013	$49.31	$9.32	$13.29	$0.00	$71.92
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) unless otherwise specified.

* Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof.
** 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.

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

NOTICE TO AWARDING AUTHORITIES

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

NOTICE TO CONTRACTORS

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

WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c.149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

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

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

STATEMENT OF COMPLIANCE

_____, 2013

I,_____,_____
(Name of signatory party) (Title)
do hereby state:
That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)
and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under M.G.L. c149, §§26-27.

Signature _____

Title _____

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

WEEKLY PAYROLL REPORT FORM

Company Name:

Project Name:

Awarding Auth.:

Work Week Ending:

Prime Contractor

Subcontractor
List Prime Contractor:

Employer Signature:

Print Name & Title:

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

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

INDEX

DIVISION 1 GENERAL REQUIREMENTS

SECTION	SUBJECT	Page #
01010	Summary of Work	87
01013	Facility Interference With Proposed Work	88-90
01019	Drawings	91-92
01020	Allowances	93
01025	Measurement and Payment	94-110
01027	Application for Payment	111
01050	Field Engineering	112
01092	Abbreviations	113-114
01100	Special Project Procedures	115-118
01120	Environmental Controls	119-121
01200	Project Meetings	122
01300	Submittals	123-124
01310	Construction Schedules	125-126
01385	Pre-Construction Video Recording	127
01505	Mobilization	128
01510	Temporary Facilities	129
01545	Protection of Property	130
01570	Traffic Regulation	131-133
01572	Uniformed Police Officers	134
01610	Product Handling	135
01700	Contract Closeout	136-137

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work under this contract generally consists of cleaning and lining of approximately 9,500 linear feet of 12-inch diameter cast iron water main and construction of approximately 2,400 linear feet of 12-inch, 8-inch, and 6-inch ductile iron water main and associated valves, fittings, hydrants, water services, and by-pass piping on Washington Street in Newton, Massachusetts.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01013

FACILITY INTERFERENCE WITH PROPOSED WORK

PART 1 GENERAL

1.01 LOCATION OF UNDERGROUND FACILITIES

A. Facilities and other underground locations shown on the Drawings are from the best sources available to the Owner at the time of this Contract preparation and are furnished only for information and convenience of the Contractor and are not guaranteed.

1. It is agreed and understood that the Owner does not warrant or guarantee that the subsurface locations of existing pipes, structures or other underground phenomena actually encountered during construction shall be the same as those shown on the Drawings.
2. It is further agreed and understood that the Contractor shall not use or be entitled to use any of the information made available to him on the plans or obtained in any examination made by him as a basis of any claim or demand against the Owner or the Engineer, because of any variance between the information made available and the subsurface locations of natural phenomena, existing pipes or other structures as actually encountered during the construction work, except as may otherwise be provided for this Section.
3. In general, main line facilities only are shown and not individual connections from main line to buildings.
4. The presence of a structure along a proposed pipeline generally indicates that there will be a corresponding connection to it from whatever main line facilities are in the street.
5. The Contractor shall take all necessary steps, including field inspections and consultations with the Utility Owner and Property Owners, to insure that the most up to date information and accurate information available is used to mark the field location of the facilities, including service connections, prior to construction.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.03 PIPE LOCATIONS

A. Pipe lines and structures installed under this Contract will be located substantially as indicated on the Drawings. The Engineer reserves the right to make such modifications in location and grade as may be found desirable to avoid interference with existing structures and/or facilities or to avoid unsatisfactory locations, all as he may see fit as in the best interests of the Owner.

1. Contract unit prices shall apply.

1.04 PROTECTION OF UNDERGROUND FACILITIES AND DAMAGES THERETO

A. The Contractor shall notify "Dig Safe" of his operations at least 72 hours prior to construction on any portion of the project.

1. The Contractor shall notify all utility companies of his operations sufficiently in advance of construction and take all measures necessary to avoid damage or undue interruption to the utilities' normal services.
2. Utility poles shall be braced by the Contractor as directed by the utilities' owner and all costs shall be included in the contract unit prices.
3. No additional compensation shall be allowed because of damage to facilities due to test pit excavation.

1.05 CONDITION OF EXISTING FACILITIES

A. In general, poor physical condition of existing facilities shall not be an acceptable basis for claiming additional compensation.

1. Further, protection or repair of existing facilities outside of the Trench Width, W, shall not be considered as a valid basis for additional compensation.
2. The Contractor shall take all prudent steps to make himself aware of the physical condition of the existing facilities expected to be encountered, and to adjust his operations accordingly.

PART 2 PRODUCTS (not applicable)

PART 3 EXECUTION

3.01 INTERFERENCE AND RELOCATION OF FACILITIES

A. INTERFERENCE BY UTILITIES
1. Interference shall be considered to exist when the facility intrudes within the Trench Width, W, for various depths to invert, as tabulated on the Drawings.

3.02 INTERFERENCE COSTS AND CLAIMS

A. Claims for the costs of protecting, repairing, and/or replacing facilities which interfere will only be considered when the Engineer determines that:
1. The facility is not shown on the Drawings.
2. The facility is shown but the facility is found in a location substantially different from the location shown.
3. The Contractor has necessarily incurred additional cost because of the interference.
4. In general, claims will not be considered for cross trench service connections which are not shown on the Drawings or incorrectly shown.

B. It is routine and customary in work of this kind to encounter subsurface or other conditions which require changes in pipe line grade, alignment and/or relocation of facilities or other adjustments which may necessitate rescheduling of the Contractor's work.
1. The Contractor should allow contingency in his bid for schedule adjustments commonly encountered.
2. The Engineer shall in general not approve claims for delay because of changes in alignment or rescheduling of construction.

C. Where facilities are shown on the Drawings to interfere, the Contractor is required to maintain facilities in operation in their existing locations.
1. Such interferences and the protection and repair of such facilities shall not constitute the basis of an approvable claim.
2. The cost to maintain such facilities in operation in their existing location shall be included by the Contractor in his bid.

3.03 RELOCATION OF FACILITIES

A. Relocation of facilities is required:
1. Where indicated on the Drawings.
2. When a 3-inch or less vertical and horizontal separation cannot be achieved between the existing facility and the new pipe line.
3. To comply with minimum water/sewer separation.
4. Relocation may be avoided in certain cases by line and grade adjustments.

B. Existing facilities shall not be disturbed until the facility owner and the Engineer agree to the arrangements and the Engineer requests the relocation to proceed in writing.
1. If the owners of the facilities permit, and the Engineer so requests, the Contractor shall do the whole or any portion of the relocation work.
2. Relocation of facilities will generally be by new pipe and appurtenances, approved and furnished by the facility owner, except where it is feasible in the opinion of the Engineer and facility owner to utilize existing materials.
3. If so requested by the facility owner, the Engineer may direct the Contractor to furnish the material.
4. All removed materials remain the property of the facility owner.

3.04 RELOCATION COSTS AND CLAIMS

A. All costs of temporary relocations for the Contractor's convenience shall be borne by the Contractor.

B. Relocation costs for all facilities specified on the Drawings to be relocated shall be the responsibility of the Contractor and be included in the Contractor's bid prices, including those specifically for facility relocations, if such are included.

C. Relocation costs for publicly owned facilities not specified on the Drawings to be relocated, but directed to be relocated by the Engineer in writing, shall be paid in accordance with General Conditions Par. 4.04, B.

D. Relocation costs for privately owned utilities for which relocation is required by the work of this Contract, will not be approved by the Engineer for payment as Extra Work.

E. Exceptions as determined by the Engineer shall be paid in accordance with General Conditions Par. 4.04, B.

3.05 PRIVATE FACILITY COMPANY CLAIM DISTINCTIONS

A. Claims against the Owner by the Contractor for the cost of delays or damage repair sustained by the Contractor because of damage to or interferences between privately owned public facilities and the proposed work will not be considered valid for additional compensation.
   1. Claims involving privately owned facilities must be settled between the Contractor and the facility owner.

B. The Owner reserves the right to exercise, or not to exercise, any rights he may have to require relocation of privately owned public facilities at the facility company's expense in case of interferences.
   1. If the Owner does not exercise such rights, no claims against the Owner for not exercising such rights shall be approved by the Engineer.

3.06 FACILITY SERVICE CONNECTIONS AND WORK

A. The Contractor shall make all arrangements with the facility companies for temporary and permanent services and relocations required under this Contract, subject to the conditions described elsewhere in these Specifications.
   1. Facility companies in the area of work, and/or expected to provide service to the work, shall be arranged for and if required paid for at no additional expense to the Owner.

END OF SECTION

SECTION 01019

DRAWINGS

PART 1 GENERAL

1.01 DESCRIPTION

A. Bid Documents:
1. Drawings must be obtained through the City of Newton Purchasing Department. The drawings can be obtained at the City's Website (**www.ci.newton.ma.us/bids**).

B. The Contract Drawings may be modified by addenda and shall be issued for construction purposes.
1. These Drawings may be supplemented or superseded by such additional general and detail drawings as may be necessary and desirable as the work progresses.
2. The Drawings issued for construction at that time or after the signing of the Contract Documents shall become the Contract Drawings.

C. Dimensions:
1. Except where noted, the Drawings are made to scale, but all working dimensions shall be taken from the figured dimensions or by actual measurements at the work, and in no case by scaling the prints.
2. The Contractor shall study and compare all Drawings and verify all figures before laying out or constructing the work and shall be responsible for any and all errors in the Contract work which might have been avoided thereby.
3. The Contractor shall take all measurements of existing established conditions notwithstanding the figured dimensions on the Drawings.
4. When figured dimensions are not in agreement with the Contractor's measurements, the Engineer shall be immediately notified and the Engineer will promptly adjust the same.
5. Whether or not an error is believed to exist, deviations from the Drawings and the dimensions given thereon shall be made only after approval in writing is obtained from the Engineer.

D. Diagrammatic Drawings:
1. Plans or Drawings where the work is shown diagrammatically indicate approved working systems. Every piece of material, fittings, fixtures or small equipment is not shown, nor every difficulty or interference that may be encountered to carry out the true intent and purpose of the Contract Documents.
2. All necessary parts to make complete, approved working systems or installation shall be included as if detailed on these Drawings.
3. The location of pipe lines and appurtenances shown on the Drawings, unless exactly dimensioned, shall be considered as approximate only.
4. The Contractor shall adjust the position of the pipe lines and appurtenances in accordance with good working practices to meet interferences, provide proper clearance and provide proper access space for operation and maintenance.

E. Typical Details:
1. Where shown on the Drawings, typical details shall apply to each and every item of the Contract work where such items are incorporated and the detail is applicable.
2. Unless noted otherwise, such typical details shall be applicable in full.

F. Copies of Drawings Furnished:
1. The Engineer shall furnish the Contractor, without charge, up to six copies of the Drawings and Specifications for execution of the Contract work.
2. Additional copies will be furnished at the Contractor's expense when requested, except that any copies of available plans and specifications returned from the bidders in good condition will be furnished to the Contractor without charge.
3. All Drawings and Specifications are the property of the Owner.
4. The Contractor shall return all copies if so requested.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 EXISTING AND ADJACENT CONDITIONS

A. Wherever existing conditions or construction not required as part of the work of the Contract are shown, they are so shown as a source of information only. The Engineer, while believing such information is substantially correct, assumes no responsibility thereof.

1. Before starting any work that might be affected by such existing construction or conditions, the Contractor shall have made himself familiar with all conditions affecting the nature and manner of performing the work, and shall not be entitled to any extra compensation for any work or expense arising from or caused by his neglect to have verified all existing conditions and requirements.

3.02 DISCREPANCIES

A. If the Contractor, during the progress of the work, discovers any discrepancies between the Drawings and the Specifications, any errors or omissions on the Drawings, or any discrepancies between the physical condition of the Work and the Drawings, then the Contractor shall immediately notify the Engineer, who will promptly adjust the same. Any work performed after such discovery without the approval of the Engineer, shall be at the risk and expense of the Contractor.

END OF SECTION

SECTION 01020

ALLOWANCES

PART 1 GENERAL

1.01 DESCRIPTION

A. Stated allowances for materials testing shall be as appears in SECTION 00300, Bid Form, Item 25: Materials Testing.

Stated allowances for materials testing shall be paid as specified in SECTION 01025, MEASUREMENT AND PAYMENT. The requirement for competitive bids is waived.

The dollar amount stated is only approximate. Whether the approved materials testing expenses are more or less, the Contractor shall be reimbursed by the Owner the actual approved costs as billed.

B. Stated allowances for miscellaneous work shall be as appears in SECTION 00300, Bid Form, Item No. 26: Miscellaneous Work Allowance (Engineer's Discretionary Fund).

Stated allowances for miscellaneous work shall be paid as specified in SECTION 01025, MEASUREMENT AND PAYMENT. The requirement for competitive bids is waived.

The dollar amount stated is only approximate. Whether the approved miscellaneous work expenses are more or less, the Contractor shall be reimbursed by the Owner the actual approved costs.

C. Stated allowances for uniformed police officers shall be as appears in SECTION 00300, Bid Form, Item No. 30: Uniformed Police Officers.

Stated allowances for uniformed police officers shall be paid as specified in SECTION 01025, MEASUREMENT AND PAYMENT. The requirement for competitive bids is waived.

The dollar amount stated is only approximate.

D. Stated allowances for water sampling (by laboratory personnel) shall be as appears in SECTION 00300, Bid Form, Item No. 80: Water Sampling (By Laboratory Personnel).

Stated allowances for sampling (by laboratory personnel) shall be paid as specified in SECTION 01025, MEASUREMENT AND PAYMENT. The requirement for competitive bids is waived.

The dollar amount stated is only approximate. Whether the approved water sampling (by laboratory personnel) expenses are more or less, the Contractor shall be reimbursed by the Owner the actual approved costs as billed.

1.02 RELATED WORK SPECIFIED ELSEWHERE

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. The purpose of this Section is to define the method of measurement and payment for each of the unit prices or lump sums listed in the Bid Proposal. If no bid item appears in the Bid Proposal for any of the following described items, no work of that description is anticipated on the project.

1. The Contractor shall thoroughly review the work required for each payment item.
2. The Contractor shall have included in his various bid items, an amount to cover costs for additional work which may be necessary, to construct the water mains in the close proximity of underground facilities, services, poles and other facilities which may exist.
3. The discovery of an underground facility during the construction, not shown on the Contract Drawings shall not constitute automatic initiation of a change order. The additional work to cross or pass this underground facility must be substantial for consideration for additional payment.
    a. The word "substantial" as used above shall mean that an additional amount of work is required, beyond the work that is normally required in the crossing or paralleling of an underground facility.

1.02 RELATED WORK

A. Documents affecting the work of this Section include General Conditions, Supplementary Conditions, and all Divisions of these Specifications.

1.03 TRENCH PAYMENT LIMITS

A. The measurements for trench payment limits shall be used for the volume of computing excavation below grade and trench related items.

1. Trench limits in earth and rock shall be measured within vertical lines. The measured lines shall not exceed a width equal to the outside pipe diameter, plus three (3) feet.
2. Grade shall be measured vertically from the surface of the existing ground to a maximum point of six (6) inches below the bottom of the pipe, for trenches in earth.
    a. In trenches where rock is encountered, grade shall be one (1) foot below the bottom of the pipe.
3. In paved roadways the trench width at the roadway surface, to a depth of twelve (12) inches below the surface shall not exceed a width of six (6) feet.
4. If the Owner orders additional width beyond the above-specified limits, or below grade excavation, the width or depth ordered will be considered for payment, as will the refill material.

1.04 TRENCH BRACING AND SUPPORT

A. All costs for furnishing, installing and removing sheeting, bracing, or the use of a steel support box shall be included in the various pipe laying items. Sheeting specifically shown on the Contract Drawings shall be paid for under the unit bid item for Sheeting Left In Place.

1.05 PIPE BEDDING

A. Measurement taken for Pipe Bedding shall be by the ton for reasonably dry material as delivered to the site and which is subsequently placed. The Contractor shall furnish the Engineer with receipts from the plant showing the weight of each load of reasonably dry sand material which is furnished and placed, however the Engineer reserves the right to adjust the payment in the event the volume of material is either not entirely used, and/or the material is excessively wet, and/or the shipment has arrived on the site as already partially used.

1.06 SURPLUS MATERIAL

A. All costs for stockpiling, loading, hauling and legal disposing of surplus material shall be included in the various pipe laying items.

1.07 DEWATERING

A. All costs for furnishing, installing and operating a dewatering system shall be included in the various pipe laying items.

1.08 EXCESS EXCAVATED MATERIAL

A. All costs for transporting, placing, and compacting excess material obtained within this Contract shall be included in Item No. 6 unsuitable material excavation and disposal (in trenches).

1.09 DENSE GRADED CRUSHED STONE, BANK-RUN SAND, AND GRAVEL

A. Measurement taken for Dense Graded Crushed Stone shall be by the ton for reasonably dry material as delivered to the site and which is subsequently placed. The Contractor shall furnish the Engineer with receipts from the plant showing the weight of each load of reasonably dry dense graded material which is furnished and placed, however the Engineer reserves the right to adjust the payment in the event the volume of material is either not entirely used, and/or the material is excessively wet, and/or the shipment has arrived on the site as already partially used.

1.10 PRESSURE/LEAKAGE TESTING AND DISINFECTION

A. Payment shall be made for labor, materials, tools and equipment necessary for or incidental to the performance of the pressure/leakage tests and the disinfection of the water main and its appurtenances. The costs associated with pressure/leakage testing and disinfection shall be included in the unit price for pressure test, leakage test, and disinfection of water main(s) item.

1.11 REMOVING AND STACKING GATE VALVES

A. No separate payment shall be made for labor, materials, tools and equipment necessary for or incidental to the removal of and stacking of the gate valves and capping of existing mains, locations determined by the Owner. The cost for this item shall be included in the unit price for the various pipe-laying items.

1.12 CAPPING AND ABANDONMENT (IN-PLACE) OF OLD MAINS

A. No separate payment shall be made for labor, materials, tools and equipment necessary for or incidental to the capping of and abandonment (in-place) of the water mains and valves including closing valves, removing valve boxes and pavement replacement. The cost for this item shall be included in the unit price for the various pipe-laying items.

1.13 RESTORATION OF DAMAGED AREAS

A. All costs for restoration of damaged areas, including but not necessarily limited, to existing curbs, shrubs, trees, stone walls, and lawns, shall be included in the unit price for the various pipe-laying items or designated items in the bid form.

B. All public or private monuments, iron pipes or other types of property line and geodetic markers damaged or disturbed by operations under this Contract shall be reset by a licensed land surveyor - all at no additional cost to the Owner. All other work, under this Section, shall not be paid separately, but shall be considered incidental to the work and included in the unit price and lump sum items.

1.14 UNIFORMED POLICE OFFICERS

A. Measurement and payment for traffic persons shall be at hourly rate for the Police Department of the Owner as billed directly to the Owner. The allowance in the bid as stated in Section 01020, "Allowances", is approximate.

B. The Police Department will bill the Owner directly, and the Owner shall pay the Police Department bills within a ten (10) working day period for uniformed Police Officers provided on the job site. The billing shall include a

weekly statement outlining the days worked, hours worked, location of the work and rate for all officers providing service during that billing period. The Police Chief must sign all bills.

C. Traffic persons ordered by the Contractor for his convenience or unforeseen problems, which are not part of the original project, shall be paid at his own expense.

D. The Contractor is responsible for contacting the Police Department in regards to scheduling requirements.

E. Uniformed Police Officers required for purposes other than public safety and/or control of traffic shall not be eligible for reimbursement of payment. No payment will be made for overtime traffic persons unless emergency conditions exist. If the Contractor elects to work more than eight (8) hours in one day, or more than forty (40) hours in one week, he shall assume all such costs and will not be reimbursed under any bid item. However, if the Owner approves emergency overtime, the Owner shall pay the Police Department directly for services rendered.

1.15 TRAFFIC REGULATION

A. Except for the payment of uniformed police officers as outlined in 1.14, there shall be no separate measurement or payment for the work performed under Section 01570 – Traffic Regulation. All costs for furnishing lighted barricades and traffic protection devices and for labor, equipment and services involved in the erecting, maintaining, moving, adjusting, relocating and storing of signs, flashers, lights, barricades, traffic cones, traffic delineators and other devices furnished by the Contractor, as well as the cost of all labor and equipment involved in the maintenance of traffic lanes and detours ordered or included in the approved scheme for maintenance of traffic shall be included in the unit price bid for items 27 thru 29, signboards, and traffic control devices.

1.16 MEASUREMENT OF QUANTITIES

A. The quantities of the various items of work performed shall be determined, for purposes of progress and final payment, by the Contractor and reviewed by the Engineer.

B. The method of measurements to be used in the determination of quantities of the work of this Contract shall be as specified in this Section.

1. Area Measurements
   a. Unless otherwise specified, measurement for area computations shall be made along the surface and taken to the nearest half (1/2) foot.
2. Linear Measurements
   a. All items such as pipe, service tubing, and curbing, etc., shall be made along the alignment of the item, at the surface, and taken to the nearest foot.
3. Volume Measurements - In figuring volumes the following shall apply:
   a. Excavation Below Grade: Measurements shall be taken to the grade actually excavated as ordered, and within the trench payment limits specified in this Section.
   b. Test Pits: Measurements shall be taken to the lines and grade actually excavated.
   c. Rock and Boulder: Only boulders greater than one (1) cubic yard in volume and rock as defined in Section 02227, shall be measured for payment. Measurements shall be taken to the lines and grades as specified, in the trench payment limits in this Section.
4. Weight Measurements: Measurement for fittings shall be measured for payment by the pound excluding weight of accessories such as bolts, nuts, glands and gaskets.
5. Lump Sum: The term “lump sum” when used as a unit of payment, shall mean complete payment for the work described in the Contract Documents.
   a. Measurement for temporary bypass piping shall be lump sum and shall include all piping and services along the water main route. Piping and services used to connect the temporary bypass pipe to existing hydrants, mains, or houses off side streets or beyond the limits shown on the drawings shall not be measured for payment.
6. Per Each: The term “per each” when used as a unit of payment, shall mean complete payment for each unit furnished and installed, completed and accepted, as described in the Contract Documents.
7. Ton: When used as a pavement payment item, shall be arrived at by the following method:
   a. Payment shall be calculated by measurements of the surface area, within the payment limits, by square yards, times the depth of the pavement, times a factor of .056, for a conversion to ton basis.

b. A five (5) percent service factor shall be allowed if a comparison between measurements and delivery slips indicate that additional material was placed. If a comparison between delivery slips and measurements indicate less material was placed, the slip quantity shall be used for payment. The Contractor shall submit to the Engineer, one (1) copy of the certified weight slips for all asphaltic concrete used in the Work.

1.17 BITUMINOUS (ASPHALTIC) CONCRETE PAVEMENT

A. MEASUREMENT

1. "Trench" Pavement shall be measured by the actual ton installed along the full length of the street for the standard trench width as identified in the specifications and on the Drawings.
   a. Included in this item shall be the adjustment of all castings if required to finish grade within the trench area, and a binder course.

2. No separate measurement shall be made for cutting of existing pavement, cutting of edges, tack coating, backfilling, compaction, preparation of subgrade; furnishing and installing additional gravel base course; or disposal of materials.

3. No separate measurement shall be made for furnishing and installing reflectorized pavement markings and the removal and resetting of manhole frames, gate boxes, catch basins and private utility castings.

1.18 DUST CONTROL

A. MEASUREMENT

1. All costs for furnishing, stockpiling, hauling, placing, and spread materials required for dust control (i.e. calcium chloride, water) shall be included in the various pipe-laying items.

1.19 PAYMENT

ITEM NO	DESCRIPTION
1	Mobilization
2	Sawcut Bituminous Concrete Roadways
3	Sawcut Reinforced Concrete Panels
4	General Excavation
5	Test Pits
6	Excavation Below Grade
7	Rock Removal
8	Gravel Borrow
9	Dense Graded Crushed Stone
10	Sand for Water Service Pipe Bedding
11	¾" Fractured Crushed Stone
12	Control Density Fill
13	Class B Cement Concrete for Encasement
14	Dust Control (Chemical Treatment)
15	Reset Existing Curb
16	4" Bituminous Concrete Type I-1 for Permanent Trench Resurfacing (Placed in Two Courses)
17	Seam and Crack Sealing (applied After the Permanent Patch Operation)
18	2" Bituminous Concrete Walks & Driveways (Patching Private Property)
19	3" Bituminous Concrete Walks & Driveway Aprons (Patching Public Property)
20	4" Cement Concrete Walks with Lampblack
21	6" Cement Concrete Driveway Aprons with Lampblack
22	Temporary Trench Pavement
23	Cold Patch
24	Regrade, Loam, & Seed (Restore Loam Borders and/or Private Yards)
25	Materials Testing
26	Miscellaneous Work Allowance (Engineers Discretionary Fund)
27	Furnish & Mount Safety & Specialty Signboards (Less the Post System)
28	Furnish, Establish, & Re-Establish the Post System for Mounted Signboards
29	Safety Controls for Construction Operations (Primary Portable Traffic Control Devices)
30	Allowance for Payment of Uniformed Police Officers

31 Vehicle Loop Detector
32 Locate & Exercise Existing Water Main Gates to Determine Pre-Construction Serviceability
33 Locate & Exercise Existing Hydrants to Determine Pre-Construction Serviceability
34 Access Pit, Removal, & Disposal of Water Gates or Hydrants that Lie Beyond the Project Limit
35 Access Pit, Removal, & Disposal of Obstructions Discovered During the Cleaning & Lining Operation
36 6" D.I. Water Main
37 8" D.I. Water Main
38 12" D.I. Water Main
39 6" Fire Service
40 Clean & Cement Line Existing 12" Pipe
41 6" Water Gate Valves with Sleeve, Box, and Cover
42 8" Water Gate Valves with Sleeve, Box, and Cover
43 12" Water Gate Valves with Sleeve, Box, and Cover
44 6" Hydrant
45 Remove and Reset Hydrant
46 Remove and Dispose or Stockpile Hydrant
47 8" Bend
48 12" Bend
49 8" x 6" Reducer
50 12" x 8" Reducer
51 8" x 6" Mechanical Joint Tee
52 12" x 6" Mechanical Joint Tee
53 12" x 8" Mechanical Joint Tee
54 12" x 12" Mechanical Joint Tee
55 6" Megalug
56 8" Megalug
57 12" Megalug
58 ¾" Diameter Threaded Steel Tie Rod Assembly (Complete in Place)
59 Class B Cement Concrete Anchorage and/or Thrust Block
60 6" Mechanical Joint Solid Sleeve or Coupling
61 8" Mechanical Joint Solid Sleeve or Coupling
62 12" Mechanical Joint Solid Sleeve or Coupling
63 6" Cap
64 2" Thick Preformed Pipe Insulation with Plastic Jacketing
65 Test Pit to Determine Water Service Tubing Type
66 1" Copper Water Service Tubing
67 1" Corporation
68 1" Curb Stop & Box
69 Nominal 1" - 1 ½" Water Service Pipe Coupling
70 2" Copper Water Service Tubing
71 2" Corporation
72 2" Curb Stop & Box
73 2" Water Service Pipe Coupling
74 Temporary By-Pass Piping – Phase I
75 Temporary By-Pass Piping – Phase II
76 Temporary By-Pass Piping – Phase III
77 Pressure Test, Leakage Test & Disinfection of Water Mains – Phase I
78 Pressure Test, Leakage Test & Disinfection of Water Mains – Phase II
79 Pressure Test, Leakage Test & Disinfection of Water Mains – Phase II
80 Water Sampling (by Laboratory Personnel)
81 Supply & Deliver Rust & Stain Remover as Required
82 Cleaning and Lining Pits
83 Additional Cleaning and Lining Pits Beyond the Scope of Work
84 Concrete and Rebar Removal and Disposal
85 Mismarked Main (Cleaning and Lining Trenches Only)
86 Existing Drainage Repair (All Sizes)
87 Silt Sacks
88 Existing Sewer Service Repair (All Sizes)
89 Tree Protection

Item No. 1: Mobilization

Payment for mobilization shall be at the lump sum price bid under Bid Item No. 1 in the Bid Form. The total price bid for Mobilization shall not exceed five (5) percent of the total amount of the remaining bid items. Payment shall be full compensation for bonds, insurance, transportation of equipment and materials to the construction site, obtaining of all permits including street opening and Jackie's Law permits, set up of storage yard, maintenance of same, telephone, electric, and the removal of equipment and materials upon completion of the Work. The Engineer shall make percentage payments as he deems appropriate during the course of the Work.

Item No. 2: Sawcut Bituminous Concrete Roadways

Payment shall be made at the unit price bid per linear foot under Bid Item No. 2 in the Bid Form. Payment shall be full compensation for each linear foot of trench sawcut that has been pre-approved by the Engineer, which shall include the price for all labor, equipment and materials which will be required to complete these tasks throughout the entire term of the project, inclusive of the supplying of water, which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item, as shown on the plans, as directed by the Engineer and as specified herein. No payment shall be made for street opening apertures associated with cleaning and lining operations.

Item No. 3: Sawcut Reinforced Concrete Panels

Payment shall be made at the unit price bid per linear foot under Bid Item No. 3 in the Bid Form. Payment shall be full compensation for each linear foot of sawcut that has been pre-approved by the Engineer, which shall include the price for all labor, equipment and materials which will be required to complete these tasks throughout the entire term of the project, inclusive of the supplying of water, which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item, as shown on the plans, as directed by the Engineer and as specified herein. No payment shall be made for street opening apertures associated with cleaning and lining operations.

Item No. 4: General Excavation

Important Informational Note: This is a Non-Pay Item

The contractor must incorporate the cost for all general excavation, and the cost of disposal of all associated undesirable materials, no matter what their nature may be, into the contract. No separate pay item shall exist for General Excavation but the cost of this work shall be factored by the Contractor into the bid prices of the various pay items of this contract.

General excavation shall consist of the work required for the excavation and disposal thereof for all operations over the entire limits of the project areas including, but not limited to, pipes, sidewalks, slopes, trenches (excluding rock/ledge removal), apertures, etc., and shall further include, in addition to the removal and disposal of all excess and/or unsuitable materials, the removal and disposal of brush, trees under six (6) inches in diameter, boulders less than one (1) cubic yard in volume, existing pavements (whatever their nature may be), peat, mud and anything else that must be removed and disposed of all as required by the Contract Documents.

Item No. 5: Test Pits

Payment shall be made at the unit price bid per cubic yard under Bid Item No. 5 in the Bid Form. Payment shall be full compensation for pavement cutting and removal, excavation, sheeting, shoring, dewatering, backfill material, backfilling and compaction of the backfill, and restoration of the surface including temporary and permanent pavement, all as required by the Contract Documents. No payment will be made under this item unless the Owner orders the test pit or required in the contract drawings.

Item No. 6: Excavation Below Grade

Under Bid Item No. 6 the Contractor will be paid the contract unit price per cubic yard of excavation below grade and the disposal of all undesirable material(s), which unit price shall include full compensation for all labor, materials, tools, equipment and all incidental work necessary to complete the work under this item, as

shown on the plans or Construction Details, as directed by the Engineer and as specified herein. No payment will be made under this item unless the excavation below grade is ordered by the Owner.

Any off-site material needed to refill the trench, as pre-approved by the Engineer, and as specified herein, shall be paid under Bid Item No. 8 through Bid Item No. 13, whichever is applicable.

Item No. 7: Rock Removal

Under Bid Item No. 7 the Contractor will be paid the contract unit price per cubic yard for rock excavation and/or for rock removed greater than one (1) cubic yard in volume from the trench(es) and subsequently disposed of at an off-site location, which unit price shall be full compensation for all labor, tools, equipment and all incidental work necessary to complete the work under these items as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 8: Gravel Borrow

Payment shall be made at the unit price per ton under Bid Item No. 8 in the Bid Form. Payment shall be full compensation for furnishing, placing, compacting, labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 9: Dense Graded Crushed Stone

Payment shall be made at the unit price bid per ton under Bid Item No. 9 in the Bid Form for furnishing and placing dense graded crushed stone, which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 10: Sand for Water Service Pipe Bedding

Payment shall be made at the unit price bid per ton under Bid Item No. 10 in the Bid Form for furnishing and placing sand, which the unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 11: ¾" Fractured Crushed Stone

Payment shall be made at the unit price bid per ton under Bid Item No. 11 in the Bid Form. The unit price shall include full compensation for all labor, tools, equipment, and all incidental work necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 12: Control Density Fill

Payment shall be made at the unit price per cubic yard under Bid Item No. 12 in the Bid Form, measured as the actual quantity furnished and placed within the trench limits where requested by the Owner or required on the Drawings. The unit price bid shall be full compensation for furnishing, placing, grading and compacting within the trench payment limits, furnish, install, and remove plates all as required by the Contract Documents.

Item No. 13: Class B Cement Concrete for Encasement

Payment shall be made at the unit price bid per cubic yard under Bid Item No. 13 in the Bid Form for Class B cement concrete, complete in place, which unit price shall include full compensation for all labor, materials, tools, equipment and all incidentals necessary to complete the work as shown on the plans, as directed by the Engineer, and as specified herein.

Item No. 14: Dust Control (Chemical Treatment)

Payment shall be made at the unit price bid per pound under Bid Item No. 14 in the Bid Form. Payment shall be full compensation for Calcium Chloride dust control, complete in place, and shall include all labor, materials, tools, equipment, and all incidental work necessary to complete the work under this item as shown on the plans,

as directed by the Engineer, and as specified herein. Water application, and daily brooming operations, for the purpose of controlling dust, will be paid under Bid Item No. 36 through Bid Item No. 40.

Item No. 15: Reset Existing Curb

Payment shall be made at the unit price bid per linear foot under Bid Item No. 15 of reset curb, complete in place, which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item, as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 16: 4" Bituminous Concrete Type I-1 for Permanent Trench Resurfacing (Placed in Two Courses)

Payment shall be made at the unit price bid per ton under Bid Item No. 16 in the Bid Form for bituminous concrete Type I-1 used for permanent trench resurfacing, complete in place, which unit price shall include full compensation for removal and disposal of temporary pavement, gravel sub-base for roadway, pavement markings, saw cutting, all excavation of undesirable material, and the disposal thereof, in addition to all labor and materials, and for all tools and equipment and all incidentals necessary to complete the work under this item in accordance with the plans, as directed by the Engineer and as specified herein. (The Contractor is reminded that the four (4) inch yield is to be applied in two separate two (2) inch courses).

Item No. 17: Seam and Crack Sealing (applied After the Permanent Patch Operation)

Payment shall be made at the unit price bid under Bid Item No. 17 in the Bid Form per gallon of sealant for cleaning and sealing of seams and/or cracks in bituminous concrete pavement, complete in place, which unit price shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under this item as directed by the Engineer and as specified herein.

Item No. 18: 2" Bituminous Concrete Walks & Driveways (Patching Private Property)

Payment shall be made at the unit price bid under Bid Item No. 18 in the Bid Form per square yard for constructing bituminous concrete walks and/or driveways, complete in place, including excavation, disposal of excess material(s), and for the gravel and dense graded crushed stone base. The unit price shall include full compensation for all labor, materials, tools, and equipment and all incidental work necessary to complete the work under this item in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 19: 3" Bituminous Concrete Walks & Driveway Aprons (Patching Public Property)

Payment shall be made at the unit price bid under Bid Item No. 19 in the Bid Form per square yard for constructing bituminous concrete walks and/or driveway aprons, complete in place, including excavation, disposal of excess material(s), and for the gravel and dense graded crushed stone base. The unit price shall include full compensation for all labor, materials, tools, and equipment and all incidental work necessary to complete the work under this item in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 20: 4" Cement Concrete Walks with Lampblack

Payment shall be made at the unit price bid under Bid Item No. 20 in the Bid Form per square yard for the cement concrete walks, complete in place, including the gravel and dense graded crushed stone base and pre-molded asphalt expansion joints, and for the excavation and the disposal of all undesirable material(s). The unit price shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein, inclusive of the raising of all service boxes to finished grade.

Item No. 21: 6" Cement Concrete Driveway Aprons with Lampblack

Payment shall be made at the unit price bid under Bid Item No. 21 in the Bid Form per square yard for the cement concrete driveway aprons, complete in place, including the gravel and dense graded crushed stone base and pre-molded asphalt expansion joints, and for the excavation and the disposal of all undesirable material(s). The unit price shall include full compensation for all labor, materials, tools and equipment and all incidentals

necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein, inclusive of the raising of all service boxes to finished grade.

Item No. 22 Temporary Trench Pavement

Payment shall be made at the unit price per ton noted under Bid Item No. 22 in the Bid Form.

Payment shall be full compensation for all preparatory work and furnishing, placing and compacting of the temporary asphaltic concrete pavement as required by the Contract Documents. The price shall include the cost of the bituminous material, placement, and maintenance throughout construction including additional materials and labor required due to settlement of low areas, leveling course, tack coat, additional gravel base course, process gravel, cutting or keying of the pavement, sand sealing, removal and resetting all manhole frames, sweeping, gate boxes, catch basins, casting adjustments, etc.; the reflective pavement markings, and all other materials, tools, equipment, labor and work necessary for or incidental to the completion and maintenance of the temporary trench pavement, all as required by the Contract Documents.

Item No. 23: Cold Patch

Payment shall be made at the price bid per ton under Bid Item No. 23 in the Bid Form. Payment shall be full compensation for all preparatory work and furnishing, placing and compacting of cold patch pavement as required by the Contract Documents. The price shall include the cost of the bituminous material placement and maintenance of the construction to include additional materials and labor required due to settlement. Payment for furnishing, installing and compacting the processed gravel sub-base for roadway shall be made under the applicable unit price bid per ton, as required by the Contract Documents.

Item No. 24: Regrade, Loam, & Seed (Restore Loam Borders and/or Private Yards)

Payment shall be made at the unit price bid under Bid Item No. 24 in the Bid Form per square yard for all loam areas, complete in place, which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item in accordance with the plans, as directed by the Engineer, and as specified herein.

Item No. 25: Materials Testing

Payment shall be made from the stated allowance noted under Bid Item No. 25 in the Bid Form for approved and/or authorized material testing services conducted by an independent and qualified laboratory. Under no circumstances will the City of Newton pay for any testing procedures which excessively exceed the accepted industry standards.

Item No. 26: Miscellaneous Work Allowance (Engineers Discretionary Fund)

Payment shall be made for work completed under Bid Item No. 26, in full or in part, as pre-approved by the Engineer.

Item No. 27: Furnish & Mount Safety & Specialty Signboards (Less the Post System)

Payment shall be made at the unit price bid per square foot under Bid Item No. 27 in the Bid Form for each new professionally made safety and specialty signboard authorized by the Engineer. The express intent, under this item is to re-use the signboards whenever safety issues are not compromised, mobilizing, and moving the signboards from project zone to project zone as the construction operation progresses, without any further additional compensation being made under this item. Under this item signboards are to be furnished, complete in place, which unit price shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under this item, as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 28: Furnish, Establish, & Re-Establish the Post System for Mounted Signboards

Under Bid Item No. 28, the Contractor will be paid the contract unit price for each signboard post system furnished, complete in place, which unit price shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under this item, as shown on the plans, as directed

by the Engineer and as specified herein. No additional payment will be made for sign post systems which are damaged and replaced.

Item No. 29: Safety Controls for Construction Operations (Primary Portable Traffic Control Devices)

Payment shall be made at the unit price bid per lump sum under Bid Item No. 29 in the Bid Form and shall constitute full payment for all materials, labor and equipment required or incidental to the work described above and/or as shown on the plans. Any devices which are lost, stolen, destroyed, or deemed unacceptable while their use is required on the project shall be replaced without additional compensation. The Engineer shall make percentage payments as he deems appropriate during the course of these operations.

Item No. 30: Allowance for Payment of Uniformed Police Officers

Payment shall be made from the stated allowance noted under Bid Item No. 30 in the Bid Form.

The Police Department will bill the Owner directly, and the Owner shall pay the Police Department bills within a ten (10) working day period for uniformed Police Officers provided on the job site. The billing shall include a weekly statement outlining the days worked, hours worked, location of the work and rate for all officers providing service during that billing period. All bills must be signed by the Police Chief. Uniformed Police Officers required for purposes other than public safety and/or control of traffic shall not be allowed.

Item No. 31: Vehicle Loop Detector

Payment shall be made at the unit price bid per linear foot under Bid Item No. 31 in the Bid Form of Vehicle Loop Detector, complete in place, which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item in accordance with the plans, as directed by the Engineer, and as specified herein. Permanent trench resurfacing shall be paid for under Item 16.

Item No. 32: Locate & Exercise Existing Water Main Gates to Determine Pre-Construction Serviceability

Payment shall be made at the unit price bid per each under Bid Item No. 32 in the Bid Form. Payment shall be full compensation for locating, accessing, and exercising gate valves and valve boxes as required by the Contract Documents. Additional work involved in coordinating these activities involves supplying and posting notices as required, subsequent backfilling of any aperture, and immediate disposal of all generated debris. The price shall include the above activities as well as time, labor, materials, tools, equipment, and all incidentals necessary to complete the work under this item as show on the plans, as directed by the Engineer and as specified herein.

Water main and water main appurtenances (i.e. gates, boxes, sleeves, pipe, couplings, hydrants, bends, clamps, tie-rods, and safety flanges) that are ordered by the Engineer to correct any pre-existing deficiency, and/or used to restore the main in order to render it fully operational prior to the commencement of the installation of the bypass system, the cleaning & lining operations, and/or the pipe replacement activities, shall be paid for under other applicable items of this contract.

Item No. 33: Locate & Exercise Existing Hydrants to Determine Pre-Construction Serviceability

Payment shall be made at the unit price bid per each under Bid Item No. 33 in the Bid Form. Payment shall be full compensation for locating, accessing and exercising hydrants, inclusive of the work involved in coordinating these activities, for supplying and posting notices as required, and for subsequently backfilling any associated aperture and/or for the immediate restoration of eroded loam borders, and for the immediate disposal of all generated debris. The price shall include the above activities as well as time, labor, materials, tools and equipment and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Water main and water main appurtenances (i.e. gates, boxes, sleeves, pipe, couplings, hydrants, bends, clamps, tie-rods, and safety flanges) that are ordered by the Engineer to correct any pre-existing deficiency, and/or used to restore the main in order to render it fully operational prior to the commencement of the installation of the bypass system, the cleaning & lining operations, and/or the pipe replacement activities, shall be paid for under other applicable items of this contract.

Item No. 34: Access Pit, Removal, & Disposal of Water Gates or Hydrants that Lie Beyond the Project Limit

Under Bid Item No. 34, the Contractor will be paid the contract unit price for each 'stand alone' isolated access pit made *prior to* the commencement of pipe cleaning and lining and/or bypass installation activities, where such pits are made specifically for the purpose of fully exposing an existing water main gate, a hydrant, a hydrant connection and/or any other water main appurtenance (exclusive of any minor work involving only boxes and sleeves) and for the subsequent removal of the deficient appurtenance(s), and such work shall include dewatering, protecting, safeguarding, barricading, shoring, decking and subsequently backfilling the aperture, as well as for the off-site disposal of all undesirable material(s), which unit price shall also include full compensation for all time, labor tools, and equipment, as well as for incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Water main appurtenances (i.e. gates, sleeves, pipe, couplings, hydrants, bends, clamps, tie-rods, and safety flanges) used to restore the main shall be paid for under the separate applicable items of this contract. Hydrants which are removed under Bid Item No. 34 *and are subsequently delivered and stockpiled* at a City of Newton DPW yard shall be paid for under Bid Item No. 46. All other hydrants shall be disposed of under Bid Item No. 34 and at no cost to the City. Cement concrete, if required, shall be paid for under Bid Item No. 13, Gravel ordered by the Engineer shall be paid for under Bid Item No. 8. Surface patch shall be paid under Bid Item No. 16 and Bid Item No. 18 through Bid Item No. 23, whichever is applicable. The excavation and backfilling operations required to straighten and/or replace only the gate boxes, either in whole or in part, shall be paid for under Bid Item No. 34.

Item No. 35: Access Pit, Removal, & Disposal of Obstructions Discovered During the Cleaning & Lining Operation

Under Bid Item No. 35, the Contractor will be paid the contract unit price for each 'stand alone' isolated access pit that is made to fully expose an existing water main obstruction that is discovered *only* during the initial cabling of the cleaning and lining operations, and such work shall additionally include the removal and disposal of the obstruction(s) and for dewatering, protecting, safeguarding, barricading, shoring, decking and subsequently backfilling the aperture, as well as for the off-site disposal of all undesirable material(s), which unit price shall also include full compensation for all time, labor, tools and equipment, and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer, and as specified herein.

Water main appurtenances (i.e. gates, sleeves, pipe, couplings, hydrants, bends, clamps, tie-rods, and safety flanges) used to restore the main shall be paid for under the separate applicable items of this contract. Hydrants which are removed under Bid Item No. 34 *and are subsequently delivered and stockpiled* at a City of Newton DPW yard shall be paid for under Bid Item No. 46. All other hydrants shall be disposed of under Bid Item No. 34 and at no cost to the City. Cement concrete, if required, shall be paid for under Bid Item No. 13, Gravel ordered by the Engineer shall be paid for under Bid Item No. 8. Surface patch shall be paid under Bid Item No. 16 and Bid Item No. 18 through Bid Item No. 23, whichever is applicable. The excavation and backfilling operations required to straighten and/or replace only the gate boxes, either in whole or in part, shall be paid for under Bid Item No. 35.

Item No. 36 thru Item No. 38: 6", 8", & 12" Ductile Iron Pipe (Class 52 Cement Lined & Dispose of Existing Pipe(s))

Under Bid Item No. 36 through Bid Item No. 38 the Contractor will be paid the contract unit price per linear foot for furnishing, trenching and laying six (6) inch, eight (8) inch, and twelve (12) inch cement lined Class 52 ductile iron pipe respectively, and for any special fittings and/or any other component, element and/or operation not otherwise listed on the Item Sheets of this contract, complete in place, which unit price shall include full compensation for all labor, notifications, providing as-built diagrams and ties, excavation, shoring, dewatering, disposal of all unclassified or undesirable material(s) including the removal and disposal of all existing water mains and water main appurtenances and removal and disposal of abandoned gate valve boxes, as well as for all backfilling operations, materials, tools and equipment, and all incidental work, inclusive of daily dust control by the method of brooming and/or water application, and for all other incidentals that are necessary to complete the work under this item as shown on the plans, and as specified herein.

Item No. 39 6" Fire Service

Important Informational Note: This is a Non-Pay Item

The contractor must incorporate the cost for all fire service replacements, and the cost of disposal of all associated undesirable materials, no matter what their nature may be, into the applicable bid items. No separate pay item shall exist for the replacement of fire services but the cost of this work shall be factored into the bid prices of the various pay items of this contract by the Contractor.

Fire service replacement shall consist of the work required to furnish, excavate and install each six (6) inch ductile iron pipe fire service, six (6) inch gate valve, and any special fittings and/or any other component, element and/or operation, complete in place, which unit prices shall include full compensation for all labor, notifications, providing as-built diagrams and ties, excavation, disposal of all unclassified or undesirable material(s) including the removal and disposal of all existing fire services and appurtenances, as well as for all backfilling operations, materials, tools and equipment, and all incidental work, that are necessary to complete the work under this item as shown on the plans, and as specified herein. Each 6-Inch Fire Service shall include the furnishing and installation of a six inch (6") open right water gate, complete with sleeves, extensions, and covers.

Item No. 40: Clean & Cement Line Existing 12" Pipe

Under Bid Item No. 40, the Contractor will be paid the contract unit price per linear foot for the cleaning and cement lining of existing twelve (12) inch inside diameter water mains, which unit price shall include full compensation for all labor, materials, for providing and distributing informational notifications, as well as for paint, layout, the determination of existing water gates/valve serviceability, providing as-built ties, and for all tools, equipment, saw cutting of pavements if not otherwise provided for under separate items, excavation, the disposal of all unclassified and/or undesirable material, shoring, backfill and backfilling, flushing, disinfection, TV inspection, and all incidentals, inclusive of daily dust control by the method of brooming and/or water application, necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

Temporary water service bypass system(s) and service pipe(s) will be paid under Item No. 74 through Item No. 76. Tees, valves, bends, restraints, couplings, hydrants, and/or pipes which are removed with the pre-approval of the Engineer and/or as shown on the plans, and are subsequently replaced with new and permanent ductile iron installations, shall be paid under the separate applicable items of this contract. Thrust blocks, crushed stone, permanent bituminous patch, cement concrete panel repair, and regrading of loam, shall be paid under the applicable items of this contract when such items are listed on the Item Sheets of this contract, otherwise the Contractor is to factor the cost of this work into his bid price under Bid Item No. 40.

Item No. 41 thru Item No. 43: 6", 8", & 12" Water Gates with Sleeve, Box, & Cover

Under Bid Item No. 41 through Bid Item No. 43, the Contractor will be paid the contract unit price for furnishing and installing each six (6) inch, eight (8) inch, and twelve (12) inch open clockwise (right) water gate, respectively, complete with sleeves, extensions, and covers, which unit price shall include full compensation for all labor, excavation, the disposal of all unclassified and/or undesirable materials, all plating, shoring and backfilling operations, the materials, tools and equipment necessary to perform this work, and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 44: 6" Hydrant

Under Bid Item No. 44, the Contractor will be paid the contract unit price for each new hydrant furnished and installed, which unit price shall include full compensation for all labor, materials, hydrant extensions, tools and equipment and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein, inclusive of excavation, dewatering, the disposal of all undesirable material, and the subsequent backfilling of the aperture. In those cases where a new hydrant is replacing an existing hydrant, then the Contractor will be paid for the removal of the existing hydrant under Bid Item No. 46.

All earth excavation and the disposal of all unclassified and/or undesirable material(s) shall be included and paid under this item. Class B cement for thrust blocks will be paid for under Bid Item No. 59. The 6" gate valve with sleeve and cover and the length of pipe, will be paid for under the respective Bid Item No. 41 and Bid Item No. 36.

Crushed stone, reset curb, reconstruction of bituminous berm, sidewalks, driveway aprons, loam borders, and roadway pavement shall be paid under standard applicable items only when such items have been made part of this contract otherwise the Contractor is to furnish and install these materials as part of this item.

Item No. 45: Remove and Reset Hydrant

Under Item No. 45, the Contractor will be paid the contract unit price for each existing hydrant removed, cleaned, relocated, and re-installed which unit price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item as shown on the plans, as directed by the Engineer, and as specified herein.

All earth excavation and the disposal of all unclassified and/or undesirable material(s) shall be included and paid under this item. Class B cement for thrust blocks will be paid for under Bid Item 59. The 6" gate valve with sleeve and cover and the length of pipe, will be paid for under the respective Bid Item No. 41 and Bid Item No. 36.

Crushed stone, reset curb, reconstruction of bituminous berm, sidewalks, driveway aprons, loam borders, and roadway pavement shall be paid under standard applicable items only when such items have been made part of this contract otherwise the Contractor is to furnish and install these materials as part of this item.

Item No. 46: Remove and Dispose or Stockpile Hydrant

Payment shall be made at the unit price bid under Bid Item No. 46 in the Bid Form per each existing hydrant removed, and either disposed of at the Contractors expense or otherwise cleaned and subsequently neatly stockpiled at a location designated by the Engineer, which unit price shall include full compensation for all labor, tools and equipment, and all incidentals necessary to complete the work under this item, as shown on the plans, and as directed by the Engineer.

All earth excavation and the disposal of all unclassified and/or undesirable material(s) shall be included and paid under this item.

Crushed stone, reset curb, reconstruction of bituminous berm, sidewalks, driveway aprons, loam borders, and roadway pavement shall be paid under standard applicable items only when such items have been made part of this contract otherwise the Contractor is to furnish and install these materials as part of this item.

Item No. 47 and Item No. 48: 8", and 12" Bends

Under Item No. 47 and Item No. 48, the Contractor will be paid the contract unit price for each bend, furnished, installed, and complete in place. Payment shall be full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under these items, in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 49 and Item No. 50: Reducers

Payment shall be made at the unit price bid under Bid Item No. 49 and Bid Item No. 50 in the Bid Form per each 8" x 6" and 12" x 8" reducer, respectively, furnished, installed, and completed in place. Payment shall be full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under these items, in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 51 thru Item No. 54: Mechanical Joint Tees

Payment shall be made at the unit price bid under Bid Item No. 51 through Bid Item No. 54 in the Bid Form per each 8" x 6", 12" x 6", 12" x 8", and 12" x 12" mechanical joint tee furnished, installed, and completed in place. Payment shall be full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under these items, in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 55 thru Item No. 57 Megalugs

Payment shall be made at the unit price under Bid Item No. 55 through Bid Item No. 57 in the Bid Form per each 6”, 8”, and 12” megalug furnished, installed, and completed in place. Payment shall be full compensation for all labor, materials, tools, and equipment, and all incidentals necessary to complete the work under these items, in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 58: ¾" Diameter Threaded Steel Tie Rod Assembly (Complete in Place)

Payment shall be made at the unit price bid per each set of tie rods complete-in-place, regardless of length, under Bid Item No. 58 in the Bid Form which price shall include full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under this item, in accordance with the plans, as directed by the Engineer and as specified herein.

Item No. 59: Class B Cement Concrete Anchorage and/or Thrust Block

Payment shall be made at the unit price bid under Bid Item No. 59 in the Bid Form per each for Class B transit mixed cement concrete, complete in place, which unit price shall include full compensation for all labor, materials, tools, equipment and all incidentals necessary to complete the work as shown on the plans, as directed by the Engineer, and as specified herein.

Item No. 60 thru Item No. 62: 6”, 8”, and 12” Mechanical Joint Solid Sleeves or Couplings

Payment shall be made at the unit price bid under Bid Item No. 60 through Bid Item No. 62 in the Bid Form per each 6”, 8”, and 12” mechanical joint solid sleeve and/or coupling that is furnished and installed. Payment shall be full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under these items, as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 63: 6" Cap

Payment shall be made at the unit price bid under Bid Item No. 63 in the Bid Form per each 6” cap that is furnished and installed. Payment shall be full compensation for all labor, materials, tools and equipment, and all incidentals necessary to complete the work under these items, as shown on the plans, as directed by the Engineer and as specified herein.

Item No. 64: 2" Thick Preformed Pipe Insulation with Plastic Jacketing

Payment shall be made at the unit price bid under Bid Item No. 64 in the Bid Form per linear foot of preformed insulation with plastic jacket complete-in-place, as shown on the plans and as specified herein. The contract unit price shall include the cost of all labor, materials, tools and equipment, and all incidentals, inclusive of any special detailed fitting, cutting, handling and/or sealants that are necessary to complete the work under this item, as shown on the plans, as directed by the Engineer, and as specified herein.

Item No. 65: Test Pit to Determine Water Service Tubing Type

Payment shall be made at the unit price bid under Bid Item No. 64 in the Bid Form per each test pit dug to determine service tubing type. Payment shall be full compensation for pavement cutting and removal, excavation, sheeting, shoring, dewatering, determination of water service tubing type, backfill material, backfilling, and compaction of the backfill, and restoration of the surface including temporary and permanent pavement, all as required by the Contract Documents. If the water service tubing is determined to not be copper, then it shall be replaced and paid for under Bid Item No. 66 through Bid Item No. 73. Water service tubing that is determined to be copper shall be left in place. For service tubing that is left in place, the Contractor shall install a new corporation on new water main, and tie over the existing service line with a coupling, which will be paid for under standard applicable items only when such items have been made part of this contract otherwise the Contractor is to furnish and install these materials as part of this item. No payment will be made under this item unless the Owner orders the test pit or it is required in the contract drawings.

Item No. 66: 1" Copper Water Service Tubing

Under Bid Item No. 66 the Contractor will be paid the contract unit price per linear foot for furnishing, trenching, laying, and the subsequent backfilling of one (1) inch copper tubing respectively, complete in place, inclusive of the excavation and the removal of all unsuitable material(s).

Under Bid Item No. 66 the unit prices shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer, and as specified herein, inclusive of excavation and the disposal of all undesirable material(s), backfilling, as-built ties, and notifications.

Item No. 67 and Item No. 68: 1" Corporations, Curb Stops, & Boxes

Under Bid Item No. 67 and Bid Item No. 68, the Contractor will be paid the contract unit price for furnishing and installing each corporation cock of each size specified and each curb stop and box of each size specified complete in place.

Under Item No. 67 and Bid Item No. 68, the unit prices shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer, and as specified herein, inclusive of excavation and the disposal of all undesirable material(s), backfilling, as-built ties, and notifications.

Item No. 69: Nominal 1" - 1 ½" Water Service Pipe Coupling

Under Bid Item No. 69, the Contractor will be paid the contract unit price for furnishing and installing each coupling of each size specified, respectively, complete in place.

Under Bid Item No. 69, the unit prices shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer, and as specified herein, inclusive of excavation and the disposal of all undesirable material(s), backfilling, as-built ties, and notifications.

Item No. 70: 2" Copper Water Service Tubing

Under Bid Item No. 70 the Contractor will be paid the contract unit price per linear foot for furnishing, trenching, laying, and the subsequent backfilling of two (2) inch copper tubing, respectively, complete in place, inclusive of the excavation and the removal of all unsuitable material(s).

Under Bid Item No. 70 the unit prices shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer, and as specified herein, inclusive of excavation and the disposal of all undesirable material(s), backfilling, as-built ties, and notifications.

Item No. 71 and Item No. 72: 2" Corporations, Curb Stops, & Boxes

Under Bid Item No. 71 and Bid Item No. 72, the Contractor will be paid the contract unit price for furnishing and installing each corporation cock of each size specified and each curb stop and box of each size specified complete in place.

Under Item No. 71 and Bid Item No. 72, the unit prices shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer, and as specified herein, inclusive of excavation and the disposal of all undesirable material(s), backfilling, as-built ties, and notifications. Owner will provide meter pits, if needed. Cost for installation of meter pits will be paid under this Bid Item No. 71.

Item No. 73: 2" Water Service Pipe Coupling

Under Bid Item No. 73, the Contractor will be paid the contract unit price for furnishing and installing each coupling of each size specified respectively, complete in place.

Under Bid Item No. 73, the unit prices shall include full compensation for all labor, materials, tools and equipment and all incidentals necessary to complete the work under these items as shown on the plans, as directed by the Engineer, and as specified herein, inclusive of excavation and the disposal of all undesirable material(s), backfilling, as-built ties, and notifications.

Item No. 74 thru Item No. 76: Temporary By-Pass Piping – Phase I, Phase II, and Phase III

Payment shall be made at the unit price bid per lump sum price, per Phase, under Bid Item No. 74 through Item No. 76 in the Bid Form. Payment shall be full compensation for preparation and submittal of a temporary by-pass plan, furnishing and installing temporary pipe, cross trenches over roadways and driveways including temporary paving of all cross trenches at driveways and roadways, temporary water services, temporary hydrants (spaced every 500 feet), proper protection of temporary pipe, disinfecting, flushing, testing, connection to house service line, connection to existing system hydrants, and/or existing mains, maintenance and all labor and materials required by the Contract Documents.

Item No. 77 thru Item No. 79: Pressure Test, Leakage Test & Disinfection of Water Mains – Phase I, Phase II, and Phase III

Payment shall be made at the unit price bid per lump sum, per Phase, under Bid Item No. 77 through Item No. 79 in the Bid Form for providing, installing and subsequently deactivating temporary (1") inch main cocks and copper 'goosenecks' and/or for providing, installing and subsequently deactivating temporary wheel valve equipped hydrant adaptors, and for the subsequent hydrostatic pressure and leakage tests. This work shall include the cost of the Consultant, and the disinfection and cleansing operations, and all related procedures, with regard to the new and permanent water main system(s) and the related water system components. The lump sum price shall include full compensation for all labor, materials, tools, equipment, including any temporary plugs required, and all incidental work necessary to complete the work under this item in accordance with the plans, as directed by the Engineer and as specified herein. Water sampling shall be paid under Bid Item No. 80.

Item No. 80: Water Sampling (by Laboratory Personnel)

Payment shall be made at the full invoice amount under Bid Item No. 80 in the Bid Form for the field and laboratory charges incurred for water sampling, sterile containers, the issuance of the numerous Certificates of Analysis, which payment shall be full compensation for all labor, tools, equipment and all incidental work necessary to complete the work under this item as shown on the plans, as directed by the Engineer and as specified herein.

The original paid invoice issued by the laboratory billing authority must be submitted to the Engineer for reimbursement under this item. In no case shall the City of Newton be obligated to pay more for these testing services than the reasonable cost of the prevailing industry rates for water sampling of a similar nature.

Item No. 81: Supply & Deliver Rust & Stain Remover as Required

Payment shall be made at the unit price per each twenty-four count @ 4 oz. cartons under Bid Item No. 81. Payment shall be full compensation for all labor, material, and all incidental work necessary to complete the work under this item as directed by the Engineer and as specified herein.

Item No. 82: Cleaning and Lining Pits

Payment shall be made at the unit price bid per each under Bid Item No. 82 in the Bid Form. Payment shall be full compensation for excavation, shoring, dewatering, removal and legal disposal of unsuitable material; furnishing, installing and the compaction of the refill material, all as required by the Contract Documents.

Item No. 83: Additional Cleaning and Lining Pits Beyond the Scope of Work

Payment shall be made at the unit price bid per each under Bid Item No. 83 in the Bid Form. Payment shall be full compensation for excavation, shoring, dewatering, removal and legal disposal of unsuitable material; furnishing, installing and the compaction of the refill material for all pits beyond the scope of work, all as required by the Contract Documents. No payment will be made under this item unless additional cleaning and lining pits are ordered by the Owner.

Item No. 84: Concrete and Rebar Removal and Disposal

Payment for removal and disposal be reinforced concrete panels and rebar shall be at the unit price bid per linear foot under Bid Item No. 84. Payment to sawcut reinforced concrete panels shall be made under Bit Item No. 3. The trench will be backfilled with CDF as directed by Owner and paved with 4-inches of Bituminous Concrete

Type I-1 placed in two lifts. CDF and Bituminous Concrete will be paid for under Bid Item No. 12 and Bit Item No. 16, respectively.

Item No. 85: Mismarked Main (Cleaning and Lining Trenches Only)

Payment shall be made at the unit price per each noted under Bid Item No. 85 in the Bid Form. Payment shall be full compensation for all work required to determine a mismarked main, repair and backfill the pipe, traffic control, etc.

Item No. 86: Existing Drainage Repair (All Sizes)

Payment shall be made at the unit price per linear foot noted under Bid Item No. 86 in the Bid Form.

Payment shall be full compensation for repair of existing drainage damaged during construction as a result of the location not being marked or the location being mismarked by more than 5 feet, and shall include SDR 35 PVC pipe, Fernco couplings, excavation, removal and disposal of unsuitable material and replacement with acceptable backfill material, dewatering, shoring, bedding, backfilling and compacting, and restoration of private and public property to original condition. Pavement cutting, temporary trench paving, leveling course, removal/resetting and replacement of curbing, restoration of concrete or bituminous sidewalks and/or driveways to original condition, removal and disposal of existing concrete or pavement, loaming and seeding and testing will be paid for under the respective bid items.

Crushed stone, reset curb, reconstruction of bituminous berm, sidewalks, driveway aprons, loam borders, and roadway pavement shall be paid under standard applicable items only when such items have been made part of this contract otherwise the Contractor is to furnish and install these materials as part of this item.

Item No. 87: Silt Sacks

Payment shall be made at the unit price per each under Bid Item No. 87 in the Bid Form. Payment shall be full compensation for furnishing, placing, maintaining, including proper disposal of collected sediments as required during construction, and proper disposal of Silt Sacks at the completion of all work.

Item No. 88: Existing Sewer Service Repair (All Sizes)

Payment shall be made at the unit price per each noted under Bid Item No. 88 in the Bid Form.

Payment shall be full compensation for repair of existing sewer services damaged during construction as a result of the location not being marked or the location being mismarked by more than 5 feet, and shall include SDR 35 PVC pipe, Fernco couplings, excavation, removal and disposal of unsuitable material and replacement with acceptable backfill material, dewatering, shoring, bedding, backfilling and compacting, and restoration of private and public property to original condition. Pavement cutting, temporary trench paving, permanent trench paving, removal/resetting and replacement of curbing, restoration of concrete of bituminous sidewalks to original condition, removal, and disposal of existing concrete or pavement, loaming and seeding and testing will be paid for under the respective bid items.

Item No. 89: Tree Protection

Payment shall be made at the unit price per each under Bid Item No. 89 in the Bid Form. Payment shall be full compensation for furnishing, placing and maintaining SDR35 PVC Pipe or recycled trex plastic for the purpose of protecting all trees 12 inches in diameter and larger within the work area during construction.

END OF SECTION

SECTION 01027

APPLICATION FOR PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Comply with procedures described in this Section when applying for progress payment and final payment under this Contract.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.

B. Progress payments are described in the General Conditions.

C. Payments upon Substantial Completion and Completion of the Work are described in the General Conditions.

1.03 QUALITY ASSURANCE

A. Prior to start of construction, secure the Engineer's approval of the Schedule of Values required to be submitted under Section 01026, Schedule of Values.
   1. During progress of the Work, modify the Schedule of Values as approved by the Engineer to reflect changes in the Contract Sum due to change orders or other modifications to the Contract.
   2. Base requests for payment on the approved Schedule of Values.

1.04 SUBMITTALS

A. Informal Submittal: Unless otherwise directed by the Engineer;
   1. Make an informal submittal of Request for Payment by filling in, with erasable pencil, pertinent portions of AIA Document G702, "Application and Certificate for Payment," plus continuation sheet or sheets.
   2. Make this preliminary submittal to the Engineer at the end of each month.
   3. Revise the informal submittal of Request for Payment as agreed, between both parties, initialing all copies.

B. Formal Submittal: Unless otherwise directed by the Engineer;
   1. Make formal submittal of Request for Payment by filling in the agreed data, by typewriter or neat lettering in ink, on AIA Document G702, "Application and Certificate for Payment", plus continuation sheet or sheets.
   2. Sign and notarize the Application and Certificate for Payment.
   3. Submit the original of the Application and Certificate for Payment, plus six (6) identical copies of the continuation sheet or sheets, to the Engineer.
   4. The Engineer shall compare the formal submittal with the approved informal submittal and when approved, shall sign the Application and Certificate of Payment, will make required copies and will distribute:
      a. Two copies to Contractor
      b. Two copies to Owner
      c. Two copies to Engineer's file

PART 2 PRODUCTS (Not Applicable).

PART 3 EXECUTION (Not Applicable).

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide such field engineering services as are required for proper completion of the work including, but not necessarily limited to:
   1. Establishing and maintaining lines and levels.
   2. Structural design of shores, forms, and similar items provided by the Contractor as part of his means and methods of construction.

1.02 RELATED WORK

A. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Additional requirements for field engineering may also be described in other Sections of these Specifications.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work of this Section.

1.04 PROCEDURES

A. In addition to procedures directed by the Contractor for proper performance of the Contractor's responsibilities:
   1. Locate and protect control points before starting work on the site.
   2. Preserve permanent reference points during progress of the work.
   3. Verification of all reference points.
      a. If a discrepancy is found, promptly notify the Engineer.
   4. Promptly advise the Engineer when a reference point is lost or destroyed, or requires relocation because of other changes in the Work.
      a. Upon direction of the Engineer, require the Field Engineer to replace reference stakes or markers.
      b. Locate such replacements according to the original survey control.

1.05 SURVEY REQUIREMENTS

A. Contractor shall establish a minimum of two permanent benchmarks on site; referenced to data established by survey control points.

B. Contractor to establish and maintain control lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements, including pavements, stakes for grading, fill and topsoil placement, utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, and floor elevations.
   4. Controlling lines and levels required for mechanical and electrical trades.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01092

ABBREVIATIONS

PART 1 GENERAL

1.01 DESCRIPTION

A. Listing of Abbreviations: The listing of abbreviations in this Specification Section represent the Standard Organization named.

B. Related Work:
1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. All related Specification Sections shall be used in conjunction with this Section.

1.02 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the Standard, except when more stringent requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids.

1.03 LISTING OF STANDARD ORGANIZATIONS AND THEIR ABBREVIATIONS

AA	Aluminum Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Institute
ADC	Air Diffusion Council
AGA	American Gas Association
AGCA	Associated General Contractors of America
AHDGA	American Hot Dip Galvanizers Association
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Constructors
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
BIA	Brick Institute of America
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
DCAM	Comm. of Massachusetts Division of Capital Asset Management
DEP	Department of Environmental Protection
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EJCDC	Engineers Joint Contract Documents Committee
EPA	Environmental Protection Agency
FM	Factory Mutual
Fed. Spec.	Federal Specification

HI	Hydraulic Institute
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrument Society of America
ISO	International Standards Organization
MIA	Masonry Institute of America
MIL.	Military Specification
MSBC	Massachusetts State Building Code
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry
NAAMM	National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NRCA	National Roofing Contractors Association
NSPC	National Standard Plumbing Code
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PPI	Plastic Pipe Institute
PS	Product Standards of the National Bureau of Standards
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry
SSPC	Steel Structures Painting Council
TCA	Tile Council of America
TPI	Truss Plate Institute
UL	Underwriters Laboratories

END OF SECTION

SECTION 01100

SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION

A. The Work of this section consists of special project procedures during construction including:
1. Construction Sequence
2. Permits
3. Contractor's Emergency Service
4. Pipe Locations
5. Protection of Underground Facilities and Damages Thereto
6. Disposal of Excavated Pipe and Construction Debris
7. Groundwater Conditions
8. Separation of Water Lines from Sewers
9. Pavement Schedule
10. Police Details
11. Water Service Replacement
12. Temporary By-Pass Piping
13. Gravel Borrow
14. Sidewalks & Curb Restoration
15. Concrete Roadway Restoration
16. Tree Protection

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION

3.01 CONSTRUCTION SEQUENCE

A. The construction sequence will be established at the preconstruction conference. Contractor shall construct water mains in sequence as requested by the Owner. No additional compensation will be provided due to the sequence selected or modification thereof during construction.

B. In general, the Contractor shall begin operations in the Phase I work zone as indicated on Drawing C-2 and complete all work associated with the area prior to proceeding to Phase II. All work associated with Phase II of the project area shall be completed prior to proceeding to Phase III.

C. Contractor is responsible for notifying residents in writing at least 48 hours in advance of shutdowns.

3.02 PERMITS

A. The Contractor is required to obtain a Street Opening Permit. The cost of the permit shall be included under the mobilization pay item.

B. The Contractor is required to obtain a Trench Opening Permit. The cost of the permit shall be included under the mobilization pay item.

3.03 CONTRACTOR'S EMERGENCY SERVICE

A. Any Contractor whose place of business is located beyond the vicinity of the site of the Work and who does not maintain local headquarters 24 hours a day must provide the following:
1. Make satisfactory arrangements with the Owner to service emergencies or complaints which may occur at night, over the weekend, or when the job is shut down. If he does not, the Owner may make arrangements and the cost will be charged to the Contractor.

B. Before the final estimate is certified for payment, the Contractor shall make similar arrangements to cover the guarantee period.

3.04 PIPE LOCATIONS

A. New water main appurtenances installed under this Contract will be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in location and grade as may be found desirable to avoid interference with existing structures and/or underground facilities or to avoid unsatisfactory locations, all as he may see fit as in the best interests of the Owner.

3.05 PROTECTION OF UNDERGROUND FACILITIES AND DAMAGES THERETO

A. The Contractor shall notify all utility companies of his operations sufficiently in advance of construction and take all measures necessary to avoid damage or undue interruption to the utilities' normal services.

B. Where indicated on the Drawings, directed, or permitted at the Contractor's request, the Contractor shall dig test pits to locate the various underground facilities.
   1. Size of test pit and method of payment shall be as specified in Section 02015 of these Specifications.

C. The Contractor shall pay, at no additional expense to the Owner, all costs associated with:
   1. Protecting and supporting underground facilities.
   2. Repairing, replacing, or relocating underground facilities which are damaged by the Contractor's operations.
   3. Temporarily or permanently relocating underground facilities for the Contractor's convenience.

D. The Contractor shall take all prudent steps to make himself aware of the physical condition of the existing underground facilities expected to be encountered.
   1. Claims by the Contractor for repair of damages alleged to be the result of the physical condition or faulty installation workmanship of the existing underground facilities, outside of the specified trench width, will in general not be considered by the Owner for extra work payment.
   2. For such underground facilities within the specified trench width, claims will be considered if, in the opinion of the Engineer, such damage was unavoidable.

E. Silt Sacks to be used on all catch basins within project limits to minimize silt deposits into drainage system.

3.06 DISPOSAL OF EXCAVATED PIPE AND CONSTRUCTION DEBRIS

A. The Contractor shall contact the Department of Environmental Protection, Division of Solid Waste, for approval of the demolition waste landfill chosen for disposal of the excavated pipe and construction debris. All excavated pipe and construction debris shall be disposed legally by the Contractor at no expense to the Owner.

3.07 GROUNDWATER CONDITIONS

A. Exact groundwater conditions due to season fluctuations shall be verified by the Contractor. It is the Contractor’s responsibility to perform all work related to dewatering at no additional cost to the Owner.

3.08 SEPARATION OF WATER LINES FROM SEWERS

A. Parallel Installation: Water mains shall in general be laid at least 10 feet horizontally from any existing sewer. The distance shall be measured edge to edge.
   1. In cases where it is not practical to maintain a ten foot separation, it is permitted to install a water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

B. Crossings: Water mains and services crossing sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer.
   1. At the crossing, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. The water main shall then be encased in a minimum of 6-inches of concrete for a distance of 6 feet on both sides of the sewer line.

C. Sewer Manholes: No water pipe shall pass through or come in contact with any part of a sewer manhole.

3.09 PAVEMENT SCHEDULE

A. All work within the paved roadway in the project extents shall receive temporary trench pavement (2-inch total thickness), and permanent pavement (6-inch total thickness) hot mix.

B. Temporary trench pavement shall be installed weekly. Contractor shall install temporary trench pavement at intersections and cross trenches within one (1) day of backfilling. Permanent Trench Paving shall be completed a minimum time period, specified by the Owner, after temporary trench pavement has been installed. Owner reserves the right to request pavement installation at more frequent intervals if weather or other conditions make it necessary. There will be no additional compensation for changes in the paving schedule.

C. The Contractor is responsible for maintaining all trenches and paving all open cut trench areas every Friday throughout the duration of the project. Paving may be required more often if rain is expected.

D. The Contractor is required to install cold patch when requested by the Owner.

3.10 POLICE DETAILS

A. Prior to the start of construction, the Contractor shall familiarize himself and adhere to the scheduling requirements of the Newton Police Department. It is the Contractor's responsibility to arrange for the details directly with the Police Department, as well as receive approval from the Owner regarding the level of police effort required.

B. The Contractor shall submit a formal traffic plan on drawings with schedules to the City for review prior to the start of construction. All costs associated with the preparation and submittal of the traffic plan shall be included in the unit price bid for the various pipe laying items as outlined in Section 01025 – Measurement and Payment.

C. The owner will pay police invoices directly.

3.11 WATER SERVICE REPLACEMENT

A. Contractor shall note that existing water services determined to be a material other than copper shall be replaced. A test pit shall be dug at each water service to determine the service type material, if it is currently unknown, as stated in the Contract Documents. The new service shall be replaced to the existing property line with a new corporation and curb stop.

3.12 TEMPORARY BY-PASS PIPING

A. Prior to the start of construction, a temporary by-pass piping system shall be installed, chlorinated, and tested by Contractor according to Contract Documents. Upon approval by Owner, temporary water services shall be installed. Upon completion of new water main and cleaned and lined areas, tie overs, and service connections, the temporary by-pass piping shall be removed by the Contractor. The Contractor shall maintain temporary by-pass system and protect from damage throughout the duration of the project. Contractor shall coordinate all temporary water operations with the City of Newton.

B. The location and method of providing service for the temporary by-pass piping shall be the responsibility of the Contractor. Contractor shall submit a by-pass piping plan for Engineer's approval. Contractor shall note that by-pass piping system shall provide the same service requirements that existing water system served. The Contractor shall provide at a minimum, a 4-inch diameter and 2-inch diameter by-pass line for each street throughout the project extents and 6-inch fire service lines.

C. At locations where temporary services cross the road, services shall be adequately protected in a solid sleeve, placed in a trench of adequate depth and covered with bituminous pavement to prevent breakage during construction of the new water main. All temporary service crossings shall be maintained throughout the duration of the project.

3.13 GRAVEL BORROW

A. The Contractor's attention is directed to the gravel borrow item on the general bid form. Contractor shall install gravel borrow when directed by the Engineer and Owner to replace unsuitable backfill material.

3.14 SIDEWALKS & CURB RESTORATION

A. Any sidewalks, curbs, and walks disturbed by the Contractor shall be replaced in kind throughout the project area.

3.15 CONCRETE ROADWAY RESTORATION

A. Any roadways that are constructed of concrete and steel reinforcing bar that are disturbed as a result of the project construction shall be restored with 4-inches of Bituminous Concrete Type I-1 placed in two lifts and flush with the existing pavement.

B. All access pits installed in area of concrete roadway shall be backfilled with excavatable control density fill or adequately compacted material at the discretion of the City.

3.16 TREE PROTECTION

A. Contractor shall protect all trees within work area. The protective means shall include fitted surround of SDR35 PVC Pipe sections or 2"x4"x8' recycled trex plastic. See detail sheet C-7.

END OF SECTION

SECTION 01120

ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide environmental controls as specified herein and as shown on the Contract Drawings.

1.02. RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.03 DEFINITIONS

A. Resource Areas
1. Those areas, conditions, or features which may suffer adverse environmental impacts when disturbed by construction activities. Such areas include, but are not limited to, densely wooded areas, wetland areas, streams, rivers, and other water crossings, steep slopes and drainage systems.

1.04 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART 2 PRODUCTS

2.01 SILT FENCE

A. Silt fence shall be Geotex 2131 as produced by Propex, Chattanooga, TN or an approved equal.
1. Physical requirements: (Minimum Average Roll Values)

a.	Grab Strength	ASTM D-4632	124 lbs.,
b.	Grab Elongation	ASTM D-4632	15%,
c.	Trapezoid Tear Strength	ASTM D-4833	65 lbs.,
d.	Mullen Burst Strength	ASTM D-3786	300 psi,
e.	Permittivity	ASTM D-4491	0.10 sec-1,
f.	Water Flow Rate	ASTM D-4491	10 gpm/ft2.

2. Resistant to ultraviolet rays.
3. Minimum width of thirty six (36) inches.

2.02 WIRE FENCE REINFORCEMENT

A. Wire fence reinforcement for fabric silt fence shall be a minimum of thirty (30) inches in height, a minimum of 14-gauge and shall have a maximum mesh spacing of six (6) inches.
1. The wire fence reinforcement shall be used with all filter fabrics.

2.03 SILT FENCE POSTS

A. Silt fence posts shall be of wood or steel and a minimum of 4 feet long.
1. Wood posts shall be nominal 1 x 1 inches.
2. Steel posts shall be round or U, T, or C shaped with a minimum weight of 1.3 pounds per foot, and have projections for fastening the wire to the fence.

2.04 HAY BALES

A. Hay bales shall consist of hay from acceptable grasses and legumes, free from weeds, reeds, twigs, chaff, debris, other objectionable material or excessive amounts of seeds and grains. Hay shall be free from rot or mold.
   1. The hay bale shall be securely baled with wire to permit rehandling.
   2. Individual bales shall be of a longitudinal shape not exceeding one hundred (100) pounds.

2.05 CATCH BASIN SILT FILTERING SYSTEM

A. Silt filtering system for catch basins accepting drainage from the site shall be Siltsack as manufactured by ACF Environmental Inc. Richmond, VA. and distributed by A. H. Harris, or approved equal.
   1. Manufactured to fit opening of catch basins or drop inlet.
   2. Two dump straps attached to the bottom to facilitate emptying the sack.
   3. Lifting loops as an integral part of the Siltsack to be used in lifting the Siltsack from the basin.
   4. A restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls.
   5. Manufactured from woven polypropylene fabric with the following properties:

a.	Grab Tensile	ASTM D-4632	300 lbs.
b.	Grab Elongation	ASTM D-4632	20%
c.	Puncture	ASTM D-4833	120 lbs.
d.	Mullen Burst	ASTM D-3786	800 psi.
e.	Trapezoid Tear	ASTM D-4533	120 lbs.
f.	Apparent Opening	ASTM D-4751	40 US Sieve
g.	Flow Rate	ASTM D-4491	40 gpm/sf

2.06 SILT SOCKS

A. Silt socks shall be constructed with a mesh tube filled with biodegradable material, with a tube diameter of 8-inches, as manufactured by Silt Sock Erosion Control Products, Inc. or approved equal. The sock shall be installed as indicated in the Contract Documents.

PART 3 EXECUTION

3.01 SEDIMENTATION AND EROSION CONTROL

A. Plan and execute all operations, particularly those associated with excavation and backfilling, in such a manner as to minimize the amount of excavated and exposed fill or other foreign material that is washed or otherwise carried into wetlands waterways and drainage systems.

B. Provide hay bales, silt fencing, Siltsacks, and other materials necessary for sedimentation and erosion control for streams wetlands and drainage systems.

C. In the event of sedimentation or siltation prevention measures used by the Contractor prove to be inadequate, the Contractor shall adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.

D. Keep streams, brooks and other water crossings clear of mud, silt, debris and other objectionable materials from construction operations.
   1. Maintain flow capacity of river and stream channels to prevent unnatural flooding.
   2. Use temporary vegetation, soil stabilization matting, and mulching to protect areas exposed during construction.
   3. Minimize the amount of bare earth exposed at any one time during construction, and minimize the length of time bare earth is exposed.
   4. Excavated material to be stockpiled for reuse shall be stored away from brooks, streams and wetland areas to prevent the erosion from washing back into the resource area.

E. Baled hay shall be placed to form temporary water stops, dams, diversions dikes, berms and for other uses connected with water pollution control.
   1. Should any bales become too clogged to be effective, they shall be removed from the site and new hay bales provided.

2. Bales shall be replaced as often as necessary to provide effective sediment control.
3. Following completion of construction activities in a particular area, bales shall be legally disposed of, by the Contractor, off-site in an environmentally sound manner.

F. Sediment laden water that is being pumped from the trenches or excavations shall not be pumped directly into water courses or drainage systems.
1. Sedimentation basins, filter fabric fencing, hay bales or other means shall be used for this purpose.

G. The silt fence shall be maintained at no additional cost to the Owner as follows:
1. Inspect silt fences and filter barriers immediately after each rainfall and at least daily during prolonged rainfall.
2. Provide any required repairs immediately.
3. Should the fabric on a fabric silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, replace the fabric promptly.
4. Remove sediment deposits after each storm event.
5. As a minimum, remove sediment when deposits reach approximately one-third the height of the barrier.
6. Dispose of sediment deposits off-site.
7. Maintain the fabric silt fence until all upslope soils are permanently stabilized by vegetation.

3.02 PROTECTION OF AIR RESOURCES

A. During the progress of work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water as necessary, so as to minimize the creation and dispersion of dust.
1. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control then the Contractor shall furnish and apply the material as directed.
2. Calcium chloride shall be commercial grade, furnished in 100-pound, and 5-ply bags, stored under weatherproof cover and stacked alternately for ventilation.
3. Application for dust control shall be at the rate of about 1/2 pound per square yard per application.

B. Burning of rubbish and waste material on the site shall not be permitted.

3.03 CLEAN UP

A. After the Contractor has stabilized/re-vegetated all disturbed areas to match or exceed pre-existing conditions, the Contractor shall notify the Engineer in order to arrange an inspection from the local conservation commission.

B. Upon review and approval of the local conservation commission, the Engineer shall notify the Contractor to remove and legally dispose of the environmental controls.

3.04 COMPLIANCE

A. The construction project shall be in compliance with all Federal, State and Local laws with respect to hazardous materials.

B. All clean up and disposal operations shall comply with all applicable Federal, State and Local statutes, regulations and ordinances and anti-pollution laws.

C. Comply with all requirements of all applicable Federal, State and Local regulations and all permits issued for the Contract.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 DESCRIPTION

A. Preconstruction Conference:
1. The Contractor shall not commence work until a conference has been held at which representatives of the Contractor, Engineer, and Owner are present. The preconstruction conference will be arranged by the Engineer.
2. The sequence of construction will be established during the preconstruction conference.

B. Progress Meetings:
1. The Contractor shall be available for progress meetings during construction if so required by the owner.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Individual requirements for submittals also may be described in pertinent Sections of these Specifications.

B. Work Not Included:
   1. Submittals which are not required shall not be reviewed by the Engineer.
   2. The Contractor may require his subcontractors to provide drawings, setting diagrams and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.

1.03 SHOP DRAWINGS AND SAMPLES

A. The Contractor shall submit to the Engineer for review six (6) clearly legible copies of all shop drawings, catalog cuts, setting schedules, and such other drawings as may be necessary for the prosecution of the work in the shop and in the field as required by the Contract Documents.
   1. Submittals which are incomplete or difficult to read shall be rejected.
   2. Deviations from the Contract Documents shall be called to the attention of the Engineer at the time of the first submission of shop drawings and other drawings for consideration.
   3. The Engineer's review of any drawings shall not release the Contractor from responsibility for such deviations.
   4. Shop drawings shall be submitted with such promptness as to cause no delay in his work or the work of any other Contractor.
   5. Schedules for reinforcing steel shall receive the Contractor's immediate attention, upon award of Contract.

B. When submitted for the Engineers' review, all shop drawings shall bear the Contractor's certification that he has reviewed, checked and approved the shop drawings, that they are in compliance with the requirements of the Contract Documents, and that he has verified all field measurements and construction criteria, materials, catalog numbers and similar data.

C. All samples called for in the Specifications or required by the Engineer shall be furnished by the Contractor and shall be submitted to the Engineer for his review.
   1. Samples shall be furnished so as not to delay fabrication, and to allow the Engineer reasonable time for the consideration of the samples submitted.

D. Checking of submittals is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents.
   1. Any action shown is subject to the requirements of the Contract Documents.
   2. Contractor is responsible for: dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

E. The Contractor may only proceed with fabrication and construction for items on returned submittals marked "No Exception Taken" or "Make Corrections as Noted."

1. Resubmit submittals if marked "Rejected," "Revise and Resubmit" or "Submit Specified Item".

F. The Contractor shall furnish such samples of material as may be required for examination and test.
   1. All samples of materials for tests shall be taken according to ASTM Specifications or as provided in the Contract Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.01 SUMMARY

A. To assure adequate planning and execution of the work so that the Work is completed within the number of calendar days allowed in the Contract, and to assist the Engineer in appraising the reasonableness of the proposed schedule and in evaluating progress of the Work, prepare and maintain the schedules and reports described in this Section.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Construction period: Contract Agreement

B. Definitions:
   1. "Day," as used throughout the Contract unless otherwise stated, means "calendar day."

1.03 QUALITY ASSURANCE

A. Employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data and in preparing and issuing periodic reports as required by this Specification.

B. Perform data preparation, analysis, charting and updating in accordance with standards approved by the Engineer.

C. Reliance upon the approved schedule:
   1. The construction schedule as approved by the Engineer shall be an integral part of the Contract and shall establish interim completion dates for the various activities under the Contract.
   2. Should any activity not be completed within 15 days after the stated scheduled date, the Engineer may request the reason for the delay in schedule from the Contractor. The Contractor shall supply the requested information and the steps which he intends to take to get back on schedule.
   3. It is expressly understood and agreed that failure by the Engineer to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.

1.04 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Preliminary Analysis: Within ten (10) calendar days after the Contractor has received the Owner's Notice to Proceed, submit four (4) prints of a preliminary construction schedule to Owner and Engineer.

C. Construction Schedule: Within thirty (30) calendar days after the Contractor has received the Owner's Notice to Proceed submit a Critical Path Method (CPM) network and a computer generated print out of a construction schedule prepared in accordance with Part 2 of this Section to Owner and Engineer.

D. Periodic Reports: See paragraph 2.02-B of this Section.

PART 2 PRODUCTS

2.01 CONSTRUCTION ANALYSIS

A. Supplemental to the critical path schedule, the Contractor shall provide a detailed work schedule, projected at least a month in advance. The implementation of the work schedule and the coordination required shall constitute the basic agenda of the coordination and planning meetings.

B. The order of new construction shall be discussed with the Engineer well in advance of the contemplated construction and the intended schedule shall meet with his approval. The Contractor, prior to starting work, shall submit to the Engineer a written description of the methods he plans to use in doing the work, including any necessary plans depicting the proposed details as well as a schedule of expected dates for beginning and completing the various buildings, structures and appurtenances which make up the work. Work shall not commence on a given portion of the project until the schedule for that portion (and preferably the entire schedule) has been approved by the Engineer. The Contractor shall be required to update this schedule periodically as necessary.

C. A guideline CPM network shall be submitted for approval to include the following items: A feasible plan to complete the project within the time specified in this contract; Mandatory milestone dates - Milestones shall be designated in the guideline CPM network by asterisks; Calendar dates will be substituted when the construction start date is established.

2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. This schedule shall include a Critical Path Network and a computer generated print out. The schedule shall account for all subcontracts in addition to the work of the Contractor.

B. The network shall be provided in the form of a time scaled schedule. The computer printout shall include as a minimum, the earliest starting, earliest finish, latest starting, latest finish dates, and the total float for each activity. The Contractor shall update (monitor) and run the schedule at least monthly and shall submit to the Engineer both the network and computer printout, both in duplicate, at the same time the pay estimate is prepared. The schedule shall contain all of the items of the periodic estimate and pay schedule.

PART 3 EXECUTION

3.01 SCHEDULE AND UPDATES

A. The monthly schedule update (monitoring) shall include the following items.

1. Network: Activities that are completed or in process are to be identified on the network by contrasting heavy lines. Each activity and work done should be proportional to the percentage of progress achieved to date.
2. Computer printout: The percentage progress status of each activity shall be shown on the computer printout. The percentage progress status will be used to support the Contractor's periodic pay estimate. Actual start and completion dates are to be included in the computer printout. All activities started and in process should be flagged in the computer printout.
3. The Engineer reserves the right to modify any schedule as required to meet the prevailing conditions. Review of the work schedules by the Engineer shall not relieve the Contractor of responsibilities regarding specified project completion times and liquidated damages.

END OF SECTION

SECTION 01385

PRE-CONSTRUCTION VIDEO RECORDING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: The Contractor shall provide all labor, materials, tools, and equipment necessary to furnish a video recording of the site prior to the start of the work.

1.02. RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and all Divisions of these Specifications.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 VIDEO RECORDING

A. Equipment
1. The equipment employed in the video recording shall be sufficient to provide a clear, full color and detailed visual description of the site along with a detailed narrative description of physical conditions and location.

B. Area Included
1. The area included in the video recording shall include the actual location of the work, the adjacent property and all other areas which could reasonably be anticipated to be affected by the work.
2. Particular attention should be paid to the existing condition of private property immediately adjacent to the work.

C. Documentation
1. The video recordings shall be conducted at a slow walking pace and shall record the physical conditions in the area described above.
2. The narrative description shall be recorded simultaneously and shall supplement the visual description particularly with regard to location.
3. Contractor shall furnish three (3) complete copies of the video recording to the Engineer prior to the start of the work.

D. Personnel
1. All personnel employed by the Contractor in video recording shall be experienced in all aspects of the process, including recognition of important physical conditions in and around the site of the Work.

END OF SECTION

SECTION 01505

MOBILIZATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Includes: The transportation and storage of all equipment and materials necessary to the Work and the field offices.

B. RELATED WORK

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 thru Division 3 of these Specifications.

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION

3.01 STORAGE AREA

A. It shall be the Contractor's sole responsibility to procure and maintain a suitable storage area for tools, materials, and equipment necessary to perform the work.

1. The storage area obtained by the Contractor shall not obstruct or interfere with pedestrian or vehicular movement, and shall not occupy any space within the public right-of-way, except with specific permission from the Owner.
2. The storage area shall be kept neat at all times.
3. The Owner shall not be a party to negotiations related to acquisition of areas for storage or cleanup of the same (unless the storage area is on Owner's property), but reserves the right to inspect such area(s) for compliance with City regulatory requirements.
4. Contractor shall not use storage area for bulk storage of hazardous materials (e.g., gasoline, solvents, oil).

3.02 EQUIPMENT

A. Contractor shall transport all equipment to the site, assemble the equipment as needed to proceed with the work and maintain the equipment as needed during the work.

END OF SECTION

SECTION 01510

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this Section shall consist of providing the following temporary facilities:
1. Water,
2. Sanitary Facilities,
3. Drainage,
4. Heat and Weather Protection.

PART 2 PRODUCTS

2.01 TEMPORARY WATER

A. Drinking water shall be provided by the Contractor for his personnel and the personnel of his sub-contractors.
1. Drinking water shall be tested and approved by the State Agency as "safe drinking water suitable for human consumption."
2. Contractor shall furnish water for construction.

2.02 TEMPORARY SANITARY FACILITIES

A. Sanitary conveniences, properly screened from public observation, for the use of all persons employed on the work and beginning with the first man engaged in preliminary operations, shall be provided and maintained by the Contractor in sufficient numbers through the completion of the work.
1. Contractor shall be diligent in maintaining sanitary facilities, pumping weekly, or more often as required to protect soil and water quality.

2.03 TEMPORARY DRAINAGE

A. Temporary drainage, as necessary shall be provided by the Contractor to keep the working area dry.

2.04 HEAT AND WEATHER PROTECTION

A. Temporary heat and weather protection shall be provided as required by Chapter 149 of Massachusetts General Law, Section 44G.

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01545

PROTECTION OF PROPERTY

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: The Contractor shall provide all necessary protection of existing property to prevent any damage to property adjacent to the construction.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 thru Division 3 of these Specifications.

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION

3.01 PROTECTION OF PROPERTY

A. The Contractor shall, at his own expense, preserve and protect from injury all property either public or private along and adjacent to the line of work, and be responsible for and repair any and all damage and injury thereto, arising out of or in consequence of any act or omission of the Contractor.

1. All existing pipes, culverts, poles, wires, fences, mailboxes, stone walls, curbs, bounds, etc., shall be temporarily removed, supported in place or otherwise protected from injury, and shall be restored to at least as good condition as that in which they were found immediately prior to the start of work.
2. Lawns, shrubs, bushes, planting beds and decorative trees disturbed or damaged shall be restored to a condition equal to that found prior to the start of construction, either by temporary transplant or replacement in kind, except as otherwise indicated on the Drawings.
3. Property, which has been damaged and replaced, shall be equal in quality and workmanship to the damaged property and shall be subject to the approval of the property owner.
4. Branches, which interfere with construction, may be removed, only upon approval of the Tree Warden.
   a. Limbs and branches shall be trimmed off neatly and cleanly, close to the trunk of the tree or to its main branch. The cut surfaces shall be coated with an approved tree wound coating.

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 GENERAL

1.01 DESCRIPTION

A. The work under this Section shall consist of maintaining and protecting traffic in the project area to the satisfaction of the applicable Local Regulatory Agencies, and the Owner.

1. Unless otherwise specified within the Contract Documents, the Contractor must maintain pedestrian and vehicular traffic and permit access to businesses, factories, residences, and intersecting streets.

PART 2 MATERIALS

2.01 TRAFFIC SIGNS

A. The Contractor shall furnish light(s) and maintain traffic signs and specialty signboards as may be directed, or may be necessary for the safe regulation, or convenience of traffic.

1. Said signs shall be as shown or noted on the Contract Drawings or elsewhere herein, or if not specified, they shall be adequate for the regulation, safety and convenience of traffic and in conformance with the applicable requirements of the State/Federal Manual on Uniform Traffic Control Devices.

2.02 BARRICADES

A. Suitably lighted barriers or barricades shall be furnished by the Contractor and put up and maintained at all times during the night or daytime, around all open ditches, trenches, excavation, or other work potentially dangerous to traffic.

1. Such barricades shall be as shown on the Contract Drawings, or if not shown, shall be constructed of 2 inch by 8 inch rough lumber, securely supported, braced and at least 3 feet high above the ground.
2. Barricades shall be placed on all sides and throughout the entire length and breadth of all open ditches, trenches, excavations, or other work which must be barred to the general public.
3. Barricades shall be properly painted to the satisfaction of the Local Regulatory Agency in order to retain a high degree of visibility to vehicular and pedestrian traffic.

2.03 FLASHERS

A. The Contractor shall furnish and securely fasten flashing units to signs, barricades, and other objects in such numbers and for such lengths of time as are required for the maintenance and protection of traffic.

1. The flashers shall be in operation during all hours between sunset and sunrise, and during periods of low visibility.
2. Suitably lighted barricades shall be defined as barricades lit by flashers in accordance with this Section or other lighting methods approved by the Local Regulatory Agency in lieu thereof.
3. Flashers shall be placed along the entire length of the barricades at an interval no greater than 8 feet, center to center. Flashers shall be power operated, lens directed, enclosed light units which shall provide intermittent light from 70 to 120 flashers per minute, with the period of light emittance occurring not less than 25 percent of each on-off cycle, regardless of temperature.
4. The emitted light shall be yellow in color and the area of light on at least one face of the unit shall be not less than 12 square inches. The discernible light shall be bright enough to be conspicuously visible during the hours of darkness at a minimum distance of 800 feet from the unit under normal atmospheric conditions.
5. For units which beam light in one or more directions, the foregoing specifications shall apply 10 degrees or more to the side and 5 degrees or more above and below the photometric axis.

2.04 TEMPORARY BRIDGING

A. The Contractor shall include in his bid, bridging for trenches at all street and driveway crossings in such manner as the Local Regulatory Agency may direct for the accommodation and safety of the traveling public, to provide facilities for access to private driveways for vehicular use, and to prevent blocking of intersecting traffic.

1. He shall erect suitable barriers around the excavation to prevent accidents to the public and shall place and maintain, during the night, sufficient lights on or near the work.
2. A space of 20 feet must be left so that free access may be had at all times to fire hydrants and proper precautions shall be taken so that the entrances to fire hydrants and fire stations shall not be blocked or obstructed.

2.05 DETOURS

A. Temporary detours shall be constructed on the site as proposed by the Contractor and approved by the Applicable State and/or Local Authorities required by the Contract Drawings or specified elsewhere herein.

1. Detours shall not have grades in excess of 10% anywhere along their lanes unless otherwise shown on the Contract Drawings. Detours shall be smooth riding.
2. Suitable barricades shall be installed continuously along both sides of a detour where:
   a. The adjacent side slope is steeper than 1 on 6 inches.
   b. The Contractor's operations or equipment may operate within 20 feet of the detour.
   c. Other unsafe conditions requiring them for the protection of traffic along the line of detour.

2.06 MISCELLANEOUS

A. The Contractor may be required to employ traffic persons and take other such reasonable means or precautions as the Local Regulatory Agency may direct, or as may be needed to prevent damage or injury to persons, vehicles, or other property and to minimize the inconveniences and danger to the public by his construction operations.

PART 3 EXECUTION

3.01 CONTROL OF TRAFFIC

A. It shall be the sole responsibility of the Contractor to keep the Local Regulatory Agencies (including but not limited to the Police and Fire Departments) pre-warned at least 72 hours in advance of changes in traffic patterns due to reduction of pavement widths or closing of streets.

B. The Contractor shall supply, install, maintain, adjust, move, relocate, and store all signs, suitably lighted barricades, traffic cones, and traffic delineators, as necessary to carry out the traffic routing plan and maintain vehicular and pedestrian traffic.

1. All of this work shall meet with the requirements of the Local Regulatory Agencies.
2. The Contractor shall maintain, relocate and operate barricades and flashers throughout the life of this Contract.

C. Should the Contractor or his employees neglect to set out and maintain barricades or lights, as required in these Specifications, the Owner immediately, and without notice, may furnish, install, and maintain barricades or lights.

1. The cost thereof shall be borne by the Contractor and may be deducted from any amount due or to become due to the Contractor under this Contract.

3.02 ACCESS TO PROPERTY AND UTILITIES

A. The Contractor shall arrange his operations to provide access to properties along the street including temporary bridges to driveways, and provide access to fire hydrants, manholes, gate boxes, or other utilities.

1. Whenever any trench obstructs traffic in or to any public street, private driveway, or property entrance, the Contractor shall take such steps as required to maintain necessary traffic and access including temporary bridging if required.
2. The Contractor shall confine his occupancy of public or traveled ways to the smallest space compatible with the efficient and safe performance of the work contemplated by the Contract.

3. If the Contractor's operations or occupancy of any public street or highway, or the uneven surfaces over any trenches being maintained by the Contractor, interfere with the removal or sanding of snow or ice by the public authorities or adjoining land owners, in an ordinary manner with regular highway equipment, the Contractor shall be required to perform such services for the public authorities or adjoining owners without charge.
4. If the Contractor fails to do so, he shall reimburse the said authorities or adjoining owners or the Owner for any additional cost to them for doing such work occasioned by conditions arising from the Contractor's operations, occupancy, or trench surfaces, together with any damage to the equipment of said parties by those conditions or claims of any parties for damage or injury or less by reason of failure to remove snow or ice or to sand icy spots under these conditions.
5. The Contractor shall observe and obey all local and state laws, ordinances, regulations, and permits in relation to the obstruction of streets and highways, keeping passageways open and protecting traffic where there may be danger from blasting or other construction activities.

B. The Contractor shall be held responsible for any damages that the Engineer, Owner, Governmental units, or their heirs or assigns may have to pay as a consequence of the Contractor's failure to protect the public from injury, and the same may be deducted from any payments that are due or may become due to the Contractor under this Contract.

END OF SECTION

SECTION 01572

UNIFORMED POLICE OFFICERS

PART 1 GENERAL

1.01 DESCRIPTION

The work under this section shall consist of providing services of uniformed traffic persons/traffic directors at such locations and for such periods as may be necessary for safety or as ordered by applicable Local Regulatory Agencies and/or Chief of Police for the control and direction of vehicular traffic and pedestrians.

No overtime for traffic persons will be allowed unless emergency conditions exist. If the Contractor elects to work more than eight (8) hours in any one day, or more than forty (40) hours in one week, he shall assume all such costs and will not be reimbursed under any bid item. However, if emergency overtime is approved by the Owner or the Engineer, payment will be made by the Owner and based on the hourly rate billed by the Police Department.

Prior to the start of construction, the Contractor shall contact the Police Department to familiarize himself and adhere to their respective scheduling requirements.

1.02 RELATED WORK SPECIFIED ELSEWHERE

SECTION 01020 - ALLOWANCES
SECTION 01025 - MEASUREMENT AND PAYMENT
SECTION 01570 - TRAFFIC REGULATION

PART 2 MATERIALS

2.01 Local police/constables are the only acceptable traffic persons/traffic directors.

2.02 The local police/constables shall be uniformed including headgear, and equipped so as to be readily distinguishable as a traffic person/traffic director.

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01610

PRODUCT HANDLING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

1.02 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.03 MANUFACTURER'S RECOMMENDATIONS

A. Comply with manufacturers' recommendations on product handling, storage and protection.

1.04 PACKAGING

A. Deliver products to the job site in their manufacturer's original container(s), with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.
2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality and other pertinent information.

1.05 PROTECTION

A. Mechanical equipment subject to damage by the atmosphere if stored outdoors, shall be stored in a building with a controlled environment. The building may be a temporary structure on the site or a building off the site.

B. PVC pipe shall be covered to protect it from UV degradation.

1.06 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the approval of the Engineer at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this Section consists of procedures and requirements for contract closeout, such as cleaning, restoration of project site to original condition, inspections, and guarantees.

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION

3.01 CLEANING UP

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

B. Where material or debris has washed or flowed into or been placed in water-courses, ditches, gutters, drains, catch basins, or elsewhere as a result of the Contractor's operations, such material or debris shall be entirely removed and legally disposed of during progress of the work, and the ditches, channels, drains, etc., kept in a neat, clean and functioning condition.

C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operation in a neat and satisfactory condition.

D. Unless otherwise specifically directed or permitted in writing, the Contractor shall perform the following tasks:
1. Tear down and remove all temporary buildings and structures built by him.
2. Remove all temporary works, tools, and machinery or other construction equipment furnished by him.
3. Remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him.
   a. Subsequent to disinfection, remove or suitably neutralize disinfectant residuals from treated area(s).
4. Remove all rubbish from any grounds which he has occupied.
5. Leave roads and all parts of premises and adjacent property affected by his operations in a neat and satisfactory condition.

3.02 RESTORATION

A. The Contractor shall restore or replace, when and as directed by the Engineer, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations.
1. To this end, the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work.
2. Suitable materials, equipment, and methods shall be used for such restoration, or as required in other divisions of this Specification.

B. In restoring the disturbed areas the Contractor shall:
1. Replace to an equivalent depth any loam that has been removed during the excavation.
2. Remove from the property and legally dispose of in an approved fashion all trees, brush, and other items that the Contractor has cut in order to prosecute his work.

3. Remove from the property upon completion of the work thereon, all excess materials of construction such as stone, pipe, concrete block, gravel, etc., that the Contractor may have stockpiled for use during the course of the work.
4. Leave the land in a smooth, even condition. All ruts, holes or other undesirable grading conditions which resulted from work under this Contract shall be filled and the area so graded to eliminate ponding.
5. All drainage course(s) shall be restored to their pre-existing condition or better.
6. Reset all public or private monuments, iron pipes or other types of property line and geodetic markers damaged or disturbed by operations under this Contract. This work shall be done by a licensed land surveyor at no additional cost.
7. Repair, reset or replace as directed all pipes, walls, utilities, fences, railings, stone walls, etc., and ornamental or utilitarian domestic accessories, such as, but not limited to, arbors, fireplaces, sheds and incinerators, or other surfaces, structures, or property which may have been damaged, either directly or indirectly by his operations under this Contract.
8. Restore to a condition at least equal to that in which they were found immediately prior to the beginning of construction all sidewalks, gutters, driveways and curbs which have been damaged by the Contractor's operations.

3.03 FINAL INSPECTION

A. At completion of all work, the Owner and Engineer, along with the General Contractor and each of the subcontractors shall conduct a final inspection jointly for "punch list" purposes and to determine the exact status of the project before final acceptance.

3.04 GUARANTEES

A. The Contractor shall take notice of special guarantees required in the technical Sections of these Specifications.
   1. If, in the opinion of the Owner, any item requires excessive maintenance during guarantee periods, the item shall be considered defective and the Contractor shall correct the defects.
   2. All defects so corrected shall be at the expense of the Contractor.

END OF SECTION

INDEX

DIVISION 2 SITE WORK

SECTION	SUBJECT	Page #
02015	Test Pits	139-140
02140	Site Drainage and De-watering	141-142
02160	Support of Excavation	143-145
02222	Earthwork for Water Distribution Systems	146-154
02227	Rock Removal	155-157
02435	Remove and Relay Existing Drains	158
02513	Asphaltic Concrete Pavement	159-161
02611	Ductile Iron Pipe and Fittings	162-165
02640	Buried Valves and Appurtenances	166-167
02645	Hydrants	168-169
02650	Thrust Blocks and Joint Restraints	170-171
02660	Service Connections	172-174
02667	Temporary Potable Water Piping and Service Connections	175-177
02675	Disinfecting Water Mains	178-180
02676	Testing Piping Systems	181-182
02766	Cleaning and Lining Existing Water Mains	183-186
02769	Television Inspection	187-188
02900	Landscaping	189-193
02930	Loam and Seed	194-198
02950	Tree Protection and Restoration	199-205

SECTION 02015

TEST PITS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide test pits where noted/shown on the Drawings or at locations requested by the Engineer.
   1. In general the work under this Section shall consist of the excavation of test pits or other miscellaneous excavations not specified for payment elsewhere, by the Contractor where it may be necessary to locate or examine soils, groundwater, drains, pipes, rock, public utilities, subsurface structures, or any other possible obstacle or condition.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02222 Earthwork for Water Distribution Systems

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 COORDINATION WITH UTILITY OWNERS

A. The Contractor shall coordinate the excavation of all test pits with the respective utility owners having facilities in the vicinity of the location of test pits.
   1. All utilities shall be informed of the necessity of work under this Section and the Contractor shall give sufficient notice to the respective utility owners to afford reasonable time for coordination.
   2. If so desired by respective utility owners, all or part of the work under this Section may be accomplished by their crews and/or supervised by them.

3.02 EXCAVATION

A. Unless otherwise specified, the Contractor shall dig test pits as required by the Contract Documents, and the Contractor shall notify the Engineer of the results immediately and prior to the start of any underground installations within said test pit areas.
   1. The Owner/Utility Companies shall be notified well in advance of excavation so that they also may make the necessary measurements to locate all objects within test pits.
   2. Excavation of test pits shall be accomplished by such means as are required to ensure that any underground utilities or structures that may be encountered are not damaged
   3. It shall be the Contractor's responsibility for any damages incurred during the excavation operations. Any such damages shall be repaired by him (if permitted) to the satisfaction of the Responsible Agency at the Contractor's own expense. Where the repair and/or replacement must be done by the Responsible Agency, any and all costs thereof shall be borne by the Contractor.
   4. The Contractor shall notify the Engineer and/or utility companies of any conflicts uncovered which may require design revisions, relocations, and/or adjustment.
   5. No work shall be started within these areas of conflict until so authorized by the Engineer.
   6. Test pit excavation and backfill shall comply with the applicable provisions of Section 02222.
   7. Hand excavation shall be performed where necessary to prevent damage to the existing utilities.

3.03 MEASUREMENT

A. The Contractor shall measure and record the size, configuration, horizontal, and vertical location of all utilities, pipes or other obstacles uncovered in the various test pits dug under this Section.

1. Size of test pits shall be as directed by the Engineer.

3.04 RESTORATION

A. Where an existing pavement has been removed for the test pit excavation, the surface shall be restored to grade. The top 12 inches shall be compacted gravel.

1. In all other areas, the surface of test pit areas shall be restored to a condition equal to or better than original.

END OF SECTION

SECTION 02140

SITE DRAINAGE AND DEWATERING

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide drainage and dewatering as required by the Contract Documents.
   1. In general, the Contractor shall furnish all materials, equipment, labor, and incidentals necessary to provide dewatering and drainage control during construction.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Distribution Systems
   2. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. None required.

PART 2 PRODUCTS

2.01 EROSION AND SEDIMENTATION CONTROL

A. Devices for erosion and sedimentation control for effluent of dewatering operations shall be as specified in Section 01120, Environmental Controls.

PART 3 EXECUTION

3.01 INSTALLATION

A. To insure proper conditions at all times during construction the Contractor shall provide and maintain ample means and devices with which to remove and dispose of all water entering trenches and other excavations.
   1. Means of water removal and disposal shall include but not be limited to wells, surface pumps, and/or well point systems, to the extent required to prevent "boils" or softening of the foundation soils.
   2. The Contractor shall pitch the ground around the excavation to prevent water from running into excavated areas and to prevent damage to other structures or work on adjacent property.
   3. The Contractor shall remove immediately any surface or seepage water or water from sewers, drains, creeks, or other sources, which may accumulate during the excavation and construction work.

B. Excavations shall be kept dry until the structures, pipes and appurtenances, to be built or installed therein, have been completed and backfilled to such extent that they shall not float or otherwise be damaged by water in the excavation.
   1. In no event shall water rise to cause unbalanced pressure on the pipe or other structures. The Contractor shall prevent flotation of the pipe or structures.
   2. Pipe, masonry and concrete shall not be placed in water. Water shall not submerge new masonry or concrete within four (4) hours after placement.

C. Sufficient stand-by pumping equipment shall be installed and mounted for immediate use in case of emergencies. The Contractor shall be responsible for the adequacy of their dewatering equipment and system in controlling the water and for protection to adjacent public and private property from damage. Any damage to permanent work or existing property resulting from the failure of the Contractor to provide an adequate dewatering system shall be repaired by the Contractor at their expense.

1. Wells, well points and pump sumps shall be installed with adequate filters to prevent loss of fine grained soils.

3.02 DISPOSAL OF DRAINAGE WATER

A. All water pumped or drained from the work shall be disposed of in such a manner as to not cause injury to public health, damage to public or private property, interference with other work or adverse impacts to adjacent wetlands.

1. Effluent from dewatering operations shall not be discharged directly to wetlands or waterways and shall not be discharged to storm drain systems prior to being filtered through a siltation basin.
2. Discharge shall be such that no erosion occurs. Erosion protection shall be as specified in Section 01120, Environmental Controls.

END OF SECTION

SECTION 02160

SUPPORT OF EXCAVATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide excavation support as required by the Contract Documents.
   1. In general, this work shall consist of furnishing and placing timber and/or steel sheeting and shoring of the types and dimensions required for proper excavation support.

1.02 DEFINITIONS

A. Shoring shall mean the use of a steel trench box, steel sheeting, or timber sheeting braced as required.

B. Timber sheeting shall mean the use of tongue and groove wood sheeting or steel soldier beams with wood lagging braced as required.

C. Steel sheeting shall mean the use of steel sheet pilings with interlocking joints, braced by steel members as required.

1.03 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02222 Earthwork for Water Distribution Systems
   3. Section 02611 Ductile Iron Pipe and Fittings

B. As established in the General Conditions of the Contract, the Contractor is solely responsible for means and methods of construction and for the sequence and procedures to be used.

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
   1. The Contractor shall not perform excavations in unstable ground and shall employ a positive means of containing the unstable ground behind shoring, before excavation may proceed.

B. Employ a qualified Engineer, properly permitted to provide such services at the location of the work, to design the shoring system and to inspect and report on the quality of its construction.

C. Comply with all pertinent requirements of governmental agencies having jurisdiction.

1.05 STANDARDS

A. The following Standards form a part of this Specification as referenced:
   1. ASTM A328, Specification for Steel Sheet Piling
   2. Massachusetts DPW Standard Specifications, Section 950 Sheeting.
   3. Code of Federal Regulations (CFR), 29 CFR 1926, OSHA Standards - Excavation.

1.06 SUBMITTALS

A. Submit shoring design to Engineer for record purposes only.

PART 2 PRODUCTS

2.01 DESIGN

A. Design a shoring system which will safely and adequately prevent collapse of adjacent materials and which will permit construction of the Work to the arrangement shown on the Drawings.

B. All shoring systems shall be designed so as to support all vertical and lateral loads and other surcharge loads imposed on the system during construction, including earth pressures, utility loads and other surcharged loads in order to provide safe and expeditious construction of the permanent structures and prevent movement and/or damage to adjacent soil, buildings, structures and utilities.

C. Secure all needed approvals, including those of governmental agencies having jurisdiction and of adjacent property owners if required, at no additional cost to the Owner.

2.02 MATERIALS

A Material shall include, but not necessarily be limited to sheet piling, solder piles, lagging, bracing members such as vales, struts, shores and tieback anchors.

B. Lumber for timber sheeting and shoring:
1. Shall be sound Spruce, Douglas Fir, white or yellow Lodgepole, Ponderosa pine, or western hemlock plank, planed on one side and either tongue and grooved or splined.

C. Steel sheeting:
1. Shall be of approved section and quality, either new or secondhand, conforming to the requirements of ASTM A328.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Construct and install the shoring system in strict accordance with the design engineer's requirements.
1. When using soldier piles and lagging, where boulders or cobbles are encountered, soldier piles shall be installed in pre-augered holes over the full depth as required to prevent misalignment and damage.
2. Vibration monitoring during installation and extraction of braced excavation shall be provided wherever the excavation is within 100 feet of existing structures.

3.03 SHEETING LEFT IN PLACE

A. Sheeting left in place, for the purpose of preventing injury to structures, utilities or other property, shall be cut-off 3 feet below finished grade.
1. The right of the Engineer to order sheeting left in place shall not be construed as creating any obligation on his part to issue such orders. His failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise growing out of a failure, on the part of the Contractor, to leave in place sufficient sheeting to prevent movement of the ground.

3.04 SHEETING REMOVED

A. All sheeting not left in place shall be carefully removed in such manner as to not endanger the construction or other structures, utilities, or property.
1. All voids left or caused by withdrawal shall be immediately refilled with approved material, and compacted with tools especially adapted to that purpose.

2. Vibratory extraction methods shall be used only when it can be demonstrated that settling of pipe and structures will not occur. If such settling occurs, it shall be corrected at the Contractor's expense.

3.05 TRENCH BOX OR SHIELD

A. Use of a trench box or shield shall not relieve the Contractor of any liability for damages to persons or property growing out of a failure of the Contractor to leave in place sufficient sheeting and bracing to prevent the caving or moving of the ground or disturbance of the completed work.

1. Care shall be taken, when a trench box or shield is moved ahead, so as not to pull apart the joints of pipe already placed or leave voids around the pipe wall.
2. At no time shall the portable box or shield be allowed to be positioned below the spring line of the pipe.
3. The width of the trench box or shield shall be such that a minimum 6-inch horizontal clearance is maintained between the pipe and shield at all times
4. If the pipe has moved, it shall be reset to the proper line and grade.
5. Any voids between the trench box or shield and the undisturbed trenchwall within the pipe zone (bottom of trench to top of cover material) shall be filled with crushed stone, bank run gravel, or approved material, immediately after the box or shield is positioned.

END OF SECTION

SECTION 02222

EARTHWORK FOR WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide all earthwork as required by the Contract Documents.

B. In general, the work of this Section shall include but not necessarily be limited to, excavation, trenching, filling, backfilling, compaction, and grading for water distribution systems.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3. Section 02227 Rock Removal
4. Section 02611 Ductile Iron Pipe and Fittings
5. Section 02640 Buried Valves and Appurtenances
6. Section 02930 Loam and Seed

1.03 SITE INVESTIGATION

A. The grades and other site information have been compiled by field surveys.
1. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work.
2. Failure by the Contractor to acquaint himself with all available information concerning the site will not relieve him from the responsibility, for estimating properly, the difficulty or cost of successfully performing the work.

1.04 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
1. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.05 PROTECTION OF PROPERTY AND UTILITIES

A. Extreme care shall be exercised to prevent damage to existing trees, shrubs, utilities, walls, sidewalks, fences and private property.
1. Any damage to these items as a result of work performed by the Contractor shall be repaired by the Contractor at his own expense.
2. Existing property boundary markers, control points and datum elevation markers or bench marks shall be preserved.
a. All such items which are displaced or destroyed by the Contractor shall be replaced by a registered Engineer or Land Surveyor, as required, with all expenses paid by the Contractor.

B. Utility agencies shall be contacted and advised of proposed work prior to the start of work by the Contractor.
1. Notify Dig Safe.
2. Obtain information from the proper sources and authorities concerning locations of all utilities within the scope of this work.
3. If and when encountered, utilities shall be supported and protected, and the Engineer shall be notified.
a. Ample time shall be allowed for entrance and taking such measures as may be required for the continuance of such services by the utility owner.

4. Rules and regulations governing the respective utilities shall be observed. The Contractor's responsibilities with respect to utility locations, protection, interferences, and relocations shall be as further specified in Section 01013.

1.06 REFERENCE STANDARDS

A. The Contractor shall comply with the provisions of the following agencies as they apply to this project:
1. Associated General Contractors of America, Inc. (AGCA) "Manual of Accident Prevention in Construction"
2. Occupational Safety and Health Administration, United States Department of Labor Requirements
3. ANSI "Safety Regulations for Construction and Demolition"
4. American Society for Testing & Materials (ASTM)
5. American Water Works Association Standards
6. Massachusetts Highway Department “Standard Specifications for Highways and Bridges”

1.07 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Testing and Samples:
1. Test reports on backfill materials, moisture density tests, in place density tests (ASTM D 1557 and D 1556).
2. Representative backfill and bedding samples and gradation tests (ASTM D 422).
3. Tests shall be in conformance with paragraph 3.16; compaction requirements and testing as specified herein.

1.08 TRAFFIC

A. While excavating and backfilling is in progress, traffic shall be maintained in a manner as specified in Section 01570 Traffic Regulations.

PART 2 MATERIALS

2.01 GENERAL

A. Except as specified for pipe bedding, pipe cover, roadway subbase, and refill for rock and unsuitable materials, backfill materials may be as follows:
1. Suitable materials for trench backfill shall be the material excavated during the course of construction, but excluding debris, pieces of pavement, frozen materials, organic matter, silt, top soil, ledge excavation and rocks over six inches in largest dimension.
2. Gradation of material shall be generally as specified for gravel borrow except that maximum size of stone shall be 6 inches.
3. The suitability of existing material for use as backfill will be determined by the Engineer.
4. All unsuitable materials shall be disposed of as per paragraph 3.18 A.

2.02 PIPE BEDDING AND COVER MATERIAL

A. Ductile Iron Pipe:
1. Gravel borrow shall be a granular material, well graded from fine to coarse, with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
2. It shall not contain vegetation, masses of roots, or individual roots.
3. It shall be free from loam and other organic matter, clay, and other fine or harmful substances.
4. Gravel borrow shall conform to requirements as specified in paragraph 2.05 herein.

B. Plastic Pipe or Copper Tubing:
1. Sand borrow shall consist of clean inert, hard, durable grains of quartz or other hard durable rock free from loam or clay, surface coatings and deleterious materials.

2. The allowable amount of material passing a No. 200 sieve as determined by AASHTO shall not exceed 10 percent by weight.
3. The maximum particle size shall be 3/8 inch.

2.03 CONCRETE SAND

A. Concrete sand shall meet ASTM C-33 for fine aggregate.

2.04 STRUCTURAL FILL

A. Structural fill shall generally range from gravelly sand to gravel, free of organic material, trash, loam, ice, snow, frozen soil, and other objectionable material, and shall conform to the following:

Sieve Size	Percent Passing by Weight
6 inch	100
No. 4	30-80
No. 40	5-35
No. 200	0-8

2.05 GRAVEL BORROW

A. Gravel borrow shall be a granular material, well graded from fine to coarse, with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
1. It shall not contain vegetation, masses of roots, or individual roots.
2. It shall be substantially free from loam and other organic matter, clay, and other fine or harmful substances.
3. Gravel borrow shall have the following gradation:

Sieve Size	Percent Passing by Weight
3 inch	95-100
1/2 inch	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-8

2.06 PROCESSED GRAVEL FOR ROADWAY BASE

A. Shall meet the requirements of the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, latest edition, M1.03.1.

Sieve Size	Percent Passing by Weight
3 inch	100
1 1/2 inch	70-100
1/4 inch	50-85
No. 4	30-60
No. 200	0-10

2.07 CRUSHED STONE (Hydrant Drains)

A. Crushed Stone: Shall consist of durable crushed stone or durable crushed gravel stone, washed, free from ice and snow, stone dust, sand, clay, loam, or other deleterious material. The crushed stone shall be uniformly blended and conform to the following:

Sieve Size	Percent Passing by Weight
5/8 inch	100
1/2 inch	85-100
3/8 inch	15-45
No. 4	0-15
No. 8	0-5

2.08 DENSE GRADED CRUSHED STONE (For Sub-Base)

A. Dense Graded Crushed Stone: Shall consist of durable crushed stone or durable crushed gravel stone, washed, free from ice and snow, stone dust, sand, clay, loam, or other deleterious material. The crushed stone shall be uniformly blended and conform to the following:

Sieve Size	Percent Passing by Weight
2 inch	100
1-1/2 inch	70-100
3/4 inch	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

2.09 3/4-INCH FRACTURED CRUSHED STONE

A. Material used to bed and cover all under drains and elsewhere as directed by the Engineer shall be 3/4 inch gravel or crushed stone with no less than 85 percent passing the 3/8-inch screen and 100 percent retained on the No. 35 screen.

2.10 EXCAVATABLE CONTROLLED DENSITY FILL (CDF)

A. Shall be Type 1E, Flowable batched at a concrete plant and meeting the following specifications:

1.	Portland Cement	Meeting AASHTO M85
2.	Fly Ash	Meeting AASHTO M4.05.02
3.	Sand	Meeting M4.02.02
4.	Water	Meeting M4.02.04
5.	Air Entraining Admixtures	Meeting M4.02.05
6.	Compressive Strength	28 day = 30 – 80 psi 90 day = 100 psi
7.	Slump	10-12 inches

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

A. The Contractor shall make all excavation in earth and in rock, necessary or incidental to the proposed construction under the terms of this Contract and as herein specified or indicated on the Drawings.

1. All trench excavation shall be accomplished by open cut method.
2. All excavation shall be made in such manner and to such widths as will give ample room for properly installing, constructing, and inspecting pipe lines and structures they are to contain.
3. The width of trenches shall be sufficient to allow thorough compacting of the refill adjacent to the lower quarters of the pipe. At pipe joints, such additional width and depth shall be excavated as is necessary to give ample room for properly making and inspecting the pipe joint.
4. Bracing and support of all trench excavation shall meet all requirements of Local and State ordinances and OSHA regulations.
   a. Sheeting and bracing, or the use of a steel support box shall be used where required to maintain a safe working condition and provide protection from collapse of the trench walls.

5. During excavations, material determined by the Engineer to be suitable for backfilling, shall be placed a sufficient distance from the banks of the trench to avoid slides or cave-ins. Unsuitable material shall be disposed of as specified in paragraph 3.18 and replaced with surplus suitable material and gravel borrow to the extent necessary.
6. Should conditions make it impractical or unsafe to place material along the trench, it shall be hauled and stored at a location provided by the Contractor. When required, it shall be re-handled and used in backfilling the trench. No additional compensation will be made for re-handling this material.
7. Pipe trenches shall be backfilled as soon as practical after the pipes have been laid, jointed, and inspected by the Engineer. The extent of excavation open at any one time shall be no more than 50 linear feet of trench during working hours and no more than 20 linear feet during non-working hours.

3.02 EXCAVATION CLASSIFICATION

A. Earth excavation shall comprise all materials not classified as rock excavation and shall include clay, silt, sand, muck, gravel, hardpan, loose shale, pavement, pavement bases, loose stone in masses and boulders measuring less than one cubic yard in volume.

B. Rock: See Section 02227 Rock Removal.

3.03 TRENCH EXCAVATION IN PAVED ROADWAYS

A. In excavating trenches in roadways having an improved pavement, the Contractor shall cut the pavement twice; once prior to excavation and again prior to permanent resurfacing.
1. The first cut may be made using a water cooled abrasive saw, pneumatic chisel or a wheel cutter attached to a front end loader.
2. The second and final cut shall be made with a water cooled abrasive saw.
3. In all cases a trial section shall be cut to indicate the performance of the equipment to be used.
4. Pavement removed shall not be mixed with other excavated materials, but shall be disposed of away from the site of the work before the remainder of the excavation is made.
5. Existing pavement and base course to remain shall be protected by the Contractor. All existing pavements and base courses which are to remain and have been damaged, shall be restored or replaced by Contractor to match existing pavements, base courses and grades, at no additional expense to the Owner.

3.04 UNSUITABLE MATERIAL

A. All pipes and structures are to be laid on a stable foundation. If material at grade is determined to be unsuitable by the Engineer, the Contractor shall excavate a further depth and/or width, and refill with an approved material. Refill material shall be structural fill, gravel borrow or crushed stone as determined by the Engineer.
1. Where fine sand and silt are encountered at the bottom of the trench, it shall be the option of the Engineer to require a 6-inch compacted depth of concrete sand meeting ASTM C-33 for fine aggregate to be installed beneath the pipe bedding to the full width of trench.
2. Payment width limits shall be the same as specified for trench excavation, unless an additional width of trench is ordered by the Engineer.
3. Any excavation in excess of the amount ordered by the Engineer shall be backfilled and compacted with an approved granular material, at the Contractors expense.

3.05 ROCK REMOVAL

A. See Specification Section 02227.

3.06 DEWATERING

A. See Specification Section 02140.

3.07 BACKFILLING AND COMPACTING

A. Backfill shall be placed in uniform layers. Each layer shall be thoroughly compacted by tamping or vibrating with mechanical compacting equipment.

1. Care shall be taken to compact the backfill materials throughout the full width of the excavation and beneath all pipes and structures.
2. The backfilling of trenches shall proceed as soon as the laying of the pipe(s) or installation of the structures will allow.
3. Pipe bedding shall be required below and up to the springline of all pipe.
   a. Pipe bedding shall be placed to the full width of the trench and to a depth of 6 inches below the bottom of the pipe barrel as indicated on the Drawings.
4. Pipe bedding shall be placed 12 inches beyond the widths of a utility structure foundation (base) and to a depth of 6 inches below the foundation (base) or as indicated on the Drawings.
5. After a pipe has been placed and bedded, the trench shall be filled to the centerline of the pipe with pipe bedding and compacted.
   a. Material under and around the pipe shall be carefully and thoroughly compacted and tamped with approved compacting equipment.
6. From the centerline of the pipe to a point 12 inches above the top of the pipe, the fill shall be pipe bedding.

B. Placement of Backfill Above the Pipe Bedding
1. Above the pipe bedding, backfill shall be suitable material from the excavation or, if ordered by the Engineer, gravel borrow.
   a. This backfill shall be placed in layers 12 inches deep in loose measure, and each layer shall be thoroughly compacted.
   b. This backfill shall be placed up to the bottom of materials specified to be placed for surfacing requirements.

C. Roadway Trench
1. The following additions shall apply specifically to trenches within roadways:
   a. The top twelve (12) inches of trench refill, roadway sub-base, shall be comprised of processed gravel furnished, placed, graded and compacted by the Contractor. This material shall be placed during the backfilling operation.
   b. The Contractor shall fine grade the surface, apply dust control treatment, and maintain the surface in a condition which will allow safe vehicular traffic until resurfacing is placed.
2. The length of unsurfaced trench shall not exceed 500 linear feet, and shall be maintained to the Owner's satisfaction, in a condition to allow safe vehicular traffic.
   a. If the trench is not maintained in a satisfactory condition, the allowable length of unsurfaced trench shall be reduced accordingly.

3.08 TRENCH SIZE

A. Trenches shall be excavated to the necessary width and depth for proper laying of pipe and placement of concrete and other materials and shall have vertical sides to 12 inches above the pipe.
1. Widths of trenches shall provide 12 inches clearance between the sides of the trench and the outside face of the pipe.
2. Maximum trench width (W) (to 12 inches above the pipe) for 12-inch nominal diameter and smaller pipe shall be 36 inches.
3. Maximum payment trench width (W) (to 12 inches above the pipe) for pipes larger than 12 inches in diameter shall be the outside diameter of the pipe plus 24 inches.
4. Above 12 inches over the pipe, the maximum trench width shall be as close to the above widths as installation requirements allow.
5. The depth of trench shall be a minimum 6 inches below the pipe barrel, or 1/4 of the pipe diameter, whichever is greater.

3.09 STRIPPING TOPSOIL

A. Topsoil shall be carefully stripped and separately stored to be used again for topsoiling and seeding on off-pavement areas within which excavations are to be made.

3.10 EXCAVATION NEAR EXISTING STRUCTURES AND UTILITIES

A. It is called to the attention of the Contractor that there are utilities and other underground pipes along the course of the work. Information shown on the Drawings as to the location of said utilities and pipes is from the best

available sources, but no guarantee is implied, nor is it to be assumed that such information is accurate or complete. Utility lines shall be crossed in the course of the work.

B. The Contractor shall exercise special care during his operations to avoid injury to all such underground utilities and structures.
   1. When necessary, the Contractor shall cooperate with, and consult with representatives of the Owner and the utility companies in order to avoid damage to the utilities.
   2. The Contractor shall arrange for or furnish and erect suitable supports and shoring or other means of protection where required to protect the utilities, all at no additional cost to the Owner.
   3. Hand methods of excavating shall be used around buried utilities and is included in the work to be done under this Contract, at no additional cost to the Owner.
   4. Interference between the proposed work and existing utilities, relocation of existing utilities, repair, or damage to existing utilities, and protection and support of existing utilities during construction of the proposed work will be as specified in Section 01013.

3.11 PROTECTION OF PROPERTY

A. The Contractor shall, at his own expense, preserve and protect from injury all property either public or private along and adjacent to the line of work, and be responsible for and repair any and all damage and injury thereto, arising out of or in consequence of any act or omission of the Contractor.
   1. All existing pipes, culverts, poles, wires, fences, mailboxes, stone walls, curbs, bounds, etc., shall be temporarily removed, supported in place or otherwise protected from injury, and shall be restored to at least as good condition as that in which they were found immediately prior to the start of work.
   2. Lawns, shrubs, bushes, planting beds and decorative trees disturbed or damaged shall be restored to a condition equal to that found prior to the start of construction, either by temporary transplant or replacement in kind, except as otherwise indicated on the Drawings.

3.12 SAFETY AND ACCOMMODATION

A. The Contractor shall provide, at his own expense, suitable bridges over trenches where required for the accommodation and safety of the traveling public, and provide facilities for access to private driveways for vehicular use.
   1. He shall erect suitable barriers around the excavation to prevent accidents to the public and shall place and maintain during the night, sufficient lights on or near the work.
   2. A space of twenty (20) feet shall be left so that free access may be had at all times to fire hydrants and proper precautions shall be taken so that the entrances to fire hydrants and fire stations shall not be blocked or obstructed.

3.13 DETOURS

A. It is the intent of this Contract to keep the roadways open to two way traffic at all times. In order to obtain permission for the closing of the roadway, the Contractor shall satisfy the Owner, Police Chief, and Fire Chief, that his operations will allow emergency access at all times.
   1. See Section 01570, Traffic Regulations.

3.14 UNIFORMED POLICE OFFICERS

A. The Contractor shall make all arrangements with the local Police Chief and/or the State Police for the services of uniformed police officers.
   1. If, in the opinion of the State Police, Police Chief, or the Owner, uniformed police officers are required for protection of persons and control of traffic, the Contractor shall be responsible for making all arrangements for said uniformed police officers as may be required.

3.15 COMPACTION REQUIREMENTS AND TESTING

A. All backfill materials shall be thoroughly compacted by rolling, tamping or vibrating with approved mechanical or pneumatic compacting equipment so that pipe, structures, paving and other construction will not settle at the time of construction or in the future. The responsibility for thorough compaction is that of the Contractor irrespective of methods of backfill and depth of backfill layers placed.

B. All percentages of compaction specified herein shall be of the maximum dry density at the optimum moisture content as established by Method D of AASHTO Standard T180 (ASTM D1557) (Modified Proctor) and verified by AASHTO Standard T147 (ASTM D 1556). When the term "thoroughly compacted" is used in these specifications, it shall mean compaction to at least 95% of the maximum density of the soils at optimum moisture content.

C. The following numbers and types of soil tests shall be made where directed by the Engineer. These tests shall be made by qualified personnel of an independent testing laboratory, acceptable to the Engineer and paid by the Contractor.

1. Particle-Size analysis of Soils and Backfill Materials in accordance with ASTM D422. A total of 5 satisfactory tests.
2. Moisture-Density Relationship of soil in accordance with ASTM D1557, Method D. A total of 5 satisfactory tests.
3. In-Place Density Tests of materials in accordance with ASTM D1556. One in-place density test shall be performed every 300 linear feet, or as directed by the Engineer. Compaction tests will be taken at random on compaction layers below and at finished surfaces.
4. Failed tests shall be repeated at the Contractor's expense.

D. The Owner reserves the right to have additional compaction tests performed by an independent laboratory with testing costs borne by the Owner, except that failed tests shall be repeated at the Contractor's expense.

E. If any of the field density test results fail to meet the density as specified herein for the earthwork involved, then the Contractor shall remove all of the earthwork in that portion of the work involved as determined by the Engineer, and shall replace it in accordance with these Specifications to the required density. After the work is replaced, additional field density tests will be made by an independent testing laboratory retained by the Owner, and the Contractor shall reimburse the Owner for all costs for such additional testing.

1. Compaction shall be to the following densities:

Fill and Backfill Location	Modified Proctor Density (Percent)
Under structures and pipes	95
Beside structure foundation walls	95
Top two feet under pavements	95
Under pavements below top two feet	95
Trenches through unpaved areas	90
In embankment	90

F. Puddling and jetting of the backfill shall not be permitted except in special cases approved by the Engineer.

3.16 TRENCH EXCAVATION IN FILL

A. Where the existing ground surface does not permit at least 4 feet of cover over the finished pipe, and where indicated on the Drawings, the Contractor shall place and compact suitable fill material to the depth necessary to provide the 4 foot minimum cover, including loam to a minimum top width of 6 feet, or as otherwise shown on the Drawings

1. Minimum side slopes shall be two horizontal to one vertical.
2. Fill material shall be from surplus suitable material or gravel borrow, and be clean, dry, and capable of satisfactory compaction, all as approved by the Engineer, and shall be placed in layers not exceeding 8 inches thick and compacted.
3. The trench shall be excavated in the compacted fill and the remainder of the work shall be in accordance with other portions of these Specifications.

3.17 DISPOSAL OF SURPLUS AND UNSUITABLE EXCAVATED MATERIAL

A. All surplus excavated material and any material unsuitable for use shall be disposed of in disposal areas provided by the Contractor.

1. It is the Contractor's responsibility to dispose of unsuitable excavated material in an approved manner.

2. The Contractor shall not dispose of surplus materials on wetlands or other areas prohibited by the Corps of Engineers or the Commonwealth of Massachusetts Department of Environmental Protection, or any other local authority having jurisdiction.

3.18 DUST CONTROL

A. The Contractor shall perform dust control operations as specified in Section 01120.

3.19 CLEAN-UP

A. The Contractor shall remove all surplus materials (earth, pipe, fittings, storage, and office trailers, barricades, etc.) from the construction site.

1. All paved roadways affected by the construction shall have their full width swept clean (paved edge to paved edge) using methods which control the dust.
2. Before the Contractor may proceed to another roadway, cleanup of the previous roadway must be complete.

END OF SECTION

SECTION 02227

ROCK REMOVAL

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Remove all rock encountered while excavating for structures, roadways, or utility trenches as required by the Contract Documents.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02140 Site Drainage and Dewatering
   2. Section 02222 Earthwork for Water Distribution Systems

1.03 DEFINITIONS

A. Rock excavation: Rock which requires explosives, wedging or impact hammer for its removal. Concrete shall be classified as rock.

B. Boulders, slabs or other single pieces of material encountered, which are less than one (1) cubic yard shall not be considered rock.

1.04 STANDARDS

A. All handling of explosives and blasting shall be in compliance with the pertinent sections of Commonwealth of Massachusetts Regulations (CMR) 13.00.

1.05 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

B. Comply with all pertinent requirements of governmental agencies having jurisdiction.

1.06 SUBMITTALS

A. Submit plans for proposed pre-blast survey (Record purposes only).

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 NOTIFICATION

A. When rock is encountered, it shall be uncovered and the Engineer notified.
   1. The Contractor shall provide the Engineer with cross sections of the rock surface or a profile of the rock where trenches are concerned.
   2. The Engineer shall be present when the cross sections or profiles are taken.
   3. The average end area method shall be used in computing the volumes wherever practicable.

3.02 LIMITS OF EXCAVATION IN ROCK

A. Excavation in rock shall be performed, so that no projection shall come within vertical planes twelve (12) inches outside of the structure being built or twelve (12) inches below the bottom of the structure base slab and footings.

B. In trenches, the rock shall be removed to the limits shown on the typical trench section.
   1. Where excavation is carried beyond the above determined limits, the additional space shall be refilled at the Contractor's expense with concrete or other specified materials.

3.03 BLASTING

A. Pre-Blast Survey: Prior to any blasting, the Contractor shall submit a pre-blast survey.
   1. The survey shall satisfy the insurance requirements of the Contractor and be acceptable to the Contractor's insurance carrier, as well as provide data to assess damages to personal property and real estate due to blasting operations.
   2. The survey shall be complete as warranted by the nature of the work.

B. Take all precautions necessary to warn and/or protect any individuals exposed to his operations. Such precautions shall include but not be restricted to the following:
   1. Present written certificate of insurance showing evidence that his insurance includes coverage for blasting operations, before doing any blasting work.
   2. Make necessary arrangements as may be required by the applicable Federal, State, County or Municipal codes, rules, regulations and laws, and shall be responsible for compliance.
   3. Obtain a permit from the local authorities to perform blasting operations.
      a. The Engineer shall be notified in writing that such permit has been obtained.
   4. Schedules for blasting shall be thoroughly coordinated with the proper authorities – Federal, State, and Local.
      a. No blasting shall be done unless the Contractor has notified all concerned parties that he may blast.
      b. The Contractor shall also notify any commercial installation in the immediate area whose operations or instrumentation may be affected by blasting, at least twenty four (24) hours prior to blasting operations.
   5. Seismographic recordings shall be made of all blasting operations on the project by a qualified testing agency hired and coordinated by the Contractor.
      a. A copy of these recordings shall be made available to the Engineer.
   6. Blasting shall be performed by persons who are licensed to use explosives.
   7. The Contractor shall keep an accurate record of each blast and submit a copy to the Engineer. The record shall show the date, time, exact stationing of the blast, the depth and number of drill holes, and kind and quantity of explosive used, and any other data required for a complete record.
   8. The Contractor shall be fully responsible for damages caused by his blasting operations.
   9. If rock below the limits of excavation is shattered by blasting, caused by holes drilled to deep, too heavy a charge of explosives or any other circumstance due to blasting, the shattered rock shall be removed and the void refilled with gravel borrow at the expense of the Contractor.
      a. Gravel borrow shall be as specified in Section 02222 Earthwork for Water Distribution Systems.

3.04 DISPOSAL AND REPLACING OF ROCK

A. Remove and dispose of all pieces of rock which are not suitable for use in other parts of the Work.
   1. Rock disposed of by hauling away to spoil areas shall be replaced by surplus excavation obtained elsewhere on the site, insofar as it is available.

B. Fragments of rock approximately twenty five (25) pounds or less may be used in the fill areas of the site (roadway areas excluded).
   1. The Contractor shall place these pieces of rock in thin layers alternating them with layers of earth to be sure that all voids between the rock are completely filled with earth.
   2. If in the opinion of the Engineer the quantity is excessive, he may order the removal and disposal of the rock.

C. Be responsible for obtaining spoil locations and the removal of all excess rock from the site.

END OF SECTION

SECTION 02435

REMOVING AND RELAYING EXISTING DRAINS

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this section consists of furnishing all labor, materials, and equipment required for removal of cast iron, concrete, reinforced concrete, corrugated metal, asbestos cement, or vitrified clay drains ranging in diameter from 4 inches to 36 inches, where required in the work, and relaying them after construction to conform with lines and grades existing prior to construction.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3 Section 02222 Earthwork for Water Distribution Systems
4. Section 02227 Rock Removal

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTION

3.01 DRAIN PIPE REMOVAL

A. A trench of sufficient width and depth shall be excavated so that the drain pipes may be removed without damage.

1. The Contractor shall stockpile all removed sections of pipe at or near the job site.
2. They shall be properly stacked or dispersed and protected to prevent damage.
3. The Contractor shall replace any pipe sections that are to be relaid which may become lost, damaged or destroyed as a result of his operations, or because of his failure to properly store and protect them in a manner that would eliminate such damage or loss.
4. Sections already damaged through no fault of the Contractor shall be replaced at the Owner's expense.

3.02 RELAYING DRAIN PIPES

A. The trenches shall be prepared to the proper widths and depths to facilitate the installation of the pipe.

1. The subgrade shall be compacted to support the pipe or other structures until it is firm and unyielding for the entire width of the trench.
2. Gravel or crushed stone shall be used to bed the pipe.
3. Pipes shall be relaid to proper line and grade by utilizing batter boards or a transit or level.
4. Pipe sections are to be thoroughly cleaned of all silt or debris prior to installation.
5. Sections which have been damaged to such an extent that they may present future maintenance problems or may fail under loading shall not be reused.
6. The Contractor shall be required to replace any sections damaged by negligence at his own expense.

END OF SECTION

SECTION 02513

ASPHALTIC CONCRETE PAVEMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide asphaltic concrete pavement and appurtenant items as required by the Contract Documents.
   1. In general the Contractor shall provide all labor, equipment, and materials, and perform all operations in connection with the installation of asphaltic concrete pavement, berms, pavement markings, calcium chloride, final grade adjustments of valve boxes, manhole and catch basin castings, and preparation of the trench.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02222, Earthwork for Water Distribution Systems

1.03 STANDARDS

A. All paving shall comply with the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, hereinafter called Standard Specifications, as referenced.

1.04 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART 2 PRODUCTS

2.01 GRAVEL SUBBASE

A. Shall be as specified in Section 02222, Earthwork for Water Distribution Systems

2.02 ASPHALTIC CONCRETE PAVEMENT

A. Binder and Top Course:
   1. Shall be Class I asphaltic concrete conforming to Sections 420, 460 and M3 of the Standard Specifications.

2.03 ASPHALT TACK COAT

A. Shall consist of either emulsified asphalt, grade RS-1 conforming to Section M3.03.1, or cutback asphalt, grade RC-70 or RC-250 conforming to Section M3.02.0 of the Standard Specifications.

2.04 PAVEMENT MARKING PAINT

A. Shall be High Heat Rapid Drying Traffic Marking Material conforming to Section M7.01.09, (Yellow High Heat Rapid Drying Traffic Marking Material) of the Standard Specifications.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FINAL PREPARATION OF SUBGRADES

A. Gravel Subbase:
1. Minimum compacted depth of 12 inches as measured from the bottom of the pavement.
2. Spread and compacted in layers not exceeding 6 inches in depth, compacted measurement.
3. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by the standard AASHO Test Designation T99 Compaction Test Method C at optimum moisture content.

3.03 GENERAL

A. All asphaltic concrete thickness referred to in this Section shall be compacted thickness.

B. No asphaltic concrete shall be placed when the air temperature is below forty (40) degrees Fahrenheit, or when the material on which the mix is to be placed contains frost.

C. Maintain asphaltic concrete under this Contract during the guarantee period of one (1) year.
1. Promptly refill and re-pave all areas which have settled or are otherwise unsatisfactory for traffic.

3.04 PLACEMENT OF ASPHALTIC CONCRETE PAVING

A. Temporary Trench Pavement
1. Place after underground facilities have been installed.
2. Pavement shall be the type as specified in this Section except that “cold-mix” will be acceptable for repairs during seasonal closure of the asphalt concrete supplier.
3. Compacted thickness shall be 2 inches unless otherwise detailed on the Drawings.

B. Permanent Trench Base Course Resurfacing
1. Shall be utilized as the base course of the permanent resurfacing.
2. Remove temporary pavement, square up all edges and prepare base course as specified in this Section.
3. Edges of the trench shall be cut back in a neat true line, twelve (12) inches outside all limits of the excavation with a water cooled abrasive saw.
4. Edges of the existing pavement shall be brushed clean and the specified tack coat applied.
5. Pavement compacted thickness shall be two (2) inch, placed in a single lift.
6. Placed with a self-propelled spreader.
7. Compaction shall be accomplished with a self-propelled roller, with a weight of approximately 285 pounds per inch of roller width.
8. Trench base course resurfacing shall be maintained by the Contractor until permanent top course resurfacing is placed.

C. Permanent Trench Top Course Resurfacing:
1. Base course pavement shall remain in place.
2. The base course shall be swept clean of all foreign matter and loose material.
3. Depressions in the base course resurfacing shall have a leveling course applied before the top course paving begins.
4. The surface receiving the top course shall be completely dry prior to the application of the tack coat.
5. Tack coat shall be applied at the rate of 0.25 gallons per square yard. The contact surface of the curbing, castings and other structures shall be painted with the tack coat.
6. Pavement compacted thickness shall be two inch (2”), placed in a single lift.

D. Sand Seal
1. The butt edges of all permanent resurfacing and overlays shall be sealed with a six (6) inch wide continuous strip of RS-1, completely covered with sand.

3.05 CASTING ADJUSTMENTS

A. Where asphaltic concrete pavement is to be applied, manhole and catch basin frames and valve boxes are to be adjusted to the grade of the new pavement.
   1. A neat line shall be cut in the pavement around the existing frames and valve boxes.
   2. The material; gravel, pavement and concrete collar (if there) shall be removed down to six (6) inches below the frame.
   3. The frame shall be freed from its existing grout bed and shimmed with steel shims of the appropriate thickness, at a minimum of four (4) alternate locations, so as to insure that the frame will not rock. The frame shall then be set into a full bed of grout, and a concrete collar placed around the frame, up to within two (2) inches of finish grade.
   4. The frame shall be protected from damage from traffic until the concrete has taken a firm set.

3.06 BERMS

A. Asphaltic Concrete Berms:
   1. Berms shall be class I asphaltic concrete Type I-1.
   2. The mixture shall be placed and compacted with a machine acceptable and approved by the Engineer, for the type of berm required.
   3. Placing and forming of berms by hand shall not be allowed.

3.07 DUST CONTROL TREATMENT

A. Calcium chloride shall be applied only upon direction of the Engineer.
   1. The roadway shall be swept clean and calcium chloride spread at a uniform rate over the prepared gravel trench surface.

3.08 PAVEMENT MARKINGS

A. Pavement markings shall be applied as shown on the contract drawings or at locations directed by the Engineer.
   1. Pavements shall have been in place 48 hours prior to the application.
   2. The surface shall be prepared to accept the application in compliance with the paint manufacturer's requirements.
   3. Applied to a dry film thickness of fifteen (15) mils.
   4. The temperature of the pavement shall be between forty (40) degrees and one hundred twenty (120) degrees Fahrenheit.
   5. No thinners are to be used for the pavement markings.
   6. The equipment used for the application of pavement markings, shall be of standard commercial manufacturer. All other equipment and devices necessary for the application of pavement markings and protection thereof and for the protection of the traveling public, shall be as usually required for work of this type, and shall be furnished by the Contractor.
   7. Pavement markings shall be either a single continuous line or broken line, four (4) inches wide.
   8. If for any reason material is spilled or tracked on the pavement or any markings applied by the Contractor the Contractor shall remove such material.
      a. The material shall be removed by a method that is not injurious to the roadway surface and is acceptable to the Engineer.
      b. Clean the roadway surface and prepare the surface for a re-application of the pavement markings.

END OF SECTION

SECTION 02611

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide buried ductile iron water mains, fittings, and other appurtenances as required by the Contract Documents.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3. Section 02222 Earthwork for Water Distribution Systems
4. Section 02640 Buried Valves and Appurtenances
5. Section 02645 Hydrants
6. Section 02650 Thrust Blocks and Joint Restraints
7. Section 02675 Disinfecting Water Mains
8. Section 02676 Testing Piping Systems

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. All ductile iron pipe and fittings shall be of domestic manufacture.

C. Coordinate the work of this Section with the work of other related Sections.

1.04 INSPECTION, TESTS, AND ACCEPTANCE

A. All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe conforms to "AWWA Standard AWWA C151 for Ductile Iron Pipe, for Water and Other Liquids."

B. All tests shall be made in accordance with the methods prescribed by the above mentioned AWWA Standard, and the acceptance or rejection shall be based on the test results.

C. Pipe which does not conform to the requirements of this contract shall be immediately removed from the site and replaced by the Contractor with pipe which does conform.

1.05 STANDARDS

A. The following American Water Works Association (AWWA) standards form a part of this specification as referenced:

1. AWWA C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
2. AWWA C110 Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water and Other Liquids
3. AWWA C111 Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
4. AWWA C150 Thickness Design of Ductile-Iron Pipe
5. AWWA C151 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids
6. AWWA C153 Ductile-Iron Compact Fittings, 3 In. through 12 In., for Water and Other Liquids

1.06 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART 2 PRODUCTS

2.01 PIPE

A. Ductile Iron Pipe (Buried Service):
   1. All pipe shall meet the requirements of ANSI/AWWA C151/A21.51.
   2. Class: 52
   3. Joints:
      a. Mechanical meeting the requirements of ANSI/AWWA C111/A21.11.
      b. Push-on meeting the requirements of ANSI/AWWA C111/A21.11.
   4. Gaskets: Conform to ANSI/AWWA C111/A21.11.
   5. Lining: Conforming to ANSI/AWWA C104/A21.4
   6. Thickness of cement-mortar lining:
      a. 1/8 inch for pipes 12 inches and smaller.
      b. 3/16 inch for pipe 14 inches and larger.
   7. Cement-mortar lining to be seal coated per AWWA C104.
   8. Accessories: Pipe shall be provided with all necessary accessories to make-up the joint (glands, tee head bolts, hex nuts, etc.).

2.02 FITTINGS

A. Fittings:
   1. Comply with ANSI/AWWA C153/A21.53.
   2. Pressure rating: 350 psi.
   3. Lining and coating: Same as pipe.
   4. Joint: Mechanical joint in compliance with ANSI/AWWA C111/A21.11.
   5. Markings on fittings: Comply with ANSI/AWWA C110/A21.10.

2.03 SPECIAL FITTINGS

A. Locking Hydrant Tees: Shall be mechanical joint, each having a bell and plain end, with a split mechanical joint on the plain end. Gate valve shall be secured directly to the tee by using the standard mechanical joint gasket and standard bolts.

B. Retainer Glands: Shall be cast of high strength ductile iron and fitted with ductile iron wedging devices and twist-off pressure nuts, four (4) each for six (6) inch pipe, six (6) each for eight (8) inch pipe, twelve (12) each for twelve (12) inch pipe, and sixteen (16) each for sixteen (16) inch pipe.

C. Couplings: Shall be ductile iron per ASTM A536 Grade 65-45-12, consisting of a middle ring, two (2) rubber gaskets, and the followers with stainless steel bolts and nuts. Coupling and gasket shall be sized for the particular application intended. Couplings shall be as manufactured by Rockwell Style 441.

D. Plugs: Shall be ductile iron with mechanical or push-on joint and retainer feature.

E. Sleeves: Shall be Class 350 ductile iron with mechanical joint, long body style meeting or exceeding the requirements of ANSI/AWWA C110/A21.10 or latest revision thereto.

F. Transition Couplings: As required for joining pipes of different diameters shall be furnished as required and designed for compatibility with the pipe and operating pressures encountered.
   1. Transition couplings shall be Dresser Style 162 as manufactured by Dresser Industries Inc., or an approved equal.

2.04 PIPE INSULATION

A. Pipe insulation shall be Trymer 2000 Brand Polyisocyanurate Foam Insulation conforming to ASTM C-591 Type I, or an approved equal.
B. Pipe insulation shall be jacketed with Perma-Jac "SX" high impact plastic jacketing or an approved equal.

2.05 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure precise fit of the items.

3.03 GENERAL

A. Earthwork:
1. Trench, backfill and compact for the work of this Section in strict accordance with the pertinent provisions of Section 02222, Earthwork for Water Distribution Systems.
2. Shoring for the work of this Section shall be in strict accordance with Section 02160, Support of Excavation.
3. Control of ground and surface water shall be in strict accordance with Section 02140, Site Drainage and Dewatering.

3.04 PIPE HANDLING

A. Handling:
1. The Contractor shall take care not to damage pipe by impact, bending, compression, or abrasion during handling, and installation. Joint ends of pipe especially shall be kept clean.
2. Pipe shall be stored a minimum 4 inches above ground at a height no greater than 5 feet, and with even support for the pipe barrel.
3. Only nylon-protected slings shall be used for handling the pipe. No hooks or bare cables shall be permitted.
4. Gaskets shall be shipped in cartons and stored in a clean area, away from grease, oil, heat, direct sunlight, and ozone producing electric motors.

3.05 INSTALLATION

A. Pipe:
1. Installation and jointing of ductile iron pipe shall be in accordance with AWWA C600 Sections 9b and 9c, latest revision, as applicable.
2. In general, jointing of ductile iron push-on pipe and fittings shall be done as follows.
3. The last 8 inches of the outside of the spigot end of the pipe and the inside of the bell end of pipe shall be thoroughly cleaned.
4. The joint surfaces and the gasket shall be painted with a lubricant, provided by the pipe manufacturer, just prior to making up the joint. The spigot end shall then be gently pushed home into the bell.
5. The position of the gasket shall be checked to insure that the joint has been properly made and is watertight.

6. Care shall be taken not to exceed the manufacturer's recommended maximum deflection allowed for each joint.
7. When laying is not in progress, including lunch time, the open ends of the pipe shall be closed by a watertight plug.
8. When cutting of pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe.
   a. Cut ends of pipe to be used with a push-on type bell shall be beveled to conform to the manufactured spigot end.
   b. Cement lining shall be inspected for damage and shall be remortared as required to ensure a continuous lining.

B. Caps and Plugs:
   1. Shall be provided with a threaded corporation or bleeder valve so that air and water pressure can be relieved prior to future connection.

C. Thrust Blocking for Fittings:
   1. As specified in Section 02650, Thrust Blocks and Joint Restraints.

D. Couplings:
   1. Contractor shall provide all adapters and fittings such as transition couplings, as determined in the field, necessary to complete all tie-ins, whether or not specifically stated in the Specifications or on the Contract Drawings.

3.06 SPECIAL CONDITIONS

A. Under no conditions shall ductile iron pipe be installed within 5 feet of gas lines without written permission from the Engineer at the discretion of the Owner.

3.07 TESTING

A. Comply with the pertinent sections of Section 02676, Testing Piping Systems.

3.08 DISINFECTING

A. Comply with the pertinent sections of Section 02675, Disinfecting Water Mains.

END OF SECTION

SECTION 02640

BURIED VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide buried valves, valve boxes, and valve accessories, as required by the Contract Documents.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications
1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3. Section 02222 Earthwork for Water Distribution Systems
4. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. An exploded view diagram with a materials list.

1.04 STANDARDS

A. The following American Water Works Association (AWWA) standards form a part of this specification as referenced:
1. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service,
2. AWWA C504 Rubber-Seated Butterfly Valves.
3. AWWA C500 Metal-Seated Gate Valves for Water Supply Service

PART 2 PRODUCTS

2.01 VALVES

A. Resilient Seated Gate Valves: Shall be used on all water mains equal to or less than twenty (20) inches in diameter and all hydrant branches.
1. Valves shall be as manufactured by Mueller Co., Mueller Resilient Gate Valve or Kennedy Valve Division of I.T.T., Grinnell Valve Co. Inc., Kennedy A.W.W.A. Gate Valve, or approved equal.
2. Meet or exceed the requirements of ANSI/AWWA C509 and C500.
3. Joints: Mechanical joint conforming to ANSI/AWWA C111/A21.11,
4. Cast iron body,
5. Bronze stem,
6. Resilient sealed wedge type:
   a. Wedge: Fully encapsulated; no exposed iron,
7. Triple O-ring seal stuffing box,
8. Non rising stem,
9. One (1) and Seven Eighths (7/8) inches square operating nut,
10. Rated for 225 psi and tested to 500 psi,
11. Open: Clockwise (right),

12. All internal and external surfaces except rubber coatings shall be coated with fusion bonded epoxy to a minimum thickness of 8 mils:
    a. Coating shall be non-toxic, impart no taste to water and shall conform to AWWA C-550.
13. Vertical Burial
14. Working Pressure of 150 psi.

2.02 VALVE BOXES

A. Valve boxes shall be provided for each buried valve. They shall be:
1. Domestic manufacture,
2. Cast iron with a cast iron cover,
3. Cover shall have the word "WATER" cast into the cover in raised letters,
4. Valve box barrel shall not be less than (5-¼) inches in diameter,
5. Shall be two (2) piece sliding type, providing a minimum overlap of six (6) inches,
6. The lower section shall enclose the operating nut and stuffing box/gear box of the valve and shall have a minimum diameter of 8 inches,
7. The box shall not transmit shock or stress to the valve.

PART 3 EXECUTION

3.01 HANDLING AND INSPECTION

A. Care shall be taken to prevent damage to valves and appurtenances during handling and installation. All materials shall be carefully inspected for defects in workmanship and materials.

B. All operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves which do not operate easily or are otherwise defective shall be replaced at the Contractor's expense.

3.02 INSTALLATION

A. General:
1. Construction methods for the work under this Section shall conform to the applicable portions of Section 02611, Buried Ductile Iron Pipe and Fittings, details as shown on the Contract Drawings, manufacturer's recommended installation procedures, and procedures specified herein.

B. Valves and Appurtenances:
1. Generally, valves shall be set and aligned plumb, supported by a flat stone or solid concrete block, with the trench bottom being firmly compacted.
2. Valve boxes shall be set centered and plumb over the operating nuts of all, direct burial valves. The top of each valve box shall be set to finished grade with at least 10 inches of overlap remaining between the upper sections for future vertical adjustment. Minimum overlap for lower, extension pieces shall be 6 inches.
3. Valves, bolts and all other appurtenances shall be thoroughly cleaned and given a shop coat of asphaltum varnish.
4. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.

END OF SECTION

SECTION 02645

HYDRANTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide hydrants as required by the Contract Documents.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 02222 Earthwork for Water Distribution Systems
2. Section 02611 Ductile Iron Pipe and Fittings
3. Section 02640 Buried Valves and Appurtenances
4. Section 02650 Thrust Blocks and Joint Restraints

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to insure compliance with the specified requirements.

1.04 STANDARDS

A. The following American Water Works Association (AWWA) Standards form a part of this specification as referenced:
1. AWWA C502 Dry-Barrel Fire Hydrants.

PART 2 PRODUCTS

2.01 HYDRANTS

A. New hydrants shall conform to AWWA Specifications tested for three hundred (300) psi water pressure and one hundred fifty (150) psi working pressure.

B. All hydrants shall be traffic type with breakable safety feature at the ground line flange joint which is to be set no more than 3" above the adjacent and/or prevailing ground elevation as determined by the Engineer.

C. Hydrants shall be Mueller Centurion as manufactured by the Mueller Co., Chattanooga, Tennessee; Kennedy Guardian as manufactured by the Kennedy Valve Manufacturing Co., Elmira, New York, American Darling (B-62-B) as manufactured by American Flow Control, Birmingham Alabama, or an approved equal.

1. 5" Valve opening
2. 6" Mechanical joint connection conforming to ANSI Specification 21.11
3. Two (2) 2-1/2 inch hose nozzles
4. One (1) Steamer Connection
5. Five (5) foot bury (Five (5) foot six (6) inches from ground line to invert of inlet connection).
6. Five (5) foot six (6) inch bury (Six (6) foot from ground line to invert of inlet connection).
7. Six (6) foot bury Six (6) foot six (6) inches from ground line to invert of inlet connection).
8. Replaceable brass nozzles,
9. Mechanical joint shoe,
10. Open clockwise (right),
11. Be in full compliance with AWWA C502.
12. Shall be tested for three hundred (300) psi water pressure and one hundred fifty (150) psi working pressure.

B. Hydrants shall conform to National Standard Specification sizes in threads and nuts. Caps shall have retainer chains and rubber gaskets.

C. The standpipe shall be of the two section traffic type and be equipped with breakable safety feature on stem and flange joint at ground line. All parts of each type and size are to be interchangeable with each other. The hydrants shall be arranged to open right, and an arrow to indicate same is to be cast thereon. The operating nut, and the nozzle cap nuts, shall be National Standard, pentagon shape measuring 1-7/8 inches from point to flat.

D. The painting shall be white for tops and nozzle caps, and red for the standpipe above the ground line.

2.02 HYDRANT EXTENSION

A. Extension Kit: If required to meet grade on site:
   1. Shall be provided by the hydrant manufacturer,
   2. Length shall be as needed to meet finish grade.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and condition under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure fit of items.

3.03 PROPOSED HYDRANT LOCATIONS

A. All new hydrant locations shown on the Contract Drawings shall be subject to field location approval by the Owner or the Engineer.

3.04 INSTALLATION

A. Hydrants:
   1. Trench, backfill and compact for the work of this Section in strict accordance with pertinent provisions of Section 02222, Earthwork for Water Distribution Systems.
   2. The hydrant drainage pit shall be approximately three (3) feet in diameter and filled with compacted crushed stone. While backfilling, place additional crushed stone to at least six (6) inches above the hydrant drain ports.
   3. After being thoroughly cleaned, all iron work set below ground shall be painted with two coats of asphalt varnish as specified in AWWA C504.
   4. Thrust blocking shall be placed behind the shoe of the hydrants, taking care not to block the drain outlets.
   5. The hydrant shall be set plumb and to the proper grade and shall remain properly supported until it is backfilled.
   6. All iron work left above ground shall be shop painted with two coats of paint of quality and color to correspond to the present standard of the Owner.
   7. After the hydrant has been set, it shall be entirely draped with burlap and remain covered until the water distribution system has been accepted and put into service.

END OF SECTION

SECTION 02650

THRUST BLOCKS AND JOINT RESTRAINTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide thrust blocks and joint restraints for the water mains as required by the Contract Documents.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
1. Section 02140 Site Drainage and Dewatering
2. Section 02160 Support of Excavation
3. Section 02222 Earthwork for Water Distribution Systems

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to insure compliance with the specified requirements.

PART 2 PRODUCTS

2.01 CONCRETE

A. Concrete shall be as specified in Section 03300, Cast-In-Place Concrete.
1. Minimum concrete strength shall be 3000 psi after 28 days.

2.02 JOINT RESTRAINTS

A. Mechanical joint restraint shall be Megalug 1100 Series as manufactured by EBAA Iron Sales Inc., Eastland, Texas, or an approved equal
1. Glands shall be manufactured of ductile iron conforming to ASTM A536.
2. The wedges shall be ductile iron, heat treated to a minimum hardness of 370 BHN.
3. Shall have a minimum working pressure of 350 psi for pipe diameters up to 16 inches with a minimum safety factor of 2:1.
4. Twist-off nuts.

2.03 OTHER MATERIALS

A Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 EXECUTION

3.01 THRUST BLOCKS

A. Concrete thrust blocks shall be provided at all hydrants and fittings.
1. The backs of thrust blocks shall be placed against undisturbed earth and the sides shall be formed.
2. Felt roofing paper shall be placed to protect pipe joints.
3. Concrete shall not be placed over bolts or nuts.

3.02 JOINT RESTRAINTS

A. Mechanical joint restraint devices shall be installed at all fittings in accordance with the manufacturer's written instructions.

END OF SECTION

SECTION 02660

SERVICE CONNECTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Work included: Provide potable water service connections as required by the Contract Documents.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Distribution Systems
   2. Section 02611 Ductile Iron Pipe and Fittings
   3. Section 02640 Buried Valves and Appurtenances

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed, to insure compliance with the specified requirements.
   3. AWWA 75-CR Type K copper tubing.

1.04 STANDARDS

A. The following Standards form a part of these Specifications as referenced:
   1. AWWA C800 Underground Service Line Valves and Fittings.

1.05 QUALITY ASSURANCE
   A. Codes and Standards
      1. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of potable water system materials and products.
      2. Water Purveyor Compliance: Comply with requirements of Purveyor supplying water to project, obtain required permits and inspections.
   B. Compliance
      1. The Owner may require an affidavit from the manufacturer or vendor that the products furnished comply with all applicable provisions of AWWA C800 and AWWA C901.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials shall be of domestic manufacture.

B. The Owner has standardized on the following products listed in this Section for service connections.

2.02 SERVICE TUBING

A. Copper Service Tubing
   1. Conform to ASTM B88.
   2. Shall be type "K" soft temper.
   3. Name or trademark of the manufacturer shall be stamped along the pipe.

2.02 CORPORATION STOPS

A. Corporation Stop: Shall be as manufactured by Ford Water Service Products.
   1. Comply with AWWA C800, Underground Service Line Valves and Fittings.
   2. Cast alloy brass body.
   3. Ball type.
   4. PTFE coated ball.
   5. Double O-ring seals.
   6. 300 psi working pressure.
   7. AWWA taper thread for inlet and CTS compression end at outlet.

2.03 CURB STOPS

A. Curb Stops shall be as manufactured by Ford Water Service Products.
   1. Comply with AWWA C800, Underground Service Line Valves and Fittings.
   2. Cast alloy brass body.
   3. Ball type.
   4. PTFE coated ball.
   5. Quarter turn check.
   6. Double O-ring seals.
   7. 300 psi working pressure.
   8. Compression ends for CTS OD tubing.

2.04 CURB BOXES

A. Curb boxes shall be as manufactured by Mueller Co.; Model No. H-10334 (1-inch service) and Model No. H-10310 (1.5-inch and 2-inch service).
   1. Two (2) piece slide type with one (1) piece lid.
   2. Five (5) foot bury with arch pattern base.
   3. Provided with 36-inch stationary shut-off rod.

2.05 SERVICE SADDLE

A. Service saddle shall be used on all corporations larger than one (1) inch installed in eight (8) inch water mains.
   1. As manufactured by Clow (model: F-1280) or approved equal.
   2. Double stainless steel strap design.
   3. Epoxy coated ductile iron body.
   4. AWWA threads with Buna-N rubber gasket.
   5. Meet all applicable parts of ANSI/AWWA C800.

2.06 ADAPTER COUPLING

A. Adapter couplings for connecting new copper tubing to existing service connections at the property lines and/or at existing corporation stops shall be straight coupling fittings.
   1. As manufactured by Ford Water Service Products, or an approved equal.
   2. Conform to AWWA C800.

2.07 METER PITS

A. Meter pits for two (2) inch water services shall be provided by the Owner.

2.08 METER SPACER ASSEMBLY

A. Meter spacer assemblies shall be provided by the Owner.

PART 3 EXECUTION

3.01 INSPECTION

A. Service tubing which does not conform to the requirements of this specification shall be immediately removed from the site by the Contractor

3.02 HANDLING PIPE

A. The Contractor shall take care not to damage pipe by impact, bending, compression, or abrasion during handling, and installation. Joint ends of pipe especially, shall be kept clean.

3.03 SERVICE LOCATIONS AND SHUT-DOWNS

A. All new service locations shown on the Contract Drawings shall be subject to field location approval by the Engineer and/or Owner.

B. Where a water service must by shut-down, it shall be the Contractor's responsibility to contact the party owning the service to arrange a shut-down schedule prior to doing any work.
   1. All such schedules must be approved prior to shut-down.
   2. Shut-down time shall be kept to a minimum so as to keep service off for the shortest possible time.

3.04 INSTALLATION OF TUBING

A. SERVICE TUBING
   1. Where directed by the Engineer, the Contractor shall install new services including 1-inch thru 2-inch tubing.
   2. For services outside the paved areas, trench excavation shall be utilized, with tubing being carefully laid in the bottom of the trench, backfill placed and compaction completed.
      a. Care shall be taken to insure against kinks or crushed areas.
   3. Backfill around and to one (1) foot over the tubing shall not contain stones greater than one (1) inch in diameter.
   4. For services to be installed beneath paved surfaces, a pneumatic drive device such as “Hole Hog” or equal, trenchless method shall be utilized to drive the new service beneath the pavement.
   5. Service tubing between the corporation stop and the curb stop shall be one (1) piece.
   6. Service tubing between the curb stop and the house shall be one (1) piece. Coupling shall not be allowed except for two (2) inch services greater than 200 feet in length.
   7. Tubing shall be connected to the curb stop and compression joints tightened.
   8. Duct tape shall be installed over the outlet end of curb stops, to be left for future connections.

3.05 APPURTENANCES

A. Corporation Stops.
   1. Provide the necessary tap, sized for the fitting.

B. Curb Stops and Boxes.
   1. Install curb stops where shown on the Drawings.
   2. Place valve box over stop, taking care that it is installed plumb.
   3. Curb stops shall be key checked after adjustment of curb box to final grade.
      a. Box shall be removed and reset over curb stop if curb stop not centered in box.

3.06 CURB STOP LOCATIONS

A. Unless otherwise directed, the new curb stops shall be generally located two (2) feet back from the curb line face, but in no case is a compression fitting to be installed within ten (10) feet of a building foundation with also installing a bonding jumper.

END OF SECTION

SECTION 02667

TEMPORARY POTABLE WATER PIPING AND SERVICE CONNECTIONS

PART 1 GENERAL

1.01 DESCRIPTION

A. Provide temporary potable water piping and service connections as required by the Contract Documents.
1. In general, the Contractor shall provide temporary distribution piping and hydrants, piping disinfection, connections to supply sources (hydrants or pipe lines), service connections to properties presently being supplied, access to ramps where temporary pipe line crosses driveways, trenching across roadways for temporary main services and all other work necessary to provide temporary potable water service to properties affected by the Washington Street project.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to:
1. Section 02222 Earthwork for Water Distribution Systems
2. Section 02675 Disinfecting Water Mains

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to insure compliance with the specified requirements.

1.04 STANDARDS

A. The following Standards form a part of these specifications as referenced:
1. ASTM D-1784 (PVC, Type 1, Grade 1, Class 12454/B)
2. ASTM D-2241 (PVC Plastic Pipe) pressure rated
3. ASTM D-3130 (Joints and Couplings)
4. ASTM F-477 O-Rings
5. AWWA C651 Water Main Chlorination

1.05 QUALITY ASSURANCE

A. Codes and Standards
1. Plumbing Code Compliance: Comply with applicable portions of National Standard Plumbing Code pertaining to selection and installation of potable water system materials and products.
2. Water Purveyor Compliance: Comply with requirements of purveyor supplying water to project, obtain required permits and inspections.

PART 2 PRODUCTS

2.01 TEMPORARY DISTRIBUTION PIPING

A. General
1. All materials in contact with potable water shall have NSF 61 approval.

B. Bypass Piping:
1. Size: Four (4) inches.
2. PVC SDR 21 or approved equal.
3. Wall thickness 0.214 inches.

C. Service Piping/Tubing
1. Size: ¾ inch to 4-inch polybutylene or approved equal.

2. Pressure class 160.
3. Meet the requirements of ANSI / AWWA C902.

D. Couplings:
1. O-Ring type.
2. Locking splines to insure coupling remains under pressure.

E. Connection Fittings
1. Provide all the necessary fittings, adapters, clamps, couplings and etc. to complete the service piping/tubing connections from the temporary potable water piping to the property being served.

F. Temporary Hydrants
1. Pumper Outlet Size: 4-½ inch diameter

PART 3 EXECUTION

3.01 GENERAL

A. The temporary distribution pipe shall be installed as required to provide potable water service where potable water service presently exists.
1. When necessary, the Contractor shall provide below ground taps to provide potable water service where fire hydrants cannot be used.
2. All temporary distribution piping connections to fire hydrants shall be made in such a manner that if it becomes necessary, they can be easily removed so that the fire hydrant can be used for firefighting purposes, with a minimum of effort.
3. Temporary hydrants shall be provided every 500 feet along the length of the project area.
4. At roadway crossings the temporary distribution pipe shall be installed in a shallow trench and adequately protected to prevent breakage and shall be overlaid with temporary bituminous surfacing.
5. At driveways crossings the temporary distribution pipe shall be ramped.
6. The Contractor shall furnish and maintain cones, barricades, flashing lights, signage and etc. during the time period in which the temporary potable water piping system is installed.
7. The Contractor shall coordinate temporary hydrants with the fire chief. At the discretion of the fire chief, 6-inch temporary hydrants and piping may be required.

3.02 INSTALLATION

A. Prior to installing any section of temporary distribution piping, the Contractor shall consult with the local Fire Department and the Owner and shall make any modifications to the piping that may be required by these agencies.
1. The temporary distribution piping and service pipe shall be chlorinated in accordance with AWWA C651.
2. The operation of all valves utilized in connection with this Contract shall be performed by a representative of the City.
3. Temporary valving shall be provided to isolate sections of the temporary potable water piping.
4. Service connections shall be provided at required locations or as requested by the Owner.
5. A valved blow-off line shall be provided.

3.03 MAINTENANCE AND REMOVAL

A. The Contractor shall maintain the temporary potable water piping in a safe and operative condition at all times.
1. No temporary potable water piping shall be installed in freezing weather and such piping already in use shall be removed and drained.

B. The Contractor shall remove the temporary potable water piping after the water main cleaning and lining has been completed, tested, chlorinated and accepted by the Owner, and the new service connections installed.

C. The Contractor shall leave the street and adjacent properties in a neat and orderly condition and in every respect equal to or better than their original condition.

END OF SECTION

SECTION 02675

DISINFECTING WATER MAINS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Disinfecting water mains and their appurtenances, as required by the Contract Documents.

B. The procedure for disinfecting water mains, as described in this section, generally consists of the following steps:

1. Flushing the new water mains.
2. Filling the new water mains with chlorinated water.
3. Disinfecting the new water mains with chlorine solution.
4. Flushing the chlorinated water from the new water mains.
5. Taking samples for bacteriological analysis.
6. Testing the samples at a state certified laboratory.
7. Placing the new water mains into service.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1. Section 02611 Ductile Iron Pipe and Fittings

1.03 SUBMITTALS

A. The Contractor shall prepare a plan for disinfecting water mains and their appurtenances that describes the proposed schedule, the location of all sampling and flushing points, and the overall procedure for disinfecting. The plan shall also present the proposed chemicals to be employed, the strength of the chemicals and the equipment employed to apply them. The plan shall be presented to the Engineer for review not less than two weeks prior to the proposed time for disinfecting the water mains.

B. Copies of all test results, as specified herein, shall be submitted directly to the Engineer from the laboratory that conducted the tests.

1.04 STANDARDS

A. The following standards are referenced, in part, in this specification:

1. Specific sections, or portions thereof, of AWWA C651 (latest revision) Disinfecting Water Mains, as further described herein.

1.05 COST OF DISINFECTING WATER MAINS

A. All costs associated with disinfecting water mains, including water, chemicals and bacteriological analysis of samples, as further described in this Section, shall be paid under the applicable items in the bid form.

PART 2 MATERIALS

2.01 WATER

A. Water for flushing of water mains, preparation of chlorine solutions and filling of water mains for disinfection shall be potable drinking water.

2.02 CHEMICALS

A. Chlorine for preparation of chlorine solutions for disinfection shall be sodium hypochlorite or calcium hypochlorite and shall conform to the requirements of ANSI/AWWA B300.

B. Chlorine solutions shall be neutralized prior to disposal using sodium bisulfite, sodium sulfite or sodium thiosulfate.

2.03 WATER SAMPLE BOTTLES

A. Sterile water sample bottles shall be obtained from a state certified laboratory.

1. Sterile bottles for bacteriological analyses shall be treated with sodium thiosulfate to neutralize any residual chlorine.
2. Two samples are required at each specified sampling point. One sample shall be analyzed for the presence of coliform bacteria and one sample shall be analyzed for the presence of heterotrophic plate count (HPC) bacteria.

PART 3 EXECUTION

3.01 WATER MAIN DISINFECTING

A. After completion of all water main related construction, except water service connection installation, all water mains, valves, hydrants, hydrant connections and other appurtenances installed under this Contract shall, be disinfected in accordance with AWWA Standard C651, Section 4.4.3 (Continuous Feed Method), as modified herein.

1. Taps for flushing, chlorination and sampling shall be installed by the Contractor at no additional expense to the Owner.
2. Flush the new water mains with potable water to remove any contaminants and debris that may have entered the water mains during construction.
3. The flushing velocity in the new water mains shall not be less than 2.5 feet per second. In the absence of a flow meter, flow rate shall be determined either by placing a pilot gage at the discharge or by measuring the time to fill a container of a known volume.
4. Prepare a chlorine solution that will be continuously fed into the potable water that is used to fill the new water mains.
5. The chlorine solution shall be applied to the new water mains with a chemical feed pump designed to feed chlorine solutions.
6. Completely fill the new water mains with the chlorinated, potable water to remove any air pockets. The point of application shall be no more than 10 feet downstream from the beginning of the new water mains.
7. The chlorine solution shall be of sufficient strength to provide a minimum residual chlorine concentration of 25 milligrams per liter (mg/l) in the filled water mains.
8. New valves and hydrants shall be operated to insure their proper disinfection.
9. Isolation valves shall be maintained in a closed position to prevent chlorinated water from entering the existing water distribution system.
10. Chlorinated water shall remain in the main for a minimum of 48 hours.
11. The minimum residual chlorine concentration at the end of the 48 hour holding period shall be 10 mg/l.
12. After the 48-hour retention period, chlorinated water shall be flushed from every hydrant branch on the main until the chlorine concentration leaving the main is no higher than that generally in the system or less than 1.0 mg/l.
13. Chlorinated water shall be discharged in a manner that will not adversely affect flora and fauna or drainage courses and shall conform to applicable State regulations for waste discharge.
14. Chlorinated water that is flushed from the mains shall be neutralized by the addition of a dechlorinating agent so that the residual chlorine concentration is zero.
15. The location of the discharge for the dechlorinated water shall be approved by the Engineer and the Owner.

3.02 BACTERIOLOGICAL TESTS

A. A minimum of 24 hours after flushing and before the new water mains are placed in service, the Contractor shall collect water samples for testing of the bacteriological quality of the water.

1. No hose or fire hydrant shall be used in the collection of samples.
2. A sampling tap shall consist of a standard corporation stop installed in the main with a PVC gooseneck assembly.
3. Samples for bacteriological testing shall be collected in sterile bottles treated with sodium thiosulfate and furnished by the state certified laboratory that will perform the tests.
4. Unless otherwise directed by the Engineer or the Owner, the minimum number of samples for bacteriological analysis shall be as follows:
   a. One sample every 1,200 linear feet of newly installed water mains.
   b. One sample at the end of the newly installed water mains.
   c. One sample at each branch.
5. One round of sampling shall be conducted on water distribution systems that continuously maintain a chlorine residual.
6. Two rounds of sampling shall be conducted on water distribution systems that do not continuously maintain a chlorine residual. The second round of sampling shall be conducted a minimum of 24 hours after the first round of samples is taken.

B. All bacteriological tests shall be performed by a state certified laboratory.

1. Two bacteriological tests shall be performed on all samples:
   a. One coliform bacteria, and
   b. One heterotrophic plate count (HPC) bacteria.
2. Test results on all samples and a copy of the chain of custody shall be mailed directly to the Engineer and Owner from the laboratory.
3. The disinfection procedure shall be considered satisfactory only if the results of all tests confirm the following:
   a. the absence of coliform bacteria in all samples taken and
   b. the HPC bacteria are less than 500 colony forming units per milliliter (cfu/ml) in all samples taken (unless the water supplier has established a stricter HPC limit from baseline data for their water distribution system, in which case the results of the HPC bacteria tests shall meet the stricter limit).
4. The new water mains may be placed in service if the results of the disinfection procedure are satisfactory and the Engineer and Owner have granted their permission.
5. If the initial disinfection procedure fails to produce satisfactory results, the new water mains shall be flushed and resampled as described above. If the test results from the resampling also fail to produce satisfactory results, the entire disinfection procedure shall be repeated.

END OF SECTION

SECTION 02676

TESTING PIPING SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide pressure/leakage tests as required by the Contract Documents.
B. Only new water mains shall be pressure tested. Cleaned and lined water mains shall not be pressure tested.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
1. Section 02611 Ductile Iron Pipe and Fittings
2. Section 02640 Buried Valves and Appurtenances
3. Section 02675 Disinfecting Water Mains and Water Storage Facilities

1.03 STANDARDS

A. The following American Water Works Association Standard shall form a part of this specification as referenced:
1. AWWA C600 Installation of Ductile Iron Water Mains and Their Appurtenances.

PART 2 PRODUCTS

2.01 WATER

A. The Owner shall furnish water free, for flushing and testing the water main, if hydrants or other connection points are convenient to the work. Otherwise, the Contractor shall be responsible for securing an acceptable potable water supply at no additional cost to the Owner.

2.02 DISINFECTION AND TESTING

A. The contractor shall provide, and attach, tamper-proof wheel valve equipped adaptors to the various hydrants located along the new, and/or the newly cleaned and lined pipeline. Whenever feasible theses adaptors shall serve as the primary port for all pressure testing and sampling operations through which the chlorine is introduced into, and subsequently flushed from the main. These adaptors are to be used in conjunction with one inch (1”) corporation cocks fitted with one inch (1”) temporary copper ‘goosenecks’ that have been strategically located within ten (10) feet of all terminus points and/or at all high points along the newly cleaned and lined, and/or newly installed water main, such that no port shall be more than twelve hundred (1,200) feet apart.

PART 3 EXECUTION

3.01 TESTING

A. A formal pressure/leakage test shall be required of the water mains, valves and appurtenances in the system constructed.
1. The pressure/leakage test shall be conducted in accordance with these specifications and the applicable requirements of AWWA C600, Section 4.
2. Where any section of a water main is provided with concrete thrust blocks, the test shall not be made until at least 5 days have elapsed since the concrete was placed.
3. If high-early-strength cement is used in the concrete thrust blocks, the test shall not be made until at least 2 days have elapsed since the concrete was placed.

4. Prior to testing, the pipe line or section thereof, the section to be tested shall be thoroughly flushed, and all air expelled. All air shall be expelled by appropriate methods including the use of corporation stops installed by the Contractor, at no additional cost to the Owner, at high points along the water main.
5. After all the air has been expelled, and the corporation stops closed, the test pressure shall be applied by means of a pump connected to the pipe.
6. The pump, pipe connections, and all necessary apparatus including the gages, shall be furnished by the Contractor.
7. Unless otherwise specified, the test pressure shall be 200 psi or 150 percent of the working pressure, whichever is greater, but in no case shall the pressure exceed 250 psi.
8. This pressure shall be maintained for 2 hours.
9. Any excessive indicated leakage, as determined by the pressure test, shall be located and repairs made. The total leakage from the pipeline or sections thereof shall not exceed the amount shown in Table 1 of this Specification Section.
10. Should the pipe line or sections thereof not come within the permissible leakage limits, the Contractor (at his own expense) shall be required to excavate and locate the source of leakage and make repairs.
11. After the Contractor has notified the Engineer that repairs have been made, the test shall be repeated until the pipeline or sections thereof are within the allowable leakage.

Table 1

Ductile and Gray Cast Iron mains
Allowable Leakage per 1000 Ft.

Avg. Test Pressure (psi)		Nominal Pipe Diameter (inches)						
		6	8	10	12	16	20	24
350	0.84	1.12	1.40	1.69	2.25	2.81	3.37	
300	0.78	1.04	1.30	1.56	2.08	2.60	3.12	
250	0.71	0.95	1.19	1.42	1.90	2.37	2.85	
200	0.64	0.85	1.06	1.28	1.70	2.12	2.55	
150	0.55	0.74	0.92	1.10	1.47	1.84	2.21	
100	0.45	0.60	0.75	0.90	1.20	1.50	1.80	

* Leakage allowable based on gallons per hour per 1000 feet of main.

END OF SECTION

SECTION 02766

CLEANING AND LINING EXISTING WATER MAINS

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this section consists of all labor, materials and equipment required to clean and cement-mortar line in place and all other incidental work the existing water mains as required and called for herein and shown on the Contract Drawings.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to:

1. Section 02222 – Earthwork for Water Distribution Systems
2. Section 02675 – Disinfecting Water Mains
3. Section 02676 – Testing Water Mains
4. Section 02769 – Television Inspection

1.03 STANDARDS

A. American Society for Testing and Materials (ASTM)

ASTM C40	Test for Organic Impurities in Sands for Concrete
ASTM C143	Test for Slump of Portland Cement Concrete
ASTM C150	Spec. for Portland Cement
ASTM C494	Spec. for Chemical Admixtures for Concrete
ASTM C618	Spec. for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Mixture in Portland Cement Concrete

B. American Water Works Association (AWWA)

AWWA C602	Standard for Cement-Mortar Lining of Water Pipelines - 4 inches and larger - In Place
AWWA C651	Standard for Disinfecting Water Mains

1.04 SUBMITTALS

A. Six sets of complete detailed description of the methods and materials to be used in the cleaning and lining shall be submitted. Included shall be the anticipated excavation locations and a time-line progress and completion schedule.

B. The Contractor shall furnish an affidavit that all material and work furnished under this section complies with the requirement of AWWA C602.

PART 2 MATERIALS

2.01 PORTLAND CEMENT

A. Portland cement shall conform to Type I or Type II of ASTM C150.

2.02 POZZOLANIC MATERIAL

A. Pozzolanic material shall consist of siliceous or a combination of siliceous and aluminous material in a finely divided form that in the presence of moisture will react with calcium hydroxide, at ordinary temperatures, for compounds possessing cementing properties. Pozzolanic material shall fulfill requirements of ASTM C618.

2.03 ADMIXTURES

A. To improve workability, density, and strength in the mortar, admixtures conforming to ASTM C494, may be used at the option of the Contractor, provided that the ratio of admixture to Portland cement does not exceed the amount used in the qualification tests of ASTM C494. No admixtures shall be used that would have a deleterious effect on potable water flowing in the pipe after the lining has been placed.

2.04 SAND

A. Sand shall consist of inert granular material. The grains shall be strong, durable, and uncoated. The sand shall be well-graded and shall pass a No. 16 mesh screen, with not more than five percent passing a No. 100 sieve.

B. Sand shall be clean and free from injurious amounts of dust, clay, lumps, shale, soft or flaky particles, mica, loam oil, alkali, and other deleterious substances. The total weight of such substances shall not exceed three percent of the combined weight of the substances and the stand that contains them.

C. Sand shall not show a color value darker than the "reference standard color solution" prepared as required in ASTM C40.

2.05 WATER

A. Potable water shall be used when mixing the mortar. Contractor shall provide all potable water required during construction.

2.06 CEMENT-MORTAR LINING

A. Mortar for the lining shall be composed of cement, sand, and water than have been well mixed and are of such consistency as to produce a dense, homogenous lining. Unless otherwise specified by the purchaser, the mortar may also include admixtures and pozzolanic materials.

B. The approximate proportions of cement and sand in the mortar for the lining shall be 1 part of Portland cement to 1 - 1-1/2 parts of sand by volume. The exact proportion shall be determined by the characteristics of the sand used. Pozzolanic materials, if used, shall be substituted for a part of the Portland cement in a proportion of approximately 1 part pozzolanic material to 5 part portland cement by volume. Admixtures if added, shall be used in strict compliance with the manufacturer's recommendations.

C. The water content shall be the minimum quantity that produces a workable mixture, with full allowance made for moisture collection on the interior of the pipe surfaces. Slump tests should be made periodically on freshly mixed mortar immediately prior to the mortar being conveyed to the lining machine. The test shall be made in accordance with ASTM C143.

D. Mortar shall be mixed long enough to obtain maximum plasticity. The mortar shall be used before initial set.

PART 3 EXECUTION

3.01 ACCESS OPENINGS - GENERAL REQUIREMENTS

A. All access openings necessary for the lining work shall be prepared and closed by the Contractor in accordance with the provisions of Section 02222 – Earthwork for Water Distribution Systems.

3.02 MISMARKED MAINS

A. A Mismarked Main is defined as an excavation and pipe opening made by the Contractor at a point marked by the OWNER as being a transition point between existing unlined and lined pipe which proves not to be the transition point or an excavation made by the Contractor at a point marked by the OWNER as being a valve, branch, main or other fitting where the actual location proves to be greater than four (4) feet horizontally from the marked location.

B. If, within the same excavation as described above, the Contractor finds the mismarked main then no additional payment will be made for the Mismarked Main.

3.03 PREPARATION OF PIPE SURFACE

A. The interior surfaces of pipe to be lined shall be cleaned by method approved by the Engineer to remove corrosion products, chemical or other deposits, loose and deteriorated remains of old coating materials, oil, grease, and accumulations of water, dirt, and debris.

B. Shot or sandblasting is not required to prepare surfaces for lining. When the method of cleaning the pipe does not include the use of water, all laterals, 2-inches and larger in diameter, shall be cleared prior to lining. Laterals less than 2-inches in diameter shall be cleared after lining as described in Section 3.05.

3.04 MACHINE APPLICATION OF MORTAR LINING

A. Immediately prior to the travel of the lining machine through a pipeline, all foreign material shall be removed. This includes sand and loose mortar that might have accumulated since the preparation of surfaces was completed.

B. The lining shall be applied in one course or more by a machine traveling through the pipe and distributing the mortar uniformly across the full section and long radius bends of the pipe.

C. The discharge shall be from the rear of the machine so that the newly applied mortar will not be marked. The rate of travel of the machine and the rate of mortar discharge shall be mechanically regulated to produce a smooth surface and uniform thickness throughout.

D. The mortar shall be densely packed and adhere wherever applied; there shall be no injurious rebound.

E. The lining shall be uniform in thickness within the allowable tolerance, except at joints or deformations in the pipeline. Cement-mortar lining thickness shall be 3/16-inch thick.

3.05 SURFACE FINISH

A. The mortar lining shall be mechanically troweled, except for places where hand troweled lining is expressly allowed.

B. Troweled Linings: The lining machine shall be provided with attachments for mechanically troweling the mortar. Both the application and troweling of the mortar shall take place at the rear of the machine so that the freshly placed and troweled mortar will not be damaged. The trowel attachment shall be such that the pressure applied to the line will be uniform and produce a lining of uniform thickness with a smooth, finished surface, free of spiral shoulders.

C. Untroweled Linings: The finished surface shall be smooth and regular, except that it may exhibit a slightly dimpled appearance similar to the surface of an orange. Ridges or uneven buildup caused by irregularity in the travel rate of the machine shall not be allowed.

D. Allowable Untroweled Lining: Untroweled cement-mortar lining is acceptable in the lining of pipe that is excessively out of round, and in pipe 20 inches in diameter and under, when lining pipeline segments containing cocked joints, sharp bends, and angle points.

3.06 SPECIAL REQUIREMENTS AT LATERALS AND SERVICE CONNECTIONS

A. Laterals and connections to the pipe that are being lined shall be left obstructed by the lining operations.

B. After the mortar lining has been placed, but before it takes final set, laterals and services 2-inches and smaller in diameter shall be cleared by backflushing with air or water, wherever necessary or as required by the Engineer. Backflushing must be accomplished in a manner that will not damage the freshly applied lining.

C. Unless it is to be cleaned and lined, no lateral shall be excavated.

D. The Contractor shall clean all interior surfaces of the mainline valves after the lining machine has passed. The Contractor may, with the Owner's approval, remove the bonnets and gates from mainline gate valves in order to accomplish the cleaning; bonnets and gates shall then be replaced.

E. The Contractor shall, with the Owner's approval, remove all butterfly valves from the mainline when necessitated by the operations and then reinstall them after the lining operation. New bolts and gaskets for bonnet or valve replacements meeting the requirements of the applicable AWWA valve standard shall be supplied and installed by the Contractor and shall be paid for as extra work.

3.07 CURING

A. Curing operations shall begin immediately following completion of the machine placement of the mortar lining in a section of pipeline. The section of pipe shall be closed with airtight covers over all openings and shall be maintained in a moist condition.

B. When a section of pipeline has been completed, the Contractor shall be responsible for careful curing of the mortar lining until the section is filled with water by the Owner, or until the lining has been accepted by the Owner, but in no case for more than seven days. In the event that the Owner cannot fill the pipeline within seven days after the lining has been placed, the Contractor may be directed to extend the curing period, and the Contractor shall be paid for this as extra work.

C. The exterior surfaces of pipe exposed to sunlight shall be sprinkled with water in the daytime during the period of lining, finishing, and curing when such sprinkling is required, as determined by the Contractor or the Engineer, to prevent cracking of the lining.

3.08 ACCEPTANCE OF CLEANED AND LINED PIPE

A. Upon the completion of the cleaning and lining of the water main and the clearing of laterals and water services the water main shall be inspected in accordance with Section 02769.

B. After the completion and acceptance of the TV inspection the water main shall be disinfected in accordance with Section 02675 of the contract documents.

C. After the water main has been inspected and disinfected and approved for acceptance and potable use by the OWNER it shall be tied into the water distribution system.

END OF SECTION

SECTION 02769

TELEVISION INSPECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this section includes the furnishing of all labor, materials and equipment necessary to televise and video tape the cleaned and lined water pipes after rehabilitation.

1.02 RELATED WORK

A. Documents affecting the work of this Section include, but are not necessarily limited to:
1. Section 02766 – Cleaning and Lining Existing Water Mains

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. The qualified contractor shall provide references and sufficient equipment to perform the work.

1.04 COORDINATION

A. Coordinate the work of this Section with sub-contractors, suppliers and other trades which might be affected by the schedule and completion of this work. The Contractor shall provide a schedule for completion of work and provide weekly updates to the schedule as applicable.

PART 2 PRODUCTS

A. None required under this Section.

PART 3 EXECUTION

3.01 PREPARATION

A. Bypass pumping shall be employed to maintain flow in the rehabilitated pipes at all times.

B. Cleaning and cement mortar lining shall be performed on the water main prior to television inspection. Cleaning and lining of the water main shall be conducted in accordance with Section 02766 of these Specifications.

3.02 TELEVISION INSPECTION

A. Equipment - The equipment employed in the television inspection shall be specifically manufactured for the inspection of rehabilitated pipes. Lighting shall be sufficient to provide a clear picture and camera shall operate satisfactorily in 100% humidity atmosphere and have a minimum of 600 line-resolution. The camera vehicle assembly shall be capable of slowing down or stopping at areas of interest (e.g. joints, cracks). At areas of interest, the camera shall be capable of rotating its lens 360 degrees to obtain a clearer, more direct viewing angle. The camera assembly shall record in full color and all monitors and video tape recordings shall be in full color.

B. Documentation - All conditions observed during the inspection shall be recorded in writing on inspection logs by Contractor, including the condition of the rehabilitated pipe, the location of service connections and similar

observations related to the conditions of the pipe. A copy of the written logs shall be provided to Engineer. A video tape recording of all television inspections shall also be provided to Engineer.

C. Personnel - All personnel employed by Contractor in television inspection of rehabilitated pipes shall be experienced with all aspects of the inspection process, including recognition of pipe defects and damage.

END OF SECTION

SECTION 02900

LANDSCAPING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide landscaping as required by the Contract Documents.
   1. Generally the Work consists of topsoiling, seeding and fertilizing all areas not covered by pavement or gravel, and where the property is disturbed by the construction work.
   2. Provide the specified quantity and size of plantings as shown of the Drawings.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to Sections in Division 1 of these Specifications.
   1. Section 02222 Earthwork for Water Distribution Systems

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART 2 MATERIALS

2.01 TOPSOIL

A. Topsoil stripped from the site and stored, shall be approved before reuse.
   1. Topsoil from the site shall be treated to conform to the requirements for topsoil furnished from offsite sources.
   2. If the required quantity of suitable topsoil is not available from stripping of the site, or if it is not approved, topsoil from outside sources shall be furnished.
   3. Stockpiled topsoil used for this work shall be screened before being spread.
   4. Surplus topsoil not required to fulfill the requirements of the Contract shall be legally disposed of unless otherwise directed by the Owner.

2.02 TOPSOIL FURNISHED FROM OFFSITE SOURCES

A. Topsoil shall be fertile, friable, typical of the locality, and obtained from a well-drained site.
   1. It shall be without admixture of subsoil or slag.
   2. Shall be screened.
   3. Topsoil as delivered to the site shall have an acidity range of pH 5.0 to 6.5 and shall contain not less than 5% organic matter as determined by loss on ignition of moisture-free samples dried at 100 degrees Centigrade.
   4. If required, limestone shall be added to the topsoil to adjust the pH, so that it complies with the required limits.

B. Mechanical Analysis: Topsoil shall meet the following mechanical analysis

	% Passing	% Retained
1-1/4" screen	100	0
1/2" screen	97-100	0-3
No. 100 mesh sleeve	60-40	40-60

2.03 TREATING TOPSOIL WITH LIMESTONE OR ALUMINUM SULFATE

A. When the hydrogen-ion value is below the specified level, add ground limestone at the rate of 2-1/2 lbs. per cubic yard of topsoil to raise pH one full point.

B. The following table shows the amount of limestone needed for various soil reactions on the basis of 1,000 sq. ft. and on the basis of one (1) acre:

pH	pH Desired	Lbs. per 1000 sq. ft.	Tons per Acre
6.0	6.5	0-46	0-1
5.5	6.5	46-92	1-2
5.0	6.5	92-138	2-3

1. Limestone shall be raw, ground agricultural limestone containing not less than 90% calcium carbonate and shall be ground to such fineness that 50% will pass through a 100-mesh sieve and 90% will pass through a 20-mesh sieve.
2. When hydrogen-ion value is above specified level, add aluminum sulfate at the rate of 2-1/2 lbs. per cubic yard of topsoil to lower the pH one full point. Aluminum sulfate shall be unadulterated and delivered in containers with the name of the material, name of the manufacturer, and net weight of contents.

2.04 FERTILIZER

A. Fertilizer shall be furnished in containers plainly marked with the chemical analysis of the product and showing one of the following compositions by weight.

	10-6-4	8-6-4	7-7-7
Nitrogen	10% min.	8% min.	7% min.
Available Phosphoric Acid	6% min.	6% min.	7% min.
Water Soluble Potash	4% min.	4% min.	7% min.

1. Fertilizer shall be stored so that when used it will be dry and free flowing.

2.05 SEED

A. Seed shall be the commercial product of an approved reputable manufacturer and shall be certified to be not more than one (1) year old and of the general proportions by weight of the following seed types:

For Lawns and Other Undisturbed Areas Except as Defined Below:

Botanical Name	Common Name	Proportion by Weight	Minimum % Purity	Minimum % Germination
Poa Pratensis	Kentucky Blue Grass	35%	85%	85%
Festuca rubra var. creeping	Red Fescue	35%	98%	90%

Lolium Perene perennial	Rye Grass	15%	95%	90%
Agrostis Alba	Red Top	10%	92%	90%
Trifolium repens	White Clover	5%	90%	90%

For Cross Country Areas

Botanical Name	Common Name	Proportion by Weight	Minimum % Purity	Minimum % Germination
Colium Perene-perennial	Rye Grass	100%	95%	90%

1. Seed shall be furnished and delivered premixed in the proportions specified above.
2. All seed shall comply with State and Federal seed laws.
3. A certificate of compliance with the specifications shall be submitted by the manufacturer with the shipment of the seed. The certificate shall include the guaranteed percentage of purity, weed content and germination of the seed, net weight and date of shipment.
4. No seed shall be sown until the Contractor has submitted the above-mentioned certificate to the Engineer.

2.06 PLANTINGS

A. Refer to Drawings for planting schedule.

PART 3 EXECUTION

3.01 APPLICATION

A. Application of Topsoil
1. Topsoil shall be applied to the prepared subgrade specified in Section 02210, Site Grading.
2. Topsoil shall be spread to a compacted depth of:
   a. Four (4) inches for cross country areas.
   b. Six (6) inches for lawn areas.
   c. Areas to have topsoil applied to them shall be scarified or otherwise roughened, just prior to the application.

B. Seedbed Preparation
1. Grade areas to be seeded to a smooth uniform grade.
2. Roll, scarify, rake and level as necessary to obtain true, even lawn surfaces.
3. Meet existing grades.
4. All lawn areas shall slope to drain.
5. All finish grades shall meet approval before grass seed is sown.

C. Application Rates of Limestone, Aluminum Sulfate, Fertilizer and Seed
1. Limestone or Aluminum Sulfate shall be applied and thoroughly incorporated in the layer of loam or topsoil to adjust the acidity of the material.
2. The rate of application of the limestone will be determined by the pH value.
3. Fertilizer shall be applied at the rate of 20 pounds per 1000 square feet.
4. The seed mixture shall be sown at the rate of 5 pounds per 1000 square feet.

D. Fertilizing and Liming
1. Fertilizing and liming shall be done when the soil is in a moist condition and at least 24 hours before the sowing of the seed.
2. The fertilizer and lime shall be applied to the soil by means of a mechanical spreader or other approved method capable of maintaining a uniform rate of application.
3. Thoroughly harrowed, raked or otherwise mixed with the soil to a depth of not less than 2 inches.
4. The fertilizer and lime shall not be applied together.

E. Time of Seeding

1. The recommended seeding periods are from April 1 to June 1, and from August 15 to October 1.
2. The Contractor may choose to seed at other times but regardless of the time of seeding he shall be responsible for a full growth of grass.
3. When directed he shall re-fertilize and reseed areas on the project which do not develop a satisfactory growth of grass.
4. Re-fertilizing and reseeding shall be incidental to the original seeding item requirements.

3.02 SEEDING METHODS

A. Fertilizer, limestone, and mulch material, if required, and seed of the type specified may be placed by one of the following methods, provided an even distribution is obtained.

B. Dry Method

1. Power Equipment: Mechanical seeders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical seeding equipment or attachments may be used when seed, limestone, and fertilizer are to be applied in dry form.
2. Manual Equipment - On areas that are inaccessible to power equipment, permission may be given to use hand-operated mechanical equipment when the materials applied are in dry form. The use of hand shovels to spread the materials shall not be allowed.
3. When the dry method is used, limestone and fertilizer shall not be mixed together prior to their application, but shall be worked into the soil together to a depth of at least 2 inches.
4. At least 24 hours shall elapse between the time fertilizer is incorporated into the topsoil and seed is spread.
5. Areas covered with park seed shall be raked, and, rolled with a roller weighing not more than 100 pounds per foot of roller width to firm the soil but not to pack it. The rolling shall be done the same day as the seeding unless otherwise permitted.
6. Lawn areas constructed in the spring after April 15 shall be covered with a 1-inch loose layer of clean wheat or oat straw. The straw shall be kept wet until a catch of grass is established. Loose straw shall be removed from the site.
7. Grass on slopes or banks may be established by another method subject to approval. Special care shall be exercised to prevent erosion or washouts.

C. Hydraulic Method

1. The application of grass seed, fertilizer, limestone, and suitable mulch, if approved, may be accomplished through the use of an approved spraying machine.
2. The materials shall be mixed with water in the machine and kept in an agitated state in order for the materials to be uniformly suspended in the water.
3. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of limestone, fertilizer, and grass seed shall be equal to the required rates.
4. Prior to the start of work, the Engineer shall be furnished with a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of seeding that can be covered with the quantity of solution in the hydroseeder.
5. The hydraulic seeding and fertilizing machine shall be completely flushed and cleaned each day before seeding is started.
6. If the results of the spray operations are unsatisfactory, the Contractor shall be required to abandon this method and apply the materials in accordance with the dry method.
7. When the hydraulic method is used, compaction or rolling shall be required.

3.03 MAINTENANCE

A. The Contractor shall be responsible for the proper care of the seeded areas during the period when the grass is becoming established.

1. This period shall extend for two months after a successful uniform stand of grass is produced.
2. The Contractor shall reseed all areas as necessary to obtain a uniform stand of grass, free from bare spots.
3. Any seeded areas which fail to show a uniform stand of grass shall be reseeded until all areas are covered
4. Any and all additional seeding shall be at the Contractor's expense.

5. If necessary, barricades of brush or other materials and suitable signs shall be placed to protect the seeded areas.
6. The seeded areas shall be carefully and suitably watered as necessary to produce a satisfactory growth.
7. Areas seeded shall be mowed whenever necessary to keep the growth between 3 inches and 4 inches.
8. Any washout that occurs shall be regraded and reseeded at the Contractor's expense until a good sod is established.

3.04 PLANTINGS

A. Planting installation shall be as follows:
1. Season for planting shall be as recommended by the nursery supplying the plantings.
2. Do not plant in muddy or frozen ground.
3. Field stake/layout plantings as shown on the DRAWINGS. CONTRACTOR shall notify the OWNER prior to installation for approval.
4. Horizontal limit of topsoil shall extend 4 feet from the center of the plantings.
5. Minimum depth of topsoil shall extend from the crown of the root ball to 6 inches below the root ball.
6. Plant pits shall be two feet greater in diameter than the root ball and excavated with vertical sides. Plant pits shall not be backfilled until the ENGINEER has approved the installation.
7. Plantings shall be set plumb and straight in the center of the pits. Crown of the plant shall be set at finished grades indicated on the DRAWINGS.
8. The pits shall be backfilled to within eight inches of finished grade and then soaked in water and allowed to settle. Backfill shall consist of planting soil thoroughly mixed with fertilizer. Backfill to finished grade after settlement.
9. Mulch material shall be placed over entire planting to a depth of four inches after settlement, not later than one week after planting. No mulch shall be applied prior to the first watering of plant materials.

END OF SECTION

SECTION 02930

LOAM AND SEED

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Provide loam and seed as required by the Contract Documents.
   1. Generally the Work consists of topsoiling, seeding and fertilizing all disturbed areas of the water main easements.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02015 Test Pits
   2. Section 02222 Earthwork for Water Distribution Systems

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
   1. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

B. If the results of the hydraulic seeding operation (if utilized) are unsatisfactory, the method shall be abandoned and seeding shall be required by the sowing method.

1.04 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

C. If hydroseeding application is to be used, a written description containing seed analysis, fertilizer and lime addition data is to be submitted for review of the Owner.

1.05 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01610.

B. Immediately remove from the site, materials which are not true to name, and do not comply with the specified requirements, and promptly replace with materials meeting the specified requirements.

PART 2 MATERIALS

2.01 TOPSOIL

A. Topsoil stripped from the site and stored, shall be approved before reuse.
   1. Topsoil from the site shall be treated to conform to the requirements for topsoil furnished from offsite sources.
   2. If the required quantity of suitable topsoil is not available from stripping of the site, or if it is not approved, topsoil from outside sources shall be furnished.
   3. Stockpiled topsoil used for this work shall be screened before being spread.

4. Surplus topsoil not required to fulfill the requirements of the Contract shall be properly disposed of unless otherwise directed by the Owner.

2.02 TOPSOIL FURNISHED FROM OFFSITE SOURCES

A. Topsoil shall be fertile, friable, natural topsoil typical of the locality, and obtained from a well-drained site.
1. It shall be without admixture of subsoil or slag.
2. Shall be screened.
3. Topsoil as delivered to the site shall have an acidity range of pH 5.0 to 6.5 and shall contain not less than 5% organic matter as determined by loss on ignition of moisture-free samples dried at 100 degrees Centigrade.
4. If required, limestone shall be added to the topsoil to adjust the pH, so that it complies with the required limits.

B. Mechanical Analysis: Topsoil shall meet the following mechanical analysis

Size	% Passing	% Retained
1-1/4" screen	100	0
1/2" screen	97-100	0-3
No. 100 mesh sleeve	40-60	40-60

2.03 TREATING TOPSOIL WITH LIMESTONE OR ALUMINUM SULFATE

A. When the hydrogen-ion value is below the specified level, add ground limestone at the rate of 2-1/2 lbs. per cubic yard of topsoil to raise pH one full point.

B. The following table shows the amount of limestone needed for various soil reactions on the basis of 1,000 sq. ft. and on the basis of one (1) acre:

pH	pH Desired	Lbs. per 1000 sq. ft.	Tons per Acre
6.0	6.5	0-46	0-1
5.5	6.5	46-92	1-2
5.0	6.5	92-138	2-3

1. Limestone shall be raw, ground agricultural limestone containing not less than 90% calcium carbonate and shall be ground to such fineness that 50% will pass through a 100-mesh sieve and 90% will pass through a 20-mesh sieve.
2. When hydrogen-ion value is above specified level, add aluminum sulfate at the rate of 2-1/2 lbs. per cubic yard of topsoil to lower the pH one full point. Aluminum sulfate shall be unadulterated and delivered in containers with the name of the material, name of the manufacturer, and net weight of contents.

2.04 LIME

A. Lime shall be ground limestone containing not less than 85 percent calcium and magnesium carbonates.
1. Ground to such fineness that at least 50 percent will pass through a 100-mesh sieve and at least 90 percent shall pass through a 20-mesh sieve.

2.05 GRASS SEED

A. General: Provide grass seed which is:
1. Free from noxious weed seeds, and recleaned.
2. Grade A recent crop seed.
3. Treated with appropriate fungicide at time of mixing.
4. Delivered to the site in sealed containers with dealers guaranteed analysis.

B. Proportions by Weight (Level Areas):

1. Chewing Fescue 60 percent.
2. Red Top 10 percent.
3. Annual Ryegrass 10 percent
4. Kentucky Blue 20 percent.

A. Proportions by Weight (Slopes):
1. Creeping Red Fescue 50 percent.
2. Perennial Rye Grass 20 percent
3. Red Clover 10 percent.
4. Winter Rye 15 percent
5. Ladino Clover 5 percent

Requirements:
1. Seed shall be furnished and delivered premixed in the proportions specified above.
2. All seed shall comply with State and Federal seed laws.
3. A certificate of compliance with the specifications shall be submitted by the manufacturer with the shipment of the seed. The certificate shall include the guaranteed percentage of purity, weed content and germination of the seed, net weight and date of shipment.
4. No seed shall be sown until the Contractor has submitted the above mentioned certificate to the Engineer.

2.06 FERTILIZER

A. Fertilizer shall be furnished in containers plainly marked with the chemical analysis of the product and showing one of the following compositions by weight.

Constituent	10-6-4	8-6-4	7-7-7
Nitrogen	10% min.	8% min.	7% min.
Available Phosphoric Acid	6% min.	6% min.	7% min.
Water Soluble Potash	4% min.	4% min.	7% min.

1. Fertilizer shall be stored so that when used it will be dry and free flowing.

2.07 HYDRAULIC SPRAY MACHINE

A. Shall be designed specifically for seed dissemination.

B. Shall allow materials to be mixed with water in the machine and kept in an agitated state to keep materials uniformly suspended in the water.

C. Shall be designed to provide equal quantities of required materials over a particular spraying area.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 APPLICATION

A. Application of Topsoil
1. Topsoil shall be applied to the prepared subgrade specified in Section 02210, Site Grading.
2. Topsoil shall be spread to a compacted depth of:
a. Four (4) inches for cross country areas.

b. Areas to have topsoil applied to them shall be scarified or otherwise roughened, just prior to the application.

B. Seedbed Preparation
1. Grade areas to be seeded to a smooth uniform grade.
2. Roll, scarify, rake and level as necessary to obtain true, even surfaces.
3. Meet existing grades.
4. All seeded areas shall slope to drain.
5. All finish grades shall meet approval before grass seed is sown.

C. Application Rates of Limestone, Aluminum Sulfate, Fertilizer and Seed
1. Limestone or Aluminum Sulfate shall be applied and thoroughly incorporated in the layer of loam or topsoil to adjust the acidity of the material.
2. The rate of application of the limestone will be determined by the pH value.
3. Fertilizer shall be applied at the rate of 20 pounds per 1000 square feet.
4. The seed mixture shall be sown at the rate of 5 pounds per 1000 square feet.

D. Fertilizing and Liming
1. Fertilizing and liming shall be done when the soil is in a moist condition and at least 24 hours before the sowing of the seed.
2. The fertilizer and lime shall be applied to the soil by means of a mechanical spreader or other approved method capable of maintaining a uniform rate of application.
3. Thoroughly harrowed, raked or otherwise mixed with the soil to a depth of not less than 2 inches.
4. The fertilizer and lime shall not be applied together.

E. Time of Seeding
1. The recommended seeding periods are from April 1 to June 1 and from August 15 to October 1.
2. The Contractor may choose to seed at other times but regardless of the time of seeding he shall be responsible for a full growth of grass.
3. When directed he shall re-fertilize and reseed areas on the project which do not develop a satisfactory growth of grass.
4. Re-fertilizing and reseeding shall be incidental to the original seeding item requirements.

3.03 SEEDING METHODS

A. Fertilizer, limestone, and mulch material, if required, and seed of the type specified may be placed by one of the following methods, provided an even distribution is obtained.

B. Dry Method
1. Power Equipment: Mechanical seeders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical seeding equipment or attachments may be used when seed, limestone, and fertilizer are to be applied in dry form.
2. Manual Equipment - On areas which are inaccessible to power equipment, permission may be given to use hand-operated mechanical equipment when the materials applied are in dry form. The use of hand shovels to spread the materials shall not be allowed.
3. When the dry method is used, limestone and fertilizer shall not be mixed together prior to their application, but shall be worked into the soil together to a depth of at least 2 inches.
4. At least 24 hours shall elapse between the time fertilizer is incorporated into the topsoil and seed is spread.
5. Areas covered with park seed shall be raked, and, rolled with a roller weighing not more than 100 pounds per foot of roller width to firm the soil but not to pack it. The rolling shall be done the same day as the seeding unless otherwise permitted.
6. Areas seeded in the spring after April 15 shall be covered with a 1-inch loose layer of clean wheat or oat straw. The straw shall be kept wet until a catch of grass is established. Loose straw shall be removed from the site.
7. Grass on slopes or banks may be established by another method subject to approval. Special care shall be exercised to prevent erosion or washouts.

C. Hydraulic Method

1. The application of grass seed, fertilizer, limestone, and suitable mulch, if approved, may be accomplished through the use of an approved spraying machine.
2. The materials shall be mixed with water in the machine and kept in an agitated state in order for the materials to be uniformly suspended in the water.
3. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of limestone, fertilizer, and grass seed shall be equal to the required rates.
4. Prior to the start of work, the Engineer shall be furnished with a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of seeding that can be covered with the quantity of solution in the hydroseeder.
5. The hydraulic seeding and fertilizing machine shall be completely flushed and cleaned each day before seeding is started.
6. If the results of the spray operations are unsatisfactory, the Contractor shall be required to abandon this method and apply the materials in accordance with the dry method.
7. When the hydraulic method is used, compaction or rolling shall be required.

D. Side Slopes Application
1. Roadway side slopes shall be seeded utilizing a hydraulic (hydro-seed) application process, to place seed and fertilizer simultaneously.
2. A color agent shall also be within the hydraulic mix.
3. Care shall be taken during the application to prevent coverage of poles, trees, signs, and etc.

3.04 MAINTENANCE

A. The Contractor shall be responsible for the proper care of the seeded areas during the period when the grass is becoming established.
1. This period shall extend for two months after a successful uniform stand of grass is produced.
2. The Contractor shall reseed all areas as necessary to obtain a uniform stand of grass, free from bare spots.
3. Any seeded areas which fail to show a uniform stand of grass shall be reseeded until all areas are covered
4. Any and all additional seeding shall be at the Contractor's expense.
5. If necessary, barricades of brush or other materials and suitable signs shall be placed to protect the seeded areas.
6. Any washout which occurs shall be regraded and reseeded at the Contractor's expense until a good sod is established.

3.05 GUARANTEE PERIOD

A. All seeded areas shall be guaranteed by the Contractor for not less than one (1) full year from the date of substantial completion.

END OF SECTION

SECTION 02950

TREE PROTECTION AND RESTORATION

PART 1 GENERAL

1.01 DESCRIPTION

A. The work under this Section consists of protecting, restoring and replacing trees affected by the work to be performed under this Contract.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   1. Section 02930 Loam and Seed

1.03 WARRANTY

A. All plants, shrubs, trees and related work required under this Contract must be planted during the recommended time planting period and must satisfactorily grow and survive for a period of one year after acceptance.

B. All plants shall be free of dead or dying branches and branch tips and have foliage of normal density, size, and color.

C. Replace all dead plants and all plants not in vigorous, thriving condition during the entire guarantee period:
   1. Without cost to Owner.
   2. As soon as weather conditions permit.
   3. Within a specified planting period.

D. Replacement plants under this guarantee shall be guaranteed for one full growing season from date of installation.

E. Replacements shall closely match adjacent specimens of the species.
   1. All replacements shall be of the same kind and size.
   2. Replacements shall be furnished and planted and specified herein.

1.04 DELIVERY, STORAGE AND HANDLING

A. Do not deliver more plant materials than can be planted in one day.

B. Deliver plants with legible identification labels.
   1. Label trees, evergreens, bundles or containers of like shrubs, or ground cover plants.
   2. State correct plant name and size.
   3. Use durable waterproof labels with water resistant ink which will remain legible for at least 60 days.

C. Protect during delivery to prevent damage to root ball or desiccation of leaves and wind burn.
   1. Plant balls shall be firmly bound, unbroken, reasonably moist to indicate watering prior to delivery and during storage.
   2. Tree trunks shall be free from fresh scars and damage in handling.
   3. No plant material from cold storage will be accepted.

D. Do not drop plants.

E. Do not pick up container plants by stems or trunks.

F. All plants and materials are subject to inspection for approval on delivery to site.
   1. Any approval shall not impair the right of the Engineer to reject plant or material damaged due to Contractor's handling, storage or planting methods.

2. Notify Engineer of plant and material delivery schedule at least 48 hours in advance so that it may be inspected upon arrival at the job site.
3. Remove unacceptable plants and materials immediately from the job site at no cost to the Owner.

G. Protect roots of plant material from drying or other possible injury.

H. Store plants in shade and protect from weather.
1. Maintain and protect plant material not to be planted within four hours.

I. On delivery, set all balled and burlapped plants which cannot be planted immediately on ground and protect with soil, wet peat moss or other acceptable material.
1. Water as required by weather conditions.

1.05 MAINTENANCE

A. Planting maintenance shall begin immediately after planting and continue until the end of the guarantee period.

B. Reset settled plants to proper grade and position, restore planting saucers and remove dead material.

C. Replace impaired, dead or missing plants promptly during specified planting season.

D. Keep planting saucers and beds free of weeds, grass and other undesired vegetation growth.

E. Tighten and adjust guys as necessary.

F. Water, weed, fertilize, cultivate, remulch, prune, spray, maintain and protect all plants to maintain a vigorous growing condition.

G. Remove soil ridges from around watering basins prior to end of maintenance period.

H. Following the completion of the maintenance period, the Contractor shall remove all wire, hoses, cables, guys and stakes from all trees which have been judged acceptable under guarantee provision.
1. Unless designated otherwise by the Owner, all such materials used for temporary support of trees shall become the property of the Contractor and shall be removed from the site.

PART 2 MATERIALS

2.01 TREES AND SHRUBS

A. Well-formed and shaped, true to type, and free from disease, injurious pests and defects such as knots, sun- scald, windburn, injuries, abrasion or disfigurement.
1. Plants shall be in accordance with the ASNS Standards of the American Association of Nurserymen.

B. True to botanical and common name and variety:
1. American Joint Committee on Horticultural Nomenclature, Standardized Plant Names.

C. Nursery grown except native pine, and approved collected stock:
1. ANSI Z60.1 (latest edition).
2. Grown within hardiness Zones 1 through 5, as established by the Arnold Arboretum, Jamaica Plain, Massachusetts, will be accepted.
a. The Contractor's supplier must certify in writing that the stock has actually been grown under Zone 5 or hardier conditions.
b. Plants not so certified will not be accepted.

D. Root balled and burlapped plants:
1. The root system of each plant shall be well provided with fibrous roots.
2. All parts shall be moist and show active green cambium when cut.
3. They shall be sound, healthy, and vigorous, well-branched and densely foliated when in leaf.
4. The plants shall be free of disease, insect pests, eggs or larvae.

5. Not root-bound or with root system hardened-off.
6. Burlap shall be untreated eight ounce burlap. Plastic or other not-biodegradable wrappings will not be accepted.
7. No plant will be accepted when the ball of earth its roots has been badly cracked or broken preparatory to or during the process of planting.
8. The plants and balls shall remain intact during all operations.
9. All plants that cannot be planted at once must be heeled in by setting in the ground and covering the balls with soil and watering.

E. Use only ground cover plants well-established in removable containers, integral containers, or formed homogeneous soil sections.

F. Do not prune prior to delivery.

G. Size and form of trees:
1. Height of trees shall be not less than the minimum size designated.
2. Caliper measurement for deciduous trees six inches above ground level up to and including four and twelve inches above ground level for larger sizes.
3. Evergreen trees shall be to the specified height with spread in proportion to height as designated by the ASNS Standards.
4. Evergreen trees shall be well branched to the ground.
5. Each tree shall have a single trunk growing from a single un-mutilated crown of roots.
6. No part of the trunk of any tree shall be conspicuously crooked as compared with normal trees of the same variety.
7. The trunks of all trees shall be free from sunscald, frost cracks, or wounds resulting from abrasions, fire, or other causes.

H. Size and form of shrubbery:
1. Shrubbery shall meet the requirements for spread or height stated in the plant list.
2. Measurement for height shall be taken from the ground level to the average height of the shrub and not to the longest branch.
3. Single stemmed or thin plants will not be accepted.
4. The shrubs shall be well branched to the ground.
5. The shrubs shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

2.02 PLANTING SOIL MIX

A. Planting soil mix shall be approved loam which has been pH adjusted according to particular planting applications and improved through the addition of organic matter as directed below. Planting loam shall conform to the following pH levels:
1. For ericaceous plants and broad-leaved evergreens requiring an acid soil, planting loam shall have a true pH of 4.5 to 5.5. If it has not, it shall be amended by the Contractor at his own expense to the proper pH range by mixing with sulfur as specified herein.
2. Planting loam for general planting of nonacid-loving plants shall have a true pH value of 6.0 to 6.5. If it has not, it shall be amended by the Contractor at his own expense to the proper pH range by mixing with dolomitic limestone as specified herein.
3. The amount of either sulfur or limestone required to adjust the planting loam to the proper pH range (above) shall be approved by the Landscape Architect on the basis of soil tests as specified herein.

B. Planting soil mix shall consist of pH adjusted loam which has been thoroughly premixed with organic material in the proportions of one (1) part peat moss with five (5) parts of approved loam.

2.03 FERTILIZER

A. Non-acid loving:
1. N: 10%
2. P_2O_5: 6%
3. K_2O: 4%

B. Acid Loving:
1. N: 7%
2. P_2O_5: 7%
3. K_2O: 7%

2.04 MULCH

A. Bark Mulch:
1. Shredded or ground, fir, hemlock or pine, average 1 inch to 2 inches.
2. Uniform color, aged a minimum of 6 months and a maximum of two years.
3. Free from weed seeds, saw dust, splinters, stringy material and chunks of wood.

B. Wood Cellulose Fiber Mulch:
1. Mulch to cover hydroseeded areas shall be fiber processed from whole wood chips manufactured specifically for standard hydraulic mulching equipment.
   a. Fiber shall not be produced from recycled material such as sawdust, paper, or cardboard.
2. Moisture content shall not exceed 10%, plus or minus 3% as defined by the pulp and paper industry standards.
   a. Fiber shall have a water holding capacity of not less than 900 grams water per 100 grams fiber.
3. The mulch shall be of such character that the fiber will be dispersed into a uniform slurry when mixed with water.
   a. It shall be nontoxic to plant life or animal life.
4. The mulch shall contain a non-petroleum based organic tackifier and a green dye to allow for easy visual metering during application but shall be non-injurious to plant growth.

2.05 GUYS AND STAKES

A. Stakes for tree support:
1. Construction grade lumber
2. Minimum nominal size: 2"x2" or 2-1/2" in diameter x 9' long and pointed at 1 end, stained dark brown.

B. Guying wire shall be minimum two strands of twisted new pliable annealed galvanized soft steel wire of No. ten gauge size.
1. Hose for guying wire: New two ply reinforced rubber garden hose not less than one-half inch inside diameter. Color shall be black.
2. Turnbuckles and eyebolts; Galvanized steel of size and gauge to provide tensile strength equal to that of the cable. Turnbuckle opening shall be a minimum of three inches.

C. Drive anchors and guy wire assembly shall be as manufactured by Laconia Malleable Iron Works, Laconia, New Hampshire, or 'Duckbill' tree anchoring system manufactured by Foresight Industries, Inc., Cheyenne, Wyoming, or 'Ground Gripper' anchors as manufactured by A.B. Chance Co., Centralia, MO, or equal. Sizes used shall be in accordance with the manufacturer's specifications and recommendations.

D. Safety flagging for diagonal guy wires shall consist of twelve inch (12") lengths of wooden one by threes, (1x3) nominal dimension, painted with two coats of white enamel paint and fastened to guy wires with screw eyes, galvanized staples or other suitable hardware.

2.06 ANTI-DESICCANT

A. Acceptable emulsion shall be permeable to transpiration and shall be tested in accordance with ASTM E96.
1. Anti-desiccant shall be "Wilt-Pruf" or approved equal.

PART 3 EXECUTION

3.01 TREE PROTECTION

A. Priority shall be given to protect the trees 12 inches in diameter and larger.
1. The removal of trees shall be allowed only when they impede construction.

B. Tie back branches or trees designated for protection.

1. Do not scar bark or break branches.
2. Remove twine immediately upon completion of operations in the vicinity.

C. SDR35 PVC Pipe or Trex Plastic shall be provided, without nails, around designated trees to prevent scarring of the trees from construction equipment.
1. Trex Plastic shall be 2”x4”x8’ in size.

D Edge of excavation shall be a minimum of eight feet from the trunk of a tree that is to be protected.
1. Trees in proximity to excavation shall be pruned prior to construction to compensate for anticipated root loss and stress.
2. Pruning shall be done in accordance with Paragraph 3.02 of this specification.

E. The Contractor shall use a saw to cut roots greater than one inch, but less than three inches in diameter.
1. Roots larger than three inches in diameter shall not be cut and may require hand digging to prevent damage.

F. No equipment or stockpiles shall be permitted within the drip-line of trees to be protected to avoid compaction of feeder roots (concentrated within the top six to eight inches of soil).
1. Flag limits of vehicle traffic and stockpiles to minimize excess disturbance.

G. Traffic over roots by heavy construction vehicles shall be minimized.

H. Engineer shall observe protective measures prior to Contractor commencing any other construction operations in the vicinity.

I. Whenever tree roots will be exposed during construction for longer than three days, they shall be covered with a three-inch layer of mulch and kept moist.

3.02 TREE RESTORATION

A. Pruning: The Engineer shall determine, with the assistance of a certified arborist as necessary, whether sufficient structural root mass remains after construction root cutting to assure the survival of the tree.
1. If not, the tree shall be removed at no additional cost to the Owner.
2. Trees whose roots were pruned during construction, but shall remain, shall have their tree crowns pruned to balance root loss.

B. Wound Repair: When wounds are inflicted on any tree within or outside of construction or permanent easements, the loose bark shall be removed by cutting the bark back to healthy tissue with a sharp knife, tracing the outline of the wound.
1. Wound tracing shall be supervised by a certified arborist, as determined by the Engineer.

C. Watering: Additional watering during periods of subnormal rainfall shall be applied at a rate equivalent to one inch per week.
1. Water shall be non-toxic and free of harmful substances.

D. Replacement: In the event that trees to be protected cannot be saved as intended by the measures outlined in Part 3 of this specification, the tree shall be cleared.
1. One tree shall be replaced for every 2-inch caliper of damaged or destroyed tree, at no additional cost to the Owner.
2. A tree of similar species, 2-1/2 to 3-inch caliper shall be provided and planted as specified below.

3.03 TREE REPLACEMENT

A. In the event that trees to be protected cannot be saved as intended by the measures outlined in this specification, the tree shall be cleared.
1. One tree for every 2 inches of caliper of damaged tree shall be replaced at no additional cost to the Owner.
2. The tree shall be of similar species and planted at a location determined by the Engineer.

B. Planting Periods

1. Deciduous Trees and Shrubs:
   a. March 21 through May 1
   b. October 1 through December 1
2. Evergreen Trees and Shrubs:
   a. April 15 through June 1
   b. August 15 through October 15

C. Plant Pits
1. Tree pits shall be at least two feet greater in diameter than the spread of the root ball and at least six inches deeper.
2. All pits shall be sharp and circular in outline and shall have vertical sides.
   a. Excavated materials of a subsoil classification or containing extraneous matter shall be removed from the site by the Contractor on a daily basis.
3. Test drainage of plant pits shall by filling with water.
   a. If water does not drain out within six hours, dig through impervious layers to a depth where drainage is adequate and backfill with sandy gravel material to proper pit depth.

D. Plants shall be placed at the proper depth, plumb and turned as directed in the pits.
1. The pits shall be backfilled to within eight inches of finished grade and then soaked in water and allowed to settle.
2. Backfilling shall consist of planting soil thoroughly mixed with fertilizer.

E. Plant when weather and soil conditions are suitable and in accordance with local practice.

F. The depth of planting pits shall be adjusted to provide a minimum of six (6) inches of compacted planting soil backfill under the balls or roots of all plants.

G. Remove top one-third of burlap, rope, wires, etc. from sides and tops of balls; do not pull burlap out from under.
1. Synthetic man-made wrapping material, such as polypropylene or other similar materials, shall be completely removed.

H. Backfill remainder of plant pits with planting soil and firmly tamp around plant ball.

I. Place weed control barrier over planting pits and beds.

J. Mulch material shall be placed over entire saucer areas of trees to a depth of two inches after settlement, not later than one week after planting.
1. No mulch shall be applied prior to the first watering of plant materials.
2. Provide temporary raised earthen saucers surrounding tree.

K. Watering shall be done by flooding plants twice within the first twenty-four hours of the time of planting.

L. Wrapping shall be completed promptly after planting.
1. The trunks of trees shall be spirally wrapped to the height of the second branches or as directed.
2. Wrapping shall be taped securely in place.

M. Guys shall be placed around the trunk at a point higher than the lowest branches of the trees in such a manner that branches will not be subject to undue strain.
1. Wires shall not come into direct contact with the bark of the tree in any place, but shall be covered with pieces of black rubber garden hose at points of contact.
2. Guys shall be kept tight at all times.
3. Bright orange flagging tape shall be tied to guys at chest height in areas subject to pedestrian traffic.

N. Pruning shall be done as specified in Paragraph 3.02 (A), but only under the direction of the Engineer.
1. Any pruning done without his direction shall be cause for replacement of the plant.
2. All newly planted trees and shrubs shall be pruned in accordance with National Park Service "Shade Tree Pruning," Tree Preservation Bulletin No. 4, and American Association of Nurserymen Standards to preserve the natural character of the plant.

O. Apply anti-desiccant to all plants in accordance with manufacturer's recommendations.

P. The Contractor shall make good to the satisfaction of the Owner any damage to lawn areas, plants, walks, walls or any other property.

Q. After completion of the work, the Contractor shall remove all debris materials, rubbish, etc. from the site and legally dispose of them.

1. The premises shall be left clean, presentable and satisfactory.

END OF SECTION

INDEX

DIVISION 3 CONCRETE

SECTION	SUBJECT	Page #
03300	Cast-in-Place Concrete	207-212

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SCOPE

A. The work of this section includes all labor, materials, tools, and equipment required for the furnishing of all materials required for the concrete work and, where appropriate, applying or installing such materials for the various items of concrete work as shown on the Drawings, as specified herein, and evidently required.

B. Codes and Standards:
1. The concrete work included in this contract has been designed in accordance with the American Concrete Institute's "Building Code Requirements for Reinforced Concrete" (ACI 318).
2. The ACI Standards "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete" (ACI 211.1) and "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete" (ACI 304) are also hereby made a part of this specification insofar as they apply and do not conflict with the provisions of this specification any local codes or ordinances having jurisdiction over the work. In addition, the various ASTM, ACI, Department of Commerce, and Federal Specifications cited throughout this section are hereby included by reference. Concrete work shall be performed in accordance with the applicable provisions of the building code of the state wherein the work is done.

C. Strength:
1. All concrete shall be designed to have a minimum 28 day compressive strength of 4,000 psi except as otherwise noted on the Drawings or specified herein.

1.02 SUBMITTALS

A. Shop drawings, brochures and samples shall be submitted for all items to be furnished in accordance with the provisions of Section 01300.

B. Submittals required under this section include, but are not limited to the following:
1. Certified mill reports of cement.
2. Fine and coarse aggregate data resulting from tests performed as specified in this section for all aggregates proposed for use.
3. Samples shall be submitted for at least the following items:
   a. Cement, each type, one vial.
4. Brochures and technical data for at least the following items:
   a. Admixtures, each type.
5. Reports:
   a. Testing laboratory reports on all tests and design mixes for each different contemplated application to the Engineer for approval within 45 days after Notice to Proceed, or at least 14 days before initial placement of concrete, whichever date is earlier.
   b. Report shall include source of cement and aggregates.

1.03 PRODUCT HANDLING

A. It is intended that the major portion of the concrete be supplied from a commercial ready mix plant capable of meeting the following requirements for storage and handling of materials. Where no such plant exists within a reasonable distance from the site, and for small amounts of concrete which may be site mixed, the following requirements shall apply.

1. Cement shall be carefully stored immediately upon receipt. Cement in sacks shall be stored in a suitable weatherproof structure which shall be as airtight as practical to prevent the absorption of moisture. Sacks shall be stacked as close together to reduce circulation of air but shall not be stacked against outside walls. The manner of storage shall permit easy access for inspection and identification of each shipment. Bulk cement shall be transferred to elevated airtight and weatherproof bins. At the

time of use, all cement that has been in storage so long that there is doubt of its quality will be tested by standard mortar to determine its suitability for use, and such cement shall not be used without approval.

2. Aggregates shall be stored in a manner that will preclude the inclusion of foreign material. Aggregates of different sizes shall be stored in separate piles. Stockpiles of coarse aggregate shall be built in horizontal layers not exceeding four feet in depth to avoid segregation.

1.04 TESTING AND INSPECTION

A. General:

1. Concrete materials and operations shall be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way preclude later rejection when such defect is discovered nor shall it obligate the Engineer for final acceptance.
2. The use of testing services shall in no way relieve the Contractor of the responsibility to furnish materials and construction in full compliance with the contract documents.

B. Responsibilities and duties of General Contractor:

1. Ingredient Tests: Prior to making design mixes, the Testing Laboratory conforming to ASTM E329 and subject to the approval of the Engineer shall conduct the following tests in accordance with the procedures referred to in the applicable Reference Standards, cited herein, to assure conformance with the applicable Specifications.
   a. Cement: Specific gravity and brand name of cement.
   b. Aggregates: Sieve analysis, specific gravity, soundness, percentage of voids, absorption, potential reactivity, moisture content of fine and coarse aggregate, dry-rodded weight of coarse aggregate, and fineness modulus of fine aggregate.
2. Design Of Concrete Mixes:
   a. The testing laboratory shall recommend as determined by trial mixes and strength curves, the design mixes to be used for each application of concrete that will produce concrete of specified strengths and finishes with slumps and workability to meet all placing conditions.
   b. Design mixes shall indicate water-cement ratio, cement factor, water content, admixture content, cement content, aggregate content, aggregate gradations, slump, air content and strength. Design mixes and related tests shall be in accordance with the procedures referred to in the applicable reference specifications cited herein.
   c. Reference Standards: Concrete mixes shall be designed in accordance with Article 3.9 of Chapter 3 of ACI 301 "Specifications for Structural Concrete Buildings" and references referred to therein.
   d. Limit of Changes for Pumping: If the Contractor elects to convey concrete by pumping, the established job mix may not be altered by more than the following:

Cement	plus 20 pounds per cubic yard
Fine Aggregate	plus 50 pounds per cubic yard
Coarse Aggregate	minus 50 pounds per cubic yard

   e. Any conveying method requiring a greater increase in FA/CA ratio will not be approved.
3. Sampling of Concrete:
   a. Samples of concrete for air, slump, unit weight, and strength tests shall be taken in accordance with ASTM C172.
   b. During the progress of the work, the Contractor shall have an independent, accredited and certified testing laboratory prepare and test concrete cylinders. The Owner shall approve the testing laboratory selected. One set of 4 cylinders each shall be taken for each 100 cubic yards, or fraction thereof, of each mixture design of concrete placed in any one day. When the total quantity of concrete with a given mixture design is less than 50 cubic yards, the strength tests may be waived by the Engineer if, in his judgment, adequate evidence of satisfactory strength is provided, such as strength test results for the same kind of concrete supplied on the same day and under comparable conditions to other work. Cylinders shall be delivered to the testing labs within 24 hours. One cylinder shall be tested at 7 days and two at 28 days. The fourth cylinder shall be saved for a 56 day break should the average of the 28 day results not achieve the specified strength. Two copies each of test results shall be submitted to the Engineer directly by the laboratory for review. All concrete testing shall be at the Contractor's expense. In any case where the strength of the cylinders fail to meet the criteria of ACI 318, Chapter 4, Section 4.7.2.3, the Engineer shall have the right to order the defective concrete

removed and proper concrete put in its place or to take such other action as they deem necessary to remedy the situation.

c. The concrete used shall have a maximum slump as herein specified unless otherwise directed by the Engineer. Slump shall be determined as per ASTM C143. Slump tests shall be taken by the testing lab, paid for by the Contractor, for each set of cylinders taken.

d. Air Content: Test for air content shall be performed in accordance with ASTM C173 or ASTM C231. A minimum of one test per day shall be conducted.

4. Furnish necessary labor to assist the testing laboratory and the field observers in obtaining and handling samples at the project or other sources of materials.

5. Advise the testing laboratory and the field observers at least 24 hours in advance of placing concrete to allow for completion of quality tests and for the assignment of personnel.

6. Provide and maintain adequate facilities for safe storage and proper curing of concrete test specimens on the project site for the first 24 hours as required by ASTM C31, Article 7.2.

7. The Contractor, at no expense to the Owner, shall have the testing laboratory conduct additional tests on concrete ingredients and make new design mixes whenever the character or source of ingredients is changed or if the placed concrete fails to meet the specified strengths.

1.05 APPROVALS

A. Commencement of Work: Concrete work shall not begin until test results and design mixes have been approved by the Engineer.

B. Mix Variations: The Engineer reserves the right to vary in the field any previously approved design mix so as to compensate for field variables including but not limited to weather conditions, placing conditions, variations in size, gradation or characteristics of aggregate and end use of the concrete.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. General:

1. All concrete used in the work shall be composed of Portland Cement, fine and coarse aggregate, and the admixtures as specified herein. Concrete for every part of the work shall be of a homogeneous structure, which when cured and hardened, will have the required strength and resistance to weathering.

2. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture of the required strength which will work readily into the corners and angles of the forms and around reinforcement and that will produce finishes acceptable to the Engineer but without permitting the materials to segregate.

B. Cement: Cement shall meet the requirements of ASTM C150, Type II. Brands of cement shall be subject to the approval of the Engineer.

C. Aggregate:

1. All aggregates shall conform to the standard specifications for Concrete Aggregates, ASTM C33 as amended by the specification. Aggregates failing to meet these specifications but proved by special test or actual service to produce concrete of the required quality may be used under ACI 318, Section 3.3, where authorized by the Engineer.

2. Fine Aggregates:

a. Fine aggregates shall consist of sand or screenings of gravel or crushed stone, well graded from fine to coarse; clean and free from soft particles, clay, loam or organic matter, with the volume removed by sedimentation not more than three percent. When tested in accordance with ASTM C40 for organic impurities, the color of the supernatant liquid above the test sample shall show not darker than organic plate No. 1.

b. Fine aggregate shall conform to the following grading:

U.S. Standard Sieve Size	Percent Passing
3/8-inch	100
No. 4	95 - 100

No. 8	80 - 100
No. 16	50 - 85
No. 30	25 - 60
No. 50	10 - 30
No. 100	2 - 10

c. Fine aggregate shall not have more than 45 percent retained between any two consecutive sieves of those listed above, and its fineness modulus shall not be less than 2.3 nor more than 3.1. If the fineness modulus varies by more than 0.20 from the value assumed in selecting proportions for concrete, the fine aggregate shall be rejected unless suitable adjustments are made in concrete proportions to compensate for the difference in grading.

3. Coarse Aggregates:

a. Coarse aggregates shall consist of crushed stone or washed gravel having clean, hard, durable, uncoated particles, free from dust, dirt, or other deleterious substances; and free from thin, flat or elongated particles. The test for organic impurities specified for fine aggregate shall also apply to coarse aggregate. Maximum size shall be 3/4 inch for all concrete 8 inches and less in thickness. For heavier walls, footings and mass concrete the maximum size may be increased to 1-1/2 inch, provided the space between the reinforcing bars therein is 1-1/3 greater than the maximum aggregate size.

b. Coarse aggregate shall conform to the grading given in Table 2 of ASTM C33 for sizes No. 467, 57, 67, 7, and 8.

D. Water: Water shall be clean, fresh and free from oil, acid, salt, alkali, sewage, organic matter, and other deleterious substances.

E. Admixtures: Admixtures shall be used as follows: The use of products other than those named herein will be allowed only with the written approval of the Engineer.

1. Air Entraining Agent: The air entraining admixture shall be a chloride free, purified and modified salt of a sulfonated hydrocarbon resin in liquid form conforming to ASTM C260.
2. Water Reducing Agents: Except when otherwise ordered by the Engineer or noted elsewhere herein, all normal structural concrete shall have a water reducing agent added. The admixture shall be a salt of lignosulfonic acid in liquid form conforming to ASTM C494, Type A. The air entraining action of the water reducing agent shall be taken into account and the air entraining agent limited accordingly.
3. Water Reducing-Retarding Agents: When the ambient temperature rises above 70 degrees F., the water reducing agent shall be replaced in whole or in part with a water reducing-retarding agent conforming to ASTM C494, Type D. The admixture shall be used in such amounts as will produce concrete with a set time equal to that which it would have at 70 degrees F. without the retarder.
4. Set Accelerator: Where a set accelerator is allowed under the provisions of SECTION 03345, Concrete Placing, Curing, and Finish, it shall be non-chloride conforming to ASTM C494, Type C and Type E.
5. Superplasticizer: Superplasticizing admixtures used to produce flowing concrete may be approved for use in concrete in any part of the structure. The dosage rate depends on the slump of the base concrete which should be kept constant and low (2-1/2 to 3 inches). Superplasticized concrete can lose slump in 60 to 90 minutes, or sooner if temperature is above 70 degrees F, therefore the admixture should be added to the mix at the project site if there is a probable combination of long concrete haul and warm temperature during placing operation. Otherwise the admixture should be added in accordance with the manufacturer's instruction.

F. Epoxy Grout: Epoxy grout shall conform to ASTM C881, Type III, Grade 2, Class C. Color shall be selected by the Engineer.

PART 3 EXECUTION

3.01 CONCRETE MIX

A. Proportions:

1. The work has been designed for concrete having a minimum compressive strength at 28 days as specified in this section.
2. The cement factor and water cement ratio shall be determined by consideration of the specified strength, the water reducing admixtures, the slump required for proper placement, air-entraining

requirements, the available and maximum allowable aggregate size and its specific gravity and the amount of water carried on the aggregates.

3. The slumps and maximum sizes of aggregate for various types of construction, as well as the computation of trial mixes shall be as described in ACI 211.1 "Recommended Practice for Selected Proportions for Normal and Heavyweight Concrete."

B. Water Cement Ratio: The water cement ratio shall be as determined from the approved design mixes as specified in this section.

C. Water Content:

1. In calculating the total water content in any mix the amount of water carried on the aggregate and the effect of admixtures shall be included. The water on the aggregate shall be determined periodically by test and the amount of free water on the aggregate subtracted from the water added to the mix.
2. In all cases the amount of water to be used shall be the minimum amount required to produce a plastic mixture of the strength specified and of the required density, uniformity, and workability. The consistency of any mix shall be at that required for the specific placing conditions and methods of placement.

D. Concrete Slumps:

1. The Contractor must satisfy himself that he is capable of producing, with the following slumps, concrete of satisfactory quality and strength, that will produce the specified finishes, free of voids, honey-combing, or excessive air bubbles.
2. Execution of this contract signifies that the Contractor accepts full responsibility for the production of concrete of satisfactory quality, strength and finishes within the slump limitations specified. Slump shall be determined as per ASTM C 143.

Types of Construction	Maximum (inches)	Minimum (inches)
Reinforced Footings and Mats	3	1
Substructure Walls	4	1
Slabs, Beams and Reinforced Walls	4	1

E. Air Entrainment:

1. All concrete, except interior concrete slabs subject to abrasion, shall be air entrained. Percent of air versus aggregate size shall be added as a part of the computed mixing water requirements, and be used strictly in accordance with the manufacturer's directions and these specifications to produce a total entrained air content, by volume, to be determined in accordance with the procedure given in ASTM C173, as follows:

Nominal Maximum Size Coarse Aggregate (inches)	Air Content By Volume (percent)
3/8	6 to 10
1/2	5 to 9
3/4	4 to 8
1	3.5 to 6.5
1-1/2	3 to 6

F. Ready Mixed Concrete: It is intended that the major portion of the concrete required for the work be ready mixed in an offsite plant. Small amounts for miscellaneous purposes may be site mixed. All concrete produced in an offsite plant shall be mixed and delivered in accordance with the requirements of the "Standard Specifications for Ready Mixed Concrete," ASTM C 94 and these specifications.

G. Mixing: Concrete shall be mixed and transported in accordance with the applicable provisions of the "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete" (ACI 304) of the American Concrete Institute and these Specifications.

END OF SECTION

ATTACHMENT A - TRENCH PERMIT
(4 PAGES)

City of Newton

Massachusetts 02459
Engineering Division
Phone (617) 796-1020
FAX (617) 796-1051

Permit Number _____

Date Issued _____

Expiration Date_____

Fee: $50 x _____=_____
Trenches Total

TRENCH PERMIT
Pursuant to G.L. c. 82A §1 and 520 CMR 7.00 et seq.(as amended)

THIS PERMIT MUST BE FULLY COMPLETED PRIOR TO CONSIDERATION

Name of Applicant **Street Address**			**Phone** **Cell**
City/Town	**MA**	**ZIP**	
Name of Excavator (if different from applicant) **Street Address**			**Phone** **Cell**
City/Town	**MA**	**ZIP**	
Name of Owner(s) of Property **Street Address**			**Phone** **Cell**
City/Town	**MA**	**ZIP**	
Other Contact		**Permit Fee Received No ( ) Yes ( )**	
Description, location and purpose of proposed trench: **Please describe the exact location of the proposed trench and its purpose (include a description of what is (or is intended) to be laid in proposed trench (e.g.; pipes/cable lines etc..) Please use reverse side if additional space is needed.**			
Insurance Certificate #:			
Name and Contact Information of Insurer:			
Policy Expiration Date:			
Dig Safe #:			
Name of Competent Person (as defined by 520 CMR 7.02):			
Massachusetts Hoisting License # **License Grade:**			**Expiration Date:**

BY SIGNING THIS FORM, THE APPLICANT, OWNER, AND EXCAVATOR ALL ACKNOWLEDGE AND CERTIFY THAT THEY ARE FAMILIAR WITH, OR, BEFORE COMMENCEMENT OF THE WORK, WILL BECOME

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

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

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

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

APPLICANT SIGNATURE

_____ DATE _____

EXCAVATOR SIGNATURE (IF DIFFERENT)

_____ DATE _____

OWNER'S SIGNATURE (IF DIFFERENT)

_____ DATE:_____

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

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

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

i. No trench may be excavated unless the requirements of sections 40 through 40D of chapter 82, and any accompanying regulations, have been met and this permit is invalid unless and until said requirements have been complied with by the excavator applying for the permit including, but not limited to, the establishment of a valid excavation number with the underground plant damage prevention system as said system is defined in section 76D of chapter 164 (DIG SAFE);

ii. Trenches may pose a significant health and safety hazard. Pursuant to Section 1 of Chapter 82 of the General Laws, an excavator shall not leave any open trench unattended without first making every reasonable effort to eliminate any recognized safety hazard that may exist as a result of leaving said open trench unattended. Excavators should consult regulations promulgated by the Department of Public Safety in order to familiarize themselves with the recognized safety hazards associated with excavations and open trenches and the procedures required or recommended by said department in order to make every reasonable effort to eliminate said safety hazards which may include covering, barricading or otherwise protecting open trenches from accidental entry.

iii. Persons engaging in any in any trenching operation shall familiarize themselves with the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CFR 1926.650 et.seq., entitled Subpart P "Excavations".

iv. Excavators engaging in any trenching operation who utilize hoisting or other mechanical equipment subject to chapter 146 shall only employ individuals licensed to operate said equipment by the Department of Public Safety pursuant to said chapter and this permit must be presented to said licensed operator before any excavation is commenced;

v. By applying for, accepting and signing this permit, the applicant hereby attests to the following: (1) that they have read and understands the regulations promulgated by the Department of Public Safety with regard to construction related excavations and trench safety; (2) that he has read and understands the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CMR 1926.650 et.seq., entitled Subpart P "Excavations" as well as any other excavation requirements established by this municipality; and (3) that he is aware of and has, with regard to the proposed trench excavation on private property or proposed excavation of a city or town public way that forms the basis of the permit application, complied with the requirements of sections 40-40D of chapter 82A.

vi. This permit shall be posted in plain view on the site of the trench.

<u>Summary of Excavation and Trench Safety Regulation (520 CMR 14.00 et seq.)</u>

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

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

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

For additional information please visit the Department of Public Safety's website at <u>www.mass.gov/dps</u>

Summary of 1926 CFR Subpart P -OSHA Excavation Standard

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

Trench Definition per the OSHA standard:

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

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

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

Inspections of every trench worksite are required:

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

Competent Person(s) is:

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

Underground Utilities must be:

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

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

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

Stability of Adjacent Structures:

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

Protection from water accumulation hazards:

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

Additional Requirements:

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