

IFB # 17-73

SOLICITATION FOR:
Bike Path Retaining Wall and Drainage Upgrades



CITY OF SOMERVILLE, MASSACHUSETTS
Joseph A. Curtatone, Mayor

Purchasing Department
Angela M. Allen, Purchasing Director

RELEASE DATE: 6/15/2017
QUESTIONS DUE: 6/28/2017 by 4:30PM EST
DUE DATE AND TIME: 7/13/2017 by 11AM EST

DELIVER TO:
City of Somerville
Purchasing Department
Attn: Michael Richards
Assistant Purchasing Director
mrichards@somervillema.gov
93 Highland Avenue
Somerville, MA 02143

IFB # 17-73
Bike Path Retaining Wall and Drainage Upgrades

Key Project Information

Project Address	Community Path adjacent to Buena Vista Rd., Somerville, MA
Estimated Construction Cost	\$605,047.00
Anticipated Contract Award	7/20/2017
Date of Substantial Completion	11/30/2017
Date of Final Completion	5/16/2018
Est. Contract Commencement Date	8/31/2017
Est. Contract Completion Date	6/30/2018
Governing Bid Law	MGL 30.39M (Horizontal Construction)
Wage Requirements	State Prevailing Wages
Payment Bond Requirements	100% of Contract Value
Performance Bond Requirements	100% of Contract Value
Liquidated Damages (\$ per Day)	\$3400.00

Managing Department Information

Managing City Department	Engineering
Project Manager	Bryan Manter
Project Manager Email	bmanter@somervillema.gov

Designer Information

Designer Name	Kleinfelder Northeast, Inc.
Designer Address	215 First Street, Suite 320, Cambridge, MA 02142
Designer Specialty	Engineering
Designer Contact	Angus O'Leary
Designer Contact Email	GOleary@kleinfelder.com

TABLE OF CONTENTS

• Part 1: Invitation for Bid Documents

Section 1: GENERAL INFORMATION ON BID PROCESS

1.1	General Instructions
1.2	Bid Schedule
1.3	Submission Instructions
1.4	Questions
1.5	General Terms

Section 2: RULE FOR AWARD, QUALITY REQUIREMENTS, AND PROJECT BACKGROUND

2.1	Rule For Award
2.2	Project Background
2.3	Minimum Quality Requirements

Section 3: REQUIRED BID FORMS / BIDDERS' CHECKLIST

3.1 <i>(required with bid)</i>	Somerville Living Wage Form
	Quality Requirements Form
	Certificate of Non-Collusion & Tax Compliance
	Certificate of Signature Authority
	Reference Form (or equivalent may be attached)
	5% Bid Deposit
	OSHA Form
	Statement of Management
	Acknowledgement of Addenda (if applicable)
	Signed W9
	Prevailing Wages and Statement of Compliance Form
3.2 <i>(required post bid)</i>	Certificate of Good Standing (will be required of awarded Vendor; please furnish with bid if available)
	Insurance Specifications (will be required of awarded Vendor; furnish sample certificate with bid, if possible)
	Performance Bond (100% of contract price)
	Payment Bond (100% of contract price)

Section 4: PRICE PROPOSAL

4.1	Form for General Bid
	Bid Alternate Form (if applicable)
	Unit Price Form

• PART 2: SAMPLE CONSTRUCTION CONTRACT / CITY'S GENERAL TERMS AND CONDITIONS

PART 3: TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01010	Summary of Work
01025	Measurement and Payment
01040	Project Coordination and Meetings
01060	Permits and Regulatory Requirements
01063	Miscellaneous Requirements
01069	Massachusetts General Laws
01070	Abbreviations
01090	Reference Standards
01105	Rodent Control
01108	Health and Safety Procedures
01200	General Requirements for Utility Work
01300	Submittals
01310	Construction Progress Schedules
01400	Quality Control
01500	Temporary Facilities and Controls
01505	Mobilization
01568	Erosion Control, Sedimentation and Containment of Construction Materials
01570	Maintenance and Protection of Traffic
01600	Products, Materials and Equipment
01630	Restoration of Grounds and Cleaning Up
01701	Project Closeout

DIVISION 2 – SITE WORK

02010	Subsurface Investigation
02015	Geotechnical Monitoring and Instrumentation
02051	Demolition, Modification, Abandonment
02080	Soil and Waste Management
02095	Transportation and Disposal of Soil and Fill
02140	Dewatering
02160	Temporary Excavation Support Systems
02210	Earth Excavation, Backfill, Fill and Grading
02252	Manholes
02525	Paving and Surfacing, Curbs and Sidewalks
02590	Brick Masonry
02604	Catch Basins
02622	Polyvinyl Chloride Pipe
02767	Cured-In-Place Pipelining
02900	Landscaping
02930	Tree Protection

DIVISION 3 - CONCRETE

03301	Cast in Place (CIP) Concrete Facing
03302	Shotcrete Facing

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07160	Bituminous Dampproofing
-------	-------------------------

APPENDIX

Appendix A	Oil and Hazardous Materials Findings, Soil Management Recommendations
Appendix B	Boring Log
Appendix C	Record Drawings
Appendix D	MBTA Expired License
Appendix E	Approved MBTA License
Appendix F	City of Cambridge Permitting Documents

• PART 4: CONSTRUCTION DRAWINGS LIST

DRAWING LIST

Sheet Number	Sheet Title
--	COVER
G-1	GENERAL NOTES
CG-1	DETAILS I
CG-2	DETAILS II
CG-3	RETAINING WALL DETAILS
C-1	SITE PLAN AND PROFILE STA 0+00 TO STA 4+00
C-2	SITE PLAN AND PROFILE STA 4+00 TO STA 7+44
C-3	RETAINING WALL SITE PLAN STA 100+00 TO STA 105+50
C-4	RETAINING WALL SITE PLAN STA 105+50 TO BUENA VISTA ROAD
TMP-1	TRAFFIC MANAGEMENT DETAILS
TMP-2	TRAFFIC MANAGEMENT PLAN
TMP-3	DETOUR PLAN

Part 1: Invitation for Bid Documents

IFB # 17-73

Bike Path Retaining Wall and Drainage Upgrades

1.1 General Instructions

Copies of the solicitation may be obtained from the Purchasing Department on and after 6/15/2017 per the below-noted City Hall hours of operation.

Hall Hours of Operation:	
Monday – Wednesday	8:30 a.m. and 4:30 p.m.
Thursday	8:30 a.m. to 7:30 p.m.
Friday	8:30 a.m. to 12:30 p.m.

All Responses Must be Sealed and Delivered To:

Purchasing Department
City of Somerville
93 Highland Avenue
Somerville, MA 02143

It is the sole responsibility of the Offeror to ensure that the bid arrives on time at the designated place. Late bids will not be considered and will be rejected and returned.

Bid Format:

Submit one, original (1) sealed bid package; it must be marked with the solicitation title and number.

BIDS SUBMITTED MUST BE AN ORIGINAL.

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

- 1) Form for General Bid
- 2) Bid Form for Alternates (if applicable)
- 3) Unit Price Form
- 4) Somerville Living Wage Form
- 5) Quality Requirements Form
- 6) Certificate of Non-Collusion & Tax Compliance
- 7) Certificate of Signature Authority
- 8) Reference Form
- 9) 5% Bid Deposit
- 10) Prevailing / Davis Bacon Wages Statement of Compliance Form
- 11) OSHA Form

If all required documents are not present, the bid may be deemed non-responsive and may result in disqualification of the bid unless the City determines that such failure(s) constitute(s) a minor informality, as defined in Chapter MGL 30B.

The Offeror's authorized official(s) must sign all required bid forms.

1.2 Bid Schedule

Key dates for this Invitation for Bids:	
IFB Issued	6/15/2017
Deadline for Submitting Questions to IFB	6/28/201 by 4:30PM EST
Bids Due	7/13/2017 by 11AM EST
Anticipated Contract Award	7/20/2017
Est. Contract Commencement Date	8/31/2017
Est. Contract Completion Date	6/30/2018

<p>Responses must be delivered by 7/13/2017 by 11AM EST to:</p>	<p>City of Somerville Purchasing Department Attn: Michael Richards 93 Highland Avenue Somerville, MA 02143</p>
--	--

1.3 Submission Instructions

Please submit *one sealed bid package* with the following contents and marked in the following manner:

Contents of Sealed Bid Package	Marked As
<p>Envelope 1: Sealed Bid: Shall Include (1) original and one (1) electronic copy. [Electronic copies are to be submitted on CD-ROM or thumb drives and are to be saved in Adobe Acrobat format. ("Read only" files are acceptable.)]</p>	<p>To Be Marked: IFB # 17-73 Bike Path Retaining Wall and Drainage Upgrades</p>
<p>Please send the complete sealed package to the attention of :</p>	<p>Michael Richards Assistant Purchasing Director Purchasing Department Somerville City Hall 93 Highland Avenue Somerville, MA 02143</p>

Bid Format

Responses shall be prepared on standard 8.5 x 11 inch paper (charts may be landscaped but must be on 8.5 x 11 inch paper) and shall be in a legible font size (12). All pages of each response shall be appropriately numbered (and with consecutive page numbering across tabs). **In an effort to reduce waste, please DO NOT USE 3-RING BINDERS.**

Elaborate format and binding are neither necessary nor desirable.

Qualifications & Experience

The Offeror may include any additional literature and product brochures. The Quality Requirements Form (Section 2), or set of basic business standards, must be submitted with bid.

References

The Offeror shall list at least three relevant references, which the City may contact. The City of Somerville reserves the right to use ourselves as a reference. References shall include the following information:

●The name, address, telephone number, and email address of each client listed above.	
●A description of the work performed under each contract.	●The amount of the contract.
●A description of the nature of the relationship between Offeror and the customer.	
●The dates of performance.	●The volume of the work performed.

1.4 Questions

Questions are due: 6/28/201 by 4:30PM EST

Questions concerning this solicitation must be delivered in writing to:

Michael Richards
Assistant Purchasing Director
Somerville City Hall
Purchasing Department
93 Highland Avenue
Somerville, MA 02143

Or emailed to:
mrichards@somervillema.gov

Or faxed to:

617-625-1344

Answers will be sent via an addendum to all Offerors who have registered as bid holders. Bidders are encouraged to contact the Purchasing Department to register as a bid document holder to automatically be alerted as to addenda as they are issued. It is the responsibility of the Offeror to also monitor the bid portal on the City's website for any updates, addenda, etc. regarding that specific solicitation. The web address is:

<http://www.somervillema.gov/departments/finance/purchasing/bids>.

Any bidders that contact City personnel outside of the Purchasing Department regarding this bid may be disqualified.

1.5 General Terms

Estimated Quantities

The City of Somerville has provided estimated quantities, which will be ordered/purchased over the course of the contract period. These estimates are estimates only and not guaranteed.

Bid Signature

A response must be signed as follows: 1) if the Offeror is an individual, by her/him personally; 2) if the Offeror is a partnership, by the name of the partnership, followed by the signature of each general partner; and 3) if the Offeror is a corporation, by the authorized officer, whose signature must be attested to by the clerk/secretary of the corporation (& with corporate seal).

Time for Bid Acceptance and City Contract Requirements

The contract will be awarded within 90 days after the bid opening. The time for award may be extended for up to 45

additional days by mutual agreement between the City of Somerville and the Offeror that is most advantageous and responsible. The Offeror's submission will remain in effect for a period of 90 days from the response deadline or until it is formally withdrawn, a contract is executed, or this solicitation is canceled, whichever occurs first. The Offeror will be required to sign a standard City contract per the City's general terms included herein as Appendix A.

Holidays are as follows:

New Year's Day	Martin Luther King Day	Presidents' Day	Patriots' Day
Memorial Day	Bunker Hill Day	Independence Day	Labor Day
Columbus Day	Veterans' Day	Thanksgiving Day	Thanksgiving Friday
Christmas Eve (half day)	Christmas Day		

Please visit <http://www.somervillema.gov/> for the City's most recent calendar. *Under State Law, all holidays falling on Sunday must be observed on Monday.

If the awarded Offeror for their convenience desires to perform work during other than normal working hours or on other than normal work days, or if the Offeror is required to perform work at such times, the Offeror shall reimburse the City for any additional expense occasioned the City, thereby, such as, but not limited to, overtime pay for City employees, utilities service, etc. UNLESS otherwise specified in these provisions, services will be performed during normal work hours. When required services occur on holidays, work will be performed on either the previous or following work day, unless specified otherwise.

Unforeseen Office Closure

If, at the time of the scheduled bid opening, the Purchasing Department is closed due to uncontrolled events such as fire, snow, ice, wind, or building evacuation, the bid due date will be postponed until 2:00 p.m. on the next normal business day. Bids will be accepted until that date and time. In the event of inclement weather, the Offeror is responsible for listening to the media to determine if the City has been closed due to weather.

Changes & Addenda

If any changes are made to this solicitation, an addendum will be issued. All proposers on record as having picked up the solicitation will be alerted via email as to the posting of all addenda. The City will also post addenda on its website (<http://www.somervillema.gov/departments/finance/purchasing/bids>). No changes may be made to the solicitation documents by the Offerors without written authorization and/or an addendum from the Purchasing Department.

Modification or Withdrawal of Bids, Mistakes, and Minor Informalities

An Offeror may correct, modify, or withdraw a bid by written notice received by the City of Somerville prior to the time and date set for the bid opening. Bid modifications must be submitted in a sealed envelope clearly labeled "Modification No. ___" to the address listed in Section 1. Each modification must be numbered in sequence and must reference the original solicitation. After the bid opening, an Offeror may not change any provision of the bid in a manner prejudicial to the interests of the City or fair competition. Minor informalities will be waived or the proposer will be allowed to correct them. If a mistake and the intended bid are clearly evident on the face of the bid document, the mistake will be corrected to reflect the intended correct bid, and the proposer will be notified in writing; the proposer may not withdraw the bid. A proposer may withdraw a bid if a mistake is clearly evident on the face of the bid document, but the intended correct bid is not similarly evident.

Right to Cancel/Reject Bids

The City of Somerville may cancel this solicitation, or reject in whole or in part any and all bids, if the City determines that cancellation or rejection serves the best interests of the City.

Unbalanced Bids

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

Brand Name “or Equal”

Any references to any brand name or proprietary product in the specifications shall require the acceptance of an equal or better brand. The City has the right to make the final determination as to whether an alternate brand is equal to the brand specified.

Electronic Funds Transfer (EFT)

For EFT payment, the following shall be included with invoices to the point of contact:

- Contract/Order number; Contractor’s name & address as stated in the contract;
- The signature (manual or electronic, as appropriate) title, and telephone number of the Offeror’s representative authorized to provide sensitive information;
- Name of financial institution; Financial institution nine (9) digit routing transit number;
- Offeror’s account number; Type of account, i.e., checking or saving.

Project Schedule

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

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

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

Sales Tax Exemption

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

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

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

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

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

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

<i>The following utility companies must be notified in writing:</i>		
M.B.T.A. Engineering and Maintenance Division 617-722-5454 Attn: Chief Engineer 500 Arborway Jamaica Plain, MA 02130	M.W.R.A. Sewer Division 617-242-6000 100 First Avenue Charlestown Navy Yard Boston, MA 02129	M.W.R.A. Water Division 617-242-6000 100 First Avenue Charlestown Navy Yard Boston, MA 02129
<i>The following utility companies must be notified in writing or through Dig-Safe:</i>		
Algonquin Gas Transmission Corp. 617-254-4050 Manager of Land and Public Relations 1284 Soldiers Field Road Brighton, MA 02135	Verizon 781-290-5154 460 Totten Pond Road Waltham, MA 02154	Boston Edison 617-541-5730 Right of Way 1165 Massachusetts Avenue Dorchester, MA 02125
Boston Gas Company 617-323-9210 201 Rivermoor Street West Roxbury, MA 02132	EVERSOURCE 617-497-1236, x4195 46 Blackstone Street Somerville, MA 02139	EVERSOURCE Steam 617-225-4568 Attn: Supervisor of Maintenance 265 First Street Somerville, MA 02142
EVERSOURCE Gas 617-369-5591 303 Third Street Somerville, MA 02142	A T & T Broadband 981-658-0400 760 Main Street Malden, MA 01887	Somerville Public Works Dept. 617-625-6600, x5200 One Franey Road Somerville, MA 02145
Somerville Fire Department 617-625-6600, x8100 266 Broadway Somerville, MA 02143	Dig-Safe 1-800-322-4844	

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

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

Schedule of Values

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

5% Bid Guaranty

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

Prevailing Wage Rate Requirements

The contractor shall pay Mass. Prevailing Wage Rates. The applicable prevailing wage rates are attached as part of this bid package and will be included in the resulting contract. Notwithstanding anything to the contrary, the City may, in its

sole discretion withhold payment unless the City has in its possession payroll records that are complete, accurate, and current as of the date of said application for payment. A signed Compliance Form must be included with the bid package (form included).

a) The Contractor shall:

- Pay wages at least once a week;
- Submit payroll information on a weekly basis in a format approved by the City, numbered in numerical sequence and signed by the Contractor (including forms for weeks when the Contractor is not on the Project Site, in which case there shall be a notation to the effect "no work this payroll period" and a date anticipated for resuming work).

b) The Contractor shall submit to the City within the first week of construction:

- A list of apprenticeship programs with which the Contractor is affiliated;
- The number of apprentices that will be employed by the Contractor on the Project;
- A list of the Contractor's employee fringe benefits;
- A copy of each project schedule, including the anticipated commencement date for each Subcontractor; and
- A list of each Subcontractor's suppliers and material men.

c) The Contractor shall include language similar to the above in all subcontracts.

Reservation of Rights

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

Maintenance Manual and As-Built Drawing Requirements

Upon Final Completion of all park construction, the contractor shall submit: two complete copies of a park maintenance manual, and two copies of an as-built drawing set, with two compact disc (CD) copies of the as-built drawings. The City will not issue the final check for park retainage until the submittal and approval of the maintenance manual and as-built drawings.

- 1) The Maintenance Manual shall be in the form of a three ring binder, organized and tabbed into appropriate sections, and shall include the following items:
 - A complete maintenance plan with recommended maintenance schedules and procedures for all systems including: HVAC, security (card access/cameras), fire suppression, irrigation, fertilization, and water systems shut-down procedures, etc., and all other applicable systems and procedures;
 - A letter from the contractor stating the period of warranty for all parts, materials, and workmanship, from the date of Final Completion;
 - A letter from the contractor stating the period of warranty for all systems (HVAC, irrigation, fire suppression, etc.);
 - All product information, product directions, and warranties;
 - List of all materials (plants, etc.), sizes of plant containers, etc.;
 - Copies of City permits with signatures of inspectors;
 - Contact information for all subcontractors including email addresses; and,
 - A record of all submittals and dates of approvals.
- 2) As-Built drawings shall be a complete and accurate record that incorporates any and all changes to the construction plan set issued at the time of contract initiation. As-built drawings shall be clearly marked and annotated and shall include but not be limited to: all field changes, change orders, and supplemental drawing provided by the landscape architect.
- 3) The Compact Discs shall include an electronic copy of all as-built drawings.

Police Details

Unless otherwise noted in the specifications, the Contractor will be responsible for requesting and paying for all necessary police details. These costs should be incorporated into the base bid amount.

Period of Performance

The period of performance for this contract begins on or about 8/31/2017 and ends on or about 6/30/2018. If applicable, optional renewal years may be exercised by the sole discretion of the City (see cover page for anticipated contract term).

Place of Performance

All services, delivery, and other required support shall be conducted in Somerville and other locations designated by the Department point of contact. Meetings between the Vendor and City personnel shall be held at the City of Somerville, Massachusetts, unless otherwise specified.

Vendor Conduct

The Vendor's employees shall comply with all City regulations, policies, and procedures. The Vendor shall ensure that their employees present professional work attire at all times. The authorized contracting body of the City may, at his/her sole discretion, direct the Vendor to remove any Vendor employee from City facilities for misconduct or safety reasons. Such rule does not relieve the Vendor of their responsibility to provide sufficient and timely service. The City will provide the Vendor with immediate written notice for the removal of the employee. Vendors must be knowledgeable of the conflict of interest law found on the Commonwealth's website <http://www.mass.gov/ethics/laws-and-regulations-/conflict-of-interest-information/conflict-of-interest-law.html>. Vendors may be required to take the Conflict of Interest exam.

Vendor Personnel

The Vendor shall clearly state the name of the proposed project manager. All proposed staff must demonstrate the ability to carry out the specified requirements.

Confidentiality

The Vendor agrees that it will ensure that its employees and others performing services under this contract will not use or disclose any non-public information unless authorized by the City. That includes confidential reports, information, discussions, procedures, and any other data that are collected, generated or resulting from the performance of this scope of work. All documents, photocopies, computer data, and any other information of any kind collected or received by the Vendor in connection with the contract work shall be provided to the City upon request at the termination of the contract (i.e., the date on which final payment is made on the contract or at such other time as may be requested by the City or as otherwise agreed by City and the Vendor). The Vendor may not discuss the contract work in progress with any outside party, including responding to media and press inquiries, without the prior written permission of the City. In addition, the Vendor may not issue news releases or similar items regarding contract award, any subsequent contract modifications, or any other contract-related matter without the prior written approval of the City. Requests to make such disclosures should be addressed in writing to the Vendor's point of contact.

IFB # 17-73

SECTION 2.0
RULE FOR AWARD /
PROJECT INFORMATION

2.1 Rule For Award

The contract shall be awarded to the responsible and responsive Bidder submitting the lowest total price. The contract will be awarded within ninety (90) days after the bid opening. The time for award may be extended for up to 45 additional days by mutual agreement between the City and the apparent lowest responsive and responsible bidder.

2.2 Background

Project Information	
Managing City Department:	Engineering
Project Manager:	Bryan Manter
Project Manager Email:	bmanter@somervillema.gov
Designer:	Kleinfelder Northeast, Inc.
Designer Contact:	Angus O'Leary
Project Address:	Somerville Community Path between Elmwood Street and Thorndike Street, and along Thorndike Street between the Somerville Community Path and Howard Street.
Brief Project Description:	The Work consists of approximately 610 linear feet of storm drain installation, approximately 130 linear feet of storm drain CIPP lining, the installation of drainage manholes and catch basin structures, the structural rehabilitation of the existing retaining wall, and surface restoration on the Community Path and Thorndike Street. The Work includes excavation above the MBTA Red Line tunnel and excavation exposing and selective removal a section of the MBTA slurry wall that protrudes above the Red Line Tunnel including restoration of waterproofing.
Estimated Project Cost:	\$605,047.00
Project Schedule	
Estimated Award Date:	7/20/2017
Estimated Start Date:	8/31/2017
Date of Substantial Completion:	11/30/2017
Date of Final Completion:	5/16/2018

IFB # 17-73

SECTION 3.0

Bike Path Retaining Wall and Drainage Upgrades

REQUIRE BID FORMS / BIDDERS' CHECKLIST

Please ensure all documents listed on this checklist are included with your bid. Failure to do so may subject the proposer to disqualification.

Required with Sealed Bids

	Form for General Bid
	Bid Form for Alternates (if applicable)
	Unit Price Form (if applicable)
	Somerville Living Wage Form
	Quality Requirements Form
	Certificate of Non-Collusion & Tax Compliance
	Certificate of Signature Authority
	Reference Form (or equivalent may be attached)
	5% Bid Deposit
	Statement of Management
	Prevailing / Davis Bacon Wages Statement of Compliance Form
	OSHA Form
	Acknowledgement of Addenda (if applicable)
	Signed W9

Required with Contract, *Post Award*

	Certificate of Good Standing (will be required of awarded Vendor; please furnish with bid if available)
	Insurance Specifications (will be required of awarded Vendor; furnish sample certificate with bid, if possible)
	Performance Bond (see specification for details)
	Payment Bond (if applicable, see specification for details)



SOMERVILLE LIVING WAGE ORDINANCE CERTIFICATION FORM
CITY OF SOMERVILLE CODE OF ORDINANCES SECTION 2-397 et seq.*

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

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

Definition of “Living Wage”: For this contract or subcontract, as of 7/1/2017 “Living Wage” shall be deemed to be an hourly wage of no less than \$12.49 per hour. From time to time, the Living Wage may be upwardly adjusted and amendments, if any, to the contract or subcontract may require the payment of a higher hourly rate if a higher rate is then in effect.

CERTIFICATIONS

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

* Copies of the Ordinance are available upon request to the Purchasing Department.

Form: _____
Contract Number: _____

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

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

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

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

CERTIFIED BY:

Signature: _____
(Duly Authorized Representative of Vendor)

Title: _____

Name of Vendor: _____

Date: _____

INSTRUCTIONS: PLEASE POST

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

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

The Living Wage as of 7/1/2017 is **\$12.49** per hour. The only employees who are not covered by the Living Wage Ordinance are individuals in a Youth Program. "Youth Program" as defined in the Ordinance, "means any city, state or federally funded program which employs youth, as defined by city, state or federal guidelines, during the summer, or as part of a school to work program, or in any other related seasonal or part-time program."

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

Minimum Quality Requirements Form

Quality requirements, or basic business requirements, are the minimum set of standards that an entity must meet and certify to be considered responsible and responsive. **Please complete the Quality Requirements form, below, and submit it with your completed bid.** The City of Somerville will disqualify any response that does not meet the minimum quality requirements. A "No Response" to items 1, 2, or 3, or a failure to respond to any of the following minimum standards may result in disqualification of your bid.

QUALITY REQUIREMENTS		YES	NO
1.	Has the contractor been established in the relevant construction field for at least 5 years?		
2.	Can the contractor certify that all employees to be provided, have successfully completed at least 10 hours of OSHA approved training in Construction Safety and Health?		
3.	Can the contract certify all work will be completed in accordance with all MBTA requirements and all terms and conditions detailed in the MBTA license?		
4.	Optional: Are you a Mass. Supplier Diversity Office MBE/WBE certified minority or woman owned business? Additional minority designations may be submitted by attaching supporting documentation.		

In order to provide verification of affirmative responses to items 1, 2, and 3 under the quality requirements listed in the Quality Requirements Form, Offeror must submit written information that details the general background, experience, and qualifications of the organization. Subcontractors, if applicable, must be also included.



Non-Collusion Form and Tax Compliance Certification

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

A. NON-COLLUSION FORM

I, the undersigned, hereby certify under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person.

As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature: _____
(Individual Submitted Bid or Proposal)
Duly Authorized

Name of Business or Entity: _____

Date: _____

B. TAX COMPLIANCE CERTIFICATION

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

Signature: _____
(Duly Authorized Representative of Vendor)

Name of Business or Entity: _____

Social Security Number or Federal Tax ID#: _____

Date: _____



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

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

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

(Complete Name of Limited Liability Company)

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

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

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

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

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

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

5. **Signature:**_____

Printed Name: _____

Printed Title:_____

Date: _____



**Certificate of Authority
(Corporations Only)**

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

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

(Insert Full Name of Corporation)

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

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

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

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

(Insert Name of Officer from Line 2) (Insert Title of Officer from Line 2)

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

4. **ATTEST:**

Signature: _____
(Clerk or Secretary)

AFFIX CORPORATE SEAL HERE

Printed Name: _____

Printed Title: _____

Date: _____

(Date Must Be on or after Date Officer Signed Contract/Bonds)

REFERENCE FORM

Bidder: _____

IFB Title: _____

Bidder must provide references for: Three other similar sized Municipalities provided the same services

Reference: _____ Contact: _____

Address: _____ Phone: _____

_____ Email: _____

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

Reference: _____ Contact: _____

Address: _____ Phone: _____

_____ Email: _____

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

Reference: _____ Contact: _____

Address: _____ Phone: _____

_____ Email: _____

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

**STATEMENT OF MANAGEMENT
For Contracts over \$100,000**

In accordance with M.G.L. Chapter 30, Section 39R, the undersigned successful bidder states that its system of internal accounting controls and that of its subsidiaries reasonably assure (1) that transactions are executed in accordance with management's general and specific authorization; (2) that transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles, and to maintain accountability for assets; (3) that access to assets is permitted only in accordance with management's general or specific authorization, and (4) that the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Executed this _____ day of _____, _____

On behalf of _____
(Name of Successful Bidder)

(Address and telephone of Successful Bidder)

(Name and title of person signing statement)

By: _____
(Signature)

CERTIFIED PUBLIC ACCOUNTANT STATEMENT

In accordance with M.G.L. 30, Section 39R I, _____
a certified public accountant, state that I have examined the above Statement of Management on internal accounting controls, and that in my opinion (1) the representations of management are consistent with the result of management's evaluation of the system of internal accounting controls; and (2) that such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the above referenced successful bidder's financial statements.

(Signature)

(Business name, address and telephone number)



OSHA GENERAL CONTRACTOR CERTIFICATION FORM

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

GENERAL CONTRACTOR'S CERTIFICATION – BID FORM

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

(1) certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is a 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.

As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature: _____
(Individual Submitting Bid)
Duly Authorized

Name of Business or Entity:_____

Date: _____

RETURN THIS FORM WITH YOUR BID

CERTIFICATE OF GOOD STANDING

TO: Vendor

FROM: Purchasing Department

RE: **CERTIFICATE OF GOOD STANDING**

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

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

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

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

IMPORTANT NOTICE

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

Thank You,

Purchasing Director

INSURANCE SPECIFICATIONS

INSURANCE REQUIREMENTS FOR AWARDED VENDOR ONLY:

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

A. GENERAL LIABILITY - Comprehensive Form

Per occurrence.....\$ Two Million

Aggregate.....\$ Two Million

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

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

EMPLOYERS' LIABILITY.....\$ Statutory

C. AUTOMOBILE LIABILITY INSURANCE AS LISTED BELOW:

Per occurrence\$ One Million

Aggregate\$ One Million

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

Certificate Should Be Made Out To:

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

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



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

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

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

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

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

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

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

ADD "X" HERETO CERTIFY THAT THE CITY OF SOMERVILLE IS AN ADDITIONAL INSURED

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

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

CERTIFICATE HOLDER**CANCELLATION**

CERTIFICATES SHOULD BE MADE OUT TO:

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

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

AUTHORIZED REPRESENTATIVE

Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

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

Part I Taxpayer Identification Number (TIN)

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

Social security number											
				-			-				
or											
Employer identification number											
				-							

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Part II Certification

Under penalties of perjury, I certify that:

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

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

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

General Instructions

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

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

Purpose of Form

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

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

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

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

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

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

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

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

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

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following persons must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5 ²
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

¹ See Form 1099-MISC, Miscellaneous Income, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.ssa.gov. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/businesses and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

- 1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.** You must give your correct TIN, but you do not have to sign the certification.
- 2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983.** You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.
- 3. Real estate transactions.** You must sign the certification. You may cross out item 2 of the certification.
- 4. Other payments.** You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).
- 5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions.** You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor ²
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee ¹ The actual owner ¹
5. Sole proprietorship or disregarded entity owned by an individual	The owner ³
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	Give name and EIN of:
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity ⁴
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

*Note. Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: spam@uce.gov or contact them at www.ftc.gov/idtheft or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

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 is available from the Department of Labor Standards (DLS) at www.mass.gov/dols/pw 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.

On a weekly basis, every contractor and subcontractor is required to submit a certified copy of their weekly payroll records to the awarding authority; this includes the payroll forms and the Statement of Compliance form. The certified payroll records must be submitted either by regular mail or by e-mail to the awarding authority. Once collected, the awarding authority is required to preserve those records for three years from the date of completion of the project.

Each such contractor and subcontractor shall furnish weekly **and** within 15 days after completion of its portion of the work, to the awarding authority directly by first-class mail or e-mail, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form, accompanied by their payroll:

STATEMENT OF COMPLIANCE

_____, 20_____

I, _____, _____
(Name of signatory party) (Title)

do hereby state:

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

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

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

Signature _____

Title _____

MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM



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

Are all apprentice employees identified above currently registered with the MA DLS's Division of Apprentices Standards? YES NO

For all apprentices performing work during the reporting period, attach a copy of the apprentice identification card issued by the Massachusetts Department of Labor Standards / Division of Apprentices Standards. No apprentices are identified above

NOTE: Pursuant to MGL c. 149, s. 27B, every contractor and subcontractor is required to submit a **true and accurate** copy of their certified weekly payroll records to the awarding authority by first-class mail or e-mail. In addition, each weekly payroll must be accompanied by a statement of compliance signed by the employer. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.

Date Received by Awarding Authority / /
--



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

CHARLES D. BAKER
Governor

RONALD L. WALKER, II
Secretary

KARYN E. POLITO
Lt. Governor

WILLIAM D MCKINNEY
Director

Awarding Authority: City of Somerville
Contract Number: **City/Town:** SOMERVILLE
Description of Work: 610 linear feet of storm drain installation, 130 linear feet of storm drain CIPP lining, installation of drainage manholes and catch basin structures, structural rehabilitation of retaining wall
Job Location: Community Path between Elmwood St & Thorndike St

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Issue Date: 06/09/2017 **Wage Request Number:** 20170609-016

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.25	\$10.91	\$10.89	\$0.00	\$55.05
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.32	\$10.91	\$10.89	\$0.00	\$55.12
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.44	\$10.91	\$10.89	\$0.00	\$55.24
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$88.29	\$9.80	\$19.23	\$0.00	\$117.32
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.60	\$7.60	\$14.65	\$0.00	\$59.85
	12/01/2017	\$38.45	\$7.60	\$14.65	\$0.00	\$60.70
	06/01/2018	\$39.40	\$7.60	\$14.65	\$0.00	\$61.65
	12/01/2018	\$40.35	\$7.60	\$14.65	\$0.00	\$62.60
	06/01/2019	\$41.35	\$7.60	\$14.65	\$0.00	\$63.60
	12/01/2019	\$42.35	\$7.60	\$14.65	\$0.00	\$64.60
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	06/01/2017	\$34.90	\$11.50	\$7.10	\$0.00	\$53.50
	12/01/2017	\$35.90	\$11.50	\$7.10	\$0.00	\$54.50
	06/01/2018	\$36.90	\$11.50	\$7.10	\$0.00	\$55.50
	12/01/2018	\$37.90	\$11.50	\$7.10	\$0.00	\$56.50
	06/01/2019	\$38.90	\$11.50	\$7.10	\$0.00	\$57.50
	12/01/2019	\$39.90	\$11.50	\$7.10	\$0.00	\$58.50
	06/01/2020	\$40.90	\$11.50	\$7.10	\$0.00	\$59.50
	12/01/2020	\$41.90	\$11.50	\$7.10	\$0.00	\$60.50
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						

Issue Date: 06/09/2017 **Wage Request Number:** 20170609-016

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.60	\$7.60	\$14.65	\$0.00	\$59.85
	12/01/2017	\$38.45	\$7.60	\$14.65	\$0.00	\$60.70
	06/01/2018	\$39.40	\$7.60	\$14.65	\$0.00	\$61.65
	12/01/2018	\$40.35	\$7.60	\$14.65	\$0.00	\$62.60
	06/01/2019	\$41.35	\$7.60	\$14.65	\$0.00	\$63.60
	12/01/2019	\$42.35	\$7.60	\$14.65	\$0.00	\$64.60
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2017	\$42.92	\$6.97	\$16.21	\$0.00	\$66.10

Apprentice - BOILERMAKER - Local 29
Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
2	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
3	70	\$30.04	\$6.97	\$11.35	\$0.00	\$48.36
4	75	\$32.19	\$6.97	\$12.16	\$0.00	\$51.32
5	80	\$34.34	\$6.97	\$12.97	\$0.00	\$54.28
6	85	\$36.48	\$6.97	\$13.78	\$0.00	\$57.23
7	90	\$38.63	\$6.97	\$14.59	\$0.00	\$60.19
8	95	\$40.77	\$6.97	\$15.40	\$0.00	\$63.14

Notes:

Apprentice to Journeyworker Ratio:1:5

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (BOSTON)</i>	03/01/2017	\$50.76	\$10.75	\$19.22	\$0.00	\$80.73
---	------------	---------	---------	---------	--------	---------

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Boston
Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.38	\$10.75	\$19.22	\$0.00	\$55.35
2	60	\$30.46	\$10.75	\$19.22	\$0.00	\$60.43
3	70	\$35.53	\$10.75	\$19.22	\$0.00	\$65.50
4	80	\$40.61	\$10.75	\$19.22	\$0.00	\$70.58
5	90	\$45.68	\$10.75	\$19.22	\$0.00	\$75.65

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2016	\$37.45	\$7.60	\$14.35	\$0.00	\$59.40
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2016	\$36.30	\$7.60	\$14.35	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2016	\$36.30	\$7.60	\$14.35	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS-ZONE 1 (Metro Boston)</i>	03/01/2017	\$45.81	\$9.90	\$17.00	\$0.00	\$72.71
	09/01/2017	\$46.93	\$9.90	\$17.00	\$0.00	\$73.83
	03/01/2018	\$48.04	\$9.90	\$17.00	\$0.00	\$74.94
	09/01/2018	\$49.19	\$9.90	\$17.00	\$0.00	\$76.09
	03/01/2019	\$50.34	\$9.90	\$17.00	\$0.00	\$77.24

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER - Zone 1 Metro Boston

Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.91	\$9.90	\$1.63	\$0.00	\$34.44
2	60	\$27.49	\$9.90	\$1.63	\$0.00	\$39.02
3	70	\$32.07	\$9.90	\$12.11	\$0.00	\$54.08
4	75	\$34.36	\$9.90	\$12.11	\$0.00	\$56.37
5	80	\$36.65	\$9.90	\$13.74	\$0.00	\$60.29
6	80	\$36.65	\$9.90	\$13.74	\$0.00	\$60.29
7	90	\$41.23	\$9.90	\$15.37	\$0.00	\$66.50
8	90	\$41.23	\$9.90	\$15.37	\$0.00	\$66.50

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.47	\$9.90	\$1.63	\$0.00	\$35.00
2	60	\$28.16	\$9.90	\$1.63	\$0.00	\$39.69
3	70	\$32.85	\$9.90	\$12.11	\$0.00	\$54.86
4	75	\$35.20	\$9.90	\$12.11	\$0.00	\$57.21
5	80	\$37.54	\$9.90	\$13.74	\$0.00	\$61.18
6	80	\$37.54	\$9.90	\$13.74	\$0.00	\$61.18
7	90	\$42.24	\$9.90	\$15.37	\$0.00	\$67.51
8	90	\$42.24	\$9.90	\$15.37	\$0.00	\$67.51

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (BOSTON)	01/01/2017	\$45.67	\$12.20	\$19.41	\$1.30	\$78.58
	07/01/2017	\$46.30	\$12.20	\$19.41	\$1.30	\$79.21
	01/01/2018	\$46.54	\$12.20	\$19.41	\$1.30	\$79.45
	07/01/2018	\$46.79	\$12.20	\$19.41	\$1.30	\$79.70
	01/01/2019	\$47.03	\$12.20	\$19.41	\$1.30	\$79.94
	07/01/2019	\$47.27	\$12.20	\$19.41	\$1.30	\$80.18
	01/01/2020	\$47.52	\$12.20	\$19.41	\$1.30	\$80.43

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.84	\$12.20	\$12.41	\$0.00	\$47.45
2	60	\$27.40	\$12.20	\$14.41	\$1.30	\$55.31
3	65	\$29.69	\$12.20	\$15.41	\$1.30	\$58.60
4	70	\$31.97	\$12.20	\$16.41	\$1.30	\$61.88
5	75	\$34.25	\$12.20	\$17.41	\$1.30	\$65.16
6	80	\$36.54	\$12.20	\$18.41	\$1.30	\$68.45
7	90	\$41.10	\$12.20	\$19.41	\$1.30	\$74.01

Effective Date - 07/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.15	\$12.20	\$12.41	\$0.00	\$47.76
2	60	\$27.78	\$12.20	\$14.41	\$1.30	\$55.69
3	65	\$30.10	\$12.20	\$15.41	\$1.30	\$59.01
4	70	\$32.41	\$12.20	\$16.41	\$1.30	\$62.32
5	75	\$34.73	\$12.20	\$17.41	\$1.30	\$65.64
6	80	\$37.04	\$12.20	\$18.41	\$1.30	\$68.95
7	90	\$41.67	\$12.20	\$19.41	\$1.30	\$74.58

Notes:

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	06/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
	12/01/2017	\$48.38	\$10.00	\$15.25	\$0.00	\$73.63

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4	06/01/2017	\$31.86	\$10.00	\$15.25	\$0.00	\$57.11
	12/01/2017	\$32.55	\$10.00	\$15.25	\$0.00	\$57.80

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DELEADER (BRIDGE) PAINTERS LOCAL 35 - ZONE 1	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PAINTER Local 35 - BRIDGES/TANKS						
Effective Date - 01/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.71	\$7.85	\$0.00	\$0.00	\$33.56
2	55	\$28.28	\$7.85	\$3.66	\$0.00	\$39.79
3	60	\$30.85	\$7.85	\$3.99	\$0.00	\$42.69
4	65	\$33.42	\$7.85	\$4.32	\$0.00	\$45.59
5	70	\$35.99	\$7.85	\$14.11	\$0.00	\$57.95
6	75	\$38.56	\$7.85	\$14.44	\$0.00	\$60.85
7	80	\$41.13	\$7.85	\$14.77	\$0.00	\$63.75
8	90	\$46.27	\$7.85	\$15.44	\$0.00	\$69.56

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN LABORERS - ZONE 1	06/01/2017	\$37.00	\$7.60	\$14.65	\$0.00	\$59.25
	12/01/2017	\$37.85	\$7.60	\$14.65	\$0.00	\$60.10
	06/01/2018	\$38.80	\$7.60	\$14.65	\$0.00	\$61.05
	12/01/2018	\$39.75	\$7.60	\$14.65	\$0.00	\$62.00
	06/01/2019	\$40.75	\$7.60	\$14.65	\$0.00	\$63.00
	12/01/2019	\$41.75	\$7.60	\$14.65	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 1	06/01/2017	\$38.00	\$7.60	\$14.65	\$0.00	\$60.25
	12/01/2017	\$38.85	\$7.60	\$14.65	\$0.00	\$61.10
	06/01/2018	\$39.80	\$7.60	\$14.65	\$0.00	\$62.05
	12/01/2018	\$40.75	\$7.60	\$14.65	\$0.00	\$63.00
	06/01/2019	\$41.75	\$7.60	\$14.65	\$0.00	\$64.00
	12/01/2019	\$42.75	\$7.60	\$14.65	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS LABORERS - ZONE 1	06/01/2017	\$37.75	\$7.60	\$14.65	\$0.00	\$60.00
	12/01/2017	\$38.60	\$7.60	\$14.65	\$0.00	\$60.85
	06/01/2018	\$39.55	\$7.60	\$14.65	\$0.00	\$61.80
	12/01/2018	\$40.50	\$7.60	\$14.65	\$0.00	\$62.75
	06/01/2019	\$41.50	\$7.60	\$14.65	\$0.00	\$63.75
	12/01/2019	\$42.50	\$7.60	\$14.65	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1	06/01/2017	\$38.00	\$7.60	\$14.65	\$0.00	\$60.25
	12/01/2017	\$38.85	\$7.60	\$14.65	\$0.00	\$61.10
	06/01/2018	\$39.80	\$7.60	\$14.65	\$0.00	\$62.05
	12/01/2018	\$40.75	\$7.60	\$14.65	\$0.00	\$63.00
	06/01/2019	\$41.75	\$7.60	\$14.65	\$0.00	\$64.00
	12/01/2019	\$42.75	\$7.60	\$14.65	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1	06/01/2017	\$37.75	\$7.60	\$14.65	\$0.00	\$60.00
	12/01/2017	\$38.60	\$7.60	\$14.65	\$0.00	\$60.85
	06/01/2018	\$39.55	\$7.60	\$14.65	\$0.00	\$61.80
	12/01/2018	\$40.50	\$7.60	\$14.65	\$0.00	\$62.75
	06/01/2019	\$41.50	\$7.60	\$14.65	\$0.00	\$63.75
	12/01/2019	\$42.50	\$7.60	\$14.65	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER LABORERS - ZONE 1	06/01/2017	\$37.00	\$7.60	\$14.65	\$0.00	\$59.25
	12/01/2017	\$37.85	\$7.60	\$14.65	\$0.00	\$60.10
	06/01/2018	\$38.80	\$7.60	\$14.65	\$0.00	\$61.05
	12/01/2018	\$39.75	\$7.60	\$14.65	\$0.00	\$62.00
	06/01/2019	\$40.75	\$7.60	\$14.65	\$0.00	\$63.00
	12/01/2019	\$41.75	\$7.60	\$14.65	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$58.86	\$9.80	\$19.23	\$0.00	\$87.89
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$63.06	\$9.80	\$19.23	\$0.00	\$92.09
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$88.23	\$9.80	\$19.23	\$0.00	\$117.26
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) ELECTRICIANS LOCAL 103	03/01/2017	\$48.33	\$13.00	\$17.45	\$0.00	\$78.78
	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
	03/01/2018	\$50.48	\$13.00	\$17.51	\$0.00	\$80.99
	09/01/2018	\$51.67	\$13.00	\$17.55	\$0.00	\$82.22
	03/01/2019	\$52.87	\$13.00	\$17.59	\$0.00	\$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN ELECTRICIANS LOCAL 103	03/01/2017	\$48.33	\$13.00	\$17.45	\$0.00	\$78.78
	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
	03/01/2018	\$50.48	\$13.00	\$17.51	\$0.00	\$80.99
	09/01/2018	\$51.67	\$13.00	\$17.55	\$0.00	\$82.22
	03/01/2019	\$52.87	\$13.00	\$17.59	\$0.00	\$83.46

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103

Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.33	\$13.00	\$0.58	\$0.00	\$32.91
2	40	\$19.33	\$13.00	\$0.58	\$0.00	\$32.91
3	45	\$21.75	\$13.00	\$13.37	\$0.00	\$48.12
4	45	\$21.75	\$13.00	\$13.37	\$0.00	\$48.12
5	50	\$24.17	\$13.00	\$13.75	\$0.00	\$50.92
6	55	\$26.58	\$13.00	\$14.11	\$0.00	\$53.69
7	60	\$29.00	\$13.00	\$14.48	\$0.00	\$56.48
8	65	\$31.41	\$13.00	\$14.85	\$0.00	\$59.26
9	70	\$33.83	\$13.00	\$15.22	\$0.00	\$62.05
10	75	\$36.25	\$13.00	\$15.60	\$0.00	\$64.85

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.71	\$13.00	\$0.59	\$0.00	\$33.30
2	40	\$19.71	\$13.00	\$0.59	\$0.00	\$33.30
3	45	\$22.18	\$13.00	\$13.39	\$0.00	\$48.57
4	45	\$22.18	\$13.00	\$13.39	\$0.00	\$48.57
5	50	\$24.64	\$13.00	\$13.76	\$0.00	\$51.40
6	55	\$27.10	\$13.00	\$14.12	\$0.00	\$54.22
7	60	\$29.57	\$13.00	\$14.50	\$0.00	\$57.07
8	65	\$32.03	\$13.00	\$14.87	\$0.00	\$59.90
9	70	\$34.50	\$13.00	\$15.25	\$0.00	\$62.75
10	75	\$36.96	\$13.00	\$15.62	\$0.00	\$65.58

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	01/01/2017	\$55.86	\$15.28	\$15.71	\$0.00	\$86.85
---	------------	---------	---------	---------	--------	---------

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.93	\$15.28	\$0.00	\$0.00	\$43.21
2	55	\$30.72	\$15.28	\$15.71	\$0.00	\$61.71
3	65	\$36.31	\$15.28	\$15.71	\$0.00	\$67.30
4	70	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
5	80	\$44.69	\$15.28	\$15.71	\$0.00	\$75.68

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2017	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
---	------------	---------	--------	---------	--------	---------

	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10

For apprentice rates see "Apprentice-LABORER"

FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 4	05/01/2017	\$42.15	\$10.00	\$15.25	\$0.00	\$67.40
--	------------	---------	---------	---------	--------	---------

	11/01/2017	\$42.88	\$10.00	\$15.25	\$0.00	\$68.13
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 4	05/01/2017	\$43.61	\$10.00	\$15.25	\$0.00	\$68.86
--	------------	---------	---------	---------	--------	---------

	11/01/2017	\$44.34	\$10.00	\$15.25	\$0.00	\$69.59
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY OPERATING ENGINEERS LOCAL 4	05/01/2017	\$22.41	\$10.00	\$15.25	\$0.00	\$47.66
---	------------	---------	---------	---------	--------	---------

	11/01/2017	\$22.83	\$10.00	\$15.25	\$0.00	\$48.08
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIRE ALARM INSTALLER ELECTRICIANS LOCAL 103	03/01/2017	\$48.33	\$13.00	\$17.45	\$0.00	\$78.78
--	------------	---------	---------	---------	--------	---------

	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
--	------------	---------	---------	---------	--------	---------

	03/01/2018	\$50.48	\$13.00	\$17.51	\$0.00	\$80.99
--	------------	---------	---------	---------	--------	---------

	09/01/2018	\$51.67	\$13.00	\$17.55	\$0.00	\$82.22
--	------------	---------	---------	---------	--------	---------

	03/01/2019	\$52.87	\$13.00	\$17.59	\$0.00	\$83.46
--	------------	---------	---------	---------	--------	---------

For apprentice rates see "Apprentice- ELECTRICIAN"

FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING ELECTRICIANS LOCAL 103	03/01/2017	\$36.25	\$13.00	\$15.60	\$0.00	\$64.85
--	------------	---------	---------	---------	--------	---------

	09/01/2017	\$36.96	\$13.00	\$15.62	\$0.00	\$65.58
--	------------	---------	---------	---------	--------	---------

	03/01/2018	\$37.86	\$13.00	\$15.65	\$0.00	\$66.51
--	------------	---------	---------	---------	--------	---------

	09/01/2018	\$38.75	\$13.00	\$15.67	\$0.00	\$67.42
--	------------	---------	---------	---------	--------	---------

	03/01/2019	\$39.65	\$13.00	\$15.70	\$0.00	\$68.35
--	------------	---------	---------	---------	--------	---------

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) OPERATING ENGINEERS LOCAL 4	06/01/2017	\$38.49	\$10.00	\$15.25	\$0.00	\$63.74
	12/01/2017	\$39.32	\$10.00	\$15.25	\$0.00	\$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER LABORERS - ZONE 1	06/01/2017	\$20.50	\$7.60	\$14.65	\$0.00	\$42.75
	12/01/2017	\$21.50	\$7.60	\$14.65	\$0.00	\$43.75
	06/01/2018	\$21.50	\$7.60	\$14.65	\$0.00	\$43.75
	12/01/2018	\$22.50	\$7.60	\$14.65	\$0.00	\$44.75
	06/01/2019	\$22.50	\$7.60	\$14.65	\$0.00	\$44.75
	12/01/2019	\$23.50	\$7.60	\$14.65	\$0.00	\$45.75
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER FLOORCOVERERS LOCAL 2168 ZONE 1	03/01/2016	\$42.13	\$9.80	\$17.62	\$0.00	\$69.55

Apprentice - FLOORCOVERER - Local 2168 Zone 1
Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.07	\$9.80	\$1.79	\$0.00	\$32.66
2	55	\$23.17	\$9.80	\$1.79	\$0.00	\$34.76
3	60	\$25.28	\$9.80	\$12.25	\$0.00	\$47.33
4	65	\$27.38	\$9.80	\$12.25	\$0.00	\$49.43
5	70	\$29.49	\$9.80	\$14.04	\$0.00	\$53.33
6	75	\$31.60	\$9.80	\$14.04	\$0.00	\$55.44
7	80	\$33.70	\$9.80	\$15.83	\$0.00	\$59.33
8	85	\$35.81	\$9.80	\$15.83	\$0.00	\$61.44

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER OPERATING ENGINEERS LOCAL 4	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS OPERATING ENGINEERS LOCAL 4	06/01/2017	\$31.86	\$10.00	\$15.25	\$0.00	\$57.11
	12/01/2017	\$32.55	\$10.00	\$15.25	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) GLAZIERS LOCAL 35 (ZONE 1)	01/01/2017	\$46.70	\$7.85	\$16.10	\$0.00	\$70.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - GLAZIER - Local 35 Zone 1						
Effective Date - 01/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.35	\$7.85	\$0.00	\$0.00	\$31.20
2	55	\$25.69	\$7.85	\$3.66	\$0.00	\$37.20
3	60	\$28.02	\$7.85	\$3.99	\$0.00	\$39.86
4	65	\$30.36	\$7.85	\$4.32	\$0.00	\$42.53
5	70	\$32.69	\$7.85	\$14.11	\$0.00	\$54.65
6	75	\$35.03	\$7.85	\$14.44	\$0.00	\$57.32
7	80	\$37.36	\$7.85	\$14.77	\$0.00	\$59.98
8	90	\$42.03	\$7.85	\$15.44	\$0.00	\$65.32

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS OPERATING ENGINEERS LOCAL 4	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 06/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$25.51	\$10.00	\$0.00	\$0.00	\$35.51
2	60	\$27.83	\$10.00	\$15.25	\$0.00	\$53.08
3	65	\$30.15	\$10.00	\$15.25	\$0.00	\$55.40
4	70	\$32.47	\$10.00	\$15.25	\$0.00	\$57.72
5	75	\$34.79	\$10.00	\$15.25	\$0.00	\$60.04
6	80	\$37.10	\$10.00	\$15.25	\$0.00	\$62.35
7	85	\$39.42	\$10.00	\$15.25	\$0.00	\$64.67
8	90	\$41.74	\$10.00	\$15.25	\$0.00	\$66.99

Effective Date - 12/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.06	\$10.00	\$0.00	\$0.00	\$36.06
2	60	\$28.43	\$10.00	\$15.25	\$0.00	\$53.68
3	65	\$30.80	\$10.00	\$15.25	\$0.00	\$56.05
4	70	\$33.17	\$10.00	\$15.25	\$0.00	\$58.42
5	75	\$35.54	\$10.00	\$15.25	\$0.00	\$60.79
6	80	\$37.90	\$10.00	\$15.25	\$0.00	\$63.15
7	85	\$40.27	\$10.00	\$15.25	\$0.00	\$65.52
8	90	\$42.64	\$10.00	\$15.25	\$0.00	\$67.89

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2017	\$43.72	\$11.45	\$23.07	\$2.35	\$80.59
	08/01/2017	\$44.82	\$11.45	\$23.07	\$2.35	\$81.69
	02/01/2018	\$45.97	\$11.45	\$23.07	\$2.35	\$82.84

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103	03/01/2017	\$48.33	\$13.00	\$17.45	\$0.00	\$78.78
	09/01/2017	\$49.28	\$13.00	\$17.48	\$0.00	\$79.76
	03/01/2018	\$50.48	\$13.00	\$17.51	\$0.00	\$80.99
	09/01/2018	\$51.67	\$13.00	\$17.55	\$0.00	\$82.22
	03/01/2019	\$52.87	\$13.00	\$17.59	\$0.00	\$83.46

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2017	\$43.72	\$11.45	\$23.07	\$2.35	\$80.59
	08/01/2017	\$44.82	\$11.45	\$23.07	\$2.35	\$81.69
	02/01/2018	\$45.97	\$11.45	\$23.07	\$2.35	\$82.84

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER) PIPEFITTERS LOCAL 537	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
--	------------	---------	--------	---------	--------	---------

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

HVAC MECHANIC PIPEFITTERS LOCAL 537	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
--	------------	---------	--------	---------	--------	---------

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

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

HYDRAULIC DRILLS LABORERS - ZONE 1	06/01/2017	\$37.60	\$7.60	\$14.65	\$0.00	\$59.85
	12/01/2017	\$38.45	\$7.60	\$14.65	\$0.00	\$60.70
	06/01/2018	\$39.40	\$7.60	\$14.65	\$0.00	\$61.65
	12/01/2018	\$40.35	\$7.60	\$14.65	\$0.00	\$62.60
	06/01/2019	\$41.35	\$7.60	\$14.65	\$0.00	\$63.60
	12/01/2019	\$42.35	\$7.60	\$14.65	\$0.00	\$64.60

For apprentice rates see "Apprentice- LABORER"

INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	09/01/2016	\$45.09	\$11.75	\$14.20	\$0.00	\$71.04
	09/01/2017	\$47.09	\$11.75	\$14.20	\$0.00	\$73.04
	09/01/2018	\$49.34	\$11.75	\$14.20	\$0.00	\$75.29
	09/01/2019	\$51.84	\$11.75	\$14.20	\$0.00	\$77.79

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

Effective Date - 09/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.55	\$11.75	\$10.45	\$0.00	\$44.75
2	60	\$27.05	\$11.75	\$11.20	\$0.00	\$50.00
3	70	\$31.56	\$11.75	\$11.95	\$0.00	\$55.26
4	80	\$36.07	\$11.75	\$12.70	\$0.00	\$60.52

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.55	\$11.75	\$10.45	\$0.00	\$45.75
2	60	\$28.25	\$11.75	\$11.20	\$0.00	\$51.20
3	70	\$32.96	\$11.75	\$11.95	\$0.00	\$56.66
4	80	\$37.67	\$11.75	\$12.70	\$0.00	\$62.12

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 7 (BOSTON AREA)	03/16/2017	\$44.65	\$7.80	\$20.85	\$0.00	\$73.30
--	------------	---------	--------	---------	--------	---------

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 03/16/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.79	\$7.80	\$20.85	\$0.00	\$55.44
2	70	\$31.26	\$7.80	\$20.85	\$0.00	\$59.91
3	75	\$33.49	\$7.80	\$20.85	\$0.00	\$62.14
4	80	\$35.72	\$7.80	\$20.85	\$0.00	\$64.37
5	85	\$37.95	\$7.80	\$20.85	\$0.00	\$66.60
6	90	\$40.19	\$7.80	\$20.85	\$0.00	\$68.84

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

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10

For apprentice rates see "Apprentice-LABORER"

LABORER LABORERS - ZONE 1	06/01/2017	\$36.85	\$7.60	\$14.65	\$0.00	\$59.10
	12/01/2017	\$37.70	\$7.60	\$14.65	\$0.00	\$59.95
	06/01/2018	\$38.65	\$7.60	\$14.65	\$0.00	\$60.90
	12/01/2018	\$39.60	\$7.60	\$14.65	\$0.00	\$61.85
	06/01/2019	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	12/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LABORER - Zone 1

Effective Date - 06/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.11	\$7.60	\$14.65	\$0.00	\$44.36
2	70	\$25.80	\$7.60	\$14.65	\$0.00	\$48.05
3	80	\$29.48	\$7.60	\$14.65	\$0.00	\$51.73
4	90	\$33.17	\$7.60	\$14.65	\$0.00	\$55.42

Effective Date - 12/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.62	\$7.60	\$14.65	\$0.00	\$44.87
2	70	\$26.39	\$7.60	\$14.65	\$0.00	\$48.64
3	80	\$30.16	\$7.60	\$14.65	\$0.00	\$52.41
4	90	\$33.93	\$7.60	\$14.65	\$0.00	\$56.18

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER LABORERS - ZONE 1	06/01/2017	\$36.85	\$7.60	\$14.65	\$0.00	\$59.10
	12/01/2017	\$37.70	\$7.60	\$14.65	\$0.00	\$59.95
	06/01/2018	\$38.65	\$7.60	\$14.65	\$0.00	\$60.90
	12/01/2018	\$39.60	\$7.60	\$14.65	\$0.00	\$61.85
	06/01/2019	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	12/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85

For apprentice rates see "Apprentice-LABORER"

LABORER: CEMENT FINISHER TENDER LABORERS - ZONE 1	06/01/2017	\$36.85	\$7.60	\$14.65	\$0.00	\$59.10
	12/01/2017	\$37.70	\$7.60	\$14.65	\$0.00	\$59.95
	06/01/2018	\$38.65	\$7.60	\$14.65	\$0.00	\$60.90
	12/01/2018	\$39.60	\$7.60	\$14.65	\$0.00	\$61.85
	06/01/2019	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	12/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85

For apprentice rates see "Apprentice-LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS - ZONE 1	06/01/2017	\$37.00	\$7.60	\$14.65	\$0.00	\$59.25
	12/01/2017	\$37.85	\$7.60	\$14.65	\$0.00	\$60.10
	06/01/2018	\$38.80	\$7.60	\$14.65	\$0.00	\$61.05
	12/01/2018	\$39.75	\$7.60	\$14.65	\$0.00	\$62.00
	06/01/2019	\$40.75	\$7.60	\$14.65	\$0.00	\$63.00
	12/01/2019	\$41.75	\$7.60	\$14.65	\$0.00	\$64.00

For apprentice rates see "Apprentice-LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10

For apprentice rates see "Apprentice- LABORER"

LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	06/01/2017	\$36.85	\$7.60	\$14.65	\$0.00	\$59.10
	12/01/2017	\$37.70	\$7.60	\$14.65	\$0.00	\$59.95
	06/01/2018	\$38.65	\$7.60	\$14.65	\$0.00	\$60.90
	12/01/2018	\$39.60	\$7.60	\$14.65	\$0.00	\$61.85
	06/01/2019	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	12/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85

For apprentice rates see "Apprentice- LABORER"

LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	06/01/2017	\$36.85	\$7.60	\$14.65	\$0.00	\$59.10
	12/01/2017	\$37.70	\$7.60	\$14.65	\$0.00	\$59.95
	06/01/2018	\$38.65	\$7.60	\$14.65	\$0.00	\$60.90
	12/01/2018	\$39.60	\$7.60	\$14.65	\$0.00	\$61.85
	06/01/2019	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	12/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85

This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10

For apprentice rates see "Apprentice- LABORER"

MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2017	\$38.78	\$10.75	\$17.67	\$0.00	\$67.20
---	------------	---------	---------	---------	--------	---------

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

Effective Date - 02/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.39	\$10.75	\$17.67	\$0.00	\$47.81
2	60	\$23.27	\$10.75	\$17.67	\$0.00	\$51.69
3	70	\$27.15	\$10.75	\$17.67	\$0.00	\$55.57
4	80	\$31.02	\$10.75	\$17.67	\$0.00	\$59.44
5	90	\$34.90	\$10.75	\$17.67	\$0.00	\$63.32

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS, TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2017	\$50.80	\$10.75	\$19.22	\$0.00	\$80.77
---	------------	---------	---------	---------	--------	---------

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

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

Effective Date - 02/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.40	\$10.75	\$19.22	\$0.00	\$55.37
2	60	\$30.48	\$10.75	\$19.22	\$0.00	\$60.45
3	70	\$35.56	\$10.75	\$19.22	\$0.00	\$65.53
4	80	\$40.64	\$10.75	\$19.22	\$0.00	\$70.61
5	90	\$45.72	\$10.75	\$19.22	\$0.00	\$75.69

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	04/01/2017	\$38.62	\$9.90	\$18.50	\$0.00	\$67.02
	10/01/2017	\$39.52	\$9.90	\$18.50	\$0.00	\$67.92
	04/01/2018	\$40.42	\$9.90	\$18.50	\$0.00	\$68.82
	10/01/2018	\$41.32	\$9.90	\$18.50	\$0.00	\$69.72
	04/01/2019	\$42.22	\$9.90	\$18.50	\$0.00	\$70.62

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.24	\$9.90	\$5.31	\$0.00	\$36.45
2	65	\$25.10	\$9.90	\$5.13	\$0.00	\$40.13
3	75	\$28.97	\$9.90	\$5.10	\$0.00	\$43.97
4	85	\$32.83	\$9.90	\$5.06	\$0.00	\$47.79

Effective Date - 10/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.74	\$9.90	\$5.31	\$0.00	\$36.95
2	65	\$25.69	\$9.90	\$5.13	\$0.00	\$40.72
3	75	\$29.64	\$9.90	\$5.10	\$0.00	\$44.64
4	85	\$33.59	\$9.90	\$5.06	\$0.00	\$48.55

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MORTAR MIXER LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	06/01/2017	\$23.47	\$10.00	\$15.25	\$0.00	\$48.72
	12/01/2017	\$23.99	\$10.00	\$15.25	\$0.00	\$49.24
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	06/01/2017	\$27.54	\$10.00	\$15.25	\$0.00	\$52.79
	12/01/2017	\$28.15	\$10.00	\$15.25	\$0.00	\$53.40
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 1	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.71	\$7.85	\$0.00	\$0.00	\$33.56
2	55	\$28.28	\$7.85	\$3.66	\$0.00	\$39.79
3	60	\$30.85	\$7.85	\$3.99	\$0.00	\$42.69
4	65	\$33.42	\$7.85	\$4.32	\$0.00	\$45.59
5	70	\$35.99	\$7.85	\$14.11	\$0.00	\$57.95
6	75	\$38.56	\$7.85	\$14.44	\$0.00	\$60.85
7	80	\$41.13	\$7.85	\$14.77	\$0.00	\$63.75
8	90	\$46.27	\$7.85	\$15.44	\$0.00	\$69.56

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2017	\$48.10	\$7.85	\$16.10	\$0.00	\$72.05
-------------------------------------	------------	---------	--------	---------	--------	---------

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PAINTER Local 35 Zone 1 - Spray/Sandblast - New						
Effective Date - 01/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.05	\$7.85	\$0.00	\$0.00	\$31.90
2	55	\$26.46	\$7.85	\$3.66	\$0.00	\$37.97
3	60	\$28.86	\$7.85	\$3.99	\$0.00	\$40.70
4	65	\$31.27	\$7.85	\$4.32	\$0.00	\$43.44
5	70	\$33.67	\$7.85	\$14.11	\$0.00	\$55.63
6	75	\$36.08	\$7.85	\$14.44	\$0.00	\$58.37
7	80	\$38.48	\$7.85	\$14.77	\$0.00	\$61.10
8	90	\$43.29	\$7.85	\$15.44	\$0.00	\$66.58
Notes: Steps are 750 hrs.						
Apprentice to Journeyworker Ratio:1:1						
PAINTER (SPRAY OR SANDBLAST, REPAINT) PAINTERS LOCAL 35 - ZONE 1	01/01/2017	\$46.16	\$7.85	\$16.10	\$0.00	\$70.11

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

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.08	\$7.85	\$0.00	\$0.00	\$30.93
2	55	\$25.39	\$7.85	\$3.66	\$0.00	\$36.90
3	60	\$27.70	\$7.85	\$3.99	\$0.00	\$39.54
4	65	\$30.00	\$7.85	\$4.32	\$0.00	\$42.17
5	70	\$32.31	\$7.85	\$14.11	\$0.00	\$54.27
6	75	\$34.62	\$7.85	\$14.44	\$0.00	\$56.91
7	80	\$36.93	\$7.85	\$14.77	\$0.00	\$59.55
8	90	\$41.54	\$7.85	\$15.44	\$0.00	\$64.83

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) LABORERS - ZONE 1	06/01/2017	\$36.85	\$7.60	\$14.65	\$0.00	\$59.10
	12/01/2017	\$37.70	\$7.60	\$14.65	\$0.00	\$59.95
	06/01/2018	\$38.65	\$7.60	\$14.65	\$0.00	\$60.90
	12/01/2018	\$39.60	\$7.60	\$14.65	\$0.00	\$61.85
	06/01/2019	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	12/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85

For Apprentice rates see "Apprentice- LABORER"

PAINTER / TAPER (BRUSH, NEW) *	01/01/2017	\$46.70	\$7.85	\$16.10	\$0.00	\$70.65
--------------------------------	------------	---------	--------	---------	--------	---------

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 1

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER - Local 35 Zone 1 - BRUSH NEW

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.35	\$7.85	\$0.00	\$0.00	\$31.20
2	55	\$25.69	\$7.85	\$3.66	\$0.00	\$37.20
3	60	\$28.02	\$7.85	\$3.99	\$0.00	\$39.86
4	65	\$30.36	\$7.85	\$4.32	\$0.00	\$42.53
5	70	\$32.69	\$7.85	\$14.11	\$0.00	\$54.65
6	75	\$35.03	\$7.85	\$14.44	\$0.00	\$57.32
7	80	\$37.36	\$7.85	\$14.77	\$0.00	\$59.98
8	90	\$42.03	\$7.85	\$15.44	\$0.00	\$65.32

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) PAINTERS LOCAL 35 - ZONE 1	01/01/2017	\$44.76	\$7.85	\$16.10	\$0.00	\$68.71
--	------------	---------	--------	---------	--------	---------

Apprentice - PAINTER Local 35 Zone 1 - BRUSH REPAINT

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.38	\$7.85	\$0.00	\$0.00	\$30.23
2	55	\$24.62	\$7.85	\$3.66	\$0.00	\$36.13
3	60	\$26.86	\$7.85	\$3.99	\$0.00	\$38.70
4	65	\$29.09	\$7.85	\$4.32	\$0.00	\$41.26
5	70	\$31.33	\$7.85	\$14.11	\$0.00	\$53.29
6	75	\$33.57	\$7.85	\$14.44	\$0.00	\$55.86
7	80	\$35.81	\$7.85	\$14.77	\$0.00	\$58.43
8	90	\$40.28	\$7.85	\$15.44	\$0.00	\$63.57

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/01/2016	\$33.08	\$10.91	\$10.89	\$0.00	\$54.88
---	------------	---------	---------	---------	--------	---------

PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) PILE DRIVER LOCAL 56 (ZONE 1) For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
--	------------	---------	--------	---------	--------	---------

PILE DRIVER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
--	------------	---------	--------	---------	--------	---------

Classification Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.02	\$9.80	\$19.23	\$0.00	\$50.05
2	60	\$25.22	\$9.80	\$19.23	\$0.00	\$54.25
3	70	\$29.43	\$9.80	\$19.23	\$0.00	\$58.46
4	75	\$31.53	\$9.80	\$19.23	\$0.00	\$60.56
5	80	\$33.63	\$9.80	\$19.23	\$0.00	\$62.66
6	80	\$33.63	\$9.80	\$19.23	\$0.00	\$62.66
7	90	\$37.84	\$9.80	\$19.23	\$0.00	\$66.87
8	90	\$37.84	\$9.80	\$19.23	\$0.00	\$66.87

Notes:

Apprentice to Journeyworker Ratio:1:3

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
---	------------	---------	--------	---------	--------	---------

Apprentice - PIPEFITTER - Local 537

Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.48	\$9.70	\$7.50	\$0.00	\$37.68
2	45	\$23.04	\$9.70	\$18.14	\$0.00	\$50.88
3	60	\$30.71	\$9.70	\$18.14	\$0.00	\$58.55
4	70	\$35.83	\$9.70	\$18.14	\$0.00	\$63.67
5	80	\$40.95	\$9.70	\$18.14	\$0.00	\$68.79

Notes:

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

Apprentice to Journeyworker Ratio:**

PIPELAYER LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
--------------------------------	------------	---------	--------	---------	--------	---------

	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
--	------------	---------	--------	---------	--------	---------

	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
--	------------	---------	--------	---------	--------	---------

	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
--	------------	---------	--------	---------	--------	---------

	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
--	------------	---------	--------	---------	--------	---------

	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
--	------------	---------	--------	---------	--------	---------

For apprentice rates see "Apprentice- LABORER"

PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12	03/01/2017	\$52.69	\$11.32	\$15.46	\$0.00	\$79.47
---	------------	---------	---------	---------	--------	---------

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - PLUMBER/GASFITTER - Local 12						
Effective Date - 03/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$18.44	\$11.32	\$5.74	\$0.00	\$35.50
2	40	\$21.08	\$11.32	\$6.49	\$0.00	\$38.89
3	55	\$28.98	\$11.32	\$8.73	\$0.00	\$49.03
4	65	\$34.25	\$11.32	\$10.23	\$0.00	\$55.80
5	75	\$39.52	\$11.32	\$11.72	\$0.00	\$62.56
Notes:						
** 1;2; 2;6; 3;10; 4;14; 5;19/Steps are 1 yr Step4 with lic\$58.50 Step5 with lic\$65.36						
Apprentice to Journeyworker Ratio:**						
PNEUMATIC CONTROLS (TEMP.) PIPEFITTERS LOCAL 537	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER LABORERS - ZONE 1	06/01/2017	\$37.85	\$7.60	\$14.65	\$0.00	\$60.10
	12/01/2017	\$38.70	\$7.60	\$14.65	\$0.00	\$60.95
	06/01/2018	\$39.65	\$7.60	\$14.65	\$0.00	\$61.90
	12/01/2018	\$40.60	\$7.60	\$14.65	\$0.00	\$62.85
	06/01/2019	\$41.60	\$7.60	\$14.65	\$0.00	\$63.85
	12/01/2019	\$42.60	\$7.60	\$14.65	\$0.00	\$64.85
For apprentice rates see "Apprentice- LABORER"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE OPERATING ENGINEERS LOCAL 4	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 4	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) OPERATING ENGINEERS LOCAL 4	06/01/2017	\$31.86	\$10.00	\$15.25	\$0.00	\$57.11
	12/01/2017	\$32.55	\$10.00	\$15.25	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY MIX CONCRETE DRIVERS after 4/30/10 (Drivers Hired After 4/30/2010)TEAMSTERS LOCAL 25a	05/01/2017	\$28.18	\$8.23	\$9.72	\$0.00	\$46.13
	07/01/2017	\$28.18	\$8.48	\$9.72	\$0.00	\$46.38
READY-MIX CONCRETE DRIVER TEAMSTERS LOCAL 25a	05/01/2017	\$31.44	\$8.23	\$9.72	\$0.00	\$49.39
	07/01/2017	\$31.44	\$8.48	\$9.72	\$0.00	\$49.64
RECLAIMERS OPERATING ENGINEERS LOCAL 4	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
RESIDENTIAL WOOD FRAME (All Other Work) CARPENTERS -ZONE 1 (Residential Wood)	06/01/2016	\$43.92	\$9.80	\$16.82	\$0.00	\$70.54
RESIDENTIAL WOOD FRAME CARPENTER **	04/01/2017	\$31.06	\$7.07	\$7.18	\$0.00	\$45.31
** 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 1 (Residential Wood)	10/01/2017	\$31.75	\$7.07	\$7.18	\$0.00	\$46.00
	04/01/2018	\$32.22	\$7.07	\$7.18	\$0.00	\$46.47
	10/01/2018	\$32.69	\$7.07	\$7.18	\$0.00	\$46.94
	04/01/2019	\$33.17	\$7.07	\$7.18	\$0.00	\$47.42
	10/01/2019	\$33.65	\$7.07	\$7.18	\$0.00	\$47.90

As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.

Apprentice - CARPENTER (Residential Wood Frame) - Zone 1						
Effective Date - 04/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.64	\$7.07	\$0.00	\$0.00	\$25.71
2	60	\$18.64	\$7.07	\$0.00	\$0.00	\$25.71
3	65	\$20.19	\$7.07	\$7.18	\$0.00	\$34.44
4	70	\$21.74	\$7.07	\$7.18	\$0.00	\$35.99
5	75	\$23.30	\$7.07	\$7.18	\$0.00	\$37.55
6	80	\$24.85	\$7.07	\$7.18	\$0.00	\$39.10
7	85	\$26.40	\$7.07	\$7.18	\$0.00	\$40.65
8	90	\$27.95	\$7.07	\$7.18	\$0.00	\$42.20
Effective Date - 10/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.05	\$7.07	\$0.00	\$0.00	\$26.12
2	60	\$19.05	\$7.07	\$0.00	\$0.00	\$26.12
3	65	\$20.64	\$7.07	\$7.18	\$0.00	\$34.89
4	70	\$22.23	\$7.07	\$7.18	\$0.00	\$36.48
5	75	\$23.81	\$7.07	\$7.18	\$0.00	\$38.06
6	80	\$25.40	\$7.07	\$7.18	\$0.00	\$39.65
7	85	\$26.99	\$7.07	\$7.18	\$0.00	\$41.24
8	90	\$28.58	\$7.07	\$7.18	\$0.00	\$42.83

Notes:

Apprentice to Journeyworker Ratio:1:5

RIDE-ON MOTORIZED BUGGY OPERATOR LABORERS - ZONE 1	06/01/2017	\$37.10	\$7.60	\$14.65	\$0.00	\$59.35
	12/01/2017	\$37.95	\$7.60	\$14.65	\$0.00	\$60.20
	06/01/2018	\$38.90	\$7.60	\$14.65	\$0.00	\$61.15
	12/01/2018	\$39.85	\$7.60	\$14.65	\$0.00	\$62.10
	06/01/2019	\$40.85	\$7.60	\$14.65	\$0.00	\$63.10
	12/01/2019	\$41.85	\$7.60	\$14.65	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE OPERATING ENGINEERS LOCAL 4	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofing &Roofers Dampproofg) ROOFERS LOCAL 33	02/01/2017	\$41.36	\$11.10	\$13.80	\$0.00	\$66.26
	08/01/2017	\$42.46	\$11.10	\$13.80	\$0.00	\$67.36
	02/01/2018	\$43.61	\$11.10	\$13.80	\$0.00	\$68.51
	08/01/2018	\$44.71	\$11.10	\$13.80	\$0.00	\$69.61
	02/01/2019	\$45.86	\$11.10	\$13.80	\$0.00	\$70.76

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.68	\$11.10	\$3.44	\$0.00	\$35.22
2	60	\$24.82	\$11.10	\$13.80	\$0.00	\$49.72
3	65	\$26.88	\$11.10	\$13.80	\$0.00	\$51.78
4	75	\$31.02	\$11.10	\$13.80	\$0.00	\$55.92
5	85	\$35.16	\$11.10	\$13.80	\$0.00	\$60.06

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.23	\$11.10	\$3.44	\$0.00	\$35.77
2	60	\$25.48	\$11.10	\$13.80	\$0.00	\$50.38
3	65	\$27.60	\$11.10	\$13.80	\$0.00	\$52.50
4	75	\$31.85	\$11.10	\$13.80	\$0.00	\$56.75
5	85	\$36.09	\$11.10	\$13.80	\$0.00	\$60.99

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 33	02/01/2017	\$41.61	\$11.10	\$13.80	\$0.00	\$66.51
	08/01/2017	\$42.71	\$11.10	\$13.80	\$0.00	\$67.61
	02/01/2018	\$43.86	\$11.10	\$13.80	\$0.00	\$68.76
	08/01/2018	\$44.96	\$11.10	\$13.80	\$0.00	\$69.86
	02/01/2019	\$46.11	\$11.10	\$13.80	\$0.00	\$71.01

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 - A	02/01/2017	\$43.72	\$11.45	\$23.07	\$2.35	\$80.59
	08/01/2017	\$44.82	\$11.45	\$23.07	\$2.35	\$81.69
	02/01/2018	\$45.97	\$11.45	\$23.07	\$2.35	\$82.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------------------------	------------

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.49	\$11.45	\$5.24	\$0.00	\$34.18
2	40	\$17.49	\$11.45	\$5.24	\$0.00	\$34.18
3	45	\$19.67	\$11.45	\$10.31	\$1.24	\$42.67
4	45	\$19.67	\$11.45	\$10.31	\$1.24	\$42.67
5	50	\$21.86	\$11.45	\$11.21	\$1.34	\$45.86
6	50	\$21.86	\$11.45	\$11.46	\$1.34	\$46.11
7	60	\$26.23	\$11.45	\$13.02	\$1.52	\$52.22
8	65	\$28.42	\$11.45	\$13.93	\$1.61	\$55.41
9	75	\$32.79	\$11.45	\$15.74	\$1.80	\$61.78
10	85	\$37.16	\$11.45	\$17.05	\$1.97	\$67.63

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.93	\$11.45	\$5.24	\$0.00	\$34.62
2	40	\$17.93	\$11.45	\$5.24	\$0.00	\$34.62
3	45	\$20.17	\$11.45	\$10.31	\$1.26	\$43.19
4	45	\$20.17	\$11.45	\$10.31	\$1.26	\$43.19
5	50	\$22.41	\$11.45	\$11.21	\$1.35	\$46.42
6	50	\$22.41	\$11.45	\$11.46	\$1.36	\$46.68
7	60	\$26.89	\$11.45	\$13.02	\$1.54	\$52.90
8	65	\$29.13	\$11.45	\$13.93	\$1.64	\$56.15
9	75	\$33.62	\$11.45	\$15.74	\$1.82	\$62.63
10	85	\$38.10	\$11.45	\$17.05	\$2.00	\$68.60

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR PAINTERS LOCAL 35 - ZONE 1	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 1						
Effective Date - 06/01/2013						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.83	\$10.91	\$10.89	\$0.00	\$55.63
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	03/01/2017	\$56.08	\$8.77	\$17.20	\$0.00	\$82.05

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

Effective Date - 03/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.63	\$8.52	\$8.70	\$0.00	\$36.85
2	40	\$22.43	\$8.52	\$8.70	\$0.00	\$39.65
3	45	\$25.24	\$8.52	\$8.70	\$0.00	\$42.46
4	50	\$28.04	\$8.52	\$8.70	\$0.00	\$45.26
5	55	\$30.84	\$8.52	\$8.70	\$0.00	\$48.06
6	60	\$33.65	\$8.52	\$10.20	\$0.00	\$52.37
7	65	\$36.45	\$8.52	\$10.20	\$0.00	\$55.17
8	70	\$39.26	\$8.52	\$10.20	\$0.00	\$57.98
9	75	\$42.06	\$8.52	\$10.20	\$0.00	\$60.78
10	80	\$44.86	\$8.52	\$10.20	\$0.00	\$63.58

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

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Issue Date: 06/09/2017

Wage Request Number: 20170609-016

Page 27 of 30

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
	12/01/2017	\$46.92	\$10.00	\$15.25	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2017	\$36.25	\$13.00	\$15.60	\$0.00	\$64.85
	09/01/2017	\$36.96	\$13.00	\$15.62	\$0.00	\$65.58
	03/01/2018	\$37.86	\$13.00	\$15.65	\$0.00	\$66.51
	09/01/2018	\$38.75	\$13.00	\$15.67	\$0.00	\$67.42
	03/01/2019	\$39.65	\$13.00	\$15.70	\$0.00	\$68.35

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 03/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$14.50	\$13.00	\$0.44	\$0.00	\$27.94
2	40	\$14.50	\$13.00	\$0.44	\$0.00	\$27.94
3	45	\$16.31	\$13.00	\$12.54	\$0.00	\$41.85
4	45	\$16.31	\$13.00	\$12.54	\$0.00	\$41.85
5	50	\$18.13	\$13.00	\$12.81	\$0.00	\$43.94
6	55	\$19.94	\$13.00	\$13.09	\$0.00	\$46.03
7	60	\$21.75	\$13.00	\$13.37	\$0.00	\$48.12
8	65	\$23.56	\$13.00	\$13.65	\$0.00	\$50.21
9	70	\$25.38	\$13.00	\$13.93	\$0.00	\$52.31
10	75	\$27.19	\$13.00	\$14.21	\$0.00	\$54.40

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$14.78	\$13.00	\$0.44	\$0.00	\$28.22
2	40	\$14.78	\$13.00	\$0.44	\$0.00	\$28.22
3	45	\$16.63	\$13.00	\$12.55	\$0.00	\$42.18
4	45	\$16.63	\$13.00	\$12.55	\$0.00	\$42.18
5	50	\$18.48	\$13.00	\$12.82	\$0.00	\$44.30
6	55	\$20.33	\$13.00	\$13.10	\$0.00	\$46.43
7	60	\$22.18	\$13.00	\$13.39	\$0.00	\$48.57
8	65	\$24.02	\$13.00	\$13.66	\$0.00	\$50.68
9	70	\$25.87	\$13.00	\$13.95	\$0.00	\$52.82
10	75	\$27.72	\$13.00	\$14.22	\$0.00	\$54.94

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2017	\$49.70	\$10.75	\$19.22	\$0.00	\$79.67
--	------------	---------	---------	---------	--------	---------

Issue Date: 06/09/2017

Wage Request Number: 20170609-016

Page 28 of 30

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile						
Effective Date - 02/01/2017						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.85	\$10.75	\$19.22	\$0.00	\$54.82
2	60	\$29.82	\$10.75	\$19.22	\$0.00	\$59.79
3	70	\$34.79	\$10.75	\$19.22	\$0.00	\$64.76
4	80	\$39.76	\$10.75	\$19.22	\$0.00	\$69.73
5	90	\$44.73	\$10.75	\$19.22	\$0.00	\$74.70

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2016	\$37.70	\$7.60	\$14.35	\$0.00	\$59.65
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2016	\$36.42	\$7.60	\$14.35	\$0.00	\$58.37
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2016	\$36.30	\$7.60	\$14.35	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$45.93	\$10.00	\$15.25	\$0.00	\$71.18
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$34.12	\$10.91	\$10.89	\$0.00	\$55.92
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2016	\$48.58	\$7.60	\$14.75	\$0.00	\$70.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2016	\$50.58	\$7.60	\$14.75	\$0.00	\$72.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2016	\$40.65	\$7.60	\$14.75	\$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2016	\$42.65	\$7.60	\$14.75	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2017	\$37.60	\$7.60	\$14.15	\$0.00	\$59.35
	12/01/2017	\$38.45	\$7.60	\$14.15	\$0.00	\$60.20
	06/01/2018	\$39.40	\$7.60	\$14.15	\$0.00	\$61.15
	12/01/2018	\$40.35	\$7.60	\$14.15	\$0.00	\$62.10
	06/01/2019	\$41.35	\$7.60	\$14.15	\$0.00	\$63.10
	12/01/2019	\$42.35	\$7.60	\$14.15	\$0.00	\$64.10
For apprentice rates see "Apprentice- LABORER"						

Issue Date: 06/09/2017

Wage Request Number: 20170609-016

Page 29 of 30

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2017	\$46.38	\$10.00	\$15.25	\$0.00	\$71.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
	12/01/2017	\$47.38	\$10.00	\$15.25	\$0.00	\$72.63
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2017	\$52.69	\$11.32	\$15.46	\$0.00	\$79.47
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER-GASFITTER"						

Additional Apprentice Information:

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

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

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.

*** APP to JM: 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM: 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

Issue Date: 06/09/2017

Wage Request Number: 20170609-016

Page 30 of 30

IFB # 17-73

SECTION 4.0

FORM FOR GENERAL BID

The undersigned proposes to furnish all labor and materials required for: Bike Path Retaining Wall and Drainage Upgrades

In accordance with the accompanying plans and specifications prepared by Kleinfelder Northeast, Inc. (215 First Street, Suite 320, Cambridge, MA 02142) and specified below, subject to additions and deductions according to the terms of the specifications.

The bidder certifies the following bulleted statements and offers to supply and deliver the materials and services specified below in full accordance with the Contract Documents supplied by the City of Somerville

- The bids will be received at the office of the Purchasing Director, Somerville City Hall, 93 Highland Avenue, Somerville, MA 02143 no later than **7/13/2017 by 11AM EST**
- If the **awarded** vendor is a Corporation a "Certificate of Good Standing" (produced by the Mass. Sec. of State) must be furnished with the resulting contract (see Section 3.0.)
- **Awarded Vendor** must comply with Living Wage requirements (see Section 3.0; only for services)
- **Awarded Vendor** must comply with insurance requirements as stated in Section 3.0.
- The Purchasing Director reserves the right to accept or reject any or all bids and/or to waive any informalities if in her/his sole judgment it is deemed to be in the best interest of the City of Somerville.
- The following prices shall include delivery, the cost of fuel, the cost of labor, and all other charges.
- This form to be enclosed in sealed bid package.

The proposed contract price is (total bid in figures):

\$

Total in words:

(If applicable) The contract price does not include the items listed on the attached "Bid Form for Alternates;" the bidder understands that the project construction cost estimate provided by the City is inclusive of all the work described in this form.

The undersigned agrees that, if he is selected as general contractor, 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 performance bond and also a labor and materials or payment bond (as indicated in the "Key Project Information" section on the 2nd page of this bid), 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; provided, however, that if there is more than one surety company, the surety companies shall be jointly and severally liable.

The undersigned hereby certifies that 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; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the

commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

The Undersigned Bidder certifies under the penalties of perjury that:

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

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

in which case the reasons for rejection were as follows:

The Undersigned Bidder has submitted all requested referenced information on the Reference Form.

The Undersigned Bidder understands that the contractor and subcontractors will be required to pay prevailing wages to laborers and mechanics, and that if the Undersigned's bid is significantly below the average bid, the Awarding Authority may require the Bidder to substantiate that the bid is based on payment of wages at prevailing rates.

The Undersigned Bidder certifies that it can achieve substantial and final completion by the dates notes in Section 2.2, herein, unless otherwise noted in the Notice to Proceed as delivered to the awarded vendor.

Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those required by the Contract Documents, by authorization of the City, unit prices listed on the attached "Unit Price Form" shall at the option of the City be the basis of payment to the Contractor or credit to the City, for such increase or decrease in the work. The unit prices shall represent the exact net amount per unit to be paid the Contractor (in the case of addition or increase) or to be refunded the City (in the case of decrease). Contractually noted adjustments will be allowed for overhead, profit, insurance or other direct or indirect expenses of the Contractor or Subcontractors.

The unit prices shall include cost of fuel, all labor, materials, equipment, overhead, profit, insurance, etc. to cover the finished work of the several kinds called for. Changes shall be processed in accordance with the provisions of the General Conditions governing changes in the work.

Executed this _____ day of _____, 20__.

Name of Company/Individual:

Address, City, State, Zip:

Tel #	Email:
--------------	---------------

Name and Title of Person Signing	
---	--

Signature of Authorized Individual

Please acknowledge receipt of any and all Addenda (if applicable) by signing below and including this form in your bid package. Failure to do so may subject the proposer to disqualification.

ACKNOWLEDGEMENT OF ADDENDA:

Addendum #1 _____ #2 _____ #3 _____ #4 _____ #5 _____ #6 _____ #7 _____ #8 _____ #9 _____ #10 _____

CITY OF SOMERVILLE, MA
 BIKE PATH RETAINING WALL AND DRAIN UPGRADES
 ITEMIZED BID FORM

BASE BID

Excludes Retaining Wall Rehabilitation

Item No.	Description	Estimated Quantity	Extended Total
1200.1	Temporary Utility Support and Coordination _____ Dollars (\$)) Lump Sum	1	\$
1200.2	Survey Construction Layout, As-Builts _____ Dollars (\$)) Lump Sum	1	\$
1200.3	MWRA Dewatering Discharge Permit Fee Ten Thousand dollars and zero cents _____ Dollars (\$10,000) Allowance	1	\$10,000
1400.1	Quality Control and Testing Six Thousand dollars and zero cents _____ Dollars (\$ 6,000.00) Allowance	1	\$6,000
1505.1	Mobilization _____ Dollars (\$)) Lump Sum	1	\$

1568.1	Sedimentation and Erosion Control	1	\$
	Dollars (\$) _____) Lump Sum		
1570.1	Traffic and Pedestrian Management	1	\$
	Dollars (\$) _____) Lump Sum		
1570.2	Safety Signing for Construction Operations	1	\$
	Dollars (\$) _____) Lump Sum		
2015.1	Vibration Monitoring	1	\$
	Dollars (\$) _____) Lump Sum		
2015.2	Utility Monitoring Points	3	\$
	Dollars (\$) _____) each		
2051.1	Disposal of Construction Debris as Solid Waste	25	\$
	Dollars (\$) _____) per TON		
2051.2	Disposal of Bituminous Concrete	170	\$
	Dollars (\$) _____) per TON		

2051.3	Demolition or Removal of Infiltration Basin, Catch Basin or Manholes <hr/> Dollars (\$) _____) each.	2	\$
2051.4	MBTA Slurry Wall Modification and Restoration <hr/> Dollars (\$) _____) Lump Sum	1	\$
2080.1	OHM - Soil and Waste Management <hr/> Dollars (\$) _____) Lump Sum	1	\$
2095.1	OHM – Disposal of Soil – Less than RCS-1 (Class A) Ten and 00/100 + _____ = Dollars (\$10.00 + _____ = _____) per TON	420	\$
2095.2	OHM - Disposal of Soil - Daily Cover Unlined Landfill (Class B-1) Fifteen and 00/100 + _____ = Dollars (\$15.00 + _____ = _____) per TON	60	\$
2095.3	OHM - Disposal of Soil - Non-Hazardous Solid Waste (Class B-2) Twenty and 00/100 + _____ = Dollars (\$20.00 + _____ = _____) per TON	60	\$
2095.4	OHM - Disposal of Soil – Non-Hazardous Solid Waste Asphalt Batching (Class B-3) Twenty and 00/100 + _____ = Dollars (\$20.00 + _____ = _____) per TON	60	\$

2210.1	Test Pits <hr/> Dollars (\$) _____) each	2	\$
2210.2	Controlled Density Fill for Backfill <hr/> Dollars (\$) _____) per CY	15	\$
2210.3	Over Excavation of Unsuitable Soil and Backfill with Suitable Soil <hr/> Dollars (\$) _____) per CY	10	\$
2210.4	Unclassified Excavation <hr/> Dollars (_____) per CY	5	\$
2252.1	Drain Manholes <hr/> Dollars (_____) each	7	\$
2252.2	5' Dia. Drop Manhole (Internal) <hr/> Dollars (_____) per each	1	\$
2525.1	Hot Mix Asphalt Trench Width – Temporary Trench Patch <hr/> Dollars (_____) per TON	10	\$

2525.2	Hot Mix Asphalt Trench Width – Base Course <hr/> Dollars (_____) per TON	95	\$
2525.3	Hot Mix Asphalt Trench Width – Top Course <hr/> Dollars (\$ _____) per TON	125	\$
2525.4	Mill 1.5-inch depth, Full Width <hr/> Dollars (\$ _____) per SY	100	\$
2525.5	Brick Sidewalks <hr/> Dollars (\$ _____) per SY	15	\$
2525.6	Remove and Reset Granite Curb <hr/> Dollars (\$ _____) per LF	25	\$
2525.7	Sidewalks <hr/> Dollars (\$ _____) per SY	20	\$
2604.1	Catch Basins <hr/> Dollars (\$ _____) each	2	\$

2622.1	Gravity Drain Pipe	610	\$
	Dollars (\$ _____) per LF		
2767.1	CIPP 8" Storm Drain	127	\$
	Dollars (\$ _____) per LF		
2900.1	Surface Restoration	1	\$
	Dollars (\$ _____) Lump Sum		

Total Amount of Base Bid:

\$ _____
 (Amount in figures)

 (Amount in words)

ALTERNATE BID ITEM

The Alternate Bid Item consists of rehabilitation of an existing retaining wall along the Somerville Community Path, Sta. 100+00 to Sta. 105+69.

The Contractor shall choose and price one (1) of the two (2) methods (either A-1 or A-2) for rehabilitation of the existing retaining wall. Contractor shall not price both options. If Contractor prices (bids on) both options the lower total will be used for comparison of total bids. Failure to provide a cost for the Alternate Bid Item will be basis for rejection of the bid.

Award of the Contract will be made on the basis of the lowest responsible bidder for the Total Bid, including Total Amount of Base Bid plus Total Amount of the Alternate chosen.

Alternate A-1 – Cast-In-Place Retaining Wall Rehabilitation

Item No.	Description	Estimated Quantity	Extended Total
3301.1	Retaining Wall Rehabilitation – Cast in Place Dollars (\$) _____) Lump Sum	1	\$

Alternate A-2 – Shotcrete Retaining Wall Rehabilitation

Item No.	Description	Estimated Quantity	Extended Total
3302.1	Retaining Wall Rehabilitation – Shotcrete Dollars (\$) _____) Lump Sum	1	\$

Total Amount of Alternate _____ (fill in chosen alternate):

\$ _____
(Amount in figures)

(Amount in words)

Total Amount of Bid: equals total amount of Base Bid plus total amount of chosen Alternate.

\$ _____
(Amount in figures)

(Amount in words)

**PART 2: SAMPLE CONSTRUCTION CONTRACT / CITY's
GENERAL TERMS AND CONDITIONS**

General Conditions

**GENERAL TERMS AND CONDITIONS OF THE CONTRACT
FOR CONSTRUCTION, RECONSTRUCTION, ALTERATIONS,
REMODELING, OR REPAIR OF ANY PUBLIC BUILDING OR PUBLIC WORKS
IN THE CITY OF SOMERVILLE**

TABLE OF CONTENTS

Article 1: DEFINITIONS
Article 2: ABOUT THE CONTRACT DOCUMENTS
Article 3: THE CITY
Article 4: THE DESIGN PROFESSIONAL
Article 5: THE CONTRACTOR
Article 6: SUBCONTRACTORS
Article 7: PERFORMANCE AND PAYMENT BONDS
Article 8: INSURANCE REQUIREMENTS
Article 9: TESTS AND INSPECTIONS
Article 10: UNCOVERING AND CORRECTING WORK
Article 11: CHANGES IN THE WORK
Article 12: CHANGE IN THE CONTRACT TIME
Article 13: PAYMENTS
Article 14: SUBSTANTIAL COMPLETION
Article 15: GUARANTEES AND WARRANTIES
Article 16: CLAIMS
Article 17: EMERGENCIES
Article 18: TERMINATION OR SUSPENSION OF THE CONTRACT
Article 19: AMERICANS WITH DISABILITIES ACT
Article 20: WRITTEN NOTICE TO THE PARTIES
Article 21: MISCELLANEOUS PROVISIONS

ARTICLE 1 DEFINITIONS

1.1. In General.

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

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

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

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

1.2. Definitions.

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

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

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

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

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

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

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

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

1.2.9. Contract Time. Unless otherwise provided, the Contract Time is the number of days allotted in the Contract Documents or the dates stated in the Agreement, including authorized adjustments, for Substantial Completion.

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

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

1.2.12. Design Professional. The **Design Professional** is the person lawfully licensed to practice architecture, engineering, or landscape architecture and has been selected by the **City** to administer the Contract. The term "**Design Professional**," while referred to in the singular, means the **Design Professional** and/or the **Design Professional's** representative.

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

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

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

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

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

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

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

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

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

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

1.2.23. Samples. Samples are physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged. Samples are not considered part of the Contract Documents.

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

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

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

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

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

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

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

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

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

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

ARTICLE 2

ABOUT THE CONTRACT DOCUMENTS

2.1. Priority;/Conflict.

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

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

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

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

2.1.2. Review of the Contract Documents and Field Conditions and Discovery of Conflict, Error, Ambiguity, or Discrepancy. Before starting the Work, and during the progress thereof, the **Contractor** shall carefully study and compare the Contract Documents with each other and with the information furnished by the **City** pursuant to Article 3 and shall at once report to the **Design Professional** any error, inconsistency, or omission the **Contractor** may discover. Any necessary change shall be ordered as provided in Article 11, subject to the requirements of any other provisions of the Contract Documents. The **Contractor** shall not proceed with the Work affected thereby (except in an emergency) until a Modification has been issued. If the **Contractor** proceeds with the Work having discovered such errors, inconsistencies, or omissions contrary to the provisions contained herein, or if by reasonable study of the Contract Documents the **Contractor** could have discovered such, the **Contractor** shall bear all costs arising therefrom. The **Contractor** shall be liable to the **City** for failure to report any conflict, error, ambiguity, or discrepancy of which it knew or should have known.

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

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

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

2.2. Execution.

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

2.3. Intent.

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

2.3.2. Statutory Provisions. Each and every provision of law, code, and regulation, required by law to be inserted

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

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

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

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

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

2.3.7. Mechanical, Electrical, and Fire Protection Plans. Not applicable.

2.3.8. Locations of Fixtures and Outlets. Not applicable.

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

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

2.4. Organization.

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

2.5. References.

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

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

2.6. Reuse of Design Professional's Written Instruments.

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

2.7. Written Material of the Contractor.

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

2.8. Modifying Words.

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

2.9. Use of Certain Words and Terms.

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

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

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

2.10. Modification of the Contract Documents.

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

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

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

- 2.10.2.1.** a Field Order; or
- 2.10.2.2.** the **Design Professional's** approval of a Shop Drawing or Sample.

**ARTICLE 3
THE CITY**

3.1. Signatory.

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

3.2. Requirements to Provide Documents.

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

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

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

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

3.3. Resident Project Representative.

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

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

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

3.4.2. When the separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "**Contractor**" in the Contract Documents in each case shall mean the **Contractor** who executes each separate City-Contractor Agreement.

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

3.5. Limitations on the City's Responsibilities.

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

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

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

3.6. Reservation of Rights.

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

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

3.7. Waivers.

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

ARTICLE 4
THE DESIGN PROFESSIONAL

4.1. City's Representative.

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

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

4.2. Administration of the Contract.

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

4.3. Visits to the Site.

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

4.4. Communications Facilitating Contract Administration.

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

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

4.5. Certification of Applications for Payment.

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

4.6. Rejection of Work.

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

4.7. Review of Submittals.

4.7.1. The **Design Professional** will review or take other appropriate action upon the **Contractor's** submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents and only to the extent that the **Design Professional** believes desirable to protect the **City's** interest. The **Design Professional's** action will be taken with reasonable promptness, while

allowing sufficient time in the **Design Professional's** professional judgment to permit adequate review, taking into account the time periods set forth in the latest schedule prepared by the **Contractor** and approved by the **Design Professional**. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the **Contractor** as required by the Contract Documents. The **Design Professional's** review of the **Contractor's** submittals shall not relieve the **Contractor** of the obligations under Article 5. The **Design Professional's** review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The **Design Professional's** approval of a specific item shall not indicate approval of an assembly of which the item is a component. After the rejection of the second resubmittal of any one Submittal, the **Contractor** shall bear the cost of the review of each subsequent resubmittal.

4.8. Preparation of Change Orders and Construction Change Directives.

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

4.9. Inspections.

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

4.10. Interpretations, Clarifications, and Decisions.

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

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

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

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

4.11. Limitation on the Design Professional's Responsibilities.

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

4.11.2. The **Design Professional** will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the **Contractor's** responsibility as provided in Article 5. The **Design Professional** will not be responsible for the **Contractor's** failure to carry out the Work in accordance with the Contract Documents. The **Design Professional** will not have control over or charge of and will not be responsible for acts or omissions of the **Contractor**, Subcontractors, Suppliers, or of any other persons performing portions of the Work.

**ARTICLE 5
THE CONTRACTOR**

5.1. Relationship with the City.

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

of the **City** or to incur any liability on the part of the **City**.

5.2. Code of Conduct.

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

5.3. Quality Assurance.

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

5.4. Supervision.

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

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

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

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

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

5.5. Personnel.

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

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

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

5.5.4. Maximum Work Day and Work Week. (*Reference: M.G.L. c. 149, §§30 and 34;*) No laborer, worker, mechanic, foreperson or inspector working within this Commonwealth in the employ of the **Contractor**, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the Contract, shall be required or permitted to work more than eight (8) hours in any one day or more than forty-eight (48) hours in any one week, or more than six (6) days in

any one week, except in cases of emergency.

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

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

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

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

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

5.6. Superintendence.

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

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

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

5.6.4. Building Grades, Lines, Etc.; The **Contractor** shall establish the building grades; lines; levels; and column,

wall and partition lines required by the various Subcontractors in laying out their Work.

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

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

5.7. Materials, Labor, Equipment, Etc.

5.7.1. Provision of. Unless otherwise provided in the Contract Documents, the **Contractor** shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the Work. The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings, and in accordance with the directions of the Design Professional or CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) as given from time to time during the progress of the work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with and be subject to all terms, conditions, requirements and limitations of the contract and specifications, and shall do, carry on and complete the entire work to the satisfaction of the Design Professional and CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT).

5.7.1.1. The Contractor shall furnish, install and/or maintain ample sanitary facilities for the workmen. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required by the sanitary codes of the State and Local Government. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations. Nothing in this Section shall be construed as forbidding the use of facilities available in existing buildings on the job site if they meet the above requirements and the use of them will not interfere with the progress of the work.

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

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

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

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

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

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

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

5.8.1.4. "Independent Certified Public Accountant" means a person duly registered in good standing and entitled

to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the **City**.

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

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

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

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

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

5.8.2.1 Federal Requirements: The Contractor shall permit the City, HUD and/or any other administering agency named herein, the Comptroller General of the United States, or any of their duly authorized representatives, to have access to any books, documents, papers, and records of the Contractor which are directly pertinent to a specific HUD program for the purpose of making audits, examinations, excerpts, and transcriptions.

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

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

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

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

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

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

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

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

and

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

5.8.7.5. The Contractor shall also file with the **City** a statement prepared and signed by an Independent Certified Public Accountant stating that s/he has examined the Statement of Management on internal accounting controls, and expressing an opinion as to:

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

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

financial statements.

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

5.8.9. The City's Contracting Department, its authorized representative and agents and the HUD Representative for the Secretary shall, at all times have access to and be permitted to observe and review all work materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however, that all instructions and approval with respect to the work will be given to the Contractor only by CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) through its authorized representatives or agents. Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in G.L. 4, §7 or equivalent federal legislation. They shall not be made available to the public, but shall be available only to the governmental authorities named herein.

5.9. Taxes.

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

5.10. Permits, Licenses, and Fees.

5.10.1 Unless otherwise provided, the **Contractor** shall obtain and pay the fees for all permits, licenses, and inspections that are necessary for the proper execution and completion of the Work and which are customarily secured after execution of the Contract and which are legally required. All fees for permits, licenses, and inspections required by any **City** department shall be waived. Unless otherwise agreed by the Awarding Authority in writing, the Contractor shall, prior to commencement of the work, (i) meet with the City of Somerville Inspectional Services Department to determine what permits are needed for the work; (ii) obtain all such permits; and (iii) provide copies of such permits to the Awarding Authority. Permits shall include, without limitation, demolition, foundation, digsafe, and building permits; permits for removal, sealing up, or installation of utilities, including gas, electrical, water and sewer; and permits for obstructing public streets and sidewalks.

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

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

5.12. Additional Information from Design Professional.

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

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

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

5.13. "Or equal."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5.14. Substitute Construction Methods or Procedures.

5.14.1 If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, the **Contractor** may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to the **Design Professional**. The **Contractor** shall submit sufficient

information to allow the **Design Professional**, in the **Design Professional's** sole discretion, to determine whether the substitute proposed is equivalent to that expressly called for by the Contract Documents.

5.15. Contractor's Progress Schedule.

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

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

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

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

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

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

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

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

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

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

5.16. Project Coordination.

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

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

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

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

5.17. Project Photographs.

5.17.1. In General. The **Contractor** shall take, at its own expense, exterior photographs at the site, from different vantages as directed by the **Design Professional** or the **City**, before beginning any Work and thereafter, at a minimum, on the

first work day of each month until final completion of the Work, including final Site photos. Photos shall be taken of any Work that will be buried or concealed while the Work is still exposed. The photographs shall be taken by a skilled commercial photographer. The number of photographs required shall be at the discretion of the **City** or the **Design Professional**. One aerial photo shall be required a) prior to commencement of the work and b) at the completion of the work. See Section 01320 – Construction Progress Documentation.

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

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

5.18. Record Documents and Samples at the Site.

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

5.19. Submittals.

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

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

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

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

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

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

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

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

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

5.19.5. Contractor’s Representations. By approving and providing Submittals, the **Contractor** thereby represents that the **Contractor** has determined and verified all dimensions, quantities, field dimensions, relations to existing Work,

coordination with Work to be installed later, coordination with information on previously accepted Submittals and verification of compliance with all the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the **Contractor**. In reviewing Submittals, the **Design Professional** shall be entitled to rely upon the **Contractor's** representation that such information is correct and accurate.

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

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

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

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

5.19.9.1. The **Design Professional** will review and approve Submittals in accordance with the schedule of Submittals accepted by the **Design Professional** as required above. The **Design Professional's** review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. The **Design Professional's** review and approval will not extend to means, method, technique, sequences, or procedures of construction (except where a particular means, method, technique, sequences or procedures of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

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

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

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

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

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

5.20. Continuing the Work.

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

5.21. Use of Site; Access to Work.

5.21.1. The right of possession of the premises and the improvements made thereon by the **Contractor** shall remain at all times in the **City**. The **Contractor's** right to entry and use thereof arises solely from the permission granted by the **City** under the Contract Documents. The **Contractor** shall confine the **Contractor's** apparatus, the storage of materials, and the operations of the **Contractor's** workers to limits indicated by law, ordinance, the Contract Documents and permits and/or directions of the **Design Professional** and shall not unreasonably encumber the premises with the **Contractor's** materials. The **City** shall not be liable to the **Contractor**, the Subcontractors, Suppliers, or anyone else with respect to the conditions of the

premises, except for a condition caused directly and solely by the negligence of the **City**.

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

5.22. Protection of Persons and Property.

5.22.1. In General. The **Contractor** shall be responsible for initiating, maintaining, and supervising all health and safety precautions and programs in connection with the performance of the Contract. The **Contractor** is responsible for the implementation of all Federal, State, and local health and safety requirements. The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance by CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT).

The Contractor shall provide sufficient competent watchmen, both day and night, including Saturdays, Sundays and holidays, as necessary, from the time the work is commenced until final completion and acceptance. Sufficient lighting shall be provided to aid in the prevention of injury to passersby or vandalism to the property or other illegal activities.

The Contractor shall avoid damage as a result of its operations to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc. and the Contractor shall at its own expense completely repair any damage thereto caused by its operations.

The Contractor shall shore up, brace, underpin, secure, and protect as may be necessary, all foundations and other parts of existing structure adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the improvements embraced in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of work. The Contractor shall indemnify and save harmless the City of Somerville and CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) from any liability for damages on account of settlement or the loss of lateral support of adjoining property resulting from the Contractor's failure to comply with this section.

5.22.1.1. If this contract is in excess of \$100,000 and is federally funded, the Contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.)

5.22.1.2. If this contract is in excess of \$2,000 and is federally funded, the Contractor shall comply with Sections 103 and 107 of the Contract Work Hours Safety Standards Acts (40 U.S.C. 327-333), as supplemented by Department of Labor regulations at 29 CFR part 5. To that end, the Contractor shall compute the wages of every mechanic and laborer on the basis of a standard workweek of 40 hours. Work in excess of the standard workweek is permissible, provided that the worker is compensated at a rate of not less than 1-1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek. The Contractor shall ensure that no laborer or mechanic is required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous.

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

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

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

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

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

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

5.22.3.1. Should the Contractor in the execution of his work uncover or discover utility service lines not indicated on the relevant drawings, or that do not show signs of singular service to any existing structures being demolished, the Contractor shall cease work in that area immediately and promptly notify the Public Works Department. Within forty-eight hours, the

Public Works Department will inspect the site and issue written instructions to the Contractor. The Contractor shall proceed with only after such written instructions have been received and shall proceed in full compliance with such instructions. The above mentioned situation or similar circumstances and/or modification if any, shall not relieve the Contractor from his responsibilities in this Contract and also it is without prejudice to any and all rights of CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) covering this said contract and surety or bonds.

5.22.4. Erection and Maintenance of Safeguards. The **Contractor** shall erect and maintain, as required by existing conditions and the terms of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent and nearby sites and utilities.

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

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

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

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

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

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

5.22.11. Weather Protection. (*Reference: M.G.L. c. 149, §44F(1).*) The **Contractor** shall install weather protection and furnish adequate heat in the protected area from November 1 through March 31. In the event of temporary suspension of work, during inclement weather, the Contractor will carefully protect and will cause his subcontractors to carefully protect all work and materials against damage or injury from the weather. If, in the opinion of the Design Professional or CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT), any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors so to protect the work, such work or materials shall be removed and replaced at the expense of the Contractor. These Specifications are not to be construed as requiring enclosures or heat for operations that are not economically feasible to protect in the judgment of CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT). Included in the preceding category, without limitation, are such items as site work, excavation, pile driving, steel erection, erection of certain "exterior" wall panels, roofing, and similar operation:

(1) "WEATHER PROTECTION" shall mean the temporary protection of that work adversely affected by moisture, wind and cold, by covering, enclosing and/or heating.

This protection shall provide adequate working areas during the months of November through March as determined by the Design Professional and consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations. The General Contractor shall furnish and install all "Weather Protection" material and be responsible for all costs, including heating required to maintain a minimum temperature of 40 degrees F, at the working surface. This provision does not supersede any specific requirements for methods of construction, curing of materials or the applicable General Conditions set forth in the Contract Articles with added regard to performance obligations of the Contractor.

(2) Within 30 calendar days after his award of contract, the General Contractor shall submit in writing to CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) for approval, three copies of his proposed methods for "Weather Protection".

(3) Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate ventilation and fire protection devices. Heating devices which may cause damage to finish surfaces shall not be used.

(4) The General Contractor shall furnish and install one accurate Fahrenheit thermometer at each work area as designated by the Designer. However, one additional accurate Fahrenheit thermometer shall be provided for every 2,000 square feet of floor space where the work areas exceed 2,000 square feet.

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

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

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

5.23. Cutting and Patching.

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

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

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

5.24. Cleaning Up.

5.24.1. During the progress of the Work, the **Contractor** shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract or other debris. At the completion of the Work, the **Contractor** shall remove from and about the Project all waste materials, rubbish, and debris, and the **Contractor's** tools, construction equipment, machinery, and surplus materials. Surplus materials to be provided to the **City** by specifications

shall be stored in a clean, safe and secure area as directed by the **City**. The **Contractor** shall leave the site clean and ready for occupancy by the **City** at Substantial Completion of the Work. Immediately prior to the **Design Professional's** inspection for Substantial Completion, the **Contractor** shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned, waxed and buffed. Woodwork shall be dusted and cleaned. Sash, fixtures and equipment shall be thoroughly cleaned. Stains, spots, dust, marks and smears shall be removed from all surfaces. Hardware and all metal surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the **Contractor** at the **Contractor's** expense. The **Contractor** shall restore to original condition all property not designated for alteration by the Contract Documents.

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

5.25. Royalties and Patents.

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

5.26. Contractor's Obligation to Perform.

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

- 5.26.1.1.** observations by the **Design Professional**;
- 5.26.1.2.** recommendation of any progress or final payment by the **Design Professional**;
- 5.26.1.3.** the issuance of a certificate of Substantial Completion or any payment by the **City** to the **Contractor** under the Contract Documents;
- 5.26.1.4.** use or occupancy of the Work, Project, or Site, or any part thereof, by the **City**;
- 5.26.1.5.** any acceptance by the **City** or any failure to do so;
- 5.26.1.6.** any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptance by the **Design Professional**;
- 5.26.1.7.** any inspection, test, or approval by others; or
- 5.26.1.8.** any correction of defective Work by the **City**.

5.27. Indemnification; and Covenant Not To Sue.

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

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

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

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

5.28. Survival of Obligations.

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

**ARTICLE 6
SUBCONTRACTORS**

6.1 Use of Subcontractors.

The **Contractor** shall use the Subcontractors named in the **Contractor's Bid**. The Contractor shall not award any work to any Subcontractor without prior written approval of the CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT). The Contractor shall not award any work to any subcontractor without prior written approval of CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT), which approval will not be given until the Contractor submits a written approval statement concerning the proposed award to the subcontractor, which statement shall contain such information as CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) may require. All subcontracts subject to Mass. General laws, Chapter 149, Sections 44A-J, shall comply with the filed sub-bid requirements of that statute. The Contractor shall be as fully responsible for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the Terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) may exercise over the Contractor under any provision of the contract documents. Nothing contained in this contract shall create any contractual relation between any subcontractor and CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT).

6.2 Substitution of Subcontractors.

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

6.3 Names of Subcontractors.

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

6.4 Objections to Subcontractors.

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

6.5 Form of the Subcontract.

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

6.6 Content of the Subcontract.

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

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

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

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

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

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

ARTICLE 7 PERFORMANCE AND PAYMENT BONDS

7.1. Form of Bonds.

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

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

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

7.3. Submission to the City.

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

ARTICLE 8 INSURANCE REQUIREMENTS

8.1 Insurance Certificates.

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

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

8.3 Additional Insured. The **City** and the **Design Professional** shall be named as an additional insured on each certificate, and the certificate must have the endorsement of the insurance agency. The additional insured shall be a separate Owners Protective Liability policy providing Bodily Injury and Property Damage coverages. Each of the additional insureds shall have Bodily Injury coverage in the amount of \$1,000,000 for each occurrence, and Property Damage coverage in the amount of \$1,000,000 for each occurrence with an annual aggregate amount of \$1,000,000.

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

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

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

ARTICLE 9 TESTS AND INSPECTIONS

9.1. Access.

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

9.2. Tests and Inspections.

9.1.2 9.2.1. The **Contractor** shall give the **Design Professional** timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

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

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

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

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

ARTICLE 10 UNCOVERING AND CORRECTING WORK

10.1. Uncovering Work.

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

10.1.2. If a portion of the Work has been covered which the **Design Professional** has not specifically requested to observe prior to its being covered, the **Design Professional** may request to see such Work, and it shall be uncovered by the **Contractor**. If it is found that such Work is in accordance with the Contract Documents, costs of uncovering and replacing shall, by appropriate Change Order, be charged to the **City**. If it is found that such Work is defective or not in accordance with the Contract Documents, the **Contractor** shall pay all claims, costs, losses, and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection, and testing and of satisfactory replacement of reconstruction (including, but not limited to, all costs of repair or replacement of work of others); and the **City** shall be entitled to an appropriate decrease in the Contract Sum. The **City** may take such decrease by reducing the then current application for payment accordingly or subsequent applications, if necessary, until the decrease is paid in full.

10.2. Correcting Work.

10.2.1. The **Contractor** shall promptly correct Work rejected by the **Design Professional** or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not

fabricated, installed, or completed. The **Contractor** shall bear all costs of correcting such rejected Work including additional testing and inspections and compensation for the **Design Professional's** services and expenses made necessary thereby and any cost, loss, or damages to the **City** resulting from such failure or defect.

10.2.2. If, within one (1) year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established in Article 15, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the **City** to do so, unless the **City** has previously given the **Contractor** a written acceptance of such condition. This period of one (1) year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation to correct under this paragraph shall survive acceptance of the Work under the Contract and termination of the Contract. The **City** shall give such notice promptly after discovery of the condition.

10.2.3. The **Contractor** shall correct, remove, or replace portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the **Contractor** nor accepted by the **City**.

10.2.4. If the **Contractor** fails within a reasonable time to correct nonconforming Work, or to remove and replace rejected Work, or fails to perform the Work in accordance with the Contract Documents, the **City** may correct it in accordance with the provisions herein. If the **Contractor** does not proceed with correction, removal, or replacement of such nonconforming Work within seven (7) days from the date of written notice from the **Design Professional**, the **City** may correct it and store any salvageable materials or equipment at the **Contractor's** expense. If the **Contractor** does not pay costs of any such removal and storage within ten (10) days after written notice, the **City** may upon ten (10) additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the **Contractor**, including compensation for the **Design Professional's** services and expenses made necessary thereby. If such proceeds of sale do not cover all the costs that the **Contractor** should have born, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the **Contractor** are not sufficient to cover such amount, the **Contractor** shall pay the difference to the **City**.

10.2.5. The **Contractor** shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the **City** or separate contractors caused by the **Contractor's** correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

10.2.6. Nothing contained in this paragraph shall be construed to establish a period of limitation with respect to other obligations that the **Contractor** might have under the Contract Documents. Establishment of the time period of one (1) year as described in the above paragraph related only to the specific obligation of the **Contractor** to correct the Work and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced nor to the time within which proceedings may be commenced to establish the **Contractor's** liability with respect to the **Contractor's** obligations other than specifically to correct the Work.

10.3. Acceptance of Nonconforming Work.

10.3.1 If, instead of requiring correction or removal and replacement of defective or nonconforming Work, the **City** prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the **City** may do so instead of requiring its removal and correction, in which case the **Contractor** shall pay all claims, costs, losses, and damages attributable to the **City's** evaluation of and determination to accept such defective or non-conforming Work. The Contract Sum will be reduced as appropriate. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 11 CHANGES IN THE WORK

11.1. In General.

11.1.1. The Contract Sum constitutes the total compensation (subject to authorized adjustments) payable to the **Contractor** for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the **Contractor** shall be at the **Contractor's** expense without any change in the Contract Sum.

11.1.2. Without invalidating the Contract and without notice to any surety, the **City** may, at any time or from time to time, order additions to, deletions from, or revisions in the Work. Such additions, deletions, or revisions will be authorized by a Change Order, a Modification or a **Construction Change Directive**. Upon receipt of any such document, the **Contractor** shall promptly proceed with the Work involved that will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

11.1.3. The **Contractor** shall not be entitled to an increase in the Contract Sum or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified, or supplemented, except as otherwise provided herein.

11.2. Change Orders.

11.2.1. (*Reference:* M.G.L. c. 30, §39I;). The **Contractor** shall perform all the Work required by this Contract in conformity with the Plans and Specifications contained herein. No willful and substantial deviation from said Plans and Specifications shall be made unless authorized in writing by the **City** and the **Design Professional** in charge of the Work who is duly authorized by the **City** to approve such deviations. In order to avoid delays in the prosecution of the Work required by such Contract, such deviation from the Plans or Specifications may be authorized by a written order of the **City** or the **Design Professional** so authorized to approve such deviation. Within thirty (30) days thereafter, such written order shall be confirmed by a certificate of the **City**, using AIA Document G701 (or its equivalent), stating: (1) If such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures, or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the Project as a whole; (3) that either the work substituted for the Work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the **City** and the **Contractor** and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the **City**. The Change Order shall also indicate whether or not the date of substantial completion has been extended. The equitable adjustment in price shall be determined by the unit prices, if any, in the General Contractor's bid; otherwise, it shall be a number which is agreed to by both parties as a fair adjustment and which can be itemized and substantiated to the reasonable satisfaction of the Contracting Authority. Where increases and decreases to the Contract Sum are included in one Change Order, the negotiated allowance for overhead and profit shall be calculated on the basis of the net increase, if any.

11.3. Construction Change Directive.

11.3.1. A **Construction Change Directive** shall be used in the absence of total agreement on the terms of a Change Order.

11.3.2. Upon request of the **City** or the **Design Professional**, the **Contractor** shall without cost to the **City** submit to the **Design Professional** in such form as the **Design Professional** may require, an accurate written estimate of the cost of any proposed extra work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the **Design Professional**. If required by the **Design Professional**, in order to establish the exact cost of new Work added or of previously required Work omitted, the **Contractor** shall obtain and furnish to the **Design Professional** bona fide proposals from recognized Suppliers for furnishing any material included in such Work. Such estimates shall be furnished promptly so as to occasion no delay in the Work, and shall be furnished at the **Contractor's** expense.

11.3.3. The **Contractor** shall state in the estimate any extension of time required for the completion of the Work if the change or extra Work is ordered. The **Contractor** shall document, through a critical path analysis, or some other clearly delineated explanation, how the proposed change affects other aspects of the Work, and why it would require an extension of time. The **Contractor** shall promptly revise and resubmit such estimate if the **Design Professional** determines that it is not in compliance with the requirements of this Article, or that it contains errors of fact or mathematical errors.

11.3.4. If the **Construction Change Directive** provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods, as selected by the **City**, selection of which does not require the consent of the **Contractor**:

11.3.4.1. by unit prices stated in the Contract Documents or otherwise mutually agreed upon; or

11.3.4.2. by Cost and Percentages estimated by the **Contractor** as provided herein and accepted by the **City**, whereupon the **Contractor's** estimate shall become a fixed price which shall not be changed by any variation in the actual cost of executing the Work covered by the change; or

11.3.4.3. by actual Cost determined after the Work covered by the change is completed, plus Percentage; or

11.3.4.4. by submission to arbitration or a court, which shall determine the fair value of the Work covered by the change.

11.3.5. "Cost" shall mean the estimated or actual net increase or decrease in cost to the **Contractor**, Subcontractor, or Sub-subcontractor for performing the Work covered by the change, including actual payments for materials, equipment rentals, expendable items, wages, and associated benefits to the workers and to supervisors employed full time at the Site, insurance, bonds, and other provable direct costs, but not including any administrative, accounting or expediting costs, or other indirect or overhead costs, or any wages or benefits of supervisory personnel not assigned full time to the Site, or any amount for profit or fee to the **Contractor**, Subcontractor, or Sub-subcontractor.

11.3.6. "Percentage" shall mean an allowance to be added to or subtracted from the Cost in lieu of overhead and profit and of any other expense that is not included in the Cost of the Work covered by the change, as defined above. Percentage for a

Sub-subcontractor shall be 8% of any net increase or decrease of Cost of any Work performed by the Sub-subcontractor's own forces plus 4% of any net increase or decrease in Cost of any Work performed for the Sub-subcontractor by lower tier Sub-subcontractors. Percentage for a Subcontractor shall be 12% of any net increase or decrease of Cost of any Work performed by the Subcontractor's own forces plus 4% of the Cost of Work performed by Sub-subcontractors. Percentage for the **Contractor** shall be 15% of any net increase or decrease of Cost of any Work performed by the **Contractor's** own forces plus 5% of any net increase or decrease in the Cost for all other Work covered by the change. When the **Contractor** is also performing Work as a Subcontractor or Sub-subcontractor, the **Contractor** shall only be entitled to a total of no more than 15% of any net increase or decrease of Cost of any Work.

11.3.7. When in the reasonable judgment of the **Design Professional** a series of **Construction Change** Directives or Change Orders effect a single change, Percentage shall be calculated on the cumulative net increase or decrease in Cost, if any.

11.3.8. If unit prices are stated in the Contract Documents or are subsequently agreed upon, and if quantities originally contemplated are so changed in a Proposed Change Order or **Construction Change** Directive that the application of such unit prices to quantities of Work proposed will cause substantial inequity to the **City** or the **Contractor**, the applicable unit prices shall be equitably adjusted. Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) to complete the work contemplated by the contract, nor shall any such increases or diminution shall in no way violate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

11.3.9. If the **City** elects to determine the Cost of the Work as provided in method (11.3.4.1) using unit prices stated in the Contract Documents or subsequently agreed upon, the unit prices shall be subject to the prior paragraph. Notwithstanding the inclusion of unit prices in the Contract Documents, it shall be the **City's** option to require the Cost of any given change to be determined by one of the other methods stated in 11.3.4. If the **City** elected to determine the Cost of the change by unit prices and the nature of the work is such that its extent cannot readily be measured after the completion of such work or any subsequent Work, the **Contractor** shall keep daily records, available at all times to the **Design Professional** for inspection, of the actual quantities of such Work put in place, and delivery receipts or other adequate evidence, acceptable to the **Design Professional**, indicating the quantities of materials delivered to the Site for use in such unit price Work, and distinguishing such from other similar material delivered for use in Work include in the base Contract Sum. If so required by the **Design Professional**, materials for use in unit price Work shall be stored apart from all other materials on the Project.

11.3.10. If the **City** elects to determine the Cost of the Work as provided in methods 11.3.4.3. or 11.3.4.4. or if the method of determining the Cost has not been established before the Work is begun, the **Contractor** shall keep detailed daily records of labor and material costs applicable to the Work.

11.3.11. Upon receipt of a **Construction Change** Directive, the **Contractor** shall promptly proceed with the change in the Work involved and advise the **Design Professional** in writing of the **Contractor's** agreement or disagreement with the method, if any, provided in the **Construction Change** Directive for determining the proposed adjustment in the Contract Time.

11.3.12. A **Construction Change** Directive signed by the **Contractor** indicates the agreement of the **Contractor** therewith, including adjustment in the Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

11.3.13. If the **Design Professional** and the **Contractor** do not agree with the adjustment in the Contract Time or the method for determining it, the adjustment or the method shall be referred to the **Design Professional** for determination.

11.4. Minor Changes in the Work.

11.4.1. The **Design Professional** has the authority to order minor changes in the Work. "Minor changes" as used in this paragraph mean changes which are so insignificant as to not affect the Contract Sum or the Contract Time and which are not inconsistent with the intent of the Contract Documents. Any minor change shall be committed to a written order which shall be binding on both the **City** and the **Contractor** and which shall be promptly carried out by the **Contractor**.

11.5. Certificate of Appropriations. (*Reference:* M.G.L. c. 44, §31C:). This Contract shall not be deemed to have been made until the **City's** auditor has certified thereon that an appropriation in the amount of this Contract is available therefor and that an officer or agent of the **City** has been authorized to execute said Contract and approve all requisitions and change orders. No order to the **Contractor** for a change in or addition to the Work, whether in the form of a drawing, plan, detail or any other written instruction, unless it is an order which the **Contractor** is willing to perform without any increase to the Contract price, shall be deemed to be given until the auditor has certified thereon that an appropriation in the amount of such order is available therefore; but such certificate shall not be construed as an admission by the **City** of its liability to pay for such work. The certificate of the auditor that an appropriation in the amount of this Contract or in the amount of such order is available shall bar any defense by the **City** on the grounds of insufficient appropriation.

ARTICLE 12
CHANGE IN THE CONTRACT TIME

12.1. Date of Commencement.

12.1.1 The date of commencement of the Work is the date established in the Notice to Proceed. The date shall not be postponed by the failure to act of the **Contractor** or persons or entities for whom the **Contractor** is responsible.

12.2. Progress and Completion.

12.2.1. Time is of the essence; all time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the **Contractor** confirms that the Contract Time is a reasonable period for performing the Work.

12.2.2. The **Contractor** shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

12.2.3. At least ten (10) working days after the Notice to Proceed or twenty (20) working days before the first application for payment, the **Contractor** shall submit to the **Design Professional** a progress schedule showing for each class of Work included in the schedule of values, the percentage of completion to be obtained and the total dollar value of Work to be completed as of the first of each month until Substantial Completion. All calculations shall be on the basis of Work in place, but may include, at the **Design Professional's** discretion, the value of materials delivered but not in place.

12.2.4. The progress schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation (including adequate time for submission and review of submittals), and leading to a reasonable certainty of Substantial Completion by the date established in the Agreement. The progress schedule will be reviewed by the **Design Professional** for compliance with the requirements of this Article and will be accepted by the **Design Professional** or returned to the **Contractor** for revision and resubmittal. Unless specifically required by law, no payment under this Contract shall be due until the progress schedule has been approved by the **Design Professional**. The **Design Professional's** review of the progress schedule shall not impose any duty on the **Design Professional** or the **City** with respect to the timing, planning, scheduling, or execution of the Work. In particular, if the **Contractor** proposes a progress schedule indicating a date of Substantial Completion which is earlier than the Contract Time, the **Contractor** shall not be entitled to additional payment or compensation of any kind if, for any reason, the full Contract Time is required to achieve Substantial Completion of the Work.

12.2.5. If in any Application for Payment, the total value of the completed Work in place, as certified by the **Design Professional**, is less than 90% of the total value of the Work in place estimated in the progress schedule, the **City** may, at the **City's** option, require the **Contractor** to accelerate the progress of the Work without cost to the **City** by increasing the workforce or hours or Work or by other reasonable means approved by the **Design Professional**.

12.2.6. If each of three successive applications, as certified by the **Design Professional**, indicate that the actual Work completed is less than 90% of the values estimated in the progress schedule to be completed by the respective dates, the **City** may at the **City's** option, treat the **Contractor's** delinquency as a default justifying the action permitted under Article 18.

12.2.7. If the **Design Professional** has determined that the **Contractor** should be permitted to extend the time for completion as provided below, the calendar dates in the progress schedule shall be adjusted accordingly to retain their same relationship to the adjusted date of Substantial Completion, and the dollar value of the Work to be completed as of the first of each month shall be adjusted pro rata.

12.2.8. If the **Contractor** fails to submit any application for payment in any month, the **Design Professional** shall, for the purpose of this evaluation of progress, certify separately to the actual value of the Work in place completed as of the first of the month to the best of the **Design Professional's** knowledge.

12.2.9. Nothing herein shall limit the **City's** right to liquidated or other damages for delays by the **Contractor** or to any other remedy which the **City** may be entitled or may possess under other provisions of the Contract Documents or by law.

12.3. Delays and Extensions of Time.

12.3.1. If the **Contractor** is delayed at any time in the progress of the Work by an act or neglect of the **City** or the **Design Professional**, or of an employee of either, or of a separate contractor employed by the **City**, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes (except weather) beyond the **Contractor's** control, or by delay authorized by the **City**, or by other causes which the **Design Professional** determines may justify delay, then the Contract Time shall be extended by Change Order or **Construction Change Directive** for such reasonable time as the **Design Professional** may determine.

12.3.2. Claims relating to time shall be made in accordance with applicable provisions of Article 16.

12.3.3. No claim for extension of time shall be allowed on account of failure of the **Design Professional** to furnish Plans, Specifications or instructions or to return Shop Drawings or Samples until fifteen (15) days after receipt by the **Design Professional** by registered or certified mail of written demand for such instructions, Plans, Specifications, or Samples, and then not unless such claim is reasonable.

12.3.4. No extensions of time shall be granted because of seasonal or abnormal variations in temperature, humidity or precipitation, which conditions shall be wholly at the risk of the **Contractor**, whether occurring within the time originally scheduled for completion or within the period of any extension granted. There shall be no increase in the Contract Sum on account of any additional costs of operations or conditions resulting therefrom.

12.3.5. The **Contractor** hereby agrees that the **Contractor** shall have no claim for damages of any kind against the **City** or the **Design Professional** on account of any delay in the commencement of the Work and/or any hindrance, delay, or suspension of any portion of the Work, whether such delay is caused by the **City**, the **Design Professional**, or otherwise, except as and to the extent expressly provided under M.G.L. c. 30, §39O, in the case of written orders by the **City**. The **Contractor** acknowledges that the **Contractor's** sole remedy for any such delay and/or suspension will be an extension of time as provided in this Article.

12.3.6. (*Reference: M.G.L. c. 30, §39O;*). (a) The **City** may order the **Contractor** in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the **City**, provided however that if there is a suspension, delay, or interruption for fifteen (15) days or more due to a failure of the **City** to act within the time specified in this Contract, the **City** shall make an adjustment in the Contract prices for any increase in the cost of performance of this Contract under this provision for any suspension, delay, interruption, or failure to act to the extent that such is due to any cause for which this Contract provides for an equitable adjustment of the Contract price under any other Contract provisions.

(b) The **Contractor** must submit the amount of a claim under provision (a) to the **City** in writing as soon as practicable after the end of the suspension, delay, interruption, or failure to act and, in any event, not later than the date of final payment under this Contract and, except for costs due to a suspension order, the **City** shall not approve any costs in the claim incurred more than twenty (20) days before the **Contractor** notified the **City** in writing of the act or a failure to act involved in the Claim.

In the event a suspension, delay, interruption, or failure to act of the **City** increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the **Contractor** for payment for an increase in the cost of its performance as provisions (a) and (b) give the **Contractor** against the **City**, but nothing in provisions (a) and (b) shall in any way change, modify, or alter any other rights which the **Contractor** or the Subcontractor may have against each other.

12.4. Liquidated Damages.

12.4.1. If the **Contractor** shall fail to achieve Substantial Completion within the Contract Time, it shall be liable to pay the **City** the daily amount specified in the Agreement, not as a penalty, but as a fixed and agreed upon damages for breach of contract. The said amount is fixed and agreed upon because of the difficulty of ascertaining the **City's** actual damages. It is mutually understood that the said amount is a reasonable approximation or estimate thereof as of the date of the Agreement. The **City** may elect to withhold said amount from periodic or final payments due to the **Contractor**, in addition to retainage and other back charges.

12.5. Changes in the Contract Time.

12.5.1. In Writing. The Contract Time may only be changed by a Change Order or a Modification. Any claim for an adjustment of the Contract Time shall be based on a written notice delivered to the party making the claim to the other party and to the **Design Professional** promptly (but in no event later than seven (7) days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty (30) days after such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the **Design Professional** in accordance with Article 16. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph.

12.5.2. Early Completion. The Contract Time shall not be changed due to a delay in the **Contractor's** early completion date.

ARTICLE 13 PAYMENTS

13.1. Schedule of Values.

13.1.1. The **Contractor** shall submit to the **Design Professional** a schedule of values which shall subdivide the Work into its component parts and shall include quantities, direct craft labor worker hours, labor cost and material/equipment cost. Labor cost shall include an appropriate amount of construction equipment costs, supplemental costs, administrative expenses, contingencies, and profit. The **Contractor** shall prepare the schedule of values in such form and supported by such data to substantiate its accuracy as the **Design Professional** may require and shall be revised if later found by the **Design Professional** to be inaccurate. This schedule, unless objected to by the **Design Professional**, shall be used as a basis for reviewing the

Contractor's applications for payment.

13.2. Content and Submission of Applications for Payment.

13.2.1. At least ten (10) days before the date established for each progress payment, the **Contractor** shall submit to the **Design Professional** six (6) copies of an itemized application for payment for Work completed in accordance with the schedule of values. Such application shall be in a form or format established or approved by the **Design Professional** and shall be supported by documentation substantiating the **Contractor's** right to payment.

13.2.2. When **Construction Change** Directives have set forth an adjustment to the Contract Sum but have not yet been included in Change Orders, the value established by the **City** may be included in the application.

13.2.3. Applications covering Work of Subcontractors or Suppliers shall not include requests for payments of amounts the **Contractor** does not intend to pay to a Subcontractor or Supplier because of a dispute or other reason. The **Contractor** shall not be paid for any Work performed by a Subcontractor unless and until the **City** receives for that Subcontractor a certificate of insurance that conforms to the requirements of the Contract Documents .

13.2.4. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the Site for subsequent incorporation in the Work. If approved in advance by the **City**, payment may similarly be made for materials and equipment suitably stored off the Site at a location agreed upon in writing. Payment for materials and equipment stored on or off the Site shall be conditioned upon the application for payment being accompanied by a bill of sale, an invoice, or other documentation warranting that the **City** has received the materials and equipment free and clear of all liens, claims, security interests, or encumbrances, hereinafter collectively referred to as "liens," and evidence that the materials and equipment are covered by appropriate insurance and other arrangements to protect the **City's** interest therein.

13.2.5. Each application for payment or periodic estimate requesting payment shall be accompanied by, at the **City's** option, a certificate from each Subcontractor stating that the Subcontractor has been paid all amounts due the Subcontractor on the basis of the previous periodic payment to the **Contractor**, or else stating the amount not so paid and the reason for the discrepancy. In the event of any such discrepancy, the **Contractor** shall furnish the **Contractor's** own written explanation to the **City** through the **Design Professional**. Such waiver or certificate shall be in a form acceptable to the **City**.

13.3. False Applications for Payment.

13.3.1. (*Reference: M.G.L. c. 266, §§67B*). Any person who makes or presents to any claim upon or against any employee or department of the **City**, knowing such claim to be false, fictitious, or fraudulent shall be punished by a fine or not ore than ten thousand dollars (\$10,000) or by imprisonment in the state prison for not more than five (5) years, or in the house of correction for not more than two and one-half years, or both.

13.4. Review of Applications for Payment.

13.4.1. The **Design Professional** shall review each application for payment and will reject any application that (1) is not accompanied by the required documentation or (2) contains errors, mathematical or otherwise.

13.4.2. Within five (5) business days after receipt of an application for payment, the **Design Professional** will either (1) return the application to the **Contractor** with a written explanation as to why it was rejected or (2) issue to the **City** a certificate for payment, with a copy to the **Contractor**, for such amount as the **Design Professional** determines is properly due. In the event an application is returned to the **Contractor**, the date of receipt of the application shall be the date of receipt of the corrected application.

13.4.3. The **Design Professional** or the **City** may make changes to any application submitted by the **Contractor**.

13.4.4. By recommending any payment, the **Design Professional** will not thereby be deemed to have represented that: (1) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to the **Design Professional** in the Contract Documents or (2) that there may not be other matters or issues between the parties that might entitle the **Contractor** to be paid additionally by the **City** or entitle the **City** to withhold payment to the **Contractor**. The **Design Professional's** approval of the application for payment and the accompanying documentation shall indicate that to the best of the **Design Professional's** knowledge, information, and belief, the Work has progressed to the point indicated by the **Contractor**, and that the quality of the Work is in accordance with the Contract Documents, subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests specified in the Contract Documents, final determination of quantities and classifications for unit price work and any other qualifications so stated.

13.4.5. The **Design Professional's** recommendation of any payment shall not mean that the **Design Professional** is responsible for the **Contractor's** means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the **Contractor** to comply with laws and regulations applicable to the furnishing or performance of Work, or for any failure of the **Contractor** to perform or furnish Work in accordance with the

Contract Documents.

13.4.6. No certificate given or payment made shall be evidence of the performance of this Contract, either wholly or in part and no payment, whether made upon the final certificate or otherwise, shall be construed as an acceptance of defective work or materials.

13.5. Decisions to Withhold Certification.

13.5.1. The **Design Professional** may refuse to recommend the whole or any part of any payment if, in the **Design Professional's** opinion, it would be incorrect to make the representations to the **City** referred to above.

13.5.2. If the **Contractor** and the **Design Professional** cannot agree on a revised amount, the **Design Professional** will promptly approve a certificate for payment for the amount for which the **Design Professional** is able to make such representations to the **City**. The **Design Professional** may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a certificate for payment previously issued, to such extent as may be necessary in the **Design Professional's** opinion to protect the **City** from loss because of:

13.5.2.1. defective Work not remedied;

13.5.2.2. third party claims filed or reasonable evidence indicating probable filing of such claims;

13.5.2.3. failure of the **Contractor** to make payments properly to Subcontractors or for labor, materials or equipment;

13.5.2.4. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

13.5.2.5. damage to the **City** or another contractor;

13.5.2.6. reasonable evidence that the Work will not be completed within the Contract Time, and that retainage currently held by the **City** would not be adequate to cover actual or liquidated damage for the anticipated delay;

13.5.2.7. persistent failure to carry out the Work in accordance with the Contract Documents; or

13.5.2.8. failure of mechanical trade or electrical trade subcontractors to comply with mandatory requirements for maintaining record drawings. The **Contractor** shall check record drawings each month. Written confirmation that the record drawings are current will be required by the **Design Professional** before approval of the **Contractor's** monthly payment requisition.

13.5.3. When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

13.6. Progress Payments.

13.6.1. After the **Design Professional** has issued a certificate for payment, the **City** shall make payment in the manner and within the time provided in the Contract Documents.

13.6.2. (*Reference: M.G.L. c. 30, §39G, 39K;*). In the case of Contracts for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building when the amount is more than two thousand dollars, the following paragraph applies: Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five per cent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one per cent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate than charged by the Federal Reserve Bank of Boston commencing on the

first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

For all other construction contracts, progress payments are governed by chapter 30, §39G, and as follows: The **City** shall pay the amount due pursuant to any periodic, Substantial Completion or final estimate within thirty-five (35) days after receipt of written acceptance for such estimate from the **Contractor**. In the case of periodic payments, the **City** may deduct from its payment a retention based on its estimate of the fair value of its claims against the **Contractor**, a retention for direct payments to Subcontractors based on demands for same in accordance with M.G.L. c. 30, §39F; and a retention to secure satisfactory performance of the contractual work, not exceeding five percent (5%) of the approved amount of any periodic payment, and the same right to retention shall apply to bonded Subcontractors entitled to direct payment under M.G.L. c. 30, §39F; provided, that a five percent (5%) value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

Retainage prior to Substantial Completion. In all construction contracts, the City may hold back a retainage of up to five percent of each progress payment to ensure satisfactory completion of the work. In addition, the City may withhold any amounts in dispute, including disputed change orders and direct payments owed to subcontractors pursuant to Chapter 30, §39F of the General Laws.

Payment upon Substantial Completion. In the case of contracts for construction, reconstruction, alteration, repair, remodeling, or demolition of a public building, where the amount is more than \$2,000, Chapter 30, Section 39K, of the General Laws governs payment upon substantial completion. For all other contracts, Chapter 30, Section 39F of the General Laws governs payment upon substantial completion.

13.6.3. No periodic, Substantial Completion or final estimate or acceptance or payment thereof shall bar the **Contractor** from reserving all rights to dispute the quantity and amount of, or the failure of the **City** to approve a quantity and amount of, all or part of any Work item or extra Work item.

13.7. Final Payment.

13.7.1. After final inspection and after the **Contractor** has completed all the required corrections to the satisfaction of the **Design Professional** and the **City** and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, bonds, certificates, or other evidence of insurance, certificates of inspection, marked-up record documents, and all other documents called for in the Contract Documents, as well as any surplus materials requested by the **City**, the **Contractor** may make an application for final payment as provided below.

13.7.2. (*Reference:* M.G.L. c. 30, §39G;). Within thirty (30) days after receipt by the **City** of a notice from the **Contractor** stating that all of the Work required by the Contract has been completed, the **City** shall prepare and forthwith send to the **Contractor** for acceptance a final estimate for the quantity and price of the Work done and all retainage on the Work less all payments made to date, unless the **City's** inspection shows that Work required by the Contract remains incomplete or unsatisfactory, or that documentation required by the Contract has not been completed.

13.7.3. The making and acceptance of final payment will constitute a waiver of all claims by the **Contractor** against the **City** other than those previously made in writing and still unsettled.

13.7.4. Interest. If the City fails to pay the Contractor within the time periods mandated by statute, the City shall pay interest to the Contractor in accordance with Chapter 30, Sections 39G and 39K, whichever is applicable.

13.8. Payments to Subcontractors.

13.8.1. Neither the **City** nor the **Design Professional** shall have an obligation to pay or see to the payment of money to a Subcontractor, Sub-subcontractor, or Supplier except as may otherwise be required by law.

13.8.2. (*Reference:* M.G.L. c. 30, §39F;) (1) Every contract awarded pursuant to sections forty-four A to L, inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

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

(b) Not later than the sixty-fifth day after each Subcontractor substantially completes its Work in accordance with the Plans and Specifications, the entire balance due under the subcontract, less amounts retained by the **City** as the estimated cost of completing the incomplete and unsatisfactory items of Work, shall be due the

Subcontractor; and the **City** shall pay that amount to the **Contractor**. The **Contractor** shall forthwith pay to the Subcontractor the full amount received from the **City** less any amount specified in any court proceeding barring such payment and also less any amount claimed due from the Subcontractor by the **Contractor**.

(c) Each payment made by the **City** to the **Contractor** pursuant to paragraphs (a) and (b) of M.G.L. c. 30, §39F(1);, for the labor performed and the materials furnished by a Subcontractor shall be made to the **Contractor** for the account of that Subcontractor; and the **City** shall take reasonable steps to compel the **Contractor** to make each such payment to each such Subcontractor. If the **City** has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the **Contractor** or which is to be include in a payment to the **Contractor** for payment to the Subcontractor as provided in paragraphs (a) and (b) of M.G.L. c. 30, §39F(1), the **City** shall act upon the demand as provided in M.G.L. c. 30, §39F.

(d) If, within seventy (70) days after the Subcontractor has substantially completed the subcontract Work, the Subcontractor has not received from the **Contractor** the balance due under the subcontract including any amount due for extra labor and materials furnished to the **Contractor**, less any amount retained by the **City** as the estimated cost of completing the incomplete and unsatisfactory items of Work, the Subcontractor may demand direct payment of that balance from the **City**. The demand shall be by a sworn statement delivered to or sent by certified mail to the **City**, and a copy shall be delivered to or sent by certified mail to the **Contractor** at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract Work. [The demand letter shall indicate the certified mail number assigned by the postal service or the date of delivery to the **Contractor**.] Any demand made after substantial completion of the subcontract Work shall be valid even if delivered or mailed prior to the seventieth day after the Subcontractor has substantially completed the subcontract Work. Within ten (10) days after the Subcontractor has delivered or so mailed the demand to the **City** and delivered or so mailed a copy to the **Contractor**, the **Contractor** may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the **City**, and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the **Contractor** and of the amount due for each claim made by the **Contractor** against the Subcontractor.

(e) Within fifteen (15) days after receipt of the demand by the **City**, but in no event prior to the seventieth day after substantial completion of the subcontract Work, the **City** shall make direct payment to the Subcontractor of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the **Contractor**, less any amount (i) retained by the **City** as the estimated cost of completing the incomplete or unsatisfactory items of Work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the **Contractor** in the sworn reply; provided that the **City** shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to or for which the sworn reply does not contain the detailed breakdown required by the previous paragraph. The **City** shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this paragraph.

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

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

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

(i) If the Subcontractor does not receive payment as provided in paragraph (a) or if the **Contractor** does not submit a periodic estimate for the value of the labor or materials performed or furnished by the Subcontractor and the Subcontractor does not receive payment for same when due less the deductions provided for in paragraph (a), the Subcontractor may demand direct payment by following the procedure in paragraph (d) and the **Contractor** may file a sworn reply as provided in that same paragraph. A demand made after the first day of the month following that for

which the Subcontractor performed or furnished the labor and materials for which the Subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the **Contractor**. Thereafter the **City** shall proceed as provided in paragraphs (e), (f), (g), and (h). "Subcontractor" as used in this paragraph (1)(i) shall mean a person approved by the **City** in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the **Contractor**.

(2) Any assignment by a Subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of M.G.L. c. 149, §29; shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the **City** or which are on deposit pursuant to paragraph (g) shall be subordinate to the rights of all Subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) A **Contractor** or a Subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in herein by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A Subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in paragraph (f) by a petition in equity in the superior court against the **City** and the **Contractor** shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. M.G.L. c. 231, §§59 and 59B shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to §§59 and 59B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any Subcontractor with the petition of one or more Subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will present unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a Subcontractor filing a demand for direct payment for which no funds due the **Contractor** are available for direct payment shall have a right to file a petition in court of equity against the **City** claiming a demand for direct payment is premature, and such Subcontractor must file the petition before the **City** has made a direct payment to the Subcontractor and has made a deposit of the disputed portion as provided in part (iii) of paragraph (e) and in paragraph (f).

(4) In any petition to collect any claim for which a Subcontractor has filed a demand for direct payment the court shall, upon motion of the **Contractor**, reduce by the amount of any deposit of a disputed amount by the **City** as provided in part (iii) of paragraph (e) and in paragraph (f) any amount held under a trustee writ or pursuant to a restraining order or injunction.

ARTICLE 14 SUBSTANTIAL COMPLETION

14.1. Substantial Completion.

14.1.1. Upon Substantial Completion of the Work, the **Contractor** shall present in writing to the **City** its certification that the Work has been substantially completed and include in its certification (1) a list of items to be completed or corrected, (2) all special warranties required by the Contract Documents, endorsed by the **Contractor** and in a form reasonably acceptable to the **Design Professional** and (3) the permits and certificates referred to in 13.7.1., or elsewhere. The failure to include any item on the list mentioned in the preceding sentence does not alter the responsibility of the **Contractor** to complete all Work in accordance with the Contract Documents. When the **Design Professional** on the basis of an inspection determines that the Work or designed portion thereof is substantially complete and the other conditions have been met, the **Design Professional** will then prepare a certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the **City** and the **Contractor** for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the **Contractor** shall complete the items listed therein. The certificate of Substantial Completion shall be submitted to the **City** and the **Contractor** for their written acceptance of the responsibilities assigned to them in such certificate.

14.1.2. Within twenty-one (21) days after receipt of the certification from the **Contractor**, the **City** shall present to the **Contractor** either a written declaration that the Work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the Contract sufficient to demonstrate that the Work has not been substantially completed. The **City** may include with such list a notice setting forth a reasonable time within which the **Contractor** must achieve Substantial Completion of the Work. If the **City** fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the **Contractor's** certification within the twenty-one (21) day period, the **Contractor's** certification shall take effect

as the **City's** declaration that the Work has been substantially completed.

14.2. Partial Use or Occupancy of the Premises.

14.2.1. The **City** may occupy or use any completed or partially completed portion of the Work at any stage. Such partial occupancy or use may begin whether or not the portion is substantially complete, provided that the respective responsibilities of the **City** and the **Contractor** with respect to payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work, insurance, correction of the Work, and warranties shall be established by agreement of the **City** and the **Contractor** or, absent such agreement, shall be determined by the **Design Professional** subject to the right of either party to contest such determination as provided in Article 16.

14.2.2. Immediately prior to such partial occupancy or use, the **City**, the **Contractor** and the **Design Professional** shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

14.2.3. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

14.2.4. (*Reference: M.G.L. c. 30, §39G;*). Within sixty-five (65) days after the effective date of a declaration of Substantial Completion, the **City** shall prepare and send to the **Contractor** for acceptance a Substantial Completion estimate for the quantity and price of the Work done and all but one percent (1%) retainage on that Work, including the quantity, price and all but one percent (1%) retainage for the undisputed part of each item and extra work item in dispute, but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory items and less the total periodic payments made to date for the Work. The **City** shall also deduct from the Substantial Completion estimate an amount equal to the sum of all demands for direct payment filed by Subcontractors and not yet paid to Subcontractors or deposited in joint accounts pursuant to M.G.L. c. 30, §39F.

14.2.5. (*Reference: M.G.L. c. 30, §39G.*) If the **City** fails to prepare and send to the **Contractor** any Substantial Completion estimate required by the provisions herein on or before the date specified, the **City** shall pay to the **Contractor** interest on the amount which would have been due to the **Contractor** pursuant to such Substantial Completion estimate at the rate of three (3) percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the **City** sends that Substantial Completion estimate to the **Contractor** for acceptance or to the date of payment therefor, whichever occurs first. The **City** shall include the amount of such interest in the Substantial Completion estimate.

14.2.6. (*Reference: M.G.L. c. 30, §39G.*) Within fifteen (15) days after the effective date of the declaration of Substantial Completion, the **City** shall send to the **Contractor** by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory items, and unless delayed by causes beyond its control, the **Contractor** shall complete all such items within forty-five (45) days after the receipt of such list or before the date for final payment and acceptance, whichever is later. If the **Contractor** fails to complete such Work within such time, the **City** may, subsequent to seven (7) days' written notice to the **Contractor** by certified mail, return receipt requested, terminate the Contract and complete the incomplete or unsatisfactory items and charge the cost of same to the **Contractor**.

14.3. Final Inspection.

14.3.1. Upon written notice from the **Contractor** that the entire Work or an agreed portion thereof is complete, the **Design Professional** will make a final inspection with the **City** and the **Contractor** and will notify the **Contractor** in writing of all particulars which this inspection reveals that the Work is incomplete or defective. The **Contractor** shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

ARTICLE 15 GUARANTEES AND WARRANTIES

15.1. In General.

15.1.1. All guarantees and warranties specifically called for by the Specifications shall expressly run to the benefit of the **City**. Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City shall constitute any acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) will give notice of observed defects with reasonable promptness.

15.2. Warranties.

15.2.1. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the

Work or designated portion thereof, unless otherwise provided in the certificate of Substantial Completion.

15.2.2. The **Contractor** warrants that the materials and equipment furnished under the Contract will be new and of recent manufacture unless otherwise specified, and that all Work will be of good quality, free from faults and defects, and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The **Contractor's** warranty excludes remedy for damage or defect caused by abuse, Modifications not executed by the **Contractor**, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the **Design Professional**, the **Contractor** shall furnish satisfactory evidence as to the kind and quality of material and equipment.

15.2.3. The **Contractor** warrants that title to all Work covered by an application for payment will pass to the **City** either by incorporation in the construction or upon the receipt of payment by the **Contractor**, whichever occurs first, free and clear of all liens. The **Contractor** further agrees that the submission of any application for payment shall conclusively be deemed to waive all liens with respect to said Work to which the **Contractor** may then be entitled, provided that such waiver of the lien rights shall not waive the **Contractor's** right to payment for such Work.

15.2.4. The **Contractor** warrants and guarantees that title to all Work, materials, and equipment covered by any application for payment, whether incorporated in the Project or not, will pass to the **City** no later than the time of payment free and clear of all liens.

15.2.5. No materials or supplies for the Work shall be purchased by the **Contractor** or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The **Contractor** warrants that it has good title to all materials and supplies used by it in the Work, free from all liens.

15.2.6. The **Contractor** shall indemnify and hold the **City** harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. The **Contractor** shall at the **City's** request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the **Contractor** fails to do so, then the **City** may, after having served written notice on the **Contractor** either pay unpaid bills, of which the **City** has written notice, direct, or withhold from the **Contractor's** unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the **Contractor** shall be resumed, in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligations on the **City** to either the **Contractor** or its surety. In paying any unpaid bills of the **Contractor**, the **City** shall be deemed the agent of the **Contractor** and any payment so made by the **City** shall be considered as payment made under the Contract by the **City** to the **Contractor** and the **City** shall not be liable to the **Contractor** for any such payment made in good faith.

15.3. Extended Warranties and Guarantees.

15.3.1. Any defective Work that is either corrected or replaced will be warranted and guaranteed for a period of three (3) years from the date of such correction or replacement.

ARTICLE 16 CLAIMS

16.1. In General.

16.1.1. Written Notice. A Claim must be made by written notice to the other party.

16.1.2. Content of Notice. The notice must include all written supporting data.

16.1.3. Burden of Proof. The party making the Claim must substantiate the Claim.

16.2. Time Limits on Claims.

16.2.1. Unless otherwise provided, all Claims must be made within twenty-one (21) days after the occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Any change or addition to a previously made Claim shall be made by a written notice within the twenty-one-day period in order to be valid.

16.3. Continuing Contract Performance.

16.3.1. Pending final resolution of a Claim including arbitration, unless otherwise agreed in writing, the **Contractor** shall proceed diligently with performance of the Contract and the **City** shall continue to make payments in accordance with the Contract Documents.

16.4. Types of Claims.

16.4.1. Claims for Differing Subsurface or Latent Physical Conditions. (*Reference: M.G.L. c. 30, §39N;*). If,

during the progress of the Work, the **Contractor** or the **City** discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the Plans or indicated in the Contract Documents, either the **Contractor** or the **City** may request an equitable adjustment in the Contract Sum of the Contract applying to Work affected by the differing Site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a **Contractor**, or upon its own initiative, the **City** shall make an investigation of such physical conditions, and if they differ substantially or materially from those shown on the Plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Plans and Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, the **City** shall make an equitable adjustment in the Contract Sum and the Contract shall be modified in writing accordingly.

16.4.2. Claims for Additional Cost. If the **Contractor** claims that any acts or omissions of the **City** or the **Design Professional**, including any instructions or orders, whether oral, written, by drawings, or otherwise, involve extra cost or time, and the **Contractor** has not received a written acknowledgment by the **City** or the **Design Professional** that extra payment will be made or time extended on account thereof, the **Contractor** shall promptly so notify the **Design Professional** in writing of such Claim and shall proceed with the Work relating to such Claim and all rights of both parties with respect to such Claim shall be deemed to have been reserved. No Claim by the **Contractor** on account of such acts, omissions, instructions, or orders shall be valid unless the **Contractor** has so notified the **Design Professional** before proceeding.

16.4.2.1. Under no circumstances shall a Claim be made for additional cost where adverse weather conditions are the basis for the Claim.

16.4.3. Claims for Additional Time. If the **Contractor** wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The **Contractor** shall have the burden of demonstrating the effect of the claimed delay on the Contract Time and shall furnish the **Design Professional** with such documentation relating thereto as the **Design Professional** may reasonably require. Under no circumstances shall the **Contractor** make a Claim for an increase in the Contract Time due to a change in the **Contractor's** early completion date. If the increase in the Contract Time extends beyond the Contract Time established by the **City**, only the time that so extends beyond the Contract Time shall be reviewed and considered. In the case of a continuing delay, only one Claim is necessary.

16.4.3.1. Under no circumstances shall a Claim be made for additional time where adverse weather conditions are the basis for the Claim.

16.4.4. Claims for Injury to Person or Damage to Property. Should either party to the Contract suffer injury to person or damage to property because of any error, omission, or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, a Claim will be made in writing to the other party within twenty-one (21) days of the occurrence of the act giving rise to the injury or damage.

16.5. Review of Claims.

16.5.1. Initial Referral. All Claims, the bases of which arise prior to final payment or the earlier termination of the Contract, shall be referred initially to the **Design Professional** for action as provided herein.

16.5.2. Time Period and Action. The **Design Professional** shall review Claims and shall do one of the following within fourteen (14) days of receipt of the Claim:

16.5.2.1. defer any action with respect to all or any part of a Claim for the purpose of requesting and receiving additional information from either party;

16.5.2.2. decline in writing to render a decision for any reason which it deems appropriate (including, but not limited to, the fact that the Claim involves allegations of fault on the part of the **Design Professional**); or

16.5.2.3. render a decision on all or a part of the Claim.

16.5.3. If the **Design Professional** requests additional information, the **Design Professional** shall take action with respect to the Claim no later than fourteen (14) days after receipt of the additional information. The **Design Professional** shall notify the parties in writing of its disposition of such Claim. If the **Design Professional** renders a decision or declines to render a decision, either party may proceed in accordance with paragraph 16.7.

16.6. Decisions.

16.6.1. Decisions by the City or the Design Professional. (*Reference: M.G.L. c. 30, §39P*). In every case in which this Contract requires the **City**, any official, or its **Design Professional** to make a decision on interpretation of the Specifications, approval of equipment, material or any other approval, or progress of the Work, the decision shall be made promptly and, in any event, no later than fourteen (14) days after the written submission for decision; but if such decision requires extended investigation and study, the **City**, the official, or the **Design Professional** shall, within fourteen (14) days after

the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made.

16.6.2. When Decision of the Design Professional is Final and Binding. The decision of the **Design Professional** shall be final and binding on the parties, unless a party files suit or a demand for arbitration within thirty (30) days after the date of the decision.

16.6.3. When Decision of the Design Professional is Not Final and Binding. (*Reference: M.G.L. c. 30, §39J*). Notwithstanding any contrary provision of this Contract, no decision by the **City** or by the **Design Professional** on a dispute, whether of fact or of law, arising under said Contract shall be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, arbitrarily, is unsupported by substantial evidence, or is based upon error of law.

16.6.4. Resolved Claims. If a Claim is resolved, the **Design Professional** shall obtain or prepare the appropriate documentation and provide the **City** and the **Contractor** with a copy of same.

16.7. Arbitration.

16.7.1. Controversies and Claims Subject to Arbitration. Any controversy or Claim arising out of or related to the Contract, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator or arbitrators may be entered in any court having jurisdiction thereof, except controversies or Claims relating to aesthetic effect, subject to the provisions of paragraph 16.7.7. In any such arbitration in which the amount stated in the demand is \$100,000 or less, the American Arbitration Association shall appoint a single arbitrator in accordance with such Rules, who shall be a lawyer. In any such arbitration in which the amount stated in the demand is in excess of \$100,000, the demand shall include the name of an arbitrator appointed by the claimant. The respondent shall appoint a second arbitrator and shall notify the claimant in writing of such appointment within thirty (30) days of receipt of the demand, failing which the matter shall be decided by the arbitrator named in the claimant's demand. Within thirty (30) days after the claimant's receipt of notice of the appointment of the second arbitrator, the two arbitrators shall appoint a neutral arbitrator and shall notify the parties in writing of such appointment, failing which either party may apply to the American Arbitration Association to appoint such neutral arbitrator. If such neutral arbitrator is appointed by the American Arbitration Association, he or she shall be a lawyer.

16.7.2. Rules for Arbitration. If the neutral arbitrator is appointed by the American Arbitration Association, the said Association shall administer the arbitration and its Construction Industry Arbitration Rules shall govern all aspects of the proceeding including the enforcement of any award. If the neutral arbitrator is not appointed by the American Arbitration Association, then the panel of arbitrators shall act as the administrator of the arbitration but the Construction Industry Arbitration Rules of the Association shall nonetheless govern all aspects of the proceeding, including the enforcement of any award, provided however that the arbitration panel shall have all of the powers and duties conferred on the Association pursuant to said rules. In addition, the following rules shall govern the selection of arbitrators and the proceedings:

16.7.2.1. Neither party may appoint as arbitrator an employee or an owner of that party, nor the parent, spouse, or child of an employee or owner of that party.

16.7.2.2. After the neutral arbitrator has been appointed, neither party may engage in *ex parte* communication with any arbitrator.

16.7.3. When Arbitration May Be Demanded. Demand for arbitration of any Claim, the basis of which arises prior to final payment or the earlier termination of the Contract may not be made before the earlier of (1) the date on which the **Design Professional** has rendered a written decision on the Claim or has notified the parties in writing that such decision will not be rendered or (2) forty-five (45) days following receipt by the **Design Professional** of a written request for a decision sent by registered or certified mail to both the **Design Professional** and the other party to this Contract.

16.7.3.1. In no event shall a demand for arbitration be made after the date when the institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations.

16.7.4. Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract Documents shall include, by consolidation or joinder or in any other manner, the **Design Professional**, the **Design Professional's** employees or consultants, except by written consent containing specific reference to the Contract and signed by the **Design Professional**, the **City**, the **Contractor**, and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the **City**, the **Contractor**, a separate contractor, and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the **City**, the **Contractor**, or a separate contractor shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a dispute not described therein or with a person or entity so named or described herein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Contract shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

16.7.5. Claims and Timely Assertion of Claims. A party who files a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. When a party fails to include a Claim through oversight, inadvertence, or excusable neglect, or when a Claim has matured or been acquired subsequently, the arbitrator or arbitrators may permit amendment.

16.7.6. Award Final. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

16.7.7. The City's Reservation of Rights. Notwithstanding any provision contained in this Article 16 or elsewhere in the Contract Documents, the **City** reserves the following rights in connection with Claims between the **City** and the **Contractor**, which rights may be exercised by the **City** unilaterally, in the **City's** sole discretion, and without the consent of the **Contractor**:

16.7.7.1. the right to institute legal action against the **Contractor** in any court of competent jurisdiction in lieu of demanding arbitration, in which case the dispute or disputes which are the subject of such action shall be decided by such court, and not by arbitration;

16.7.7.2. the right to obtain from any court of competent jurisdiction a stay of any arbitration instituted by the **Contractor**, provided that the application for such stay is made before the appointment of the neutral arbitrator in such arbitration, in which case the dispute or disputes which are the subject of such arbitration shall be decided by such court and not by arbitration;

16.7.7.3. the right to require the **Contractor** to join as a party in any arbitration between the **City** and the **Design Professional** relating to the Project, in which case the **Contractor** agrees to be bound by the decision of the arbitrator or arbitrators in such arbitration.

16.7.8. In case the **City** elects to proceed in accordance with 16.7.7.1. or 16.7.7.2. above, the word "litigation" shall be deemed to replace the word "arbitration" wherever the latter word appears in the Contract Documents.

ARTICLE 17 EMERGENCIES

17.1. In an emergency affecting the health and safety of persons or property, the **Contractor** shall act to prevent threatened damage, injury, or loss.

17.2. In emergencies affecting the health, safety, or protection of persons, the Work or property at the Site or adjacent thereto, the **Contractor**, without special instruction or authorization from the **City** or the **Design Professional**, is obligated to act to prevent threatened damage, injury, or loss. The **Contractor** shall give the **Design Professional** prompt written notice if the **Contractor** believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the **Design Professional** determines that a change in the Contract Documents is required because of the action taken by the **Contractor** in response to such an emergency, a **Construction Change** Directive or Change Order will be issued to document the consequences of such action.

ARTICLE 18 TERMINATION OR SUSPENSION OF THE CONTRACT

18.1. Suspension by the City.

18.1.1. At any time and without cause, the **City** may suspend the Work or any portion thereof for a period of not more than ninety (90) days by notice in writing to the **Contractor** and the **Design Professional** that will fix the date on which Work will be resumed. The **Contractor** shall resume Work on the date so fixed. The **Contractor** shall be allowed an adjustment in the Contract Sum or an extension of the Contract Time, or both, directly attributable to any such suspension if the **Contractor** makes an approved Claim therefor, provided, however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the Awarding Authority to act within the time specified in this contract, the Awarding Authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the General Contractor on such increase; and provided further, that the Awarding Authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption, or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions. The General Contractor must submit the amount of a claim under provision (1) to the Awarding Authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the Awarding Authority shall not approve any costs in the claim incurred more than twenty days before the General Contractor notified the Awarding Authority in writing of the act or failure to act involved in the claim. The General Contractor must submit the amount of a claim under provision (1) to the Awarding Authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the Awarding Authority shall not approve any costs in the claim incurred more than twenty days before the General Contractor

notified the Awarding Authority in writing of the act or failure to act involved in the claim.

18.1.1.1 Notwithstanding the above, if the City is required to suspend the work as a result of a request from the Office of the Attorney General in connection with a bid protest or an injunction, the Contractor shall not have a claim for damages, but the City shall extend the date of substantial completion for a period of time commensurate with the period of the suspension, and the liquidated damages clause shall not take effect until the extended date of substantial completion. If any of the following occurrences causes a delay in the work, the Contractor shall immediately notify CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) in writing. If, upon investigation, the City finds that the delay is excusable, the City shall extend the date of substantial completion for a period of time commensurate with the period of the excusable delay, and the liquidated damages clause shall not take effect until the extended date of substantial completion: (1) any acts of the Government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, National Defense, or any other national emergency; (2) delays which are caused by the City and which are not occasioned by the Contractor's failure to supply CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) or its design professional with progress schedules, documents, samples, and the like, in a timely manner; (3) causes not reasonably foreseeable by the parties to this Contract, which are beyond the reasonable control of the Contractor, such as blizzards, floods, hurricanes, tornadoes, and strikes; (4) any delay of any subcontractor resulting from paragraphs (1), (2), or (3).

18.1.2. If the Work is defective, if the **Contractor** fails to provide a sufficient number of skilled workers or suitable materials or equipment, or if the **Contractor** defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the **City** to begin and prosecute correction of such default or neglect with diligence and promptness, the **City** may correct such deficiencies, without prejudice to other remedies the **City** may have. In such case, an appropriate **Construction Change** Directive shall be issued deducting from payments then or thereafter due to the **Contractor** the cost of correcting such deficiencies including compensation for the **Design Professional's** additional services and expenses made necessary by such default, neglect, or failure and any and all direct, indirect, or consequential costs associated with the order to stop the Work. If such payments then or thereafter due the **Contractor** are not sufficient to cover such amounts, the **Contractor** shall immediately pay the difference to the **City**. The **Contractor** shall remain responsible for maintaining progress and shall not be entitled to any increase in the Contract Time or the Contract Sum.

18.2. Termination by the Contractor.

18.2.1. If, through no act or fault of the **Contractor**, a Subcontractor, or a Sub-subcontractor, the Work is suspended for a period of more than ninety (90) days by the **City**, or under an order of court or other public authority, or the **Design Professional** fails to act on any application for payment within thirty (30) days after it is submitted in proper form and content or the **City** fails for thirty (30) days to pay the **Contractor** any sum finally determined to be due, then the **Contractor** may terminate the Contract upon seven (7) days' written notice to the **City**, provided that the **City** does not remedy such suspension or failure within that time.

18.3. Termination by the City.

18.3.1. If the **Contractor** is adjudged a bankrupt, or if the **Contractor** makes a general assignment for the benefit of the **Contractor's** creditors, or if a receiver is appointed on account of the **Contractor's** insolvency, or if the Contractor makes a written admission of the Contractor's inability to pay debts, or if the Contractor becomes a debtor or defendant in (i) a voluntary or involuntary petition in bankruptcy, (ii) a petition for appointment of a receiver, (iii) a levy of an attachment or execution, (iv) a winding up or dissolution of a partnership or corporation, (v) or any other proceeding under which a court of competent jurisdiction assumes custody or control over the Contractor, or if the **Contractor** persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or fails to prosecute the work with such diligence as will, in the reasonable estimation of the City, ensure substantial completion within the time specified in the Contract Documents, or if the **Contractor** fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction or disregards an instruction, order, or decision of the **Design Professional**, or otherwise is in breach of any provision of the Contract and has failed to cure such breach after written notice from the City specifying 1) the breach, 2) what must be done to cure the breach, and 3) the time within which the breach must be cured, or otherwise is guilty of substantial violation of any provision of the Contract, then the **Contractor** shall be in default, and the **City** may, without prejudice to any other right or remedy and upon written notice to the **Contractor**, temporarily withhold cash payments pending correction of the deficiency, hold the Contractor and its sureties liable in damages, require the Contractor's sureties to complete the Contract, take possession of all materials, tools, appliances, equipment, construction equipment and machinery and vehicles, offices and other facilities on the Project Site, and all materials intended for the Work, wherever stored, without liability for loss or damage, following which use, the Contractor shall be liable for their removal from the site; and, seven (7) days after such notice, may terminate the

employment of the **Contractor**, accept assignment of any or all subcontracts pursuant to Paragraph 6.6.1.1, and finish the Work by whatever method the **City** may deem expedient (including but not limited to using the services of another contractor (in which case the City shall have no obligation to use a competitive process to obtain the lowest contract prices) and look to the Contractor and the Contractor's sureties for the difference between the cost to complete the work and the contract sum hereunder.

The **City** shall be entitled to collect from the **Contractor** all direct, indirect, and consequential damages suffered by the **City** on account of the **Contractor's** default, including without limitation additional services and expenses of the **Design Professional** made necessary thereby. The **City** shall be entitled to hold all amounts due to the **Contractor** at the date of termination until all of the **City's** damages have been established, and to apply such amounts to such damages.

18.3.1.1. HUD Action. If the Contractor is in default, HUD and/or any other administering agency named herein may, with or without the consent of the City, cancel, suspend, or terminate this Contract in whole or in part; require the withholding or disallowance all or part of the funding for the project; declare the contractor ineligible for further Government contracts or avail itself of any other remedies available under the law.

18.3.2. (*Reference:* Somerville Municipal Code Chapter 2.117, Section 2.117.110C). In the event the **Contractor** or any of its agents or employees violates any provision of Somerville Municipal Code Chapter 2.117 that is applicable to **City** contractors in connection with the awarding, administration, or performance of the Contract, the **City** may terminate the Contract.

18.3.3. (a) The City may terminate this Contract without cause, at any time, effective upon the date of termination specified by written notice to the Contractor, in which case, the Contractor shall be compensated for: (1) sums due under this Contract incurred up to the date of termination for all Work performed and accepted by the City up to the termination date, calculated on a percentage completion basis covering the period of time between the last approved application for payment and the date of termination using the progress schedule and schedule of values. The Contractor shall use its best efforts to mitigate any expenses and shall in no event incur any new obligations after the date of termination.

(1) Payment by the City as provided in this section shall be deemed to fully compensate the Contractor for all expenses and those of any consultants, subcontractors and suppliers, directly or indirectly attributable to the termination. Lost profits shall not be payable. Any such termination shall not give rise to any cause of action for damages against the City.

(b) Contractor's Duties Upon Termination For Convenience. Upon termination of this Contract without cause, the Contractor shall: (1) immediately stop the Work; (2) stop placing orders and Subcontracts in connection with this Contract; (3) cancel all existing orders and Subcontracts (subject to the City providing notice that it accepts assignment of any or all subcontracts pursuant to Paragraph 6.6.1.1); (4) surrender the site to City in a safe condition; and (5) promptly transfer to City all materials, supplies, work in process, appliances, facilities, equipment and machinery of this Contract, and all work product, plans, drawings, specifications and other information and documents used in connection with Services performed under this Contract. Failure by the Contractor to comply with said duties shall relieve the City of its obligation to compensate the Contractor, as provided for under this section.

ARTICLE 19

AMERICANS WITH DISABILITIES ACT (42 U.S. 12131)

19.1. On July 26, 1994, the Americans with Disabilities Act ("the Act") became effective for employers of fifteen or more employees.

19.2. The Act protects against discrimination on the basis of "disability," which is defined as a physical or mental impairment that substantially limits at least one "major life activity;" or discrimination against an individual who has a record of such impairment; or discrimination against an individual being regarded - even if inaccurately - as having such impairment. The Act also expressly prohibits job discrimination that is based on any individual's relationship or association with a disabled person.

19.3. If the **Contractor** is subject to the Act, it must comply with its provisions.

ARTICLE 20

WRITTEN NOTICE TO THE PARTIES

20.1. In General.

20.1.1. All written communications from the **Design Professional** to the **Contractor** shall be copied to the **City**. All written communications from the **Contractor** to the **Design Professional** shall be copied to the **City**. All written communications from the **Contractor** to the **City** shall be copied to the **Design Professional**.

20.2. Addresses.

20.2.1. To the City. Written notice to the **City** shall be sent or hand-delivered to:

Mayor
City of Somerville
93 Highland Avenue
Somerville, MA 02143

City Solicitor
Law Department
93 Highland Avenue
Somerville, MA 02143

Director of Contracting Department (as stated on first page of this Agreement)
City Hall
93 Highland Avenue
Somerville, MA 02143

20.2.2. To the Contractor. Both the address given on the bid form upon which the Agreement is founded and the **Contractor's** office at or near the Site of the Work are hereby designated as places to either of which notices, letters, and other communications to the **Contractor** shall be certified, mailed, or delivered. Delivery of any notice, letter, or other communication to the **Contractor** at or depositing same in a postpaid wrapper directed to either place shall be deemed sufficient service thereof upon the **Contractor**. Written notice shall be deemed to have been duly served on the **Contractor** if it is sent or hand-delivered to any member or officer of the **Contractor**. The date of said service shall be the date of such delivery or mailing. The address may be changed at any time by an instrument in writing, executed and acknowledged by the **Contractor** and delivered to the **City** and to the **Design Professional**. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon the **Contractor** personally. Moreover, any notice, letter, or other communication required under the Contract may be served on the **Contractor's** representative at job meetings. The **Contractor** shall provide the **City** with its change of address seven (7) days prior to its effective date.

20.2.3. To the Design Professional. Written notice to the **Design Professional** shall be sent or hand-delivered to the address appearing on the Project Manual. Written notice shall be deemed to have been duly served on the **Design Professional** if it is sent or hand-delivered to any member or officer of the **Design Professional**.

ARTICLE 21 MISCELLANEOUS PROVISIONS

21.1. Governing Law.

21.1.1. This Contract shall be governed by the laws of the Commonwealth of Massachusetts and the United States of America.

21.2. Venue.

21.2.1. Venue for any court action or proceeding shall be Middlesex County in the Commonwealth of Massachusetts only. The **Contractor**, all Subcontractors, and Suppliers waive any and all jurisdictional and venue defenses.

21.3. Successors and Assigns.

21.3.1. The **Contractor** shall not assign, in whole or in part, its rights and obligations under the Contract Documents without prior written consent of the **City**. An assignment without the prior written consent of the **City** shall not relieve the **Contractor** of its obligations thereunder.

21.3.2. The **City** and the **Contractor** respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents.

21.4. Statutory Limitation Period.

21.4.1. It is expressly agreed that the obligations of the **Contractor** hereunder arise out of contractual duties, and that the failure of the **Contractor** to comply with the requirements of the Contract Documents shall constitute a breach of contract, not a tort, for the purpose of applicable statutes of limitations and repose. Any cause of action which the **City** may have on account of such failure shall be deemed to accrue only when the **City** has obtained actual knowledge of such failure, not before.

21.5. Rights and Remedies.

21.5.1. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall

be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

21.5.2. No action or failure to act by the **City**, the **Design Professional**, or the **Contractor** shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

21.6 Severability. In the event that any provision of this Agreement is found to be legally unenforceable, the remainder of the Agreement shall remain in full force and effect.

21.7 Conflict of Interest Laws. The City and the Contractor shall comply with all applicable conflict of interest statutes and regulations.

21.8 If this contract is in excess of \$2,000 and is federally funded, the Contractor shall comply with the Copeland “Anti-Kickback Act” (18 U.S.C. 874 and 29 CFR Part 3), and shall not induce any person employed in the construction, completion, or repair of a public building or public work, to give up any part of the compensation to which he would otherwise be entitled.

21.9. EQUAL EMPLOYMENT OPPORTUNITY/NONDISCRIMINATION

a) the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, sexual orientation, national origin, age, disability, Vietnam Era veteran status or because an employee or applicant is a recipient of federal, state, or local public assistance or housing subsidies; and

b) the Contractor shall not discriminate, in any stage of the contract from award to completion, in the selection or retention of subcontractors, suppliers, and materialmen, or in the procurement of materials or supplies, or the rental of equipment, on the basis of race, religion, sex, marital status, sexual orientation, national origin, age, disability, Vietnam Era veteran status, or because an individual is a recipient of federal, state, or local public assistance or housing subsidies; and

c) the Contractor shall post an equal employment opportunity notice in conspicuous places at the worksite, shall make copies of such notice available to employees and job applicants, and shall send such notice to each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding; and

d) the Contractor shall, to the greatest extent feasible, give employment and on-site training opportunities, to lower-income, minority, women, and disabled members of the local community and shall award subcontracts, when possible, to Minority Business Enterprises (MBE) and Women Business Enterprises (WBE).

e) the contractor shall include language similar to the above in all subcontracts.

END

PART 3: TECHNICAL SPECIFICATIONS

SOMERVILLE, MASSACHUSETTS

TECHNICAL SPECIFICATIONS
FOR

BIKE PATH RETAINING WALL AND DRAINAGE
UPGRADES



June 2017



TABLE OF CONTENTS

DIVISION 1 - GENERAL REQUIREMENTS

01010	Summary of Work
01025	Measurement and Payment
01040	Project Coordination and Meetings
01060	Permits and Regulatory Requirements
01063	Miscellaneous Requirements
01069	Massachusetts General Laws
01070	Abbreviations
01090	Reference Standards
01105	Rodent Control
01108	Health and Safety Procedures
01200	General Requirements for Utility Work
01300	Submittals
01310	Construction Progress Schedules
01400	Quality Control
01500	Temporary Facilities and Controls
01505	Mobilization
01568	Erosion Control, Sedimentation and Containment of Construction Materials
01570	Maintenance and Protection of Traffic
01600	Products, Materials and Equipment
01630	Restoration of Grounds and Cleaning Up
01701	Project Closeout

DIVISION 2 – SITE WORK

02010	Subsurface Investigation
02015	Geotechnical Monitoring and Instrumentation
02051	Demolition, Modification, Abandonment
02080	Soil and Waste Management
02095	Transportation and Disposal of Soil and Fill
02140	Dewatering
02160	Temporary Excavation Support Systems
02210	Earth Excavation, Backfill, Fill and Grading
02252	Manholes
02525	Paving and Surfacing, Curbs and Sidewalks
02590	Brick Masonry
02604	Catch Basins
02622	Polyvinyl Chloride Pipe
02767	Cured-In-Place Pipelining
02900	Landscaping
02930	Tree Protection

DIVISION 3 - CONCRETE

03301	Cast in Place (CIP) Concrete Facing
03302	Shotcrete Facing

DIVISION 7 – THERMAL AND MOISTURE PROTECTION
07160 Bituminous Dampproofing

APPENDIX

Appendix A	Oil and Hazardous Materials Findings, Soil Management Recommendations
Appendix B	Boring Log
Appendix C	Record Drawings
Appendix D	MBTA Expired License
Appendix E	Approved MBTA License
Appendix F	City of Cambridge Permitting Documents

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 LOCATION OF WORK

- A. The work for the Contract is located in the City of Somerville on the Somerville Community Path between Elmwood Street and Thorndike Street, and along Thorndike Street between the Somerville Community Path and Howard Street. The Work consists of approximately 610 linear feet of storm drain installation, approximately 130 linear feet of storm drain CIPP lining, the installation of drainage manholes and catch basin structures, the structural rehabilitation of the existing retaining wall, and surface restoration on the Community Path and Thorndike Street. The Work includes excavation above the MBTA Red Line tunnel and excavation exposing and selective removal a section of the MBTA slurry wall that protrudes above the Red Line Tunnel including restoration of waterproofing. Approximately 70 linear feet of the existing retaining wall rehabilitation will be in the City of Cambridge along the Somerville Community Path.

1.3 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals to remove and replace the existing gravity sewer and manholes complete and ready for operation as indicated on the Drawings and specified herein.
- B. A general description of the Work to be performed under this Contract shall include, but will not be limited to the following construction operations:
 - 1. Furnish and install project signs, traffic cones, road closure barriers and other miscellaneous traffic control devices as required.
 - 2. Prepare notifications in cooperation with the City of Somerville Communication Department.
 - 3. Prepare a Health and Safety Plan.

4. Furnish, install and maintain all required sedimentation barriers and other items required to comply with the requirements specified hereinafter by the engineer.
 5. Furnish, install, and maintain vibration monitoring and installation of structure, ground, and utility monitoring points.
 6. Grading, excavating, filling, backfilling and compacting for pipe laying, access pits, and for resurfacing.
 7. Furnish and install all storm drain pipes, fittings, catch basins, manholes, and connections to existing mains.
 8. Demolition of existing structures and pipes as required.
 9. Disposal of excess geotechnically unsuitable excavated material.
 10. Reuse of geotechnically suitable excavated material on site as backfill and disposal of excess material from excavation not required for fill or backfill as specified, and to the satisfaction of the Owner.
 11. Perform required paving operations.
 12. Protection of trees within the project area.
 13. Restore all signs, pavement markings, fences, walls, drives, curb lines, concrete sidewalks, berms, lawns, shrubbery, and landscaping disturbed during storm drain installation work.
- C. The work shall conform to such additional drawings, specifications and addenda to these Specifications and Drawings as may be published or exhibited prior to the opening of Bid Proposals or as may be furnished by the Engineer from time to time during the construction.
- D. Work and materials which are necessary in the construction but which are not specifically referred to in the Specification, or shown on the Drawings, but implied by the Contract shall be furnished by the Contractor and included in the Contractor's Unit and Lump Sum Prices Bid. The work and materials shall be such as will correspond with the general character of the work as may be determined by the Engineer, whose decisions as to the necessity for and character of such work and materials shall be final and conclusive. It is the intent of these specifications to produce a complete, finished job whether shown in every detail or not.
- E. For the purposes of this Contract, anywhere the term "Temporary" is used in the Specifications, in the Plans, in Contract Addenda, in any revisions made to the Contract Documents at any time prior to or during construction,

verbally, in writing, in change orders or work change directives or at any other time whether listed here or not, it shall be taken to mean “Temporary” only as it relates to the duration of the Contract. All repairs, restoration, and construction shall be considered permanent.

1.4 CONSTRUCTION SEQUENCE

Inclusion of the following sequencing restrictions does not relieve the Contractor from its responsibility to complete the Work with the specified contract duration, nor does it relieve the Contractor from its responsibility to sequence and carry out the work so as not to cause harm to the existing systems, environment, or community.

- A. Establish baseline Sedimentation and Erosion Control
- B. Establish baseline Geotechnical Instrumentation and Monitoring
- C. Mobilization
- D. Layout of site work and survey control
- E. Installation of tree protection and support of above ground structures adjacent to the Work as shown on the Drawings.
- F. Rehabilitation of the existing pile and timber lagging Retaining Wall as specified
- G. Prior to installation of the Work the Contractor shall verify the relocation of any existing utilities that are scheduled for relocation, coordinate with the responsible utility, and relocate those utilities which are the Contractor’s responsibility as per these Contract Documents.
- H. Replacement and installation of new main, catch basins, and manholes.
- I. Connection to existing mains where required.

1.5 UNDERGROUND UTILITIES

- A. The underground utilities shown on the plans have been located primarily from information furnished by others and are considered approximate both as to size and location. There may be additional utilities to be encountered that are not shown on the plans, and it shall be the Contractor's responsibility to locate all existing utilities and to protect same from damage or harm. All utilities interfered with or damaged shall be properly restored, at the expense of the Contractor, as required by Owner. Unapproved service interruptions will not be allowed. Refer to Specification Section 01200 for additional utility coordination information and requirements.

1.6 SURFACE RESTORATION

- A. Any damage to the pavement, curbing, or sidewalks outside of the limits of excavation and excavation support as defined in the Contract Documents shall be the responsibility of the Contractor and all costs associated with the repair of the excavation, sub-base, pavement, curbing, and sidewalks shall be fully borne by the Contractor. Repairs shall be immediately made by the Contractor as per the Contract Documents and as required by the Engineer.

1.7 HOURS OF WORK

- A. The hours of work shall be Monday through Friday, 7:00 a.m. – 4:00 p.m. excluding City of Somerville Holidays.
- B. During non-work hours (4:00 p.m. – 7:00 a.m. weekdays; weekends and holidays), the Contractor shall make the following provisions:
 - 1. Access to all properties shall be maintained. Work zones shall be clean, protected and safe. The Contractor shall minimize the amount of parking restrictions.
 - 2. At the end of each work day, the Contractor shall backfill and pave and/or place steel road plates over all excavations so as to maintain emergency vehicle and pedestrian traffic access and flow. Under no circumstances will open excavations be allowed during non-work hours. All parking will be given back to the community and businesses during non-work hours. Work zones shall be cleaned, protected and made safe.

1.8 CONTRACTOR USE OF PROJECT SITE

- A. The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, and on-site fabrication facilities.
- B. The Contractor shall determine the location(s) of the staging area(s) to be used for this project and shall obtain approval of the location(s) from the City of Somerville prior to any mobilization activities. The Contractor shall not store equipment or materials on private properties, without prior negotiations with the property owner.
- C. The Contractor shall maintain access to street parking and driveway parking and access to all properties and businesses outside the work zone during off work hours.

1.9 LIST OF DRAWINGS

- A. The location, general characteristics, and principal details of the work are indicated on a set of drawings entitled "Bike Path Retaining Wall and Drainage Upgrades."
- B. The drawings stated above are the Contract Drawings, sometimes referred to herein as the "Drawings." Additional drawings showing details in accordance with which the work is to be done may be furnished from time to time by the Engineer, if found necessary, and shall then become a part of the Drawings.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01010

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 — GENERAL

1.1 SUMMARY

- A. Payment for the items specified in the Bid Schedule shall include compensation for furnishing all labor, tools, equipment, supplies, and manufactured articles, and for all operations, and incidentals appurtenant to the items of work described, to complete the various items of the Work, all in accordance with the requirements of the Contract Documents, Drawings, Specifications, Addendum, and other modifications issued and approved by the Owner and Engineer.
- B. Payment for the items specified in the Bid Schedule shall include all costs for permits and compliance with the regulations of public agencies having jurisdiction including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).
- C. The bid prices listed in the Bid Schedule shall include all Work items described or implied in the Contract Documents, Drawings, Specifications, Addendum, and other modifications issued and approved by the Owner and Engineer, and all other Work items necessary to manufacture, furnish, install and test a complete working project.
- D. The following items are considered “Incidental” to the completion of the Work included in this Contract. These incidental work items shall be included in the Bid Schedule prices and are not included for separate payment. The incidental work items include, but are not limited to:
 - a. Abandonment, removal and disposal of existing, abandoned or relocated private utilities not specified for payment elsewhere
 - b. Construction photographs
 - c. Attending Owner meetings, neighborhood meetings, and all other Construction meetings
 - d. Preparation of notifications in cooperation with the City and distribution to residents’ 1-week in advance of work.
 - e. Submitting work plans, shop drawings, and materials samples.

MEASUREMENT AND PAYMENT

- f. Protection of installed materials from damage, and replacement of damaged materials as directed by the Engineer.
- g. Warrantees and Guarantees as indicated in the Contract Documents.
- h. Maintenance of plant materials as indicated in the Contract Documents.
- i. Concrete encasement of impacted utilities
- j. Dust control and air quality monitoring for dust and total volatile organic compounds. For any confined space entry air quality monitoring for methane, hydrogen sulfide, % Lower Explosive limit, and oxygen levels will be required.
- k. Street sweeping, including power sweeping as required.
- l. Removal of snow from streets and sidewalks where work is ongoing
- m. Transporting trash and recyclables out of the work area where municipal pickup is hindered
- n. Providing certificates of design where required
- o. Developing and submitting Construction Progress schedule, monthly schedule updates, and weekly construction schedule projections and updates
- p. Fulfilling all reporting requirements
- q. Clean-up and restoration of all surface features not included for payment elsewhere.
- r. Obtain all permits including payment of fees
- s. Demolition and Removal of Pipe
- t. Permanent Bulkheads for Pipe Abandonment
- u. Furnishing and installing fittings for storm drain installation.
- v. Furnishing and Placing Backfill by one of the approved methods listed below:
 - 1. Reuse excavated material, if suitable, immediately on site at the general area of excavation.

MEASUREMENT AND PAYMENT

2. Furnish and install imported suitable backfill
 3. Transport the material to a staging area, stage and protect the material, load the material, transport the material to be used as backfill at the general area of excavation.
- w. Furnishing, installing, compacting and testing gravel sub-base by one of the approved methods listed below:
1. Reuse excavated sub-base material, if suitable, immediately on site at the general area of excavation, as sub-base material
 2. Furnish and install imported suitable gravel sub-base
 3. Transport the material to a staging area, stage and protect the material, load the material, transport the material to be used as sub-base at the general area of excavation.
- x. Remove and reset all signs and sign posts, meters, trash receptacles, or any other site feature or furnishing not specifically listed for separate payment elsewhere.
- y. Protection of private property including walls at the back of sidewalk and landscaping at the back of the retaining wall.
- z. Rodent control.
- E. No separate payment shall be made for any item that is not specifically specified in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.
- F. The Contractor and Subcontractors shall not take advantage of any apparent error or omission on the Drawings or in the Specifications. The Contractor and Subcontractors shall make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents at no additional cost to the Owner.
- G. Anywhere in these Contract Documents, the term furnish shall mean manufacture; supply; delivery to the Project site including the actual unloading and unpacking; assembly; erection; placing; installation; anchoring; applying; working to dimension; finishing; curing; protecting; cleaning; testing; start-up; and similar operations unless stated otherwise.

MEASUREMENT AND PAYMENT

1.2 LUMP SUM ITEMS

- A. Payment for the lump sums shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that lump sum item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.
- B. Payment shall fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

1.3 UNIT PRICE ITEMS

- A. Unit prices shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that unit price item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.
- B. Payment shall fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

1.4 MEASUREMENT FOR PAYMENT

- A. Work completed to date shall be submitted by the Contractor and substantiated as required by the Engineer.
- B. The Owner and Engineer will review the submittal for completeness and verification. Failure to submit any of the below requirements will be grounds for a rejection of the submitted pay request until such time as the submittals are complete, accurate, up to date, and have been approved by the Owner and Engineer.
 - 1. Include a checklist of completed items. Only items signed-off by the Engineer will be considered for payment.
 - 2. Include red-lined "As-built" drawings indicating degree of completion, as described in Section 01346 – As Built Drawings.

MEASUREMENT AND PAYMENT

3. Include a revised Construction Progress schedule and narrative as required in the Specifications and showing actual record information.
4. Include a copy of all required test results including, but not limited to geotechnical and settlement monitoring results, compaction test results, concrete strength test results, grain size analysis and analytical test results.
5. Certified pay-rolls for general and all sub-contractors.
6. MBE and WBE reporting and certifications as required by the Contract.

1.5 ITEM DESCRIPTIONS – Base Bid

- A. Base bid items include all items identified in Division 01, 02, and 07. Refer to Part 4 of each section for measurement and payment.

1.6 ITEM DESCRIPTIONS– Alternate Bid

- A. The Alternate Bid Item consists of an alternate structurally reinforced concrete wall rehabilitation over the existing timber lagging and H pile retaining wall for approximately 569 linear feet, from STA 100+00 to 105+69.
 1. The contractor shall choose and price one (1) of the two (2) methods, either item 3301.1, Cast-in-Place Concrete Facing Retaining Wall, or 3302.1, Shotcrete Facing Retaining Wall, for providing rehabilitation to the existing retaining wall. Contractor shall not price both options. If Contractor prices (bids on) both options the lower total will be used for comparison of total bids. Failure to provide a cost for the Alternate Bid Item will be a basis for rejection of the bid. Refer to Part 4 of section 3301 and 3302 for measurement and payment.
 2. Award of the Contract will be made on the basis of the lowest responsible bidder for the Total Bid, including Total Amount of Base Bid plus Total Amount of the Alternate chosen.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

MEASUREMENT AND PAYMENT

END OF SECTION 01025

[THIS PAGE INTENTIONALLY LEFT BLANK]

MEASUREMENT AND PAYMENT

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

01025-6

SECTION 01040

PROJECT COORDINATION AND MEETINGS

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes general coordination requirements including preconstruction conference, site mobilization conference, and progress meetings.

1.2 CONTRACTOR COORDINATION

- A. Coordinate scheduling, submittals, and the Work to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Contractor shall coordinate work with the City of Somerville Communications Department. Contractor shall prepare notifications in cooperation with the City and shall distribute them to residents 1-week in advance of the Work. Contractor shall assume that up to five (5) notifications shall be prepared, coordinated, and distributed throughout the contract.
 - a. In addition to the five notifications indicated above, the Contractor shall post a flyer notifying pedestrians and cyclists of the closure at each community path entrance effected by the detour. The flyer shall include a description of the work, a copy of the detour plan, and the dates of the closure. The flyer shall be posted and installed a minimum of 1-week in advance of the Work.
- C. Contractor shall coordinate work with the City of Cambridge to notify residents of any disruptions to the property, utilities, etc. at least 24 hours in advance by written notice. The Contractor may obtain a sample notice for reference from the City of Cambridge.
- D. Coordinate completion of the Work and clean up for Substantial Completion and for portions of Work designated for Owner's partial utilization.

PROJECT COORDINATION AND MEETINGS

01040-1

D. Coordinate access to site for correction of nonconforming Work to minimize disruption of Owner's activities where Owner is in partial utilization.

ES. Contractor to provide a project manager for the duration of the project.

1.3 PRECONSTRUCTION CONFERENCE

A. The Owner will schedule a preconstruction conference.

B. Attendance Required: Owner's representatives, Engineer, Contractor, Contractor's Project Manager and Superintendent and major Subcontractors.

C. Sample Agenda:

1. Designation of personnel representing the parties in Contract and the Architect/Engineer.
2. Description of the Project background, purpose, basis of design and major elements of the Work.
3. Community Relations requirements
4. Soil and Waste Management requirements
5. Major Geotechnical requirements such as temporary support of excavation; backfill and compaction; geotechnical instrumentation and monitoring, and dewatering.
6. Requirements and procedures for the submission of change orders and pay requisitions.
7. Requirements, procedures and processing of shop drawings and other submittals; Schedules and schedule updates; substitutions; and Requests for Information.
8. Scheduling of the Work and coordination with other contractors.
9. Review of Subcontractors

PROJECT COORDINATION AND MEETINGS

01040-2

10. Continuation of City services (trash and rubbish removal, recycling, street sweeping, dust control, tree protection, and snow removal).
11. Meeting requirements (Progress, Work Shops, etc.)
12. Utility coordination
13. Traffic and pedestrian management requirements
14. Other

1.4 PROGRESS MEETINGS

- A. Project meetings shall be held at a location designated by the Owner and Engineers. Meetings shall be held at weekly intervals, or as required by the Owner or Engineer.
- B. Attendance Required: Job superintendent, Contractor's Project Manager, major Subcontractors and suppliers, Owner representatives, and Architect/Engineer as appropriate to agenda topics for each meeting.
- C. The Owner or Engineer or their representative will make arrangements for meetings, and record minutes.
- D. The Owner or Engineer or their representative will prepare the agenda and preside at meetings.
- E. Contractor shall provide required information and be prepared to discuss each agenda item.
- F. Sample Agenda:
 1. Review minutes of previous meetings
 2. Community Relations
 3. Review of work progress. Review of work completed, work on going and work scheduled within the coming month.
 4. Field observations, problems, and decisions

PROJECT COORDINATION AND MEETINGS

01040-3

5. Identification of problems which impede planned progress
6. Review of submittals schedule and status of submittals
7. Review of RFI and RFP status
8. Proposed Change Orders (PCO), claims, credits, Work Change Directive, and change order status
9. Review of off-site fabrication and delivery schedules
10. Maintenance of progress schedule
11. Corrective measures to regain projected schedules
12. Maintenance of quality and work standards
13. Effect of proposed changes on progress schedule and coordination
14. Other item relating to Work

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01040

PROJECT COORDINATION AND MEETINGS
01040-4

SECTION 01060

PERMITS AND REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 REGULATORY AGENCIES

- A. The Contractor shall comply with all laws, rules, and regulations and ordinances promulgated by any authority having jurisdiction over the Work.
- B. The Contractor shall be fully responsible for obtaining and complying with all required permit(s). The Contractor shall be responsible for including all costs and fees required to obtain and comply with the permits, in the Bid. The Contractor shall ensure that all necessary permits from the Somerville Fire Department, Police Department, Electrical Department, Water Department, Department of Public Works, Massachusetts Water Resource Authority, Massachusetts Department of Environmental Protection and all other regulatory agencies and/or inspectional authorities having jurisdiction are obtained and paid for by the Contractor or its subcontractor (s) as appropriate.

1.2 PERMITS OBTAINED BY THE CONTRACTOR

- A. The Contractor or its subcontractor shall be responsible for obtaining; paying for; and complying with, as part of its base Bid, all permits; licenses; certifications; and approvals required for the work of this contract. The Contractor's responsibility includes but is not limited to, all permits required for his equipment, work force, and particular operations such as transportation and storage of fuel, chemicals or other materials and air emission.
- B. At a minimum, the Somerville Department of Public Works and Traffic and Parking Department permits that the Contractor shall be responsible for obtaining and complying with include, but are not limited to, the following:
 - 1. Trench Permit
 - 2. Street Opening Permit
 - 3. Sidewalk Occupancy Permit
 - 4. Traffic Management Permit

The City will waive fees associated with Department of Public Works and Traffic and Parking Department permits for this work.

- C. At a minimum, the other Permits the Contractor shall be responsible for obtaining, paying for, and complying with include, but are not limited to, the

PERMITS AND REGULATORY REQUIREMENTS

01060-1

following:

1. MWRA Construction Dewatering Discharge Permit, as required.
2. City of Cambridge Excavation Permit
 - i. For any excavation within the City of Cambridge, the contractor shall obtain an excavation permit. Refer to Appendix F for City of Cambridge information on the permitting requirements and process. The City of Cambridge permitting fees will be waived.
 - ii. For any City of Cambridge permitting inquiries, contact Jared Silva, jsilva@cambridgema.gov, or Rob Linke, rlinke@cambridgema.gov.
 1. Insurance requirements for City of Cambridge permits shall include a \$1,000,000 certificate of liability insurance with the City of Cambridge as a certificate holder and additional insured and a \$5,000 street opening surety bond.

D. The Contractor shall be responsible for scheduling and coordinating inspections and receipt of local, state, or federal permits/approvals/certifications for all Work as part of this Contract.

1.3 PERMITS OBTAINED BY THE OWNER

- A. The Contractor is solely responsible for the implementation of the permit requirements and shall include as such in the Bid.
- B. The Contractor is solely responsible for any punitive action resulting from any violation of the permit.
- C. Actual permits, issued by the respective agencies will be considered part of this Contract.
- D. The Contractor shall, at a minimum, include compliance with the provisions and requirements of a typical MWRA dewatering discharge permit, and the typical Somerville permits listed above. The Contractor will receive no additional compensation for compliance with any permit requirements.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01060

PERMITS AND REGULATORY REQUIREMENTS

01060-2

SECTION 01063

MISCELLANEOUS REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. The Contractor shall conform to all miscellaneous requirements as herein specified.

1.3 TRAFFIC CONTROL

- A. Contractor shall be solely responsible for traffic control.
- B. For control of traffic, the Contractor shall provide an adequate number of traffic control devices employed at his own expense.
- C. Whenever and wherever traffic is sufficiently congested, public safety is endangered, or as required by authorities having jurisdiction, furnish uniformed police officers to direct traffic and to keep traffic off the area affected by construction operations. Such officers shall be in addition to the traffic control requirements specified in other provisions of the contract.
- D. The Contractor shall provide invoices for police details to the City for payment.
- E. The use of traffic control devices or police shall in no way relieve the Contractor of any responsibility or liability which is his under the terms of the contract. Anticipated traffic control requirements for this project are expected to include cones, barrels, and signs. Owner reserves the right to require additional measures if police require them.

MISCELLANEOUS REQUIREMENTS

01063 - 1

1.4 INTERFERENCE WITH EXISTING WORKS

- A. The Contractor shall at all times conduct his operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations there from are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Before starting work which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.

- B. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operations to meet the above requirements.
- C. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operations to the need for continuous flow of water.

1.5 BURIED UTILITY WARNING AND IDENTIFICATION TAPE

- A. Provide detectable aluminum foil plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 3 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED STORM DRAIN PIPING BELOW or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 18 inches below the top surface of earth or the top surface of the subgrade under pavements.

1.6 WATERTIGHTNESS

- A. All structures, pipes, and equipment which are to contain water shall be watertight under all operating conditions for which they are intended. The

MISCELLANEOUS REQUIREMENTS

01063 - 2

Contractor shall furnish all labor, materials and equipment and do all work required by the Engineer to make all such parts of the work watertight, or to replace them if in the opinion of the Engineer any leakage is excessive. All such parts of the work filled with water for testing water tightness shall be left filled as ordered by the Engineer.

1.7 CARE OF WATERCOURSES

- A. The Contractor shall maintain the flow in all watercourses, whether open channels or in pipes, in all sewers and other pipes interfered with in the line of work and convey the flow to a suitable point of discharge so as not to flow upon the work or create a nuisance. In the discharge of water removed from the excavations by pumping or by gravity similar precautions shall be observed.

1.8 FIRE HYDRANTS AND SPRINKLER CONNECTIONS

- A. Fire hydrants on or adjacent to the work shall be kept operational and accessible to fire-fighting equipment at all times.
- B. Contractor shall coordinate any required shutdown of fire sprinkler service lines with the Fire Department and the impacted property owner. Three days notice shall be provided to fire department and property owner prior to deactivating a fire sprinkler line.

PART 2 – PRODUCTS

2.1 TRAFFIC CONTROL DEVICES

- A. Materials required for the work of this Section need not be new, but must be in first-class condition and acceptable to the Owner. Any materials that in the judgment of the Owner are unsatisfactory in appearance or performance shall be removed and immediately replaced by acceptable units.
- B. Signs, portable barricades, and drums shall have “Type III High Intensity Encapsulated Lens Reflective Sheeting” in accordance with Section M9.30.0 of the 1995 MHD Standard Specifications for Highways and Bridges and MUTCD requirements.
- C. Safety Signing for Construction Operations shall be fabricated in accordance with the provisions of subsection M9.30.0, Type III or IV High Intensity, of the MHD Standard Specifications for Highways and Bridges, where these colors are specified.
- D. Portable Type III Barricades shall conform to Standard Plate No. 406.2.0 of the MHD Construction and Traffic Standard Details (Metric Edition). ReflectORIZED sheeting to conform to Section M9.30.0 Type III or IV, of the MHD Standard Specifications for Highways and Bridges.

MISCELLANEOUS REQUIREMENTS

01063 - 3

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01063

MISCELLANEOUS REQUIREMENTS

01063 - 4

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01069

MASSACHUSETTS GENERAL LAWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 EXCERPTS FROM MASSACHUSETTS STATUTES

- A. In addition to the requirements as set forth under “Compliance with Laws” in the AGREEMENT, particular attention is directed to certain stipulations of Chapter 149 of the General Laws of Massachusetts, as amended to date as follows:

Section 25. “Every employee in public work shall lodge, board, and trade where and with whom he elects; and no person or his agents or employees under contract with the commonwealth, a county, city or town, or with a department, board, commission or officer acting therefore, for the doing of public work shall directly or indirectly require, as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the contract for such employment.”

Section 26. “In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the commonwealth, or by a country, town or district, or by persons contracting or subcontracting for such works, preference shall first be given to citizens of the commonwealth who have been residents of the commonwealth for at least six months at the commencement of their employment who are male veterans as defined in clause Forth-third of section seven of chapter four, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provision to this effect”.

Section 34. “Every contract, except for the purchase of material or supplies, involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the commonwealth or any county or any town, subject to

MASSACHUSETTS GENERAL LAWS

01069 - 1

section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working with the commonwealth, in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency, or in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one day, except as aforesaid...”

Section 34A. “Every contract for the construction, alteration, maintenance, repair or demolition of or addition to, any public building or other public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty-two to all persons to be employed under the contract, and that the contractor shall continue such insurance in full force and effect during the term of the contract. No officer or agent contracting in behalf of the commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation by registered mail, postage prepaid, with a return receipt of he addressee requested, shall be a sufficient notice...”

Section 34B. “Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall pay to any reserve police office employed by him in any city or town the prevailing rate of wage paid to regular police officers employed by him in such city or town.”

Attention is also directed to certain stipulations of Chapter 30 as follows:

Section 39F. “(1) Every contract awarded shall contain the following subparagraphs and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

MASSACHUSETTS GENERAL LAWS
01069 - 2

- “(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.
- “(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such 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 that 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 the payment to the general contractor for payment to the subcontractor as provided in sub-paragraphs (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 as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from 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

MASSACHUSETTS GENERAL LAWS

01069 - 3

demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the 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 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) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from any 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 the 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

MASSACHUSETTS GENERAL LAWS

01069 - 4

contractor and the subcontractor or as determined by decree of 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 paragraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment for a subcontractor and out of amounts which later become payable to the general contractor and in 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 the 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.
- “(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made for the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g), and (h).”

Section 39N. “Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

“If, during the progress of the work, the contractor or the awarding authority

discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and if they differ substantially or materially from those shown on the plans or as indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.”

Section 39O. “Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety...

“(a) The awarding authority may order the general contract in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

“(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any

MASSACHUSETTS GENERAL LAWS

01069 - 6

costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.

Section 39P. “Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made.”

Section 39R. ‘(a) The words herein shall have the meaning stated below whenever they appear in this section:

“(1) “Contractor” means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to section thirty-nine M of chapter thirty, sections forty-four A through H, inclusive, of chapter one hundred and forty-nine and sections thirty B through thirty P, inclusive, of chapter seven.

“(2) “Contract” means any contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven and any contract awarded or executed pursuant to section thirty-nine M of chapter thirty, or sections forty-four A through H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

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

“(4) “Independent Certified Public Accountant” means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact

MASSACHUSETTS GENERAL LAWS

01069 - 7

independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

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

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

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

“(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principals and auditing standards.

“(b) Subsection (a)(2) hereof notwithstanding, every agreement of contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

MASSACHUSETTS GENERAL LAWS

01069 - 8

- “(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and
 - “(2) until the expiration of six years after final payment, the officer of inspector general, and the deputy commissioner of capital planning and operations shall have the right to examine any books, documents, papers or records of the contractor or his/her subcontractors that directly pertain to, and involve transactions relating to, the contractor or his/her subcontractors, and
 - “(3) if the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his/her description with a letter from the contractor’s independent certified public accountant approving or otherwise commenting on the changes, and
 - “(4) if the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and
 - “(5) if the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.
- “(c) Every Contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and its subsidiaries reasonably assures that:
- “(1) transactions are executed in accordance with management’s general and specific authorization;
 - “(2) transactions are recorded as necessary i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and ii. to maintain accountability for assets;

“(3) access to assets is permitted only in accordance with management’s general or specific authorization; and

“(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

“Every contractor awarded a contract shall also file in the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he/she has examined the statement of management on internal accounting controls, and expressing an opinion as to

“(1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management’s evaluation of the system of internal accounting controls; and

“(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant’s financial statements.

“(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the deputy commissioner of capital planning and operations during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The financial statement filed shall include the date of final payment. All statements shall be accompanied by an accountant’s report. Such statements shall be made available to the awarding authority upon request.

“(e) The office of inspector general, the deputy commissioner for capital planning and operations and any other awarding authority shall enforce the provisions of this section. The deputy commissioner of capital planning and operations may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor’s failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

“(f) Records and statements required to be made, kept or filed under provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

1.3 MINIMUM WAGE RATES

- A. A schedule of minimum wage rates excerpted from that for “Mechanics, Apprentices, Teamsters, Chauffeurs, and Laborers” issued for this work by the Commissioner of Labor and Industries of Massachusetts, in accordance with Chapter 461, Acts of 1935, are included in Appendix A of these specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01069

MASSACHUSETTS GENERAL LAWS

01069 - 11

[THIS PAGE INTENTIONALLY LEFT BLANK]

MASSACHUSETTS GENERAL LAWS
01069 - 12

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01070

ABBREVIATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meanings indicated herein.

1.2 ABBREVIATIONS

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AAR	Association of American Railroads
AASHTO Officials	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADA	American Disabilities Act
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association or American Parquet Association, Inc.
API	American Petroleum Institute
APWA	American Public Works Association
ARI	Air-Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control

ABBREVIATIONS

01070-1

ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials and Code Administrators International
BHMA	Builders Hardware Manufacturer's Association
CABO	Council of American Building Officials
CDA	Copper Development Association
CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DCDMA	Diamond Core Drill Manufacturer's Association
DCR	Department of Conservation and Recreation
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FCI	Fluid Controls Institute
FM	Factory Mutual System
FPL	Forest Products Laboratory
HI	Hydronics Institute
HPMA	Hardwood Plywood Manufacturers Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISDSI	Insulated Steel Door Systems Institute
ISA	Instrument Society of America
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MADEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation
MBMA	Metal Building Manufacturer's Association
MIL	Military Standards (DoD)
MBTA	Massachusetts Bay Transit Association
MHD	Massachusetts Highway Department

ABBREVIATIONS

01070-2

MPTA	Mechanical Power Transmission Association
MSS	Manufacturers Standardization Society
MUTCD	Manual of Uniform Traffic Control Devices
MWRA	Massachusetts Water Resource Authority
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturer's
NACE	National Association of Corrosion Engineers
NAGDM	National Association of Garage Door Manufacturers
NB	National Board of Boiler and Pressure Vessel Inspectors (alternate NBBPVI)
NBS	National Bureau of Standards (Now NIST)
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association or National Fluid Power Association or National Forest Products Association
NISO	National Information Standards Organization
NLGI	National Lubricating Grease Institute
NMA	National Microfilm Association
NPDES	National Pollution Discharge Elimination
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PPI	Plastics Pipe Institute
RCRA	Resource Conservation and Recovery Act
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Association
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SAMA	Scientific Apparatus Makers Association
SDI	Steel Door Institute
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry, Inc.
SPIB	Southern Pine Inspection Bureau
SPR	Simplified Practice Recommendation
SSA	Swedish Standards Association
SSBC	Southern Standard Building Code, Southern Building Code Congress

ABBREVIATIONS

01070-3

SSPC	Society for Protective Coating
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
TIA	Telecommunications Industries Association
TPI	Truss Plate Institute
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WEF	Water Environment Federation
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01070

ABBREVIATIONS
01070-4

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Titles of Sections and Paragraphs: Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.
- B. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.
- C. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the Contractor.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.
- B. References herein to "Building Code" or "Uniform Building Code" shall mean Uniform Building Code of the International Conference of Building Officials (ICBO). Similarly, references to "Mechanical Code" or "Uniform Mechanical

REFERENCE STANDARDS

01090-1

Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the Work is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

- C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or furnishing labor. The Contractor shall bid for the most stringent requirements.
- D. The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.
- E. Applicable Standard Specifications: References in the Contract Documents to "Standard Specifications" or SSPWC shall mean the Standard Specifications for Public Works Construction, 1991 Edition unless otherwise stated in the specification section.
- F. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- G. References herein to "OSHA Standards" shall mean, Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.
- H. References herein to "MUTCD Standards" shall mean, the latest edition of the Manual for Uniform Traffic Control Devices (MUTCD) published by the US DOT, including all changes and amendments thereto.
- I. References herein to "MHD Standards" and/or "MASSDOT Standards" shall mean, the Massachusetts Highway Department Standard Specifications for Highways and Bridges, latest edition, including all changes and amendments thereto.
- J. References herein to "ADA Standards" shall mean, the Americans with

REFERENCE STANDARDS

01090-2

Disabilities Act of 1990 including all changes and amendments thereto.

- K. ASTM: American Society for Testing Materials
- L. AASHTO: American Association of State Highway and Transportation Officials
- M ACI: American Concrete Institute
- N. Final Rule for the Accessibility Guidelines for Recreational Facilities and Outdoor Developed Areas by the Recreational Access Advisory Committee, US Architectural and Transportation Barriers Compliance Board, most recent edition, including all changes and amendments thereto.
- O. MAAB: Massachusetts Architectural Access Board, most current edition.

1.3 REGULATIONS RELATED TO HAZARDOUS MATERIALS

- A. The Contractor is responsible for ensuring that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01090

REFERENCE STANDARDS
01090-3

[THIS PAGE INTENTIONALLY LEFT BLANK]

REFERENCE STANDARDS
01090-4

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01105

RODENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. This section specifies rodent control and general pest control requirements within project areas, and bordering areas as designated by the Owner and Engineer. This work is to be performed prior to demolition, excavation, and site preparation and throughout the Contract, so that rodents and other pests do not disperse from or infest the project area.
- B. The Contractor shall develop and implement an Integrated Pest Management (IPM) approach. As part of that approach, the Contractor shall maintain a cooperative dialogue with appropriate agencies and management/representatives of neighboring properties.
- C. The Contractor shall perform the rodent control tasks described in this Scope of Work and also respond to other pest control needs when required by the Owner.

1.2 SUBMITTALS

- A. Submit to the Engineer copies of pesticide applicator certifications and licenses within ten (10) days of the start of Rodent Control activities.
- B. After performing the survey described in Paragraph 3.2 below and before initiating baiting, submit to the Engineer a written description of proposed pest control procedures, indicating materials, quantities, methods, and time schedule. For all pesticides to be used, submit a copy of the pesticide manufacturer's EPA-approved pesticide label with application directions.
- C. Submit to the Engineer documentation of pest control activities and results and follows:
 - 1. Submit data sheets with locations of sites treated, amounts and types of pesticide used, number and types of traps set, survey and inspection results, sanitation conditions, complaint calls investigated, and any problem that occurred. Submit a map that shows bait stations, manholes, and catch basins where rodent baits are being maintained.

RODENT CONTROL
01105-1

1.3 QUALIFICATIONS

- A. The Contractor shall perform this work at all times in accordance with the following minimum standards and as acceptable to the Owner and Engineer.
 - 1. The Contractor and key personnel shall have experience with commercial and residential accounts and construction projects; have experience and technical training in vertebrate pest management and integrated pest management; have experience with various rodent control techniques, equipment, and strategies; have training and experience with insect control; and have knowledge of and experience with techniques to reduce non-target hazards.
 - 2. The supervisor shall be licensed and certified by the Massachusetts Pesticide Bureau and certified in General Pest Control (category 41) and Vertebrate Pest Control (category 44). The supervisor shall have specific training and experience in vertebrate pest management, commercial rodent control, general pest control, and integrated pest management.
 - 3. Applicators shall be licensed by the Massachusetts Pesticide Bureau and certified in General Pest Control (category 41). Applicators shall have specific training and experience in commercial rodent control and integrated pest management.

1.4 COORDINATION

- A. Perform this Work in cooperation with the other Work performed under the Contract.
- B. Initiate the work on or before field mobilization begins for the Contract and with adequate timing to achieve control before environmental disruptions. Provide a maintenance program until Contract is completed and all equipment and materials are removed.
- C. Perform the Work according to the preliminary schedule described in this section and as accepted or revised by the Owner and Engineer. Estimated durations and start dates may be changed by the Owner or Engineer to suit changes in construction schedules and field conditions. The Work could potentially require performance any day of the week and any hour of the day or night, regardless of weather.
- D. Perform this work in such a manner that toxicant or other control tools do not

RODENT CONTROL
01105-2

pose a hazard to persons, domestic animals, or non-target wildlife.

1.5 PERMITS

- A. Obtain and maintain in coordination with the Subcontractor appropriate permit(s) from city or state agencies for pest control activities associated with this Work.
- B. Obtain and maintain in coordination with the Subcontractor all right of entry permits required for the performance of this Work. This includes all utilities and private properties to which entrance is required.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Furnish and use only pesticide formulations registered by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Food and Agriculture, where appropriate according to label directions and as acceptable to the Engineer.
- B. Furnish and use devices and supplies (e.g., traps and bait stations) to facilitate the management and effectiveness of the pest control program, where appropriate and as acceptable to the Engineer.

PART 3 - EXECUTION

3.1 MEETINGS

- A. Before proceeding with the Work, the Contractor shall notify the Engineer of all planned pest control methods and coordination.
- B. The supervisor shall inform the Engineer and Owner of the sequence of activities prior to performing any pest control work.

3.2 INTEGRATED PEST MANAGEMENT SURVEY

- A. Prior to baiting, survey the proposed construction area and accessible or observable bordering areas and record signs of rodent activity and sanitation conditions. Closely inspect all embankments, edge areas, and properties within and abutting the construction area. Maintain survey records in the manner described in Paragraph 3.7 below.

RODENT CONTROL
01105-3

- B. Thoroughly inspect construction area and accessible or observable bordering areas and any nearby areas designated by the Owner or Engineer, for rodent activity and sanitation deficiencies weekly throughout the duration of this Contract and in accordance with the work schedule. Maintain inspection records in the manner described in Paragraph 3.7 below.
- C. Plan the control program and allocate resources based on survey and inspection data and as acceptable to the Owner.

3.3 APPLICATION FOR RODENT CONTROL

- A. Apply rodenticide in strict accordance with EPA-approved label directions and the Rules and Regulations of the Massachusetts Department of Food and Agriculture. Maintain records of all bait placements in the manner described in Paragraph 3.7 below.
- B. Where appropriate, especially for surface placements of rodent baits, use properly secured and tamper-resistant bait stations consistent with EPA regulation. Individually number and properly identify all bait stations.
- C. Surface Applications

- 1. Initial Surface Baiting

Rid the construction area of all detectable rodents before construction begins, or as acceptable to the Owner. Bait all observable rodent burrows. Install and secure bait stations at regular and appropriate intervals and locations, and document rodent activity (burrows, droppings, bait consumed, dead rodents). Replenish bait and shift bait stations as necessary to ensure complete control of rodent populations. Bait edge and accessible bordering areas as necessary to ensure that rodents will not be dispersed by construction activities and that rodents will not infest work areas.

- 2. Maintenance Surface Baiting

Establish a maintenance baiting program prior to mobilization by the Contractor, including construction areas and accessible bordering areas, as acceptable to the Owner. Check bait placements weekly. Use survey and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute bait and bait stations as appropriate to ensure continued control.

RODENT CONTROL
01105-4

D. Subsurface Applications

1. General

For situations involving underground construction/demolition, utility relocation, or utility construction, and for other situations when determined necessary by the Owner or Engineer, initiate subsurface baiting and rid underground environments of all detectable rodents before construction begins. Assign an identifying number to each manhole and catch basin where bait is placed so that locations of bait placements can be identified and rodent activity (droppings, bait consumed, dead rats) can be documented. Conduct bait applications during off-peak traffic hours unless otherwise required by the Engineer. Access manholes according to the requirements of appropriate agencies and utility companies. Coordinate the Work with appropriate municipal agencies and utility companies.

2. Initial Subsurface Baiting

Apply appropriate baits to control rodent populations in manholes and catch basins. This will involve suspending and securing bait using noncorrosive wire (e.g., 24 gauge plastic coated). Place bait in all accessible manholes and catch basins within the construction work area. In addition, bait an appropriate set of manholes and catch basins in the blocks bordering the work area and as acceptable to the Owner. Identify all baited manholes and catch basins with a standardized paint mark on the street and a numbered tag to be attached to the suspending wire. Approximately seven days after completion of the first baiting, check all manhole and catch basin baits and record estimates on the amount of bait consumed. Replenish or increase the amount of bait applied according to the amount consumed or as acceptable to the Owner and Engineer. Repeat this process again approximately fourteen days later and until there is little or no bait consumed. Check manholes and catch basins weekly when they repeatedly have 100 percent of the bait consumed.

3. Maintenance Subsurface Baiting

Prior to mobilization by the Contractor, establish a maintenance baiting program appropriate for the rodent infestation patterns identified during initial subsurface baiting. This program shall ensure continued control and shall be performed in a manner acceptable to the Owner and Engineer. Maintain bait in manholes and catch basins that have rodent activity and those that had activity during initial baitings. Check each

RODENT CONTROL
01105-5

bait according to rodent activity levels. This could range from weekly to approximately every three months, depending upon the recent history of bait consumption. Use utility maps and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute baiting locations as necessary to ensure adequate interception points for controlling immigrating rodents.

E. Cleanup

1. Remove visible rodent carcasses and dispose of them daily consistent with the pesticide label directions and applicable codes, laws, and regulations.
2. Upon completion of any pest control operations at the site, remove remaining bait and dispose of it according to the pesticide label and applicable codes, laws, and regulations. Also remove all wires used for subsurface baiting and any bait stations or traps.

3.4 SANITATION

- A. Prior to construction and throughout the duration of this Contract, identify and document harborage and food sources available to rodents on the construction site and in observable bordering areas. This includes any littering or improper or insufficient use of trash receptacles in construction areas. It also includes any bordering areas with sanitation conditions or structural deficiencies that violate City or State sanitation codes.
- B. Maintain records of sanitation conditions in the manner described in Paragraph 3.7 below.

3.5 COMPLAINT CALLS

- A. During construction, respond to pest-related complaints from the "adjacent" neighborhood (i.e. within 200 feet of the project limits) within 12 hours when required by the Owner or Engineer. Inspect the particular premises and adjacent areas for sanitation and structural deficiencies and also signs of historic and recent pest activity. Provide sanitation and structural maintenance information to the property owner or manager. Use pesticides or traps as necessary and appropriate to resolve the complaint when there is a relationship between the pest infestation and construction activities, or when required by the Owner or Engineer.
- B. Maintain records of all complaints investigated, including location, contact person, inspection results, and actions taken. Document the relatedness of the

RODENT CONTROL
01105-6

pest infestation to construction activities.

3.6 GENERAL PEST CONTROL

- A. When required by the Owner or Engineer, the Contractor shall determine appropriate methods for any pest control task not specifically identified above and shall submit them in writing to the Owner and Engineer for approval in advance. Such pest control tasks would relate to unanticipated pest control needs within construction areas or adjacent areas. This could include control of insects or vertebrates other than rats and mice.
- B. Maintain records of general pest control activities and results in the manner described in Paragraph 3.7 below.

3.7 RECORD KEEPING

- A. Use standardized data sheets acceptable to the Owner and Engineer to maintain accurate records of date, placement, type, and amount of pesticides or other control tools (e.g., traps) applied. Similarly, maintain records of surveys, inspections, changes in pest activity, sanitation conditions, and complaint calls. Submit data in a format acceptable to the Owner and Engineer and as required under Paragraph 1.3 (3) above.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01105

RODENT CONTROL
01105-7

[THIS PAGE INTENTIONALLY LEFT BLANK]

RODENT CONTROL
01105-8

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002A

SECTION 01108

HEALTH AND SAFETY PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Prepare a Health and Safety Plan (HASP) that meets all applicable state and federal health and safety regulations, including, but not limited to, those listed below. The Contractor shall be solely responsible for developing a HASP suitable for the Contractor's use and all work done by their subcontractors. The Owner, Engineer and/or their representative is not responsible for establishing or enforcing the health and safety requirements of the Contractor, and that nothing herein shall relieve the Contractor from its exclusive responsibility for the health and safety of its employees, and/or its representatives, and/or subcontractors.
- B. The Contractor shall be responsible for being aware of all potential hazards at the site, and reviewing existing information which provides evidence of contamination within the limit of the work.
- C. A copy of the “Somerville Bike Path and Drainage Upgrades Project - Environmental Conditions (Thorndike Street)” dated 3/23/2017 is attached as Appendix A to these Specifications.
- D. The Contractor shall also be required to defend, indemnify, and hold the City of Somerville, MA, and the Engineer harmless against any and all claims, liabilities, fines, or penalties arising out of actual or alleged failure of the Contractor and/or its agents, employees, or subcontractors to comply with any health or safety regulation, rule, ordinance, legislation, and/or health and safety plan.
- E. All work required in the Specifications regarding development and implementation of a HASP shall be in accordance with State hazardous waste site regulations (310 CMR 40.0018) and OSHA requirements (29 CFR 1910 and 1926). The HASP shall be submitted to the Engineer prior to site mobilization. Work shall not proceed at the site until the Engineer and the City of Somerville have received a copy of the Contractor's Health and Safety Plan meeting all the requirements specified herein.
- F. The Contractor shall be responsible for the construction, maintenance, and dismantling of the decontamination areas specified within the HASP. This includes providing all labor, materials, and equipment to prepare, maintain in working order, and remove the decontamination area, including collection and disposal of decontamination water and solids, and subsequent dismantling and disposal of materials.

HEALTH AND SAFETY PROCEDURES

01108-1

- G. The Contractor is responsible for establishing, implementing and maintaining of ambient air and dust monitoring programs and all other environmental monitoring programs. All such programs shall be operated by the Contractor whenever there are soils handling construction activities occurring at the site.
- H. The Contractor shall be responsible for providing all materials, equipment, and labor associated with applying dust control suppressants, including equipment that shall be required during all soil handling activities, in the event that fugitive dust or excessive odors are encountered.

1.2 DUST CONTROL

- A. During excavation of soil and fill material, dust shall be controlled to limit potential spread of contaminants and potential exposure of contaminants to workers and the public. The dust control measures implemented at the site shall be performed in accordance with this Section.
- A. During the progress of the work, the Contractor will conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water if acceptable to the Engineer, so as to minimize the generation and dispersion of dust.

1.3 AIR MONITORING

- A. Air monitoring shall involve direct reading instruments capable of providing real-time indications of air contaminants to protect on-site personnel and the local population. The Contractor's Site Health and Safety Officer and Superintendent shall be responsible for assuring that monitoring is conducted in an approved manner, that air monitoring/sampling are conducted at a frequency sufficient to ensure accurate assessments of site conditions, and that work practices, engineering controls, and/or personal protective equipment are proper for the conditions.
- B. At a minimum, detectors for organic contaminants shall be utilized to monitor on-site and off-site breathing zones and possible sources of potentially hazardous material (e.g., excavations, regrading, etc.). All personnel shall be made aware of the potential hazards and be informed of air monitoring information. Particular attention to air quality shall be made in the work area during earthwork activities to ensure that contaminants do not escape to the atmosphere and affect off-site population, on-site control, working conditions, and personnel protection measures.
- B. The Contractor shall keep accurate documentation of all air monitoring, which shall be made available to the Owner and Engineer for review at all times.

PART 2 - PRODUCTS

2.1 HEALTH AND SAFETY PLAN AND CERTIFICATIONS

- A. The Contractor shall, prior to the start of work on the site, submit a copy of its site-specific Health and Safety Plan to the Engineer. Submit with the site-specific Health and Safety Plan, a certification that states the following:
1. The Contractor hereby certifies that the Contractor and any workers engaged in work on the project meet the requirements of 29 CFR 1910.120 and the provisions of the American National Standards Institute, Standard Z88.2, for training, medical surveillance, and respirator protection unless the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards. These requirements include, but are not limited to, the following items:
 - a. The Contractor's employees have been examined by a licensed physician within the last 12 months, and have been determined to be physically able to perform the work and use the respirator and other protective or safety equipment required for this assignment.
 - b. The employees have received health and safety training for working in environments with known and unknown hazards within the past twelve months.
 - c. The Contractor has established and is maintaining a respiratory protection program that complies with the provision of 29 CFR 1910.134.
 - d. The Contractor maintains appropriate surveillance of the work area conditions and degree of employee exposure or stress.
 2. The Contractor shall further certify that only respirators approved or accepted by NIOSH/MSHA shall be provided and used by the Contractor's employees; that each of the Contractor's employees has been properly fitted to the respirators provided by the Contractor, including a test of the face-to-face piece seal; that the Contractor has provided its employees with written procedures covering the use of respirators in dangerous atmospheres; and that the Contractor has established a program for inspection, maintenance, and care of the respirators.

The certification shall be signed and dated by the Contractor.

HEALTH AND SAFETY PROCEDURES
01108-3

3. Work shall not proceed at the project site until the Engineer has received all certification(s) and the Contractor's Health and Safety Plan. Any delays incurred by the Contractor relating to the Health and Safety Plan shall be the responsibility of the Contractor, and constitute no additional costs or claims to the City of Somerville.

PART 3 - EXECUTION

3.1 HEALTH AND SAFETY PLAN CONTENTS, MAINTENANCE, AND IMPLEMENTATION

A. The Contractor's Plan shall address the specific work activities to be conducted by the Contractor. The HASP shall include, but not be limited to, the following:

1. All anticipated hazards based on site conditions, construction activities and the levels of contamination and information presented in previous studies.
2. Provisions for continually updating the Plan in accordance with any new applicable state and federal regulations or any additional information regarding conditions at the site.
3. The following information, shall be included in the HASP in accordance with the minimum standards set forth in 29 CFR 1910.120, 29 CFR 1910.1000, and 29 CFR 1926, and 310 CMR 40.0018:
 - a. Contractor's Standard Operating Procedures, including Personnel Training and Field Orientation; Personal Hygiene Requirements and Guidelines; Field Monitoring of Site Contaminants; Respiratory Protection Training and Requirements; Levels of Protection and Selection of Equipment Procedures; Zone Delineation of the Project Site; Site Security and Entry Control Procedures; Contingency and Emergency Procedures; and Listing of Emergency Contacts.
 - b. Identification of Contractor's Site Safety Officer.
 - c. Identification of Contractor's Designated Field Personnel.
 - d. Identification of hazard and risks associated with the Contractor's work.
 - e. Type of Medical Surveillance Program.

HEALTH AND SAFETY PROCEDURES
01108-4

- f. List of all hazardous materials that the Contractor shall have on site; the location of the latest Material Safety Data Sheets (MSDS) for each material listed; and the plan for notifying all on-site personnel, including, but not limited to, the Engineer and/or their representatives, of the presence of hazardous materials on site. If there are no hazardous materials to be brought on site, the Contractor shall provide a written statement to the Engineer and/or their representative, prior to initiating work activities, certifying that the Contractor shall not transport, store, or use hazardous materials on site.

- B. The Contractor shall keep a copy of the HASP on site during all operations and shall conduct daily health and safety meetings. Failure to keep a copy of the HASP on site, or any other breach of the Contractor's Plan, shall be cause for stopping work at the cost of the Contractor. Delays caused by the Contractor's failure to comply with the health and safety regulations, or any health and safety plan, shall not entitle the Contractor to recover any additional costs or time lost. The Contractor shall not be allowed to resume activities until corrective measures are implemented.

- C. Medical surveillance records, OSHA 40-hour training forms, accident forms, and all other documentation requirements of the Contractor's health and safety plan for personnel working on the site shall be up-to-date and kept on file at the site. The Contractor shall provide documentation of employee status upon request of the Engineer.

- D. The Contractor shall make available Level C personal protective equipment and clothing, not including respirators, to the Engineer and/or their representative for use during site inspections by the Engineer and/or their representative, up to a maximum of three (3) complete sets per day. These shall be supplied and maintained at no cost to the Owner and shall be returned to the Contractor upon completion of the work (except for expendable disposal protective clothing). The Contractor shall provide a repository for collection of disposed health and safety materials. Collection and disposal of contaminated expendable supplies shall be the Contractor's responsibility.

- E. The level of dermal and respiratory protection shall be determined based upon continuous air monitoring to be performed by the Contractor. The Engineer may conduct duplicate air monitoring for quality control purposes. As air monitoring indicates the levels of contaminants in the air, the personal protective equipment shall be determined based upon established standards and the standards set forth in the Contractor's Health and Safety Plan. Regardless, modified Level D protection for all on-site personnel is the minimum project requirement.

HEALTH AND SAFETY PROCEDURES
01108-5

- F. The Contractor shall be aware of site-specific requirements, such as site security during non-working hours, limited work space, and minimizing the effects of soil excavation, in preparing its health and safety program.

3.2 ROUTINE SAFETY MEETINGS

- A. The Contractor shall keep a copy of the HASP on site during all operations, and shall conduct routine health and safety meetings to ensure that all work is being performed in accordance with OSHA regulations, the Contractor's HASP, and prior to initiating a new task, following an incident or following any changes to the HASP necessitated by site conditions. Failure to conduct routine safety meetings may be cause for stopping work at the cost of the Contractor.

PART 4 – COMPENSATION

END OF SECTION 01108

HEALTH AND SAFETY PROCEDURES
01108-6

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002A

SECTION 01200

GENERAL REQUIREMENTS FOR UTILITY WORK

1200.1	TEMPORARY UTILITY SUPPORT AND COORDINATION	LUMP SUM
1200.2	SURVEY CONSTRUCTION LAYOUT AND BASELINE, AS-BUILTS	LUMP SUM
1200.3	MWRA DEWATERING DISCHARGE PERMIT FEE	ALLOWANCE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section specifies general requirements for construction, protection, support, maintenance, and restoration for underground and overhead utilities affected by construction of the Project. This section includes coordination with private utility companies. The Work includes new construction, reconstruction, relocation, and abandonment.
- B. The utility works and services that may be affected include, but are not limited to:
 - 1. Storm drain, sanitary sewer, and combined sewer
 - 2. Water distribution and transmission mains
 - 3. Gas distribution
 - 4. Electric power, heat exchange return pipelines, utility poles, and street lighting (underground and overhead)
 - 5. Telephone
 - 6. Traffic signals
 - 7. Fiber optic communications
 - 8. Cable Television
 - 9. Signal communication
 - 10. City fire signal lines and pull boxes
 - 11. Steam
- C. The Work will be completed within a Massachusetts Bay Transportation Authority (MBTA) Right of Way (ROW). Any excavation within the MBTA ROW will require an approved MBTA License. The current MBTA License of Entry for this work expired and the Owner submitted an application to the MBTA on March 27, 2017 for an updated license. The Contractor shall assume that the Work will be completed in accordance with all MBTA requirements and all terms and conditions detailed in the expired license dated February 27, 2014 included in Appendix D. Once an approved license

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-1

for the Work is issued, the Contractor shall complete the Work per the approved license terms and conditions.

- D. The Work will include retaining wall rehabilitation within the limits of the City of Cambridge from Sta. 100+00 to Sta. 100+70. Coordination with the City of Cambridge will be required to complete this Work. The City of Cambridge DPW contact will be the Supervising Engineer, [Melissa A. Miguel, P.E.](mailto:Melissa.A.Miguel@cambridgema.gov), by phone at 617-349-9351 or by email at mmiguel@cambridgema.gov. The following list include the minimum requirements for any work within the City of Cambridge.
1. Property owners within the City of Cambridge shall be notified of any disruptions to the property, utilities, etc. at least 24 hours in advance by written notice.
 2. Any work impacting private property will require a right of entry. Contractor shall be responsible for obtaining right of entry.
 3. For any work in the City of Cambridge, a Cambridge detail officer shall be on site. Detail requests must be made a minimum 24 hours prior. To schedule a Cambridge Detail officer, contact [Sgt. John Lopes](mailto:Sgt.John.Lopes@cambridgema.gov) by phone at 617-349-3350 or by email at jlopes@cambridgema.gov. The detail office closes at 4 PM Monday through Thursday and closes at 12 PM on Friday.
 4. For any excavation in the City of Cambridge, the contractor shall obtain required City of Cambridge permits. Refer to Section 01060.1.2.C.
 5. All traffic management plans shall be reviewed by the City of Cambridge Traffic, Parking, and Transportation Department. For City of Cambridge traffic management reviews, contact [Patrick Baxter](mailto:Patrick.Baxter@cambridgema.gov) by email at pbaxter@cambridgema.gov.
- E. This Section shall be used in conjunction with the specific underground utility work sections that apply to the Contract.

1.2 RELATED TECHNICAL SECTION

- A. Section 01060 – Permits And Regulatory Requirements
- B. Section 01400 – Quality Control
- C. Section 02051 – Demolition, Modification, and Abandonment

1.3 WORK BY UTILITY COMPANIES

- A. Certain parts of the utility work shall be performed, where shown or specified, by the utility company.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-2

- B. For all utilities, with the exception of storm drains, sanitary sewers, combined sewers, water main, and electrical conduit for street lighting, work shall be performed by the respective utility companies.
 - 1. Disconnecting and connecting of storm drains, sanitary sewers, and combined sewers services shall be the Contractor's responsibility as shown on the Drawings or required in the Specifications. In the event the Contractor determines sewer disconnections or connections must be made that are not shown on the Drawings or required by the Specifications, he shall first notify the Owner before performing this work.
 - 2. Disconnecting and connecting of water services shall be the Contractor's responsibility as shown on the Drawings or required in the Specifications. In the event the Contractor determines water service disconnections or connections must be made that are not shown on the Drawings or required by the Specifications, he shall first notify the Owner before performing this work
- C. Contact the utility companies in advance of construction to allow sufficient time for the utility companies to accomplish the work they are required to perform. Provide the utility company at least thirty (30) days advance notice prior to the scheduled date for commencement of work under this Contract.
- D. Work performed by utility companies to facilitate the Work under this Contract, and other work performed by utility companies solely for the convenience of the Contractor, shall be at no additional cost to the Owner.

1.4 DEFINITIONS

- A. Abandoned means that use of a utility asset has been discontinued by the utility company.
- B. To be abandoned means that use will be discontinued as part of the Work under this Contract.
- C. Maintenance means providing continuous service that meets project requirements during construction.
- D. Maintain complete-in-place means to protect, support, and otherwise maintain the existing condition and function of a facility during construction.
- E. Restoration means replacement of a facility or portions of a facility that have been removed or made inoperative by the Contractor in the performance of the Work.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-3

- F. Utility Company means the company, agency, owner, or operator of the facility concerned.
- G. Temporary Facility means a facility provided, in lieu of an existing or new facility, to ensure continuity of service. When a temporary facility is not shown on the Contract Drawings, but is provided for the convenience of the Contractor, it shall be constructed at no additional cost to the Owner.

1.5 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS
 - 1. Submit working drawings and, if applicable, shop drawings showing the details, procedures, and scheduling for performance of each utility work. Show actual verified field locations of existing utility facilities that are affected by the Work under this Contract; interferences which these facilities present to the new work; location of settlement markers; method proposed to proceed with the construction; and, if applicable, procedures for restoration and method of testing to demonstrate restoration was performed satisfactorily.
 - 2. Submit to the Engineer specifications and drawings describing the method to be used to temporarily support existing subsurface, surface and overhead utilities during construction. Include working drawings that indicate proposed materials and details.
 - 3. Submit to the Engineer for review a detailed excavation procedure for subsurface utilities. At a minimum, the procedure shall include:
 - a. Equipment to be used for anticipated subsurface utility investigation and excavation.
 - b. Personnel to be used and designated utility coordinator.
 - c. Duration and schedule of investigation and excavation.
 - d. Techniques proposed to isolate and protect existing utilities.
 - e. Method for the Contractor to provide utility information derived from subsurface investigation to field personnel doing excavation.
 - f. A disciplinary plan that delineates all steps to be taken as a result of a utility disruption caused by negligence or failure to follow proper procedures or the Contract requirements,

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-4

including possible removal of Contractor personnel from the site.

5. Submit an emergency action plan outlining procedures to be followed by the Contractor in case of unplanned utility interruptions or unplanned damage to utilities in service. Obtain concurrence from each affected utility company.
 - a. List Contractor's personnel assigned responsible charge for emergency action on site for each shift, and those on call.
 - b. List phone notification numbers for each utility company, fire, and police departments, and other relevant agencies.
 - c. Include copies of utility plans showing the valve or switch locations to isolate each line.
- B. Transmit to the Engineer the as-built utility location survey data as specified in Article 3.11 of this Section.

1.6 APPROVAL BY UTILITY COMPANIES

- A. All personnel performing work on to expose and support existing utility facilities shall be fully qualified and able to meet the standards of the affected utility company. If the Contractor does not have the required utility experience, Contractor shall retain a specialist firm acceptable to the affected utility company to perform the Work.
- B. Prior acceptance of temporary support methods for each affected utility facility shall be obtained by the Contractor from each utility company concerned.
- C. Prior permission for disrupting a utility shall be obtained by the Contractor from each utility company concerned.
- D. Prior approval for disrupting fire signal lines, high pressure fire water mains and hydrants, and fire service lines shall be obtained from the Somerville Fire Department.

1.7 NOTIFICATION

- A. In addition to the initial 30 day utility company notification, the Contractor shall notify the appropriate utility companies and the Engineer at least fourteen (14) days prior to starting any work involving or adjacent to surface, subsurface, or overhead utility facilities.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-5

B. Eversource Gas Requirements:

1. The Contractor shall coordinate and sequence relocations and replacements with Eversource Gas as necessary.
2. If cut-off or connection is expected, notify the Eversource Gas Company Engineering Department four (4) weeks prior to cut-off or connection to gas main.
3. At locations where the sand bedding material of gas mains are excavated and removed by the Contractor, the Contractor shall put back or replace the bedding material, in kind. Crushed stone shall not be used as backfill for bedding material beneath gas mains.
4. Buried gas caution tape shall be replaced if disturbed or removed. In the case of any damage to the tracer wire for the gas main, the Contractor is to notify Eversource Gas prior to backfilling the trench.
5. Immediately notify the Gas Company Engineering Department if surface or subsurface settlement or movement in excess of the design amount is observed, regardless of the proximity to an existing gas facility.
6. Eversource Gas to immediately be notified if gas main or service breaks during construction and the Somerville Fire Department (911) to be called. If an odor is detected, but there is no break, Contractor to notify Eversource Gas only.
7. Existing steel gas mains found within the project area potentially contain asbestos fibers on the coal tar pipe coating of the main. Where required for removal, the Contractor shall use hand tools for removal. Contractor to notify and coordinate removal of pipe with Eversource. Eversource will be responsible for disposing of removed steel mains and the Contractor will be responsible, where required, to remove steel mains with use of hand tools.

1.8 STANDARD SPECIFICATIONS OF UTILITY OWNERS

- A. Specifications and construction methods from each utility owner apply to individual utility specification sections.
- B. It is the Contractor's responsibility to ensure that, unless otherwise specified, the standards for materials and construction methods required by the utility owner are met.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-6

PART 2 - MATERIALS

2.1 GENERAL

- A. Materials for temporary and permanent work shall be of the type, grade, and class specified by reference to utility company standards.

PART 3 - EXECUTION

3.1 GENERAL CONSTRUCTION REQUIREMENTS

- A. Unless otherwise noted, conform to the construction standards, specifications, and standard practices of the affected utility companies. Coordinate with each utility company the work to be done by the Contractor and the work to be done by utility company. Ensure continuity of all existing utility services to all users, except when the utility company determines that temporary interruption is acceptable.
- B. Unless otherwise indicated, maintain all utility facilities complete in place. Provide temporary support of utilities during construction only by methods acceptable to the utility company concerned.
- C. Provide and maintain all temporary facilities required to provide interim utility service when a utility facility is to be relocated and when a utility facility to be replaced is abandoned prior to replacement.
- D. Where an existing utility facility is encountered that is not indicated or that is determined to be a different utility facility than that indicated, promptly notify the Engineer. The Contractor is responsible for determining the owner of the facility and the disposition of the facility.
- E. All water, sanitary, and storm services must be maintained throughout the project through the use of temporary pumps and piping. Unless otherwise noted, no service interruptions will be permitted.
- F. The Contractor shall dewater existing utility manholes and structures prior to beginning construction. Any dewatered material shall be properly treated and disposed.

3.2 SUBSURFACE UTILITY INVESTIGATION

- A. The Contractor shall excavate test pits where indicated on the Contract Drawings and as specified.

3.3 UNSAFE AND UNSUITABLE UTILITY STRUCTURES

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-7

- A. If, upon exposure, the condition of a facility to be maintained complete-in-place is found to be unsafe, the Contractor shall notify the utility company, for support or for maintenance of service, the Contractor shall replace or reconstruct or coordinate the replacement or reconstruction of the facility with the utility Owner and shall promptly notify the Engineer of additional costs anticipated prior to beginning the work.

3.4 ABANDONED FACILITIES

- A. Demolish and remove abandoned utility facilities that interfere with the Work of this Contract. Abandoned facilities that do not interfere with the Work of this Contract may remain.
- B. Do not undertake demolition or removal until permission for such Work has been obtained from the utility company.
- C. When abandoned facilities are to be left in place, plug or cap the ends of conduits and pipes, and fill with controlled density fill (CDF) unless otherwise indicated. Remove abandoned utility manholes, junction boxes, and similar structures to a minimum depth of 4 feet below finished grade, and puncture or break the bottom slabs of manholes and similar structure to allow drainage. Backfill and compact excavations resulting from removal of utility facilities as required to restore original grade.

3.5 SETTLEMENT OR MOVEMENT

- A. In case of settlement or other movement that causes or could cause damage, take immediate remedial measures to correct the conditions and repair the damage.

3.6 ACCESS

- A. At all times permit free and clear access to the affected facilities by personnel of the utility companies.
- B. Throughout the construction period, maintain access to all utility vaults and structures.

3.7 SERVICE CONNECTIONS

- A. Work required for maintaining, supporting, relocating, restoring, and constructing all service connections is included as part of the Work of this Contract, even though some existing service connections, for which record information is not available, may not be shown on the Contract Drawings.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-8

3.8 REPAIR AND RESTORATION

- A. Repair all damage to utilities caused by Work under this Contract. Clean all utility structures of dirt caused by Work under this Contract. Immediately notify the Engineer and the utility company of damage to utilities.

3.9 EXCAVATION AND BACKFILL

- A. Perform excavation and backfill in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.
- B. Excavation and handling of contaminated soil is specified in Sections 02080 - SOIL AND WASTE MANAGEMENT, and 02095 – TRANSPORTATION AND DISPOSAL OF SOIL AND FILL.

3.10 CLEANING UP

- A. In accordance with Section 01630 – RESTORATION OF GROUNDS AND CLEANING UP, the Contractor shall, upon completion of the Work, remove all temporary construction facilities, equipment, debris, and unused materials, and shall restore the project area and adjacent affected areas to a neat and clean condition.

3.11 AS-BUILT UTILITY LOCATION SURVEY

- A. For each new or relocated utility installed, including those installed or relocated by others in the Project Area, perform an as-built location survey by coordinates prior to backfilling the excavation.
- B. The survey work, including verification of the existing survey data, shall be performed by a licensed Professional Land Surveyor registered in Massachusetts or the Contractor to accurately record progress of the work throughout the duration of the Contract.
 - 1. All coordinates shall be geographically registered in the project datum coordinate system using the control points for horizontal and vertical controls.
 - 2. Horizontal accuracy shall be 0.01 feet.
 - 3. Elevation accuracy shall be 0.1 feet except benchmarks, topography, and structure foundations (including manholes pipe inverts) shall be accurate to 0.01 feet.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-9

4. Digital As-built drawings, including surface data shall be provided in AutoCAD Civil 3D format to match the text styles and line types of the design drawings provided by the Engineer.
- C. The Contractor shall also maintain red line record documents at the site to accurately record progress of the work throughout the duration of the Contract.
1. Contractor shall delegate the responsibility for maintenance of the record documents to one person on the Contractor's staff as approved by the Owner.
 2. Changes to the record documents shall be coordinated with adequate and proper entries on each page of the specifications and each sheet of drawings and other documents where such entry is required to show progress and changes properly, including change orders, approved shop drawings, RFIs, and other modifications.
 3. Record information shall be updated within 24 hours of installation or survey.

PART 4 - COMPENSATION

Item 1200.1 – Temporary Utility Support and Coordination

METHOD OF MEASUREMENT:

Measurement for payment for Temporary Utility Support and Coordination will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.

BASIS OF PAYMENT/INCLUSIONS:

Payment for Temporary Utility Support and Coordination will be based on the bid for this item in the proposal. Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment and incidentals required to maintain continuity of gas, telephone, electric, telecommunications, cable TV, steam, and privately owned utilities. The work includes all trunk, supply, transmission, service, heat exchange pipelines and main lines impacted by the Work. Under the Lump Sum Price bid for this item, the Contractor shall also furnish all labor, materials, tools, equipment and incidentals to coordinate and/or temporarily support all utilities exposed during the excavation for the installation of the Work; submission of all utility coordination and support work plans and shop drawings; coordinate the protection of and protect all overhead utilities; excavation and relocation of the electric conduit noted on the drawings in coordination with the electric company; and perform all coordination with the utility companies for the relocation, abandonment, protection, support, and other work required to facilitate the completion of the project. This Item further includes utility location (Dig Safe); provide, install, maintain, and disconnect portable generators to maintain electrical service to dwellings; coordination of construction with existing utility owners and operators; providing access for utility owners and operators to their respective utilities; coordination with the City of Somerville Communications Department; and communicating with affected homeowners and residents.

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-10

EXCLUSIONS:

The following items are not included for payment under this item and are included for payment elsewhere; labor, materials, tools, equipment and incidentals required to maintain continuity of water mains; restoration of curbing, sidewalks, and bituminous concrete pavement.

Item 1200.2 – Survey Construction Layout and Baseline, As-Builts

METHOD OF MEASUREMENT:

Measurement for payment for Survey Construction Layout and Baseline, As-Builts will be made on a percent of half of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as proposed by the Engineer. The remaining half of the Lump Sum bid will be made upon acceptance of the As-Builts by the Engineer.

BASIS OF PAYMENT:

Payment for Survey Construction Layout and Baseline, As-Built will be based on the bid for this item in the proposal. Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, professional services, technician, equipment, and incidentals for the Contractor to establish survey control, survey construction baseline and layout and provide as-builts as required and not included in other pay items. The work includes, but is not limited to, survey control, survey construction baseline and layout and as-builts.

Item 1200.3 – MWRA Dewatering Discharge Permit Fee

METHOD OF MEASUREMENT:

Payment will be made against the allowance based on invoices submitted by the General Contractor on a monthly basis. Incomplete or incorrect invoices will not be approved.

BASIS OF PAYMENT:

The allowance for this item shall be reimbursement to the General Contractor to pay MWRA Dewatering Discharge Permit Fee.

END OF SECTION 01200

GENERAL REQUIREMENTS FOR UTILITY WORK

01200-11

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes general requirements for project submittals by the Contractor.

1.2 PROGRESS REPORTS, RECORDS AND DATA

- A. The Contractor shall submit to the Owner such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as outlined in Section 01310 – CONSTRUCTION PROGRESS SCHEDULES and as the Owner may request concerning work performed or to be performed under this Contract.

1.3 SHOP DRAWINGS, SAMPLES, PROJECT DATA

- A. Shop Drawings and engineering data (submittals) covering all equipment and all fabricated components and building materials which will become a permanent part of the Work under this Contract shall be submitted to Engineer for review, as required. Submittals shall verify compliance with the Contract Documents, and shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and the operation of component materials and devices; the external connections, anchorages, and supports required; the performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.
 - 1. Each submittal shall cover items from only one section of the specification unless the item consists of components from several sources. Contractor shall submit a complete initial submittal including all components. When an item consists of components from several sources, Contractor's initial submittal shall be complete including all components.
 - 2. All submittals, regardless of origin, shall be clearly identified with the name and number of this Contract, Contractor's name, and references to applicable specification paragraphs and Contract Drawings. Each submittal shall indicate the intended use of the item in the Work. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data crossed out. The current revision, issue number, and date shall be indicated on all drawings and other descriptive data. Engineer will not accept submittals from anyone but Contractor. Submittals shall be

SUBMITTALS 01300-1

consecutively numbered in direct sequence of submittal and without division by subcontracts or trades.

3. All deviations from the Contract Documents shall be identified as deviations on each submittal and shall be tabulated in Contractor's letter of transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by Contractor (including modifications to other facilities that may be a result of the deviation) and all required piping and wiring diagrams.
4. Contractor shall submit shop drawings electronically. For electronic submittals, drawings and the necessary data shall be submitted electronically to Engineer as specified below. Submittal documents shall be in black and white unless color is required for the review of the submittal. All electronic files shall be in Portable Document Format (PDF) as generated by Adobe Acrobat Professional Version 7.0 or higher. The PDF file(s) shall be fully indexed using the Table of Contents, searchable with thumbnails generated. PDF images must be at a readable resolution. For most documents, they should be scanned or generated at 300 dots per inch (dpi). Optical Character Recognition (OCR) capture must be performed on these images so that text can be searched, selected and copied from the generated PDF file. The PDF documents shall have a bookmark created in the navigation frame for each major entry ("Section" or "Chapter") in the Table of Contents. Thumbnails shall be generated for each page or graphic in the PDF file.

The opening view for each PDF document shall be as follows:

- Initial View: Bookmarks and Page
- Magnification: Fit In Window
- The file shall open to the Contractor's transmittal letter, with bookmarks to the left. The first bookmark shall be linked to the Table of Contents.

PDF document properties shall include the submittal number for the document title and the Contractor's name for the author. Electronic submittal file sizes shall be limited to 10 MB. When multiple files are required for a submittal the least number of files possible shall be created. The contractor shall transmit submittals and receive the Engineer's submittal review comments via email. Instruction on procedures for transmitting and receiving submittals will be provided after award of the Contract. Facsimiles (fax) will not be acceptable. Engineer will not accept submittals from anyone but Contractor. Submittals shall be consecutively numbered in direct sequence of submittal and without division by subcontracts or trades.

5. In addition, two hard copies of each *full size* drawing shall be submitted to

SUBMITTALS
01300-2

Engineer and will return two marked copies (or one marked reproducible copy) to Contractor.

6. Engineer's submittal review period shall be 14 consecutive calendar days and shall commence on the first calendar day following receipt of the submittal or resubmittal on the project website. The time required to mail any hard copies of the submittal or resubmittal back to Contractor shall not be considered a part of the submittal review period.
 7. Contractor shall accept full responsibility for the completeness of each resubmittal. Contractor shall verify that all corrected data and additional information previously requested by Engineer are provided on the resubmittal. When corrected copies are resubmitted, Contractor shall direct specific attention to all revisions in writing and shall list separately any revisions made other than those called for by Engineer on previous submittals. Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) or a unique identification that indicates the initial submittal and correct sequence of each resubmittal. If more than one resubmittal is required because of failure of Contractor to provide all previously requested corrected data or additional information, Contractor shall reimburse Owner for the charges of Engineer for review of the additional resubmittals. This does not include initial submittal data such as shop tests and field tests that are submitted after initial submittal. Resubmittals shall be made within 60 days of the date of the letter returning the material to be modified or corrected, unless within 30 days Contractor submits an acceptable request for an extension of the stipulated time period, listing the reasons the resubmittal cannot be completed within that time. The need for more than one resubmittal, or any other delay in obtaining Engineer's review of submittals, will not entitle Contractor to extension of the Contract Times unless delay of the Work is the direct result of a change in the Work authorized by a Change Order or failure of Engineer to review and return any submittal to Contractor within the specified review period.
- 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 harmony with the requirements of the Project and with the provisions of the Contract Documents, and that he has verified all field measurements and construction criteria, materials, catalog numbers and similar data. The Contractor shall also certify that the work represented by the shop drawings is recommended by the Contractor and the Contractor's Guaranty will fully apply.
- 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. Samples shall be furnished so as not to delay fabrication, and to allow

SUBMITTALS
01300-3

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. Any action shown is subject to the requirements of the plans and specifications. 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 of items with returned submittals marked "No Exception Taken", "Make Corrections as Noted" or "Noted : No Action Required". 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. All samples of materials for tests shall be taken according to ASTM Specifications or as provided in the Contract Documents.
- G. All samples shall be submitted by the Contractor with a covering letter indicating that such samples are recommended by the Contractor for the service intended and that the Contractor's Guaranty will fully apply.
- H. All materials, equipment and workmanship shall be in accordance with samples guaranteed by the Contractor and reviewed by the Engineer.
- I. Submittals requiring a Certificate of Design will be considered incomplete and not acceptable unless a complete Certificate of Design is submitted.
- J. The Certificate of Design requires that the engineer providing the submittal carries Professional Liability insurance meeting the requirements laid out in the "General Terms and Conditions" and additionally meeting the requirements of the "Supplemental General Conditions" to the Contract.

1.4 CONTRACTOR'S ORDER OF CONSTRUCTION

- A. The Contractor shall submit schedules and reporting information in accordance with the requirements of Section 01310 – Construction Progress Schedules

1.5 CONTRACTOR'S COST BREAKDOWN

- A. The Contractor shall submit a schedule of values.

1.6 CERTIFICATE OF DESIGN

SUBMITTALS 01300-4

CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of _____ and that he/she has been employed by (Name of Contractor) _____ to design _____ in accordance with Specifications Section ____ for the (Name Project) _____. The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the _____; and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the City of Somerville or Owner's representative with seven (7) days following written request therefore by the Owner.

P.E. Name

Contractor's Name

P.E. Registration Number, State of Registration and Discipline

Signature

Signature

Title

Title

Address

Address

Telephone

Telephone

Email Address

Email Address

SUBMITTALS
01300-5

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01300

SUBMITTALS
01300-6

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01310

CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. The scheduling of the Work under the Contract shall be performed by the Contractor in accordance with the requirements of this Section. Contractor shall prepare and submit to Engineer for review within 15 days after the date of commencement stated in the Notice to Proceed, a construction progress schedule.
- B. No work shall be done between 4:00 p.m. and 7 a.m., nor on Sundays or legal holidays, except where required, without written permission of OWNER. Emergency work may be done without prior permission.
- C. Night work may be established by CONTRACTOR as regular procedure with written permission of OWNER. Such permission, however, may be revoked at any time by OWNER if CONTRACTOR fails to maintain adequate equipment and supervision for proper prosecution and control of work at night.
- D. No work beyond a five-day week or 9-hour day which requires the Engineer to be present shall be allowed. If the Contractor wishes to work beyond the number of hours or days stated herein, he shall submit his request in writing to the Engineer for review. Contractor completion times will be adjusted to reflect extended work periods.
- E. The City moratorium period is typically November 1 – April 1 at the discretion of the City DPW Commissioner.

1.3 FORM OF SCHEDULES

- A. Prepare schedules in form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal time Scale: Identify first work date of each week.
 - 3. Scale and spacing to allow space for notations and future revisions.

CONSTRUCTION PROGRESS SCHEDULES

01310 - 1

B. Format of Listings: Chronological order of start of each item of work.

C. Identification of Listings: By major specification section numbers.

1.4 CONTENT OF SCHEDULE

A. Within 15 calendar days after the commencement date stated in the Notice to Proceed, the Contractor shall submit for review by the Owner an electronic and hard copy of the Construction Progress schedule. This submittal shall have already been reviewed and approved by the Contractor's Project Manager, Project Superintendent, and the Project Estimator prior to submission.

B. The Construction Progress Schedule shall show a complete interdependence and sequence of construction and project related activities reasonably required to complete the Work. The Construction Progress Schedule shall also describe the activities to be accomplished and their logical relationships and show a discernible Critical Path. Show dates for beginning and completion of each major element of construction and installation dates for major terms of equipment. Elements shall include, but not limited to, the following:

1. Shop drawing submittal – review periods.
2. Material and equipment order, and delivery.
3. Traffic Management and Detour Setup
4. Retaining Wall installation
5. Storm Drain, Catch Basin, and Manhole installation.
6. Testing
7. Backfilling, grading, seeding, landscaping, and paving.
8. Subcontractor's items of work.
9. Final cleanup.
10. Allowance for inclement weather.

B. Revisions to the Original Construction Progress Schedule: The Owner reserves the right to require that the Contractor adjust, add to, or clarify any portion of the schedule which may later be discovered to be insufficient for the monitoring of the Work, coordinating the Work with the work of other contractors in the area or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions or clarifications.

C. Acceptance: The acceptance of the Contractor's schedule by the Owner will be based solely upon the schedule's compliance with the Contract requirements. By way of the Contractor assigning activity duration and proposing the sequence of the Work, the Contractor agrees to utilize sufficient and necessary management and other resources to perform the work in accordance with the schedule. Upon submittal of a schedule update, the updated schedule shall be considered the "current" project schedule.

CONSTRUCTION PROGRESS SCHEDULES

01310 - 2

- D. Submission of the Contractor's progress schedule to the Owner shall not relieve the Contractor of total responsibility for scheduling, sequencing, and pursuing the Work to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed work.
- E. Updates and Periodic Construction Progress Schedule Submittals: Following the acceptance of the Contractor's Original Construction Schedule, the Contractor shall monitor the progress of the Work and adjust the schedule to reflect actual progress and any changes in planned future activities. Each schedule update submitted must be complete including all information requested in the original schedule submittal. Each update shall continue to show all work activities including those already completed. These completed activities shall accurately reflect the "as built" information by indicating when the work was actually started and completed.
- F. Neither the submission nor the updating of the Contractor's original schedule submittal nor the submission, updating, change or revision of any other report, curve, schedule or narrative submitted to the Owner by the Contractor under this Contract, nor the Owner's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying, in any way, the Contract completion date or milestone dates or of modifying or limiting, in any way, the Contractor's obligations under this Contract. Only a signed, fully executed change order can modify these contractual obligations.

1.5 SCHEDULE REVISIONS

- A. Every 30 days CONTRACTOR shall revise construction schedule to reflect changes in progress of work.
- B. Indicate progress of each activity at date of submittal.
- C. Show changes occurring since previous submittal of schedule.
 - 1. Major changes in scope.
 - 2. Activities modified since previous submittal.
 - 3. Revised projects of progress and completion.
 - 4. Other identifiable changes.
- D. Provide a narrative report as needed to define.
 - 1. Problem areas, anticipated delays, and impact on schedule.

CONSTRUCTION PROGRESS SCHEDULES

01310 - 3

2. Corrective action recommended and its effect.
3. Effect of changes on schedules of other CONTRACTORS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01310

CONSTRUCTION PROGRESS SCHEDULES

01310 - 4

SECTION 01400

QUALITY CONTROL

1400.1 QUALITY CONTROL AND TESTING ALLOWANCE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes quality assurance and control of installation and manufacturer's field services and reports.

1.2 RELATED TECHNICAL SECTION

- A. Section 01200 – General Requirements for Utility Work
- B. Section 02210 – Earth Excavation, Backfill, Fill, and Grading

1.3 WATERTIGHTNESS

- A. All structures, pipes, and equipment which are to contain water shall be watertight under all operating conditions for which they are intended. The Contractor shall furnish all labor, materials and equipment and do all work required by the Engineer to make all such parts of the work watertight, or to replace them if in the opinion of the Engineer any leakage is excessive. All such parts of the work filled with water for testing watertightness shall be left filled as required by the Engineer.

1.4 CARE OF WATERCOURSES

- A. The Contractor shall maintain the flow in all watercourses, whether open channels or in pipes, in all sewers and other pipes interfered with in the line of work and convey the flow to a suitable point of discharge so as not to flow upon the work or create a nuisance. In the discharge of water removed from the excavations by pumping or by gravity similar precautions shall be observed as well as those outlined in specifications relating to contaminated and hazardous materials.

1.5 HYDRANTS

- A. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times.

1.6 MANUFACTURER'S FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, provide material or

QUALITY CONTROL
01400-1

product supplier's or manufacturer's technical representative to observe site conditions; conditions of surfaces and installation; quality of workmanship; start-up of equipment; operator training, testing, adjustment, and balance of equipment as applicable; and to initiate operation, as required. Conform to minimum time requirements for start-up operations and operator training if defined in specification sections.

- B. At the Owner's or Engineer's request, submit qualifications of the manufacturer's representative 15 days in advance of required representative's service. The representative shall be subject to approval of the Owner and Engineer.
- C. Manufacturer's representative shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions. Submit reports within 14 days of observation to Engineer for review.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION

Item 1400.1 – Quality Control and Testing

METHOD OF MEASUREMENT:

Payment will be made against the allowance based on invoices submitted by the General Contractor on a monthly basis. Labor, professional services, technician, and other invoices shall include a breakdown of hours, labor rates, direct expenses all sub-consultant and contractor mark-ups, material costs, shipping, taxes and all other costs included in the request. Incomplete or incorrect invoices will not be approved.

The General Contractor is allowed up to a 5% Mark-up on labor, professional service, technician, and other costs related to testing.

BASIS OF PAYMENT:

The allowance for this item shall be reimbursement to the General Contractor to furnish all labor, professional services, technician, equipment, and incidentals for testing required in this contract and not included in other pay items. The work includes, but is not limited to, testing for: backfill compaction, concrete and Hot Mix Asphalt standard paving compaction testing items.

QUALITY CONTROL
01400-2

SPECIAL NOTES/EXCLUSIONS:

Contamination, pipe and manhole testing, water main testing, test pits and all other testing not explicitly called out in this Section will not be paid for under this item and are covered under separate pay items.

END OF SECTION 01400

QUALITY CONTROL
01400-3

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

[THIS PAGE INTENTIONALLY LEFT BLANK]

QUALITY CONTROL
01400-4

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 PLANT

- A. The Contractor shall furnish plant and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Contract. If at any time such plant appears to the Engineer to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the plant equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.2 SUBMITTALS

- A. The Contractor shall submit a complete work plan including: proposed hours of operation, sequencing of work, number of shifts, number of work crews, and anticipated conflicts with existing utilities and facilities throughout the project. The work plan shall also include dates for temporary facility service interruption and required utility relocation. The plan shall also include a detailed schedule of all cooperation requirements with owners/operators of existing utilities and facilities.

1.3 PRIVATE LAND

- A. The Contractor shall not enter or occupy private land outside of easements, except by permission of the Owner through right of entry documents.

1.4 PIPE LOCATIONS

- A. Pipelines shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing utilities, structures or for other reasons.
- B. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him for laying and jointing different or additional items where required.

TEMPORARY FACILITIES AND CONTROLS

01500-1

1.5 HAULING, HANDLING AND STORAGE OF MATERIALS

- A. The Contractor shall, at his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him and shall be responsible for any loss or damage to any equipment or materials by theft, breakage, or otherwise. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

1.6 OPEN EXCAVATIONS

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, steel plates, construction and caution signs, concrete barriers, protective 7' tall fencing, lights and other means to prevent accidents to persons, vehicles, and damage to property. The Contractor shall, at his own expense, provide suitable and safe means for completely covering all open excavations and for accommodating pedestrian and/or vehicular travel when work is not in progress. Bridges provided for access to private property during construction shall be removed when no longer required. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of open trench.

1.7 TEST PITS

- A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor in accordance with the requirements of the Engineer, as shown on the Drawings, or described in the Specifications, or as directed by the Owner or Engineer. Test pits shall be backfilled and compacted immediately after their purpose has been completed and the surface restored and maintained as required by the Engineer.

1.8 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including, but not limited to, poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, fiber optic

TEMPORARY FACILITIES AND CONTROLS 01500-2

lines, fire signals, cable television cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. The Contractor shall notify the owner/operator of the proposed work and proposed protection plan so the owner/operator can review and approve protection measures. The Contractor is required to comply with all provisions of Massachusetts General Laws Chapter 353 entitled "Excavations-Public Ways-Notice Requirements" otherwise known as Dig Safe. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.

- B. The Contractor shall bear full responsibility for obtaining all locations of underground structures, utilities, and services. Services to buildings shall be maintained and all costs or charges resulting from damage thereto shall be paid by the Contractor.
- C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the work under the Contract. The Contractor will be responsible for the removal and replacement of existing utilities or coordination with the owners/operators of the existing utilities and assisting the existing utilities where required.
- D. If, in the opinion of the Engineer, permanent relocation of a utility owned by the City of Somerville is required, that is not shown on the plans or the specifications; he may require the Contractor, in writing, to perform the work. Work so ordered will be paid for as extra work under provisions of the General Conditions. If relocation of a privately owned utility is required, the Contractor will notify the utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and utility, and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies in writing at least seven days (excluding Saturdays, Sundays and legal holidays) before excavating or working in any public way. The Contractor shall notify public utilities 30 days prior to any service call wherever possible.

1.9 WATER FOR CONSTRUCTION PURPOSES

- A. The Contractor will be allowed to purchase water from the Owner for construction testing and start-up purposes.
- B. The express approval of the Somerville Water Department shall be obtained before water is used. Water shall be metered as specified by the Somerville Water Department. Hydrants shall only be operated under the supervision of Somerville Water Department personnel. Meters and backflow preventers shall be procured from the Somerville Water Department. Contractor shall coordinate with the Somerville Water Department in advance of procuring a meter and backflow preventer to provide all documentation required.

TEMPORARY FACILITIES AND CONTROLS 01500-3

- C. No direct cross connections will be permitted between the public water supply and the new water mains, or any other point where the possibility of backflow of contaminated water exists. All connections to points where there is the possibility of backflow shall be arranged to prevent backflow and shall be approved by the City's Water Superintendent or his representative before they are put into operation.

1.10 PROTECTION OF CONSTRUCTION AND EQUIPMENT

- A. All newly constructed Work shall be carefully protected. No driving or wheeling, walking or placing of heavy loads on newly constructed Work shall be allowed. All portions damaged shall be reconstructed, repaired, or replaced by the Contractor at his own expense.
- B. All elements of the Work shall be protected in a manner approved by the Engineer. Should any part of the Work become heaved, cracked, or otherwise damaged, all such damaged portions of the Work shall be completely repaired and made good by the Contractor at his own expense as required by of the Engineer.
- C. If, in the final or any daily inspection of the Work, any defects, faults or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein for at least the guarantee period described in the Contract Documents.
- D. The Contractor shall take all necessary precautions to prevent damage to all elements of the Work due to water pressure during and after construction and until such Work is accepted and taken over by the Owner.

1.11 CARE AND PROTECTION OF PROPERTY

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor at his expense to a condition similar or equal to that existing before the damage was done or he shall make good the damage in another manner acceptable to the Owner and Engineer.
- B. Along the location of this Work, all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly

TEMPORARY FACILITIES AND CONTROLS 01500-4

workmanlike manner. Fences and other features removed by the Contractor shall be replaced in their original location or at a location indicated on the Drawings as soon as conditions permit. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be graded and seeded.

- C. Trees close to the work shall be boxed or otherwise protected against injury. No trees shall be cut, braced, or damaged without prior notification and the approval of the City Arborist.
- D. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the Bid Proposal unless a Bid Item has been established elsewhere in these Construction Documents for the express payment of that specific item of Work.

1.12 INSTALLATION OF EQUIPMENT

- A. All wedges, shims, filling pieces, keys, packing, red or white lead grout, or other materials necessary to properly align, level and secure apparatus in place shall be furnished by the Contractor. All parts intended to be plumb or level must be proven exactly so. Any grinding necessary to bring parts to proper bearing after erection shall be done at the expense of the Contractor.

1.13 REJECTED MATERIALS AND DEFECTIVE WORK

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

1.14 TEMPORARY UTILITIES

- A. Temporary Light and Power: The Contractor shall at his own expense, provide his own temporary light and power as required for the prosecution and completion of work, including light and power for the construction and engineering field office as well as light and power for dewatering pumps, and trench and staging area lighting.

TEMPORARY FACILITIES AND CONTROLS 01500-5

- B. Temporary Heat: The Contractor shall, at his own expense, provide sufficient temporary heat to maintain minimum temperatures specified elsewhere, in all areas designated elsewhere in these documents.
- D. Temporary Water: Water for drinking purposes and other usage will be provided by the Contractor at his own expense.
- E. Sanitary Provisions: The Contractor shall provide and maintain sanitary accommodations for the use of his employees and the Engineer, as may be necessary to comply with the requirements and regulations of the local and state departments of health.
- F. Maintaining Operation of the Existing Facilities:
 - 1. The Contractor shall provide temporary utilities and/or cooperate with utilities to maintain full service to the residences and buildings in the project area. The Contractor shall be responsible for careful consideration of the construction scheduling and anticipation of potential interferences with existing utilities, operations and structures. The Contractor shall maintain close communications with the Engineer and provide the Engineer with a detailed description of each proposed activity sufficiently in advance of its commencement for review and comments to be made.
 - 2. Temporary facilities which may be required include, but are not limited to, electrical power; lighting; heating; cooling; ventilating; telephone; cable television; potable water; fire protection; drainage; sanitary facilities; trench covers; protection of existing utilities; structures; streams; trees and shrubs; access roads; sewage conveyance; piping; and pumping. The Contractor will be responsible for providing, connecting, and maintaining emergency generators to serve homes in the event temporary electrical services cannot be established by the power company. The Contractor will be responsible to furnish a licensed electrician to connect the houses to the emergency generators, maintain the generators 24 hours a day, and disconnect the houses when service can be reestablished to the power lines. The generators will be provided and maintained at no additional cost to the Owner.
 - 3. The Contractor shall coordinate efforts with the owners and/or operators of the existing facilities to avoid any service interruption. The Contractor shall keep utilities informed of proposed work activity and notify utilities of required work four weeks in advance. The Contractor must schedule work to avoid repeated, unnecessary, or last minute service calls by the owners/operators of existing facilities.

TEMPORARY FACILITIES AND CONTROLS
01500-6

1.15 ACCESS TO THE WORK

- A. The Contractor shall provide sufficient and proper facilities at all times for inspection of all work under this project in preparation or in progress, by the Owner, the agents and employees of the Owner, by authorized representatives of the Commonwealth of Massachusetts and the Federal Government and by the Engineers.
- B. The Contractor shall furnish the Engineer or his authorized representative and other personnel mentioned above with such facilities and assistance as are necessary to ascertain performance of the work in accordance with the plans and specifications.
- C. The Contractor must provide sufficient and safe access to existing facilities for the owners/operators of existing facilities to maintain service.

1.16 POLLUTION CONTROL

- A. The Contractor shall conduct clean-up and disposal operations, as necessary, to comply with state and local ordinances and anti-pollution laws.
- B. Outdoor burning of rubbish and waste material on the site will not be permitted.
- C. Disposal of volatile fluid wastes (such as mineral spirits, oil, gasoline, or paint thinner) in storm, combined, or sanitary sewer systems or into streams or waterways is not permitted.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01500

TEMPORARY FACILITIES AND CONTROLS
01500-7

[THIS PAGE INTENTIONALLY LEFT BLANK]

TEMPORARY FACILITIES AND CONTROLS
01500-8

Bike Path Retaining Wall and Drain
Somerville, MA
20171752.002

SECTION 01505

MOBILIZATION

1505.1

MOBILIZATION

LUMP SUM

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes mobilization consisting of moving all plant and equipment onto the site required for the contractors operations; furnishing and erecting plants, temporary buildings, and project and other construction facilities; erecting project signs and traffic management signs; implementing security features and requirements; all as required for the proper performance and completion of the Work. Mobilization shall further include the following principal items:

1. Developing construction water supply.
2. Providing on-site sanitary facilities and potable water facilities.
3. Arranging for and erection of Contractor's work and storage/staging yard(s).
4. Having all OSHA required notices and establishment of safety programs.
5. Having the Contractor's superintendent at the job site full time and having a project manager. The project manager shall not have superintendent duties.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION

Item 1505.1 - Mobilization

METHOD OF MEASUREMENT:

Payment for Mobilization will be at lump sum price bid for this item in the proposal and shall be payable by percentage complete per the previous listed items when the Contractor is

MOBILIZATION
01505-1

operational on the site. Operational is defined as the substantial commencement of work on site as described in the following paragraph.

BASIS OF PAYMENT:

Under the Lump Sum price bid for Mobilization, the Contractor shall move his equipment to the site and prepare to begin construction. Mobilization shall include all costs of initiating the Contract, exclusive of the cost of materials. Mobilization includes securing and constructing a staging area(s) for materials; furnishing and paying for all utilities; furnishing and installing pre-construction traffic management signage; fabrication and installation of project sign; distributing contact numbers for Contractor's staff to Owner and Engineer; submission and approval of initial shop drawings; submission and approval of Traffic Management Plans; submission and approval of initial work plans and sequencing plans; installing temporary power, lighting and water for construction purposes; implementing security features; furnishing and installing temporary sanitary facilities; transporting all necessary trucks and construction equipment to the site necessary to begin construction; and all other work necessary to start Construction.

END OF SECTION 01505

MOBILIZATION
01505-2

SECTION 01568

EROSION CONTROL, SEDIMENTATION AND CONTAINMENT
OF CONSTRUCTION MATERIALS

1568.1 SEDIMENTATION AND EROSION CONTROL LUMP SUM

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall provide all work and take all measures to control soil erosion resulting from construction operations, prevent flow of sediment from construction site.

1.2 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS:
 - 1. Two weeks prior to the start of the work, the Contractor shall submit for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.
 - 2. Contractor shall submit manufacturer's literature describing products, installation procedures, and routine maintenance of the sediment filter device.

1.3 QUALITY ASSURANCE

- A. Use acceptable procedures, including water diversion structures, diversion ditches, settling basins, and sediment filter devices.
- B. Operations restricted to areas of work indicated on Contract Drawings.
- C. If construction materials are washed away during construction, contractor shall remove materials from fouled areas.

PART 2 – PRODUCTS

2.1 SEDIMENT FILTER DEVICE

- A. Sediment filter device shall be manufactured to fit the opening of the catch basin or drop inlet. The sediment filter device shall have the following features:

EROSION CONTROL, SEDIMENTATION AND
CONTAINMENT OF CONSTRUCTION MATERIALS

01568-1

1. Two dump straps attached at the bottom to facilitate the emptying of the device and shall have lifting loops as an integral part of the system.
2. Yellow restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls. Yellow restraint cord is also a visual means of indicating when the sack should be emptied.
3. Fabric shall consist of a woven polypropylene geotextile and be sewn by a double needle machine, using a high strength nylon thread.
4. Sediment filter device shall have a certified average wide width strip tensile strength of 165 lbs/in per ASTM Standard D-4884.
5. The Contractor shall remove and restore sediment filter devices for anticipated weather events as required by the City or the Resident Engineer.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall not discharge chemicals, fuels, lubricants, bitumen, raw sewage, and other harmful waste into or alongside any body of water or into natural or manmade channel.
- B. It is the intent of these Specifications to prevent the unnecessary occurrence of sedimentation or siltation of waterways and private properties. In the event the sedimentation or siltation prevention measures used by the Contractor prove to be inadequate as determined by the Owner and Engineer, the Contractor shall be required to adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.

3.2 INSTALLATION

- A. The Contractor shall protect catch basins by installing sediment filter devices as specified in this Specification in every catch basin within and downstream of the project limits.
- B. The Contractor shall install the sediment filter device before any work begins and shall place the device so that it is flush with the material around the frame of the grate of the catch basin structure. The Contractor shall be responsible for maintenance and placement of the strap lift holes to ensure that they do not become a hazard for pedestrians.
- C. The Contractor shall maintain the sediment filter device and remove the collected debris as required by the Engineer. If any material is lost in the removal of the sediment filter device, then the Contractor shall be responsible

EROSION CONTROL, SEDIMENTATION AND
CONTAINMENT OF CONSTRUCTION MATERIALS

01568-2

for cleaning of the catch basin. The Contractor shall inspect the position of the device to ensure that the sediment filter device will work properly during any heavy rain or any storm greater than a 10 year flood.

- E. Existing natural drainage patterns and vegetative cover shall be preserved to the maximum possible extent.
- F. The Contractor shall use temporary vegetation, mulching, gravel, and paving to protect areas exposed during construction. He shall minimize the amount of bare earth exposed at any one time during construction, and he shall also minimize the length of time bare earth is exposed.
- H. Water that is being pumped from the trenches or excavations shall not be pumped directly into water courses or pipe conveyance systems. At a minimum, sedimentation control measures shall include portable sedimentation tanks, pumps, and piping, or other means acceptable to the Owner and Engineer to meet the water quality parameters specified in both the Dewatering Permits and these Specifications, whichever is more stringent.
- I. Spoil resulting from the trench excavation shall be leveled or removed to permit free entry of water from adjacent land surfaces without excessive erosion or harmful ponding.

PART 4 – COMPENSATION

Item 1568.1 – Sedimentation and Erosion Control

BASIS OF PAYMENT/INCLUSIONS

Payment for Sedimentation and Erosion Control will be based on the bid for this item in the proposal. Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment and incidentals required to furnish, install, maintain, relocate, and remove all sedimentation and erosion control measures. Under the Unit Price bid for this item, the Contractor shall also furnish all labor, materials, tools, equipment and incidentals to prepare and submit all work plans and submittals; line all existing catch basins with sediment filter devices and remove prior to inclement weather; removal and disposal of all silt and sediment collected from sedimentation and erosion control measures; and all other items of work not specifically included herein or elsewhere required to furnish, install, maintain, relocate, and remove sedimentation and erosion control devices as specified and required.

METHOD OF MEASUREMENT:

Measurement for payment for Sedimentation and Erosion Control will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.

END OF SECTION 01568

EROSION CONTROL, SEDIMENTATION AND
CONTAINMENT OF CONSTRUCTION MATERIALS

01568-3

SECTION 01570

MAINTENANCE AND PROTECTION OF TRAFFIC

1570.1	TRAFFIC AND PEDESTRIAN MANAGEMENT	LUMP SUM
1570.2	SAFETY SIGNING FOR CONSTRUCTION OPERATIONS	LUMP SUM

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, equipment, and materials and perform all operations in connection with the maintenance and protection of vehicular, bicycle, and pedestrian traffic on all roads, state and local, directly or indirectly affected by the construction. The work of this section also includes maintaining access to all properties adjacent to the work.
- B. The Contractor is responsible for preparing and submitting a plan for traffic management to the Owner and Engineer, including updates as conditions warrant. The Contractor is responsible for design and implementation of revisions to the traffic management procedures during the course of the project at the requirements of the Engineer and at no additional cost to the Owner.
- C. The Contractor shall develop and implement a detailed Traffic Management and Control Plan and obtain approval from the City of Somerville Traffic Department and Department of Public Works and the City of Cambridge Traffic, Parking, and Transportation Department prior to proceeding with the work.
- D. Furnish, erect, set, reset, relocate, move, remove, and dismantle sufficient signs, temporary lighting, barrels, flashers, channelizing devices (concrete barriers), fencing, and other traffic control devices on a continuous basis as necessary to protect the work and the general public at all times during construction in accordance with Contractor's approved Traffic Management and Control Plans. The work of this Section shall also include temporary bridging for traffic across excavations.
- E. The design, application, and installation of all traffic control devices required by this section shall conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD) published by U.S. DOT, latest edition; American Disabilities Act (ADA); Massachusetts Architectural Access Board; and the Commonwealth of Massachusetts, Highway Department (MHD), Standard Specifications for Highways and Bridges, latest edition.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-1

- F. “Approved by the Owner” throughout this Section shall mean the approval of the Somerville Department of Public Works and Traffic and Parking Department.
- G. Traffic control during construction also includes street sweeping and snow removal from sidewalks and streets within the work zone as described in section 3.1 D. Maintaining rubbish and recyclable removal is also required and described in Section 01500 - TEMPORARY FACILITIES AND CONTROLS.

1.2 REFERENCES

- A. Reference is made herein to the Commonwealth of Massachusetts, Highway Department, Standard Specifications for Highways and Bridges, latest edition. References made to particular sections or paragraphs in the Standard Specifications for Highways and Bridges shall include all related articles mentioned therein.
- B. Manual of Uniform Traffic Control Devices Part VI Standard and Guides for Traffic Controls for Streets and Highway Construction, Maintenance, Utility and Incident Management Operations, latest edition.

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
 - 1. Traffic Management and Control Plan: Before starting any work under this Contract, the Contractor shall prepare a plan that indicates construction equipment movement and the traffic routing proposed by the Contractor during the various stages and time periods of the work, and the location of temporary pedestrian, bicycle routes and construction facilities, temporary barricades, signs, drums, and other traffic control devices to be employed during each stage and time period of the work, to maintain traffic and access to abutting properties. Particular care shall be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety. The Plan shall be submitted a minimum of four weeks prior to the start of construction for acceptance by the Engineer and approved by the Owner and the City prior to start of Work. The Plan shall be reviewed on a daily basis with the Engineer during construction. The Plan shall include procedures for the Contractor to coordinate daily with the Owner and City Departments (Department of Public Works, Traffic and Parking Department, Police, Fire, and Emergency Medical Services).

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-2

2. Temporary Pedestrian Access Ramp Work Plan, Temporary Pedestrian Protection Work Plan and Temporary Pedestrian Detour Plan: Contractor shall provide a work plan detailing the location and layout of ramps and their protection, type of ramps and protection to be used with manufacturer's information, and duration the ramps and protection will be utilized. All pedestrian detours required shall be submitted for approval with these plans.
- B. Shop Drawings shall be submitted for review four weeks prior to start of construction. Thereafter, the Contractor shall submit to the Engineer updated Traffic Management and Control Plans a minimum of 10 working days prior to the start of construction at any new location or updates required in the work zone resulting from progress of Work throughout the duration of construction.
1. Submit complete shop drawings and work plans for staged construction and traffic movement including temporary vehicle, pedestrian, and bicycle as needed, certified by a Professional Engineer registered in the Commonwealth of Massachusetts.
 2. Show on the shop drawings all materials, dimensions, sizes, and methods of installation.
 3. Safety Signing for Construction Operations: The Contractor shall submit temporary pedestrian, bicycle, and traffic management sign placement and sign size sketches showing the proposed sign setups intended to be used to provide the necessary traffic control and protection during the progress of work, plus the sign and legend size and layout. These sketches shall be submitted to the Engineer, Owner and City for review and approval before work begins.
 4. When a detour or by-passing of vehicular traffic is anticipated, the Contractor shall submit for approval by the Engineer, Owner and City, a detour plan showing the proposed alternative routes and location, size, and type of signs and traffic controls to be used. The traffic routing through or around the Work and provisions for control of same shall be approved by the Engineer, Owner, and City.
 5. The Contractor shall submit a Truck and Hauling Route Work Plan for all proposed truck routes prior to mobilizing. No trucking or hauling will be allowed without the approval of the City of Somerville. No trucking or hauling will be allowed outside the proposed routes without the prior approval of the Engineer, Owner, and City. The Contractor is responsible for obtaining all permits and permissions. The Contractor

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-3

is further responsible for obtaining approval for and coordinating parking restrictions required to facilitate trucking and hauling.

1.4 SPECIAL REQUIREMENTS

- A. The Contractor shall provide access for fire apparatus and other emergency vehicles through the work zones to abutting properties at all times.
- B. At the end of each workday, where trenches in areas of public travel are covered with steel plates, each edge of the plates shall be either beveled or protected by a bituminous concrete ramp as accepted by the Engineer. Temporary bituminous patching material may be used to construct the ramps. The cost of patching materials, and their maintenance and removal, will be considered incidental to the Traffic Management item with no separate payment elsewhere. Plates shall be pinned or welded together to eliminate movement, noise or vibration.
- C. Open excavations adjacent to the traveled way or shoulders shall not remain open through non-work hours unless steel plated for the passage of heavy vehicles or protected by concrete barricades or barriers and specifically authorized by the Owner, City and Engineer.
- D. Do not block more than one-side of the roadway at a time when making open cut or other street crossings unless otherwise approved.
- E. The Contractor shall be responsible for the costs in obtaining all permits to perform the Work.
- F. At least one serviceable driveway access to all residences and businesses within the project shall be maintained at all times unless otherwise approved.
- G. The Contractor shall provide temporary lighting to properly illuminate the work area and approaches in the event of nighttime work.
- H. The Contractor shall not allow unnecessary idling of trucks and/or equipment throughout the entire project area. The City of Somerville prohibits idling of trucks and equipment for periods of time exceeding five (5) minutes when not in use.
- I. The Contractor shall notify the Somerville Fire and Police Departments of any street closings.

1.5 SEQUENCING AND SCHEDULING

- A. All streets within or adjacent to the contract limits, not specifically cited shall have their full roadway widths available for traffic or permitted parking at all

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-4

times except for such restrictions as may be approved by the Owner, City and Engineer.

- B. Notify the Owner, City and Engineer at least 48 hours in advance (not including Saturday or Sunday or Holidays) prior to the access lane restriction of the roadway. Notification shall include the date of the restriction, the hours of the day the roadway access will be restricted, and the estimated completion date.
- C. The Owner, City and Engineer shall be notified of any re-routing of traffic 48 hours in advance (not including Saturday or Sunday or Holidays). Approval shall be obtained from the Owner, City and Engineer prior to any re-routing of traffic (except emergencies).
- D. The Contractor shall verify street sweeping schedules in the work zone. Delivery related parking restrictions will not be permitted on days where street sweeping is scheduled unless otherwise approved.

1.6 HAULING AND TRUCK ROUTES

- A. The Contractor is advised that all roads and bridges within or adjacent to the project shall be subject to legal loads, heights of vehicles and vehicle type / use restrictions. The Contractor is responsible for understanding the restrictions and obtaining all necessary permits.
- B. The Contractor is advised that no agreements have been made by the Owner, the City of Somerville, MassDOT, or with surrounding cities or towns to relieve the Contractor of liability for damage to local roads and bridges caused by the Contractor's operation. The Contractor shall contact appropriate officials of the surrounding cities, towns or agencies concerning hauling over city or town roads and bridges.

1.7 STORAGE OF MATERIALS, PARKING OF CONSTRUCTION EQUIPMENT AND WORKER PARKING

- A. No material shall be stored within the work area or on adjacent roadways or residential streets except that which is needed to complete the work for that day.
- B. Construction workers shall park their vehicles within the work zone during work hours, and remove them thereafter. Parking outside the work zone will be required if the vehicles obstruct traffic flow.
- C. The Contractor shall park construction equipment within the work zone and protect equipment with barriers or barricades. Parking outside the work zone will be required if the equipment obstructs traffic flow.

MAINTENANCE AND PROTECTION OF TRAFFIC 01570-5

1.8 BARRICADES, WARNING SIGNS AND OTHER PROTECTIVE DEVICES

- A. Install, inspect, remove, maintain, and reset all temporary construction controls as frequently as required and in accordance with an approved construction staging sequence and traffic management plan.
- B. Regulatory and warning devices shall be subject to removal, replacement and repositioning as often as necessary, and as directed by the Owner and Engineer.
- C. Temporary pavement markings and devices shall be used as shown on the approved plans and as required by MUTCD and ADA standards for traffic control and pedestrian safety.

1.9 POLICE DETAILS SERVICE

- A. Uniformed City, Municipal, or State police officers shall be utilized to maintain safe traffic flow throughout the construction period. A Police Detail is to be present during all construction activity. Scheduling Police Details shall be the responsibility of the Contractor. To schedule a detail officer, call (617) 349-3350.
- B. The Somerville Police Department requires 24-hour advance notice to obtain a Police Detail, except in emergencies and 4-hour advance notice to cancel a detail. Contractor shall use as many police details as needed to ensure the safety of pedestrians and traffic at all times.
- C. The Contractor shall coordinate all work with the police officers including but not limited to: locations of work, delivery of materials, equipment movement, required traffic management and schedules.
- D. The Contractor must submit all signed detail forms to the project managers or engineer, so that the City of Somerville can pay all submitted and approved Police Detail invoices. Any invoices that are not approved will be the responsibility of the Contractor to pay.
- E. The City of Somerville Police Department shall bill the City of Somerville Department of Public Works or the department having oversight of the contract for the services of uniformed police officers provided by the Police Department.
- F. The Contractor will be required to reimburse the the department having oversight of the contract for Police Details, if the Contractor fails to show for the job or if the Contractor fails to cancel the detail with adequate advance notice.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-6

1.10 PEDESTRIAN TRAFFIC

- A. Sidewalks shall be maintained at all times through the construction period. Temporary sidewalks, pedestrian detours and pedestrian and construction facilities shall be constructed as needed to maintain pedestrian traffic and business access. The Contractor shall anticipate that temporary pavement markings (paint or tape) will be required in order to comply with this provision.
- B. Pedestrian access shall be provided to abutting land uses and businesses at all times, as approved by the Owner, City and Engineer and in accordance with MUTCD and ADA requirements.
- C. Unobstructed walkways of 4-foot minimum width, unless otherwise approved by the Owner, City and Engineer shall be provided at all times.
- D. Temporary pedestrian walkways shall be separated from roadway and construction areas by barricades and fence as approved by the Owner, City and Engineer.
- E. The Contractor shall be notified by telephone of any location not providing adequate pedestrian access. The Contractor shall acknowledge notification of the call within one (1) hour by contacting the Project Engineer or the Public Works Dispatcher at (617) 666-3311.
- F. The Contractor shall respond to the work site within one and a half (1.5) hours of acknowledged notification with sufficient equipment and labor to perform the required work.
- G. The Contractor's failure to respond within the specified response time twice within the Contract time will result in a permanent deduction of \$250.00 from Contract payments due.
- H. The Contractor's failure to respond within the specified response time three times within the Contract time will result in an additional permanent deduction of \$400.00 from Contract payments due.
- I. The Contractor's failure to respond within the specified response time four or more times within the Contract time will result in an additional permanent deduction of \$500.00, per each additional occurrence, from Contract payments due.
- J. Continued failure to provide adequate pedestrian access may result in the

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-7

City terminating the contract in accordance with the General Terms and Conditions of the Contract.

1.11 VEHICULAR CONTROL REQUIREMENTS

- A. The Contractor shall meet the following conditions, unless otherwise specifically approved by the Owner, City, and Engineer:
1. All work shall be prosecuted with proper regard for the convenience of the public and in a manner to permit unimpeded traffic flow whenever possible. The interruption of traffic will not be permitted unless specifically allowed by the Owner, City and Engineer and in accordance with the requirements of the Owner and City and in conformance with MUTCD requirements.
 2. The Contractor shall be responsible for necessary coordination with the City departments affected by the project.
 3. Traffic control devices and signs shall be removed, demounted or properly covered for those periods of the day not in use.
 4. The Contractor shall coordinate the work with the schedules of City Rubbish and Recycling Collection trucks and delivery trucks to the adjacent stores and property owners so as not to impede their access, and cooperate with delivery personnel to facilitate deliveries to properties within the work zone.
 5. No operations shall be conducted, including the loading or unloading of equipment or materials, on or near the traveled lanes or road shoulders without first erecting warning signs and channelizing devices. These precautions shall be maintained at all times while work, loading and unloading is in progress.
 6. Construction signs and channelizing devices shall be used to separate traffic from the work areas and for traffic control. Placement, other than as shown in the plans or the MUTCD, will require prior approval.
 7. Temporary signs and channelizing devices shall not be set up until there is adequate visibility or appropriate construction lighting. The Contractor shall schedule his work so that temporary signs and channelizing devices are removed and traffic is returned to its normal pattern before the end of the work period.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-8

8. Work requiring overnight lane closures shall not begin until all materials required for the completion of each night's work are delivered or available to the project site, unless otherwise approved by the Owner, City and Engineer.
9. Accesses to buildings shall be maintained at all times.
10. Any blocked disability parking spaces to be temporarily relocated to another location within a reasonable distance from the permanent space.
11. Work operations shall not be performed on the roadway in such a manner that traffic is obstructed or endangered simultaneously from both sides of the roadway unless otherwise approved.
12. The Contractor shall keep all roadway areas open to traffic as clear as possible at all times. Materials shall not be stored on any roadway area or within 4-ft. of the traveled way. Material shall be delivered to the installation areas as they are needed to provide a continuous installation. Location of storage areas shall be subject to approval.
13. The Contractor shall remove all equipment and construction vehicles from the traveled way and shoulders open to traffic during non-work hours. Vehicles shall be parked no closer than 4-feet from the traveled way in pre-approved areas unless specifically permitted.
14. Each driver of any vehicle or piece of equipment used on this contract shall be furnished written instructions concerning the manner of operation for that vehicle or piece of equipment. Specifically, these instructions shall warn against stopping on the traveled portions of the roadway, against passing other vehicles, and against traveling in close proximity to other vehicles. A copy of these instructions shall be given to the Engineer.
15. Temporary signs and channelizing devices shall not be set up in inclement weather.
16. The Contractor shall furnish 60-inch x 30-inch approved signs reading "CONSTRUCTION VEHICLE - DO NOT FOLLOW" to be used on trucks hauling to the project, when such signs are deemed necessary by the City and/or Engineer. The color, type of sheeting and size of lettering shall conform to that of the permanent construction signs.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-9

17. The Contractor shall furnish, install, and maintain 36-inch x 36-inch approved signs reading “ROUGH ROAD” in advance of all roadway areas which have been cold-planed.
18. The Contractor shall furnish, install and maintain additional temporary cones and barrels, as required by the Engineer, after Traffic Calming devices (horizontal and vertical deflections) have been constructed.
19. The Contractor will be responsible for snow removal within active work zones.

1.12 BICYCLE CONTROL REQUIREMENTS

A. The Contractor shall meet the following conditions, unless otherwise specifically approved by the Owner, City, and Engineer:

1. Bicycle traffic shall be accommodated on all public streets either within bicycle lanes where existing or in vehicular travel lanes.
2. When travel lanes are restricted to less than 14-foot in width warning signage (W11-1/W16-1 combination - Bicycle warning symbol with SHARE THE ROAD plaque) shall be placed warning motor vehicle operators of the presence of bicycles in the roadway.
3. If the disruption occurs in a bicycle lanes over a short distance (approximately 500 feet or less), bicyclists should be routed to share a motor vehicle lane.
4. On projects where the disruption occurs over a longer distance (more than 500 feet), and on busy roadways, a temporary bicycle lane or wide outside lane (at least 14 foot wide) should be provided. If that is not feasible, provide access, including ramps if necessary, for bicyclists to have the option of using sidewalks, except within zones where sidewalk bicycle riding is prohibited by the City.
5. Steel plates:

When steel plates are used in the travel way warning signage (Warning Steel Plates 100 FT) shall be placed at least 100 feet in advance.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-10

Steel plates shall be set so there is no vertical lip over 1/4 inch between the plate and adjacent pavement. This shall be accomplished in one of the following ways:

- a. Recessing the plate so that the top of the plate matches adjacent pavement (with no lip over 1/4 inch).
- b. Providing bituminous concrete lip painted reflective orange to provide a smooth transition slope up from existing pavement to top of plate.

Non-slip surface steel plates are preferred for use, and must be used where plates are in an intersection or within a crosswalk.

6. Raised castings: Where raised castings are present after cold planing and/or in anticipation of final paving, provide the following:
 - a. Advance warning signs saying: "Caution – Raised Castings Ahead."
 - b. Spray paint reflective fluorescent pink the raised portions of the castings.
7. Cold planing and pavement installation: Where cold planing or the installation of pavement in lifts results in vertical joints greater than 1/4 inch, provide temporary bituminous concrete lip painted reflective orange to provide a smooth transition slope between the pavement layers.
8. When the roadway or travel lanes narrow due to construction, advance warning signs should be placed at least 20 feet in advance.
9. Narrow cuts that are parallel with the direction of travel create an extreme hazard for cyclists, whose tires could get caught. These should never be made and left in an area where bicyclists will be traveling. If necessary, they should be blocked off and cyclists routed around the hazard. When performing advance pavement cutting for trenching or other roadway excavation, use only saw cutting (approximately 1/4 inch or narrower).
10. Debris should be swept to maintain a reasonably clear riding surface in the bicycle lanes or, where there are no bicycle lanes, the outer 5 or 6 feet of roadway. Promptly remove gravel, debris, litter, sand, stone, and other obstructions from bicycle lanes and travel lanes.
11. Advance construction signs shall not be placed in bicycle lanes and

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-11

shall not otherwise obstruct bicyclists' path.

12. Temporary ramps for site access ramps. The creation of ramps in the roadway is not permitted unless being created in an area that is otherwise used by on-street parking.
13. Restore pavement markings for bike lanes within 2 weeks of paving.

PART 2 – PRODUCTS

2.1 MATERIAL

- A. All barricades, drums, cones and other channelizing devices shall meet the requirements for MassDOT Standard Specifications for Highways and Bridges Section 850 Traffic Control for Construction and Maintenance Operation (Latest Revision) and the Manual of Uniform Traffic Control Devices (Latest Revision).
- B. Traffic Control Materials
 1. Materials required for the work of this Section need not be new, but must be in first-class condition and acceptable to the Owner and Engineer. Any materials that in the judgment of the Owner are unsatisfactory in appearance or performance shall be removed and immediately replaced by acceptable units.
 2. Signs, portable barricades, and drums shall have “High Intensity Encapsulated Lens Reflective Sheeting” in accordance with Section M9.30.2 of the MHD Standard Specifications for Highways and Bridges and MUTCD requirements.
 3. Signs shall be fabricated with “High Intensity Encapsulated Lens Reflective Sheeting”. Transparent red, blue, yellow or black opaque paint (ink) may be used over “High Intensity Encapsulated Lens Reflective Sheeting” in accordance with the provisions of subsection M9.30.2, “D.2 Surface”, of the MassDOT Standard Specifications for Highways and Bridges, where these colors are specified.
 4. Safety signage for construction operations shall consist of furnishing, positioning, repositioning, inspecting, maintaining, and removing regulatory, warning, and guide signs and temporary bus stop signs and taxi stop signs and their supports as approved by the Owner, City and Engineer.
 5. Replace all signs and posts, which are damaged or are missing from their location at no additional cost to the Owner.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-12

6. Maintain all signs in a satisfactory manner including the removal of dirt or road film that cause a reduction in sign reflective efficiency.

C. Portable Barricades

1. Furnish, install, relocate, remove, re-install, and maintain portable barricades in accordance with MassDOT and MUTCD requirements or as directed by the Owner, City and Engineer.
2. Portable barricades shall conform with Standard Plate No. 40612 of the MassDOT (Metric Edition). Reflectorized sheeting shall conform to Section M9.30.2, of the MassDOT Standard Specifications for Highways and Bridges.
3. Eight-foot-long units of portable barricades shall be constructed, as needed.
4. Alternating 6 inches (152.4 mil) wide diagonal stripes shall be orange and white and shall slope downward at 45 a degree toward the end by which traffic is to pass. Barricades that block the passage of traffic or designate the end of the traveled way shall have alternating vertical orange and white stripes on the rails.
5. Barricades shall be maintained in good and serviceable condition throughout the duration of the Contract.
6. Temporary pedestrian and construction facilities shall be kept clean and freshly painted as required.

D. Signs, Covered

1. Cover any existing regulatory and warning signs as required by the Owner, City and Engineer.
2. Use a cover approved by the Owner, City and Engineer which shall be securely fastened to the existing sign and shall completely cover the legend of the existing sign. The cover shall remain in place as long as necessary at which time it shall be promptly removed.
3. Signs shall be covered without causing any damage to the existing sign.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-13

E. Traffic Signals

1. Traffic lights shall remain operable at all times throughout the duration of the contract unless approved otherwise by the City.
2. It shall be the Contractor's responsibility to maintain the traffic signal system in continuous and good working order. The Contractor at his expense, shall repair any damage to the traffic signal system resulting from the Contractor's work and notify the Somerville Traffic Department immediately if any traffic controls are damaged.

F. Temporary Precast Concrete Barriers and Work Zone Protection

1. Temporary precast concrete barriers shall be furnished and installed as shown on the approved traffic management plans and where required to protect work zones and excavations which cannot be completed and backfilled or plated within a daily work period. Barriers shall be removed or relocated when no longer required and with the approval of the Owner, City and Engineer.
2. Precast concrete median barrier shall conform with Standard Plate No. 401.15.1 of the MassDOT, as well as be acceptable for temporary pedestrian and construction facilities and signage.
3. Temporary precast barrier for use for temporary pedestrian and construction facilities shall have three sleeves cast in the barrier to receive a post for panel and fence installations.
4. Temporary chain link fence, 4-feet high, shall be erected at work zones abutting pedestrian travel paths and around work zones hazardous to pedestrians in conjunction with precast barriers to form a "safety zone" 7 feet high, or as required by the Owner, City and Engineer. The top 2-feet shall be fixed with plywood panels painted as required by the Owner and Engineer. The barriers and fencing shall be overlapped at the corners of the excavated area to provide a continuous protective screen.

PART 3- EXECUTION

3.1 GENERAL

- A. Conduct the work in manner that interferes as little as possible with public travel, whether vehicular or pedestrian.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-14

- B. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel whenever it is necessary to cross, or obstruct roads, driveways, and walks, whether public or private.
 - 1. Give a minimum of 48 hours (not including Saturday, Sunday or Holidays) written notice to owners of private driveways before interfering with them.
- C. Provide temporary surfacing on shoulders when necessary.
- D. Provide snow removal and street sweeping within the work limits to maintain safe and efficient vehicular and pedestrian traffic flow, including accesses and sidewalks. Contractor shall plow snow out of the work zone in all areas where municipal snow removal is prevented by construction in the opinion of the Owner, City and Engineer. The Contractor shall also remove snow from all sidewalks in areas where construction related activities are occurring or have recently occurred. The Contractor shall sweep sidewalks, pedestrian walkways and detours, and streets within the work zone on a daily basis. In the event that the Contractors work zone restricts municipal street sweeping in the area, the Contractor shall sweep the restricted streets (including streets outside the work zone) to a point where municipal street sweeping can continue.
- E. Sufficient and adequate signs, flashers, channelizing devices, lights, arrow boards and other precautions necessary to protect the work and the public, as determined by the Engineer shall be used at all times during construction.
- F. Provide trench bituminous paving repairs on a daily basis, but at intervals no longer than weekly, unless required or allowed otherwise by the Owner, City and Engineer or applicable agency having jurisdiction.
- G. Pedestrian access shall be maintained at all times. Access shall be a minimum of 4-feet, clear of all obstructions and meet all American with Disability Act (ADA) requirements. If an existing pedestrian walkway is interrupted, temporary ADA compliant walkways with ramps shall be provided.
- H. Contractor shall post “No Parking” signs 48-hours in advance for residential permit parking locations and 24-hours in advance for metered, public, etc. If work does not take place that day, signs must be reposted. Standard Somerville signs shall be used that provide information regarding proposed construction and parking restriction hours. Signs shall be placed at a minimum of 25-foot intervals.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-15

3.2 DETOURS

- A. If approved by the Owner, City, and Engineer, construct and maintain detours around the work to maintain traffic over any construction work in a public street, road, or highway where traffic cannot be maintained on alignment of original roadbed or pavement.
- B. When detours are allowed, the Contractor shall provide all detour signs approved by the City and/or Engineer with directional arrows. Signs shall be placed at all streets and intersections to provide required direction to allow motorists to return to the street location beyond the detour. The Contractor must submit a written detour plan for the City and/or Engineer's approval prior to implementation of the detour.
- C. All detouring and signing shall meet the requirements of the applicable references specified in Parts 1 and 2 above.
- D. The Contractor shall provide Police details in the work areas. Contractor shall coordinate vehicle towing with the police.
- E. The Detour Plan shall be reviewed and approved by the Owner, City, and Engineer prior to establishing any detours.
- F. The Contractor is responsible for the notification of any parties affected by the detour, including, but not limited to Somerville Police, State Police, MBTA, Somerville Traffic Department, and abutting property owners.

3.3 PROTECTION

- A. Signs and Channelizing Devices:
 - 1. Locate signs and channelizing devices with lights to protect public thoroughfares which are closed to traffic.
 - 2. Ensure that all open trenches and other excavations have signs, channelizing devices and lights to provide protection to the public.
 - a. Provide similar warning signs and lights for obstruction such as material piles and equipment.
 - b. Ensure that the material storage and conduct of the work on or alongside streets causes minimum obstruction and inconvenience to the traveling public.

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-16

3. Install and maintain all signs, channelizing devices, lights, and other protective devices in conformity with applicable statutory requirements and as required by the municipalities or agencies having jurisdiction.
4. Illuminate all channelizing devices with flashing lights.
5. No traffic control devices shall be stored adjacent to the roadway.

PART 4 – COMPENSATION

Item 1570.1 - Traffic and Pedestrian Management

METHOD OF MEASUREMENT:

Measurement for payment for Traffic and Pedestrian Management will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the original Contractual construction time limit as approved by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Traffic and Pedestrian Management shall be based on the lump sum price bid for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to provide, maintain, relocate, and remove Traffic and Pedestrian Management in areas directly or indirectly influenced by construction within the limits of work or outside the limits of work; along truck routes inside or outside the limits of work; as delineated in the approved Traffic and Pedestrian Management Plan, by the MUTCD, ADA, MA AAB, and MassDOT standards; and as further required by the Owner and Engineer. The work includes but is not limited to; obtaining permits; coordination with the City Department of Public Works and Traffic and Parking Department; coordination with private property owners within the limits of work; preparing, submitting, reviewing, implementing, and revising traffic management and control plans; work zone layouts, installing, and maintaining traffic management devices based on approved traffic management and control plans including precast concrete and/or triplex barriers with fencing and plywood panels, reflectorized drums, lane delineators, portable barricades, temporary crosswalks, and cones; temporary pavement markings; removal of temporary and existing pavement markings; restoring and maintaining existing pavement markings disturbed within work zone limits (prior to installation of final pavement marking); furnishing, installing, shimming, pinning, maintaining, and removing steel road plates; furnishing, installing, and removing cold patch pavement as necessary or as directed by the Engineer; ordering and coordinating police details; furnishing and installing temporary construction fencing; maintaining roadways and sidewalks inside or outside the limits of work; establishing and dismantling detours; covering existing traffic signs; obtaining, posting and maintaining “No Parking” signs; meeting with police details daily; coordinating police

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-17

detail locations; and all incidental work, whether listed here or not, required to provide maintenance and protection of traffic and pedestrians.

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item and are included for payment elsewhere; bituminous hot mix asphalt pavement; and Police Details. Police Details will be paid directly by the Owner.

Item 1570.2 – Safety Signing for Construction Operations

METHOD OF MEASUREMENT:

Measurement for payment for Safety Signing for Construction Operations shall be based on the Contractors Lump Sum bid calculated by dividing the elapsed time to date by the original Contractual construction time limit as approved by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Safety Signing for Construction Operations shall be based on the lump sum price bid for this item in the proposal. Under the lump sum price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to fabricate, furnish, install, secure, maintain, relocate and remove Safety Signing for Construction Operations as required for the management of traffic and pedestrians and as further directed by the Owner, City and Engineer. The work includes, but is not limited to; fabrication of the signs; furnishing and installing signage; mounting and securing signage; maintaining signage; protecting and storing signage not in use; relocating signage; removal of signage; and all incidental work required to fabricate, furnish, install, maintain, relocate, and remove the Safety Signing for Construction Operations

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item; "No Parking" signs; signs not specified or requested or approved by the Owner or Engineer, installed for the convenience of the Contractor; and signs not fabricated by a professional shop specializing in the fabrication of Signage for Construction Operations, i.e. hand painted or fabricated. Signage damaged as a result of misuse or improper handling shall be replaced by the Contractor at no additional cost to the Owner.

END OF SECTION 01570

MAINTENANCE AND PROTECTION OF TRAFFIC
01570-18

SECTION 01600

PRODUCTS, MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish and install products, equipment and materials as specified and indicated in accordance with the Contract Documents.
- B. Provide transportation, handling, storage, and protection of all products, materials and equipment in accordance with the Contract Documents.

1.2 DEFINITIONS

- A. The word "Products," as used herein, is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for the project or taken from Contractor's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," "special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.
- B. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
- C. Spare Parts are defined as subassemblies or components of the Products installed in the Work.

1.3 QUALITY ASSURANCE

- A. Source Limitations: To the greatest extent possible for each unit of work, the Contractor shall provide products, materials, and equipment of a singular generic kind from a single source.
- B. Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product, material, or equipment, the Contractor shall select an option which is compatible with other products, materials, or

equipment. Compatibility is a basic general requirement of product, material and equipment selections.

1.4 PRODUCT DELIVERY AND STORAGE

- A. The Contractor shall deliver and store products, materials, and equipment for the Work in accordance with manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of materials, products, and equipment at site and overcrowding of construction spaces. In particular, the Contractor shall ensure coordination to ensure minimum holding or storage times for flammable, hazardous, easily damaged, or sensitive products, materials, and equipment to deterioration, theft, and other sources of loss.

1.5 TRANSPORTATION AND HANDLING

- A. Products, materials and equipment shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging.
- B. The Contractor shall provide equipment and personnel to handle products, materials, and equipment by methods to prevent soiling and damage.
- C. The Contractor shall provide additional protection during handling to prevent marring and otherwise damaging products, materials, equipment, packaging, and surrounding surfaces.

1.6 STORAGE AND PROTECTION

- A. Products, materials and equipment shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive products, materials and equipment shall be stored in weather-tight climate controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.
- B. For exterior storage of fabricated products, materials and equipment, the products, materials and equipment shall be placed on sloped supports above ground. Products, materials and equipment subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.
- C. Loose granular materials shall be stored on solid flat surfaces in a well-drained area and shall be prevented from mixing with foreign matter.
- D. Storage shall be arranged to provide access for maintenance and inspection. The Contractor shall periodically inspect to assure products, materials and equipment are undamaged and are maintained under required conditions.

- E. Storage of materials and equipment in resource areas shall not be permitted.
- F. Material or equipment is not permitted to be stored on private property within approval from the property owner.
- G. No material or equipment to be stored within 25 feet of a street corner.

1.7 MAINTENANCE OF STORAGE

- A. Stored products, materials and equipment shall be periodically inspected. The Contractor shall maintain a log of inspections and shall make the log available on request.
- B. The Contractor shall comply with manufacturer's product, material and equipment storage requirements and recommendations.
- C. The Contractor shall maintain manufacturer-required environmental conditions continually.
- D. The Contractor shall ensure that surfaces of products, materials and equipment exposed to the elements are not adversely affected and that weathering of finishes and coatings does not occur.
- E. Products, materials and equipment shall be serviced on a regularly scheduled basis, and a log of services shall be maintained and submitted as a record document prior to acceptance by the Owner in accordance with the Contract Documents.
- F. Contractor to keep materials free of debris, trash and water.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Do not use materials and equipment removed from existing premises, except as specifically required by the Contract Documents.
- B. Where similar Products (such as grease fittings, flexible couplings, etc.) are used on different pieces of equipment or in different areas within the Work, standardize the Products by providing all Products from the same Supplier as specified by the Engineer.

2.2 GENERAL MATERIAL AND EQUIPMENT REQUIREMENTS:

- A. The following requirements shall constitute the acceptable minimum standards for the equipment specified herein. Should these requirements

conflict with the Supplier's recommendations or in any way be less stringent than the Supplier's requirements, they shall be superseded by the Supplier's requirements.

B. Sleeves:

1. Provided sleeves shall be of ample diameter to pass the pipe and its insulation, if any, and to permit expansion.
2. Provide sleeves that are flush at the walls and at the bottom of slabs. Sleeves must project one inch above the finished floor surface. Threaded nipples shall not be used as sleeves.

C. Protection against Electrolysis:

1. Where dissimilar metals are used in conjunction with each other, provide insulation between adjoining surfaces to eliminate direct contact and any resultant electrolysis. Provide bituminous insulation, heavy bituminous coatings, nonmetallic separators or washers, impregnated felt, or similar arrangement.

PART 3 - EXECUTION

3.1 GENERAL MATERIAL AND EQUIPMENT INSTALLATION REQUIREMENTS

A. The following requirements shall constitute the acceptable minimum standards for installing the equipment specified herein. Should these requirements conflict with the Supplier's recommendations or in any way be less stringent than the Supplier's requirements, they shall be superseded by the Supplier's requirements.

B. Sleeves and Openings

1. Provide all chases or openings for the installation of the Work, or cut the same in existing Work.
2. Provide all sleeves or forms at the Work, and set them as indicated and as specified, and in ample time to prevent delays.
3. Locate all chases, openings, and sleeves as specified and indicated. If the location is not specified or indicated, locate all openings to avoid interference with equipment and piping.
4. If openings and/or sleeves were not provided prior to concrete placements, the Contractor shall provide and set them afterwards at no additional cost to the Owner. Confine the cutting to the smallest extent possible. In no case shall piers or structural members be cut without the written consent of the Owner.

5. Fit around, close up, repair, patch, and point around the work specified herein to the requirements of the Owner.
6. Perform all of this work by workmen using small hand tools. Do not use power tools except where, in the opinion of the Owner, the type of tool proposed can be used without damage to any work or structures and without interference with the operation of any facilities. The Owner's concurrence with the type of tools shall not in any way relieve or diminish the responsibility of the Contractor for such damage, or interference resulting from the use of such tools.
7. Do not cut or alter the work of any subcontractor or any other contractor, nor permit any subcontractor to cut or alter the work of any other contractor or subcontractor, except with the written consent of the contractor or subcontractor whose work is to be cut or altered, and with the written consent of the Owner. All cutting and patching or repairing made necessary by the Contractor or any subcontractors shall be done at no additional cost to the Owner.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01600

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01630

RESTORATION OF GROUNDS AND CLEANING UP

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. The Contractor on or before the completion of the work, except as otherwise expressly required or permitted in writing by the Owner, shall tear down and remove and legally dispose of all temporary structures built or used by him; shall remove all rubbish and debris of all kinds from all Contract structures and from any grounds which he shall have occupied within the limits of the project site; shall leave the site of the work in a satisfactorily neat and clean condition; shall remove from the land all abandoned materials and plant; and shall leave the spoil areas and the property which may have been affected by his operations in a neat and satisfactory condition. Also included is the restoration of all private grounds, including lawns, landscaped areas, driveway aprons and walkways damaged or disturbed in connection with the new work not elsewhere specified. Unless otherwise specified, all materials salvaged and not required to be reused shall be the property of the Contractor, and shall be legally disposed of off the site of the work.
- B. Included in the work under this Section is the restoration, including replacement of damaged and disturbed shrubs and trees, retaining walls, of all grounds and grassed and landscaped areas removed or disturbed or damaged during the construction of the new work, including pipe laterals within private property areas, and storage and field office areas.
- C. Also included in the work under this Section is the furnishing of all labor, materials, and equipment required to remove, store, and reset or replace bumper posts, stone walls of all types, flagstone, brick, concrete, asphalt walks, fences of all types, railings, signs and sign posts, signal posts, mailboxes and such other miscellaneous objects damaged or disturbed during construction.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01630

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01701

PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes the requirements for project closeout including final clean up, closeout timetable, Owner's manual submittal, final submittals, maintenance and guarantee, and bonds.

1.2 FINAL CLEANUP

- A. The Contractor shall promptly remove from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction according to Specification Section 01630 – Restoration of Grounds and Cleaning Up. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final cleanup of the project site.
- B. The Contractor shall cleanup and restore all areas affected by staging, trailer(s) placement and parking. Restoration includes regrading, re-establishing topsoil and reseeding.

1.3 CLOSEOUT TIMETABLE

- A. The Contractor shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established as specified elsewhere in the Contract Documents.

1.4 FINAL SUBMITTALS

- A. The Contractor, prior to requesting final payment, shall obtain and submit the following items to the Engineer for transmittal to the Owner:
 - 1. Written guarantees, where required.
 - 2. Maintenance stock items; spare parts; special tools.
 - 3. CCTV video and report of pre and post-installation CCTV inspection for new drains and, if needed, completed storm drain main lining.
 - 4. O&M manuals of equipment as specified in Contract Documents.

5. Completed as-built / record drawings as described in Section 01200 GENERAL REQUIREMENTS FOR UTILITY WORK.
6. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
7. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

1.5 MAINTENANCE AND GUARANTEE

- A. The Contractor shall comply with the guarantee and warranty requirements contained in the General Conditions.
- B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the Contractor which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the Contractor shall have obtained a statement in writing from the affected private owner or public agency releasing the Owner from further responsibility in connection with such repair or resurfacing.
- C. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the Owner. If the Contractor fails to make such repairs or replacements promptly, the Owner reserves the right to do the Work and the Contractor and his surety shall be liable to the Owner for the cost thereof.

1.6 BOND

- A. The Contractor shall provide a bond to guarantee performance of the provisions contained in Paragraph "Maintenance and Guarantee" above, and of the General Conditions.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01701

SECTION 02010

SUBSURFACE INVESTIGATION

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section includes the basic requirements and expectations of the Contractor in all work pertaining to subsurface conditions.

1.2 GENERAL REQUIREMENTS

- A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the Work; the general and local conditions, particularly those bearing upon groundwater table or similar physical conditions at the site; the characterization and conformation of subsurface materials to be encountered; and all other matters that can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work.

1.3 SUBSURFACE DATA

- A. The findings of recent subsurface investigations are provided in the boring log information (included in the Appendix to these Specifications and as shown on the Drawings) and the analytical results of samples collected for waste characterization analyses are provided in the Appendix.
- B. Such data is offered in good faith solely for the purpose of placing the Contractor in receipt of information available. The Contractor shall interpret such data according to his own judgment, and acknowledges that he is not relying upon the same as accurately describing the actual subsurface conditions or quantities of materials that may be encountered. The Contractor further acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions to be actually encountered in performing the work covered by the Contract, even though such actual conditions may result in the Contractor performing more or less work than originally anticipated. In the event that quantities of waste soil/fill and related work as established in this Contract vary significantly from estimates provided, the unit bid prices will be the basis for compensation.
- C. Re-use of excavated soils on- or off-site is subject to local, state and federal regulations and as specified in Section 02080 – SOIL AND WASTE MANAGEMENT and 02095 – TRANSPORTATION AND DISPOSAL OF SOIL AND FILL.

- D. Additional subsurface investigation as may be warranted to satisfy a disposal facility's data requirements shall be the responsibility of the Contractor. Subsurface investigation activities shall not commence until a written work plan detailing the Contractor's approach for obtaining the data is approved by the Owner's Licensed Site Professional. The work plan must indicate the location and frequency of sampling; sampling parameters and sampling methodology. The Contractor shall allow a minimum of 14 days for review and comment.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02010

SECTION 02015

GEOTECHNICAL MONITORING AND INSTRUMENTATION

2015.1	VIBRATION MONITORING	LUMP SUM
2015.2	UTILITY MONITORING POINTS	EACH

PART 1 – GENERAL

1.1 SUMMARY

- A. Work in this Section shall include, but not be limited to, all materials, equipment, labor, and services required to install, protect, replace, monitor and report on geotechnical instrumentation specified herein.
- B. The work included in this section includes the following:
 - 1. Vibration monitoring shall be performed continuously during excavation, installation and removal of temporary earth support, and backfill and compaction for installation of the drain pipe and structures within Thorndike Street. One seismograph shall monitor vibrations adjacent to the nearest private property. Vibration levels shall not exceed the criteria indicated herein.
 - 2. Furnish, install, protect, replace, monitor and report on deformation monitoring points which shall include shoring monitoring points (SMPs) and utility monitoring points (UMPs).
 - a. SMPs shall be installed around the perimeter of the temporary excavation support walls within Thorndike Street
 - b. UMPs shall be installed at the approximate location shown on the drawings.
 - 3. At locations where structure and/or monitoring points are required on private property, the Contractor shall obtain a right of entry to obtain access.
 - 4. The Contractor shall retain the services of Geotechnical Monitoring Consultant and Surveyor to install, monitor, maintain and report on geotechnical instrumentation described herein and show on the Contract Drawings.
 - 5. Replace instrumentation damaged or made inaccessible by the construction operations at no additional cost to the Owner.

1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS.
1. Qualifications of Surveyor and Geotechnical Monitoring Consultant. The Surveyor and Geotechnical Monitoring Consultant shall be approved by the Engineer and must be approved two weeks prior to mobilization for construction.
 2. Shop drawings that indicate the instrumentation locations, sizes, material types, manufacturers' data and specifications, installation procedures, and other data. Provide description of work and materials. Provide description of methods to be used to monitor movement and/or settlement of exposed utilities.
 3. Contractor submittals shall be acceptable to the Engineer at least two weeks prior to undertaking the work. The Contractor shall forward submittals in advance considering that re-submittals may be required.
- B. A mitigation plan shall be submitted to the Engineer by the Contractor a minimum of one week prior to any excavation and installation of the excavation support system. The mitigation plan shall detail the Contractor's course of action in the event threshold or limiting response values are met or exceeded. Such mitigation plan shall be revised as appropriate for each instance threshold and/or limiting values are reached.
- C. The Contractor shall submit initial baseline survey data on a plan indicating locations and elevations of all instrumentation monitoring points to the Engineer at least three days prior to beginning of the installation of the excavation support and excavation operations.
- D. The Surveyor shall submit subsequent survey data on all instrumentation monitoring points to the Engineer prior to the beginning of work the following day. A faster turnaround of data reporting may be required by the Engineer if threshold or limiting response values, as specified in this Section, are approached or exceeded. Data shall be tabulated and depicted graphically on plots and show incremental and cumulative movement since the start of excavation.

1.3 QUALITY CONTROL

- A. The Contractor shall provide sufficient notice to the Engineer to allow the Engineer to be present to observe the Work. Cooperate with the Engineer in all respects to facilitate any testing or observations.
- B. The Contractor may conduct additional testing or monitoring for its own information, at no additional cost to the Owner.

- C. The presence of the Engineer (including observations and review of test results) shall not relieve the Contractor of its sole responsibility to perform the work in accordance with the Contract Documents, nor shall they be construed to relieve the Contractor from full responsibility for the means and methods of construction and for safety on the construction site.
- D. Work not in conformance with the specified requirements shall be improved, or removed and replaced, at no additional cost to the Owner. All costs related to testing of nonconforming Work or materials shall be paid for by the Contractor, at no additional cost to the Owner.
- E. Measure and report all data on movements of all deformation monitoring points to the nearest 0.01 ft.
- F. Retain the services of Geotechnical Monitoring Consultant to monitor the geotechnical instrumentation, which includes and is not limited to deformation monitoring points and vibration monitors. The consultant shall be a Geotechnical Engineer registered in the Commonwealth of Massachusetts and shall have demonstrated at least five years' experience and at least three projects of similar type, size, and complexity including installation and monitoring of surface settlement and vibrations with seismographs. The Geotechnical Monitoring Consultant shall adhere to all methods and standards described in this Specification.
- G. Retain the services of a Surveyor to monitor the deformation monitoring points, which includes and is not limited to ground surface, utility, and excavation support system monitoring points. The Contractor's Surveyor shall be registered in the Commonwealth of Massachusetts and shall have demonstrated at least 5 years' experience and at least three (3) projects of similar type, size, and complexity including installation and monitoring of surface vertical and horizontal displacement points. The Contractor's Surveyor shall be approved by the Engineer and must be approved two weeks prior to construction. The Contractor's Surveyor shall adhere to all methods and standards described in this Specification.

PART 2 – PRODUCTS

2.1 SHORING MONITORING POINTS

- A. Shoring monitoring points (SMPs) shall consist of an observable point punch marked on the top horizontal surface of the piles or sheeting. The surface within three inches of the point shall be cleaned by wire brush to permit easy identification of the exact point. The point shall be clearly identified using fluorescent spray paint adjacent to the point.

2.2 VIBRATION MONITORING

- A. Provide portable seismographs for monitoring the velocities of ground vibrations resulting from construction activities.
- B. The seismograph shall have the following minimum features:
 - 1. Seismic range: 0.01 to 10 inches per second with an accuracy of 5 percent and no more than a 3 db roll off at the low frequency end.
 - 1. Flat frequency response: 2 to 200 Hertz.
 - 2. Three component sensor.
 - 3. Fourth channel for air blast monitoring
 - 4. Two power sources: Internal rechargeable battery and charter and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for up to 24 hours.
 - 5. Capable of internal dynamic calibration.
 - 6. Direct writing to printer and to electronic memory that can be downloaded or saved to an external memory device. Instruments provided shall be capable of producing strip chart recordings of readings on site within one hour of obtaining the readings. Provide computer software to perform frequency analyses of data obtained on magnetic disks.
 - 7. Continuous monitoring mode must be capable of recording peak velocities.
- C. A factory calibration shall be conducted on all seismographs at the manufacturer's facility prior to shipment. Each factory calibration shall include a calibration curve with data points clearly indicated, and a tabulation of the data. Each instrument shall be marked with a unique identification number.

2.3 UTILITY MONITORING POINTS

- A. Utility Monitoring Points (UMPs) will be used to monitor vertical deformation of the existing utilities at the locations shown on the plans.
- B. Provide 2-inch PVC casing, threaded and coupled, as-needed.
- C. Provide No. 4 rebar, threaded and coupled, as-needed.
- D. Provide centralizers spaced at 3 feet maximum

- E. Installation borehole shall be backfilled with cement-bentonite grout.
- F. Provide a 6 inch (I.D.) cast iron road box cover.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Do not install any instruments until the Owner and the Engineer have been notified.
- B. Construction activity shall not commence until instrumentation installed within the vicinity of the work are set up.

3.2 INSTALLATION

A. Utility Monitoring Points (UMPs)

1. UMPs shall be installed at the locations shown on the plans.
2. Where necessary, the Contractor shall install the UMPs by the use of vacuum excavation exercising due diligence not to disturb or damage the utility being monitored and to minimize disruption and damage to adjacent areas.
3. The location of the utility in plan shall be determined and the excavation advanced to within a maximum of 2-feet above the utility. The Contractor shall be responsible for any damage to the utility during installation of the utility monitoring points.
4. After completion of installation, the as-built location in horizontal position shall be determined to an accuracy of 0.01-foot and in elevation to an accuracy of 0.01-feet.

B. Shoring Monitoring Points (SMPs)

1. SMPs shall be installed on the temporary excavation support walls within Thorndike Street.
2. SMPs shall be spaced at a minimum of one every 20 feet distributed uniformly around the perimeter of the temporary excavation support wall at locations proposed by the Contractor and accepted by the Engineer.
3. After completion of installation, the as-built location in horizontal position shall be determined to an accuracy of 0.01-foot and in elevation to an accuracy of 0.01-feet.

C. Seismographs

1. A seismograph shall be installed each day for each crew performing earthwork operations. The seismographs shall be installed adjacent to the nearest private property within 25 feet of the work. If there are no private properties within 25 feet, the seismograph shall be installed on a firm surface 25 feet from the work zone.
2. Vibration sensors shall be firmly mounted on the surface of concrete or asphalt, or firmly set in undisturbed soil.
3. The daily reports shall clearly describe the location of the seismograph relative to the work zone and the work performed in the vicinity on that date.

D. Formal Initial Readings

1. Obtain formal initial readings (FIRs) on all installed instruments for use as the baseline reference for the instrument. Before establishing the FIR for each instrument, a minimum of three readings shall be performed that demonstrate that changes resulting from the installation process have ceased. The three readings demonstrating that the installation has stabilized shall be performed on different days and may be used to establish the FIR.
2. Obtain the first initial baseline readings on SMPs, and UMPs no later than seven days prior to the start of installation of the temporary excavation support or excavation operations.
3. The FIR for a SMP or UMP will consist of the average of two survey measurements of elevation or horizontal offset with two independent set-ups. Where applicable, the initial readings shall be taken after allowing sufficient time for the grout or epoxy to set. Each reading other than the FIR shall consist of a single set of survey measurements. Reference all elevation readings to a deep benchmark. Reading accuracy shall be +/-0.01 foot. Report elevations to the nearest 0.01 foot.
4. The FIR (background reading) for a seismograph shall be performed prior to any vibration-producing construction activities to document background vibrations, and also at the start of vibration-producing construction activities to establish the maximum energy which can be used without surpassing acceptable vibration and overpressure levels at nearby facilities. The Contractor shall notify the Authority at least 24 hours prior to starting a new vibration-producing construction task. Monitoring during installation of temporary excavation support systems, pavement breaking, demolition, excavation, and other vibration-producing construction activity shall consist of recording

single-component peak particle velocities, which shall be printed on a strip chart. Continuous monitoring and full waveform data shall be recorded and submitted. During all monitoring of vibration-producing construction activities the Contractor shall document all events that are responsible for the measured vibration levels, and submit the documentation to the Authority with the data.

3.3 MONITORING

A. Monitoring Frequency

1. Vibration Monitoring

- a. Vibration monitoring shall be performed continuously during excavation, installation and removal of temporary earth support, and backfill and compaction for installation of the drain pipe and structures within Thorndike Street

2. Utility Monitoring Points

- a. Monitoring frequency shall be daily during installation of the temporary support of excavation.
- b. Thereafter, during all excavation, backfill and compaction activities, monitoring frequency shall be at a minimum daily for monitoring points located within 25 feet of the work and two times per week for monitoring points located within 100 feet of the work, unless otherwise directed by the Engineer or specified.

3. Shoring Monitoring Points

- a. Monitoring frequency shall be at a minimum daily during excavation; twice a week for the duration that the excavation remains open; and daily during backfill, and compaction activities unless otherwise directed by the Engineer or specified.
- b. Monitoring frequency shall be at a minimum two times per week thereafter until the support of excavation system is removed.
- c. Immediately following installation of each element of the lateral support system, the Surveyor shall establish a baseline parallel to each side of the excavation from which offset (horizontal displacement) measurements shall be made to the pile.

- d. Offset (horizontal position) monitoring of the temporary lateral earth support systems shall be made at least twice per week until the excavation is backfilled to within 2-ft of final grade, or as directed by the Engineer. A minimum accuracy of 0.01 ft. shall be maintained.
4. Monitoring frequency may be increased as required by the Engineer for some or all of the monitoring points if the threshold or limiting response values are approached or exceeded during the Work, at no additional cost to the Owner.
- B. After each set of readings is obtained, the data shall be sent to the Engineer within 24 hours, where the data will be reviewed and interpreted. The Contractor shall make its own interpretations for the data. The Contractor shall monitor and interpret data from additional instrumentation that it deems necessary to ensure the safety of its work. The Engineer is not responsible for the safety of the work based on its review of the instrumentation data.
- C. Reporting Data:
1. A plan showing location and numbering system for monitoring points shall be submitted to the Engineer prior to start of temporary excavation support installation and excavation operations, along with results of two initial baseline surveys.
 2. Tables of results of surveys shall be submitted prior to the beginning of work the following day. The table of survey results shall include the initial measurement, the current measurement, and the amount of movement since start of excavation.
 3. Survey data shall be depicted graphically on plots and submitted with the tabular results to show incremental and cumulative movement since the start of excavation.
- D. Criteria for “threshold” and “limiting” response values have been established as provided in the following table:

Instrument	Monitoring	“Threshold” Value	“Limiting” value
SMP	Vertical or horizontal movement	0.25 inches	0.5 inches
UMP	Vertical or horizontal movement	0.25 inches	0.5 inches
Seismograph	Vibrations in peak particle velocity	0.3 inches per second at frequencies of 60 Hz or less	0.5 inches per second at frequencies of 60 Hz or less

- E. The Contractor shall immediately notify the Engineer and shall take immediate steps to control further movement by revising construction procedures, providing supplemental bracing or other measures (working extended hours as approved or temporarily terminating work in the area of movement if necessary) as required if any of the following occur:
1. Field measurements indicate that any of the "threshold" movement criteria are reached or exceeded.
 2. Field measurements or observations indicate that significant or sustained wall movements, beyond those reasonably expected, are occurring (total movement may be less than the "Limiting" movement criteria).
 3. Movements of adjacent structures, utilities or other facilities are detected.
- F. If "Limiting" movements are being approached or reached, the Owner may require the Contractor to temporarily suspend the work in the area where such movement is occurring and implement all necessary mitigation measures which are satisfactory to the Engineer, to arrest the movements, at no cost to the Owner.
- G. Installation of Work in the area where the Limiting Values had been reached shall not be permitted until the results of optical surveys indicate no increase in lateral movement of the earth support system and adjacent surface and building settlement for the one-week period immediately prior to resuming construction.
- H. These criteria are intended to establish a minimum basis for the Contractor's design and procedures and do not relieve the Contractor of its responsibility for preventing detrimental movements and damage to adjacent structures, utilities or other work.
- I. The Contractor shall pay a penalty \$1,000 for each day the Contractor works in violation of any threshold or limiting values being reached or exceeded as determined by the Engineer.
- J. In the event the Contractor does not comply with the approved mitigation plan, or continues to work in violation of threshold or limiting values being reached or exceeded, the Contractor shall not be allowed to continue work until proper mitigation procedures and corrections have been made as required by the Owner and Engineer.
- K. The Contractor shall be responsible for repairing all property damage caused by construction activities.

SECTION 02051

DEMOLITION, MODIFICATION, AND ABANDONMENT

2051.1	DISPOSAL OF CONSTRUCTION DEBRIS AS SOLID WASTE	TON
2051.2	DISPOSAL OF BITUMINOUS CONCRETE	TON
2051.3	DEMOLITION OR REMOVAL OF INFILTRATION BASIN, CATCH BASIN, OR MANHOLES	EACH
2051.4	MBTA SLURRY WALL MODIFICATION AND RESTORATION	LUMP SUM

PART 1 – GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all plant, labor, tools, equipment, materials, and supplies as required for utility and structure removal, demolition, modification, and/or abandonment as specified.
- B. The Work of this Section shall include the following significant items; all other activity shown on the Drawings; and work necessary and defined herein pertaining to the project area: removal of pavement; removal of existing manholes; removal of existing pipe; and selective demolition.

1.2 RELATED DOCUMENTS

- A. Section 02080 – SOIL AND WASTE MANAGEMENT
- B. Section 02095 – TRANSPORTATION AND DISPOSAL OF SOIL AND FILL
- C. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING
- D. Section 02590 – BRICK MASONRY
- E. Section 02160 – TEMPORARY EXCAVATION SUPPORT SYSTEMS

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
1. Removal and abandonment procedures that shall provide for safe conduct of the Work, careful removal and disposition of materials and equipment, protection of utilities, structures, property, or other features which are to remain undisturbed and coordination with existing utilities or owners responsible for those nearby elements to remain in service.
 2. A detailed work plan to include a list of items to be removed and/or abandoned, a sequence and schedule, and a list of salvageable materials and equipment.
 3. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
 4. Schedule of Selective Demolition, Modification and Abandonment Activities subject to approval by the Owner and Engineer. Indicate the following:
 - a. Detailed sequence of selective demolition, modification and abandonment work, with starting and ending dates for each activity. Ensure the Owner's operations are uninterrupted.
 - b. Interruption of utility services.
 - c. Coordination for shutoff, capping, bulkheading and continuation of utility services.
 - d. Proposed materials, construction details, locations of temporary utilities, abandonment materials, and means of access.
 - e. Coordination of Owner's continuing use of portions of utilities, structures, property or other features and of Owner's partial occupancy of completed Work.
 5. Additional Submittals for Selective Demolition, Modification, and Abandonment Activities

- a. Inventory: After selective demolition or modifications are complete, submit a list of items that have been removed and salvaged.
 - b. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining utility construction and site improvements that might be misconstrued as damage caused by selective demolition or modification operations. Submit before Work begins.
 - c. Landfill Records: Indicate receipt and acceptance of all wastes by disposal facility licensed to accept the wastes to be disposed.
6. Plugs and Bulkheads
- a. If temporary pneumatic or hydro plugs are proposed the Contractor shall submit the method and procedure of maintaining bladder pressure.

1.4 REPAIR OF DAMAGE

- A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner.
- B. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this Contract.

1.5 PROTECTION OF EXISTING WORK

- A. Before beginning any cutting, trenching or demolition work, the Contractor shall carefully review the work sequence and examine the Drawings and Specifications to determine the extent of the Work. The Contractor shall take all necessary precautions to prevent damage to existing facilities, which are to remain in place, and be responsible for any damages to existing facilities, which are caused by the operations. Damages to such work shall be repaired or replaced to its existing condition at no additional cost to the Owner. The Contractor shall carefully coordinate the work of this Section with all other work and shall provide shoring, bracing, and supports, as required. The Contractor shall insure that structural elements are not overloaded or compromised and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this

Contract. The Contractor shall remove all temporary protection when the work is complete.

- B. The Contractor shall carefully consider all bearing loads and capacities for placement of equipment and material on site. In the event of any questions as to whether an area to be loaded has adequate bearing capacity, the Contractor shall consult with the Owner prior to the placement of such equipment or material.

1.6 JOB CONDITIONS

- A. The Owner assumes no responsibility for actual condition of the facilities to be removed, abandoned or modified. The Contractor shall visit the site; inspect all facilities to get familiarized with all existing conditions and utilities.
- B. The Owner may occupy portions of the utilities, structures, properties or other facilities immediately adjacent to selective demolition area. Conduct selective demolition, modification and abandonment so Owner's operations will not be disrupted. Provide not less than 24 hours notice to Owner of activities that will affect Owner's operations.
- C. Owner assumes no responsibility for condition of the utilities, structures, properties or other facilities to be selectively demolished.
- D. If materials suspected of containing hazardous or asbestos materials are encountered, do not disturb; immediately notify Engineer.
- E. Storage or sale of removed items or materials on-site will not be permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition, modification and abandonment operations.

1.7 QUALITY ASSURANCE

- A. Comply with Section 01400 - QUALITY CONTROL
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Pre-Demolition, Modification, and Abandonment Conference: Conduct conference at Project site, which includes Owner and Engineer. Review methods and procedures related to selective demolition.

- D. Review and finalize selective demolition, modification and abandonment schedule and verify availability of materials, labor, equipment, and facilities needed to make progress and avoid delays.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Comply with material and installation requirements specified in individual Specification Sections.

2.2 MATERIALS OWNERSHIP

- A. Coordinate with Engineer and Owner, who will make final determination as to whether an item is to be salvaged or removed. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

2.3 REPAIR MATERIALS

- A. Use repair materials identical to existing materials. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible. Use repair materials whose installed performance equals or surpasses that of existing materials.

2.4 WATERPROOFING MEMBRANE

- A. Contractor shall use waterproofing membrane SikaBit S-60 or approved equal per the manufacturer's installation instructions and per the Contract Drawings for restoring removed or damaged waterproofing on the MBTA slurry walls. Contractor shall verify the waterproofing membrane can adhere to the existing below grade MBTA Slurry Wall.

PART 3 – EXECUTION

3.1 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

3.2 PREPARATION FOR WORK

- A. Verify that utilities have been disconnected and capped, shut-off, or bulk headed. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition, modification and abandonment required. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- B. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.
- C. Engage a professional engineer to survey condition of structures to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- D. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- E. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition, modification, and abandonment operations.

3.3 SITE ACCESS, TEMPORARY FACILITIES AND PROTECTION

- A. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used utilities, structures, properties or facilities.

- B. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
- D. Protect existing site improvements, appurtenances, and landscaping to remain.
- E. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
- F. Temporary Facilities: Provide temporary barricades and other protection required for demolition security and to prevent injury to people and damage to adjacent utilities, structures, properties and facilities to remain.
- G. Provide protection to ensure safe passage of people around the area.
- H. Temporary Shoring: Provide and maintain in accordance with Section 02160 - TEMPORARY EXCAVATION SUPPORT SYSTEMS.
- I. Strengthen or add new supports when required during progress of selective demolition.
- J. Existing landscaping materials, structures, pipes and appurtenances, which are not to be removed/abandoned shall be protected and maintained as required by the Engineer and as specified.

3.4 POLLUTION CONTROL

- A. Water sprinkling, temporary enclosures, and other suitable methods shall be used to limit dust and dirt rising and scattering in the area. Comply with government regulations pertaining to environmental protection. Water shall not be used when it creates hazardous or objectionable conditions such as ice, flooding, or pollution.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.5 CLEANING

- A. During and upon completion of work, the Contractor shall promptly

remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by work in a clean, approved condition.

- B. All areas shall be cleaned of dust, dirt, and debris caused by demolition, modification, or abandonment and adjacent areas returned to conditions existing prior to start of work.

3.6 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition, modification and abandonment operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
- C. Provide at least 72 hours notice to Owner if shutdown of service is required during changeover.
- D. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished or abandoned.
- E. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition, relocation or abandonment, and that maintain continuity of service to other parts of building.

3.7 DEMOLITION AND ABANDONMENT PROCEDURES

- A. Disposal of all materials shall be performed in compliance with applicable local, state, and federal codes and requirements. Provide labor, equipment, and materials to perform work as specified and indicated.
- B. The Contractor shall flush all pipe and structures to be removed or abandoned to remove solids and objectionable material prior to commencing demolition, modification, or abandonment.
- C. When existing pipe is removed, the Contractor shall plug all resulting abandoned connections whether or not shown. Where removed piping is exposed, the remaining piping shall be fitted with a removable cap or plug, or bulk headed. Where existing piping, to include catch basin laterals, is to be abandoned, the Contractor shall cut back the abandoned pipe for a

distance of 5 feet from any connecting structures to remain. Pipes to be abandoned in structures to be abandoned may be capped, plugged or bulk headed from inside the structure. All holes at the existing structures shall be repaired. Abandoned pipe smaller than 15 inches diameter shall be capped or plugged at both ends, where accessible, prior to backfill. Abandoned pipe 15 inches diameter and larger shall be filled with Controlled Density Fill (CDF) prior to being capped, plugged, or bulk headed and backfilling unless otherwise noted. Each pipe reach to be abandoned with CDF shall be filled with CDF from the up gradient end of the pipe reach wherever possible. The CDF shall completely fill each pipe reach and flow out the other end. The Contractor can aid the flow of the CDF in the pipe by providing a temporary structure at the access point to build up head or by pumping the CDF or by providing vibration in the pipe reach or access point. Requirements for Controlled Density Fill are described in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

- D. Where existing drainage structures such as catch basins, drain manholes, sewer manholes, and combined sewer manholes are to be abandoned in place, the Contractor shall remove the frames, grates, and covers and cut the structures down a minimum of 2 feet below final grade. The Contractor shall put a minimum of four, 2-inch diameter drainage holes in the invert of each structure and then backfill the structure with control density fill or compacted sand as specified and as approved by the Engineer. Backfill around the structure shall be in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.
- E. Permanent plugs shall be constructed of Class B concrete, brick or other material approved by the engineer.
- F. Fill excavations with solid fill resulting from earth removal operations and/or with select borrow material in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING. Final grade to be restored in kind unless otherwise noted.
- G. Exercise precautions for fire prevention. Make fire extinguishers approved for Class A, B and C fires available at all times in areas where performing demolition or abandonment work with burning torches. Do not burn demolition debris on site.

3.8 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to

complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings, joints and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
3. Maintain adequate ventilation when using cutting torches.
4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
5. Dispose of demolished items and materials promptly.
6. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
7. Existing Facilities: Comply with Owner's requirements for using and protecting utilities, structures, properties and other facilities.

B. Removed and Salvaged Items: Comply with the following:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items: Comply with the following:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.9 REHABILITATION/MODIFICATION PROCEDURES

- A. Certain areas of existing piping, conduits, and the like will be affected by work necessary to complete modifications under this Contract. The Contractor shall be responsible to rehabilitate those areas affected by his construction activities.
- B. When new piping is installed in existing manholes, catch basins or other structures, the Contractor shall accurately position core-drilled openings in the concrete as shown or otherwise required. Openings shall be of sufficient size to permit a final alignment of pipelines and fittings without deflection of any part and to allow adequate space for satisfactory installation of a flexible connector to ensure water tightness around openings so formed.
- C. When new piping is to be connected to existing piping, the existing piping shall be cut square and ends properly prepared for the connection shown. Any damage to the lining and coating of the existing piping shall be repaired by the Contractor.
- D. At locations where existing piles are to be reused to replace the existing sewer or drain, the Contractor shall verify that the wood pile is not deteriorating. If wood piles scheduled for reuse are found to be in good condition, the piles shall be trimmed and capped with a concrete pile cap as indicated in the Contract Drawings. If wood piles scheduled to remain in place are found to be deteriorating, the Contractor shall notify the Engineer immediately.

3.10 DISPOSAL OF REMOVED/DEMOLISHED MATERIALS

- A. The Contractor shall prepare and transport all demolition debris, materials, refuse, and abandoned equipment to an approved disposal site as part of the work under this section. All costs associated with the proper performance of this work shall be included in the appropriate Bid Items and at no additional cost to the Owner.
- B. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site. Demolition material shall be reused as fill to the extent possible. Removal of demolition debris, not utilized as fill, shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the Owner. Alternate routes shall be provided around closed or obstructed traffic ways.
- C. Burning: Do not burn demolished materials.
- D. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.11 REPAIR OF DAMAGE

- A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this Contract.
- B. Promptly repair damage to adjacent construction caused by selective demolition operations.
- C. Patching: Comply with Section 01045 - CUTTING AND PATCHING.
- D. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- E. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

PART 4 – COMPENSATION

Item 2051.1 - Disposal of Construction Debris as Solid Waste

METHOD OF MEASUREMENT:

Bike Path Retaining Wall and Drain DEMOLITION, MODIFICATION, AND
Somerville, MA ABANDONMENT
20171752.002 02051-12

Measurement for payment for Disposal of Construction Debris as Solid Waste shall be on the basis of Tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip. Solid Waste disposed of for which return manifests or certified weight slips have not been submitted will not be paid for.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Disposal of Construction Debris as Solid Waste shall be based on the per ton price bid for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to Dispose of Construction Debris as Solid Waste. The work includes, but is not limited to; handle, load, transport, stockpile, weigh and dispose at an appropriately permitted facility; all cobbles, rail, timber, brick, cement concrete, metals, granite curb, edging, inlets and corners, plastic, or other construction debris; and all fees, permits, taxes, sampling, testing and analysis required by the facility.

SPECIAL NOTES ON EXCLUSIONS:

The excavation and removal of the items listed above for disposal are not included herein but are included for payment elsewhere. This is a disposal item only. Soils are not included for payment herein but are included for payment in the appropriate soil disposal item. Soil weight excavated and disposed with Construction Debris due to poor segregation techniques shall be estimated by the Engineer and deducted from the total weight disposed. Disposal of bituminous concrete is not paid for herein but is included for payment elsewhere. Bituminous Concrete weight excavated and disposed with Construction Debris due to poor segregation techniques shall be estimated by the Engineer and deducted from the total weight disposed. Payment for the disposal of abandoned or relocated existing gas, telephone, electric, cable TV, telecommunications, fire alarm and traffic signal utilities shall NOT be paid herein or separately elsewhere and are considered “incidental” to the Contract, with costs to be carried in the Contractor’s base bid. Disposal of concrete and brick sidewalks, driveways, and handicap ramps removed and disposed of is not included herein but is carried under the unit price for the construction of the new sidewalks, driveways and handicap ramps.

Item 2051.2 - Disposal of Bituminous Concrete

METHOD OF MEASUREMENT:

Measurement for payment for Disposal of Bituminous Concrete shall be on the basis of Tons of bituminous concrete actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip. Bituminous Concrete disposed of for which return manifests or certified weight slips have not been submitted will not be paid for.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Disposal of Bituminous Concrete shall be based on the per ton price bid for this item in the proposal. Under the per ton price for this item, the Contractor shall

furnish all labor, materials, tools, equipment, and incidentals required to Dispose of Bituminous Concrete. The work includes, but is not limited to; handle, load, transport, stockpile, weigh and dispose at an appropriately permitted facility all bituminous concrete; and all fees, permits, taxes, sampling, testing and analysis required by the facility.

SPECIAL NOTES ON EXCLUSIONS:

The excavation and removal of bituminous concrete is not included herein. The excavation of bituminous concrete is considered incidental to the contract and is not included for separate payment unless otherwise specified. This is a disposal item only. The disposal of brick at existing brick sidewalks is not included herein, but is included for payment elsewhere. Soils are not included for payment herein but are included for payment in the appropriate soil disposal item. Soil weight excavated and disposed with Bituminous Concrete Pavement due to poor segregation techniques shall be estimated by the Engineer and deducted from the total weight disposed. Disposal of construction debris as solid waste is not included for payment herein but is included for payment elsewhere.

Item 2051.3 - Demolition or Removal of Infiltration Basin, Catch Basin or Manholes

METHOD OF MEASUREMENT:

Measurement for payment for Demolition or Removal of Infiltration Basin, Catch Basin or Manholes shall be on the basis of the number of individual lamp holes, manholes, catch basins or other structures demolished or removed complete as measured by the Engineer. Infiltration basins, catch basins or manholes that are partially demolished or removed for the Contractor's convenience, or not fully removed or demolished where indicated in the Contract Documents, will be at the Contractor's expense and at no additional cost to the Owner.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Demolition or Removal of Infiltration Basin, Catch Basin or Manholes shall be based on the number of individual manholes, catch basins or other structures demolished or removed complete for this item in the proposal. Under the per each price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Demolition or Removal of Lamp Hole, Manhole, Catch Basin or Other Structure. The work includes, but is not limited to: saw cutting existing bituminous and cement concrete; excavation; furnishing and placing backfill per one of the approved methods; furnish and install filter fabric as required; compaction and compaction testing; temporary excavation support furnished and installed complete; construction dewatering; disconnecting existing pipe, services and other connections; removal or demolition of the manhole, catch basin or other structure; masonry plugs in the disconnected pipe not specified for payment elsewhere; remove and stack or remove and dispose existing castings as required; salvage of materials specified; stockpile of salvaged materials and delivery of materials identified as to be salvaged to a location designated by the Owner.

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item but are included for separate payment elsewhere; disposal of construction debris as solid waste; demolition and removal of pipes; abandonment of manholes, catch basins or other structures.

The demolition of existing, abandoned or relocated gas, electric, telephone, cable TV, fire alarm, traffic signal, or telecommunications structures and utilities are not included for payment herein or elsewhere but are considered incidental to the Contract and the Contractor shall carry costs in the base bid as necessary.

2051.4 - MBTA Slurry Wall Modification And Restoration

METHOD OF MEASUREMENT:

Measurement for payment for MBTA Slurry Wall Modification and Restoration will be on a percent of the Lump Sum bid based on the percentage of the work completed as calculated or otherwise approved by the Engineer.

BASIS OF PAYMENT/INCLUSIONS:

Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete selective removal and restoration of the MBTA Slurry Wall, or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: sawcutting into the existing slurry wall; removing concrete, preparation of the wall; installing waterproofing membrane; sand backfill; notification and coordination with the MBTA inspector on site, adhering to conditions and requirements contained in the MBTA License for this work.

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item but are included for separate payment elsewhere; excavation; disposal of construction debris as solid waste; trench restoration materials.

END OF SECTION 02051

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 02080

SOIL AND WASTE MANAGEMENT

2080.1 **OHM - SOIL AND WASTE MANAGEMENT** **LUMP SUM**

PART 1 – GENERAL

1.1 QUALIFICATIONS

- A. The Contractor shall be experienced and knowledgeable and have the trained and qualified personnel needed to conduct the work as specified herein

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.
- B. The following documents are available for review at the office of the Owner, 1 Franey Road, Somerville, MA 02145, and appended to the technical specifications in Appendices.
 - 1. “Somerville Bike Path and Drainage Environmental Conditions (Thorndike Street)”, dated February 17, 2017.

1.3 OBJECTIVE AND OVERVIEW

- A. This Section includes furnishing all plant, labor, equipment, appliances, and materials, and performing all operations in connection with the handling, treating, stockpiling, transporting, and disposal and/or reuse of soil and associated fill and waste material resulting from the construction operations as specified.
- B. This Section also includes requirements for handling spills of contaminated and/or hazardous materials.
- C. The objective of soil management practices is to handle all soil and fill excavated during this contract in accordance with applicable state, federal and local regulations and bylaws and to implement off-site soil management in a cost-effective manner. The Contractor shall reuse excavated soils on-site and in the general area of excavation to the maximum extent possible and minimize the volume of material to be disposed off-site.
- D. This Section includes protocol for handling and management of waste materials, including, but not limited to, construction debris, municipal waste, boulders, soil, fill, ash, rubble, and empty or crushed drums and/or drum

parts. The Contractor shall provide the services of an Environmental Professional qualified to coordinate all soil/fill-handling activities with the Owner or Engineer and/or their representative.

- E. In the course of the work, it may be necessary to excavate and handle potentially contaminated soil/fill. The soil/fill management practices specified herein apply to all soil/fill excavated during the course of this contract. To the extent possible, the Contractor shall reuse geotechnically suitable excavated material prior to using imported backfill to reduce the volume of material to be disposed off-site. Imported backfill shall be used only as accepted by the Engineer.
- F. Excavation and management of project soils and groundwater shall be conducted in accordance with:
 - 1. A release-specific Utility-related Release Abatement Measure (URAM) Plan to be prepared by the Owner's Licensed Site Professional (LSP) and submitted to MassDEP by the City of Somerville DPW in the event that an unanticipated release is encountered; and
 - 2. The Memorandum "Somerville Bike Path and Drainage Environmental Conditions (Thorndike Street)", dated February 17, 2017 and attached to these specifications.
- G. All work shall be conducted in compliance with the following Contractor-prepared plans, which may be combined as appropriate so long as all requirements of each Plan are incorporated and distinct:
 - 1. Site-Specific Health and Safety Plan;
 - 2. Soil Management Plan;
 - 3. Equipment and Personnel Decontamination Plan;
 - 4. Dust, Vapor and Odor Control Plan;
 - 5. Air Monitoring and Quality Control Plan; and
 - 6. Spill and Discharge Control Plan.

1.4 DEFINITIONS

- A. Area of Contamination: For the purpose of managing soil which is RCRA hazardous waste, the area of contamination is the contiguous area within which the waste has been identified.
- B. Area of Excavation: For the purposes of reusing soil/fill on-site, the *area of excavation* is considered to be the approximate area in which the soil/fill was removed provided that area is consistent in soil strata, color, texture, geotechnical properties and has substantially similar visual and olfactory characteristics as accepted by the Engineer. Soil/fill returned to the *area of*

excavation shall be placed approximately in the same horizontal and vertical location from which it originated

- C. Excavation: The removal of materials encountered to the elevation and width limits indicated in the Contract Drawings, Specifications, or as directed by the Engineer.
- D. Fill (Historic Fill): Fill, also known as historic fill or miscellaneous fill, is defined as a mixture of soil and other materials which have been located in the area through man-made processes primarily for the purpose of grading, backfilling or filling in low areas. Materials commonly associated with historic fill include, but are not limited to; coal, glass, brick, ash, wood fragments and other similar granular materials. Historic fill shall not include boulders, ledge, consolidated rock, asphalt pieces, concrete, railroad timbers, rail, cobblestones or other abandoned building materials that would preclude the disposal of the urban fill as daily cover at a landfill.
- E. Hazardous Waste:
 - 1. Defined in 310 CMR 40.0006; or
 - 2. Defined in 40 CFR 261.3.
 - 3. A waste, or combination of wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may:
 - a. Cause or significantly contribute to an increase in mortality or cause or significantly contribute to an increase in a serious irreversible or incapacitating reversible illness; or
 - b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.
- F. Peat: A substance of vegetable origin, consisting of roots and fibers, moss, etc., in various stages of decomposition, and found as a kind of turf or bog. Peat shall be considered natural soil when it is encountered in small amounts (layers 1-foot (304.8 mm) or less in thickness) and when it is impractical to separate the peat from the natural soil or urban fill strata. Otherwise, peat shall be considered a distinctive stratum.
- G. Sediment: All detrital and inorganic or organic matter situated on the bottom of lakes, ponds, streams, rivers, the ocean, or other surface water bodies.
- H. Soil Classification Categories: Unless specifically stated otherwise terms used in this specification are as defined in the MCP, 310 CMR 40.0006. The following definitions and soil classifications apply to these specifications:

1. (Class A) Any soil or fill material which has concentrations of chemicals < RCS-1 Reportable Concentrations established by 310 CMR 40.0300 and 40.1600.

Class A soils may be reused at a the following types of facilities: Managed Fill Site (operating under an Administrative Consent Order (ACO) issued by MassDEP, unless otherwise approved by the owner); or a permitted landfill, provided that in all cases, the excavated soil analyte concentrations meet the acceptance criteria established by the facility and that disposal of soil at the receiving facility will not result in an exceedance of an RC applicable at the point of disposal and which would require notification of a release pursuant to 310 CMR 40.0300. Soils not exhibiting evidence of contamination or soils determined through laboratory chemical analysis to be Class A soils may also be reused in the area of excavation.

Soil/fill with OHM concentrations \geq RCS-1, but which have been confirmed by the Owner's LSP to contain asphalt as a result of historic road construction or filling operations, and therefore exempt from notification requirements, may be categorized as Class A at the discretion of the Owner's LSP.

Class A soil may be reused as common fill/ordinary borrow provided it also meets the physical requirements as specified herein and as specified in Section 02210 - Earth Excavation, Backfill, Fill and Grading. Class A soil may be used in gravel processing facilities provided the soil analytical data is comparable to materials being used by the facility and such use is approved by the Engineer.

Class A soil /fill which is reused or disposed of off-site shall be transported under a Material Shipping Record (MSR). Management of Class A soils shall be conducted in conformance with the MassDEP Similar Soils Provision Guidance – WSC#-13-500 (2014).

2. (Class B) Contaminated: Any soil or fill material which contains oil or hazardous materials at concentrations equal to or greater than (\geq) a release notification threshold established by 310 CMR 40.0300 and 40.1600, regardless of whether it is exempt from notification.

Any soils exhibiting either petroleum or chemical odor or visual indications of oil or hazardous materials as accepted by the Engineer shall be handled as potentially contaminated soils. Potentially contaminated soils can be reused within the area of excavation without first performing laboratory analyses, with the approval of the Owner's LSP. Any excavated soil/fill material which is not reused within the area of excavation, must be characterized prior to reuse. After analytical results are available, soil/fill shall be handled in accordance with the type and degree of contamination (if any) present in the

soil/fill. Surplus soil/fill which may be contaminated shall be segregated by the Contractor. Potentially contaminated soils shall not be mixed with soils not exhibiting either petroleum or chemical odor or visual indications of oil or hazardous materials. Soil/fill which has been staged and characterized can be reused within the area of excavation or elsewhere on site provided the material has been characterized by laboratory analysis and has equal or less contamination than the point where it is to be reused.

3. Class B soil which cannot be reused on site shall be reused off-site, recycled, or disposed of at a permitted facility. Subcategories of Class B, which establish off-site management requirements, are defined as follows:
 - a. Class B-1: Soil and Fill that meet all applicable criteria (i.e., Massachusetts Department of Environmental Protection (MassDEP) Policy # COMM 97-001 - Reuse and Disposal of Contaminated Soil at Massachusetts Landfills Policy, and/or facility-specific permit requirements) for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state unlined landfills. Note: per COMM 97-001, sediments may not be re-used as Class B-1.
 - b. Class B-2: Soil and Fill that meet all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state lined landfills.
 - c. Class B-3: Soil and Fill that meet all applicable criteria for recycling at an asphalt batching plant and/or the specific licensing requirements for the proposed recycling facility.
 - d. Class B-4: Soil and Fill that contain concentrations of contaminants that exceed in-state, lined, and unlined landfill reuse criteria as well as asphalt batching acceptance criteria, but meet the criteria for regional thermal treatment facilities, and are not classified as a RCRA Hazardous Waste.
 - e. Class B-5: Soil and Fill that contain concentrations of contaminants that exceed in-state, lined and unlined landfill reuse criteria or which require removal to regional disposal facilities and which is not classified as RCRA Hazardous Waste.
 - f. Class B-6: Soil and fill which does not meet one of the designations above due to excessive foreign materials and/or debris and which is not classified as a hazardous waste.
4. (Class C) Hazardous Waste: A waste, or combination of wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or cause or significantly contribute to an increase

in a serious irreversible or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Also included within the definition of hazardous waste is hazardous waste as defined 310 CMR 40.0006 and 40.CFR 261.3. Hazardous waste, as defined in 40 CFR 261.3, is a solid waste that exhibits any of the characteristics of hazardous waste in excess of regulation levels presented in 40 CFR 261, subpart C and/or that is listed in 40 CFR 261, subpart D; that is a mixture of solid and hazardous waste; or that is derived from a listed waste.

Soil having or suspected of having the characteristics of a hazardous waste or of containing a listed hazardous waste shall not be removed from the excavation or staged at another location except at the direction of the Engineer. Subcategories of Class C shall be as follows:

- a. Class C-1: Soils classified as hazardous waste that can be treated on-site to eliminate the toxicity characteristic (e.g., for lead).
 - b. Class C-2: Material determined to contain "listed" or "characteristic" hazardous waste constituents which cannot be treated on-site. Land disposal of hazardous soil is prohibited until the soil has been treated to meet Land Disposal Restrictions (LDR) standards pursuant to 40 CFR 268.48. This material must be transported to an out-of-state approved RCRA permitted disposal or treatment facility under a Uniform Hazardous Waste Manifest. Land disposal following achievement of the Uniform Treatment Standards (UTS) shall be at a RCRA landfill.
- I. **Special Waste**: means any solid waste that is determined not to be a hazardous waste pursuant to 310 CMR 30.000 and that exists in such quantity or in such chemical or physical state, or any combination thereof, so that particular management controls are required to prevent an adverse impact from the collection, transport, transfer, storage, processing, treatment or disposal of the solid waste. Asbestos and PCB-contaminated soils/fill (at regulated concentrations) are examples of special waste categories.
- J. **Soil (Natural Soils)**: Soil, otherwise known as natural soil, is defined as unconsolidated sand, gravel, silt and clay, and the organic material which has become part of the unconsolidated soil matrix.
- K. **Over Excavation**: Consists of removal of materials beyond indicated elevations and width limits indicated in the Contract Documents without direction of the Engineer. Over-excavation material handling, transportation and disposal, backfilling and compaction shall be at the Contractor's expense. Over-excavations shall be backfilled and compacted as specified for excavations of the same class, unless otherwise directed by the Engineer.

- L. Unknown Materials: Any material, that is not readily identifiable as non-hazardous waste, and which has not been previously characterized or encountered during site investigation activities. The Unknown Material classification is to be used in the event that an unexpected, unusual material is encountered for which special handling procedures shall be required in order to handle the material safely. Such wastes include but are not limited to:
 - 1. Unlabeled drums or containers containing material which is not readily identifiable as a non-hazardous substance.
 - 2. Any material which varies significantly from material previously observed on site and which cannot be readily identified as a non-hazardous.
 - 3. Waste material of unusual color or odor or material with indications of hazardous levels (e.g. exceeding OSHA permissible exposure limits) of contaminants as evidenced on an organic vapor monitor or other similar instrument.

The Owner reserves the right to apply generator knowledge to classify and profile the material as a previously encountered waste or as a known waste. In the event that a material is encountered which the Contractor is uncertain as to its nature, the Owner or their representative shall assess the material with the Contractor and direct the Contractor as to the nature of the material being known or unknown.

1.5 WORK INCLUDED

- A. Managing excavated soil and fill material, including disposal and/or reuse of excavated soil and fill material.
- B. The Contractor's Environmental Professional shall characterize all excavated soil and fill material prior to off-site reuse or disposal. Characterization requirements may vary depending on the site selected to receive soil suitable for reuse or the disposal facility permits and policies. Precharacterization data collected by the Owner's LSP may be used; however, the Contractor is responsible for final waste characterization and shall determine if any additional waste characterization is required. The Owner shall not be responsible for any additional for soil characterization.
- C. Characterization of soil, fill, and unknown material for disposal/reuse purposes, including; field screening and soil management/segregation; temporary storage/staging; and laboratory analysis (as may be necessary for unknown materials and/or for compliance with receiving facility requirements). Where additional analysis is required, metal analysis shall be for MCP 14 metals.

All laboratory chemical analyses conducted shall utilize currently accepted U.S. EPA and applicable state agency analytical protocols and procedures. Laboratory chemical analysis reports shall meet MassDEP Compendium of Analytical Methods (CAM) requirements for analysis which have published CAM requirements. The MassDEP MCP Analytical Method Protocol Certification Form shall be provided by the Laboratory with all sample results. TCLP analysis shall be conducted for any analyte for which the RCRA “rule of twenty” is exceeded.

- D. Management of contaminated groundwater: If groundwater potentially impacted by OHM, based on visual or olfactory evidence, is encountered in the course of the work and dewatering is required, discharge permits, modification of discharge permits, and/or groundwater treatment may be necessary depending upon the discharge method(s) and/or location(s) utilized by the Contractor. The Owner and Engineer shall be notified by the Contractor if groundwater potentially impacted by OHM is identified.
- E. All work at the site must be performed in accordance with all applicable federal, state, and local regulations, permits and licenses, including, but not limited to:
1. The applicable parts of the Code of Federal Regulation (CFR) Title 40: Protection of Environment, pertaining to the Comprehensive Environmental Response and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA), RCRA, Toxic Substances Control Act (TSCA), and the National Emission Standards for Hazardous Air Pollutants (NESHAPS) as regulated by the U.S. Environmental Protection Agency (U.S. EPA);
 2. State regulations specified in the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000), and Massachusetts General Law 21E - Massachusetts Oil and Hazardous Materials Release Prevention and Response Act, and applicable Massachusetts Department of Environmental Protection (MassDEP) guidelines and policies;
 3. MassDEP Technical Update. Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil (2002)
 4. Department of Transportation (DOT) regulations 49 CFR, and state transportation licenses and permits;
 5. OSHA regulations (including, but not limited to, 29 CFR 1910.1000, 29 CFR 1926, and CFR 1910.120), 40-hour Occupational Safety and Health Administration (OSHA) training (plus 8-hour refresher training) and all other applicable state and federal regulations regarding health and safety requirements;

6. NIOSH/OSHA/USCG/EPA: "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" October 1985, DHHS (NIOSH). Publ. No. 85-115;
7. Department of Transportation training;
8. U.S. Army Corps of Engineers Section 404 Programmatic General Permit, Commonwealth of Massachusetts;
9. General Contractor's license;
10. National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) to discharge and associated Construction General Permits and Remediation General permits;
11. Regional and local Publicly Owned Treatment Works (POTW) pre-treatment and construction dewatering requirements and permits;
12. Excavation and/or grading permits;
13. Special use permits;
14. Special waste haulers certificate;
15. Massachusetts Wetlands Protection Act and associated Order of Conditions;
16. The Contractor's Soil Management Plan (SMP) and Health and Safety Plan to protect the workers and the public.
17. Massachusetts Division of Occupational Safety (DOS): The Removal, Containment or Encapsulation of Asbestos (453 CMR 6), including all clarifications, policy statements, etc.
18. Massachusetts Department of Environmental Protection: 310 CMR 7.00, 7.09, 7.15 and all related amendments and policy statements, and
19. MassDEP: Asbestos Cement Pipe Guidance Document (2011)
20. Massachusetts Division of Occupational Safety (DOS): The Removal, Containment or Encapsulation of Asbestos (453 CMR 6), including all clarifications, policy statements, etc.
21. Massachusetts Department of Environmental Protection: 310 CMR 7.00, 7.09, 7.15 and all related amendments and policy statements.
22. MassDEP Technical Update: Considerations for Managing

Contaminated Soil: RCRA Land Disposal Restrictions and Contained-In Determinations, August 2010;

23. MassDEP Similar Soils Provision Guidance (2014)
 24. MassDEP - Best Management Practices for Controlling Exposure to Soil during the Development of Rail Trails
- E. Implementation of the submitted HASP and other applicable monitoring and control plans including establishing work zones (e.g., support zone, contamination reduction zone, exclusion zone), preparing a decontamination pad(s) and staging area(s), performing the appropriate environmental monitoring, training and medical monitoring of personnel, coordinating waste disposal and waste characterization as needed.
- F. The Contractor shall develop, implement, maintain, supervise, and be responsible for all soil management practices during the course of this contract. The Contractor's Environmental Professional shall be present during all field screening, segregating, handling, and characterization of all soils excavated in the course of completing this contract to ensure that soil is managed in accordance with applicable laws, regulations, and this Section.

Soil management activities shall include and be conducted as specified herein:

1. Providing and constructing a secure soil staging area sized to adequately segregate soils in accordance with the conditions specified without impeding construction-related activities. The Contractor is to use existing information and obtain additional information as may be needed at no additional cost to the Owner to minimize the need for a staging area. If a staging area is required to characterize unknown or excess material for any reason, the Contractor is responsible for locating, selecting, preparing and securing the area. Contractor shall provide means of separating potentially contaminated material from the staging area ground surface to prevent the potential of cross-contamination. Separation method to be provided in accordance with 3.4(C).
2. Excavated soil that cannot be re-used on site shall be staged at a location determined and secured by the Contractor pending sampling and analytical characterization by the Contractor's Environmental Professional prior to characterization and off-site reuse or disposal, with the exception that soil suspected of having the characteristics of a hazardous waste or of containing a listed hazardous waste shall not be removed from the excavation or staged at another location except at the direction of the Engineer. Since individual disposal facilities have different permit conditions and specific pre-characterization data requirements, the Contractor is responsible for final soil characterization prior to transport and disposal. The Contractor is

hereby made aware that for the purposes of disposal, final soil characterization is the responsibility of the Contractor and costs for securing a staging area and conducting waste characterization shall be incorporated into the Contractor's bid price for construction.

3. The Contractor shall control and contain runoff of free liquids drained from stockpiled soil/fill. Free liquids shall be managed in accordance with applicable regulations.
 4. Soil that has been chemically stabilized shall be confirmed through laboratory chemical analysis to be characteristically non-hazardous pursuant to RCRA prior to off-site shipment and disposal.
 5. Soil/fill shall not be staged within 100 feet (30.5 meters) of a Reservoir, or Area of Critical Environmental Concern. Soil/fill shall not be staged in the work area over night.
 6. Excavating unknown, previously uncharacterized material which may be classified as RCRA hazardous waste and disposing of it at an approved facility and/or on-site treatment of these materials to render it non-hazardous prior to and disposing of it at an approved facility.
 7. Removing characterized on-site materials for off-site re-use or disposal.
 8. Demobilizing the site, including, but not limited to, removing and disposing of construction-related equipment and materials used for personnel and equipment decontamination and related waste such as personal protective equipment (PPE), decontamination water/solids, temporary covers, and washwater storage tanks; disconnection of temporary utilities; and final clean-up to pre-construction conditions.
 9. The Contractor shall manage unknown material separately and temporarily stage the material pending characterization.
- G. All incidental, Contractor-generated waste (such as Personal Protective Equipment, decontamination wash water, etc.) resulting from the services hereunder are the property and responsibility of the Contractor and are to be disposed of by the Contractor under a Uniform Hazardous Waste Manifest and/or by a Massachusetts Bureau of Waste Site Cleanup Bill of Lading, as appropriate.
- H. The Contractor is responsible for identifying potential hazards at the site and reviewing existing information.

1.6 RELATED WORK

A. Section 01025 – MEASUREMENT AND PAYMENT

- B. Section 01108 – HEALTH AND SAFETY PROCURES
 - C. Section 01500 - TEMPORARY FACILITIES AND CONTROLS
 - D. Section 02010 - SUBSURFACE INVESTIGATION
 - E. Section 02095 - TRANSPORTATION AND DISPOSAL OF SOIL AND FILL
 - F. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING
 - G. Section 02140 – DEWATERING
- 1.7 EXISTING CONDITIONS.

A. Limited chemical characterization of soil has been conducted, the results of which are presented in the report referenced in Paragraph 1.2 of this section. The Contractor is obligated to review existing environmental assessment reports and manage the soil and groundwater in accordance with applicable state and federal regulations.

B. Reports and files regarding the project area indicate the following:

1. Two gasoline service stations, each with one or more documented releases of petroleum, are located adjacent to the Project Area. While available reports indicate that petroleum concentrations in soil and groundwater decrease to below applicable regulatory standards by the property boundaries nearest the Project Area, petroleum impacted soil and/or groundwater may be encountered.

C. Site investigation results indicate the following:

1. No soil sampling was conducted within the limits of the Somerville Community Path.
2. One soil boring (B-1), finished as a monitoring well, was advanced in the Project Area on Thorndike Street. Two representative samples were collected (fill and natural soil) and analyzed for disposal parameters. No analytes were detected above MCP RCS-1 Reportable Concentrations. No visual or olfactory indication of contamination was noted. Approximately nine feet (9') of fill soils were observed in the Thorndike Street boring. Fill was noted to contain brick and pavement pieces. \

Though no contamination was encountered in boring B-1, considerable heterogeneity is possible due to the variable nature of historic fill. Contamination may be encountered during Project Excavation.

1.8 SUBMITTALS

- A. The Contractor shall prepare a Work Plan that generally describes the work to be performed under Section 02080 Part 3 (Execution). The work plan shall include, but not be limited to detailing the submittal and implementation of the following:
1. Site-Specific Health and Safety;
 2. Soil Management;
 3. Dust, Vapor, and Odor Control;
 4. Air Monitoring and Quality Control; and
 5. Spill and Discharge Control.

The Work Plan shall be submitted to the Owner and Engineer for review and acceptance at least two weeks prior to beginning any intrusive work at the site.

- B. The Contractor shall provide the qualifications of the Environmental Professional(s) to be assigned to this project. The Environmental Professional(s) shall be at a minimum certified, registered or licensed as an Environmental Professional or equivalent and hold a Bachelor of Science Degree in Environmental Science, Environmental Engineering, or Public Health or related degree and have sufficient experience in similar work to perform the responsibilities detailed herein. The Environmental Professional(s) shall have demonstrated experience in management of RCRA hazardous waste soils and groundwater.
- C. Soil Management: The Contractor shall prepare a Soil Management plan that outlines measures for soil and fill sampling, field screening, laboratory chemical analysis, treatment, and disposal/reuse. At a minimum, this plan shall address the following:
1. Methods, procedures, and equipment used for treating, excavating, dewatering, characterizing, segregating, reusing/backfilling, loading, and transportation of contaminated soil/fill materials encountered during excavation operations, including Class A, B, and C soils;
 2. A list of all transporters and waste facilities, complete with license numbers, permit or ACO numbers (as applicable), contact person, and address and telephone number that the Contractor utilizes for waste disposal. The Contractor shall provide copies of the permits/ACOs held by each disposal facility which the Contractor plans to use to dispose of non-hazardous solid waste; and if necessary, to dispose of hazardous waste (due to lead toxicity), PCB-impacted waste and/or asbestos-containing waste;

3. A summary of the history of compliance actions for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. The Owner reserves the right to reject any facility on the basis of poor compliance history;
4. Procedures for securing the staging area, controlling dust and soil/fill migration, prevention of contamination of excavated soil by trucks used for asphalt, separation of stockpiled materials from staging area ground surface, preventing damage to uncontaminated areas via contaminant migration and for decontaminating vehicles and personnel exiting the staging area;
5. The means and methods for decontaminating all equipment and personnel, including provisions for installing an equipment decontamination pad if required or specified;
6. Methods and procedures for identifying stockpiled material (e.g., labeling, marking containers) and procedures for identification and tracking;
7. Methods, procedures, and equipment used for obtaining the necessary information needed to satisfy the off-site reuse/disposal facility requirements specified herein and/or by the facility;
8. Methods, procedures, and equipment proposed for assessing and handling Unknown Materials. The SMP shall indicate which laboratory(ies) the Contractor shall utilize for chemical analysis of soil, groundwater and unknown materials:
 - a. An Unknown Materials information sheet shall be developed as part of the Contractor's SMP, upon which the Contractor shall record information such as container type, size, and condition; and, any identifying characteristics of the unknown material. The format of the information sheet shall be as accepted by the Owner and/or its representatives;
 - b. The Contractor's plan for notifying the Owner and Engineer in the event that an unknown material as defined in this specification is encountered. The plan shall include the phone numbers and names of the Owner's representative(s) that the Contractor will contact in such an event.
9. Provisions for separation of incompatible materials;

10. Protocol for over-packing drums (if encountered);
11. Procedures for consolidating (i.e., bulking) compatible materials for disposal; and
12. Procedures for dewatering; testing, handling, treatment, and disposal/discharge of groundwater.

D. Soil Management/Tracking Documentation:

Prior to off-site disposal or reuse, the Contractor shall provide to the Engineer a letter from the disposal facility indicating that the facility has reviewed the available data relative to the soil/fill to be delivered and agrees that the soil/fill meets their acceptance criteria. The letter shall be signed by a duly authorized representative of the receiving facility.

Within the time constraints established in state and/or Federal laws and regulations, the Contractor shall submit to appropriate authority(ies), as applicable, Uniform Hazardous Waste Manifests and/or Bills of Lading for all soils and associated fill disposed or reused off-site utilizing such documents. Copies of all manifests, Bills of Lading, and all other documents used to track and/or permit off-site transportation of soils shall be submitted to the Engineer within ten (10) days of shipment. The Contractor is responsible for preparation of all manifests, Bills of Lading, Material Shipping Records, and all other related documents completely, legibly, and accurately prior to submitting them to the Owner and/or its representative for generator and LSP signatures. (Bills of Lading shall be prepared electronically by the Owner's LSP; the Contractor shall be responsible for providing information necessary for completion of the BOL). The Contractor shall be responsible for paying for any and all fines associated with inaccurate, incorrect, or improperly completed manifests, Bills of Lading and all other related documents, including fines resulting from late or untimely submittals.

- E. Spill and Discharge Control (SDC): The SDC program shall provide contingency measures and reporting responsibilities for potential uncontrolled spills and discharges of contaminated and/or hazardous materials, including, but not limited to, leachate, decontamination water, sewage, and other on-site waste materials. In addition to the above listed items, the SDC program shall specifically contain: procedures for containing dry and liquid spills; absorbent material available on site; storage of spilled materials; governmental reporting (i.e., notification) procedures; decontamination procedures; discharges of sanitary or combined sewers into storm drains either by flow handling/bypassing or accidental or unintentional discharge; and procedures for protecting wetlands and surrounding public and private property.

The Spill and Discharge Plan shall indicate the location and quantity of the materials to be staged on site and the basis for the quantities (i.e. indicate the

vessel which will be on site containing the greatest volume of oil or hazardous materials). No fuel or oil tanks or drums may be temporarily staged on site unless they are stored within a secondary containment system. Fuel deliveries shall be performed in a designated area which has either secondary spill containment or an impervious surface with absorbent berms located around the point of fuel delivery. The Spill and Discharge Plan shall indicate the location of the fueling area and the nature of secondary containment which the Contractor intends on utilizing.

1. Notification Procedures: The Contractor shall prepare in advance of work activities a notification list, complete with phone numbers, addresses, and contact names for all parties to be notified in the event of a spill. This list shall include:
 - a. Owner's designated representatives;
 - b. Owner;
 - c. Fire Department;
 - d. Engineer; and
 - e. Massachusetts Department of Environmental Protection (as required per 310 CMR 40.0000).

The Owner shall be notified immediately of an uncontrolled spill or discharge. If human health or the environment are potentially threatened, the Contractor shall take immediate action to abate the conditions and notify emergency personnel.

2. Spill Incident Report(s): In the event of an uncontrolled spill or discharge, a written report detailing each uncontrolled spill or discharge shall include, at a minimum, the cause and resolution of incident, outside agencies involved, and date of occurrence. The report shall be submitted to the Owner within 48 hours of the incident. The Contractor shall document all spills on the as-built Drawings and submit the Drawings to the Owner at project completion. The Contractor shall be responsible for remediating any spills or releases of oil or hazardous materials as a result of the Contractor's activities. The site shall be remediated to pre-release conditions at no additional cost to the Owner.

- F. Dust, Vapor and Odor Control (DVOC): The DVOC program shall include measures to control objectionable dust, vapors, and chemical or natural odors originating from the work area or soil/fill staging area. The DVOC Plan shall describe procedures to minimize the creation of dust, and the control of objectionable vapors and odors originating from the site. At a minimum, the DVOC program shall include air monitoring as specified in paragraph 3.6. The Contractor shall have materials on hand to implement control measures.

PART 2 – PRODUCTS

2.1 DUST AND VAPOR CONTROL

- A. Air monitoring shall include total dust testing using MIE, Inc. Miniram PDM-3 Dust Monitors, or like instruments. Air monitoring shall include monitoring total volatile organic vapors using a MiniRAE Photoionization Detector or like instrument.

2.2 SPILL CONTROL

- A. At a minimum, the Contractor shall maintain on-site absorbent pads, booms and absorbent materials in sufficient quantity to address a release of fuel oil, hydraulic oil or other OHM that the Contractor intends to use or store on site, including fuel oil and hydraulic oil that is used within earth moving equipment. The quantity of spill containment materials maintained on site shall be sufficient to respond to a catastrophic release from the vessel containing the greatest quantity of oil or hazardous material on-site.

2.3 EQUIPMENT DECONTAMINATION PAD

- A. The Contractor shall provide all materials and labor to complete an equipment decontamination pad if required or specified. Liner materials and collection system shall be selected by the Contractor to perform as specified.

PART 3 – EXECUTION

3.1 GENERAL

- A. All work in this section will be performed in accordance with the Contractor's Work Plan, SMP and Site-Specific HASP.
- B. The primary concern of the Contractor in the excavating, handling, sampling, bulking, and on-site storage of soil/fill and/or drummed material (if encountered) will be to protect the health and safety of the site workers, the public, and the environment.
- C. The Contractor shall keep a copy of the Health and Safety Plan (HASP) on site during all operations and shall conduct daily health and safety meetings. Failure to keep a copy of the HASP on-site, or any other breach of the Contractor's Plan, may be cause for stopping work at the cost of the Contractor. Delays caused by the Contractor's failure to comply with the health and safety regulations or any health and safety plan shall not entitle the Contractor to recover any additional costs or time lost. The Contractor shall not be allowed to resume activities until corrective measures are accepted by the Engineer and/or their representative and implemented.

- D. Medical surveillance records, OSHA 40-hour training forms, accident forms, and all other documentation requirements of the Contractor's safety and health program for personnel working on the site (who are subject to exposure to potentially contaminated soil) shall be up-to-date and kept on file at the site. The Contractor shall provide documentation of employee status upon request of the Engineer and/or their representative.

3.2 SOIL/FILL MANAGEMENT

- A. Soil and fill material that is managed under a Utility-related Abatement Measure (URAM) Plan pursuant to the MCP, which is staged off-site, and which is not characteristically hazardous, may be re-used within fourteen (14) calendar days of excavation. Any material which is suitable for re-use as ordinary borrow, based on analytical results and could have been placed on site, but was not, due to Contractor delay (i.e. analytical results were not available within 10 days following excavation) will be disposed in accordance with the applicable regulations by the Contractor at no cost to the Owner.
- B. Soil and fill material that is managed under a Utility-related Abatement Measure (URAM) Plan pursuant to the MCP, which is staged off-site and which is determined at the staging area to be characteristically hazardous for lead may be treated (stabilized) within the "Area of Contamination" (AOC) only and must be reused or disposed of within ninety (90) calendar days of excavation. No treatment may occur at the staging area if outside the "Area of Contamination".
- C. Class B and C excavated soils shall be completely covered with a minimum 10-mil thick layer of plastic tarp. Soils exhibiting evidence of potential contamination including but not limited to odors and/or staining shall be covered prior to characterization and off-site reuse or disposal. Stockpiled soils determined to be Class B or C, as described herein, shall be securely covered at the close of each day and continuously when not being added to or otherwise being handled by the Contractor. Stockpiles, including those of Class A soils, shall also be covered at times as directed by the Engineer.
- D. Excavated soil shall be managed such that it is not exposed to contamination following excavation. Equipment and supplies in contact with excavated soil shall be free of asphalt, petroleum products or other hazardous materials that could be transferred to soil. Vehicles used to transport asphalt shall not be used to transport soil except by permission of and following inspection by of the truck, by the Engineer.

3.3 SOIL/FILL CHARACTERIZATION

- A. Soil and fill material shall be classified based on the criteria established in the accepted SMP and these Specifications.
- B. Initial Characterization of Soil/Fill Material: A summary of existing conditions and investigation findings performed by the Engineer during design, including a summary of analytical results, is appended to this section.
- C. It is the Contractor's responsibility to determine if the data appended to this section is sufficient to pre-characterize soil/fill for disposal. If additional data is required, the Contractor may either perform independent sampling and pre-characterization of soil/fill strata to be encountered during construction in advance of excavation such that excavated soil can be directly transported to an appropriate facility; or the Contractor shall make the necessary arrangements to secure a staging area(s) suitable for storing soil stockpiles pending analyses.
- D. Soil shall be preliminarily segregated based on the Soil Classification Categories detailed in Sub-section 1.4, except as indicated below.
 - 1. Potential Asbestos Containing Material (PACM): If soil/fill suspected of including asbestos-containing debris is encountered during excavation, the Contractor or the Contractor-hired Environmental Professional shall immediately contact the Engineer to discuss the nature and extent of the PACM and to assess potential hazards and appropriate handling procedures. Prior to handling and removing the PACM, MassDEP shall be notified and approval for handling and disposal obtained. Discovery and management of PACM shall be documented as required in the SMP. Evidence of PACM includes but is not limited to the presence of suspect asbestos-containing building debris such as broken or crushed asbestos-cement (transite) piping, vinyl floor tiling, tar-based pipe wrap, roofing paper or paper-like insulation materials. Following MassDEP approval, such soil/fill shall be managed in accordance with applicable regulations. Soils shall be analyzed for OHM to determine appropriate disposal requirements, as required by the proposed disposal facility.
 - 2. Unknown Material. If unknown material is encountered during excavation, the Contractor or the Contractor-hired Environmental Professional shall immediately contact the Engineer to discuss the nature and extent of the unknown material and to assess potential hazards and appropriate handling procedures. Prior to handling and removing the unknown material from the excavation area, the Contractor and Owner and/or its representatives, shall visually assess the material and its potential hazards. Drums shall be assessed to determine whether they are leaking, bulging (evidence of reactive

waste), crushed, or empty. Crushed, empty, and/or skeletal parts of drums shall be handled as solid waste, as specified. The Contractor shall record any identification or markings on the drummed material(s). Discovery and management of unknown materials shall be documented as required in the SMP.

- E. Disposal Characterization: Waste characterization shall be the responsibility of the Contractor. The Contractor shall be responsible for determining the characterization requirements of each disposal facility in advance to facilitate timely disposal and to adequately estimate the disposal costs. The Contractor shall perform additional segregation based on disposal requirements. Disposal or reuse of the material shall depend on sampling and characterization analytical results. The Contractor shall, at the direction of the Engineer, provide a split sample to the Engineer. The Contractor shall provide notice to the Engineer of when sampling will occur so that the Engineer may observe the sampling procedure.

Stockpiles within the staging area shall be sampled and characterized within a timely manner so as not to impede construction activities or preclude the reuse of soil/fill on site. If soil/fill cannot be reused on site due to the Contractor's delay in sampling material, the Contractor shall dispose of the soil/fill at no additional cost to the Owner including the cost of imported fill material used in its place.

3.4 STAGING AREAS

- A. Unless the staging area is comprised of an impervious surface material such as asphalt or concrete, the Contractor shall pre-characterize the surface soils (0-6") at the staging area(s) prior to staging any soils to document the existing conditions relative to contamination which may result from using the area to stage excess or unknown materials. A minimum of one composite surface soil sample, consisting of at least five grab samples, for every 2,500 square feet of staging area shall be collected by the Contractor prior to staging materials at the location. The samples will be submitted to a certified laboratory for analysis for:
1. MCP 14 total metals;
 2. Volatile organic compounds (EPA Method 8260B);
 3. Semi-volatile organic compounds (EPA Method 8270);
 4. Total petroleum hydrocarbons (EPA Method 8100M or equivalent); and
 5. Polychlorinated biphenyls (PCBs) (EPA Method 8082).
- B. At the completion of the work, the Contractor shall replicate the pre-staging sampling and analysis protocol to assess impacts to the area from use as a staging area.

- C. Stockpiles located within the soil staging areas shall be placed on asphalt or concrete, or on a 20-mil HDPE liner and bermed to minimize the effects of contamination release. Each soil category shall be staged in separate areas with berms constructed a minimum of 2 feet above the existing grade with common fill, hay bales, concrete barriers, or functionally equivalent berm material. Waste characterized as RCRA hazardous waste shall not be stored on site for a period greater than sixty (60) days. All other waste must be disposed off-site within ninety (90) days of excavation.
- D. As described above and herein, excavated materials shall be completely covered with a minimum 10-mil thickness polyethylene tarp and secured with tires, ropes, anchors or equivalent material. The covered system shall be capable of resisting actual wind gusts at the site, with a minimum wind capacity of 40 miles per hour. The stockpile covers shall be installed and secured at the end of each working day and at all times when earthwork is not taking place on site. Stockpile covers shall be immediately recovered should wind forces expose any of the excavated materials. Stockpiles shall also be covered at times as directed by the Engineer.
- E. Stockpiles are to be segregated based on a review of pre-characterization data and visual and olfactory conditions and field screening results obtained during excavation. Stockpiles shall be segregated by source location as approved by Engineer. Each stockpile must be clearly separated from adjacent stockpiles.
- F. Stockpiles shall be limited in size to approximately 500 cubic yards, unless approved by the Engineer. If, as a result of combining soil piles into larger volumes than 500 cubic yards, soil must be disposed of as a higher cost bid item than would otherwise be required, the Contractor shall be responsible for the additional cost.
- G. Stockpiles shall be clearly designated by a sign post or marker which can be cross-referenced with the source location and with samples collected from the pile for characterization purposes. The signs/markers are not to be moved, except by authorized personnel and not until the soil is ready to be either reused on site or loaded for off-site disposal.
- H. Excavated soil shall not be added to a stockpile after it has been sampled for characterization.
- I. Unknown, potentially hazardous soils/debris and drummed materials encountered during the project shall be located in a separate bermed location. The Contractor's Soil Management Plan shall provide construction details of the dimensions and protective measures proposed for the staging area(s). The construction details and protective measures are subject to the acceptance of the Owner and/or its representatives. The Contractor shall select the area to facilitate handling of the material and to minimize interference with other

ongoing construction activities. The Owner or Engineer must agree with the location prior to construction.

3.5 EQUIPMENT AND PERSONNEL DECONTAMINATION

- A. Equipment and personnel decontamination area(s), conforming with the Contractor's HASP and these Specifications, shall be constructed in such a manner to protect existing site surfaces, materials, and structures from contamination. Equipment decontamination areas shall be sized adequately to provide for the decontamination of the largest piece of equipment to be decontaminated. Filter fabric shall be placed over an impermeable liner to protect the liner from rips, punctures, or tears from traffic and heavy equipment.
- B. The Contractor shall establish a site-specific decontamination protocol and decontamination areas for personnel and equipment utilized at the subject site. Personnel and equipment decontamination shall be conducted in compliance with the HASP.
- C. The decontamination protocol shall include (i) the means, methods, and materials for the proposed decontamination procedures; (ii) the procedures employed to contain and store the wash or rinse liquids/sludges; (iii) procedures used to sample, analyze, and characterize the contaminated wash or rinse liquids/sludges; (iv) procedures to contain or clean contaminated equipment and PPE; and (v) the procedures for handling and disposing of solid wastes generated from site decontamination activities. All sample analysis or sample compositing shall be completed by a certified laboratory. The Contractor shall be responsible for the cost of this analytical work. The Contractor shall submit a copy of the analytical results and laboratory certifications to the Owner for review prior to proceeding with disposal. The Contractor shall be responsible to properly manifest and dispose of all residual wastes generated from on-site activities in conformance with federal, state, and local environmental and transportation regulations. The Contractor shall be responsible for the manifests and procedures to be used to package and dispose of contaminated solid wastes, wash, or rinse liquids at an EPA or state-approved treatment or disposal facility. The Contractor shall be responsible for any releases from site or decontamination activities due to its work, and will remediate any release for which the Contractor is responsible to pre-existing conditions at the Contractor's expense.
- D. Provisions for collecting decontamination water will be incorporated into the maintenance of the decontamination pad and will include placing an impermeable liner over a sloped surface such that water is directed, if necessary, into an area for subsequent pumping to 55-gallon drums or other appropriate tankage. Following completion of the work, the wash water shall be characterized by the Contractor and disposed off-site, in accordance with federal, state, and local regulations.

3.6 ENVIRONMENTAL FIELD MONITORING/DUST CONTROL

- A. The Contractor's Site Health and Safety Officer shall keep accurate documentation of all air monitoring in accordance with the Contractor's Health and Safety Plan. Air monitoring data shall be made available to the Engineer or Owner upon request. At the direction of the Engineer, air monitoring may be limited to visual assessment for dust and odor monitoring; instrument monitoring may be required at any time by the Engineer, based on the results of visual and odor monitoring.
- B. During excavation and construction at depths of greater than 2 feet below ground surface, the Contractor shall monitor the air quality at and surrounding the areas where construction activities involve soil handling such as excavation, re-location, staging, loading or grading of soil/waste materials. Air monitoring shall involve appropriate techniques, capable of providing real-time indications of air contaminants to protect on-site personnel and the local population. If there are indications of contamination, the frequency of air monitoring shall be determined by the Contractor's Industrial Hygienist or competent environmental health professional. The Contractor's Site Health and Safety Officer and Superintendent shall be responsible for assuring that monitoring is conducted in an appropriate manner by personnel trained to operate the air monitoring equipment, record measurements, and compare to action limits established by the Contractor's Health and Safety Plan, and that work practices, engineering controls and/or Personal Protective Equipment are proper for the conditions.
- C. The air monitoring program is to be designed to protect public health and the environment from the potential generation of dust and odors and contaminant release during work. At a minimum, the air monitoring shall include daily monitoring and documentation of one upwind, and two downwind conditions during periods of activity on the site and when there is a potential for dust being generated on the site. The air monitoring information including air monitoring in the vicinity of all site activities shall also be utilized for establishing levels of personal protection measures in the Contractor's Site Specific Health and Safety Plan. The Contractor shall submit his/her air quality monitoring program for review prior to commencement of site activities.
- D. Air monitoring shall be performed by the Contractor during all soil handling operations. In contaminated areas, detectors for organic contaminants and dust should be utilized to monitor on-site and off-site breathing zones and possible sources of potentially hazardous material (e.g. excavations, regrading, etc.). All personnel shall be made aware of the potential hazards and be informed of air monitoring information by the Contractor. Particular attention to air quality shall be made in the work area during earthwork activities to ensure that contaminants do not escape to the atmosphere and affect off-site population, on-site control, working conditions and personnel protection measures.

- E. Dust shall be controlled during excavation of soil/fill material to limit potential spread of contaminants and potential exposure of contaminants to workers and the public.
- F. Ambient dust levels at the site shall be monitored by the Contractor prior to construction. During construction, real-time dust monitoring shall be conducted during any soil/fill handling activities. The monitoring shall consist of total dust testing using MIE, Inc. Miniram PDM-3 Dust Monitors, or like instruments. The total dust criteria at the site shall conform to the requirements of the HASP. Should fugitive dust quantities exceed 20 percent of the ambient level, the Contractor shall perform additional measures to reduce the total dust concentrations.
- G. Nuisance dust levels shall be reduced by pre-wetting the surface soils and by establishing and maintaining clean access roads. The Contractor's Dust, Vapor, and Odor Control Plan shall describe the procedures and materials to minimize dust. At a minimum, the Contractor shall provide clean water, free from salt, oil, and other deleterious materials.

Areas of exposed earth to be excavated shall be lightly sprayed with water before excavation if there is potential for nuisance dust generation. Additional water spray may be utilized only when any indication of excessive dust is observed. To the extent feasible, the Contractor shall minimize the use of water within the limits of excavation.

Access roads shall be sprayed with water on a regular basis to minimize the generation of dust.
- H. All containers temporarily storing waste material shall be covered at all times except as necessary to place waste material into the container. The Contractor shall monitor the covers daily to ensure the covers are in place and effectively eliminating the generation of dust and make appropriate notes in the site log.
- I. In the event that asbestos containing materials are encountered, dust control measures, which may include negative air containment, shall be instituted in accordance with all applicable local, state and federal laws and regulations.
- J. Air monitoring shall include screening for methane, %Lower Explosive Limit, hydrogen sulfide, oxygen and total volatile organic compounds.

3.7 VAPOR AND ODOR CONTROL

- A. The Contractor shall provide the materials and labor to control objectionable vapors and odor in accordance with the Contractor's Vapor and Odor Control Plan. The Contractor shall limit the exposure area and shall cover the exposure area with synthetic reusable covers, lime, foam suppressants, or other methods to reduce off-site odors to acceptable levels. The Contractor

shall not use soil suitable for on-site reuse as cover to control vapor and odors.

3.8 BULKING

- A. Following characterization and compatibility testing of waste material, the Contractor shall place compatible materials into common containers to reduce transport and disposal costs. In addition, materials that are improperly contained shall be transferred into the appropriate containers. Drums and containers used during this project shall meet the appropriate DOT, OSHA, and U.S. EPA regulations for the materials contained. The Contractor shall describe the bulking procedures in the Soil and Fill Management Plan.

3.9 BACKFILLING AND COMPACTION

- A. Excavated areas shall be backfilled with appropriate backfill material (including excavated material suitable for reuse and, when necessary, imported off-site material). Imported backfill used in excavated areas shall have been analyzed and certified as free of contaminants and as specified in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL, AND GRADING.

PART 4 – COMPENSATION

Item 2080.1 – OHM - Soil and Waste Management

METHOD OF MEASUREMENT:

Measurement for Payment shall be based on the following breakdown; a maximum of 3 percent of the lump sum will be paid upon the finished construction of the completed soil/fill staging area as specified and accepted by the Engineer. A maximum of 4 percent of the lump sum will be paid upon the submittal and acceptance of all related submittals, plans and shop drawings. A minimum of 3 percent of the lump sum will be paid at the complete removal and restoration of the staging area, as approved by the Engineer. The balance of the Lump Sum measurement for payment for will be on a percent of the Lump Sum bid remaining, calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer. Deducts for work not performed as specified shall be applied.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Soil and Waste Management shall be based on the lump sum price complete for this item in the proposal. The Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Soil and Waste Management. The work includes, but is not limited to; Environmental Professional; dewatering Professional; soil/fill sampling; analytical services; development and implementation of all submittals and plans specified including, but not limited to: Health and Safety Plan; Equipment and Personnel Decontamination Plan; Soil and Waste Management Plan; Dust, Vapor, and Odor Plan; Air Quality Control Plan; and a Spill and Discharge Control Plan; submittal of all required certifications; coordination with all parties affected and maintaining proper documentation necessary; disposal of wastes, such as construction-related waste and by-products, and Contractor-generated waste material, such

as personal protective equipment, excess materials, debris, wash water, and any other waste materials not specifically addressed in other payment items; waste characterization sampling and analysis costs for the waste referenced above; construct and maintain a secure (enclosed with 8 foot high fencing and gate) soil/fill staging area for soil/fill stockpiling pending analytical testing, reuse, or disposal; all permits and administration fees; collecting and testing surface soil samples pre- and post- use of staging area; placement of polyethylene liner under piles; additional placement of bituminous or cement concrete as may be needed at the staging area; construction of segregated soil/fill bays; signage and lighting at the staging area; installation of sedimentation and erosion control at the staging area; construction of a truck wash down area; construction of a decontamination area with wheel wash; maintenance including placement of daily polyethylene covers over existing stockpiles; performing dust control; street sweeping; vehicle wheel-washing in the staging areas as needed to control airborne dust and sediment from spreading beyond the staging area or presenting a health risk to the workers or public; day to day security measures; maintenance of the soil/fill stockpiles to avoid migration; and maintenance of the sedimentation and erosion control measures; and removal, hauling, and disposal of all items of which the staging area was constructed as well as the restoration of the site to pre-construction conditions.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material; re-use of soil and fill material on site as backfill; handling unknown materials; sedimentation and erosion control for other uses besides soil management (at the staging area); and all work associated with a staging area for other uses beyond soil and waste management.

END OF SECTION 02080

SECTION 02095

TRANSPORTATION AND DISPOSAL OF SOIL AND FILL

2095.1	OHM - DISPOSAL OF SOIL- LESS THAN RCS-1 (CLASS A)	TON
2095.2	OHM - DISPOSAL OF SOIL – DAILY COVER UNLINED LANDFILL (CLASS B-1)	TON
2095.3	OHM - DISPOSAL OF SOIL – DAILY COVER LINED LANDFILL (CLASS B-2)	TON
2095.4	OHM - DISPOSAL OF SOIL – NON-HAZARDOUS SOLID WASTE ASPHALT BATCHING (CLASS B-3)	TON

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Furnish all labor, materials, equipment, and incidentals required to transport off site, and dispose, reuse or recycle excess soil (defined herein as including sediments and fill) at a licensed facility approved by the Owner.
- B. All personnel involved in the transportation of waste from the site shall have the required Department of Transportation (DOT) and Occupational Safety and Health Administration (OSHA) training.

1.2 RELATED WORK

- A. Section 01108 – HEALTH AND SAFETY PROCEDURES
- B. Section 01500 – TEMPORARY FACILITIES AND CONTROLS
- C. Section 02010 – SUBSURFACE INVESTIGATION
- D. Section 02051 – DEMOLITION, MODIFICATION, AND ABANDONMENT
- E. Section 02080 – SOIL AND WASTE MANAGEMENT
- F. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
1. A list of all transporters, destination/receiving sites and waste facilities, complete with license numbers and permit numbers (as appropriate), contact person, and address and telephone number that the Contractor utilizes for soil management and waste disposal.
 2. Where appropriate the Contractor shall submit waste manifests for all waste disposed off-site to the appropriate authority, agency, facility, or person within the time constraints specified by state and federal regulations. Copies of all waste manifests and Bill of Lading documentation including weight slips and BOL summary sheets shall be provided to the Owner within 10 days. It is the responsibility of the Contractor to complete all waste manifests and bills of lading completely and accurately prior to submitting them to the Owner. For MassDEP Bills of Lading the Contractor shall provide the Owner's Licensed Site Professional (LSP) all information required for preparation of electronic Bills of Lading. The Contractor shall be responsible for preparation of Material Shipping Records. The Contractor shall be responsible for submitting to the Owner's LSP all information necessary for preparation of LSP opinion letters to disposal facilities and coordinating disposal documentation with all parties. The Owner's LSP and the Owner shall sign any MassDEP Bill of Lading forms where required only after the Contractor has provided the information required for preparation of electronic MassDEP forms. The Contractor shall reimburse the Owner for all fines associated with inaccurate, incorrect, or improperly completed waste manifests, including fines resulting from late or untimely submittals.
 3. Disclose a summary of the history of compliance for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. The Owner reserves the right to reject any facility on the basis of poor compliance history.
 4. Prior to transporting any soils or fill material to a disposal facility the Contractor shall submit a letter from the disposal facility indicating that the facility has reviewed the available data and the generator's profile of the material and the facility agrees that it meets the facility's acceptance criteria.

5. Following off-site disposal of soil or fill materials at a disposal facility the Contractor shall submit Material Shipping Record or MCP Bill of Lading load log sheets signed by the facility.
6. Following disposal of all the soil represented by a Material Shipping Record or Bill of Lading, the Contractor shall submit that Material Shipping Record "Acknowledgment of Receipt by Receiving Facility" or Contractor shall arrange for receiving facility to electronically sign that Bill of Lading "Attestation of Disposal", as applicable, within 60 days of shipment.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Provide completed Bills of Lading, Material Shipping Records, manifests, certificates of disposal, weight slips and all other documentation relative to disposal, reuse, treatment or recycling of soil material.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall reuse, recycle or dispose of all excess soil resulting from excavation activities in accordance with federal, state and local regulations and these specifications. Transport shall be by a permitted and licensed waste transporter. The Contractor shall be responsible for supplying the proper manifests to be approved and signed by a representative of the Owner.
- B. Prior to disposal, it shall be the responsibility of the Contractor to maintain segregated waste stockpiles in conformance with all applicable federal, state, and local waste disposal regulations and as specified in Section 02080 - SOIL AND WASTE MANAGEMENT.
- C. The Contractor shall be responsible for preparing and keeping in proper order all waste manifests, BOLs, MSRs, and shall designate one person who shall be made available to sign all transportation documentation. The Engineer shall be responsible for obtaining the Owner's and receiving facilities' signature and all other signatures required for the proper completion of the manifests. The Contractor shall allow a minimum of five working days from the date of the submittal for any documents requiring the signature of the Owner and/or the LSP. The manifests shall document the handling of the waste from the time it is generated until the time it is properly disposed.
- D. The Contractor shall be responsible for obtaining all federal, state, and local permits and variances to allow transport of materials on public roadways.

- E. The Contractor shall be responsible to inform the Owner if hazardous waste disposal will not be performed within 60 days of hazardous waste characterization. This notification shall take place a minimum of 30 days prior to the 60-day deadline. No hazardous waste stockpiled at the site shall remain on site more than 60 days after it is characterized.
- F. The Contractor shall obtain certificates of disposal for all disposed waste.
- G. Transportation of solid wastes shall be in compliance with any relevant federal, state and local special waste requirements, and such as to assure that waste material is not released during transit.

3.2 SOLID WASTES

- A. Transporters of solid wastes that include, but are not limited to, contaminated soil/fill (including oil-contaminated soil/fill), construction and demolition debris, non-hazardous laboratory wastes, bottles, tires, metal parts, tree stumps, brush, and grass cuttings will utilize truck or dumpsters specifically designed to ensure that material, dust, or liquid is not released in transit. No truck shall be allowed to exit the site until all free liquids are drained from soil/fill or other solid waste being transported off-site. Material shall be covered at all times. The vehicle in which the waste is transported shall be driven directly to the intended destination without any stops or detours in between, except those necessary in response to road conditions, vehicle service needs, or emergencies. Discharge or release of material during transport shall be immediately reported to the Owner. Transporters shall clean up any discharge that occurs in transit, at the Contractor's expense.
- B. The disposal site shall be permitted by the state in which the facility is located to receive and dispose of solid waste, and shall be approved for use by the Owner. The Contractor shall provide copies of the disposal facility's operating permit.
- C. Manifesting of solid waste shall be required and shall include vehicle identification; date of loading and disposal; tonnage, as measured at the disposal site; and signature of the Owner and/or its representative, transporter, and disposal facility's representative. Transportation of the wastes shall be accompanied by the appropriate manifests as required in the Code of Massachusetts Regulations (CMR) 310 CMR 40.0030, such as a Material Shipping Record or by a Uniform Hazardous Waste Manifest. The original shall be returned to the Owner, and/or their representative, within ten (10) working days of disposal.
- D. All solid waste shall be disposed in accordance with all applicable federal, state and local laws and regulations, as well as all other state laws through which the waste material is being transported.

- E. Transport of soils in which asbestos containing materials have come to be located shall be transported and disposed of in accordance with Section 02080 – SOIL AND WASTE MANAGEMENT and all applicable local, state and federal laws and regulations.

3.3 HAZARDOUS WASTES

- A. Transporters of hazardous wastes shall be in conformance with Code of Federal Regulations (CFR) 40 CFR, Part 171, all other federal laws and regulations, 310 CMR 30.400, and all other state laws through whose boundaries the waste material is being transported. The transporter shall provide copies of its EPA identification number, Massachusetts transporter's license, and proof of driver training in transporting hazardous waste.
- B. The disposal site shall be in conformance with 40 CFR, Part 264 and relevant laws of the state in which the facility is located. The Contractor shall provide copies of the disposal facility's EPA and state treatment and disposal permit.
- C. Manifesting of hazardous wastes shall be in conformance with 40 CFR, Part 264, Subpart E, 310 CMR 30.310 and 310 CMR 30.405.

3.4 DUST CONTROL

- A. Dust control measures shall be implemented during loading and transport of waste material from the site in accordance with the contractor's Dust Control Plan, as specified in Section 02080 – SOIL AND WASTE MANAGEMENT.

PART 4 – COMPENSATION

4.1 GENERAL

- A. Measurement and Payment for Transportation and Disposal of Soil and Fill items shall be as listed below. Payment for lump sum items and unit price items shall constitute full payment for all fees, labor, materials and equipment required to perform the work; all supervision; all overhead items including but not limited to bonds, insurance, labor burden, profit, protections and cautions are also included. Payment for unit price items shall be as detailed below and as measured by the Engineer. The Contractor shall be made aware that for Transportation and Disposal of Soil and Fill unit price items, the actual quantities encountered may vary significantly from the estimated quantities presented in the Bid Schedule. The estimated quantities presented have been established for bid comparison purposes only and do not represent a warranty of work. In the event of quantity changes, the unit bid price shall be the basis for compensation or credit.

- B. The following unit price payment items are for transporting and disposing excess soils and fill material encountered during the course of this contract. Management of soil/fill shall be in accordance with applicable regulations and technical specifications. The costs associated with disposing excess soil and fill other than allowed for in the following payment items shall be incorporated into the contractor's Base Bid Item 2080.1- Soil Management. A minimum unit bid cost has been established for each unit price bid item. The Contractor is required to review the minimum unit bid price and increase it within the bid table as the Contractor sees fit. The Contractor is not obligated to accept the minimum unit price indicated but shall not be able to reduce it. The minimum unit price established may be below actual market cost and is provided to avoid unbalanced bidding. The Contractor is required to review the minimum unit price presented and develop a competitive unit price for inclusion in the bid table. Any bids received which do not present a unit price entered by the Contractor within the bid table or present a unit price below the minimum unit price established, shall be rejected as non-responsive.
- C. The quantity of any pay item expressed as tons shall be subject to verification by the Engineer by calculation of the in-place weight using the horizontal and vertical trench pay limits defined in the Contract Drawings, a bulking factor applicable to the soil type, and in place density tests supplied from a certified soil testing lab, hired by the Contractor. Should the quantity presented by the Contractor on the certified weight slips, be significantly more (i.e. greater than 10%) than that as determined through the Engineer's calculations, the Contractor shall be compensated for the lesser tonnage. The Contractor shall receive no additional compensation for material removed outside of the approved pay limits. The Owner, and/or their representative, shall have the right to perform independent weighing of trucks. No payments will be made in cases of incomplete documentation of disposal. Payment will be at the unit price established set in the FORMS FOR GENERAL BID.
- D. The quantity of any pay item expressed as cubic yards shall be as measured by the Engineer, per the horizontal and vertical trench pay widths established in the Drawings, and confirmed through field engineering surveys performed by the Contractor. The Contractor shall receive no additional compensation for material removed outside of the approved pay limits. Payment will be at the unit price established set in the FORMS FOR GENERAL BID.
- E. Preference is to be given to the most cost effective option of either reusing excavated material on-site as fill or disposal off-site.

02095.1 – OHM Disposal of Soil- Less than RCS-1 (Class A):

Measurement for Payment for Disposal of Soil – <RCS-1 (Class A) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate Lading or Material Shipping Record form. Measurement shall be verified as

described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents or as directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

It is the intent that payment under this item shall be limited to soil/fill excavated on site, which is non-remediation waste as defined in the Massachusetts Contingency Plan and has been determined through testing to be suitable for general reuse as fill. This pay item shall apply to material which is suitable for re-use off-site as fill and shall include the costs associated with characterizing the destination site as necessary to assess background conditions.

It is the intent that, if the analytical characteristics of the material meet the criteria for this classification, that the disposal be paid for at the unit price bid for this item. The Contractor shall use due diligence to identify a reuse location that meets the criteria identified in Section 02080 (Item 1.4 Definitions). Payment for disposal of the material at a higher unit price item shall be made only if the Contractor provides written certification that a reuse location that meets the criteria is not available; and only if approved in writing by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for OHM - Disposal of Soil – Less than RCS-1 (Class A) shall be based on the per ton price complete for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for OHM - Disposal of Soil – Less than RCS-1 (Class A). The work includes, but is not limited to; handle, load, transport, and dispose at a facility in accordance with the facilities acceptance criteria, all soil/fill which is unsuitable for on-site reuse and is defined as less than RCS-1; placing, grading and compacting the material at the disposal site as specified; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

2095.2 – OHM - Disposal of Soil – Daily Cover Unlined Landfill (Class B-1)

METHOD OF MEASUREMENT:

Measurement for Payment for OHM - Disposal of Soil – Daily Cover Unlined Landfill (Class B-1) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate MassDEP Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents or as required by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

It is the intent, that if the analytical characteristics of the material meet the criteria for this classification, but not that of lower levels of contamination, that the disposal be paid for at the unit price bid for this item. The Contractor shall use due diligence to identify a disposal facility that meets the criteria identified in Section 02080 (Item 1.4 Definitions). Payment for disposal of the material at a higher unit price item shall be made only if the Contractor provides written certification that a reuse location that meets the criteria is not available; and only if approved in writing by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for OHM - Disposal of Soil – Daily Cover Unlined Landfill (Class B-1) shall be based on the per ton price complete for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for OHM - Disposal of Soil – Daily Cover Unlined Landfill (Class B-1). The work includes, but is not limited to; handle, load, transport, and dispose at an appropriately permitted, solid waste facility, all soil/fill which is unsuitable for on-site reuse and is defined as a non-hazardous solid waste suitable for reuse as daily cover at an unlined Massachusetts Landfill (as defined in MassDEP Policy #COMM-97-001); placing, grading and compacting the material at the disposal site as specified; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which can be disposed of at the A level; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

2095.3 – OHM - Disposal of Soil – Daily Cover Lined Landfill (Class B-2)

METHOD OF MEASUREMENT:

Measurement for Payment for OHM - Disposal of Soil – Daily Cover Lined Landfill (Class B-2) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate MassDEP Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents or as required by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

It is the intent, that if the analytical characteristics of the material meet the criteria for this classification, but not that of lower levels of contamination, that the disposal be paid for at the unit price bid for this item. The Contractor shall use due diligence to identify a disposal facility that meets the criteria identified in Section 02080 (Item 1.4 Definitions). Payment for disposal of the material at a higher unit price item shall be made only if the Contractor provides written certification that a reuse location that meets the criteria is not available; and only if approved in writing by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for OHM - Disposal of Soil – Daily Cover Lined Landfill (Class B-2) shall be based on the per ton price complete for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for OHM - Disposal of Soil – Daily Cover Lined Landfill (Class B-2). The work includes, but is not limited to; handle, load, transport, and dispose at an appropriately permitted, solid waste facility, all soil/fill which is unsuitable for on-site reuse or disposal at one of the lesser unit price options and is defined as a non-hazardous solid waste suitable for reuse as daily cover at a lined Massachusetts Landfill (as defined in MassDEP Policy #COMM-97-001); placing, grading and compacting the material at the disposal facility as specified; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which can be disposed of at the A or B-1 levels; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

2095.4 – OHM - Disposal of Soil – Non-Hazardous Solid Waste Asphalt Batching (Class B-3)

METHOD OF MEASUREMENT:

Measurement for Payment for OHM - Disposal of Soil – Non-Hazardous Solid Waste Asphalt Batching (Class B-3) shall be on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the appropriate MassDEP Bill of Lading form. Measurement shall be verified as described above and the lesser tonnage, as further described above, paid for. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents or as required by the Engineer shall be done at the Contractor’s expense, at no additional cost to the Owner.

It is the intent, that if the analytical characteristics of the material meet the criteria for this classification, but not that of lower levels of contamination, that the disposal be paid for at the unit price bid for this item. The Contractor shall use due diligence to identify a disposal facility that meets the criteria identified in Section 02080 (Item 1.4 Definitions). Payment for disposal of the material at a higher unit price item shall be made only if the Contractor provides written certification that a reuse location that meets the criteria is not available; and only if approved in writing by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for OHM - Disposal of Soil – Non-Hazardous Solid Waste Asphalt Batching (Class B-3) shall be based on the per ton price complete for this item in the proposal. Under the per ton price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for OHM - Disposal of Soil – Non-Hazardous Solid Waste Asphalt Batching (Class B-3). The work includes, but is not limited to; handle, load, transport, and dispose at an appropriately permitted, asphalt batching plant, all soil/fill which is suitable for recycling at an asphalt batching plant (as defined in MassDEP Policy WSC-94-400) and

which is unsuitable for on-site reuse or off-site reuse or as daily cover at a Massachusetts Landfill; and all fees, permits, and taxes.

EXCLUSIONS:

The following items are not included for payment under this item; transportation and disposal of soil and fill material which can be disposed of at the A, B-1, or B-2 levels; reuse of soil and fill material on site as backfill; furnishing and installing replacement imported backfill; staging; disposal of bituminous concrete; and disposal of construction debris.

END OF SECTION 02095

SECTION 02140

DEWATERING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and allow work to be performed under dry and stable conditions and comply with permit and other regulatory requirements. Work to be done as part of dewatering includes, but is not limited to:
 - a. Lower the groundwater level within excavations to at least 2 feet below the bottom of the excavation.
 - b. Lower hydrostatic pressure.
 - c. Prevent surface water from entering the excavation during construction.
 - d. Limit settlement of utilities and adjacent structures.
 - e. Implement erosion and sedimentation control measures for disposing of discharge water.
 - f. Provide treatment system to treat all water removed from excavations, except water that is re-infiltrated to the ground on site in a manner that does not result in negative on- or off-site impacts.
 - g. Provide observation wells and geotechnical instrumentation as specified and indicated or as otherwise required by the Engineer.
 - h. Common dewatering methods include, but are not limited to, sump pumping.

2. The Contractor shall be aware of groundwater under drains that may exist under all existing sanitary, storm, or combined piping. The Contractor shall identify such drains, bypass pump and dewater in accordance with the dewatering permits, and relocate and reconnect under drains upon completion of the work in the area.
- B. Water removed from excavations shall be re-infiltrated to the ground if feasible. If re-infiltration is not feasible, water shall be directly or indirectly discharged to a surface water in accordance with a Dewatering Discharge permit issued by the Massachusetts Water Resource Authority (MWRA). The Contractor shall be responsible for obtaining, paying for, and complying with the MWRA Dewatering Discharge Permit.

The Contractor shall be responsible for scheduling and coordinating inspections and receipt of local, state, or federal permits/approvals/certifications for all Work as part of this Contract.

- C. The Contractor shall obtain approval from the City of Cambridge for any construction dewatering to the City of Cambridge drain/sewer system prior to any construction dewatering.

1.3 SUBMITTALS

- A. Shop Drawing: Submit the following in accordance with Section 01330 – SUBMITTALS:
1. Submit a dewatering plan including design calculations at least four (4) weeks prior to start of any dewatering operation. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
 - a. Dewatering plan and details that conform to the requirements of the dewatering permit(s), and all other applicable regulations and permits including, but not limited to, requirements for equipment, monitoring, sampling and reporting.
 - b. Submit a generalized plan of actions at least two (2) weeks before operation of the groundwater control system to be implemented in the event that the Threshold and Limiting

values for groundwater lowering have been reached.

- c. Certificate of Design.
 - d. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.
 - e. A description of the proposed method of dewatering; water re-infiltration; containment; treatment and discharge; and installation, monitoring, maintenance, and system removal procedures.
 - f. The monitoring plan shall address groundwater control within the excavations and address settlements of utilities and adjacent structures.
 - g. A description of erosion/sedimentation control measures, and methods of disposal of pumped water.
 - h. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.
2. A modified dewatering plan within 24 hours, if open pumping from sumps and ditches results in boils, loss of fines or softening of the ground.

1.4 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 – QUALITY CONTROL and as specified.
- B. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Engineer, stabilize the subgrade, and modify system to perform as specified at no additional cost to the Owner.
- C. Notify the Engineer immediately if any settlement or movement is detected on any adjacent structures. If the settlement or movement is deemed by the Engineer to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within 24 hours. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.
- D. If oil and/or other hazardous materials are encountered after dewatering begins, immediately notify the Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Provide groundwater monitoring wells in accordance with the submitted dewatering plan or as specified.
- B. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.
- C. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.
- D. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- E. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every five (5) used.
- F. Provide dewatering equipment, including an appropriately sized settling tank, and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
- G. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
- H. Provide cement grout having a water cement ratio of 1 to 1 by volume.

PART 3 – EXECUTION

3.1 GENERAL

- A. Execution of any earth excavation, installing temporary excavation support systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed, the geotechnical instrumentation has been installed and baselines established and submitted to the Engineer.
- B. Furnish, install, operate, and maintain dewatering, re-infiltration, treatment and discharge systems as indicated or specified and in accordance with the dewatering plan. It is anticipated that all dewatering flows will be re-infiltrated to the ground, as such, at a minimum the Contractor shall provide pumps, piping, erosion controls, and tankage necessary to allow dewatering flows to be appropriately discharged to grade or to a settling tank and overflow to grade. Delays due to insufficient storage capacity will be at

no additional cost to the Owner. The Contractor is responsible to evaluate available data and determine the necessary storage capacity so as to not impede construction activities.

- C. Do not excavate until the dewatering system is operational and the required drawdowns have been achieved.
- E. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.
- F. Discontinue open pumping from sumps and ditches, if such pumping is resulting in boils, loss of fines, softening of the ground, or instability of the slopes. Modify dewatering plan and submit to the Engineer at no additional cost to the Owner.
- G. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL, AND GRADING at no additional cost to the Owner.

3.2 DEWATERING DISCHARGE

- A. Water to be infiltrated need not be treated. Contractor shall provide infiltration that complies with relevant local, state and federal regulations.
- B. Transport pumped or drained water to discharge location in compliance with applicable permits and without interference to other work; damage to or contamination of pavement, other surfaces, or property; erosion; or siltation.
- C. Provide separately controlled pumping lines.
- D. Immediately notify the Engineer if groundwater is encountered that is suspected to be contaminated with substances other than those for which the treatment system has been designed. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.

3.3 COMPLIANCE WITH DEWATERING AND RELATED PERMITS AND REGULATIONS

- A. Discharging groundwater and allowing for natural infiltration may not be a viable option for controlling groundwater in the project area. Should dewatering activities be required where the Contractor needs to discharge groundwater to a location other than the point of origin, then the Contractor shall be prepared to store, treat and discharge the water in accordance with applicable permits and regulations. Periodic sampling, as may be required to

demonstrate treatment effectiveness and compliance with pretreatment standards specified in any local, state, or federal discharge permit required shall be the responsibility of the Contractor. The Dewatering Plan shall include a description of procedures and information related to the collection of readings, maintenance of logs and other required documents. At a minimum, the dewatering plan shall describe compliance with relevant provisions of the MWRA dewatering discharge permit obtained by the Contractor.

B. The Contractor:

1. Shall furnish all labor, equipment and materials necessary to obtain accurate representative samples of the groundwater and for analysis for the set of analytical parameters specified above and as required by local, state and federal permits and regulations.
2. Shall coordinate sampling activities with the Engineer. The engineer reserves the right to sample treated and untreated dewatering flows at any time.
3. Shall take readings from the treatment system in accordance with the dewatering plan.
4. Shall collect an initial sample of untreated and treated groundwater at the beginning of dewatering activities within the construction area.
5. Shall prepare and keep in proper order all records required by regulatory authorities and permits.
6. Shall maintain logs and other records in accordance with the Specifications, regulatory agency and permit requirements, and the Dewatering Plan.
7. Shall coordinate analysis of samples by an appropriately certified analytical laboratory in accordance with the Specifications, regulatory agency and permit requirements, and the Dewatering Plan, and ensure that laboratory detection limits meet permit requirements.
8. Shall comply with reporting requirements in a timely manner and in the format required by the relevant permit. Reporting in compliance with permit requirements includes, but is not limited to, notification to the appropriate regulators and the Owner and Engineer prior to discharge; submittal of laboratory analytical reports for each sampling event; submittal of reports for each reporting period during which no discharge occurs; notification of non-compliant discharges; notification of termination of discharge; and response to permit-related questions posed by regulators or the Owner and Engineer.

- a. If re-infiltration is not feasible, water will be discharged under a MWRA dewatering discharge permit as applicable. The Contractor shall submit notifications and reports to the entities identified in the permit. Comply with pre-discharge notification, discharge reporting, notification of no discharge, and termination of discharge notification requirements; and respond to inquiries or correspondence from agencies regarding permit issues.
 - b. If water will be discharged under a local permit, submit notifications and reports as required in the permit.
 - c. For monthly or less frequent reporting deadlines, provide the Engineer with copies of all reports fourteen (14) days prior to the reporting deadline, and submit reports to the appropriate agency(ies) at the same. Provide copies of other dewatering documents to the Engineer immediately.
9. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.
 10. The Contractor shall obtain all federal, state, county, and local permits and variances to allow transport of materials on public roadways, should such transport be necessary.
 11. The Contractor shall dispose of all wastes resulting from construction dewatering activities in accordance with local, federal and state regulations.
 12. The Contractor is solely responsible for the implementation of the permit requirements, and is solely responsible for any punitive action resulting from any violation of the permit. The actual permit issued by the MWRA shall become part of this Contract by either addendum or by change order. If the actual permit is included by change order, no additional costs for implementing the permit will be considered by the Owner, when the actual permit is issued.

3.4 REMOVAL

- A. Do not remove dewatering system without written approval from the Engineer.
- B. Backfill and compact sumps or ditches with crushed stone wrapped with geotextile fabric in accordance with Section 02210 – EARTH

EXCAVATION, BACKFILL, FILL AND GRADING.

- C. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02140

SECTION 02160

TEMPORARY EXCAVATION SUPPORT SYSTEMS

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Design, furnish and install temporary excavation support systems as required to maintain lateral support, prevent loss of ground, limit soil movements to the allowable limits indicated, and protect from damage existing and proposed improvements including, but not limited to, pipelines, utilities, structures, roadways, and other facilities.
2. The location, configuration, design, construction, and maintenance of the excavation support walls and internal bracing shall be the sole responsibility of the Contractor.
3. The temporary excavation support system to be used on this project may include singular or multiple stages comprised of internally braced timber or steel sheeting, soldier piles and timber lagging, or trench boxes. Trench boxes may be used if feasible for excavations within the Community Path (approximately Station 0+00 to 5+55), but shall not be used as temporary excavation support within Thorndike Street (approximately Station 5+55 to 6+25). Temporary excavation support system is, at a minimum, required at excavation locations within 25 feet of building walls, and where buried utilities are located within the soil wedge extending from the base of the excavation, upward to the ground surface at a slope of 2 horizontal to 1 vertical.
4. Soldier piles and timber or steel sheeting shall be drilled or hydraulically pushed in place. Vibratory or impact hammers shall not be used to install the excavation support system.
5. Wherever the word "sheeting" is used in this section or on the Contract Drawings, it shall be in reference to steel soldier piles and timber lagging or steel and timber sheeting support systems.
6. Construction of the temporary excavation support system shall not disturb the existing structures or the completed proposed structures. The Contractor, at no additional cost to the Owner, shall repair damage to such structures.

7. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper installation, maintenance or design of the temporary excavation support systems. The Contractor shall pay for all claims, costs and damages that arise as a result of the work performed at no additional cost to the Owner.
8. Monitoring movement of the excavation support systems by optical survey techniques is required by an independent geotechnical monitoring consultant per Specification 02015 until installation and backfilling is complete. Additional survey monitoring may be required if movement (lateral or vertical) is measured following backfilling to the existing grade.
 - a. In addition to monitoring the movement of the excavation support systems, where existing utilities are exposed within the trench, they shall be monitored for movement and/or settlement for the entire time they are exposed.
9. If, in the Engineers judgment, the performance of the excavation support system is unacceptable, the Owner may instruct the Contractor to stop work and implement remedial measures to arrest further movements or restore groundwater levels to pre-construction levels. The Contractor shall take immediate steps to implement the remedial measures designed by the Contractor and reviewed by the Engineer. The costs for these measures shall be at no additional cost to the Owner.
10. Temporary excavation support systems shall be designed and installed in accordance with OSHA excavation safety standards.

1.2 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS.
 1. Submit the following qualifications at least three weeks prior to the start of construction:
 - a. Qualifications of Contractor’s temporary excavation support system designer as specified below.
 - b. Qualifications of Contractor’s temporary excavation support system installer as specified below.
 2. Submit a temporary excavation support plan stamped and signed by a Professional Civil Engineer registered in the Commonwealth

of Massachusetts at least two weeks prior to start of the construction. Submit design calculations for review that will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:

- a. Drilled or hydraulically pushed in place excavation support system details, location, layout, depths, extent of different types of support relative to existing features and the permanent structures to be constructed, and methods and sequence of installation and removal.
 - b. Certificate of Design
 - c. Requirements of dewatering during the construction.
 - d. Minimum lateral distance from the edge of the excavation support system for use for vehicles, construction equipment, and stockpiled construction and excavated materials.
 - e. List of equipment used for installing the excavation support systems.
 - f. Estimates of the lateral and vertical displacements of the excavation lateral support systems under applied loads at critical stages.
3. Plans for preventing movement of the existing utilities adjacent to, or exposed within the trench including, but not limited to, 4-inch Cast Iron gas mains, 12-inch water main, 8-inch sewer, 345 KV transmission main,. Lateral support systems shall not come in contact with existing utilities. In addition, in accordance with Specification Section 02015, the Contractor shall propose and submit for the Engineer's approval no less than 30 days prior to the start of excavation, the methods to be used to monitor movement and/or settlement of exposed utilities.
 4. Submit a Construction Contingency Plan specifying the methods and procedures to maintain excavation support system stability if the allowable movement of the adjacent ground and adjacent structures is exceeded.
 5. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:

- a. Survey locations of the temporary excavation support systems, including coordinates of the ends and points of change in direction.
- b. Type of the temporary excavation support system.
- c. Elevations of top and bottom of the excavation support systems left in place.

1.3 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 – QUALITY CONTROL and as specified.
- B. Conform to the requirements of the OSHA Standards and Interpretations: "Part 1926 Subpart P - Excavation, Trenching, and Shoring", and all other applicable laws, regulations, rules, and codes.
- C. All welding shall be performed in accordance with AWS D1.1.
- D. Prepare design, including calculations and drawings, under a Professional Civil Engineer registered in the Commonwealth of Massachusetts and having the following qualifications:
 1. Not less than five years experience in the design of soldier pile and lagging and steel or timber sheeting temporary excavation support systems of at least 15 feet deep in urban areas of comparable type, size, and complexity as this project.
 2. Completed not less than five successful soldier pile and lagging and steel or timber sheeting temporary excavation support system projects of comparable type, size, and complexity as this project within the last five years.
- E. Temporary Excavation Support System Installer's Qualifications:
 1. Not less than five years' experience in the installation of soldier pile and lagging and steel or timber sheeting temporary excavation support systems of at least 15 feet deep in urban areas of comparable type, size, and complexity as this project.
 2. Completed not less than five successful soldier pile and lagging and steel or timber sheeting temporary excavation support system projects of comparable type, size, and complexity as this project within the last five years.
- F. Install all temporary excavation support system under the supervision of a supervisor having the following qualifications:

1. Not less than five years' experience in installation of soldier pile and lagging and steel or timber sheeting temporary excavation support systems of at least 15 feet deep in urban areas of comparable type, size, and complexity as this project.
 2. Completed not less than five successful soldier pile and lagging and steel or timber sheeting temporary excavation support system projects of comparable type, size, and complexity as this project within the last five years.
- G. Notify the Engineer immediately if any settlement or movement is detected on any adjacent structures. If the settlement or movement is deemed by the Engineer to be related to the temporary excavation support system, take actions to protect the adjacent structures and submit a modified temporary excavation support plan to the Engineer within 24 hours. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.

1.4 DESIGN CRITERIA

- A. Design of temporary excavation support systems shall meet the following minimum requirements:
1. Support systems shall be designed for earth pressures, hydrostatic pressure, equipment, traffic, temporary stockpiles, construction loads, and other surcharge loads in accordance with the current AASHTO (American Association of State Highway and Transportation Officials) Design Criteria.
 2. Design internal bracing as needed to provide sufficient reaction to maintain stability.
 3. Limit movement of buildings, ground, and buried utilities adjacent to the excavation support system to be within the allowable ground deformation as specified in Section 02015 – GEOTECHNICAL MONITORING AND INSTRUMENTATION.
 4. Design the embedment depth below bottom of excavation to minimize lateral and vertical earth movements and provide bottom stability. Toe of unbraced temporary excavation support systems shall not be less than 5 feet below the bottom of the excavation.
 5. Design temporary excavation support system shall withstand an additional 3 feet of excavation below proposed bottom of excavation without redesign except for the addition of lagging and/or bracing.
 6. Maximum width of pipe trench excavation shall be as indicated on the Drawings.

7. Permanent structure walls shall not be directly cast against excavation support walls.
8. Excavation support shall not rest upon or come in contact with the top of the roof slab for the MBTA Red Line tunnel which underlies the pipe alignment within the Community Path.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide support of excavation in accordance with Section 01600 – PRODUCTS, MATERIALS AND EQUIPMENT and as specified.
- B. Store sheeting and bracing materials to prevent sagging, which would produce permanent deformation. Keep concentrated loads, which occur, during stacking or lifting below the level which would produce permanent deformation of the material.

1.6 PROJECT/SITE CONDITIONS

- A. Subsurface investigation data are provided in the Contract Documents. The geotechnical data is made available to the Contractor for informational purposes only and shall not be interpreted as a warranty of subsurface conditions whether interpreted from written text, boring logs, or other data.
- B. Prior to submitting a bid, the Contractor shall review and understand the information contained in the geotechnical data and all Contract Documents.
- C. The Contractor shall draw their own conclusions regarding site conditions based upon site visit(s) and from available sources, for which the Owner and its Consultants assume no responsibility. The Contractor shall assume that subsurface conditions outside of subsurface exploration locations could differ from conditions shown in the records of the explorations.
- D. The Contractor shall notify the Engineer immediately if obstructions are determined to conflict with the location of the excavation support system. Cobbles and boulders within dense well-bonded soils or other competent naturally deposited soils will not be considered obstructions.
- E. The Contractor shall protect adjacent structures above ground and buried from damage associated with lateral support of excavation operations and other operations. Damage due to lateral excavation support operations or other Contractor activities shall be repaired immediately by the Contractor at his own expense.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Structural Steel: All soldier piles, wales, rakers, struts, wedges, plates, waterstop and accessory steel shapes shall conform to ASTM A36.
- B. Timber Lagging: Structural grade having a nominal thickness of 3 inches and a minimum allowable working stress of 1100 psi.
- C. Timber Sheeting: Structural grade having a nominal thickness of 4 inches and a minimum allowable working stress of 1100 psi.
- D. Other Materials
 - 1. Tamping tools adapted for backfilling voids after removal of the excavation support system.
 - 2. Hydraulic, pneumatic or screw-jack shoring systems (Speed Shores) used to support excavations shall be in good working order and shall conform to all of the manufacturer's requirements for new equipment; bent or otherwise damaged supports, leaking hydraulic cylinders, or damaged sheeting shall not be used, and the Contractor shall immediately remove such damaged materials/equipment from the work site.

PART 3 – EXECUTION

3.1 GENERAL

- A. Installation of the temporary excavation support systems shall not commence until the Engineer has reviewed the related earth excavation and dewatering submittals with all Engineers' comments satisfactorily addressed.
- B. Install excavation support system in accordance with the Contractor's temporary excavation support plan.
- C. Carry out program of temporary excavation support in such a manner as to prevent undermining or disturbing foundations of existing structures and utilities, and of work ongoing or previously completed. Excavation support system within Thorndike Street (approximate Station 5+55 to 6+25) shall be installed to prevent loss of soil outside of the trench.
- D. Perform preparatory work to discover, protect, maintain and restore, or remove utilities, foundations or other facilities located in close proximity of the proposed temporary excavation support system.
- E. Conduct pre-excavation as necessary to remove obstructions and identify exiting utilities along the alignment of the temporary excavation support system which will interfere with installation in accordance with Specification Section 02210. Pre-excavation shall not extend greater than 4 feet in depth, and shall not extend within a 2 horizontal to 1 vertical (2H:1V) envelope below existing utilities or structures to remain

- F. The Contractor shall provide fully equipped rig(s) and appropriate tools in full-time operation at the site during the work, and shall mobilize additional equipment, if necessary, to complete the work on schedule.
- G. Excavation shall not proceed more than 2 ft below the bracing level, anywhere within the excavation support limits, until the entire level of bracing is completely installed, including prestressing.
- H. Notify utility owners if existing utilities interfere with the temporary excavation support system. Modify the existing utility with the utility owner's permission or have the utility owner make the modifications at no additional cost to Owner.
- I. All trench support shall be installed and maintained so it is in continuous contact with the earthen trench walls being supported. Trench boxes may not be used for temporary shoring within Thorndike Street (Station 5+55 to 6+25).
- J. Installation, maintenance and removal of the temporary excavation support shall be coordinated with the exposure and support of existing utilities, which may include but are not limited to 4-inch cast iron gas mains, 12-inch water main, 8-inch sewer, and 345 KV transmission main,.
- K. Contractor shall control the rate of the trench excavation and removal of the support system to minimize the movement of permanent structures and the adjacent ground surface.

3.2 SOLDIER PILES AND TIMBER LAGGING

- A. Install steel soldier piles before starting excavation. Install soldier piles by drilling or hydraulically pushing to the design tip elevation. Driving by impact or vibratory hammers shall not be allowed. If used, drilled methods shall prevent loss of ground around the hole. Each soldier pile shall be installed in its drilled hole within 2 hours after drilling is completed to the required depth.
- B. The Contractor shall have equipment on-site able to advance the drilled hole for installation of the soldier piles through sand below the water table, through concrete, and through large boulders and other obstructions which may be encountered.
- C. Space soldier piles at intervals indicated on the Shop Drawings. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- D. Within the same day of seating the soldier piles in the drilled holes, encase the piles with MHD (1995) M4.08.0 – Controlled Density Fill, Type 1E from the tip elevations to the currently existing ground surface. Crushed stone or other granular materials are not acceptable.

- E. Where the excavation support is to be left in place, soldier piles shall be cut off 5 feet below the final ground surface prior to completion of the final backfilling operations.
- F. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. As installation progresses, backpack the voids between the excavation face with sand and on-site soils to establish a tight contact. Pack louver openings between lagging with hay or other porous material to allow free drainage of groundwater without loss of retained soil or backpacking. In no case shall the louvered openings be allowed to exceed 1-inch.
- G. Beginning at the top of the soldier piles, the maximum permissible height of unlagged face of excavation shall not exceed 1-foot in all soil types encountered at the site. If water is flowing from the face of the excavation, or if soil to be retained moves toward the excavation, the maximum height of unlagged face shall not exceed 8-inches.
- H. If unstable ground is encountered, take suitable measures (grouting behind the lagging or other approved method) to retain the material in place and prevent loss of ground or movements, which may cause damage to adjacent structures or utilities.

3.3 INSTALLATION – STEEL OR TIMBER SHEETING

- A. Length Markings: Before installation is started each steel or timber section shall be marked so that the depth of the tip can be readily determined. This shall be accomplished by a method that is approved by the Engineer.
- B. Sheeting shall be installed by means of hydraulically pushing each sheet piling to the required design depth. No impact or vibratory hammers will be allowed for installation of steel or timber sheeting on this project. The Contractor shall take all precautions against excessive vibrations in all areas. The Contractor shall be solely responsible for any damages caused directly or indirectly to structures, utilities, and shall repair any such damage occurring due to his operations to the requirements of the Owner.
- C. All sheeting shall be protected from damage during installation.
- D. All sheeting shall be hydraulically pushed to its full depth ahead of the excavation so as to avoid the loss of material from behind the sheeting; where voids occur outside of the sheeting, they shall be filled immediately with structural fill and thoroughly compacted.
- E. The Contractor shall provide all inspection equipment to determine whether the sheeting has been started in their planned location, are vertical, and are within the allowable tolerance for position after installation.

- F. Requirements for the sheeting include the following:
1. Install sheeting in the plumb position.
 2. Install sheeting such that the piling is in direct contact with the material to be retained.
 3. Install sheeting to the depths indicated on approved Shop Drawings.
 4. Methods and equipment used in pushing, setting, cutting and splicing shall conform to approved Shop Drawings.
 5. Use templates or other temporary alignment facilities to maintain piles plumb and on line.
 6. Control vibrations and noise associated with installation.
 7. Pre-excavate as necessary to remove existing structures along alignment of the sheeting.
 8. Sheeting shall be positioned within 3 inches of the design plan location along its length from top down to bottom of excavation grade. Design plan locations are to be established by the Contractor's Professional Engineer and submitted to the Engineer for review.

3.4 INTERNAL LATERAL WALL BRACING (WALES AND STRUTS)

- A. Use wales and struts as necessary to provide support of the temporary excavation support system as required. Include web stiffeners, plates, brackets, or angles as required to prevent rotation, crippling or buckling of connections and points of bearing between structural steel members. All for eccentricities due to fabrication and assembly. Consider effects of temperature changes.
- B. Install and maintain all support members in continuous tight contact with each other and with the earth wall being supported.
- C. Coordinate locations of all bracing and components thereof for temporary lateral excavation support with locations of permanent structures.
- D. Control rate of excavation and installation of support members to minimize movement of adjacent ground surface.
- E. Excavation shall proceed in accordance with the detailed sequence submitted by the Contractor and reviewed by the Engineer. It shall be the responsibility of the Contractor to schedule and sequence the work accordingly.

3.5 MONITORING

- A. As proposed by the Contractor and approved by the Engineer.
- B. In the event the monitoring system proposed by the Contractor proves ineffective, the Contractor shall implement additional measures as required by the Engineer at no additional cost to the Owner.

3.6 REMOVAL OF EXCAVATION SUPPORT SYSTEM

- A. Where sheeting cannot be removed without damage to existing utilities or work recently installed or other facilities it shall be left in place with the exception of the top 5 feet of excavation support wall below final grades, which shall be removed, unless otherwise approved by the Engineer.
- B. Remove excavation support in a manner that will maintain support as excavation is backfilled and will not leave voids in the backfill.
- C. Do not begin the removal of the excavation support system until it can be safely removed damage to existing facilities, completed work or adjacent property.
- D. Fill any void left by the shoring system or voids created by the removal of the shoring system to provide soil support between the trench backfill and the native soil.
- E. Sheet piling removal must be performed in a manner that will avoid “vibro-consolidation” (densification) of sandy or granular material below or adjacent to the excavation that could lead to settlement and damage of the pipeline, existing utilities, other works of construction and adjacent property.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02160

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 02210

EARTH EXCAVATION, BACKFILL, FILL AND GRADING

2210.1	TEST PITS	EACH
2210.2	CONTROL DENSITY FILL FOR BACKFILL	CUBIC YARD
2210.3	OVEREXCAVATION OF GEOTECHNICALLY UNSUITABLE MATERIAL	CUBIC YARD
2210.4	UNCLASSIFIED EXCAVATION	CUBIC YARD

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. The Work shall consist of excavation of all materials within the limits of the Contract in accordance with the Specifications and in close conformity with the lines, grades, thickness and cross sections shown on the plans or established by the Engineer.
 - 2. The Contractor shall comply with all applicable laws, rules, ordinances, and general regulations of the Federal Government, the Commonwealth of Massachusetts, the City of Somerville, the Somerville Department of Public Works, DEP, EPA, OSHA, and other regulatory agencies having jurisdiction over the Work.
 - 3. Provide materials for backfilling excavations as indicated and specified.
 - 4. Grade surfaces to meet finished grades indicated. Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.
 - 5. Excavate test pits at locations indicated in the Contract Drawings.
 - 6. The Contractor shall monitor existing utilities and structures for movement during excavation and backfilling as indicated on the

Contract Drawings.

7. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper excavation, maintenance or backfill of excavation. The Contractor shall pay for all claims, costs and damages that arise as a result of the work performed at no additional cost to the Owner.

1.3 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Submit an Excavation, Backfilling, Grading and Compaction plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
 - a. Detailed sequence of work.
 - b. General description of construction methods.
 - c. Numbers, types, and sizes of equipment proposed to perform excavation, backfilling, grading and compaction.
 - d. Details of dust control measures.
 - e. Proposed locations of stockpiled excavation and/or backfill materials.
 - f. Proposed surplus excavated material off-site disposal areas and required permits.
 - g. Erosion and sedimentation control measures, which will prevent erosion and sedimentation during the earth moving and soil stockpile activities.

B. Backfill Materials: Submit a grain size analysis and moisture density curve performed in accordance with AASHTO T311 and AASHTO T180, respectively, for each proposed source and type of backfill, imported material, and on-site material to be reused for review by the Engineer at least, one week prior to use of the material. The grain size analysis shall indicate that the backfill material conforms to the gradation requirements specified.

1. In addition, a certification statement and analytical results shall

accompany each physical sample of earth materials to be imported onto the site, including but not limited to crushed stone, loam, bedding sand, gravel sub-base, common fill and structural backfill. At a minimum the certification shall state the point of origin and that the material is free of contaminants. The certification shall include representative sample analysis from each point of origin of backfill to be used on the site. The sample(s) shall be analyzed by a certified laboratory for RCRA 8 metals, volatile organic compounds (EPA Method 8260), semi-volatile organic compounds (EPA Method 8270), petroleum hydrocarbons (EPA Method 8100), and Total PCBs and pesticides (EPA Method 8081 and 8082). On-site soils defined as suitable for reuse in this Section and in Section 02080 – SOIL AND WASTE MANAGEMENT can be used as backfill without providing the certification required above.

2. All sampling of soils for chemical testing shall be performed by a person experienced in sample collection and shall be either: 1) a Licensed Site Professional registered in the Commonwealth of Massachusetts; 2) a Professional Engineer registered in the Commonwealth of Massachusetts; 3) a Professional Geologist registered in the Commonwealth of Massachusetts; 4) a certified groundwater/environmental professional; or 5) an authorized representative of the one of the persons listed above. Samples of each material shall be submitted to a chemical analytical laboratory, certified by the Massachusetts Department of Environmental Protection.
 3. Submit additional geotechnical and analytical test data and certifications for every 1000 cubic yards (every 200 cubic yards for moisture density curves) of material imported or reused on-site or anytime consistency of material changes in the opinion of the Engineer. Submit associated chemical laboratory data on the imported materials throughout the course of the Work, if requested by the Engineer, to evaluate the consistency of the source or process, at no additional cost to the Owner.
- C. Controlled Density Fill Mix Design: Prior to beginning the work the Contractor shall submit for review, controlled density fill mix designs which shall show the proportions and gradations of all materials proposed for each class and type of controlled density fill specified herein.
- D. Filter Fabric: Submit shop drawings and product data sheets.
- E. During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations.
- F. Submit Qualifications of the Contractor's Independent Testing Laboratory as

specified in Paragraph 1.7.C, three weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.

G. Test Pit Logs

1. Prepare and submit a log of the existing conditions observed. Each test pit log shall be submitted as its own document. The following information shall be indicated on the log at a minimum:
 - a. Plan sketch indicating size, material, quantity, function, ownership and direction of flow for each structure and utility. Include a north arrow.
 - b. Swing ties indicating the horizontal location of each structure, utility and duct bank. Where horizontal alignment is found to vary, swing ties shall be recorded at appropriate intervals.
 - c. Top and bottom elevations of each structure and utility, and the dimensions of any encasement. Where vertical elevations are found to vary, elevations shall be recorded at appropriate intervals.
 - d. Where test pits are conducted to establish a vertical corridor for a proposed pipeline through conflicting utilities, include a profile sketch indicating the vertical separation between utilities.
2. Submit photographs that document wide-angle and close-up views of the existing conditions observed.

1.4 DEFINITIONS

- A. Suitable Material: Material which does not contain organic silt or organic clay; peat; vegetation; wood or roots; stones or rock fragments over 6-inch in diameter; porous biodegradable matter; loose or soft fill; excavated pavement; or refuse. Material for backfill shall conform to the gradation requirements specified herein.
- B. Unsuitable Materials: Materials that do not comply with the requirements for the acceptable material or which cannot be compacted to the specified or indicated density.
- C. Percentage of compaction is defined as the ratio of the field dry density, as determined by AASHTO T310 or AASHTO T191 to the maximum dry density determined by AASHTO T180, multiplied by 100.
- D. Proof Roll: Compaction with a minimum of four passes of a vibratory steel drum roller. Vibratory plate compactors shall be used in small areas where a vibratory steel drum roller cannot be used.

1.5 EXCAVATION CLASSIFICATIONS

- A. Earth Excavation or "Excavation" consists of removal of materials encountered to the subgrade elevations indicated and subsequent reuse or disposal of the materials removed. All excavation is classified as earth excavation unless it otherwise meets the classifications provided below for unauthorized excavation, additional excavation, or rock excavation.

- B. Unauthorized Excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at Contractor's expense.
 - 1. Under footings, foundations bases, concrete slabs, retaining walls or other structures, fill unauthorized excavations to the proper elevations with material as directed by Engineer. Elsewhere, backfill and compact unauthorized excavations as specified for excavations of the same class, unless otherwise directed by the Engineer.

- C. Additional Excavation:
 - 1. When excavation has reached required subgrade elevations, notify the Engineer who will review subgrade conditions.
 - 2. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by the Engineer.
 - 3. Removal of unsuitable material and its replacement as directed will be paid on the basis of contract conditions relative to changes in work or as provided for under the unit rates for this classification.

- D. Rock Excavation:
 - 1. Rock excavation in trenches and pits includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42-inch wide bucket on track-mounted power excavator equivalent to Caterpillar Model 215, rated at not less than 90HP flywheel power and 30,000 lb. drawbar pull. Trenches in excess of 10 feet 0-inches in width and pits in excess of 30 feet 0-inches in either length or width are classified as open excavation.
 - 2. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be

dislodged and excavated with modern track-mounted heavy-duty excavating equipment without drilling, blasting or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or No. 977K, or equivalent track-mounted loader, rated at not less than 170HP flywheel power and developing 40,000 lb. break-out force (measured in accordance with SAE J732C).

3. Determination of rock excavation classification shall be made by the Engineer. Typical of materials classified as rock are boulders 1.0 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling, blasting or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by Engineer. Visual observation of the completed excavation may be made by the Engineer to modify the excavation classifications. Removal of rock excavation prior to classification by the Engineer shall be considered as earth excavation unless accepted by the Engineer in writing. Such excavation will be paid on the basis of contract unit rates for this classification.

1.6 REGULATIONS

- A. The Contractor shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- B. Comply with all applicable laws, rules, ordinances, and general regulations of the Federal Government, the Commonwealth of Massachusetts, the City of Somerville, the Somerville Department of Public Works, DEP, EPA, OSHA, and other regulatory agencies having jurisdiction over the Work.

1.7 QUALITY ASSURANCE

- A. Do not excavate or fill until the Engineer has reviewed all the required submittals.
- B. Dig test pits considered separate to the normal excavation as required to locate underground utilities, obstructions or water table.
- C. Employ an independent testing laboratory to perform particle size and gradation analyses, in accordance with AASHTO T311, as well as

compaction testing. The independent testing laboratory shall have the following qualifications:

1. Be accredited by the American Associates of State Highway and Transportation Officials (AASHTO) Accreditation Program;
2. Have three years' experience in sampling, testing and analysis of soil and aggregates, and monitoring field compaction operations;
3. Able to provide three references from previous work.

1.8 AVAILABLE INFORMATION

- A. Prior to submitting his bid, the Contractor shall review and understand all available information. Subsurface exploration data is made available to the Contractor for informational purposes only and shall not be interpreted as a warranty of subsurface conditions whether interpreted from written text, boring logs, or other data. The subsurface data represent conditions only at the sampling locations at the times the explorations were conducted.
- B. Neither the Owner nor Engineer shall be liable for any error or discrepancy in the subsurface information provided, nor for the Contractor's use or interpretation of the information. Additional test borings, test pits or other exploratory operations may be made by the Contractor with the written approval of the Owner, at no additional cost to the Owner.

1.9 CONSTRUCTION TOLERANCES

- A. Construct finished surfaces to plus or minus 0.5 inches of the elevations indicated. Provide the Engineer with adequate survey information to verify compliance with above tolerances.

1.10 FIELD TESTING

- A. Field Testing and Inspections: By Contractor's independent testing laboratory, acceptable to the Engineer, at Contractor's expense as specified. Location of tests shall be mutually acceptable to testing laboratory and the Engineer or as required by the Engineer. In the event compacted material does not meet specified in-place density, recompact material and retest this area until specified results are obtained at no additional cost to the Owner.
- B. Methods of Field Testing: In-Place Density and Moisture Content shall be determined by AASHTO T310 or AASHTO T191.
- C. Testing Frequency: Crushed stone and Sand Borrow shall be compacted as specified and indicated. For other backfill and fill materials, minimum test frequency shall be as follows, and no less than two tests per lift:

1. Trenches under structures, sidewalks, or roadways subbase: Every 30 lin. ft. per lift.
2. Trenches in areas without structures or roadways: Every 50 lin. ft. per lift.
3. Under Structure: Every 100 sq. ft. per lift.
4. Around Structures: Every 100 sq. ft. per lift.

PART 2 – PRODUCTS

2.1 SAND BORROW

- A. The Sand Borrow shall conform to Massachusetts Department of Transportation (MassDOT) 1988 Standard Specifications section, M1.04.1.

2.2 CRUSHED STONE

- A. Crushed stone shall conform to the requirements of MassDOT 1988 Standard Specifications section M2.01.4 for ¾-inch crushed stone.
- B. Crushed stone shall be wrapped in filter fabric, placed in maximum 6-inch thick layers, loose measure, and compacted with a minimum of four passes of a vibratory plate or roller compactor. The crushed stone shall be uniformly blended.

2.3 ORDINARY BORROW:

- A. Ordinary Borrow shall consist of sand and gravel consisting of hard durable particles, and free from trash, ice and snow, tree stumps, roots and other organic matter, and shall conform to MassDOT 1988 Standard Specifications section M1.01.0, and the following gradation requirements:

Sieve Size	Percent Finer by Weight
6-inch (152.4mm)	100
No. 4	30-80
No. 40	30-50
No. 200	0-25

- B. On-site excavated material may be used as Ordinary Borrow, provided it meets the requirements specified herein and can be compacted to the required degree.

2.4 CONTROLLED DENSITY FILL (CDF)

- A. Controlled density fill shall consist of a cementitious excavatable mixture of aggregate, Portland Cement, and air entraining admixtures. The material shall be of the type specified in MassDOT 1995 Standard Specifications for Highway and Bridges, as amended, Type 2E.
- B. Controlled density fill placed in contact with ductile iron pipe shall utilize a non-fly ash mix design.

2.5 GRAVEL BORROW

- A. Gravel Borrow shall conform to the requirements of MassDOT 1988 Standard Specifications section M1.03.0 for Type b Gravel Borrow.

2.6 GRAVEL SUBBASE

- A. Gravel Subbase shall conform to the requirements of MassDOT 1988 Standard Specification section M1.03.1.

2.7 FILTER FABRIC

- A. Filter Fabric, shall consist of a nonwoven fabric made from polypropylene or polyethylene filaments or yarns. The fabric shall be inert to organic chemicals commonly encountered in the soil. The fabric shall conform to the following recommended property tests:

Property	Unit	Test Method	Minimum Value
Weight	oz/sy	ASTM D-3776	4.5
Grab Strength	Lbs	ASTM D-4632	120
Grab Elongation	percent	ASTM D-4632	55
Trapezoid Tear Strength	Lbs	ASTM D-4533	50
Mullen Burst Strength	PSI	ASTM D-3786	210
Puncture Strength	Lbs	ASTM D-4833	70

- B. Edges and ends of filter fabric shall overlap a minimum of two feet.

PART 3 – EXECUTION

3.1 GENERAL

- A. Execution of any earth excavation shall not commence until the related dewatering, soil and fill management, excavation support systems, and required backfill and fill materials submittals are reviewed by the Engineer and all

Engineers' comments addressed.

- B. Cut pavement and all surface materials to the top of the existing fill material with a saw to prevent damage to remaining pavement without extra compensation. Surface materials may include concrete slabs, cobblestones, rails and other miscellaneous materials. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
- C. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines and embankments or existing structures and pipelines.
- D. During progress of work, conduct earth-moving operations and maintain work site so as to minimize the creation and dispersion of dust.
- E. Roadway and Site Leveling: Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.

3.2 TRENCH EXCAVATION

- A. Excavate to widths that give adequate working space for constructing structures or laying and jointing piping, and to allow for safety of personnel.
- B. Excavate to lines and elevations indicated in an orderly and continuous program.
- C. Excavate trench by machinery to, or just below designated subgrade. Excavate deeper, as required by the Engineer, to remove unsuitable subgrade material.
- D. Exercise care to preserve material below and beyond the lines of excavations. If material remaining at the bottom of the trench is disturbed, recompaction shall be required.
- E. Excavations shall be performed in the dry, and kept free from standing water, snow and ice during construction.
- F. Maintain groundwater levels a minimum of 2 feet below the bottom of the trench during excavation and subgrade preparation. Dewatering systems shall be provided and maintained as specified in Section 02140 - DEWATERING.
- G. Excavation Around Existing Structures or Utilities:
 - 1. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Excavate using only hand tools when within 3 feet horizontally of exposed structures or utilities, and within a soil wedge delineated by a downward line at 45 degree angle drawn from the springline of exposed utilities. Include such

manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.

2. Excavations to remove unsuitable material shall not extend within a 2 horizontal to 1 vertical (2H:1V) envelope below existing structures to remain, except when excavation is supported by an approved shoring system designed and installed in accordance with Specification Section 02160.
3. Excavate test pits when determination of exact location of pipe utilities or other underground structures is necessary for doing work properly.

3.3 REUSE OF EXCAVATED MATERIAL

- A. Carefully remove material from excavated areas and store separately for further use as backfill material or for disposal or immediately reuse at the area of excavation as backfill.
- B. Reuse surplus suitable excavated materials for backfill as indicated and in accordance with Section 02080 – SOIL AND FILL MANAGEMENT; deposit neatly and grade.
- C. In general, the material used for backfilling trench excavations within the zone above structures and above 6 inches above pipe crowns shall be material removed from the excavation, provided that the reuse of these materials result in the required trench compaction and the material meets the requirements specified herein for Ordinary Borrow.

3.4 SUBGRADE PREPARATION AND PROTECTION

- A. Proof compact with a vibratory plate compactor or double drum roller (4 passes) the exposed subgrade prior to backfilling and filling operation, or placing pipe or structure bedding. Proof rolling shall be performed in the presence of the Engineer.
- B. As required by the Engineer, over-excavate any unstable or unsuitable materials below the subgrade.
 1. Existing fills may remain below structures and pipes constructed within the Community Path (Station 0+00 to 6+05) provided the material can be be proof-compacted to the satisfaction of the Engineer.
 2. Existing fills and unsuitable materials must be removed to a depth of 1 foot below pipe bedding for pipes constructed within Thorndike Street (Station 6+05 to 6+28), or deeper as directed by the Engineer.

3. Existing fills and unsuitable materials must be completely removed below manhole or catch basin structures constructed within Thorndike Street (Station 6+16), as directed by the Engineer.
 4. The overexcavation shall be backfilled with Crushed Stone wrapped in filter fabric and compacted as specified herein.
- C. Use excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the pipe trench subgrade to avoid disturbance of the bearing surface. Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- D. In areas where the bottom of the excavation is in silt and clay, and is below the groundwater table, a working mat and drainage layer of 12 inches of compacted crushed stone wrapped in filter fabric may be placed.

3.5 BACKFILL PLACEMENT

- A. The trenches shall be backfilled as soon as practicable with the material specified herein. All trench backfilling shall be done with special care, in the following manner and as required by the Engineer.
- B. All fill shall be placed in horizontal layers. Fill shall not be placed following the natural contours of the ground. Fill shall be placed starting in the lowest areas working up to finish grades in horizontal layers in the manner specified herein.
- C. Place backfill to a maximum loose lift thickness of 9 inches except where used as pipe bedding, and compact to the degree specified herein.
- D. Backfill material for pipe bedding shall be deposited across the entire width of the trench, uniformly on both sides of the pipe simultaneously to ensure that all loads applied to the utility by the backfill are properly balanced and that they do not exceed the safe load carrying capacity of the utility at any time as indicated on the drawings.
1. Sand borrow bedding shall be placed by hand shovels, in layers not more than 4-inches thick in loose depth, and each layer shall be thoroughly and evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids.
 2. Crushed stone bedding material shall be placed in layers not more than 6-inches thick in loose measure, and compacted with at least 4 passes using a vibratory plate compactor.
- E. The trench shall be backfilled with quick-set CDF to 2 feet above the crown of any utility crossing the trench in areas where compaction cannot be

achieved using mechanical compaction equipment.

- F. Backfill shall be placed in appropriately sized lifts and on both sides of the utility simultaneously to ensure that all loads applied to the utility by the backfill are properly balanced and that they do not exceed the safe load carrying capacity of the utility at any time.
- G. All trench backfilling shall be done with special care and must be carefully placed so as not to disturb the work at any time. If necessary, timber grillage or other suitable method shall be used to break the fall of material. The moisture content of the backfill material shall be such that proper compaction will be obtained. Backfill shall be made to grades required to establish the proper subgrade for the placement of topsoil or pavement base courses.
- H. In no case shall fill be placed in standing water, over unsuitable material, or material that is frozen. Water shall not be allowed to rise upon or flow over the bedding and backfill material.
- I. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.
- J. Any trenches or excavations improperly backfilled or where settlement occurs, shall be reopened to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.
- K. During filling and backfilling operations, pipelines will be checked by the Engineer to determine whether any displacement of the pipe has occurred. Pipelines observed to display poor alignment, displacement, or other defects shall be remedied to meet Engineer and Owner requirements at no additional cost to the Owner.
- L. After backfilling trenches and excavations, the Contractor shall maintain the surfaces of backfill area in good condition so as to present a smooth surface at all times level with adjacent surfaces. The Contractor shall repair any subsequent settling over backfilled area immediately, in a manner satisfactory to the Engineer, and such maintenance shall be provided by the Contractor for the life of this Contract, at no additional expense to the Owner.
- M. The finished subgrade of the fills and filled excavations upon which topsoil is to be placed or pavements are to be constructed, shall not be disturbed by traffic of other operations, and shall be maintained in a satisfactory condition until the finished courses are placed. The storage or stockpiling of materials on finished subgrade will not be permitted.
- N. Backfilling around structures should not commence until after the satisfactory completion of leakage tests and of any other required work in connection with

the structures.

- O. Symmetrical backfill loading shall be maintained around structures. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures.
- P. The Contractor shall conduct his compacting and other operations in a manner to prevent damage to structures due to passage of heavy equipment over or adjacent to structures, and any damage thereto shall be remedied by the Contractor at no additional expense to the Owner.

3.6 COMPACTION REQUIREMENTS

A. Compaction equipment:

- 1. The compaction equipment shall be selected by the Contractor, and shall be capable of consistently achieving the specified compaction requirements.
- 2. Except where restricted per Section 3.7.A.2, the selected compaction equipment shall meet the following minimum requirements.
 - a. Manually operated vibratory plate compactors weighing no less than 200 pounds with vibration frequency no less than 1600 cycles per minute
 - b. Vibratory steel drum roller weighing at least 12,000 pounds.
 - c. Water jetting and puddling will not be allowed
- 3. Compaction equipment restrictions over MBTA Red Line Tunnel:
 - a. When within 2 to 5 feet above the top of the MBTA Red Line Tunnel roof, compaction equipment is restricted to manually operating vibratory plate compactors weighing no more than 150 pounds.
 - b. When within 2 feet above the top of the MBTA Red Line tunnel roof, mechanical compaction shall not be permitted, and compaction shall be done by hand-operated tampers.

B. The degree of compaction is expressed as a percentage of the maximum dry density at optimum moisture content as determined by AASHTO T180. The required degrees of compaction are as follows:

Area	ASTM Density Degree of Compaction
------	-----------------------------------

Area	ASTM Density Degree of Compaction
Natural subgrade	Proof roll
Crushed stone	As specified herein
Sand Borrow	As specified herein
Gravel subbase	95%
Trench backfill (on-site fill)	
- below pavements	95%
- below landscaped areas	90%
Other areas	90%

- C. Moisture Control: Maintain backfill material with a uniform moisture content, with no visible wet or dry streaking, between plus 2 percent or minus 3 percent of optimum moisture content.
1. Fill that is too wet for proper compaction shall be desiccated, harrowed, or otherwise dried to a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill at no additional cost to the Owner.
 2. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density
- D. Compaction Control: In-place density tests shall be made at the Contractor's expense in accordance with AASHTO T310 or AASHTO T191 as the work progresses, to determine the degree of compaction being attained by the Contractor. Any corrective work required as a result of such tests, such as additional compaction, or a decrease in the thickness of layers, shall be performed by the Contractor at no additional expense to the Owner.
- E. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of the day's operations. Prior to terminating work for the day, the final layer of compacted fill shall be rolled with a smooth wheeled roller to eliminate ridges of soil left by compaction equipment.
- F. The Engineer's duties do not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Engineer nor any observation and testing performed by him shall excuse the Contractor from defects discovered in his work at that time or subsequent to the testing.

3.7 CDF QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. Slump: ASTM C143; one test at point of discharge for each day's placement; additional tests when CDF consistency seems to have changed.

- B. Compression Test Specimen: ASTM C31; one set of four (4) standard cylinders for each compression strength test, plus additional sets for each 100 cu yds more than the first 50 cu yds placed in any one day unless otherwise required.
- C. Compressive Strength Tests: ASTM C39; one set for each day's pour plus additional sets for each 100 cu. yds more than the first 50 cu. yds placed in any one day; two specimens tested at 28 days, and two specimens tested at 90 days.
- D. Test results will be reported in writing to Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of placement, name of testing service, fill type and class, location of fill batch along route, design compressive strength limits at 28 days and 90 days, fill mix proportions and materials, compressive breaking strength, and type of break for both 28 day tests and 90 day tests.

3.8 REMOVAL OF SUBSURFACE OBSTRUCTIONS

- A. Remove indicated or approved subsurface structures and related obstructions to complete the work.
- B. Promptly notify the Engineer when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls and foundations.

3.9 UNAUTHORIZED EXCAVATION

- A. When the bottom of any excavation is excavated beyond limits indicated or specified, backfill with crushed stone wrapped with non-woven geotextile fabric. No additional payment will be made for the excavation of backfill or unauthorized excavation.

3.10 CARE AND RESTORATION OF PROPERTY

- A. Restore all surfaces damaged by the Contractor's operations, including paved surfaces damaged by the treads of the Contractor's equipment, to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.

3.11 POLLUTION CONTROL

- A. During progress of work, conduct earth-moving operations and maintain work site so as to minimize the creation and dispersion of dust.

- B. Separation of Excavated Material for Reuse: Remove only existing pavement and all other surface materials, which may include concrete slabs, cobblestones, rail ties, by saw cutting that is necessary for prosecution of work.

PART 4 – COMPENSATION

Item 2210.1 - Test Pits

METHOD OF MEASUREMENT:

Measurement for payment for Test Pits will be based on the actual amount of test pits excavated as required by the Engineer. Test Pits, completed for the Contractor's convenience, not approved by the Engineer, will be at the Contractor's expense and at no additional cost to the Owner.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Test Pit shall be based on the actual amount of test pits excavated for this item in the proposal. Under the per each for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Test Pits. The work includes, but is not limited to; saw cutting bituminous and cement concrete; excavate and backfill such materials as necessary to locate pipe, utilities and other possible obstructions as indicated on the Drawings, as required by the Owner or Engineer, or as approved by the Owner or Engineer prior to performing the test pit; temporary excavation support; furnishing and placing backfill per one of the approved methods; compaction and compaction testing; coordination with utility companies/owners; survey of existing conditions including horizontal and vertical utility alignments and reflecting the actual conditions on the Project's As-built Drawings; and construction dewatering and all work incidental thereto and all work not specifically included for payment under other items.

EXCLUSIONS:

Test Pits completed for the purpose of soil characterization shall not be paid for under this item. Pre-trenching prior to the installation of temporary support of excavation or for any other purpose shall not be paid for herein unless approved by the Owner and Engineer prior to the pre-trenching or test pitting. Test pitting related to transferring existing water services to an existing water main are not paid for here and are paid for elsewhere.

Item 2210.2 - Controlled Density Fill for Backfill

METHOD OF MEASUREMENT:

Measurement for payment for Controlled Density Fill for Backfill shall be made on the basis of cubic yards placed within the trench width pay limits shown indicated elsewhere in the Construction Documents or as otherwise approved by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Controlled Density Fill for Backfill shall be based on the cubic yards installed complete for this item in the proposal. Under the per cubic yard price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for

Controlled Density Fill for Backfill. The work includes, but is not limited to; furnish and install controlled density fill for backfill under existing utilities, encasement of shallow pipe and utilities, and in areas of difficult compaction, and where required by the Engineer; temporary bulkheads and forms; furnishing and installing filter fabric; and material testing.

EXCLUSIONS:

Controlled Density Fill used for the abandonment of pipes and structures will not be paid for under this item.

Item 2210.3 – Overexcavation of Geotechnically Unsuitable Material

METHOD OF MEASUREMENT:

Measurement for payment for Overexcavation of Geotechnically Unsuitable Material shall be made on the basis of cubic yards of organic peat or silt, loose foundation soils, or other unsuitable material excavated as approved by the Engineer. The depth of unsuitable material in pipe trenches shall be measured from 6 inches below the invert of the pipe to the top of suitable material or specified depth of overexcavation as determined by the Engineer. The width of unsuitable material shall be determined as outlined in the Typical Trench Detail included with the Contract Documents. The depth of unsuitable material in structure excavations shall be measured from 12 inches below the bottom of the structure slab to the top of suitable material or specified depth of overexcavation as determined by the Engineer. The width of unsuitable material in structure excavations shall be based on a 1:1 slope from the edge of the bottom of the structure to the top of the acceptable material.

BASIS OF PAYMENT / INCLUSIONS:

Overexcavation of Geotechnically Unsuitable Material shall be based on the cubic yards excavated complete for this item in the proposal. Under the unit price bid, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for overexcavation of organic peat or silt, loose foundation soils, or other unsuitable material below the grade of structures, pipe, or manholes, as directed and approved by the Engineer and as may be indicated in the Contract Documents. The work includes, but is not limited to; excavate organic peat or silt, loose foundation soils, or other unsuitable material; transporting material to the temporary soil staging area; furnish and install required temporary excavation support; furnish and place approved geotechnically suitable replacement backfill; compaction and compaction testing; and construction dewatering and all work incidental thereto and all work not specifically included for payment under other items.

EXCLUSIONS/SPECIAL NOTES:

This item does not include payment for the disposal and transportation of soil, other than to temporary staging, as it is paid for under soil management, transportation, and disposal quantities.

Item 2210.4– Unclassified Excavation

METHOD OF MEASUREMENT:

Measurement for payment for Unclassified Excavation shall be made on the basis of cubic yards of asphalt, concrete subbase, and cobblestones, excavated to final grade as indicated elsewhere in the Construction Documents or as otherwise approved by the Engineer. Under

the per cubic yard price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the removal of concrete subbase and cobblestones excavated to final grade. The work includes, but is not limited to; saw cutting bituminous and cement concrete; excavating, and all work incidental thereto and all work not specifically included for payment under other items.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Unclassified Excavation shall be based on the cubic yards excavated complete for this item in the proposal. Under the per cubic yard price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the removal of asphalt, concrete subbase, and cobblestones excavated to final grade. The work includes, but is not limited to; saw cutting bituminous and cement concrete; excavating concrete subbase and cobblestones; and all work incidental thereto and all work not specifically included for payment under other items.

EXCLUSIONS OR SPECIAL NOTES:

This item does not include payment for as removal of asphalt or temporary asphalt within the trench limits of structures, manholes, or pipe, as it is paid for elsewhere in the Contract Documents. This item does not include payment for removal of existing sidewalks (all types) as it is paid for elsewhere in the Contract Documents. This item does not include transportation and disposal of Unclassified Excavation, as it is paid for elsewhere in the Contract Documents. This item does include payment for removal of soil or gravel, as it is paid for elsewhere in the Contract Documents.

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 02252

MANHOLES

2252.1	PRECAST 4-FOOT DIAMETER MANHOLES	EACH
2252.2	PRECAST 5- FOOT DIAMETER DROP MANHOLE (INTERNAL)	EACH

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Furnishing, installing, and testing of precast concrete drain manholes, complete and in place, within the limits and to the lines and grades indicated.

1.2 RELATED TECHNICAL SECTION

- A. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING
- B. Section 02590 – BRICK MASONRY
- C. Section 07160 – BITUMINOUS DAMPPROOFING

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Complete shop drawings for all precast manhole sections, cast iron frames and covers and appurtenances.
2. Prior to fabrication, submit shop drawings showing details of precast monolithic base sections; risers; eccentric cone and flat slab manhole tops; joints and gaskets; and construction details, tolerances, and other information as required by the Owner.
3. Submit manufacturer's recommended installation procedures for informational purposes.
4. Submit concrete strength testing as specified herein.

1.4 QUALITY CONTROL

- A. Provide in accordance with Section 01400 – QUALITY CONTROL and as specified.
- B. Owner reserves right to inspect and test by independent services at manufacturer’s plant or elsewhere at his own expense.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01600 – PRODUCTS, MATERIALS, AND EQUIPMENT.
- B. Removed manhole fixtures must not be reused and shall be salvaged and delivered to the City of Somerville Public Works storage yard unless directed by the Owner to dispose off site.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Precast Bases, Risers, and Tops:
 - 1. Except as otherwise indicated, precast reinforced concrete manhole bases and risers shall be 48 inches, 60 inches, 72 inches, or 96 inches, with top sections of types indicated or as directed.
 - 2. Manhole sections shall conform to the requirements of ASTM C478, latest revision, except as modified herein and/or on the drawings.
 - 3. Each manhole section shall be constructed with a bell-and-spigot or tongue-in-groove joint.
 - 4. The manhole sections shall be manufactured by the centrifugal, roller suspension or vertical cast process; workmanship and methods shall be in accordance with the best practices of modern shops for this type of work.
 - 5. The height and diameter of manhole bases shall be as required to accommodate size of pipe used, as approved. The manhole risers shall be available in 1, 2, 3, and 4-foot lengths.
 - 6. Manhole tops of the eccentric cone type shall be 3 or 4 foot lengths, with opening at top matching size of casting nominal diameter, unless otherwise noted as shown in the details.
 - 7. Manholes larger than 4 feet in diameter at the base shall be reduced in diameter to 4 feet at the top riser section unless noted otherwise on

the plans.

8. Manhole tops of the flat slab type, where space restrictions exist or where directed, shall not be less than 8 inches thick and reinforced as indicated, and shall have an opening having a minimum inside diameter of 24 inches.
9. Manhole bases and risers shall have the wall thicknesses as stated in the Drawings; cone type units shall taper to a minimum wall thickness of 8-inches at top.
10. Exterior concrete surfaces not otherwise manufactured with crystalline waterproofing admix shall be coated with bituminous damp proofing as per Section 07160 – BITUMINOUS DAMPPROOFING.

B. Concrete:

1. Cement shall be moderate heat-of-hydration Portland cement conforming to ASTM C150, latest revision, Type II. Absorption, determined by absorption test described in ASTM C478, latest revision, shall not exceed 8 percent of dry weight.
2. The concrete for precast manhole sections shall have an average strength of not less than 4,000 psi at 28 days. Strength shall be determined by tests on 6-inch by 12-inch vibrated test cylinders cured in the same manner as the manhole sections, cores cut from the manhole sections, or by other approved methods. Not less than two concrete strength tests shall be made for each 100 linear feet of manhole sections and the test results submitted to the Owner. Testing may be conducted at the manufacturer's plant or at an approved testing laboratory and shall be the responsibility of the Contractor, at no additional expense to the Owner.

C. Frames and Covers:

1. All frames shall have a minimum clear opening of 24 inches. Standard frame height shall be 8-inches high. Compact 4-inch high frames shall be used only where indicated on the drawings or directed by the ENGINEER.
2. Iron castings shall be true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow-holes and other defects affecting the strength and value for the service intended. The finished coating shall be tough and tenacious when cold and not brittle or with any tendency to scale off under seasonable temperature changes.

3. Frames and Covers shall be Cast Iron, conforming to ASTM A48, Class 35B and as follows:
 - a. Castings to be free from scale, lumps, blisters and sandholes.
 - b. Machine contact surfaces to prevent rocking.
 - c. Thoroughly clean and conduct hammer inspection.
4. Two pickholes cast 180° apart shall be closed loops to facilitate removing cover allowing manhole pick to “hook” the loops.
5. Manhole frames with 26-inch covers for 24 –inch opening shall be 475 pounds minimum by East Jordan Iron Works 1047Z (frame), 1040A (cover), or approved equal.
6. Frames and covers shall be capable of withstanding AASHTO H-20 loading unless otherwise indicated or specified.
7. The Contractor shall furnish all manhole frames and covers conforming to the details shown on the drawings, or as herein specified. Frames and covers shall be of cast iron with diamond cover surface design. Manhole covers shall be machined to fit securely and evenly on the frame.
8. Covers for all structures shall have the word “DRAIN” or other appropriate designation cast upon them.

D. Jointing:

1. Precast machine-made solid segments shall conform to ASTM C139.
2. Ends of each length of manhole riser, the bottom end of manhole tops of the cone type, base slabs, and the tops of monolithic bases shall be provided with bell-and-spigot or tongue-and-groove ends of concrete formed on machined rings to insure accurate joint surfaces.
3. Jointing shall be O-ring gaskets or butyl rubber molded sealants. All joints shall be provided so as to be watertight under all conditions of service. The ends of base, riser, and cone sections to be jointed using neoprene "O-ring" type joints shall be designed to enclose the gasket on four surfaces when the joint is in its final position.

E. Gaskets:

1. Gaskets for sealing joints using the "O-ring" type gaskets shall conform to ASTM C443, latest revision, and shall be of rubber of a

special composition having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five years experience in the manufacture of neoprene gaskets for pipe joints, or shall be vulcanized butyl rubber sealants meeting or exceeding Federal Specifications SS-S-210.

2. Each gasket shall be a continuous ring of round solid cross-section having smooth surfaces free from blisters, porosity and other imperfections. The joint sealing gasket shall be of a composition and texture which shall be resistant to sewage, industrial wastes including gasoline, oils and groundwater, and which will endure permanently under the conditions likely to be imposed by this use. The tensile strength shall be at least 1,200 psi. The elongation shall be such that 2-inch gauge marks shall stretch to not less than 9 inches. The compression set (constant deflection) shall not exceed 25 percent of the original gauge length. The tensile strength after accelerated aging shall be not less than 80 percent of the original strength.
3. The butyl rubber sealant shall have a self-adhesive nature, shall have a diameter of 1 inch, and shall be furnished in coils. The sealant shall meet the following properties:

<u>DESCRIPTION</u>	<u>SEALANT PROPERTY</u>
Base	Vulcanized Butyl Rubber
Percent of Solids	100%
Shore "A" Durometer:	
- Initial	10
- Aged	20
Adhesion to Clean Surfaces	Excellent
Temperature Range:	
- Application	-20° F to 120° F
- Service	-65° F to 200° F
Water Absorption after 14 days immersion:	Less than 5%
Chemical Resistance after 7 days immersion in 5% Potassium Hydroxide and 5% Hydrochloride Acid	Excellent
Resistance to Water and Organic Solvents	Excellent
Resistance to Shock, Heat, and Cold	Excellent
Color	Black
Shelf Life	Excellent
Elongation	
- Initial	30%
- 2 weeks at 190° F, drying	250%
- 2 weeks in water	300%
Weather Resistance	Excellent
Moisture Diffusion Resistance	Excellent
Specific Gravity	1:18
Flash Point	None
Fire Point	Over 620° F

F. Mortar for Sealing Joints:

1. Mortar (grout), for sealing mortar-type joints or grouting field made pipe openings, shall be a non-shrink type mortar or grout which shall be a factory-mixed ready-to-use product containing especially prepared aggregate, cement and sand and other components which will produce a mortar or grout with properties to counteract shrinkage, increase density, withstand impact, improve workability, produce watertight joints, and which will be suitable for jointing around pipes entering manholes.

G. Mortar for Brickwork:

1. Per Section 02590 – BRICK MASONRY

H. Brick

1. Per Section 02590 – BRICK MASONRY

- I. Flexible Pipe to Manhole Seals
 1. Flexible manhole seals shall be:
 - a. New Lok Joint Flexible Sleeve by Interpace,
 - b. A-Lok Manhole Sleeve by L & L Concrete Products,
 - c. Press Wedge II by Press-Seal Gasket Corporation,
 - d. or approved equal.
 2. Field applied seals shall be similar to a style typified by Kor-N-Seal boot or an approved equal.
 3. Manhole sleeves, gaskets and sealants shall be furnished complete with lubricants, stainless steel stops, inserts, clamps, etc.

PART 3 – EXECUTION

3.1 HANDLING:

- A. Manhole sections shall not be shipped for at least five days after manufacture.
- B. All manhole sections which have been damaged after delivery, and manhole sections installed in the work which are found to be damaged will be rejected and shall be removed and replaced by the Contractor with new, sound and approved material, at no additional expense to the Owner. At the time of inspection, the surfaces of the sections shall be dense and close-textured. Cores shall serve as a basis for rejection of manhole sections if poor bond or reinforcement is exposed.
- C. Each manhole section shall be handled into its position in the trench only in such manner and by such means as recommended by the manufacturer of the manhole sections, and as approved. Provide all necessary slings, straps and other devices for the safe and satisfactory handling and support of the manhole sections during lifting, installation and final positioning of the sections. Lifting holes may be permitted provided suitable rubber or concrete stopper or other approved devices are provided for plugging and sealing the holes and watertight, all as approved.

3.2 INSPECTION

- A. All manhole sections will be inspected upon delivery; manhole sections which do not conform to specification requirements will be rejected and shall be removed immediately from the site by the Contractor at no additional cost

to the Owner. The Contractor shall furnish all labor and facilities necessary to assist the Owner in inspecting the material.

- B. The quality of all materials, processes of manufacture, and the finished manhole sections shall be subject to inspection and approval of the Owner. Such inspection may be made at the place of manufacture and/or on the site, and the manhole sections shall be subject to rejection at any time because of failure to meet any of the specification requirements, even though sample manhole sections may have been accepted as satisfactory.

3.3 INSTALLATION

- A. Manhole sections shall be installed level and plumb and set on 12 inches compacted crushed stone or gravel base as indicated on the Drawings.
- B. Manhole sections shall be installed using approved type neoprene "O-Ring" type gasket or butyl rubber sealants for sealing joints of manhole sections; jointing shall be performed in accordance with the pipe manufacturer's recommendations, and as approved.
- C. Water shall not be permitted to rise over newly made joints until after inspection as to their acceptability. All jointing shall be done in a manner to insure watertight joints.
- D. All holes in sections used for handling shall be thoroughly plugged with non-shrink grout.
- E. The manhole frames shall be set with tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings utilizing brick and mortar or reinforced precast concrete rings as per Section 02590 – BRICK MASONRY. Frames shall be set in a full bed of mortar so that the space between the top of the brick and mortar and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to a height of 4-inches above the flange. Exterior surfaces of brick masonry shall be plastered with 1/2 inch of cement mortar.
- E. Opening in precast manhole sections to extent indicated on the drawings to receive entering pipes shall be made at the place of the manufacturer. Where opening cannot be determined, they shall be hole cored in the field. Depending upon the type of pipe seals to be furnished, pipe openings shall be provided with manhole seals of proper sizes to accommodate pipe sizes and shall be cast into the manhole at the time of manufacture. When openings are hole cored in the field, the openings for entering pipes shall be of a size to provide a uniform annular space between the outside of pipe wall and the opening in the manhole section. The annular space for pipes requiring mortar

connections (RCP pipe) shall be 3/4 inch, and after the pipe is in position the annular space shall be solidly filled with non-shrink mortar. The annular space for pipes requiring flexible connections (DI, PVC and FRP pipe) shall be made in accordance with the Drawing details. Care shall be taken to assure that the openings are made to permit setting of the entering pipe at its correct elevation as indicated or directed. Openings which are hole cored in the manhole sections in the field shall be circular, not square and shall be made by the appropriate coring operation; damaged sections will be rejected and shall be replaced at no additional expense to the Owner.

- F. Manhole inverts shall be brick masonry or concrete and shall have a cross-section shaped to conform to connecting pipes; changes in size shall be made gradually and evenly. Concrete for manhole inverts shall conform to specified material in Part 2, constructed as indicated and as specified. Brick masonry for manhole inverts shall conform to Section 02590 – BRICK MASONRY, constructed as indicated and as specified.

3.4 BACKFILLING

- A. Conduct backfill operations of open cut trenches closely following laying, jointing, and bedding of pipe, and after initial inspection and testing are completed, all in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL, AND GRADING.

3.5 INSPECTION AND TESTING

- A. Acceptance of precast reinforced concrete manhole sections will be made on the basis of plant tests, material tests, and inspection of the completed product, in accordance with the requirements of ASTM C478, latest revision, with the following modifications.
- B. Manhole sections shall not be shipped for at least five days after manufacture when cured by subjecting them to thoroughly saturated steam at a temperature between 100 and 150° F for a period of not less than 8 hours, or when necessary, for such additional time as may be required to enable the manhole sections to meet specification requirements.
- C. Leakage Tests
 - 1. Leakage tests for four (4) foot and five (5) foot diameter manholes may be made using vacuum testing equipment. This type of test may be used only immediately after assembly of the manhole and only prior to backfilling. The manhole to pipe connection should only be a flexible connector. All lift holes shall be plugged with a non-shrinking mortar. For this test, each four or five foot diameter manhole shall be tested under 10-inch of Hg vacuum. The test shall pass if the vacuum remains at 10-inch Hg or drops no lower than 9-inch Hg after 60 seconds for

manholes 0 to 10 feet deep, 75 seconds for manholes 10 to 15 feet deep or 90 seconds for manholes 15 to 25 feet deep.

3.6 CLEANING

- A. All excess material including dirt, loose concrete, bricks, grit, stones and any other material, shall be removed from all manholes prior to final review by the Engineer. A final cleaning shall be performed, to include complete removal of all accumulated debris and fluids from each catch basin, upon complete project completion.

PART 4 – COMPENSATION

Item 2252.1 --- Precast 4-foot Diameter Manhole

BASIS OF PAYMENT/INCLUSIONS:

Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement, installation, cleaning, and leakage testing/inspection of 4-foot diameter precast concrete manholes complete as indicated on the Drawings and Specifications, or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: pavement or sidewalk sawcutting; removal of brick, concrete, or bituminous sidewalk; excavation of bituminous concrete roadway; excavation; transporting material to/from soil staging area; temporary excavation support consisting of timber or steel sheeting, left in place and cut off below grade where required by the Contract Specifications; sanitary sewer and storm drain flow handling; removal of groundwater from the trench; handling groundwater recharged back to the soil; filter fabric as required; bedding, including compaction; precast manhole sections with frames, covers, masonry chimney, appurtenances, bench and masonry invert construction, and storm drain (if applicable) pipe sleeve (if applicable); bituminous damp proofing (if applicable); furnishing, placing and compacting suitable backfill soil; grade and compact gravel pavement sub-base; compaction testing; and all appurtenances and incidental work.

METHOD OF MEASUREMENT:

Payment for Precast 4-foot Diameter Manhole shall be based on the Unit Price bid in the proposal. Measurement for payment shall be based on the actual number of complete and functional manholes as shown on the Contract Drawings or as directed by the Owner or Engineer.

Manholes installed but not successfully tested and accepted shall be paid for at a maximum of 95 percent of the unit prices bid under this item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reductions in payment due to unsuccessful testing shall be made prior to normal retainage.

SPECIAL NOTES ON EXCLUSIONS:

The following item(s) are not included for payment under this item and are included for payment elsewhere: disposal of bituminous concrete and construction debris; treatment of

groundwater discharged under a MWRA Dewatering Discharge Permit; procurement, installation, and compaction of CDF.

2252.2 PRECAST 5- FOOT DIAMETER DROP MANHOLE

BASIS OF PAYMENT/INCLUSIONS:

Under the unit price bid, the Contractor shall furnish and install five-foot diameter drop manholes of reinforced precast concrete sections, complete, including concrete bases, riser sections, cones or top slabs, brick invert, steps, landing platforms, internal piping, strapping and appurtenances, and standard and/or watertight frames and covers, pipe sleeves and brick or riser rings under frames. The Contractor shall also perform all excavation and backfill, removing excess material from the job, furnishing and placing 3/4-inch crushed stone bedding; filter fabric; repair and/or relocation of any utility lines broken and/or conflicting with construction, dewatering, connecting sewer piping, furnishing and applying dampproofing, leakage testing/inspection, clean up and raising manholes to grade under the unit price for this Item.

METHOD OF MEASUREMENT:

Measurement for payment shall be based on the actual number of complete and functional 5-foot diameter drop manholes furnished and installed as shown on the Contract Drawings or as directed by the Owner or Engineer.

SPECIAL NOTES ON EXCLUSIONS:

The following item(s) are not included for payment under this item and are included for payment elsewhere: disposal of bituminous concrete and construction debris; treatment of groundwater discharged under a MWRA Dewatering Discharge Permit; procurement, installation, and compaction of CDF.

-END OF SECTION 02252-

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 02525

PAVING AND SURFACING, CURBS, AND WALKWAYS

2525.1	HOT MIX ASPHALT BASE COURSE (TEMPORARY TRENCH PATCH)	TON
2525.2	HOT MIX ASPHALT BASE COURSE (PERMANENT TRENCH PATCH)	TON
2525.3	HOT MIX ASPHALT TOP COURSE	TON
2525.4	MILL 1.5-INCH DEPTH, FULL WIDTH	SQUARE YARD
2525.5	BRICK SIDEWALKS	SQUARE YARD
2525.6	REMOVE AND RESET/RELOCATE GRANITE CURB (STRAIGHT AND CURVED)	LINEAR FOOT
2525.7	SIDEWALKS	SQUARE YARD

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Furnish and install paving on all roadway areas as indicated and specified. Restore all asphalt walkways, concrete sidewalks, brick walkways, curbing to match existing or better conditions.
- B. Pavement and surfacing shall be constructed in courses as shown on the plans and as required in accordance with these specifications and in close conformity with the lines, grades, compacted thickness and cross sections shown on the plans.
- C. The Contractor shall take all reasonable measures to assure proper drainage on the final surface of the roadway. Pavement that does not drain properly due to poor workmanship shall not be accepted by the Owner and shall be replaced by the Contractor at no additional cost to the Owner.
- D. Reference is made herein to the Commonwealth of Massachusetts Department of Transportation, Standard Specifications for Highways and Bridges, latest edition, and all addendums/supplemental specs hereinafter referred to as the "Standard Specifications." All references to method of measurement, basis of payment, and payment items in the Standard Specifications are hereby deleted. References made to particular sections or

paragraphs in the Standard Specifications shall include all related articles mentioned therein.

1.2 RELATED WORK

- A. Division 1 – General Requirements
- B. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING
- C. Section 2590 – BRICK MASONRY

1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with the General Conditions of Contract and Section 01300 – SUBMITTALS:
 - 1. Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
 - 2. Design Data: Submit design mix for asphalt base, binder and top course.

1.4 GRADE CONTROL

- A. Establish and maintain required lines and elevations.

1.5 QUALITY CONTROL

- A. The Engineer may require the Contractor to remove at their own expense, any defective mix not conforming to the specified job mix formula within the stipulated tolerances. Samples of the actual mixture in use will be taken as many times daily as necessary and the mixtures shall be maintained uniform for the project. The Engineer may suspend further approval for use of the Plant mixtures if the mixtures do not conform to the specified requirements.
- B. Do not place materials when underlying surface is muddy, frozen, or has frost, snow, or water thereon.

1.6 GUARANTEE

- A. During the one-year guarantee period, the Contractor shall maintain the surfacing and shall promptly fill with similar material in compliance with the Specifications, any depressions and holes that may occur during that time period.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Gravel Subbase

1. Materials including preparation of subgrades shall meet the requirements of the applicable sections of the Specifications.
2. The trench gravel subbase shall be used in the upper 1-foot of trench backfill material immediately below pavements and graded in accordance with Massachusetts Highway Department “Standard Specifications” Section M1.03.1 and applicable subsections of Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

B. Hot Mix Asphalt Pavement – Base Course

1. Asphalt Base Course and Asphalt Tack Coat shall conform to the applicable subsections of Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications”.
2. Tack coat shall be RS-1 emulsion.

C. Hot Mix Asphalt Pavement – Binder Course

1. Asphalt Binder Course shall conform to the applicable subsections of Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications.”

D. Hot Mix Asphalt Pavement – Top Course

1. Asphalt Top Course shall conform to the applicable subsections of Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications.”

E. Hot Poured Rubberized Asphalt Sealer

- a. Hot Poured Rubberized Asphalt shall conform to Federal Specification Number SS-S-1401 as required in Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications.”

F. Cement Concrete for Sidewalks, Driveways and Pedestrian Ramps: Cement concrete shall conform to the Standard Specifications, M4.02.00

through M4.02.12 and be 4000 PSI at 28 day test, ¾-inch coarse aggregate, 610 pounds cement per cubic yard, 7% air entrained (AASHTO - M154), Type A water reducing admixture (AASHTO - M194), 3 to 4-inch slump, and Type II dark colored by adding 1 lb. of lamp black per cubic yard at the plant. Cement concrete shall contain micro-fiber added during batching at the plant to insure uniform distribution.

- G. Micro-fiber: The cement concrete shall contain 1 pound of polypropylene microfiber per cubic yard. Fibers shall be 1/2" or 3/4" 100% polypropylene fibers, maximum 3 denier, complying with ASTM C 1116, Type III, Par. 4.1.3. Fibers per pound shall be not less than 50 million individual fibers. The micro-fiber shall be used in accordance with the manufacturer's specifications.
- H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
 - 1. Available products: subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Evaporation Retarder products shall be Eucobar manufactured by Euclid Chemical Co, E-Con manufacturer by L&M Construction Chemicals, LLC, Confilm manufactured by BASF Construction Chemicals, LLC or approved equal.
 - b. Clear, Waterborne, Membrane-Forming Curing Compound, 18 to 22 percent solids, products shall be Klear-Kote WBII 20 percent manufactured by Burke Chemicals, Dress & Seal WB; L&M Construction Chemicals, Inc., Vocomp-20 manufacturer by W.R. Meadows, Inc. or approved equal.
 - c. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound products shall be Res-Cure manufactured by Atlas Tech Products, Lumiseal WB Plus manufactured by L&M Construction Chemicals, Inc., Vocomp-30 manufacturer by W.R. Meadows, Inc., or approved equal.
- I. Expansion Joints: Shall be 3/8" thick polyethylene foam and ¼" thick polyethylene foam conforming to ASTM D1751.
- J. Bricks for sidewalks shall be a full dimension paver conforming to the quality standards, size and color range of: "Pathway Full Range" brick paver as manufactured by Pine Hall Brick, Winston-Salem, NC, or an equivalent approved by the Engineer. Size shall be 4" W by 8" L by 2 1/4" D. Brick shall meet or exceed the requirements of ASTM C902, Class SX,

Abrasion Type I, Application PS with average water absorption of not more than 5% with the five hour boil and an average compressive strength of 8,000 PSI (55Mpa) or more. Brick shall pass a minimum of 100 freeze thaw cycles.

- K. Setting Bed: Shall contain coarse sand and aggregates mixed with the Portland Cement as processed by Rowe Contracting Company, Malden, Massachusetts or Quinn Perkins Company, Burlington, Massachusetts or approved equivalent, in order to add stability to the brick walk so that bricks will not roll, move, or rock. The sand for joint sweeping shall be mixed with Portland Cement Type II (2 parts sand to 1 part Portland Cement) and be free of coarse aggregates, enabling the fines to freely fill in around all sides of the bricks.
- L. Edge Restraints: Edge sections shall be L-shaped galvanized steel paver restraints and are to be notched to provide for smooth curves and crisp angles. Sections shall conform to the following specifications: Height: 1.5", Flange: 1.75", Lengths: 6'0" or 8'0" and Thickness: 3/16". Edge Restraints to be supplied by Border Concepts, Inc., P.O. Box 471185, Charlotte, NC 28241, Telephone Numbers: 1-800- 845-3343 or 1-704-541-5509, Fax Number: 1-704-541-5610 or approved equivalent.
- M. The mastic adhesive shall consist of 2% neoprene (grade WM1) oxidized asphalt with 155 degrees F softening point (80 penetration) and 10% asbestos-free fibers and 88% asphalt. Contractor shall follow manufacturer's installation procedure.
- N. Iron Edge Sections shall be provided at all tree pits, all locations where the back of sidewalk does not abut a hard edge and as directed by the Engineer. Iron Edge sections shall be L-shaped galvanized steel paver restraints and are to be notched to provide for smooth curves and crisp angles. Sections shall conform to the following specifications: Height: 1.5", Flange: 1.75", Lengths: 6'0" or 8'0" and Thickness: 16 gauge. Iron Edge to be supplied by Border Concepts, Inc., P. O. Box 471185, Charlotte, NC 28241, Telephone numbers: 1-800-845-3343 or 1-704-541-5509, Fax Number: 1-704-541-5610 or approved equal.
- O. Spikes: Are to be galvanized steel spiral not less than 10" in length.

PART 3 – EXECUTION

3.1 PROJECT SITE CONDITIONS/PROJECT DESCRIPTION

- A. In general, the following pavement repairs shall be made:
1. Trench repairs on Thorndike Street shall consist of a 2-inch hot mix asphalt base course temporary pavement placed at trench width. After a winter settlement or 90-day period, the temporary pavement shall be removed, the existing pavement shall be cut back to a distance of 1' on either side of the trench, to a depth sufficient to place the pavement subbase as detailed, and replaced with a 2.5-inch permanent base course pavement and a 1.5-inch permanent top course pavement flush with existing grade.
 2. Community Path restoration shall consist of removal and disposal of all existing pavement within the limits of drain installation. Weekly, after excavating and backfilling the trench the Contractor shall cut back the existing subgrade to the limits detailed and shall provide 12" of compacted gravel subbase. The existing subbase material outside the cutback limits shall be maintained and supplemented as necessary for fine grading. Pavement within the limits of drain installation shall consist of 2.5" base course to match existing pavement surface elevation. After a 90 day settlement period a continuous 1.5" top course overlay shall be installed across the full length of the path from the City line to Buena Vista Road, with milled transitions to existing brick sidewalks as shown on sheets C-3 and C-4.
 3. Concrete sidewalk repair shall consist of a 4-inch thick repair.
 4. Furnish and remove steel plates as required.
 5. Driveway aprons and waterways shall be paved as part of the work.
 6. The paving thicknesses specified above may vary based on permit or field requirements.
 7. Curbing shall be removed and reset as part of the work where required.

3.2 SUBGRADE PREPARATION AND PROTECTION

- A. Bring subgrade to required grade as necessary prior to placing subbase material.
- B. Subgrade under walks, pedestrian ramps, driveways, and curbs shall be graded to required elevations and proof rolled.
- C. As required by the Engineer, over-excavate on-site fill material and any unacceptable materials below the subgrade. Utilize excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the on-site fill material and unacceptable materials to avoid disturbance of the bearing surface.

- D. Proof roll the overexcavated subgrade prior to placing crushed stone.
- E. Backfill the overexcavation with crushed stone and compact as indicated in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

3.3 PLACEMENT OF SUBBASE

- A. Do not begin placement of subbase and paving work until deficient subgrade areas have been corrected and are ready to receive paving.
- B. Subbase under roadway shall be installed and compacted as covered in the Contract Drawings and in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.
- C. Gravel subbase under sidewalks, pedestrian ramps, driveways, and curbs shall be graded to required elevations and compacted with plate-type mechanical compactors to ninety-five percent (95%) of the maximum dry density at optimum moisture content as determined by the AASHTO Standard Method of Test T99 Method.
- D. The subbase for sidewalks shall be graded to be sloped from the City right of way towards the street in order to meet ADA requirements, or as shown on the Contract Drawings, or as required by the Engineer.

3.4 HOT MIX ASPHALT BASE COURSE

- A. Weather Limitations
 - 1. Apply prime and tack coats when ambient temperature is above 50 deg.F (10 deg.C), and when temperature has not been below 35 deg.F (1 deg.C) for 12 hours immediately prior to application. Do not apply when subbase is wet or contains an excess of moisture.
 - 2. Base course pavement for temporary pavement may be placed when air temperature is above 30 deg.F (-1 deg.C) and rising.
- B. Placement
 - 1. Base course shall be spread and compacted to a finished thickness indicated on the Contract Drawings. A smooth even surface shall be produced.
 - 2. Base course placement for temporary paving and trench paving shall be performed on a weekly basis or as otherwise approved by the

Owner and Engineer. Cold Patch for temporary pavement shall not be allowed with the exception of in an emergency or to cover steel road plate edges.

3. Base course placed as temporary paving shall be maintained until removed prior to final paving.

3.5 HOT MIX ASPHALT TOP COURSE

A. Weather Limitations

1. Construct asphalt surface course when atmospheric temperature is above 40 deg.F (4 deg.C) and when base is dry.

B. Settlement Period

1. After a 90-day minimum period, or a winter settlement period, permanent pavement shall be installed in accordance with the requirements of the trench paving detail provided in the drawings.

C. Placement

1. Top course shall be spread and compacted, to the width required in the Contract Documents and to a finished thickness indicated in the Contract Documents. A smooth, even surface shall be produced. Overlays shall be installed after the street has been cold planed or as approved by the Owner and Engineer.
2. Apply tack coat at a rate of 0.05 to 0.10 gallons per square yard over the base and binder courses. Apply material to penetrate and seal, but not flood, surface. Cure and dry as long as necessary to attain penetration and evaporation of volatile.

D. Placing Mix

1. Place hot mix asphalt mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 deg.F (107 deg.C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness. Protect all adjacent construction from staining with mix or damage by mechanical equipment. Clean, repair or replace any construction stained or damaged at no additional cost to the Owner.
2. Place pavement in strips not less than 2-feet wide, unless otherwise acceptable to Engineer. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.

Complete binder course for a section before placing top course.

3. The Contractor shall supply an approved Dial Type Asphalt Thermometer (Range 10° C to 260° C) for each paving machine in operation on the project. The thermometer shall remain the property of the Contractor upon completion of the project.

E. Rolling

1. Begin rolling when mixture will bear roller weight without excessive displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
2. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
3. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.
4. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
5. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot mix asphalt. Compact by rolling to match the surrounding surface density and smoothness.
6. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked by wheel traffic.

F. Existing Pavement/Joints

1. The edges of existing pavement, which are to remain, shall be saw cut to even, straight edges. This includes sidewalk, walkway, road and trench edges. Any joints at junction of old and new pavements shall be sealed with an asphalt emulsion and covered with sand.
2. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as

other sections of asphalt course. Clean contact surfaces and apply tack coat.

G. Compaction

1. The asphalt mixture shall be compacted to at least 95% of the density achieved on the laboratory testing of the design mix for the project. Density will be checked by the Nuclear Density Gage Method, ASTM D2950. Testing shall be completed by Contractor at no expense to Owner for every 200 square yards of surface area placed.

H. Field Quality Control

1. Thickness: Test in-place asphalt courses for compliance with requirements for thickness. Repair or remove and replace unacceptable paving as required by Engineer, and at no additional cost to the Owner. In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
 - a. Base or Binder Course: 1/4-inch, plus or minus.
 - b. Surface Course: 1/4-inch, plus or minus.

I. Crack Sealing

1. Crack sealing shall be performed where required by the Engineer with modified asphalts (e.g. hot poured rubberized asphalt sealer). Prior to sealing a crack all compressible material shall be removed by high-pressure air or routing. If grass or vegetation is present in the crack the Contractor shall inject a liquid herbicide to prevent future growth. For small hairline cracks, an asphalt slurry mixture type SS-1, SS-1h shall be squeegeed over the surface and forced in the cracks. The slurry shall be maintained at a significant fluidity to be able to flow into the hairline cracks. Sealing of cracks shall be considered to be complete upon review and approval by the Engineer.

J. Liquid Asphalt Emulsion

1. Liquid Asphalt Emulsion shall be applied prior to installation of asphalt as incidental to all pavement pay items. Emulsion shall be AC-20 conforming to AASHTO M226 and shall be applied at a temperature over 100 degrees F by an emulsion truck.
2. The emulsion truck shall have pneumatic tires of such width and number that the load produced on the surface shall not exceed 672

lbs/in of tire width, and it shall be designed, equipped, and operated so that at an even heat the emulsion may be applied uniformly on variable widths of surface at a readily controlled rate of 1/20 gal/square yard or as required by the Engineer.

3. The emulsion shall be applied within a pressure range of 25 psi to 75 psi. Distributor equipment shall include a tachometer, pressure gauges, volume-measuring devices, and a thermometer for reading the temperature of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

3.6 BRICK WALKS

- A. Hot mix asphalt base shall be installed to a depth of 4" and placed in accordance with the MHD Standard Specifications for hot mix asphalt.
 1. Hot mix asphalt surface shall be rolled to remove irregularities prior to installing stone dust.
- B. The iron edge shall be installed as detailed, longitudinally to the granite curb at the back edge of the specified brick walk width and at all tree wells. The iron edge shall be secured by 10" spiral galvanized steel spikes placed every 12".
- C. A 3/4" sand setting bed shall be installed on the asphalt base. Wet saw is required for cutting of bricks and filling in pieces where needed. No other method will be acceptable.
- D. After all the bricks are in place, stone dust free of coarse aggregates shall be swept into the voids around the bricks.
- E. Once the bricks are placed in their specified patterns, they shall be compacted with a plate compactor. The compactor shall have a minimum force of 5000 lbs. and a frequency of 75 to 90 cycles per second.
- F. Contractor shall follow manufacturer's installation procedures for the installation of mastic adhesive.
- G. The Contractor shall lay brick to match existing brick sidewalk pattern and grade, and shall meet ADA requirements.

3.7 RAISING AND ADJUSTING CASTINGS

- A. Prior to top course paving, all existing City or Owner owned catch basin and manhole castings and curb and valve boxes shall be raised, if necessary, to the proper grade by the Contractor.

- B. Castings owned by private utilities shall be raised by the responsible utility. The Contractor shall be responsible for coordinating this work.
- C. The method of adjusting catch basin and manhole castings shall be as follows: Cut around catch basin or manhole castings a minimum of 8 inches from casting. Excavate and, if required, rebuild up to 12 inches of masonry below the bottom of the casting. Backfill with suitable material and compact to bottom of casting. Place high, early strength cement concrete or hot mix asphalt collar, as required by the Authority, to approximately 1½ inches below the raised casting grade. Masonry work shall conform to Section 02252 - MANHOLES and Section 02590 – BRICK MASONRY.
- E. The method of raising curb and valve boxes shall be as follows: Cut around valve box a minimum of 8 inches from valve box. Excavate as required and raise the valve box. Pour high early strength cement concrete or hot mix asphalt collar, as required, to approximately 1½ inches below the top of the valve box.

3.8 CEMENT CONCRETE WALKS AND DRIVEWAYS

- A. Concrete shall be installed to a depth of 6” at pedestrian ramps, across driveways, at street intersection corners (5’ beyond the point of tangency on either side of the corner curve), and at other locations as directed by the Engineer. At all other locations, concrete shall be installed to a depth of 4”.
- B. Concrete shall be placed between April 1st (pending no upcoming snow storms) and November 1st only. Ambient temperature shall be 40 degrees of more.
- C. Forms shall be placed in accordance with Standard Specification Section 701.61A.
- D. Concrete placement shall be in accordance with the Standard Specifications Section 701.61B.
 - 1. The concrete shall be placed in alternating slabs 30 feet in length unless otherwise required by the Engineer.
 - 2. The slabs shall be separated by transverse performed expansion joint filler as specified below:
 - a. Expansion joints of 3/8” thick foam shall be placed every 30 feet perpendicular to curb alignment extending through the sidewalk depth. Expansion joints of 3/8” thick foam

shall also be placed around all appurtenances such as utility poles, hydrants, manholes, and other obstructions extending into and to a depth to match the adjacent sidewalk (4" or 6"). Six-inch expansion joints shall be placed at all locations where six-inch concrete driveways meet four-inch concrete walks. Expansion material protruding above the finished sidewalk shall be trimmed flush with a sharp instrument as soon as the concrete has set.

- b. A 3/8" thick expansion joint shall be installed between all new cement concrete installations and existing cement concrete.
 3. The slabs shall be separated by the curb by longitudinal expansion joint filler as specified below:
 - a. Expansion joints of 1/4" thick foam shall be placed 4" or 6" deep longitudinally along the granite curb between curb and the concrete and also between buildings and retaining walls and the concrete as required by the Engineer. Six-inch expansion joints shall be placed at all locations where six-inch concrete corner slabs or driveways meet four inch concrete walks. Expansion material protruding above the finished sidewalk shall be trimmed flush with a sharp instrument as soon as the concrete has set.
 4. In conveying the concrete from the place of mixing to the place of deposit, the operation shall be conducted in such a manner that no mortar will be lost and the concrete shall so be handled that the concrete will be of uniform composition throughout, showing neither excess nor lack of mortar in any one place.
- D. Concrete finishing shall be in accordance with the Standard Specifications Section 701.61B.
1. No finishing operation shall be performed while free water is present. Finishing operations shall be delayed until all bleed water and water sheen has left the surface and concrete has started to stiffen.
 2. Between the expansion joints at 30 foot spacing, the sidewalk shall be divided at five foot intervals with score joints, made with creasing tools, having a penetration depth of minimum 1/2" and at 10 foot intervals with construction joints. Joints shall be placed

90° transverse with the direction of traffic and shall be straight within a tolerance of ¼-inch of a straight edge laid along the joint. Longitudinal joints shall be installed, at the requirements of the Engineer when the sidewalk is greater than 6' wide.

3. The surface shall be floated after completion of edging.
 4. Immediately after floating the surface shall be steel troweled. If necessary the joints and edges shall be rerun before and after troweling to maintain uniformity.
 5. After troweling the surface shall be brushed by drawing a soft-bristled pushbroom with a long handle over the surface of the concrete to produce a non-slip surface.
- E. Concrete shall be membrane-cured. The curing compound shall not discolor the concrete, shall be compatible with linseed oil application after 28 days, and shall be applied according to the manufacturer's specifications. The mixture shall be applied immediately after the finishing is complete and free water has left the concrete's surface. The Contractor shall provide the Engineer with the curing compound specification prior to its use.
- F. Penetrating Liquid Concrete Sealer: Prepare, apply, and finish penetrating liquid concrete sealer according to manufacturer's written instructions.
1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Do not apply to concrete that is less than 14 days old.
- G. Forms shall be left in place for a period of 12-hours prior to removal. Upon removal, the Contractor shall backfill the void with either loam in accordance with Section 02210 – EARTH EXCAVATION, FILL, BACKFILL AND GRADING and seeded in accordance with Section 02900 – LANDSCAPING or match the existing material and grade as specified.
- H. After 28days, using pressure-spray equipment, the Contractor shall apply a mixture of boiled linseed oil to the new concrete pavement as an anti-spalling seal. The mixture shall consists of 50% double boiled linseed oil and 50% petroleum spirits, AASHTO M-233-79. Upon approval by the Engineer, the Contractor may use other products available on the market in accordance with manufacturer's recommendations (2 applications at right

angles to each other are required for complete coverage). The sidewalk shall be swept and cleaned of any debris, gum, etc. and pressure washed, just prior to application of curing linseed oil compound.

- I. The Contractor shall fully protect all new concrete work for a minimum of forty-eight hours. A representative of the Contractor shall remain on site at least three hours after the last section of concrete is placed. In addition, the contractor shall fully protect the concrete with plastic sheeting or matting. Plastic sheeting shall be installed so that it cannot pull or blow away under windy conditions and not damage installed concrete. Sidewalk vandalized or disturbed within three hours after the last section of concrete is placed shall be replaced by the Contractor at no additional cost to the Owner.

PART 4 – COMPENSATION

Item 2525.1 - Hot Mix Asphalt – Base Course (Temporary Trench Patch)

METHOD OF MEASUREMENT:

Measurement for Payment for Hot Mix Asphalt - Temporary Trench Patch shall be based on the tons of base course placed complete, to a maximum width defined by the trench width payment limits shown on the Contract Drawings or as required by the Engineer and as measured by the Engineer. Tonnage of pavement placed will be verified through calculation based on the actual thickness and trench widths and lengths or the pavement thicknesses, widths, and lengths defined in the Contract, whichever is less. The formula for calculating the tonnage of pavement shall be $W' \text{ (trench width)} \times L' \text{ (trench length)} \times D' \text{ (trench depth)} \times 0.075 \text{ ton/cf} = \text{tons}$. Calculated tonnage will be compared to the actual tonnage placed as submitted on pavement tonnage slips. If the tonnage calculated is greater than 10% lower than the tonnage on the pavement slips, the lesser tonnage shall be paid to the Contractor. Placement of pavement to excess thicknesses and outside the limits defined in the Contract Documents shall be at no additional cost to the Owner.

BASIS OF PAYMENT:

Payment for Hot Mix Asphalt – Temporary Trench Patch shall be based on the unit price bid for this item in the proposal. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to install hot mix asphalt base course within the limits of the trenches to depth and width indicated within the payment limits, complete, as shown in the Contract Documents or at the requirements of the Engineer. The work includes, but is not limited to the following; raising and resetting existing structures, castings and boxes; installation and compaction of hot mix asphalt base course to the depth and width and in the area specified; hand placement and compaction of hot mix asphalt around structures, aprons, driveways and as required; power sweeping; keyways and other jointing between new and existing asphalt; furnish and place tack coat on all edges; and all incidental work not included for payment elsewhere.

SPECIAL NOTES ON EXCLUSIONS:

Items not included for payment herein include, but are not limited to; hot mix asphalt for permanent base course placed within trenches; hot mix asphalt for permanent top course; and pavement installed to replaced asphalt damaged by the Contractor.

Item 2525.2 - Hot Mix Asphalt – Base Course (Permanent Trench Patch)

METHOD OF MEASUREMENT:

Measurement for Payment for Hot mix asphalt Base Course – Trench Width shall be based on the tons of base course placed complete, to a maximum width defined by the payment limits shown on the Contract Drawings or as required by the Engineer and as measured by the Engineer. Tonnage of pavement placed will be verified through calculation based on the actual thickness and trench widths and lengths or the pavement thicknesses, widths, and lengths defined in the Contract, whichever is less. The formula for calculating the tonnage of pavement shall be W' (trench width) x L' (trench length) x D' (trench depth) x 0.075 ton/cf = tons. Calculated tonnage will be compared to the actual tonnage placed as submitted on pavement tonnage slips. If the tonnage calculated is greater than 10% lower than the tonnage on the pavement slips, the lesser tonnage shall be paid to the Contractor. Placement of pavement to excess thicknesses and outside the limits defined in the Contract Documents shall be at no additional cost to the Owner.

BASIS OF PAYMENT:

Payment for Hot mix asphalt Base Course – Trench Width shall be based on the unit price bid for this item in the proposal. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to install hot mix asphalt base course and top course within the limits of the trenches to depth and width indicated within the payment limits, complete, as shown in the Contract Documents or at the requirements of the Engineer. The work includes, but is not limited to the following; raising and resetting existing structures, castings and boxes; installation and compaction of hot mix asphalt base course and top course to the depth and width and in the area specified; milling of base course material after the settlement period; hand placement and compaction of hot mix asphalt around structures, aprons, driveways and as required; power sweeping; keyways and other jointing between new and existing asphalt; furnish and place tack coat on all edges; and all incidental work not included for payment elsewhere.

SPECIAL NOTES ON EXCLUSIONS:

Items not included for payment herein include, but are not limited to: pavement installed to replace asphalt damaged by the Contractor.

Item 2525.3 - Hot Mix Asphalt – Top Course

METHOD OF MEASUREMENT:

Measurement for Payment for Hot mix asphalt Top Course shall be based on the tons of top course placed complete, to a maximum width defined by the payment limits shown on the

Contract Drawings or as required by the Engineer and as measured by the Engineer. Tonnage of pavement placed will be verified through calculation based on the actual thickness and trench widths and lengths or the pavement thicknesses, widths, and lengths defined in the Contract, whichever is less. The formula for calculating the tonnage of pavement shall be W' (trench width) x L' (trench length) x D' (trench depth) x 0.075 ton/cf = tons. Calculated tonnage will be compared to the actual tonnage placed as submitted on pavement tonnage slips. If the tonnage calculated is greater than 10% lower than the tonnage on the pavement slips, the lesser tonnage shall be paid to the Contractor. Placement of pavement to excess thicknesses and outside the limits defined in the Contract Documents shall be at no additional cost to the Owner.

BASIS OF PAYMENT:

Payment for Hot mix asphalt Top Course shall be based on the unit price bid for this item in the proposal. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to install hot mix asphalt top course within the limits of the trenches and overlay to depth and width indicated within the payment limits, complete, as shown in the Contract Documents or at the requirements of the Engineer. The work includes, but is not limited to the following; raising and resetting existing structures, castings and boxes; installation and compaction of hot mix asphalt base course and top course to the depth and width and in the area specified; milling of base course material after the settlement period; hand placement and compaction of hot mix asphalt around structures, aprons, driveways and as required; power sweeping; keyways and other jointing between new and existing asphalt; furnish and place tack coat on all edges; and all incidental work not included for payment elsewhere.

SPECIAL NOTES ON EXCLUSIONS:

Items not included for payment herein include, but are not limited to: pavement installed to replace asphalt damaged by the Contractor.

Item 2525.4 - Mill 1.5-inch depth, Full Width

METHOD OF MEASUREMENT:

Measurement for the Mill 1.5-inch depth, Full Width will be based on the square yards of hot mix asphalt pavement milled to a depth of 1.5-inches, as measured by the Engineer to the payment limits described in the Contract Drawings and Specifications.

BASIS OF PAYMENT:

Payment for Mill 1.5-inch depth, Full Width shall be based on the unit price bid for this item in the proposal. Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to mill 1.5-inches to the pay limits indicated on the Drawings and as specified. The work includes milling and removal of milled asphalt material; sweeping after the milling operation; removal of asphalt from around existing structures and castings; providing temporary transitions at the limits of the milling and at castings until final paving; maintaining the milled surface until final paving; providing temporary pavement markings, as required, until final paving; and all incidental work not included for payment elsewhere.

SPECIAL NOTES ON EXCLUSIONS:

Items not included for payment herein include, but are not limited to: handle, load, transport, stockpile, weigh and disposal at an appropriately permitted facility all milled bituminous concrete; and all fees, permits, taxes, sampling, testing and analysis required by the facility.

Item 2525.5 - Brick Sidewalks

METHOD OF MEASUREMENT:

Measurement for Brick Sidewalks shall be based on the square yard installed, complete, within the payment limits, as shown on the Contract Drawings or as required by the Engineer.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Brick Sidewalks shall be based on the square yard of Brick Sidewalk installed complete for this item in the proposal. Under the square yard price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the installation of Brick Sidewalks as detailed and where indicated or required by the Owner or Engineer. The work includes, but is not limited to; remove, transport, stack, protect, and reset all parking meters, signs or other items obstructing the construction of the sidewalk; furnish, install, grade, compact, and test compaction of gravel sub-base and sub-grade; raise and adjust gate boxes, frames and covers, and other castings; removal and disposing existing bricks; furnish and install hot mix asphalt base; compaction of the hot mix asphalt base; protect the asphalt after placement; furnish and install bricks; furnish and install iron edge with spiral galvanized steel spikes; furnish and install ¾" sand dust setting bed; applying asphalt tack coat and neoprene modified asphalt tack coat; sweeping with dry sand/ cement mix; compaction of bricks; backfilling; furnish and install loam and seed, mulch, or other backing and/or adjacent material specified including grass areas; and all other work not included for payment elsewhere.

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item; brick installed to replace bricks damaged by the Contractor during construction.

Item 2525.6 - Remove and Reset/Relocate Granite Curb (Straight and Curved)

METHOD OF MEASUREMENT:

Measurement for Remove and Reset/Relocate Granite Curb (Straight and Curved) shall be based on the linear foot of granite curb removed and reset installed, complete, within the payment limits, as shown on the Contract Drawings or as required by the Engineer. Payment will be made only after the curb has been reset.

BASIS OF PAYMENT / INCLUSIONS:

Payment for Remove and Reset/Relocate Granite Curb (Straight and Curved) shall be based on the linear foot of granite curb removed and reset or relocate complete for this item in the proposal. Under the linear foot price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to remove and reset and/or relocate existing granite curb as detailed and where indicated or required by the Owner or Engineer. The work includes, but is not limited to; saw cut; excavate, remove, transport, stack, protect and reset straight and curved granite curb; furnish, install, grade, compact and test compaction of gravel sub-base and sub-grade; modifications to the existing granite curb; furnish and install Cement Concrete; point the granite curb; backfilling; furnish and install loam and seed, mulch, or other backing material specified; and all other work not included for payment elsewhere.

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item; granite curb removed and reset to accommodate the Contractor's means and methods; new curb to replace curb damaged by the Contractor; new granite curb; and removing and resetting granite curb transition for pedestrian ramps.

Item 2525.7 - Sidewalks

METHOD OF MEASUREMENT:

Measurement for payment for Sidewalks will be on the basis of square yards of sidewalks and driveways constructed, accepted and measured in place by the Engineer. Limits of depth will be measured as specified by the Engineer. Any driveway(s) that during the course of construction are damaged by the Contractor shall not be measured for payment, but repaired by the Contractor at his expense as directed by the Engineer.

BASIS OF PAYMENT:

Under the unit price for Sidewalks, the Contractor shall furnish all plant, labor, equipment, appurtenances and materials to place driveways and sidewalks as shown on the drawings and as directed by the Engineer. The unit price bid will constitute full compensation for furnishing and placing bituminous concrete or concrete; sawcutting; excavation; gravel subbase, compaction, and dust control.

END OF SECTION 02525

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 02590

BRICK MASONRY

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The work covered under this Section includes the furnishing of all plant, labor, equipment, appliances and materials, and in performing all operations in connection with providing brick masonry, as directed, for furnishing and installing masonry plugs, brick inverts and tables, raising and adjusting castings, and for all other necessary appurtenant work complete and accepted in accordance with the Drawings and Specifications and as directed.

1.2 RELATED TECHNICAL SECTIONS

- A. Section 02051 – DEMOLITION, MODIFICATION, AND ABANDONMENT
- B. Section 02252 – MANHOLES

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
 - 1. Submit manufacturer specification sheets for and shop drawings for all masonry items, mortar and appurtenances.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Masonry
 - 1. Masonry shall include brick masonry for extending manhole and catch basin frames to grade, brick masonry plugs for pipes and structures, manhole invert tables, cement mortar plaster on interior and exterior surfaces of masonry walls, mortar and related work. Brick masonry plugs for pipes and structures shall be a minimum of 8-inches thick, unless otherwise shown or directed. Other brick masonry shall be provided to the details and the dimensions specified, indicated or as directed.
- B. Bricks
 - 1. Bricks in general shall be clay or shale brick and shall conform in all

respects to ASTM C32, latest revision, Grade SS. Bricks that are broken, warped, cracked or of improper size or quality, or otherwise defective shall not be used in the work and shall be removed from the site.

2. Brick for extending manhole frames to grade shall be concrete brick conforming to ASTM C139, latest revision.

C. Cement

1. Cement shall conform to the standard specifications for Portland cement of ASTM C150, latest revision, Type II, unless otherwise directed. Whenever directed by the Owner, a quick-setting cement (Type III) shall be used for any desired purpose at no additional expense to the Owner.

D. Sand

1. Sand for mortar shall be graded uniformly from fine to coarse and when dry shall pass a No. 8 sieve. Sand shall consist of aggregate having clean, hard, durable, strong, uncoated grains and free from injurious amounts of dust, lumps, soft or flaky particles, shale, alkali, organic matter, loam or other deleterious substances. The sand shall be washed clean before loading on delivery trucks. Natural sand which shows a color darker than the standard color when tested in accordance with the Colorimetric Test for Sands as described in ASTM C40, latest revision, will be cause for rejection.

E. Lime

1. Lime shall be hydrated lime conforming to ASTM C207, latest revision.

F. Water

1. Mixing water for concrete and mortar shall be clean and free from oil, acid, alkali, injurious amounts of vegetable matter and other impurities. Potable water obtained from a municipal supply is preferable.

G. Mortar

1. Mortar and mortar plaster shall be composed of one part Type II portland cement, and two parts sand to which a small amount of hydrated lime, not to exceed 10 lbs. to each bag of cement, shall be added. Only a sufficient amount of water shall be added to make a stiff plastic mortar of a consistency and texture satisfactory to the

Owner. Retempering of mortar in which the cement has started to set will not be permitted.

PART 3 – EXECUTION

3.1 GENERAL

- A. All exterior surfaces of masonry walls shall be plastered with mortar plaster to provide a minimum thickness of 1/2 inch. Mortar plaster shall be applied with sufficient pressure to insure a dense plaster completely filling all voids and thoroughly bonded to the masonry wall. Masonry construction shall be done in a manner to insure watertight construction and all leaks in masonry shall be sealed.
- B. All workmanship shall conform to the best standard practice, and all brick masonry shall be laid by skilled workmen. Brick masonry for extending frames to grade shall be constructed to the thickness indicated. Brick masonry walls shall be constructed to the thickness indicated. All beds on which masonry is to be laid shall be cleaned and wetted properly. Brick shall be wetted as required and shall be damp but free of any surface water when placed in the work. Bed joints shall be formed of a thick layer of mortar which shall be smoothed or furrowed slightly. Head joints shall be formed by applying to the brick to be laid a full coat of mortar on the entire end, or on the entire sides as the case requires, and then shoving the mortar-covered end or side of the brick tightly against the bricks laid previously; the practice of buttering at the corners of the brick and then throwing mortar or scrapings into the empty joints will not be permitted. Dry or butt joints will not be permitted. Joints shall be uniform in thickness and shall be approximately 3/8-inch thick. Joints on the inside face of walls shall be tooled slightly concave with an approved jointer when the mortar is thumbprint hard; the mortar shall be compressed with complete contact along the edges so as to seal the surface of the joints. Brickwork shall be constructed accurately to dimensions, and brickwork at top of manholes shall be to the dimensions of the flange of the cast iron frames.
- C. No water shall be allowed to flow against brickwork or to rise on the masonry for 60 hours after it has been laid, and any brick masonry damaged in this manner shall be replaced as directed at no additional expense to the Owner. Adequate precautions shall be taken in freezing weather to protect the masonry from damage by frost. Plaster shall be troweled to a smooth hard finish and no backfill shall be placed until the mortar has thoroughly hardened.

PART 4 – COMPENSATION (Not Used)

-END OF SECTION 02590-

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 02604

CATCH BASINS

2604.1 CATCH BASIN - TYPE 1 SINGLE GRATE EACH
(4-FOOT DIAMETER)

PART I – GENERAL

1.1 WORK INCLUDED

- A. The work covered under this Section includes the furnishing of all plant, labor, equipment, appliances and materials, and performing all operations in connection with installing catch basins, infiltration basins, frames and grates, and hoods at the locations and to the details indicated and/or directed, including pre-cast concrete sections, bases, and tops; brick, grout, and mortar; catch basin hoods; and frame and grate; as well as repairing sidewalks, pavement and curbs affected by catch basin installation.
- B. Removed catch basin fixtures must not be reused and shall be salvaged and delivered to the City of Somerville Public Works storage yard unless required by the owner to dispose off-site.

1.2 SUBMITTALS

- A. The Contractor shall furnish complete shop drawings for all pre-cast sections, cast iron frames, grates and other appurtenances in accordance with Section 01300 – SUBMITTALS
- B. Shop drawings and manufacturers data showing dimensions, reinforcing, and materials for all items furnished under this section.

PART 2 – PRODUCTS

2.1 CATCH BASINS

- A. Catch basins shall be constructed as detailed. Single grate catch basins shall be a minimum of 4 feet inside diameter dimensions. Catch basins shall be designed for a minimum of H-20 loading. Catch basins shall have a minimum of 4 ft sump depth, unless otherwise noted and shall conform to ASTM C478-72.
- B. Pre-cast concrete catch basins, infiltration basins, and sump manholes shall

further conform to the applicable requirements of Section 02252 – MANHOLES and applicable details.

- C. Mortar where required shall conform to Section 02590 – BRICK MASONRY.

2.2 FRAMES

- A. Single Catch Basin Frames shall be as manufactured by East Jordan Iron Works (formerly E. L. LeBaron Foundry Co.), model 5525Z, or equivalent.

2.3 GRATES

- A. Single Catch Basin Grates shall be cascade type, as manufactured by East Jordan Iron Works (formerly E. L. LeBaron Foundry Co.), model 5520M8, or equivalent unless otherwise shown on the Drawings.

2.4 HOODS

- A. Catch Basin Hoods shall be as manufactured by East Jordan Iron Works (formerly E. L. LeBaron Foundry Co.), model 5954 for Type 1 Catch Basins, or equivalent.

PART 3- EXECUTION

3.1 SETTING PRECAST CONCRETE CATCH BASIN SECTIONS

- A. Catch basins shall be constructed with a pre-cast concrete base placed on a firm compacted $\frac{3}{4}$ -in crushed stone sub-base as specified and as detailed on the Drawings. Catch basins shall be installed level, plumb and in accordance with the provisions of Section 02252 - MANHOLES.
- B. Catch basins shall be installed with specified joint sealant as specified in Section 02252 - MANHOLES.
- C. Care shall be taken to assure that the openings are made to permit setting of the entering pipe at its correct elevation as indicated or required and also to accommodate the correct outside diameter of the pipe.
- D. All holes in sections used for handling shall be thoroughly plugged with non-shrink grout.
- E. Cutting or tampering of catch basin and/or infiltration basin structures in the field, for the purpose of creating new openings or modifying existing openings, will not be permitted.

3.2 LAYING BRICKWORK

- A. Only clean bricks shall be used in brickwork for catch basins and infiltration basins. The brick shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

3.3 SETTING CATCH BASIN FRAMES AND GRATES

- A. Catch Basin frames shall be set with tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the Drawings. Frames shall be set concentric with the top of the manhole and in a full bed of mortar so that the space between the top of the brick and mortar and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to a height of 4-inches above the flange.

3.4 INSTALLING HOODS

- A. Hoods shall be built into the catch basin wall, shall be watertight, and shall be installed in conformance with the manufacturer's instructions.

3.5 CLEANING

- A. All excess material including dirt, loose concrete, bricks, grit, stones and any other material, shall be removed from all manholes prior to final review by the Engineer. A final cleaning shall be performed, to include complete removal of all accumulated debris and fluids from each catch basin, upon complete project completion.

PART 4 - COMPENSATION

Item 2604.1 --- Catch Basin - Single Grate (4-Foot Diameter)

BASIS OF PAYMENT / INCLUSIONS:

Catch Basin - Single Grate (4-Foot Diameter) shall be based on the unit price bid for this item in the proposal. Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete installation of Catch Basin - Single Grate (4-Foot Diameter) as shown and indicated in the Contract Documents, at the requirements of the Engineer and as specified. The work includes but is not limited to; saw cutting bituminous and cement concrete; excavation; construction dewatering; furnish and install pre-cast sections and structures; furnish and install temporary support of excavation; for vertical wood sheeting or soldier piles and lagging,

cut off 5-ft below grade and leave in place where required or directed; furnish, install and compact bedding; furnish and install backfill per one of the approved methods; furnish, install and compact gravel road sub-base; compaction and compaction testing; frames and grates; hoods; dampproofing; testing; grouting; gaskets; pipe connections, including flexible sleeves; and all other work required for the installation of Catch Basin - Single Grate (4-Foot Diameter), not included for payment elsewhere.

METHOD OF MEASUREMENT:

Measurement for payment shall be based on the actual number of complete and functional Catch Basin - Single Grate (4-Foot Diameter) as shown on the Contract Drawings or as directed by the Owner or Engineer.

SPECIAL NOTES/EXCLUSIONS:

Installation of sediment filter devices and the removal and disposal of existing infiltration basins shall not be paid for under this Bid Price Item and are paid for elsewhere.

END SECTION 02604

SECTION 02622

POLYVINYL CHLORIDE PIPE

2622.1 GRAVITY DRAIN PIPE LINEAR FOOT

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This Section includes the following:
 - 1. Furnishing, installing, and testing of PVC pipe and fittings complete and in place, within the limits and to the lines and grades indicated.

1.2 RELATED TECHNICAL SECTIONS

- A. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING
- B. Section 02252 – MANHOLES
- C. Section 02604 - CATCH BASINS

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
 - 1. Shop drawings of pipe and fittings,
 - 2. Product data and certified dimensional drawings of all pipe, joints, bends, special fittings, and appurtenances.
 - 3. Gasket and pipe manufacturer’s joint assembly directions,
 - 4. Certified affidavit of compliance for all pipe and other products or materials furnished under this Section of the Specifications, as specified in the referenced standards,
 - 5. For informational purposes only, submit manufacturer’s printed installation instructions.
 - 6. Certification with each delivery, that pipe complies with this specification,
 - 7. Anticipated production and delivery schedule.
 - 8. Results of leakage tests performed prior to final paving.

- a. Test results shall be logs maintained during Infiltration or Exfiltration Tests, or footage and logs of Close Circuit Television Inspection.

1.4 QUALITY CONTROL

- A. Provide in accordance with Section 01400 – QUALITY CONTROL and as specified.
- B. Owner reserves right to inspect and test by independent services at manufacturer’s plant or elsewhere at his own expense.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01600 – PRODUCTS, MATERIALS, AND EQUIPMENT.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General

1. All PVC pipe shall be continuously and permanently marked with the manufacturer's name, pipe size, and pressure rating or stiffness in psi (kpa).
2. The Contractor shall also require the manufacturer to mark the date of extrusion on the pipe. This dating shall be done in conjunction with records to be held by the manufacturer for 2 years, covering quality control tests, raw material batch number, and other information deemed necessary by the manufacturer.

B. Pipe

1. All PVC pipe shall be joined by compression joints unless otherwise shown or specified, and shall conform to the following requirements:
2. Non Perforated Polyvinyl chloride pipe (PVC) shall conform to the requirements of ASTM D 3034, Class SDR 35. Material for PVC pipe shall conform to the requirements of ASTM D 1784 for Class 12454-B or 12454-C as defined therein. All diameters shall be as specified on the Contract Drawings.
3. Elastomeric seals for compression type joints for PVC pipe and fittings shall conform to the requirements of ASTM D 3212.

C. Fittings

1. All fittings shall conform to the requirements of ASTM D 3034 or ASTM F 679. The ring groove and gasket ring shall be compatible with PVC pipe ends. The flanged fittings shall be compatible with cast-iron or ductile iron pipe fittings.
2. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.
3. PVC pipe fittings shall be full-bodied, either injection molded or factory fabricated. Saddle-type tee or wye fittings are acceptable in accordance with Figure 02622 A. Inserta-tees may be used only where approved by the Engineer and if allowed, shall be cast in 6-inches of concrete.

D. Shielded Flexible Couplings

1. General

- a. Shielded flexible couplings shall be used to connect to sewer pipe. Typical applications are where new pipe connects to existing pipe or a pipe with dissimilar material or size.
- b. Non-shielded flexible couplings are permitted for sewer and drain service laterals 6-inch in diameter or less.
- c. Couplings and shields shall be sized to fit the outer diameter of pipe, and be rated for the pipe material and conditions of service by the manufacturer.
- d. Eccentric couplings shall be used where connecting pipes of different nominal diameter.
- e. The CONTRACTOR will not be allowed to substitute any other type of coupling unless approved by the ENGINEER.

2. Construction

- a. Flexible couplings shall be in accordance with ASTM C1173 – Standard Specification for Flexible Transition Couplings for Underground Piping Systems.
- b. Rubber sleeves shall be rated for heavy earth loads and be immune to attack by chemicals and impurities normally found in water or wastewater.
- c. Shields shall consist of a rigid stainless steel shear ring.

- d. Bolts, nuts, straps, and all miscellaneous hardware shall be Type 316 stainless steel.
3. Manufacturer
- a. Shielded flexible couplings shall be Fernco (5000 Repair series), Mission Rubber (Flex-Seal Repair series), Indiana Seal (Heavy Duty Repair series) or approved equal.
- E. Service Connections
- 1. Storm Drain services shall be connected to new, parallel, replacement or existing sanitary sewer or storm drain lines with full bodied tees, wye fittings, or saddle-type tees in accordance with the following:
 - a. For 6-inch dia. services to storm drain mainlines a saddle type (Romac Style CB or equal) or full bodied fitting with solid transition coupling shall be used;
 - b. For 8-inch dia. services to existing 12-inch dia or less storm drain mainlines a full bodied fitting with solid transition coupling shall be used;
 - c. For 8-inch dia. services to new 15-inch dia or less storm drain mainlines a full bodied fitting with solid transition coupling shall be used;
 - d. For 10-inch dia. services consult with engineer; and
 - e. Otherwise reference Figure 02622 A.

Figure 02622 A

Service Connection On New Mainline Pipes
Dia. of Mainline Pipe

Service Dia.	8"	10"	12"	15"	18"	21"	24"
New Sanitary Sewer							
6"*	FB/S	FB/S	FB/S	FB/S	FB/S	FB/S	FB/S
8"	FB	FB	FB	FB	FB/S	FB/S	FB/S
10"	C	C	C	C	C	C	C
New Storm Drain							
6"*	FB/S	FB/S	FB/S	FB/S	S	S	S
8-10"	C	FB / C	FB / C	FB / C	FB / C	FB / C	FB / C
12"	C	C	FB / C	FB / C	FB / C	FB / C	FB / C

Note: In every situation a full body fitting is acceptable

* Minimum allowable service diameter

C: consult engineer

FB: full bodied fitting required

S: saddle

F. Bedding Materials

1. Unless otherwise specified or shown, all material used for pipe bedding shall conform to the requirements in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

G. Gaskets

1. Gaskets shall be flexible elastomeric rings conforming with ASTM F 477.

PART 3 – EXECUTION

3.1 PIPE AND PIPE FITTINGS

- A. Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-inch per foot of length. If a piece of pipe fails to meet this requirement for straightness, it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be

defective either before or after installation shall be removed and replaced with a sound unit.

- B. All premolded gasket joint polyvinyl chloride pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as hereinbefore specified. If the pipe is unsatisfactory, as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the same shipment from the work and shall furnish pipe from another manufacturer which will conform to all of the requirements of these specifications.

3.2 INSTALLATION

- A. Install PVC pipe and fittings in accordance with manufacturer's printed instructions.
- B. No pipe or fitting shall be permanently supported on saddles, blocking, or stones. Bedding material shall be as specified in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.
- C. Suitable bell holes shall be provided, so that after placement, only the barrel of the pipe receives bearing pressure from the supporting material. Special care shall be taken to hold the trench width at the crown of the pipe to the maximum indicated on the Trench Detail included in the Details Section of these Specifications.
- D. Before any joint is made, the previously installed unit shall be checked to assure that a close joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber or other unyielding object.
- E. Contractor shall verify line and grade of sewers using a laser level, or other means of equivalent accuracy during installation and before proceeding to the next section.
- F. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be checked to see that the rubber ring is properly seated. Apply lubricant to the spigot end only, paying particular attention to the bevel, in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe units together so that they will fit with minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. Joints shall not be "pulled" or "cramped" unless permitted by the Engineer. The resulting joints shall be watertight and flexible.

- G. Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.
- H. Allowable Pipe Deflection
1. Pipe provided under this Specification shall be so installed as to not exceed a maximum deflection of 5.0 percent. Such deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.
 2. Upon completion of a section of pipe, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gage assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer, and be reviewed by the Engineer. The section of pipe must be placed and backfilled for a minimum of 90 days before the deflection can be measured. Deflection shall be measured before final paving.
 3. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem without additional compensation.
- I. Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.
- J. After each pipe has been properly bedded, enough bedding material shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment. Bell holes, provided for jointing, shall be filled with bedding material and compacted, and additional material shall be placed and compacted to complete the pipe bedding.
- K. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench. At all times pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs, or by other acceptable means.
1. If water is in the trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe. Pipelines shall not be used as conductors for trench drainage during construction.
- L. For installation near crossing utilities and encasement requirements, refer to Contract Drawings.

M. For lateral service connections and encasement requirements, refer to Contract Drawings.

N. Cleaning

1. Care shall be taken to prevent earth, water and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the Contractor shall clean out the pipeline and manholes being careful to prevent soil, water and debris from entering any existing pipe.

O. Shielded Flexible Couplings

1. Where couplings are used, plain ends of pipe shall be made smooth and round for a distance of 12 inches from the ends of the pipe, with an outside diameter not more than 1/64 inch smaller than the manufactured outside diameter of pipe. Install couplings per manufacturer's written instructions.
2. SPARE PARTS - CONTRACTOR shall maintain an on-site inventory of couplings suitable for use with the various nominal diameters and materials of proposed and existing pipe referenced in the CONTRACT DOCUMENTS. CONTRACTOR shall be responsible to verify the outer diameter of pipe in advance through measurements taken at access manholes and test pits. The lead times for fabrication, stocking and shipping of couplings shall not be cause for delay or the use of other types of couplings.

3.3. LEAKAGE TESTS

- A. Storm drains shall be made as nearly watertight as practicable. Where practical, as determined by the Owner, leakage tests will be performed for the new sewers.
- B. Testing of sewers will be limited, as determined by the Owner, to physical inspection of the pipe sections by closed circuit television inspection. Any defective pipe, joints, or other construction shall be replaced or repaired by the Contractor at no additional expense to the Owner.
- B. The contractor shall perform CCTV inspection of the sewer at no additional cost to the Owner. The Engineer must be able to witness the tests and must be provided with a video recording of each test for further inspection.

PART 4 – COMPENSATION

Item 2622.1 – Gravity Drain Pipe

BASIS OF PAYMENT/INCLUSIONS:

Under the Unit Price bid for item 2622.1, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement, installation, cleaning, and leakage testing/inspection of gravity drain pipe complete as indicated on the

Drawings and Specifications, or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: pavement or sidewalk sawcutting; removal of brick, concrete, or bituminous sidewalk; excavation of bituminous concrete roadway; excavation; transporting material to/from soil staging area; temporary excavation support consisting of timber or steel sheeting, left in place and cut off below grade where required by the Contract Specifications; removal of groundwater from the trench; handling groundwater recharged back to the soil, a settling tank, hose connections, hoses and other dewatering apparatus as required for staging and reinfiltration of groundwater; filter fabric as required; bedding, including compaction; drain pipe, fittings, couplings, and appurtenances; connecting existing laterals; connections to structures; cleanout assemblies (if required); placing and compacting suitable backfill soil; grade and compact gravel pavement sub-base; compaction testing; and all appurtenances and incidental work.

METHOD OF MEASUREMENT:

Payment for Gravity Drain Pipe shall be based on the Unit Price bid in the proposal.

Measurement for payment of item 2622.1 shall be based on the actual linear feet of complete and functional pipes as shown on the Contract Drawings or as directed by the Owner or Engineer. Measurement shall be taken along the centerline of the pipe from the inside face of structures to inside face of structures, or to the points of connection with existing pipes.

Pipe installed but not successfully tested and accepted shall be paid for at a maximum of 95 percent of the unit prices bid under this item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reductions in payment due to unsuccessful testing shall be made prior to normal retainage.

SPECIAL NOTES ON EXCLUSIONS:

The following item(s) are not included for payment under this item: disposal of bituminous concrete and construction debris; treatment of groundwater discharged required by an NPDES Dewatering Permit; procurement, installation, and compaction of CDF.

END OF SECTION 02622

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 02767

CURED-IN-PLACE PIPELINING

ITEM 02767.1

CIPP 8" STORM DRAIN

LINEAR FOOT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Inspecting and measuring the interior of the pipe to be lined.
2. Grout sealing of leaks which may interfere with installation and/or curing of the lines. Sealing shall include all required materials including packers.
3. Furnishing all plant, labor, equipment and materials as well as performing all operations associated with the installation of cured-in-place pipelining (CIPP) inside the existing pipeline where indicated on the Drawings and in accordance with municipal, state and federal requirements, including OSHA, and these Specifications.
4. Performing the work in a sequence that is the least disruptive to vehicular and pedestrian traffic and in a manner that shall protect the public from damage to persons and property within the limits and for the duration of the work.
5. Handling and disposal of discharge water from the CIPP curing operation.

1.3 SUBMITTALS

- A. After Notice to Proceed, and before beginning Pre-inspection work in preparation for CIPP construction, the Contractor shall submit:
 1. Shop drawings and/or manufacturer's descriptive literature indicating materials, equipment and methods specific to this project to be used to complete CIPP operations.

- a. Material Safety Data Sheets (MSDS's) for all materials used during preparation and installation.
- b. Certification stating that the Contractor is fully licensed by the CIPP manufacturer (if different).
- c. Method(s) and equipment for repairs of any uncured areas, defects, and test sample section repairs or other deformities in the completed product.
- d. Certified copies of all test reports on the material properties of the cured liner by the material manufacturer indicating that the supplied materials conform to the design criteria used in calculating the liner thickness.
- e. Description of odors anticipated as a result of the curing process and methods to mitigate odors to prevent migration outside of the pipeline.
- f. Confined Space Entry Certifications for all Contractors' personnel entering pipeline or access structures.
- g. Name(s) of all supervisory personnel to be directly involved with each cured-in-place pipelining method of pipe rehabilitation for this project. Supervisory personnel shall meet the experience requirements listed under Section 1.4 of this specification. Attach resumes of each person named. Resume information shall include, as a minimum, educational background, the number of years in a supervisory capacity and a list of projects worked on within the past five years, describing the type of construction, project description, complexity, and contract amounts.

2. A work plan to include the following items:

- a. Details and description of construction methods and any intended variances from the specified methods, materials, equipment, and process description, including on-site or off-site tube wet out, insertion procedure, curing and cool down procedure including procedures to account for constrained downstream access through the Tannery Brook Conduit, access structures and lateral connection details, method of cutting lateral connections, method for sealing ends of liner and lateral cut-outs, water sources and method of cure-water/steam discharge.
- b. Description of surface activities including access structures, staging and inversion locations.
- c. A plan for maintaining vehicular and pedestrian access, avoiding damage to existing trees, preventing leakage from hoses, and minimizing noise from pumps.
- d. A description of the process or technique(s) to be used to progressively round the liner tube to remove all trapped water between the liner pipe and the existing pipe.

- e. Detailed action plan and description of techniques and equipment used in the event of odor migration into public and/or private property (indoors as well as outdoors).
- f. Traffic and pedestrian management plan.
- g. A written description of curing water or steam condensate disposal method.
- h. The name, address, and EPA identification number of the transporter and disposal facility in the event a treatment or disposal facility is used for cure water discharge. Test results and disposal documentation from the facility shall also be submitted.
- i. The Contractor shall submit method of repair of any rejected inversion/installation length for review and approval by the Owner prior to any such repair or replacement.

B. After Pre-Inspection, and prior to CIPP installation, the Contractor shall submit:

- 1. Design calculations specific to each inversion. The submittal shall provide documentation supporting the basis of the values used in the design calculations. The calculations shall be prepared and stamped by a Professional Engineer registered in the state within which the work shall take place in accordance with the requirements of ASTM F1216. For pulled-in systems, Contractor shall submit design calculations for the maximum allowable pulling force on tube as well as the type of equipment and monitoring provisions to measure such forces during installation.
- 2. Curing tables indicating resin\liner manufacturer's recommended water\steam temperature during the cure period; or for UV cure systems the UV lamp firing rate, pull back speed, air pressure, and liner surface temperature for the liner diameter, thickness and length to be installed. Curing tables for UV systems shall specifically indicate the acceptable liner surface temperature range which will assure that the cure will complete.
- 3. A certification stating that the sources of all lateral connections identified during internal inspection have been investigated within the pipeline as well as in adjacent buildings and structures and that the Contractor has secured these connections to prevent the migration of odors.

C. The Contractor shall submit curing logs within 24 hours of cool-down completion for each inversion consisting of the specified monitoring reports from the curing process.

D. The Contractor shall submit final CIPP testing reports and post construction inspection videos and reports after CIPP construction as specified herein.

1.4 QUALITY ASSURANCE

- A. The Contractor installing the CIPP system shall have completed at least three (3) projects, in the United States, within the past two (2) years and projects that included CIPP installation lengths of at least 300 continuous linear feet, on-site or off-site wet-out or resin impregnation of the liner tube, and design and installation of at least 24-inch diameter CIPP with a wall thickness based on a fully deteriorated condition.

Note: A combination of projects satisfying each of the above provisions may be acceptable as long as two (2) projects have been successfully completed for each provision.

- B. Supervisory personnel shall have a minimum of five (5) years experience and shall have completed at least two (2) projects of similar size and complexity as this project in the United States within the past five (5) years. Resume information shall include, at a minimum, educational background, the number of years in a supervisory capacity and a list of completed projects within the past five (5) years, including project description, complexity and contract total amounts.
- C. Rejection of any contractor and/or manufacturer by the Engineer due to insufficient qualifications shall not be grounds for modifications to the Contract Documents such as change in scope, time of completion or contract amount.
- D. Designated supervisory personnel shall be directly involved with and used on this project. Substitutions of personnel will not be allowed without written authorization of the Engineer.
- E. At the time of manufacture, inspect each lot of liner for defects. At the time of delivery, the liner shall be homogeneous throughout, uniform in color, free of cracks, holes, foreign materials, blisters, or deleterious faults.
- F. All Contractor's personnel entering pipeline or access structures shall be Confined Space Entry trained per OSHA, Title 29 CFR 1910.46 and shall have a copy of their certification available on site at all times.

1.5 ASTM STANDARDS

- A. CIPP work and materials shall comply with all applicable sections of the following ASTM standards.
 - 1. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - 2. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
 - 3. ASTM D2990 - Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

4. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
 5. ASTM D3567 - Standard Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
 6. ASTM F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
 7. ASTM F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
- B. If conflicts exist between the specifications and the above-referenced standards, the more stringent requirements, as determined by the Engineer, shall apply.

1.6 WARRANTY REQUIREMENT

- A. As a minimum, all project work and components shall be warranted for one (1) year from the date of substantial completion or owner's acceptance.
- B. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- C. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- D. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- E. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights or remedies.
- F. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

- G. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- H. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cured-In-Place Piping
 - 1. Designed and constructed in accordance with ASTM F1216 for “Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube”, and/or ASTM F2019 for “Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)” and these Specifications.
 - 2. Fabricated to a size that, when installed, shall neatly fit the internal circumference of the existing pipeline. Allowances shall be made for circumferential stretching during installation.
 - 3. Consisting of one or more layers of flexible needled felt, an equivalent woven, non-woven or combination material, or one or more layers of fiberglass laminate in a resin-impregnated flexible tube.
 - 4. Capable of carrying resin withstanding installation pressures and curing temperatures. Curing the liner shall form a continuous, hard, impermeable, tight-fitting lining between each installed reach.
 - 5. The finished product in place shall meet the minimum chemical resistance requirements for domestic sanitary sewer applications as listed in table X2.1 of ASTM F1216. Exposure shall be for a minimum of 30 days at 73.4°F (23°C). At least three (3) specimens shall be used for each material being tested and for each chemical solution involved. Specimens shall be removed from each chemical solution and tested. If any specimen fails to meet the 30 days requirements specified herein, the material will be subject to rejection. During this period, CIPP test specimens shall lose no more than 20 percent of their initial flexural strength and flexural modulus when tested in accordance with Section 8 of ASTM F1216.

6. For glass fiber reinforced liner materials, the Contractor shall provide chemical resistance test reports required under ASTM 3681 “Chemical Resistance of ‘Fiberglass’ (Glass-Fiber, Thermosetting-Resin) Pipe in a Deflected Condition” as indicated herein.

B. Resin

1. General purpose, unsaturated, styrene-based resin and catalyst system, an epoxy resin and hardener, or an epoxy vinyl ester resin and catalyst system, or other approved material compatible with the installation and curing method process that provides cured physical strength properties specified herein.

C. Lateral Connection and End Sealing

1. The sealing material shall be an acrylamide based gel with a minimum of ten (10) percent acrylamide base material by weight in the total sealant mix. The chemical sealing material shall have a viscosity of approximately two (2) centipoises, which can be increased with additives, and a controllable reaction time from ten (10) seconds to one (1) hour. The application of the sealant shall be through a lateral sealing packer. Joint sealing shall be accomplished by forcing chemical sealing materials through the lateral packer into the surrounding soil through the leaking joint, crack or other lateral defect. Final acceptance of the sealed lateral shall be accomplished via an air test of the joint or a visual inspection to verify that water is not leaking through the repaired lateral connection.
2. End seals shall be compression type hydrophilic seals consisting of seamless neoprene rubber, suitable for use with all pipe materials and held in place by spring loaded retaining rings during the inversion process. End seals shall be Insignia End Seal as manufactured by LMK Technologies of Ottawa, IL, or approved equal.

2.2 DESIGN CRITERIA

A. General

1. The CIPP shall be designed to have sufficient structural strength to support all dead loads, live loads, and groundwater load imposed, including 100 year flood elevation requirements as applicable, with the assumption that the existing pipeline is fully deteriorated and cannot share any loading or contribute to structural integrity of the CIPP.
2. All CIPP shall have a wall thickness that, when tested by the parallel plate deflection method in accordance with ASTM D2412, shall have a minimum pipe stiffness of six (6) psi.

3. The properties of the CIPP, when cured, shall have the following minimum values, verified by ASTM testing as indicated in the table below:

<u>Property</u>	<u>ASTM Test Method</u>	<u>Initial¹ psi</u>	<u>Long Term² psi</u>
Flexural Strength	D790	4,500	NA
Flexural Modulus	D790 & D2990	300,000	150,000

Notes: ¹Initial values are determined by ASTM D790.

²Long term value is defined as fifty (50) years and is determined by ASTM D2990.

B. Design Performance Limits and Design Parameters

1. The CIPP shall be designed such that the lining shall not fail, collapse, buckle, crack or delaminate under load. The maximum long-term fifty (50) years calculated deflection under all loads shall not exceed five (5) percent. For glass fiber reinforced liner pipe, the bending strain fifty (50) years developed shall not exceed the higher of the minimum long-term value in ASTM D3262 for the pipe stiffness supplied or that substantiated by long-term strain tests done in accordance with ASTM D3681 using 1.0 N sulfuric acid.

C. The following design parameters shall be used and all criteria shall apply to each CIPP installations:

Depth of Cover Above Crown of Pipe ¹	6.5'
Depth of Groundwater Above Crown (Perm.)	Ground surface.
Specific Weight of Soil	120 pcf
Wheel Load ²	16,000 lbs.
Temperature	80° F
Deflection Lag Factor, D _L	1.0 (Initial) 1.5 (50 years)
Modulus of Soil Reaction E'	1,100 psi
Ovality Correction Factor	2%.
Long Term Modulus of Elasticity	50 years under constant stress, when submerged in water, to be used for constrained buckling resistance design for combined external loads from groundwater and earth cover.
Minimum Factor of Safety (Perm.)	2.0, unless otherwise specified
Manning's Roughness Coefficient, n	0.010

Notes: ¹Design of the CIPP shall be based on prism load on the liner pipe, using the outside diameter of the liner in the calculations.

²Impact factors to be included when depth of cover is less than three (3) feet per values recommended by AASHTO.

- D. The minimum thickness of the CIPP shall be as determined for the design parameters imposed and based on material properties meeting the requirements of Section 2.2.A above. Calculations for the determination of the required liner pipe stiffness shall be the largest pipe stiffness for each CIPP installation reach (inversion/installation access structure to termination point), as determined by calculations provided for the following parameters: (1) Maximum Deflection; (2) Minimum Pipe Stiffness; (3) Ring Bending Strain; and (4) Constrained Buckling Resistance Using Long Term Modulus of Elasticity. The design calculations shall consider all cases of loading on the CIPP and the liner thickness required shall withstand these loads without collapsing.

PART 3 - EXECUTION

3.1 GENERAL

- A. Contractor shall perform all work in accordance with municipal, state and federal requirements.
- B. Contractor shall obtain all permits required to perform work prior to the commencement of construction except those permits already obtained by the owner.
- C. The Contractor shall verify the internal pipe diameter/dimension(s) and lengths in the field prior to liner manufacture.
- D. Individual inversions/installations may be performed via one or more existing access structures as determined by the Contractor and as approved by the Owner.
- E. The CIPP shall be performed with minimal excavation or removal of existing structures. Excavation for point repairs or emergencies shall be permitted, but only as approved by the Owner.
- F. Contractor shall review all existing conditions data prior to the commencement of construction.
- G. Contractor shall inspect, clean and CCTV the existing pipe prior to commencement of CIPP operations, and provide the Engineer the opportunity to verify the condition of the pipe for CIPP operations.
- H. Contractor shall commence CIPP operations at the beginning of a period of at least three (3) days of anticipated dry weather or otherwise directed by the Owner and as directed by the Engineer.

3.2 PREPARATION

- A. Contractor shall inspect interior of the pipelines to determine locations of any conditions which may prevent proper installation of the liner. Inspections shall

note protruding service taps, collapse/crushed pipe and reductions in cross-sectional area that could impact lining of the pipe.

- B. Contractor shall grout seal visible leaks prior to installation of the liner material.

3.3 INSTALLATION

- A. Contractor shall install a resin impregnated flexible felt tube inverted/installed into the existing pipe utilizing a vertical inversion standpipe and hydrostatic head method, air pressure inversion method, pulled-in and inflate method or other method approved by the Engineer.
- B. Curing shall be accomplished by circulating hot water, steam, ultraviolet light, or other approved methods to cure the resin into a hard, impermeable pipeline. When cured, the new material shall extend over the length of the inversion/installation reach in a continuous, tight-fitting, watertight pipe-within-a-pipe.
- C. The Contractor shall designate the locations where the reconstruction tube will be vacuum impregnated prior to installation. The Contractor shall allow the Engineer and the Owner to inspect the materials and “wet-out” procedure. A catalyst system compatible with the resin and reconstruction tube shall be used. The wet-out reconstruction tube shall be inserted through an existing access structure or other access point by approved techniques/processes of the Contractor. Tubes that are pulled in place shall be done in a manner that shall not damage the tube. The winch shall be equipped with a dynamometer to record the pulling forces required during installation. Pull forces shall not exceed manufacturer’s recommendations that shall be based on a maximum longitudinal stretch of five (5) percent of the total tube length. Inversion heads for tubes that are inverted in place shall not exceed manufacturer’s recommendations so as not to overstress the tube material or exceed 5% longitudinal stretch. Progressive rounding of the liner shall be performed, prior to curing, to eliminate all trapped water between the liner and the existing pipeline.
- D. After inversion/installation is completed, the Contractor shall supply a suitable heat source and fluid recirculation equipment, suitable application of Ultraviolet (UV) light, or other approved methods. The equipment shall be capable of delivering hot water/steam/UV throughout the section by means of a pre-strung hose to uniformly raise the water/steam temperature above the temperature required to effect a cure for the resin or other approved methods. Curing temperature or level of exposure to UV shall be as determined by the CIPP manufacturer and based on the resin/catalyst system employed.
- E. For hot water or steam cured CIPP liners:
 - a. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water/steam supply. Another such gauge shall be placed between the impregnated reconstruction tube and the pipe invert at the terminating manhole to determine the

temperatures during cure. Water/steam temperature in the line during the cure period shall be recommended by the resin manufacturer.

- b. Initial cure shall be deemed to be completed when inspection of the exposed portions of cured liner appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the CIPP process, during which time the recirculation of the water/steam and cycling of the heat exchangers to maintain the temperature continues. Curing temperatures and duration shall be in accordance with previously submitted data and information.
- c. The Contractor shall cool the hardened pipe to a temperature below 100 degrees F before relieving the static head. Cool-down may be accomplished by the introduction of cool water or air, as applicable, into the inversion standpipe to replace water/steam being drained from a small hole made in the downstream end. If Contractor elects to drain cure-water via the upstream end, the water shall be pumped to a discharge location approved by the Owner at no additional cost to the Owner. Care shall be taken in the release of the static head so that a vacuum shall not develop that could damage the newly installed pipeline.
- d. After completion of pipeline curing, the Contractor shall dispose of curing water or condensate in accordance with all federal, state, and local requirements. The Contractor may elect to transport the curing water off site for disposal utilizing a uniform hazardous waste manifest. The transporter shall be appropriately licensed and the disposal facility shall be a licensed wastewater treatment facility. The Contractor shall sample and analyze appropriate samples as required by the disposal facility.
- e. Contractor shall verify with the Owner that discharging the cure-water directly into the existing system is acceptable. If deemed unacceptable, Contractor shall collect and pump cure-water to a location to be determined by the Contractor and approved by the Owner.

F. For UV cured CIPP liners:

- a. The light source shall be fitted with a computer control system that shall control the ignition speed of the UV lamps and the pull speed of the light train. The computer control system shall monitor and record the liner inflation pressure and liner surface temperature in addition to UV lamp ignition speed and light train pull speed throughout the cure process. The computer control system shall also record video output from the light train for inclusion in the curing log. These records shall be submitted to the Engineer after the cure as required by subsection 1.3 of this specification.

- b. The liner system manufacturer shall provide to the installer curing tables specific to the installers equipment, dictating acceptable ranges of lamp ignition speed, pull back speed, liner inflation pressure, and surface temperature of the liner during the curing process based on liner diameter, length, and thickness. The computer control system shall be programmed based on these tables. Installation shall be conform to the requirements of these curing tables.

- G. Contractor shall mitigate all odors onto public or private property due to renewal operations immediately after notification from the Owner or the Engineer including, but not limited to, forced-air ventilation and/or chemical cleaning of buildings at no additional cost to the Owner.

- H. If odors persist on public or private property to a point that air sampling and/or associated testing is required by the Owner, the Engineer or a regulatory agency, the Contractor shall perform this work at no additional cost to the Owner.

- I. Contractor shall repair all uncured areas, defects, test sample section repairs or other deformities in the liner during inversion operations in accordance with the manufacturer's recommendations.

- J. The finished CIPP shall be continuous over the entire length of an inversion/installation run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes, wrinkles, blisters, delamination or other deformities. Any such conditions deemed by the Owner shall be repaired and/or replaced at no additional cost to the Owner.

3.4 SYSTEM REINSTATEMENT

- A. Once a section of liner has been cured completely, the Contractor shall reinstate all access structures located along its alignment. At inversion/installation or termination access structures, the Contractor shall extend the liner a sufficient distance into the structure to allow for a smooth, clean cut to match the configuration of the riser and base sections. The top half of the pipe shall be neatly cut off, and not broken or sheared off, at least four (4) inches away from the walls. The channel in the manhole shall be a smooth continuation of the pipe(s) and shall be merged with other lines or channels, if any. Any nominal annular gap between the liner and the host pipe shall be filled with a resin mixture and/or epoxy compatible with the CIPP liner and the terminated ends of the liner shall be beveled to allow for a smooth transition.

- B. Lateral connections shall be reestablished with a cutting device specifically designed for cutting CIPP. The exact location and number of lateral connections shall be determined during the internal inspection(s) and/or in the field. The Contractor shall reconnect all lateral connections to the liner pipe, including those unoccupied, abandoned, or from vacant lots, unless otherwise directed by the Engineer. Shape of pipeline cut-out shall match shape of lateral connection. The annular space between the liner pipe and the lateral connection shall be sealed with a resin mixture and/or epoxy compatible with the CIPP.

- C. Lateral connections shall be reinstated by experienced operators so that no blind attempts are made in the liner. Location shall be re-verified with pre-construction videotapes for accuracy, especially where dimples are not defined or clearly ascertained. The cut shall be smooth and circular with no jagged edges. The hole shall be a maximum of 100 percent and a minimum of 95 percent of the lateral pipe inside diameter. It shall be properly aligned and be concentric to the existing connection.
- D. The Contractor shall minimize the time that an inversion/installation access point remains open. Consideration shall be provided to complete and coordinate all work including pipeline cleaning, pre installation internal inspection, pipeline renewal and post installation internal inspection to minimize disturbance to adjacent property owners.

3.5 TESTING

- A. For each separate length of CIPP installed, the Contractor shall prepare at least two (2) samples in accordance with ASTM F1216, Section 8.1.1 or Section 8.1.2 for testing at a laboratory approved by the Engineer. For samples used per section 8.1.1, the Contractor shall hold the pipe in place by a suitable heat sink, otherwise this method will not be acceptable. For samples taken from UV cured liners, contractor shall line through a spool piece pipe of matching interior diameter in order to obtain collection sample, as described in ASTM F 1216 subsection 8.1.1.
- B. The Contractor shall provide one sample for each inversion to the Engineer for independent testing. The samples shall be labeled with each pipe inversion identification and date.
- C. Samples secured as specified shall be tested to verify that the pipe flexural modulus and flexural strength of the CIPP is at least equal to that required by the approved design submittal, and the wall thickness is at least equal to that required in the approved design submittal. Wall thickness shall also be verified at each inversion, intermediate manholes, and termination access at four equidistant points around the perimeter.
- D. If any sample fails the verification tests specified, the Contractor shall take five (5) additional samples throughout the length of the inversion/installation and retested to ensure the specified criteria has been met. If any sample fails these retests, the entire inversion/installation length shall be rejected.
- E. Any rejected inversion/installation shall be relined or replaced by the Contractor at no additional cost to the Owner in accordance with the submitted method of repair/replacement. Any samples taken from within the final completed liner pipe shall be repaired by the Contractor, in accordance with the shop drawings, at no expense to the Owner.
- F. Contractor shall submit curing water or condensate test reports as applicable.

- G. Contractor shall submit the names, address, and EPA identification number of the transporter and disposal facility in the event a treatment or disposal facility is used for cure water discharge. Test results and disposal documentation from the facility shall also be submitted.

3.6 ACCEPTANCE

- A. Prior to final acceptance, any defects that may affect the integrity or strength of the pipeline in the opinion of the Engineer shall be repaired by the Contractor at no additional cost to the Owner. Wrinkles or fins in the bottom half of the lined pipe shall not exceed 2% of nominal pipe diameter and shall not have an adverse effect on the flow. If in excess, the liner shall be repaired and/or removed and replaced at no additional cost to the Owner.
- B. Pipeline shall be true to line and grade, with no bulges, sags, protrusions, wrinkles transverse to the flow, deflections, offset joints, leaking joints, or other visible infiltration, or other defects that would impair the intended use of the completed pipeline.
- C. All active service connections shall be open and clear.
- D. Final acceptance of work shall not be granted until all defective areas are repaired in accordance with the CIPP manufacturer's recommendations and to the Owner's satisfaction.
- E. Any repairs required by the Engineer as a result of the post construction internal inspection shall be performed by the Contractor.
- F. Contractor shall perform a post construction internal inspection via Closed Circuit Television Inspection (CCTV) and provide a post construction inspection report which details the condition of constructed items and describes recommendations for repairs of any defects.
 - 1. All areas where the construction is defective due to workmanship, chemical deterioration, or other, shall be identified by the Contractor.
 - 2. If repairs are required, the Contractor shall produce a second post construction inspection report.
- G. Contractor shall perform testing as specified. Final acceptance of the work shall not be granted until the appropriately formatted testing results have been reviewed and approved by the Engineer.

PART 4 – COMPENSATION

02767.1 – CIPP 8” Storm Drain

DESCRIPTION:

Bike Path Retaining Wall and Drain Somerville, MA 20171752.002	CURED-IN-PLACE PIPELINING 02767-14
--	---------------------------------------

The lump sum price for Item 02767.1 shall constitute full compensation for all work, complete, as indicated on the drawings and as specified. Under the price specified to be paid, the Contractor shall furnish all materials and equipment, furnish all labor and plant, and perform all operations to complete all work as indicated and specified in order to provide complete working and fully functional systems. The per linear foot price stated shall constitute full compensation for the work completed in accordance with the drawings and specifications, including cleaning up; furnishing, installing, and testing pipe liner as described in the Contract Specifications; pipeline cleaning; transportation of the material removed during cleaning operations to a temporary stockpile area; temporary storage and control of stockpiling; pre- and post-installation inspection by closed circuit television; providing inspection photos and logs, sealing around manhole connections;. Provide all supervision, overhead items, protection and precautions, and all other costs incidental to the construction work, complete, and as specified. A complete working and operational job shall be produced whether or not any particular wording or direction is omitted or not clearly stated.

METHOD OF MEASUREMENT:

Payment for items 2767.1 shall be based on the Unit Price bid in the proposal. Measurement for payment shall be based on the actual linear feet of complete and functional cured-in-place pipeliner as shown on the Contract Drawings or as directed by the Owner or Engineer. Measurement shall be taken along the centerline of the pipe from the inside face of structures to inside face of structures.

Cured-In-Place Pipe liner installed but not successfully tested and accepted shall be paid for at a maximum of 95 percent of the unit prices bid under this item. The remaining 5 percent shall be paid upon receipt of successful test results by the Engineer. All reductions in payment due to unsuccessful testing shall be made prior to normal retainage.

SPECIAL NOTES ON EXCLUSIONS:

The following item(s) are not included for payment under this item and are included for payment elsewhere: disposal of bituminous concrete and construction debris; adjusting castings for paving.

END OF SECTION 02767

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 02900

LANDSCAPING

ITEM 2900.1

SURFACE RESTORATION

LUMP SUM

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Providing loam, fertilizer, seed, plants and related work as indicated and specified.

1.2 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTAL PROCEDURES:

1. Submit with seed, certificates concerning seed mixture, purity, germinating value, and crop year identification.
2. Submit test samples of loam to a certified soils consultant to determine fertilizer and lime requirements and return two copies of results for implementation.
3. If hydroseeding is to be used, provide written description containing seed analysis, fertilizer, and lime addition data.
4. Submit list of plant material to be used and source.
5. Prior to end of maintenance period, furnish two copies of written maintenance, instructions for maintenance and care of installed plants and lawn areas.

1.3 QUALITY ASSURANCE

A. Provide in accordance with Section 01400 and as specified.

B. General:

1. Furnish suitable quantities of water, hose and appurtenances.
2. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.

3. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.
8. Repair or replace seeded areas which, in judgment of Engineer, have not survived and grown in a satisfactory manner, for a period of one year after acceptance.
9. Provide as specified seedings replacements of the same type and size as specified.
10. The Engineer reserves the right to test and reject any material not meeting specifications by utilizing tests in accordance with methods adopted by the Association of Official Agricultural Chemists. Costs for these tests shall be paid by the Contractor.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01600 and as specified.
- B. Delivery:
 1. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, and conformance to state law.

1.5 JOB CONDITIONS

- A. See drawings for trees to be protected. Clear trees required to be removed only after approval by Engineer. Engineer to approve changes or exceptions required in grading on the job.
- B. Planting Seasons:
 1. Recommended Spring Planting Season: From time soil can be satisfactorily worked until following dates at end of planting season:
 - a. Lawns - April 15.
 2. Recommended Fall Planting Season: Commence and terminate at time listed below:
 - a. Lawns - August 1 to October 1.
- C. Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

- D. Protection:
 - 1. Protect seeded and planted areas against damage by trespass and other causes.
 - 2. Protect work until accepted.
 - 3. Replace, repair, restake, or replant as directed by Engineer, and at own expense, seeding or planting which is damaged.
- E. Wherever landscape work must be executed in conjunction with construction of other work, arrange a schedule of procedure that will permit execution of landscape work as specified.

1.6 WARRANTY

- A. Guarantee lawn areas for duration of one full year after seeding to be alive and in satisfactory growth at end of guarantee period.
 - 1. For purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than 1 sq. ft. will be allowed up to a maximum of 3% of lawn area.

PART 2 - PRODUCTS

2.1 BONE MEAL

- A. Commercial raw bone meal, finely ground and containing a minimum of 1 percent nitrogen and 18 percent phosphoric acid.

2.3 LOAM

- A. Fertile, friable, natural topsoil typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Free of stumps, roots, heavy or stiff clay, stones larger than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.
- B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

2.4 LIME, FERTILIZER AND SEED

- A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

- B. Commercial type fertilizer, uniform in composition, free flowing, conforming to state and federal laws, and at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight: Nitrogen 10 percent, Phosphorus 10 percent, Potash 10 percent.
- C. Lawn seed mix [this is a general mix and maybe adjusted if extreme conditions are known such as shade, drought, etc.] clean, high in germinating value and of the latest year's crop mixed as follows:

Name	Minimum proportion by weight
Creeping Red Fescue	50%
Perennial Ryegrass	30%
Colonial Bentgrass	5%
Kentucky Bluegrass	15%

- D. Weeds shall not exceed 0.25 percent.

PART 3 - EXECUTION

3.1 LOAM

- A. Spread loam on areas to be seeded, to required depth indicated on Contract Drawings or as directed by Engineer, fine grade and compact. Specified depth shall be that after compaction.

3.2 LIME, FERTILIZER AND SEEDING

- A. Apply lime by mechanical means at rate of 50 pounds per 1,000 sq. ft., or as soil analysis recommends.
- B. Apply fertilizer at rate of 50 pounds per 1,000 sq. ft., or as soil analysis recommends.
- C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 4 pounds per 1,000 sq. ft. on calm day, by mechanical means. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.
- D. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period.
- E. Loam, lime, fertilize and seed required areas outside of perimeter same as lawn areas. Apply seed at rate of 150 pounds per acre. Rake seed lightly, after

sowing, into top 1/4 in. of loam, and compact by suitable rollers weighing 100 to 150 pounds per linear foot of width.

3.3 CLEAN-UP

- A. Remove soil or similar material which has been brought onto paved areas, keeping these areas clean.
- B. Upon completion of planting, remove excess soil, stones and debris which has not previously been cleaned up and legally dispose of off-site.
- C. Prepare lawns and planting areas for final inspection.
- D. Protect slopes and embankments against erosion until work is accepted. Repair eroded portions of seeded or sodded areas by refilling, resodding, remulching and reseeded as required by condition and to satisfaction of Engineer. Protection may be by installation of sod strips or other methods.

3.4 MAINTENANCE - SEEDED AREAS AND PLANTING

- A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing. Weed thoroughly once and maintained until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.
- B. Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.

3.5 INSPECTION FOR ACCEPTANCE

- A. Upon written request by the Contractor, the Engineer shall inspect all lawn areas to determine completion of contract work. This request must be submitted at least 10 days prior to the anticipated date. The lawns will become acceptable if they show a uniform, thick, well developed stand of grass that may be occupied by the Owner for their intended use. When acceptance is made in writing to the Contractor, the Contractor's responsibility for maintenance shall terminate.
- B. The Contractor shall furnish to the Owner complete written instructions for maintenance of all lawn areas at time of acceptance.
- C. Acceptance of the lawn area shall not occur before acceptance of the entire facility.

3.7 CONTRACT CLOSEOUT

- A. Provide in accordance with Section 01701.

PART 4 – COMPENSATION

Item 2900.1 – Surface Restoration

METHOD OF MEASUREMENT:

Measurement for payment for Surface Restoration will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.

BASIS OF PAYMENT/INCLUSIONS:

Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete modification and restoration of the surface, or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: removal and relocation of signs; installation of loam; installation of seed; installation of crushed stone for retaining wall drainage; installation, maintenance, and removal of tree protection as specified and detailed.

SPECIAL NOTES ON EXCLUSIONS:

The following items are not included for payment under this item but are included for separate payment elsewhere; excavation; disposal of construction debris as solid waste.

-END OF SECTION 02900-

SECTION 02930

TREE PROTECTION

PART 1 -- GENERAL

1.1 SUMMARY

- A. The work to be done under this section consists of instituting and maintaining positive measures to protect and maintain public and private shade trees within and adjacent to the limits of work as detailed on the Drawings and as directed by the Owner's Representative.
- B. This work includes proactive measures prior to, during and after construction to ensure the short- and long-term health of existing trees to remain on site and to prevent damage due to construction operations.
- C. Tree Protection should be assumed for existing trees to remain within the project limit of work where proposed construction activity is to occur beneath the canopy and within the drip lines of existing trees to remain. Tree protection shall remain in place throughout the duration of the construction project but may be temporarily relocated to allow for work in select areas in close proximity to the trees to occur as approved by the Owner's Representative. Tree protection shall be promptly restored following work operations. The measures described herein are anticipated to be required and will be verified based on actual field conditions. Provisions under this item include: tree protection fencing measures to minimize disturbance to existing trees and their root systems; canopy system review and evaluation; canopy pruning in areas of proposed disturbance; and post-pruning care including mulching and watering of root zones.
- D. Work in this section includes the following:
 - 1. Tree Protection
 - 2. Preparation of a Tree Protection and Maintenance Plan and Work Schedule
 - 3. Hiring of a Certified Arborist for the Duration of the Construction Activity
 - 4. Tree Pruning

1.2 RELATED TECHNICAL SPECIFICATIONS

- A. The Contractor shall carefully examine all of the Contract Documents for requirements which affect the Work of this Section.

1.3 GENERAL REQUIREMENTS

- A. All tree protection fencing must be installed and approved by the Owner's Representative and the City Tree Warden or City Arborist before site preparation or other construction activity commences. Any modifications to tree protection fencing during construction can only take place with advanced written approval from the Owner's Representative and the City Tree Warden or City Arborist.
- B. Pruning: The Contractor shall prune City and private trees within the limit of work under the direction of a Massachusetts Certified Arborist and only as directed by Owner's Representative.

- C. Provide protection of existing trees and vegetation not designated for removal within the limits of work and along truck routes outside the limit of work. Temporarily stump or stockpile as applicable topsoil, shrubs, and vegetation within the limits of work that will interfere with construction and as required.
- D. Conduct site clearing and pruning operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities only as directed by the Owner's Representative. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Owner's Representative.
- E. Public trees are protected by Massachusetts State Law, Chapter 87. Section 12 states that a fine of up to five hundred dollars, (\$500.00) per incident of damage to public shade trees can be levied. Each branch broken or improperly pruned, each improper wounding of the trunks of the trees, and each root improperly pruned shall constitute an infraction. Section 12 further provides that anyone who negligently or willfully damages a tree will be liable to the City for all damages.
- F. The Contractor shall take the utmost care to avoid unauthorized, unnecessary or improper wounding of City or private shade trees. Prior to construction, the Contractor shall provide a Tree Protection and Maintenance Plan and Work Schedule. A Massachusetts or International Society of Arboriculture Certified Arborist shall be sub-contracted by the Contractor to provide a protection and maintenance plan and perform specified work. All plans and schedules shall be subject to review and approval by the City Tree Warden or City Arborist. Infraction of Massachusetts State Law Chapter 87 or failure to provide a protection plan and work schedule will result in fines or the immediate cancellation of the contract.
- G. The Contractor shall engage a board certified arborist with a **minimum of five (5) years of experience** including experience with supersonic air tools such as the "airspade" for the project.
- H. The work shall consist of the provision of all labor, materials, equipment, and transportation required to complete the pruning as required by the Owner's Representative in strict accordance with the conditions and specifications of these Contract Documents. The work shall include, but is not necessarily limited to, the following:
 - 1. Attending initial site visit and assessment with City representatives
 - 2. Securing necessary permits and approvals before commencement of work
 - 3. Posting work areas for parking restrictions
 - 4. Securing police details, if necessary
 - 5. Marking work zones for traffic and pedestrian control
 - 6. Providing a schedule of work for City review and approval
 - 7. Meeting with City staff on a periodic basis (up to 5 meetings)
 - 8. Visual assessment of each tree to be pruned
 - 9. Determination of pruning objectives

- 10. Making pruning cuts and wound care
- 11. Wood waste and debris consolidation & disposal
- 12. Site cleanup

1.4 QUALITY ASSURANCE

- A. Tree Protection measures to be performed by Massachusetts Certified Arborist with a minimum of five years of experience and as reviewed and approved by the Owner's Representative and City Tree Warden or City Arborist.

1.5 SUBMITTALS

- A. Certification: Submit the Certification of the arborist to be performing the work.
- B. Tree Protection and Maintenance Plan, Plant Health Care Program and Work Schedule: submit for review and approval by the Owner's Representative and City Tree Warden/ City Arborist at least two (2) weeks prior to beginning initial work on a project street.
- C. Product Data: Submit most recent printed information from manufacturers for:
 - 1. Slow Release Fertilizer
- D. Samples: Submit samples of:
 - 1. Tree Trunk Wrapping
 - 2. Tree Protection Fencing
 - 3. Wood Chips
- E. Shop Drawing/ Field Mock-Up: Submit for review and approval by the Owner's Representative and City Tree Warden:
 - 1. Tree Box. Owner's Representative to approve first tree box constructed prior to Contractor completing remaining boxes.

PART 2 -- PRODUCTS

2.1 TREE BOX

- A. Tree Box shall be constructed from 2 in. x 4 in. lumber creating a box around the border of the tree pit with 2 in. x 4 in. lumber standing straight up at the corners and wrapped with orange snow fence. Fasteners as per detail.

- 2.2 TREE TRUNK WRAPPING PROTECTION LUMBER shall consist of 2 in. x 4 in. and 8 ft. height lumber wired together in close spacing with 16 gauge galvanized steel wire to form a protective enclosure around tree trunks.
- 2.3 WOOD CHIPS
- A. Wood Chips shall conform to provisions of Wood Chip Mulch under Materials Section M6.04.3 of the MassDOT Standard Specifications.
- 2.4 WATER
- A. Water shall be furnished by Contractor, suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment required for work shall be furnished by Contractor.

PART 3 -- EXECUTION

- A. Remove trees, shrubs, grass and other vegetation, improvements, or obstructions that interfere with installation of new construction and as required. Removal includes digging out stumps in their entirety and grubbing roots to at least 2.5 feet below existing grades shown on the Drawings.
- B. Prior to start of subsurface work, Contractor shall conduct project-wide pruning of existing trees and shrubs within the right-of-way.
- C. A list of additional trees requested to be removed or pruned by the City as part of this project are attached to the end of this specification section. This work is required to be completed at the beginning of construction operations (Fall 2013). Associated removal of stumps can be postponed to coordinate with the work on individual streets.
- 3.2 SPECIAL REQUIREMENTS
- A. The Contractor is required to conform to the requirements of the City of Somerville Office of Strategic Planning and Community Development regulation "Tree Protection During Construction". This regulation contains specific measures and remedies should the Contractor fail to abide the City's requirements.
- B. For definitions and pruning standards, the Contractor is required to adhere to the requirements of ANSI A300, American National Standard for Tree Care Operations "Tree, Shrub and Other Woody Plant Maintenance Standard Practices".
- 3.3 SITE REVIEW OF EVALUATION OF TREES AND POTENTIAL CONSTRUCTION RELATED IMPACTS TO ROOT SYSTEMS
- A. Prior to mobilization and construction operations, Contractor, Arborist, Owner's Representative and City Tree Warden or City Arborist shall conduct a site review of the existing trees to remain in relation to proposed limits of construction operations, confirm the limits of tree protection fencing, and confirm which trees are to receive other types of Tree Protection including those designated as "Special Mature Trees". Contractor to document the trees and strategy to receive type of Tree Protection and submit for Owner's Representative's approval.

3.4 PROTECTION OF EXISTING TREES AND IMPROVEMENTS

- A. Provide protection necessary to prevent damage to existing trees and improvements indicated to remain in place inside or outside of the limit of work. Existing trees and shrubbery to remain shall be protected from injury. Except as otherwise approved, cutting and trimming of existing tree limbs and roots will not be permitted. Existing trees to remain which can potentially be damaged by construction operations shall be protected. Trees having a caliper under 20" diameter at breast height (dbh) shall be wrapped with tree protection lumber. "Special Mature Trees", those trees with a caliper over 20" dbh, shall be wrapped with tree protection lumber and protected with a tree box. Protection shall be maintained until completion of the work of the Contractor. Tree protection requirements are described in City of Somerville Office of Strategic Planning and Community Development regulation "Tree Protection During Construction".
- B. Protect trees and improvements on adjoining properties and within Cityright-of-way. Restore improvements damaged by Contractor's clearing and construction activities to their original condition, at no additional expense to the City. Remove and replace trees damaged by Contractor's clearing and construction activities at no additional expense to the City.
- C. Protect existing trees and other vegetation indicated to remain in place or outside of the clearing/grading limit lines.

3.5 TEMPORARY ACCESS

- A. Temporary access within plant protection areas is permitted to perform construction operations as approved by the Owner's Representative. Work within tree protection areas shall be performed by hand or with small equipment that will not damage or threaten damage to trees. Restore tree protection at the end of each day's operation.

3.6 TREE PROTECTION FOR SPECIAL MATURE TREES

- A. The Contractor shall stake out the following in relation to "Existing mature trees" as identified as being greater than 20" dbh or as identified in the field by the City Arborist at the start of the project. This should be done prior to initiating excavation and should be reviewed together in the field by the City's representatives, the Contractor, Contractor's arborist, and Owner's Representative. This includes:
 - 1. limits of utility trenching
 - 2. limits of sidewalks and proposed tree pit openings
 - 3. limits of proposed construction fences,
 - 4. alignment of proposed limits of excavation.
- B. After areas of potential negative impact are reviewed and confirmed in the field, the Contractor's arborist shall perform subsurface root exploration and evaluate root distribution in the area of the final cut lines.
- C. As a guideline, the minimum final cut line distance from trunk of tree shall be established by taking the tree's diameter at breast height in inches and converting it to feet, (For example, 12" caliper tree translates into a 12' offset from the edge of the trunk to the final cut line). Site

constraints may dictate that the final cut line is closer to the trunk than guidelines will allow. Do not perform subsurface exploration near the trunk or within the drip line without authorization from the Owner's Representative.

- D. The Contractor's arborist shall perform subsurface exploration in areas of negative impact adjacent to the final cut line using an air spade to cut windows in the soil to a depth of 10" or greater to expose the root systems without damaging them.
- E. Based on the proposed alignment of the new utilities, pavement, curbs, formwork, etc. in relation to "Existing mature trees" the Contractor's arborist with the Owner's Representative's review and approval, will define the final cut lines depending on the density and distribution of the root systems.
- F. The Contractor's arborist shall redirect root systems within the final cut line area and shall prune roots that extend beyond the final cut line with pruning tools. The Contractor and arborist shall minimize exposure of tree root systems during the exploration and pruning/construction activities over exposed roots, support edge of excavation and mulch to a depth approved by the Owner's Representative. The Contractor shall saturate burlap and mulch with water and maintain the burlap in a damp condition during daylight hours as to not allow roots to dry out. If tree roots will be exposed for a period of time longer than 1 week, the contractor shall install 2" depth of wood chip mulch.
- G. Once final cuts are completed by the Contractor's arborist with pruning tools, no mechanical excavation shall be allowed beyond the final cut line around the existing tree to remain.

3.7 GENERAL HORTICULTURAL TREE AND ROOT RELATIONSHIPS

- A. The majority of a tree's roots are located in the upper few inches of topsoil. For this reason, trees are vulnerable to immediate and long-term damage. Immediate damage to roots is caused by grading, use of vehicles and tools, and excess pedestrian traffic above the roots. Long-term damage is caused by the compaction of the soil above the roots by use of vehicles, storage of materials, and excess pedestrian traffic.
- B. Protection of a tree therefore includes the protection of the roots of the tree as well as its trunk, branches, and leaves. Roots are best protected by fencing off as large an area as possible around each tree, so that no driving, parking, walking, or storage of materials takes place where it may cause damage.
- C. The roots of a tree often extend far into the surrounding landscape, including areas well beyond the outer perimeter of the tree's canopy / drip line. For this reason, operations should be confined to the smallest possible area.
- D. As a practical minimum, however, every effort shall be made to protect the area beneath the canopy of the tree, also known as the area inside the "drip line." This area is sometimes referred to as the "root zone."
- E. Soil is most vulnerable to compaction, and roots to damage, when the soil is wet.

3.8 ROOT PROTECTION

- A. Roots that cannot be avoided during construction for all other trees to remain shall be carefully and cleanly cut. Only hand methods for grubbing roots will be accepted inside drip lines of

trees to be left standing. All pruning of any roots greater than 2" must be completed under the supervision of the City Arborist. Root pruning shall include application of root treatment or fertilizer as required. In order to minimize impacts to roots, Contractor shall uncover roots with air spade for all Special Mature Trees as identified under Section 3.8 of this specification. Additionally, the City Arborist may determine that certain significant roots of trees under 20" in diameter may also require the use of an air spade.

- B. Trucks and heavy equipment shall not pass over or park on roots of public shade trees; nor shall construction materials, debris, or excavated material be stored within drip line of trees or within tree pits. For occasional or one time access over roots, ½-inch plywood overlapped may be used. Permeable materials such as gravel or wood chips shall be placed over root systems of trees which are not covered by hardscape and over which trucks and heavy equipment must travel during construction operations, when such travel is unavoidable, to prevent soil compaction and root damage. Material shall be replaced as needed. Contractor must have prior approval for access from the Owner's Representative or City Arborist.
- C. During sidewalk construction adjacent to trees, suitable soil shall be maintained within tree wells. Moist soil or mulch shall also be maintained around surface roots outside of tree wells which may become exposed during construction. Such covering shall be placed as soon as possible after roots are exposed. If roots are going to be exposed for more than one hour, cover roots with damp burlap. Burlap shall be kept moist until most soil and mulch can be used for permanent cover.
- D. Tunneling shall be the preferred method of excavation adjacent to tree roots to avoid root pruning. If root pruning is unavoidable, a certified arborist shall be onsite to execute or oversee the operation with sufficiently sharpened hand tools and in such a fashion as to have minimum negative impact on tree health and safety.

3.9 EXCAVATION WITHIN DRIP LINE

- A. Where excavation for new construction is required within drip line of trees, tie branches out of the way, hand clear and excavate to minimize damage to root systems and place wood chips to a depth of six inches (6") on the ground to protect the root systems.
- B. Use narrow-tine spading forks and comb soil to expose roots. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits to bend and relocate them without breaking. No roots greater than two (2) inches in diameter shall be cut from trees to remain without prior approval of the Owner's Representative or City Arborist. Provide protection for roots over one inch (1") diameter cut during construction operations. Prune roots that are either cut or broken with a smooth, clean cut.

3.10 ROOT PRUNING

- A. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of structures. Cut roots with sharp pruning instruments; do not break or chop; cutting of roots with machinery is expressly prohibited. When roots that must be cut are encountered, work shall cease until roots have been properly cut.

3.11 ROOT SYSTEM EXPOSURE AND SUPPORT

- A. Provide saturated burlap or temporary earth to cover tree roots exposed by construction. Do not allow exposed roots to dry out before placing permanent backfill. Water and maintain roots

in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.12 PRUNING SAFETY STANDARDS

- A. Tree pruning and airspading shall be performed only by certified arborists or arborist trainees who, through related training or on-the-job experience, or both, are familiar with the practices and hazards of arboriculture and the equipment used in such operations.
- B. The Contractor's certified arborist must be present at all times while tree pruning is performed.
- C. Tree pruning operations shall comply with the American National Standard for Tree Care Operations—Safety Requirements (ANSI Z133.1), as approved by the American National Standards Institute, and published by the National Arborists Association. Operations shall also comply with applicable Occupational Health and Safety Administration (OSHA) standards.

3.13 PRUNING OBJECTIVES

- A. The pruning operation shall focus on the following types of pruning:
 - 1. **Cleaning.** Cleaning shall consist of selective pruning to remove one or more of the following parts—dead, diseased, and/or broken branches. All deadwood that is two (2) inches or greater in diameter shall be removed. Branches with splits, large cavities or any defect that may result in failure shall be reduced, or removed to the trunk if reduction is not feasible.
 - 2. **Thinning.** Thinning shall consist of selective pruning to reduce density of live branches. Thinning shall result in an even distribution of branches on individual limbs and throughout the crown.
 - 3. **Raising.** Raising shall consist of selective pruning to provide vertical clearance. The intent of crown raising for this project will be the removal of all branches extending lower than fourteen (14) feet above a public roadway and eight (8) feet above a public sidewalk. This includes trees endangered by traffic re-routing as the result of construction operations, as well as trees over existing roadways and sidewalks which do not presently meet these height requirements. However, the level of pruning of each tree will be determined at the site walk with the Contractor, Contractor's arborist, Owner's Representative and City Arborist. Additionally, any cuts to lateral branches over 4" as well as any questionable cuts will require the approval of the City Arborist.
 - 4. **Reducing.** Reduction shall consist of selective pruning to decrease height and/or spread. Consideration shall be given to the ability of a tree species to tolerate this type of pruning. All branches obstructing park signs, street signs, traffic signs, traffic lights, and park or street lighting shall be removed. Branches shall be pruned away from all houses and buildings a minimum of five (5) feet, or more if appropriate to the tree shape and structure.
 - 5. **Specialty (Young) Trees.** For young yet established trees, branches that are rubbing or poorly attached shall be removed. A central leader or leaders as appropriate to the species should be developed. A strong, properly spaced scaffold branch structure should be selected. For newly planted trees, pruning shall be limited to cleaning.

- a. During the First Three Years After Planting: A central leader or leaders (as most appropriate for the species and specimen) shall be developed by removing competing leaders and removing vigorously growing branches that compete with the selected leader(s). A strong scaffold branch structure shall be developed by selecting the primary scaffold branches. To improve the scaffold structure, branches that are crossing, have included bark or interfere with the scaffold branches shall be removed. Scaffold branches shall be properly spaced. For deciduous shade trees that will reach or exceed 40 ft (12.2 m) in height at maturity, the recommended spacing is approximately 18 in (457.2 mm). For smaller species, 6 to 8 in. (152.4 mm to 203.2 mm) would be adequate.
- b. Between Four and Six Years After Planting: The development of a good, structurally sound scaffold branch system should be continued by selective thinning of or on branches and removing dead, interfering, split and broken branches. Large-growing branches with narrow angles of attachment shall be removed from the trunk and canopy. The crown shall be raised for pedestrian clearance and vehicular clearance.

3.14 PRUNING PRACTICES

- A. The Contractor's certified arborist shall visually inspect each tree before commencing work.
- B. If a condition is observed requiring attention, the condition should be reported to the City within 24 hours. Such conditions may include structural weakness, rot or decay that cannot be corrected by cleaning, and dead trees.
- C. Equipment and work practices that damage living tissue and bark beyond the scope of work shall be avoided. Climbing spurs shall not be used when climbing and pruning trees. Spurs may be used to reach an injured climber or when removing a tree.
- D. Pruning tools (e.g. chain saws, pole saws, hand saws, pole pruners, etc.) shall be sharp and regularly sharpened and maintained throughout the Contract Term.
- E. Not more than 25% of the foliage of an individual tree should be removed within an annual growing season. The percentage and distribution of foliage to be removed shall vary according to the tree species, age, health and site, in accordance with the types of pruning identified above.
- F. Not more than 25% of the foliage of a branch or limb shall be removed when it is cut back to a lateral. The lateral shall be large enough to assume apical dominance.
- G. Heading shall be permitted only by the expressed permission of the City, when needed to reach a defined objective.
- H. Topping and lion tailing shall be considered unacceptable pruning practices.
- I. All pruning cuts shall be made in accordance with the American National Standard for Tree Care Operations—Standard Practices (ANSI A300 Part 1), as approved by the American National Standards Institute, and published by the National Arborists Association (revised 2001). All terminology included in these Technical Specifications shall be defined by ANSI A300 Part 1.

- J. When tracing wounds, only loose, damaged tissue should be removed. No other wound treatments shall be used.
- K. On mature trees the maximum diameter of any undesirable branch (dead, broken, rubbing, structurally unsound) that may be left shall not exceed 2 in. (50.8 mm).
- L. Pruning cuts shall be clean and smooth with the bark at the edge of the cut firmly attached to the wood.
- M. Large or heavy branches that cannot be thrown clear shall be lowered on ropes to prevent injury to the tree and other property.
- N. Rope injury to trees from leading out heavy wood shall be avoided by using a cambium guard or installing a false crotch.

3.15 UTILITY CONSTRUCTION NEAR TREES

- A. Route utilities away from existing trees. Review re-routing with Owner's Representative. Do not proceed without written direction. Minimize the cutting of tree roots, and when cutting is unavoidable, cut cleanly with a power saw and not an excavating machine.

3.16 ACTIVITIES PROHIBITED WITHIN DRIP LINE

- A. Do not store and stockpile construction materials and/or excavated materials, park vehicles, drive vehicles, remove soils, and stockpile soils within the drip line of trees, including trees located on adjacent properties which overhang the site unless otherwise indicated in Contract Drawings. Excavation within these areas shall be subject to special care as described below in "Excavation within Drip line".

3.17 EQUIPMENT

- A. The following equipment and vehicles shall be available on-site for use. All gas-powered equipment and vehicles must be five years old or less and in good condition as determined by the Owner's Representative.
 - 1. One (1) aerial lift trucks with an articulating boom that have a working height of not less than sixty (60) feet with Contractor's name painted on each side.
 - 2. One (1) wood chippers with a capacity for 16" diameter limbs.
 - 3. All relevant traffic control devices as prescribed by the Manual of Uniform Traffic Control Devices (MUTCD) of the U.S. Department of Transportation.

3.18 PLANT HEALTH CARE PROGRAM

- A. Prior to mobilization and construction operations, Contractor's arborist to document and submit a strategy for maintaining the health of existing trees within the project limits including strategies for watering and fertilizing as outlined below.
- B. Watering: Water trees and other vegetation to remain within limits of contract work as required to maintain their health during course of construction operations.

- C. Drainage: Do not permit water to stand around the base of plants within the drip line during construction operations except during that period of inundating flooding which would, in its natural course, cover the base of trees. Provide temporary drainage where required to avoid ponding during construction operations.
- D. Fertilizing: After pruning operations are completed, fertilize trees to increase vigor with a complete, slow release nitrogen, phosphorus, potassium (1:1:1 or 2:1:1) liquid injected fertilizer. Where liquid injected fertilizer is not practical, and when approved by Owner's Representative, drill holes 6" to 10" deep and place granular fertilizer at frequent spacing.

3.19 DAMAGE DUE TO CONSTRUCTION OPERATIONS

- A. Contractor shall be responsible for the health of the existing trees in the immediate vicinity of construction. Trees damaged by construction operations which, as determined by the Owner's Representative, can be remedied by corrective pruning measures shall be addressed immediately.
- B. Owner's Representative shall engage an independent qualified Arborist to inspect the damaged trees and to make a determination on damage, sustainability, and remediation procedures.
- C. The Contractor shall strictly adhere to the independent Arborist's recommendations.
- D. Broken limbs shall be pruned according to industry standards.
- E. Wounds shall not be painted.
- F. The total cost of tree repair, including the cost of the independent Arborist, shall be borne by the Contractor.

3.20 TREE REPLACEMENT DUE TO DAMAGE

- A. If the independent Arborist determines that the damaged tree cannot be repaired and restored to full-growth status, the Contractor shall replace the damaged tree(s) and pay liquidated damages as noted below.
- B. The size of the replacement tree shall equal ½" caliper for every 1" caliper inch of the damaged tree (size of the damaged tree shall be measured, the new tree shall be based on nursery measurements). The species of the replacement tree shall be determined by the Owner's Representative and the City.
- C. In addition to providing a new tree replacement, Contractor shall pay City \$250.00 for every caliper inch of the damaged tree (the size of the damaged tree shall be as shown on the Drawings).
- D. An example of the conditions stated above: A 20" caliper tree was damaged and determined to need replacement. To remedy this situation, the Contractor would purchase and install a 10" caliper tree and pay the Owner \$5,000. Type of tree and installation specifications to be determined and signed off by the City Arborist.
- E. The total cost of tree replacement, including the cost of the tree and stump removal and the independent Arborist, shall be borne by the Contractor.

3.21 TEMPORARY REMOVAL OF SHRUBS AND TOPSOIL

- A. Topsoil, shrubs, and vegetation to be temporarily removed shall be carefully removed from overall areas to be excavated, and over all other areas to be disturbed as a result of the Contractor's operations in the performance of the Contract work. The topsoil shall be transported and deposited in storage piles convenient to the areas which are subsequently to receive the application of topsoil, separate from other excavated materials, and in approved locations. The topsoil shall be stockpiled free of roots, stones and other undesirable material. The Contractor shall take all necessary precautions to prevent other excavated material or other objectionable material from becoming intermixed with the topsoil, either before or after the stripping and stockpiling operations. Shrubs and other vegetation shall be balled and burlaped with the root ball size equal to or greater than that recommended in American National Standards Institute (ANSI) Z60.1-2014 American Standard for Nursery Stock, and then transported and stored until they can be replaced after construction has been completed in that area. Move all balled and burlaped plants by the root ball; never pick up or move using the trunk or stem as a handle. All The shrubs and vegetation must be watered regularly and maintained to remain healthy while being temporarily stored. Any shrubs and vegetation that do not remain healthy during storage shall be replaced by the Contractor at no additional cost to the City.

3.22 DISPOSAL OF WASTE MATERIALS

- A. Remove waste materials and unsuitable topsoil from project area and dispose of off site in a legal manner. Waste materials shall include but not be limited to timber, brush, refuse, stumps, roots, vines, debris and other objectionable matter. Removal includes raking and sweeping after completion of clearing and pruning operations.
- B. Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree, or to surrounding people and property. Where necessary, ropes or other equipment shall be used to lower large branches to the ground. To avoid injury when lowering heavy branches, use a cambium guard or install a false crotch.
- C. All severed limbs shall be chipped, hauled away from the site, and disposed of in a legal manner. All wood waste, sawdust, leaves, and associated organic debris shall be collected from both public ways and adjacent private property, hauled away from the site, and disposed of in a legal manner.
- D. Site cleanup shall follow as closely as possible to the pruning operation.

3.23 POST-CONSTRUCTION CLEANUP

- A. After construction is complete, but prior to preparation and seeding of lawn area and planting, remove and properly dispose of the following off site: wood chips, temporary fencing, branch protection, tree boxes and trunk protection, and other materials.

END OF SECTION

SECTION 03301

CAST-IN-PLACE CONCRETE FACING

03301.1

**CAST-IN-PLACE CONCRETE
FACING RETAINING WALL**

LUMP SUM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The work described in this section shall consist of constructing new cast-in-place facing in front of the existing soldier pile retaining wall and timber lagging. Work shall include furnishing all materials and labor required for constructing cast-in-place concrete facing for the existing soldier pile wall. The work shall include all aspects of facing construction.

1.2 QUALITY ASSURANCE

- A. The contractor is responsible for implementing a quality control program. All workers shall be fully qualified to perform the work.

1.3 SUBMITTALS

- A. The following submittals shall be provided by the contractor for the engineer's review and approval. The contractor will not be allowed to begin wall construction until all submittal requirements are satisfied and found acceptable to the engineer. Changes or deviations from the approved submittals must be re-submitted for approval. No adjustments in contract time will be allowed due to incomplete submittals. At least 15 days prior to initiating the work, the contractor shall submit to the engineer:
1. Shop drawings illustrating reinforcing layout and schedules.
 2. Concrete mix design including: brand and type of Portland cement to be used; source, gradation, and quality of aggregates as specified herein; mix proportions by weight; proposed admixtures, and their manufacturer, dosage, and technical literature; and compressive strength test results from the manufacturer's records no older than 6 months verifying the 28-day compressive strength.
 3. Certified mill tests for all reinforcing steel from each heat specifying the minimum ultimate strength, yield strength, elongation, and composition.
 4. Certifications of compliance for bearing plates, nuts, and curing compounds.
 5. Detailed cold-weather protection methods.

PART 2 - MATERIALS

2.1 GENERAL

- A. All materials for reinforced concrete facing shall conform to the following requirements.

CEMENT	- ASTM C150 / AASHTO M85, TYPE I.
FINE AGGREGATE	- ASTM C33 / AASHTO M6.
COARSE AGGREGATE	- AASHTO M-80, CLASS B FOR QUALITY.
WATER	- Potable, clean, and free from substances deleterious to concrete and steel, or that would cause staining. Chemical admixtures accelerator fluid type, applied at nozzle, meeting the requirements herein.
FLY ASH	- ASTM C618 / AASHTO M295, TYPE F OR G, cement replacement up to 35 percent by weight of cement. Silica fume ASTM C1240, 90 percent minimum silicon dioxide solids content, not to exceed 12 percent by weight of cement.
WELDED WIRE FABRIC	- ASTM A185 / AASHTO M55.
REINFORCING BARS DEFORMED.	- ASTM A615 / AASHTO M31, GRADE 60,
CURING COMPOUNDS	- AASHTO M148, TYPE ID OR TYPE 2.
HEADED STUDS	- ASTM A307 OR APPROVED EQUAL.
WELD	- E70XX AND IN ACCORDANCE WITH AWS D1.1-88.

2.2 CONCRETE MIX DESIGN

A. Concrete shall conform to the following mix design requirements:

1. MINIMUM COMPRESSIVE STRENGTH – 4,000 PSI (28 DAY)
2. MAXIMUM AGGREGATE SIZE – 3/8 INCH
3. MINIMUM SLUMP – 3 INCHES
4. AIR ENTRAINMENT – 5 PERCENT ±1½ PERCENT BY VOLUME.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. The contractor shall remove all loose materials, including loose timbers or timbers protruding into the cast-in-place section, from all surfaces by methods acceptable to the owner's representative. The removal shall be accomplished in such a manner as not to loosen, crack, or shatter the surfaces to receive the cast-in-place concrete. Any surface material that, in the opinion of the owner's representative, is so loosened or damaged shall be removed to sufficient depth to provide a base that is suitable to receive the cast-in-place concrete. Material that loosens as the cast-in-place concrete is applied shall be removed. Cast-in-place concrete shall not be placed on frozen surfaces.

3.2 CONNECTION OF HEADED STUDS

- A. Headed studs shall be end welded to soldier piles with automatically timed stud welding equipment connect to a suitable power source.
- B. Prior to welding, the soldier piles should be cleared of rust, rust pits, scale, oil, or other deleterious matter at the point of welding
- C. Studs shall be free from any rust, rust pits, scale, oil, or other deleterious matter which would adversely affect the welding operation
- D. Studs shall not be welded when the welding surface is wet or exposed to rain or snow.

3.3 PLACEMENT

- A. The concrete shall not be dropped more than 3 feet or dragged more than 10 feet in the forms. Points of deposit shall be spaced not more than 20 feet apart nor more than 10 feet from the ends of the forms.
- B. Each layer shall be thoroughly consolidated by vibration. The face forms shall be carefully spaded, if possible, to bring dense mortar to the face, and produce a good finish.
- C. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

3.4 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

3.5 CURING TIME

- A. Formwork should not be stripped until the concrete has reached 75 percent of the minimum compressive strength as determined by concrete cylinder breaks.

3.6 FINISH

- A. Finish shall be a smooth form finish.
- B. Within 48 hours after the forms have been removed and form ties cut back from the face of the concrete, all fins, projections and irregularities shall be carefully removed and all

voids and cavities shall be carefully and completely filled with a stiff mortar of the same composition and air-entrainment as the mortar in the original concrete mix. The same brand and color of cement, and the same kind and color of aggregate as was used in the original concrete mix shall be used in this mortar. The mortar for filling shall have been mixed and let set for 30 minutes and then remixed before placing in the work. The surface film of all such pointed surfaces shall be carefully removed before setting of the mortar occurs.

- C. If the engineer determines these surfaces as prepared above do not present a uniformly smooth, clean surface of even texture and appearance, the surface shall be treated or rubbed to obtain a satisfactory finish.

PART 4 – MEASUREMENT AND PAYMENT

ITEM 03301.1 CAST-IN-PLACE CONCRETE FACING RETAINING WALL

BASIS OF PAYMENT/INCLUSIONS:

Under the Lump Sum bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement, existing wall preparation, installation, and finishing of a CAST-IN-PLACE Concrete Facing Retaining Wall, or as directed by the Owner or Engineer. This work shall include furnishing, installing, and/or performing the following: preparation of the existing retaining wall; removal of broken timber lagging; protection of existing exposed roots and trees; welding studs to existing piles; installation of structural reinforcement; installation of internal drainage board and weep holes; installation of concrete wall; furnishing smooth concrete finish.

METHOD OF MEASUREMENT:

Measurement for payment for Cast-In-Place Facing Retaining Wall will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.

SPECIAL NOTES ON EXCLUSIONS:

The following item(s) are not included for payment under this item: protection of the existing chain link fence installed above the existing retaining wall. The contractor shall be responsible for any damage to the existing chain link fence as a result of the Work, and the contractor shall pay for and repair any damages to the existing chain link fence.

SECTION 03302
SHOTCRETE FACING

ITEM 03302.1 **SHOTCRETE FACING RETAINING WALL** **LUMP**
SUM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The work described in this section shall consist of constructing new shotcrete facing in front of the existing soldier pile retaining wall and timber lagging. Work shall include furnishing all materials and labor required for constructing shotcrete facing for the existing soldier pile wall. The work shall include all aspects of facing construction.
- B. Shotcrete shall comply with the requirements of ACI 506.2-94, "specification for shotcrete", except as specified otherwise herein.
- C. The owner's representative / shotcrete inspector shall be qualified to inspect reinforcement and shotcrete placement.

1.2 QUALITY ASSURANCE

- A. The contractor is responsible for implementing a quality assurance program. All workers, including foreman, nozzle men, finishers and delivery equipment operators shall be fully qualified to perform the work. All nozzle men shall have at least one year of cumulative experience in the past 3 years in similar shotcrete application work and shall demonstrate ability to satisfactorily place the material in accordance with the recommendations of ACI 506.3r "guide to certification to shotcrete nozzle men" and any local code requirements.
- B. Qualification of nozzle men shall be based on a visual inspection of the shotcrete density and void structure and on achieving the specified 3-day and 28- day compressive strength requirements determined from the average test results from three cores extracted from each pre-construction and production test panel. Pre-construction and production test panels, core extraction and compressive strength testing shall be conducted in accordance with ACI 506.2-94 unless specified otherwise herein.

- C. The contractor shall notify the owner's representative not less than 2 days prior to the shooting of a qualification panel. Shotcrete mix and equipment used to make qualification test panels shall be the same as those to be used for the wall facing placement.
- D. Each finisher shall have at least one year of cumulative experience in the past 3 years in similar structural shotcrete application work.

1.3 SUBMITTALS

- A. At least 15 days prior to initiating the work, the contractor shall submit to the engineer for approval:
 - 1. Written documentation listing at least 5 similar shotcrete walls successfully completed within the past 3 years, including photographs of the project as well as name, address, and phone number of the owner's representative.
 - 2. Written documentation of the nozzlemen and finishers qualifications and proposed method of shotcrete placement.
 - 3. Shop drawings illustrating reinforcing layout and schedules.
 - 4. Shotcrete mix design including: brand and type of portland cement to be used: source, gradation, and quality of aggregates as specified herein; mix proportions by weight; proposed admixtures, and their manufacturer, dosage, and technical literature; and compressive strength test results from the manufactures records no older than 6 months verifying the 28-day compressive strength.
 - 5. Certified mill tests for all reinforcing steel from each heat specifying the minimum ultimate strength, yield strength, elongation, and composition.
 - 6. Certifications of compliance for curing compounds.
 - 7. Specification and data for review on equipment proposed for the project including shotcreting and compressed air equipment, proposed access arrangements, and capacities.
 - 8. Methods of controlling the location of the finish face and determining shotcrete thickness.

PART 2 - MATERIALS

2.1 GENERAL

- A. All materials for shotcrete shall conform to the following requirements.
 - Cement - ASTM C150 / AASHTO M85, Type I.
 - Fine Aggregate - ASTM C33 / AASHTO M6.

Coarse Aggregate	- AASHTO M-80, Class B For Quality.
Water	- Potable, Clean, And Free From Substances Deleterious To Concrete And Steel, Or That Would Cause Staining. Chemical Admixtures Accelerator Fluid Type, Applied At Nozzle, Meeting The Requirements Herein.
Water-Reducer	- ASTM C494 / AASHTO M194, Type And Super-A, D, F,G. Plasticizer Air-Entraining ASTM C260 / AASHTO M154. Agent Mineral Admixtures:
Fly ash	- ASTM C618 / AASHTO M295, Type F Or G, Cement Replacement Up To 35 Percent By Weight Of Cement. Silica Fume ASTM C1240, 90 Percent Minimum Silicon Dioxide Solids Content, Not To Exceed 12 Percent By Weight Of Cement.
Welded wire fabric	- ASTM A185 / AASHTO M55.
Reinforcing Bars	- ASTM A615 / AASHTO M31, Grade 60, Deformed.
Curing Compounds	- AASHTO M148, Type 1d Or Type 2.
Film Protection	- AASHTO M171 Or Polyethylene Film.

2.2 ADMIXTURES

- A. Shotcrete admixtures shall not be used unless approved by the engineer. Admixtures used to entrain air, to reduce water-cement ratio, to retard or accelerate setting time, or to accelerate the development of strength shall be thoroughly mixed into the shotcrete at the rate specified by the manufacturer unless specified otherwise. Accelerating additives shall be compatible with the cement used, be non-corrosive to steel and shall not promote other detrimental effects such as cracking or excessive shrinkage. The maximum allowable chloride ion content of all ingredients shall not exceed 0.10 percent when tested per AASHTO T260.

2.3 MATERIALS HANDLING AND STORAGE

- A. Materials shall be delivered stored and handled to prevent contamination, segregation, corrosion or damage. Liquid admixtures shall be stored to prevent evaporation and freezing.

2.4 SHOTCRETE MIX DESIGN

- A. Aggregates for shotcrete shall meet the strength and durability requirement of AASHTO M80 and shall meet the following gradation requirements:

Percent passing		percent passing	
Sieve size	by weight	sieve size	by weight
1/2 inch	100	no. 16	35-55
3/8 inch	90-100	no. 30	20-35
No. 4	70-85	no. 50	8-20
No. 8	50-70	no. 100	2-10

- B. Cement content shall be at least 600 pounds per cubic yard. The water/cement ratio shall not be greater than 0.45. For wet-mix shotcrete exposed to freezing and thawing, the air content at the truck shall be between 6 to 10 percent when tested in accordance with ASTM C231 / AASHTO T152. The mix shall be proportioned to be pumpable with the concrete pump furnished for the work. Admixtures shall be used in accordance with the manufacturer's recommendations.
- C. Shotcrete shall be proportioned to produce a mix capable of attaining a compressive strength of 2000 psi in 3 days and 4000 psi in 28 days. The average compressive strength of each set of three cores extracted from test panels or wall face shall be equal to or exceed 85 percent, with no individual core less than 75 percent of the specified compressive strength in accordance with ACI 506.2. The boiled absorption of shotcrete, when tested in accordance with ASTM C642 at 7 days, shall be less than 8.0 percent.

PART 3 - EXECUTION

3.1 SHOTCRETE MIXING AND BATCHING

- A. Aggregate and cement may be batched by weight or by volume in accordance with the requirements of ASTM C94 / AASHTO M157. Mixing equipment shall be capable of thoroughly mixing the materials in sufficient quantity to maintain placing continuity. Ready-mix shotcrete shall be delivered and placed within 90 minutes of being batched unless approved otherwise by the engineer.

3.2 SHOTCRETE TEST PANELS

3.2.1 GENERAL

- A. Pre-construction and production shotcrete test panels are required (unless waived by the engineer). Pre-construction and production test panels shall not be disturbed or moved within the first 24 hours after shooting. Test panels shall be field cured under conditions similar to those anticipated for the work. Shotcreting

and coring of test panels shall be performed by qualified personnel in the presence of the owner's representative

- B. Unless waived by the engineer, the contractor shall provide equipment, materials, and personnel as necessary to obtain shotcrete cores for testing including construction of test panel boxes, field curing requirements and coring. Compressive strength testing will be performed by the owner. Shotcrete will be accepted based on the 28-day strength. The frequency specified for test panels is approximate. A greater or lesser number of panels may be made as required by the engineer.

3.2.2 PRECONSTRUCTION TEST PANELS

- A. Each shotcrete application crew shall furnish at least two preconstruction test panels for each proposed mixture being considered and for each shooting position encountered on the job. Preconstruction test panels shall be made by each application crew using the equipment, materials, mixture proportions, and procedures proposed for the job prior to the commencement of work.
- B. Preconstruction test panels for plan shotcrete shall be 30 in. X 30 in. In accordance with ACI 506.2-94, with the following exceptions:
 1. One preconstruction test panel shall be of the maximum shotcrete thickness shown on the plans and shall include the maximum anticipated reinforcing congestion. Cores extracted from the test panel shall demonstrate encapsulation of the reinforcement in accordance with aci 506.2 equal to core grade 2 or better.
 2. One preconstruction test panel shall be at least 6 inches thick and constructed without reinforcement and used for absorption and compressive strength testing
 3. The corners of production and preconstruction test panels shall be chamfered outward at 45 degrees over the full thickness of the panel.

3.2.3 PRODUCTION TEST PANELS

- A. The contractor shall furnish at least one production test panel, or, in lieu of production test panels, six 3-inch diameter cores from the shotcrete face during the first application of shotcrete and henceforth for every fifth application of shotcrete, or every 5000 sq. Ft., or every 50 cu. Yds., whichever is less. The production test panels shall be constructed simultaneously with the shotcrete facing installation at times designated by the owner's representative. The production test panels shall have minimum dimensions of 18" x 18" x 6".

3.2.4 CORE TESTING

- A. At least nine core samples will be cut from each preconstruction and production test panel for compressive strength. Cores shall be at least 3-in. Diameter and

shall have a minimum length to width ratio of one. When the length of the core is less than twice the diameter, apply the correction factors given in ASTM C42 to obtain the compressive strength of individual cores. Three cores shall be tested at 3-days and three cores shall be tested at 28-days for compressive strength.

3.3 SHOTCRETE ALIGNMENT CONTROL

- A. Alignment wires and/or thickness control pins shall be provided as necessary to establish and maintain the minimum shotcrete thickness shown on the plans. The maximum distance between wires and/or thickness control pins on any surface shall be equal to the vertical headed stud spacing. The contractor shall ensure that alignment wires are tight, true to line, and placed to allow further tightening.

3.4 SURFACE PREPARATION

- A. The contractor shall remove all loose materials, including loose timbers or timbers protruding into the shotcrete section, from all receiving surfaces by methods acceptable to the owner's representative. The removal shall be accomplished in such a manner as not to loosen, crack, or shatter the surfaces to receive the shotcrete. Any surface material that, in the opinion of the owner's representative, is so loosened or damaged shall be removed to sufficient depth to provide a base that is suitable to receive the shotcrete. Material that loosens as the shotcrete is applied shall be removed. Shotcrete shall not be placed on frozen surfaces.

3.5 DELIVERY AND APPLICATION

- A. A clean, dry, oil-free supply of compressed air sufficient for maintaining adequate nozzle velocity for all parts of the work and for simultaneous operation of a blow pipe for cleaning away rebound shall be maintained at all times. The equipment shall be capable of delivering the premixed material accurately, uniformly, and continuously through the delivery hose.
- B. The shotcrete shall be applied from the lower part of the work area upwards to prevent accumulation of rebound on uncovered surfaces. Thickness, methods of support, air pressure, and rate of placement of shotcrete shall be controlled to prevent sagging or sloughing of freshly applied shotcrete. Rebound shall not be worked back into the placement nor shall the rebound be salvaged. Rebound that does not fall clear of the working area shall be removed. The nozzle shall be held at a distance and at an angle approximately perpendicular to the working face so that rebound will be minimal and compaction will be maximized. The nozzle shall be rotated steadily in a small circular pattern.

3.6 VISUAL OBSERVATION

- A. A clearly defined pattern of continuous horizontal or vertical ridges or depressions at the reinforcing elements after they are covered will be considered indication of insufficient cover of reinforcement or poor application and probable

void. In this case, the work shall be immediately suspended and the work carefully inspected by the owner's representative. The contractor shall implement and complete corrective measures prior to resuming the shotcrete operations.

3.7 DEFECTIVE SHOTCRETE

- A. Surface defects shall be repaired as soon as possible after initial placement of shotcrete. All shotcrete that lacks uniformity, exhibits segregation, sagging, honeycombing, or lamination, or contains any voids or sand pockets shall be removed and replaced with fresh shotcrete by the contractor to the satisfaction of the owner's representative.

3.8 FINISH

- A. Shotcrete finish shall be a smooth screeded finish, unless shown otherwise on the plans.

3.9 ATTACHMENT OF THE CONNECTION HARDWARE

- A. For shotcrete facings, the headed stud shall be located within the wall such that the proper shotcrete cover is provided as shown on the plans.

3.10 CURING

3.10.1 GENERAL

- A. Permanent shotcrete shall be protected from loss of moisture for at least 7 days after placement. When shotcrete is being protected from low temperatures, curing shall be terminated no sooner than one day after the removal of low temperature protection. Curing of shotcrete shall be by methods that will keep shotcrete surfaces adequately wet and protected during the specified period. Curing shall commence within one hour of shotcrete application. When the ambient temperature exceeds 80 degrees fahrenheit, the contractor shall plan the work such that curing can commence immediately after finishing. Curing shall be completed in accordance with the following requirements.

3.10.2 WATER CURING

- A. The rate of water application shall be regulated to provide complete surface coverage with a minimum of runoff.

3.10.3 MEMBRANE CURING

- A. Curing compounds shall not be used on any surfaces against which additional shotcrete or other cementitious finishing materials are to be bonded unless the surface is thoroughly sandblasted immediately prior to shotcrete placement in a manner acceptable to the owner's representative. Membrane curing compounds shall be spray applied as quickly as practical after initial shotcrete set at a coverage of not less than 40 sq. Ft. Per gallon.

3.10.4 FILM CURING

- A. Film curing with polyethylene sheeting may be used to supplement water curing on shotcrete that will be covered later with additional shotcrete or concrete. The sheeting shall completely cover all surfaces, and have edges overlapped for proper sealing and anchorages.

3.11 WEATHER LIMITATIONS

- A. Shotcrete shall not be placed in cold weather unless adequately protected when the ambient temperature is below 40° f and falling and/or when the shotcrete is likely to be subjected to freezing temperatures before reaching a minimum strength of 750 psi. Cold weather protection shall be maintained until the strength of the in-place shotcrete is greater than 750 psi. Cold weather protection shall include heating under tents, blankets or other means acceptable to the owner's representative. The temperature of the shotcrete, when deposited, shall be not less than 50° f nor more than 80° f. The air in contact with shotcrete surfaces shall be maintained at temperatures above 32° f for a minimum of 7 days.
- B. Shotcrete application shall be suspended during high winds and heavy rains when in the opinion of the owner's representative the quality of the application is not acceptable. Newly placed shotcrete exposed to rain that washes out cement or otherwise makes the shotcrete unacceptable to the owner's representative shall be removed and replaced. The contractor shall provide adequately secured polyethylene sheeting or equivalent when adverse exposure to weather is anticipated.

3.12 TOLERANCES

The tolerances for shotcrete facings shall be as follows:

THICKNESS OF SHOTCRETE: - 0.5"

HORIZONTAL LOCATION OF REINFORCEMENT: 1"

REINFORCING LAP LENGTH: - 1"

REINFORCEMENT SPACING : 1"

PART 4 – MEASUREMENT AND PAYMENT

ITEM 03302.1 SHOTCRETE FACING RETAINING WALL

BASIS OF PAYMENT/INCLUSIONS:

Under the Lump Sum price bid for this item, the contractor shall furnish all labor, materials, tools, equipment, and incidentals required for the complete procurement, existing wall preparation,

installation and finishing of a shotcrete facing retaining wall, or as directed by the owner or engineer. This work shall include furnishing, installing, and/or performing the following: preparation of the existing retaining wall; removal of broken timber lagging; protection of existing exposed roots and trees; welding studs to existing piles; installation of structural reinforcement; installation of internal drainage board and weep holes; installation of shotcrete concrete wall; furnishing smooth concrete finish.

METHOD OF MEASUREMENT:

Measurement for payment for shotcrete facing retaining wall will be on a percent of the lump sum bid calculated by dividing the constructed portion to date by the contractual quantity as approved by the engineer.

SPECIAL NOTES ON EXCLUSIONS:

The following item(s) are not included for payment under this item: protection of the existing chain link fence installed above the existing retaining wall. The contractor shall be responsible for any damage to the existing chain link fence as a result of the work, and the contractor shall pay for and repair any damages to the existing chain link fence.

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 07160

BITUMINOUS DAMPPROOFING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Cold-applied, cut-back (asbestos-free) bituminous dampproofing applied to the following surfaces:
 - a. Apply dampproofing to exterior below grade surfaces of new concrete walls and slabs.
 - b. Exterior, below-grade surfaces of all new manholes and drain structures.
 - c. Exterior, below-grade surfaces of other concrete items specified.
- B. Bituminous dampproofing can be factory applied, providing the application meets coating manufacturer's requirements. Additional field coatings must be applied, as directed by Engineer, to repair any coating imperfections, and chipped or damaged areas.

1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS.
 - 1. Product Data: For each type of product indicated.
 - 2. For informational purposes only, submit recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.
 - 3. Material Certificates signed by manufacturers.

1.3 QUALITY CONTROL

- A. Provide in accordance with Section 01400 – QUALITY CONTROL and as specified.
- B. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

APPENDIX A
OIL AND HAZARDOUS MATERIALS FINDINGS, SOIL MANAGEMENT
RECOMMENDATIONS



MEMORANDUM

TO: Michael Cunningham, PE
Gus O'Leary, PE

FROM: Richard Quateman, LSP, CHMM

DATE : 03/23/2017

SUBJECT: Somerville Bike Path and Drainage Upgrades Project - Environmental Conditions (Thorndike Street)

Project No. 20171752.002A

CC: File

This memorandum summarizes soil conditions and recommendations for soil and groundwater management in the area of the proposed drainage and retaining wall improvements in the area of Thorndike Street in Somerville, Massachusetts. As of the date of this memorandum, the project consists of the following:

- Rehabilitation of an approximately 570-foot-long soldier pile and lagging retaining wall along the southern side of the Somerville Community Path, between Thorndike Street and the Cambridge City Line; and
- Construction of approximately 710 linear feet (LF) of new 12" PVC storm drain and up to nine (9) catch basin/manhole structures within the Community Path, Thorndike Street, and Howard Street, to connect to the existing 42"x52" rubble masonry storm drain in Howard Street.

Additional details regarding the Site and Project conditions may be found in the Kleinfelder March 2, 2017 geotechnical memo (Summary of Subsurface Conditions – Drain Connection in Thorndike St. – Bike Path Retaining Wall and Drainage Upgrades – Thorndike St to City Limits, Somerville, Massachusetts).

Data in support of this memorandum includes observations and analytical results from a soil boring and monitoring well installed by Kleinfelder, as well as information presented in publicly available reports associated with adjacent Massachusetts Contingency Plan (MCP) Sites.



Soil Observations & Analytical Results

Between January 30, 2016 and February 2, 2017, Kleinfelder observed advancement of one soil boring, designated B-1, near the intersection of Thorndike and Howard Streets in Somerville, MA, as shown on Figure 1. The boring log is included as Attachment A. New England Boring Contractors (NEBC) advanced the boring to a depth of 31 feet. The explorations took place between January 30 and February 2, 2017. NEBC obtained soil samples using a vacuum-truck and hand auger to a depth of 6 feet. Below 6-feet, the boring was advanced using drive and wash drilling techniques, and samples were collected using the Standard Penetration Test (SPT) method. A Kleinfelder environmental professional maintained logs of the boring and classified the soils in general accordance with the visual manual procedure described in ASTM D2488 during drilling operations. Descriptions of the soil strata encountered in the boring are included in the boring log presented in Attachment A. A monitoring well was installed to a depth of 29 feet upon completion of drilling.

Approximately three-inches (3") of asphalt overlying five-inches (5") of gravel road base were encountered at the surface. Underlying this road base was approximately nine-feet (9) of historic fill composed of silty sand and sandy silt with varying amounts of gravel. Pieces of brick and bituminous pavement were encountered throughout the fill layer. Cobbles of 6 to 8-inch-diameter were observed within the fill at a depth of about 3 feet. Underlying the fill material, natural soils consisting of sands (to 22.5' bgs) overlying clay was observed. Soil was screened using a photoionization detector (PID) using the jar headspace method for the detection of volatile organic compounds (VOCs). No elevated PID results (defined herein as exceeding 10 per million by volume (ppmv)) were detected in the screened soil. Groundwater was measured at a depth of 6.3' bgs on February 17, 2017.

Two composite soil samples, with a grab for volatile organic compound (VOC) analysis, were collected from boring B-1 at 0 – 9 feet bgs (fill) and 9 – 21 feet bgs (natural), representing the intervals anticipated to be encountered during construction activities. The samples were submitted to Con-Test Analytical of East Longmeadow, MA for analysis of disposal characterization parameters, including total petroleum hydrocarbons (TPH) by U.S. EPA Method 8015C; Massachusetts Contingency Plan (MCP) 14 metals; volatile organic compounds (VOCs) by U.S. EPA Method 8260C; semi-volatile organic compounds (SVOCs) by U.S. EPA Method 8270D; polychlorinated biphenyls by U.S. EPA Method 8082A, conductivity by Method 2510B, pH, flashpoint, and reactivity. Toxicity characteristic leaching procedure analysis was not performed, as no compounds were detected at concentrations above the RCRA "Rule of 20." Soil sample analytical results are tabulated on Table 1.



VOCs, and PCBs were not detected at or above laboratory reporting limits in either the fill or natural soil samples. The SVOC, pyrene, was detected in the fill sample; SVOCs were not detected in the natural soil sample. The metals arsenic, barium, beryllium, chromium, lead, mercury, nickel, vanadium, and/or zinc were detected at concentrations above laboratory reporting limits, but below natural background levels. TPH was detected at 66 mg/kg in the fill sample and at 15 mg/kg in the natural soil sample. No analytes were detected at or above applicable MCP RCS-1 Reportable Concentrations (RC).

Groundwater Analytical Results

Soil boring B-1 was completed as a groundwater monitoring well, designated MW-1. Well construction is detailed on the attached boring log. As no analyte was detected in soils at or above the soil RC, a groundwater sample was not collected. No evidence of odors was identified during well gauging.

Adjacent Documented Releases

A review of the Massachusetts Department of Environmental Protection (MassDEP) Searchable Sites Database did not indicate reported releases of Oil or Hazardous Materials (OHM) to the environment in the project area.

Discussion and Recommendations

Community Path Area

The Community Path area in which drainage improvements are to be conducted is the location of a former railroad right-of-way (ROW). Rail ROW soils are typically impacted by OHM related to historic railroad operations, including polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons, lead, arsenic (from pesticides/herbicides) and other contaminants. Soils excavated within the community path should be reused on-site to the maximum extent feasible. Surplus soil will be generated from new storm drain installation. They should be stockpiled in a secure location and subsequently sampled for the parameters indicated above to determine the appropriate off-site disposal location.

Soil management requirements under state law within former RR corridors turned into bike paths (referred to as "rail trails" under the MGLs) include a municipal exemption for instances where the municipality has taken ownership of the land or has an interest in the property with the MBTA (defined as a lease, easement, or license).

This exemption allows for management and disposal of soil within the rail trail under a Utility Related Abatement Measure (URAM) – the same process as when the work occurs within a municipal right of way. The exemption indicates that if the soil is managed properly under the requirements of the URAM and Chapter 21E, then no Notice of



Responsibility is issued to the City or property owner (MBTA) and there are no further requirements under the MCP (see MGL 21e, §2(d)).

Thorndike Street ROW

Soil from the area of Thorndike Street is characterized by soil samples from boring B-1. No analytes were detected above RCS-1 Reportable Concentrations, nor were there any visual or olfactory indications of contamination. Fill soils were reported to contain debris such as brick and asphaltic particle typical of historic fill under roadways. As such, excavated material, as precharacterized in this location, is considered suitable for reuse either at a less than RCS-1 facility or at a Massachusetts unlined landfill. Kleinfelder recommends that if a <RCS-1 facility is selected, that facility should have entered into an Administrative Consent Order (ACO) issued by MassDEP. An ACO ensures compliance with Massachusetts Contingency Plan (MCP) regulations by setting forth time tables, Fill Management Plan requirements and sampling schedules, third party inspections and reporting requirements to reduce liability associated with soil reuse and disposal. Soil may also be reused at the point of excavation, or as fill at other locations, pending approval of the receiving site by a Licensed Site Professional representing the City of Somerville. All excavated soil should be transported under a MassDEP Material Shipping Record (MSR) and requires approval from the receiving facility prior to transportation and reuse.

While no contamination was encountered in boring B-1, considerable heterogeneity is possible due to the variable nature of historic fill. If conditions encountered during excavation differ from those described in boring B-1, additional analysis may be required and disposal recommendations may change. If conditions in the project excavation are consistent with those encountered in boring B-1, Kleinfelder recommends that the data presented in this memorandum be used for disposal characterization and that additional samples be collected only if required by the receiving facility.

Groundwater may be managed by recharge at the point of excavation, or by permitted discharge to the Somerville stormwater drainage system. If dewatering is required, and recharge is not feasible, Kleinfelder anticipates that dewatering would be implemented under a National Pollution Discharge Elimination System (NPDES) Construction General Permit or Construction Dewatering Permit.

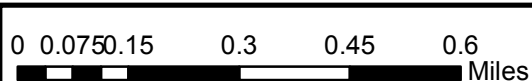
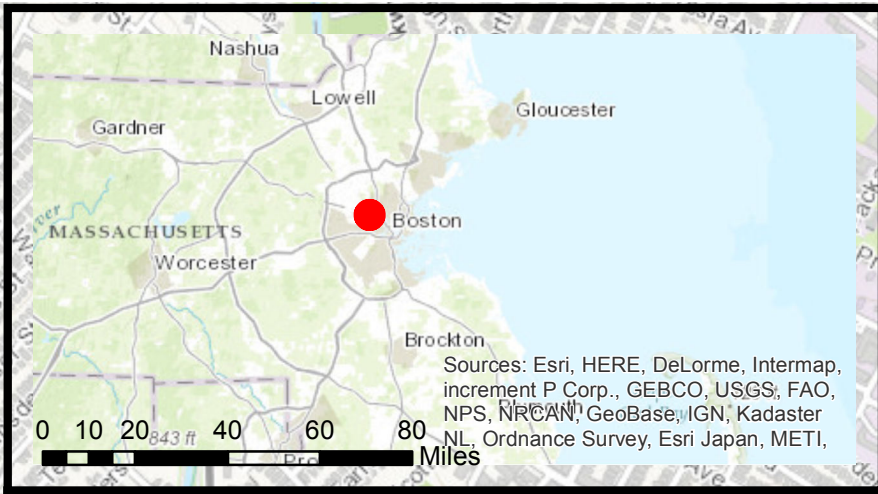
Kleinfelder anticipates that sediment filtration, only, will be required for pre-treatment. It will be the contractor's responsibility to obtain the NPDES permit, determine if additional sampling is required, design any necessary pretreatment, and ensure compliance with the permit. Alternatively, recovered groundwater may be stored in a frac tank or tanker truck and disposed of at a licensed treatment facility.

List of Attachments

Figure 1 – Boring location



Table 1 - Soil sample analytical results
Appendix A – Boring logs



Scale: As Noted

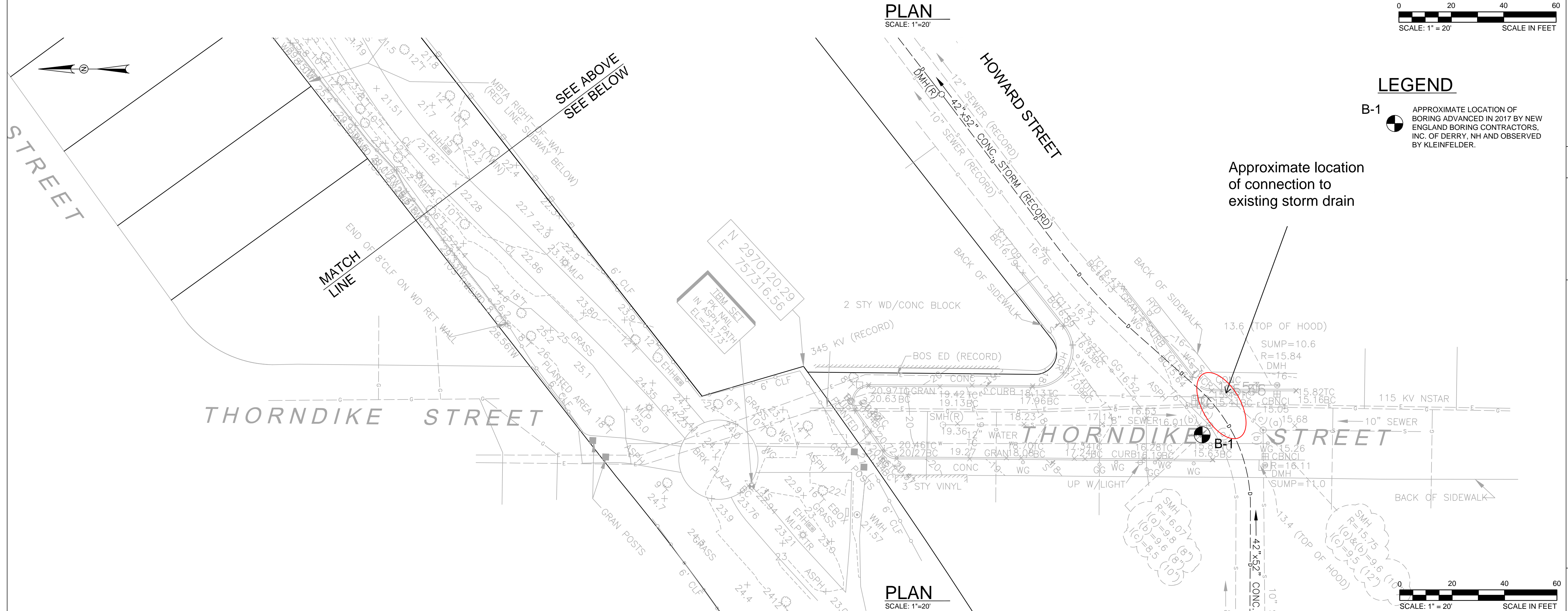
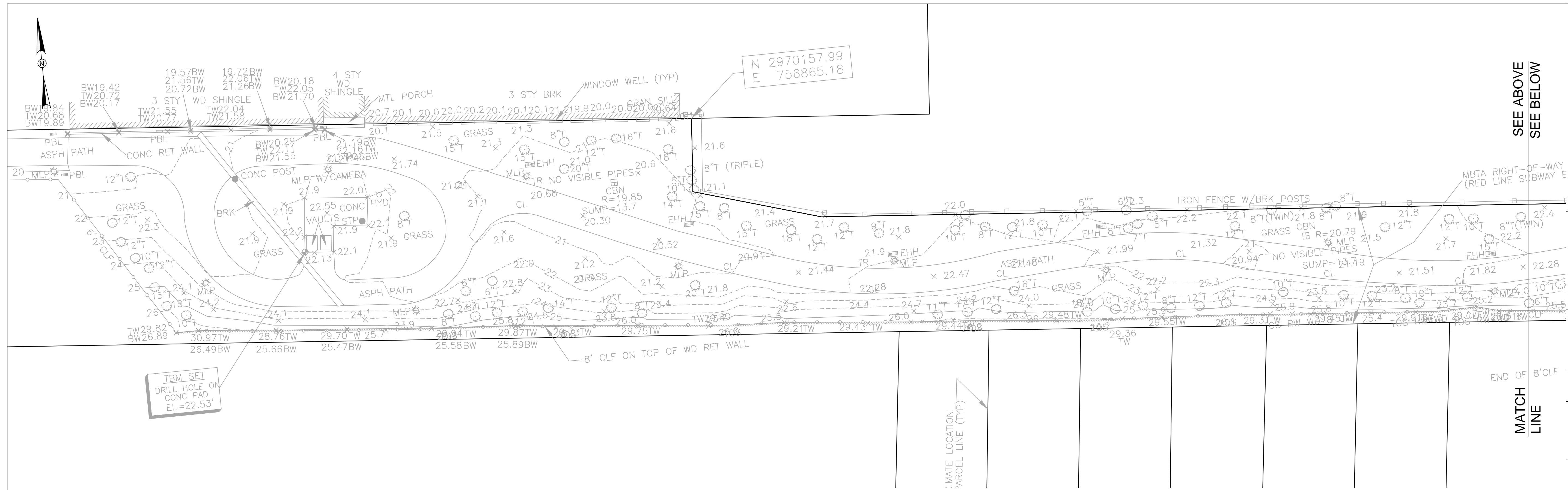
Date: 2/27/17

Job No: 20161752.002A

Drawn By: SJB

**Bike Path Retaining Wall and
Drainage Upgrades
Somerville, MA**

Figure 1: Site Location



LEGEND

B-1 APPROXIMATE LOCATION OF BORING ADVANCED IN 2017 BY NEW ENGLAND BORING CONTRACTORS, INC. OF DERRY, NH AND OBSERVED BY KLEINFELDER.

DATE	REVISIONS
MARCH 2017	
PROJECT NO. 20171752.002A	
DRAWN BY AS	
CHECKED BY GO	
FILE NAME	

THORNDIKE AND HOWARD STREET BORING PLAN

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

Figure 2

Table 1
Soil Analytical Results

Parameter	Reportable Concentrations (RCs)			MCP - Method 1 Cleanup Standards	SAMPLING LOCATION			
	RCS-1	RCS-2	UCL		B-1 (THORN)-0-9'	B-1 (THORN)-14-16'	B-1 (THORN)-7-9'	B-1 (THORN)-9-21'
Sampling Date					2/2/2017 11:00:00 AM	2/2/2017 12:40:00 PM	2/2/2017 11:10:00 AM	2/2/2017 12:30:00 PM
Sample Depth					0-9 Feet	14-16 Feet	7-9 Feet	9-21 Feet
SM 2540G (% Wt)								
% Solids	~	~	~		88.7	82.7	86.2	81.2
SM21-22 2510B Modified (µmhos/cm)								
SPECIFIC CONDUCTANCE	~	~	~		54	NT	NT	9.8
SW-846 1010A (°F)								
FLASHPOINT	~	~	~		> 212 °F	NT	NT	> 212 °F
SW-846 6010C-D (mg/Kg dry) Metals Digestion								
ANTIMONY	20	30	300		ND (2.8)	NT	NT	ND (3.0)
ARSENIC	20	20	500		ND (2.8)	NT	NT	12
BARIUM	1000	3000	10000		42	NT	NT	15
BERYLLIUM	90	200	2000		0.46	NT	NT	ND (0.30)
CADMIUM	70	100	1000		0.41	NT	NT	0.50
CHROMIUM	100	200	2000		9.8	NT	NT	8.5
LEAD	200	600	6000		53	NT	NT	2.4
NICKEL	600	1000	10000		13	NT	NT	6.9
SELENIUM	400	700	7000		ND (5.6)	NT	NT	ND (5.9)
SILVER	100	200	2000		0.59	NT	NT	ND (0.59)
THALLIUM	8	60	800		ND (2.8)	NT	NT	ND (3.0)
VANADIUM	400	700	7000		17	NT	NT	14
ZINC	1000	3000	10000		29	NT	NT	15
SW-846 7471B (mg/Kg dry) Metals Digestion								
MERCURY	20	30	300		0.052	NT	NT	ND (0.030)
SW-846 8082A (mg/Kg dry)								
PCB 1016	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1221	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1232	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1242	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1248	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1254	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1260	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1262	1	4	100		ND (0.11)	NT	NT	ND (0.12)
PCB 1268	1	4	100		ND (0.11)	NT	NT	ND (0.12)
SW-846 8100 Modified (mg/Kg dry)								
TPH	1000	3000	10000		66	NT	NT	15
SW-846 8260C (mg/Kg dry)								
ACETONE	6	50	10000		NT	ND (0.072)	ND (0.066)	NT
TERT-AMYL METHYL ETHER	~	~	~		NT	ND (0.00072)	ND (0.00066)	NT
BENZENE	2	200	10000		NT	ND (0.0014)	ND (0.0013)	NT
BROMOBENZENE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
BROMOCHLOROMETHANE	~	~	~		NT	ND (0.0014)	ND (0.0013)	NT
BROMODICHLOROMETHANE	0.1	0.1	5000		NT	ND (0.0014)	ND (0.0013)	NT
BROMOFORM	0.1	1	10000		NT	ND (0.0014)	ND (0.0013)	NT
BROMOMETHANE	0.5	0.5	6000		NT	ND (0.0072)	ND (0.0066)	NT
2-BUTANONE (MEK)	4	50	10000		NT	ND (0.029)	ND (0.026)	NT
N-BUTYLBENZENE	~	~	~		NT	ND (0.0014)	ND (0.0013)	NT
SEC-BUTYLBENZENE	~	~	~		NT	ND (0.0014)	ND (0.0013)	NT
TERT-BUTYLBENZENE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
TERT-BUTYLETHYL ETHER	~	~	~		NT	ND (0.00072)	ND (0.00066)	NT
CARBON DISULFIDE	100	1000	~		NT	ND (0.0043)	ND (0.0039)	NT
CARBON TETRACHLORIDE	5	5	10000		NT	ND (0.0014)	ND (0.0013)	NT
CHLOROBENZENE	1	3	10000		NT	ND (0.0014)	ND (0.0013)	NT
CHLORODIBROMOMETHANE	0.005	0.03	5000		NT	ND (0.0014)	ND (0.0013)	NT
CHLOROETHANE	100	1000	~		NT	ND (0.0072)	ND (0.0066)	NT
CHLOROFORM	0.2	0.2	10000		NT	ND (0.0029)	ND (0.0026)	NT
CHLOROMETHANE	100	1000	~		NT	ND (0.0072)	ND (0.0066)	NT
2-CHLOROTOLUENE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
4-CHLOROTOLUENE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
1,2-DIBROMO-3-CHLOROPROPANE	10	100	~		NT	ND (0.0029)	ND (0.0026)	NT
1,2-DIBROMOETHANE (EDB)	0.1	0.1	400		NT	ND (0.0014)	ND (0.0013)	NT
DIBROMOMETHANE	500	5000	~		NT	ND (0.0014)	ND (0.0013)	NT
1,2-DICHLOROBENZENE	9	100	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,3-DICHLOROBENZENE	3	200	5000		NT	ND (0.0014)	ND (0.0013)	NT
1,4-DICHLOROBENZENE	0.7	1	10000		NT	ND (0.0014)	ND (0.0013)	NT
DICHLORODIFLUOROMETHANE	1000	10000	~		NT	ND (0.0072)	ND (0.0066)	NT
1,1-DICHLOROETHANE	0.4	9	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,2-DICHLOROETHANE	0.1	0.1	9000		NT	ND (0.0014)	ND (0.0013)	NT
1,1-DICHLOROETHYLENE	3	40	10000		NT	ND (0.0029)	ND (0.0026)	NT
CIS-1,2-DICHLOROETHYLENE	0.1	0.1	5000		NT	ND (0.0014)	ND (0.0013)	NT
TRANS-1,2-DICHLOROETHYLENE	1	1	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,2-DICHLOROPROPANE	0.1	0.1	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,3-DICHLOROPROPANE	500	5000	~		NT	ND (0.00072)	ND (0.00066)	NT
2,2-DICHLOROPROPANE	0.1	0.2	~		NT	ND (0.0014)	ND (0.0013)	NT
1,1-DICHLOROPROPENE	0.01	0.1	~		NT	ND (0.0014)	ND (0.0013)	NT
CIS-1,3-DICHLOROPROPENE	0.01	0.1	4000		NT	ND (0.00072)	ND (0.00066)	NT
TRANS-1,3-DICHLOROPROPENE	0.01	0.1	4000		NT	ND (0.00072)	ND (0.00066)	NT
DIETHYL ETHER	100	1000	~		NT	ND (0.0072)	ND (0.0066)	NT
DIISOPROPYL ETHER	100	1000	~		NT	ND (0.00072)	ND (0.00066)	NT
1,4-DIOXANE	0.2	6	5000		NT	ND (0.072)	ND (0.066)	NT
ETHYLBENZENE	40	1000	10000		NT	ND (0.0014)	ND (0.0013)	NT
HEXACHLOROBUTADIENE	30	100	1000		NT	ND (0.0014)	ND (0.0013)	NT
2-HEXANONE	100	1000	~		NT	ND (0.014)	ND (0.013)	NT
ISOPROPYLBENZENE	1000	10000	~		NT	ND (0.0014)	ND (0.0013)	NT
P-ISOPROPYLTOLUENE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
METHYL TERT-BUTYL ETHER (MTBE)	0.1	100	5000		NT	ND (0.0029)	ND (0.0026)	NT
METHYLENE CHLORIDE	0.1	20	10000		NT	ND (0.0072)	ND (0.0066)	NT
4-METHYL-2-PENTANONE (MIBK)	0.4	50	10000		NT	ND (0.014)	ND (0.013)	NT
NAPHTHALENE	4	20	10000		NT	ND (0.0072)	ND (0.0066)	NT
N-PROPYLBENZENE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
STYRENE	3	4	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,1,1,2-TETRACHLOROETHANE	0.1	0.1	5000		NT	ND (0.0014)	ND (0.0013)	NT
1,1,1,2-TETRACHLOROETHANE	0.005	0.02	4000		NT	ND (0.00072)	ND (0.00066)	NT
TETRACHLOROETHYLENE	1	10	10000		NT	ND (0.0014)	ND (0.0013)	NT
TETRAHYDROFURAN	500	5000	~		NT	ND (0.0072)	ND (0.0066)	NT
TOLUENE	30	1000	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,2,3-TRICHLOROBENZENE	~	~	~		NT	ND (0.0072)	ND (0.0066)	NT
1,2,4-TRICHLOROBENZENE	2	6	10000		NT	ND (0.0072)	ND (0.0066)	NT
1,1,1-TRICHLOROETHANE	30	600	10000		NT	ND (0.0014)	ND (0.0013)	NT
1,1,2-TRICHLOROETHANE	0.1	2	5000		NT	ND (0.0014)	ND (0.0013)	NT
TRICHLOROETHYLENE	0.3	0.3	600		NT	ND (0.0014)	ND (0.0013)	NT
TRICHLOROFLUOROMETHANE	1000	10000	~		NT	ND (0.0072)	ND (0.0066)	NT
1,2,3-TRICHLOROPROPANE	100	1000	~		NT	ND (0.0014)	ND (0.0013)	NT
1,2,4-TRIMETHYLBENZENE	1000	10000	~		NT	ND (0.0014)	ND (0.0013)	NT
1,3,5-TRIMETHYLBENZENE	10	100	~		NT	ND (0.0014)	ND (0.0013)	NT
VINYL CHLORIDE	0.7	0.7	600		NT	ND (0.0072)	ND (0.0066)	NT
M/P-XYLENE	100	100	10000		NT	ND (0.0029)	ND (0.0026)	NT
O-XYLENE	100	100	10000		NT	ND (0.0014)	ND (0.0013)	NT

Table 1
Soil Analytical Results

SW-846 8270D (mg/Kg dry)							
ACENAPHTHENE	4	3000	10000	ND (0.19)	NT	NT	ND (0.21)
ACENAPHTHYLENE	1	10	10000	ND (0.19)	NT	NT	ND (0.21)
ACETOPHENONE	1000	10000	~	ND (0.38)	NT	NT	ND (0.42)
ANILINE	1000	10000	~	ND (0.38)	NT	NT	ND (0.42)
ANTHRACENE	1000	3000	10000	ND (0.19)	NT	NT	ND (0.21)
BENZO(A)ANTHRACENE	7	40	3000	ND (0.19)	NT	NT	ND (0.21)
BENZO(A)PYRENE	2	7	300	ND (0.19)	NT	NT	ND (0.21)
BENZO(B)FLUORANTHENE	7	40	3000	ND (0.19)	NT	NT	ND (0.21)
BENZO(G,H,I)PERYLENE	1000	3000	10000	ND (0.19)	NT	NT	ND (0.21)
BENZO(K)FLUORANTHENE	70	400	10000	ND (0.19)	NT	NT	ND (0.21)
BIS(2-CHLOROETHOXY)METHANE	500	5000	~	ND (0.38)	NT	NT	ND (0.42)
BIS(2-CHLOROETHYL)ETHER	0.7	0.7	800	ND (0.38)	NT	NT	ND (0.42)
BIS(2-CHLOROISOPROPYL)ETHER	0.7	0.7	10000	ND (0.38)	NT	NT	ND (0.42)
BIS(2-ETHYLHEXYL)PHTHALATE	90	600	10000	ND (0.38)	NT	NT	ND (0.42)
4-BROMOPHENYL PHENYL ETHER	100	1000	~	ND (0.38)	NT	NT	ND (0.42)
BUTYLBENZYLPHthalate	100	1000	~	ND (0.38)	NT	NT	ND (0.42)
4-CHLOROANILINE	1	3	3000	ND (0.74)	NT	NT	ND (0.81)
2-CHLORONAPHTHALENE	1000	10000	~	ND (0.38)	NT	NT	ND (0.42)
2-CHLOROPHENOL	0.7	100	3000	ND (0.38)	NT	NT	ND (0.42)
CHRYSENE	70	400	10000	ND (0.19)	NT	NT	ND (0.21)
DIBENZ(A,H)ANTHRACENE	0.7	4	300	ND (0.19)	NT	NT	ND (0.21)
DIBENZOFURAN	100	1000	~	ND (0.38)	NT	NT	ND (0.42)
DI-N-BUTYLPHthalate	50	500	~	ND (0.38)	NT	NT	ND (0.42)
1,2-DICHLOROBENZENE	9	100	10000	ND (0.38)	NT	NT	ND (0.42)
1,3-DICHLOROBENZENE	3	200	5000	ND (0.38)	NT	NT	ND (0.42)
1,4-DICHLOROBENZENE	0.7	1	10000	ND (0.38)	NT	NT	ND (0.42)
3,3'-DICHLOROBENZIDINE	3	20	1000	ND (0.19)	NT	NT	ND (0.21)
2,4-DICHLOROPHENOL	0.7	40	8000	ND (0.38)	NT	NT	ND (0.42)
DIETHYLPHthalate	10	200	10000	ND (0.38)	NT	NT	ND (0.42)
2,4-DIMETHYLPHENOL	0.7	100	10000	ND (0.38)	NT	NT	ND (0.42)
DIMETHYLPHthalate	0.7	50	10000	ND (0.38)	NT	NT	ND (0.42)
2,4-DINITROPHENOL	3	50	8000	ND (0.74)	NT	NT	ND (0.81)
2,4-DINITROTOLUENE	0.7	10	800	ND (0.38)	NT	NT	ND (0.42)
2,6-DINITROTOLUENE	100	1000	~	ND (0.38)	NT	NT	ND (0.42)
DI-N-OCTYLPHthalate	1000	10000	~	ND (0.38)	NT	NT	ND (0.42)
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	50	500	~	ND (0.38)	NT	NT	ND (0.42)
FLUORANTHENE	1000	3000	10000	ND (0.19)	NT	NT	ND (0.21)
FLUORENE	1000	3000	10000	ND (0.19)	NT	NT	ND (0.21)
HEXACHLOROBENZENE	0.7	0.8	8	ND (0.38)	NT	NT	ND (0.42)
HEXACHLOROBUTADIENE	30	100	1000	ND (0.38)	NT	NT	ND (0.42)
HEXACHLOROETHANE	0.7	3	2000	ND (0.38)	NT	NT	ND (0.42)
INDENO(1,2,3-CD)PYRENE	7	40	3000	ND (0.19)	NT	NT	ND (0.21)
ISOPHORONE	100	1000	~	ND (0.38)	NT	NT	ND (0.42)
2-METHYLNAPHTHALENE	0.7	80	5000	ND (0.19)	NT	NT	ND (0.21)
O-CRESOL	500	5000	~	ND (0.38)	NT	NT	ND (0.42)
M/P-CRESOL	500	5000	~	ND (0.38)	NT	NT	ND (0.42)
NAPHTHALENE	4	20	10000	ND (0.19)	NT	NT	ND (0.21)
NITROBENZENE	500	5000	~	ND (0.38)	NT	NT	ND (0.42)
2-NITROPHENOL	100	1000	~	ND (0.38)	NT	NT	ND (0.42)
4-NITROPHENOL	100	1000	~	ND (0.74)	NT	NT	ND (0.81)
PENTACHLOROPHENOL	3	10	700	ND (0.38)	NT	NT	ND (0.42)
PHENANTHRENE	10	1000	10000	ND (0.19)	NT	NT	ND (0.21)
PHENOL	1	20	10000	ND (0.38)	NT	NT	ND (0.42)
PYRENE	1000	3000	10000	0.22	NT	NT	ND (0.21)
PYRIDINE	500	5000	~	ND (0.38)	NT	NT	ND (0.42)
1,2,4-TRICHLOROBENZENE	2	6	10000	ND (0.38)	NT	NT	ND (0.42)
2,4,5-TRICHLOROPHENOL	4	600	10000	ND (0.38)	NT	NT	ND (0.42)
2,4,6-TRICHLOROPHENOL	0.7	20	4000	ND (0.38)	NT	NT	ND (0.42)
SW-846 9014 (mg/Kg)							
REACTIVE CYANIDE	~	~	~	ND (3.9)	NT	NT	ND (4.0)
SW-846 9030A (mg/Kg)							
REACTIVE SULFIDE	~	~	~	ND (20)	NT	NT	ND (20)

NOTES:

1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
2. ND = Not detected above the lab reporting limits shown in parenthesis.
3. NT = Not tested.
4. ~ = No Method 1 Standard or UCL available
5. Bolded values indicates > laboratory reporting limits
6. Bold and Shaded = > Reportable Concentration

APPENDIX B

BORING LOG

PLOTTED: 03/02/2017 10:23 AM BY: SBridges

Date Begin - End: 1/30/2017 - 2/02/2017	Drilling Company: NEBC	BORING LOG B-1
Logged By: T. Bernier	Drill Crew: B. Walsh / M. D'Ambrosio	
Hor.-Vert. Datum: Not Available	Drilling Equipment: Mobile B-47	Hammer Type - Drop: 140 lb. Donut - 30 in.
Plunge: -90 degrees	Drilling Method: Drive and Wash	
Weather: Sunny, 40s	Casing Diameter: 4 in. I.D.	

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS							MONITORING WELL CONSTRUCTION*			
			Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr.: Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit		Plasticity Index (NP=NonPlastic)		
			3-inches Bituminous Pavement														
			5-inches Gravel Road Base	G1													
			G1: Fill Silty SAND with Gravel (SM) : fine to coarse-grained, reddish brown, moist, fine subangular to angular gravel. PID = 0.0ppm.	G2													
			G2: Similar to G1 except contains small pieces of bituminous pavement. PID = 0.0ppm.	G3													
			G3: Similar to G1 except coarse gravel, and some 6" to 8" cobbles, pieces of bituminous pavement. PID = 0.0ppm.	G4													
			G4: Fill Silty SAND (SM) : fine to coarse-grained, very dark brown, moist, trace fine subangular gravel, contains small pieces of bituminous pavement. PID = 0.0ppm.	G5													
			G5: Similar to G4 except no asphalt. PID = 0.0ppm.	G6													
			G6: Fill Silty SAND (SM) : fine to coarse-grained, very dark brown, moist, trace fine subangular gravel, contains small pieces of bituminous pavement. PID = 0.0ppm.	S1			BC=4 7 11 12	9"									
			S1: Fill Silty SAND with Gravel (SM) : fine to coarse-grained, gray, wet, medium dense, fine subangular gravel, contains large brick pieces. PID = 0.1ppm.	S2			BC=8 10 9 7	11"	SP-SM								
			S2: Poorly graded SAND with Silt (SP-SM) : fine-grained, greenish gray, wet, medium dense, trace fine subangular gravel. PID = 3.9ppm.														
			Assumed lithology change														
			S3: Silty SAND (SM) : fine-grained, olive gray, wet, loose to medium dense, trace fine gravel, petroleum odor. PID = 88.2ppm.	S3			BC=4 4 6 6	12"									
			S4: Similar to S3. Faint petroleum odor. PID = 4.9ppm.	S4			BC=5 5 10	14"									

<p>KLEINFELDER Bright People. Right Solutions.</p>	PROJECT NO.: 20171752	BORING LOG B-1	PLATE
	DRAWN BY: SJB	Bike Path Retaining Wall and Drainage Thorndike St Somerville, MA	B-1
CHECKED BY: JMG	DATE: 3/2/2017		
REvised: 3/2/2017			PAGE: 1 of 2

PROJECT NUMBER: 20171752.002A
GINT LIBRARY: 2017.GLB [KLF_BORING/TEST PIT SOIL LOG]
GINT FILE: KLF_gint_master_2017
GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB

PLOTTED: 03/02/2017 10:23 AM BY: SBRidges


Date Begin - End: 1/30/2017 - 2/02/2017	Drilling Company: NEBC	BORING LOG B-1	
Logged By: T. Bernier	Drill Crew: B. Walsh / M. D'Ambrosio		
Hor.-Vert. Datum: Not Available	Drilling Equipment: Mobile B-47	Hammer Type - Drop: 140 lb. Donut - 30 in.	
Plunge: -90 degrees	Drilling Method: Drive and Wash		
Weather: Sunny, 40s	Casing Diameter: 4 in. I.D.		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS							MONITORING WELL CONSTRUCTION*				
			Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit		Plasticity Index (NP=NonPlastic)			
			Approximate Ground Surface Elevation (ft.): 16.00 Surface Condition: Bituminous pavement															Completion Method: Flush mount cap in concrete
-5				S4 (cont.)			14	14" (cont.)										
			Assumed lithology change															
	25		S5: Sandy Lean CLAY with Gravel (CL) : low to medium plasticity, bluish gray, wet, stiff, fine to coarse grained sand, fine gravel. No initial recovery with 2" spoon, a 3" spoon was driven to recover sample. PID = 0.0ppm.	S5			BC=41 15 13 16	14"										
-10																		
	30		S6: Lean CLAY (CL) : medium plasticity, bluish gray, wet, medium stiff to stiff, PID = 0.0ppm.	S6			BC=11 9 12 14	24"							49	27		
-15																		

The boring was terminated at approximately 31 ft. below ground surface. Monitoring Well installed to a depth of 29ft

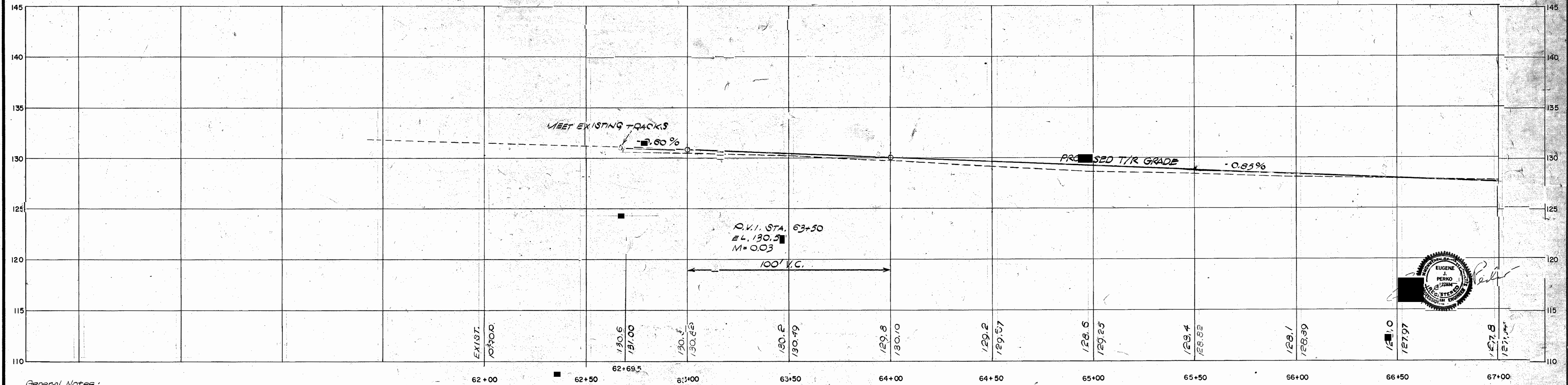
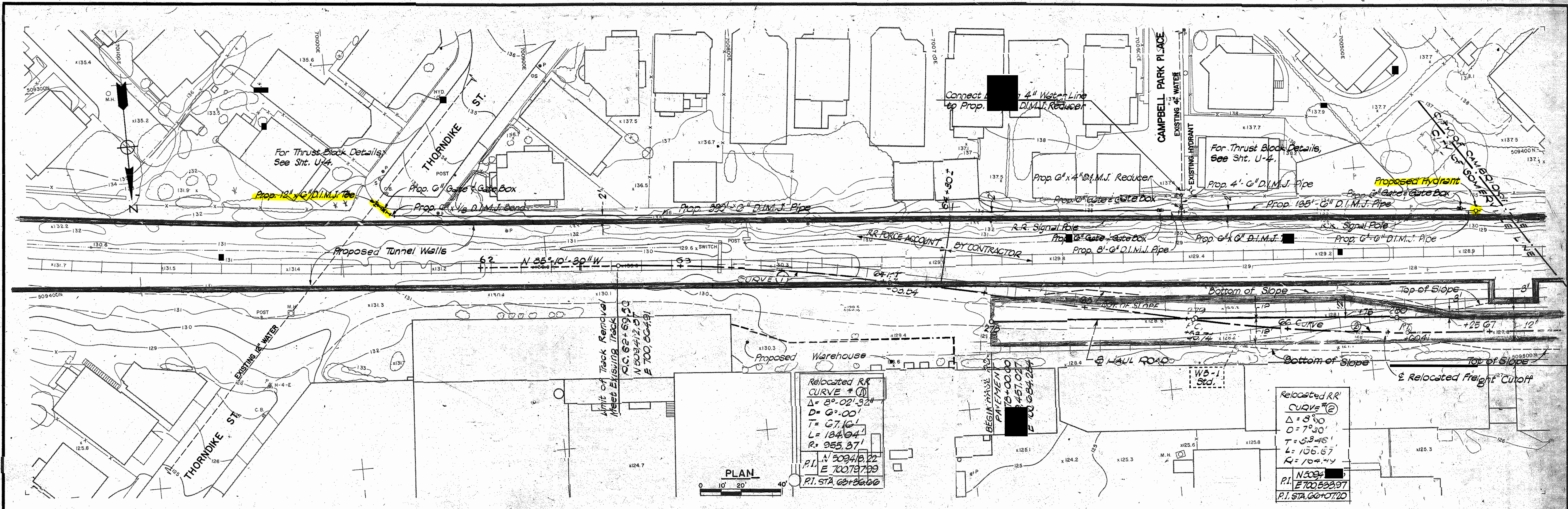
GROUNDWATER LEVEL INFORMATION:
 ▽ Groundwater was observed at approximately 6.5 ft. below ground surface 15 days after drilling completion.
GENERAL NOTES:
 The exploration location and elevation are approximate and were estimated by Kleinfelder.
 A PID (ppmv) was used for environmental field screening.

PROJECT NUMBER: 20171752.002A
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_BORING/TEST PIT SOIL LOG]
 GINT FILE: KLF_gint_master_2017

	PROJECT NO.: 20171752	BORING LOG B-1 Bike Path Retaining Wall and Drainage Thorndike St Somerville, MA	PLATE
	DRAWN BY: SJB CHECKED BY: JMG DATE: 3/2/2017 REVISED: 3/2/2017		B-1

APPENDIX C

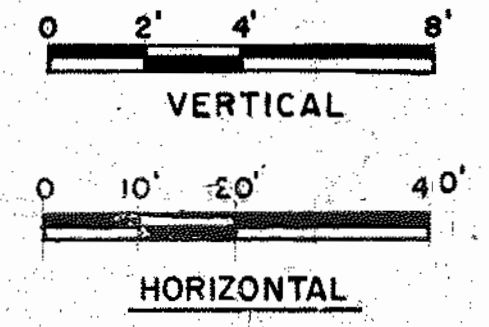
RECORD DRAWINGS



General Notes:

- All Railroad control and signal items are to be removed or relocated as required for work on tunnel, haul road, and railroad relocation construction. Coordinate all railroad work with the Boston & Maine Railroad.
- All existing track removals are limited to the MBTA Freight Cutoff and easement areas as shown on sheets RW-1 through RW-3.
- For site preparation and fencing work, see sheets PGR-1 through PGR-3.
- See sheets T5 through T8 for Haul Road Profile.
- See sheet T9 for Typical Section for Haul Road and Relocated R.R.
- See sheet T10 for Track Work Details.
- See sheets X1 through X9 for Cross Sections.
- See sheets U1 through U9 for Public & Private Utility work.
- All 24' wide Haul Roads shall have a solid 6" wide reflectorized yellow center line.
- The contractor is to design and construct a similar type Haul Road back from Haul Road @ Sta. 278+00 a distance of 800' ft. towards Davis Square.

PROFILE



11. All plans with the note "RAILROAD WORK (N.I.C.)" contain work that has been designed with the assumptions that the MBTA Freight Cutoff tracks will be relocated to the north side of the railroad Right-of-Way and that service will be maintained during construction. However, this railroad service will be discontinued prior to the start of construction and the tracks will no longer be required. Therefore the contractor shall both remove the existing railroad and revise the Haul Road in accordance with the Specifications, and shall also eliminate any work associated with the railroad work on these plans that is required solely to accommodate the relocated railroad. All revisions must be approved by the Engineer.

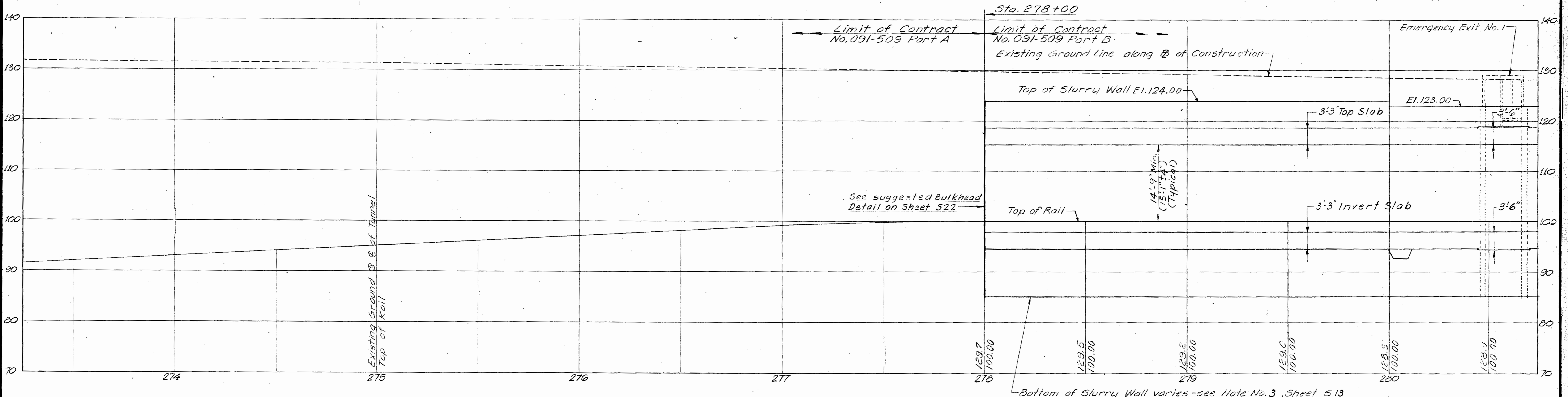
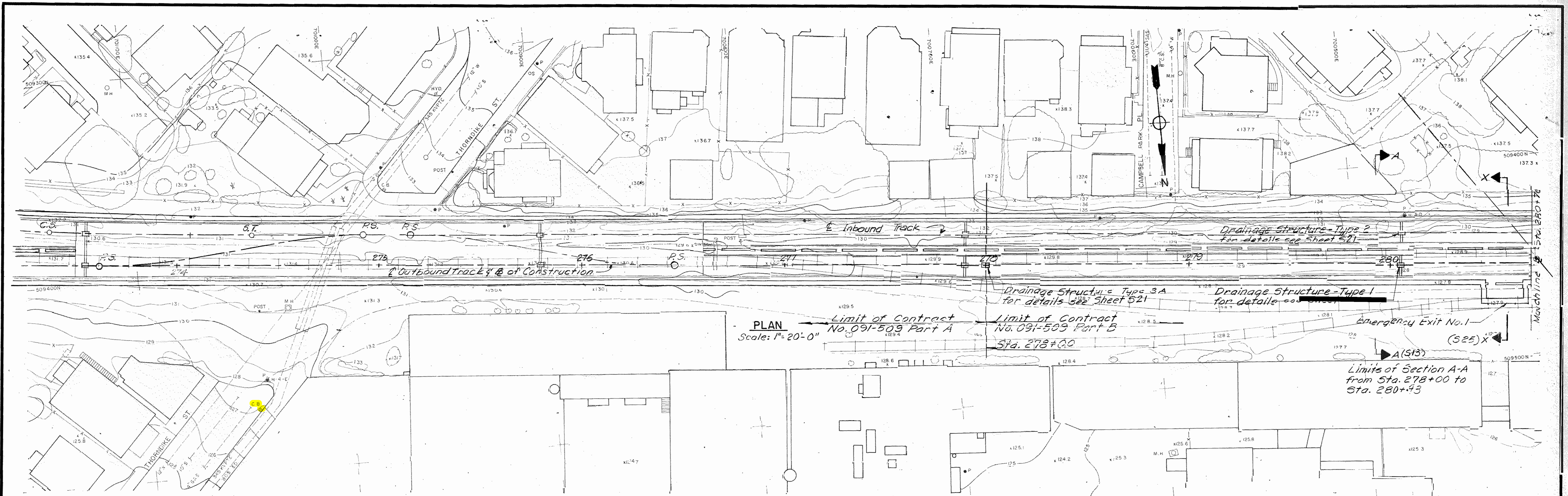
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NW DAVIS TO ALEWIFE
 CONTRACT NO. 091-509 PART B
TUNNEL CAMPBELL PARK PL. TO HARVEY ST.
HAUL RD. & FREIGHT CUTOFF RELOCATION
PLAN AND PROFILE

SVERRUP & PARCEL AND ASSOCIATES, INC.
 ENGINEERS-ARCHITECTS-PLANNERS
 BOSTON, MASSACHUSETTS

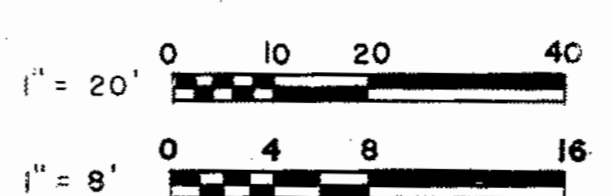
APPROVED BY
John L. Carney
 PROJECT MANAGER

SCALE: AS SHOWN
 DATE 2/7/80
 PLAN NO. 64685
 SHEET T 1 OF 10

"RAILROAD WORK (N.I.C.)"



ELEVATION
Scale: Horizontal 1" = 20'
Vertical 1" = 8'



MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NW DAVIS TO ALEWIFE
CONTRACT NO. 091-509 PART B

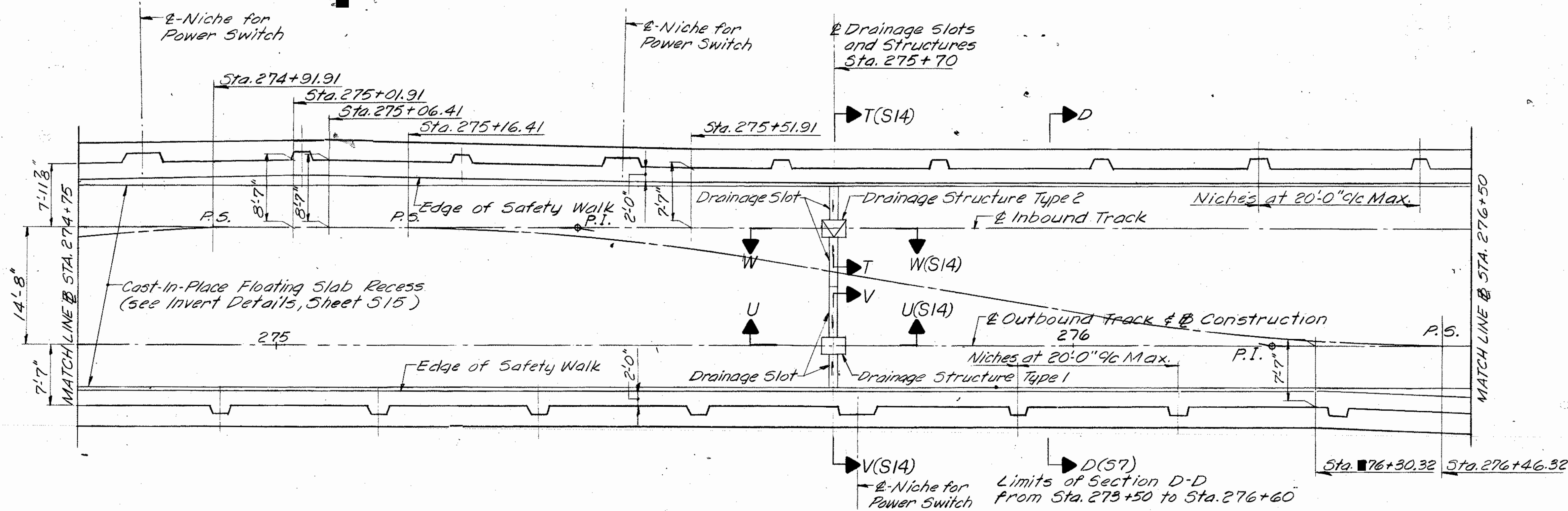
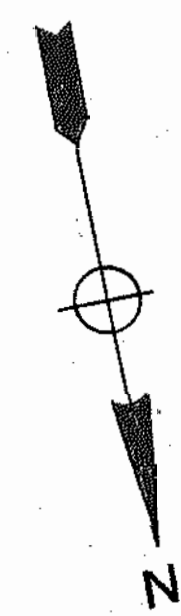
TUNNEL CAMPBELL PARK PL. TO HARVEY ST.
PLAN AND PROFILE OUTBOUND
STA. 278+00 TO STA. 280+70

APPROVED BY
Eugene J. Peltor
PROJECT MANAGER

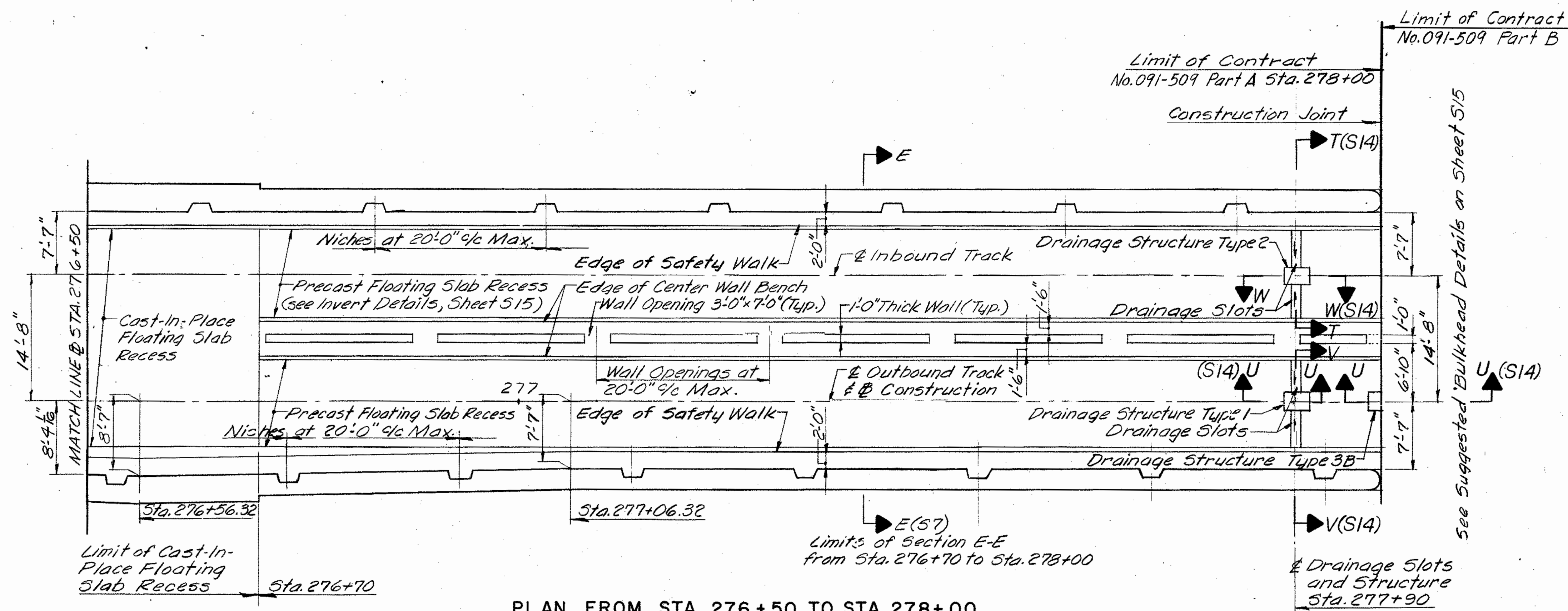
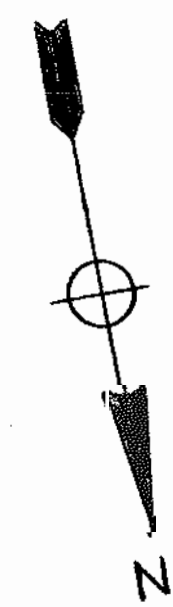
ISSUE DATE	DESCRIPTION	BY	CHECKED BY

SCALE as noted
DATE 2/7/80
DRAWN BY
DESIGN BY
CHECK BY
PLM 54701
SHEET 52 OF 29

5152
786327



PLAN FROM STA. 274+75 TO STA. 276+50
Scale: 1/8"=1'-0"



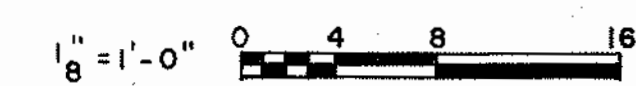
PLAN FROM STA. 276+50 TO STA. 278+00
Scale: 1/8"=1'-0"

NOTES:

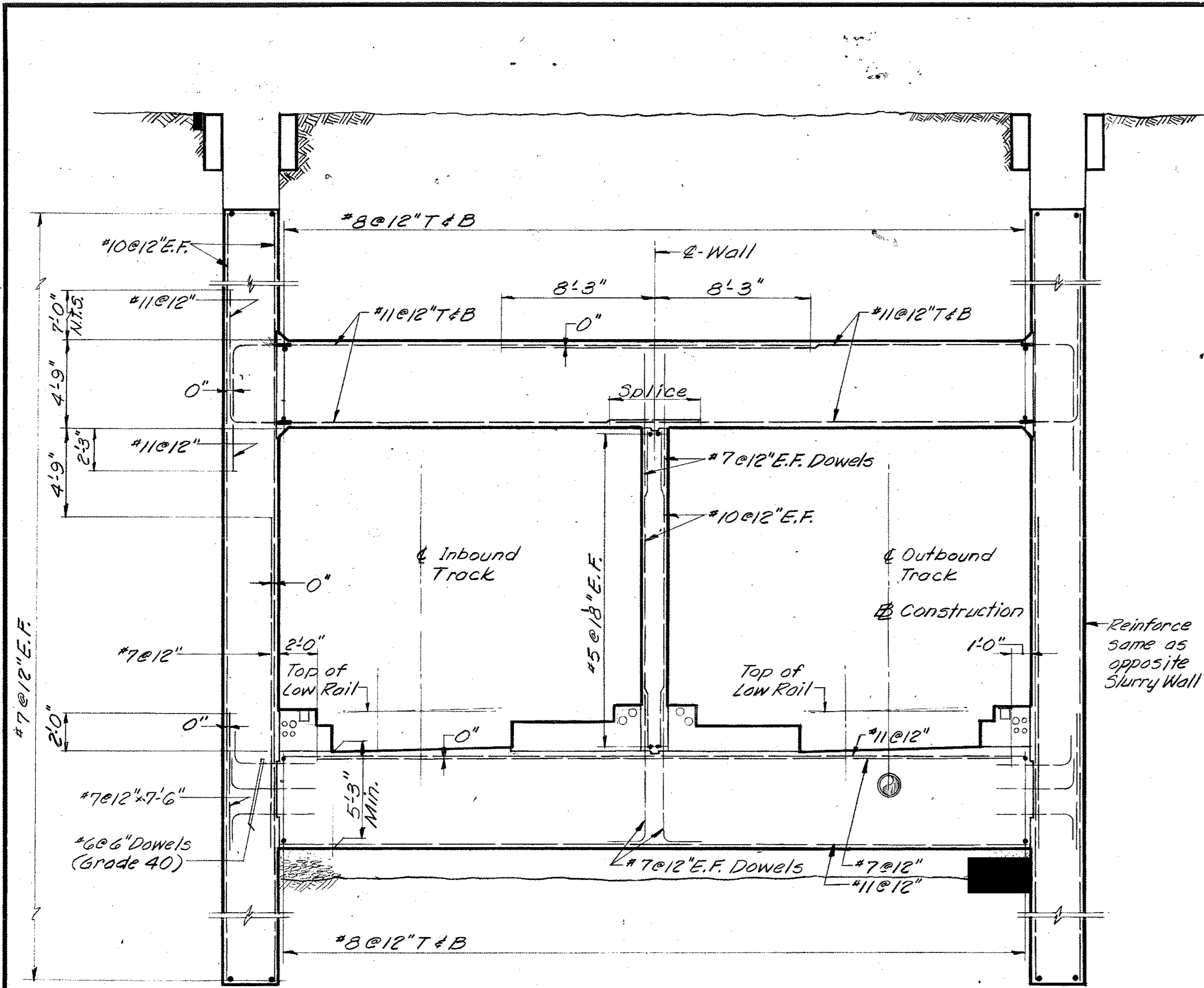
1. For General Notes see sheet S1.
2. For Additional Notes see sheet S7.
3. Provide Safety Niches on both sides of Tunnel at 20'-0" 9/16" maximum, for full length of this Contract. Location of Safety Niches shall be determined by the Contractor. For Niche details see sheet S14.
4. For Center Wall opening details, see sheet S14.
5. (I.B.) stands for Inbound Track Stationing.
6. For Drainage Structure details, see sheet S14.



MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RED LINE EXTENSION NW DAVIS TO ALEWIFE CONTRACT NO. 091-509 PART A			
TUNNEL-DAVIS SQ STA. TO CAMPBELL PARK PL. INVERT PLAN STA. 274+75 TO STA. 278+00			
EVERDRUP & PARCEL AND ASSOCIATES, INC. ENGINEERS-ARCHITECTS-PLANNERS BOSTON, MASSACHUSETTS		MASS. BAY TRANSPORTATION AUTHORITY APPROVED BY <i>John J. Carey</i> PROJECT MANAGER	
ISSUE DATE: _____ DESCRIPTION: _____ BY: CHC/APP	DATE 2/7/80 SCALE 1/8"=1'-0" DRAWN BY: _____ DESIGN BY: _____ CHECK BY: _____ PLAN NO. 54620 SHEET S5 OF 18		

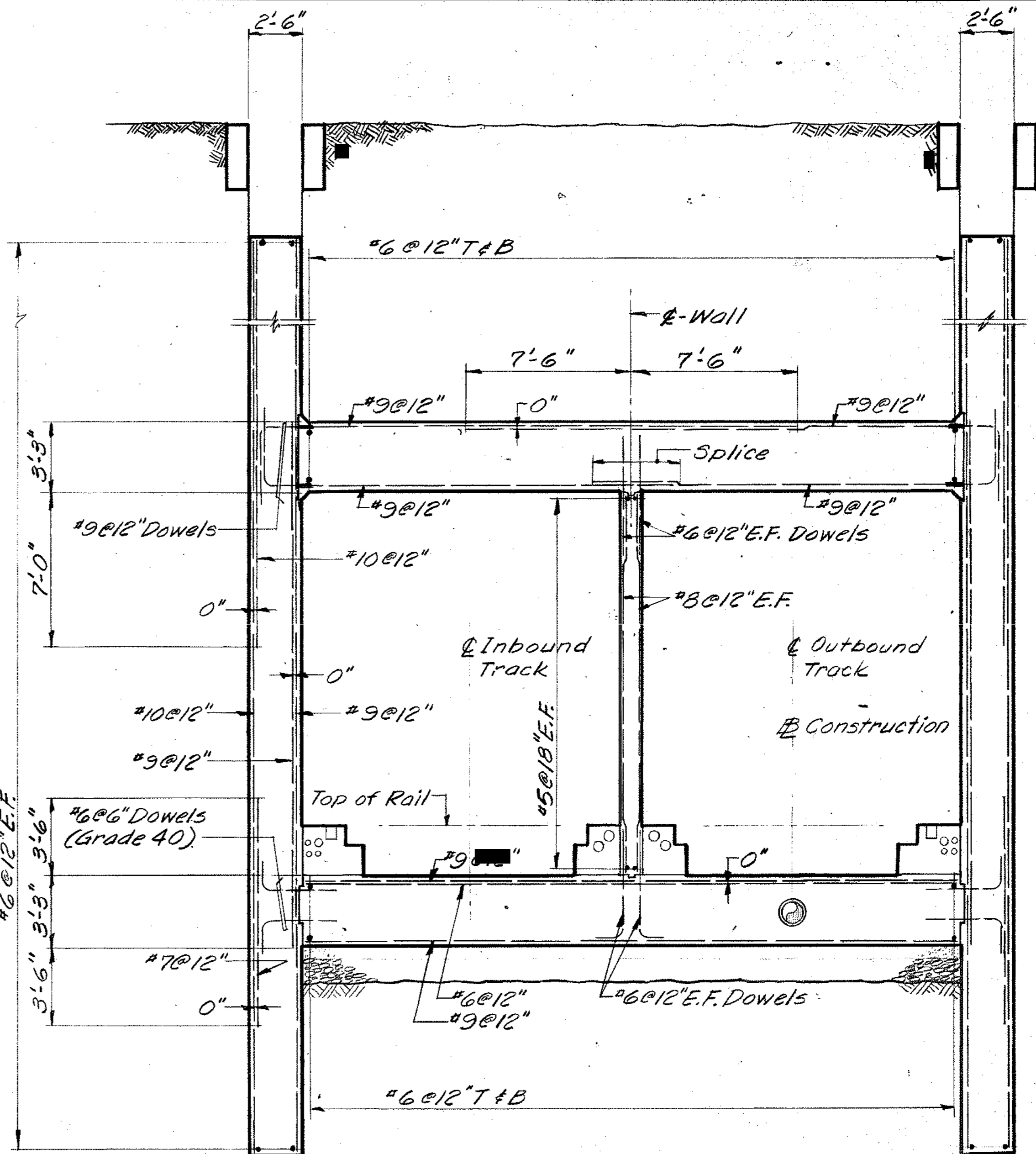


5152
795342

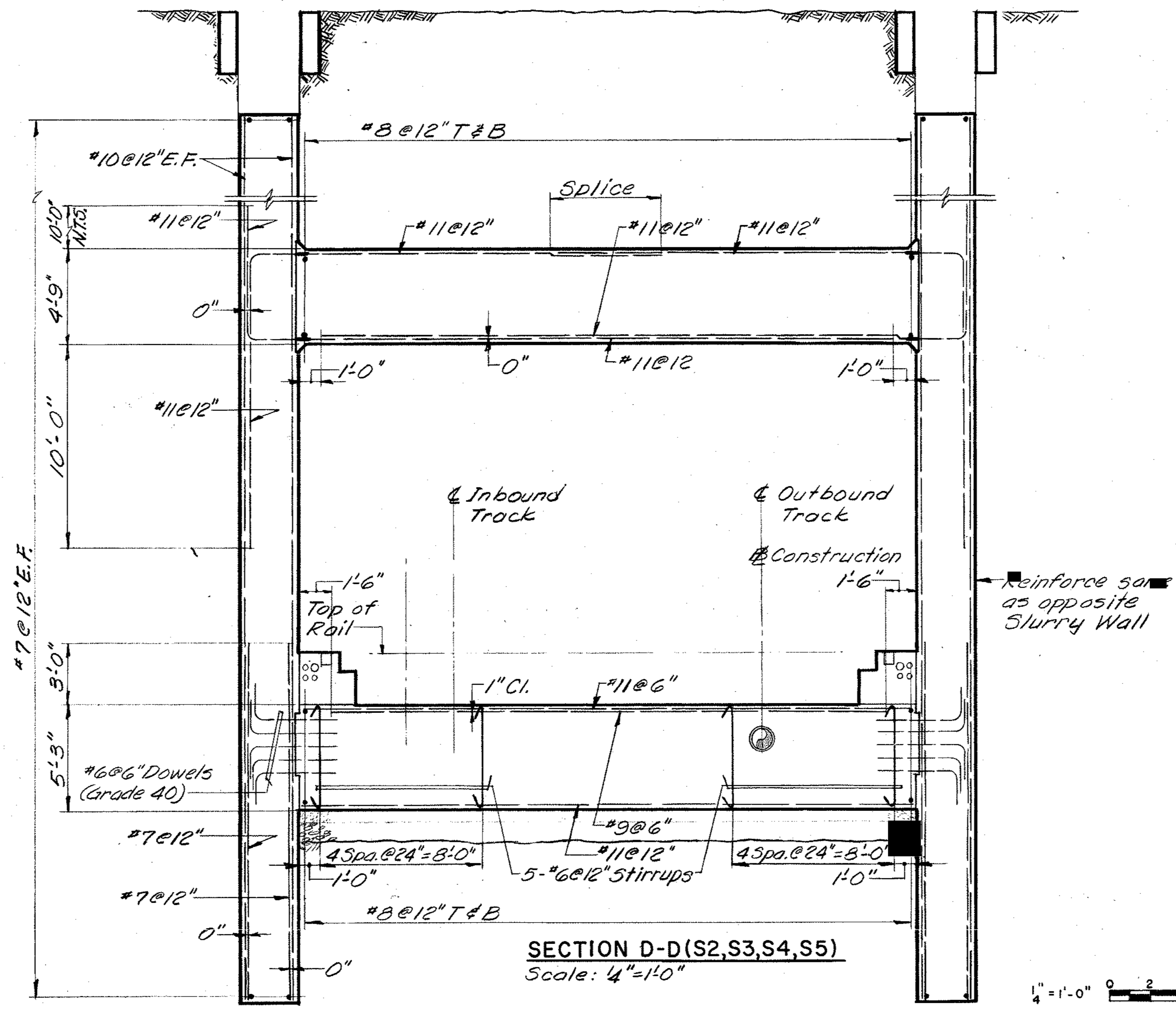


SECTION C-C (S2,S4)
Scale: 4"=1'-0"

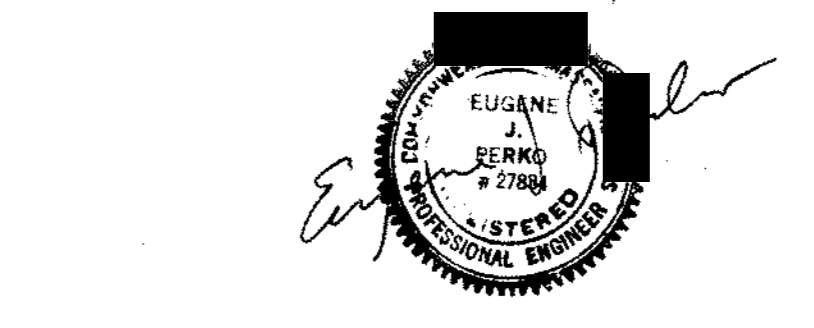
- NOTES:**
1. For General Notes see Sheet 51.
 2. All exterior walls are 3'-0" thick Slurry Walls unless otherwise noted, as in Section E-E.
 3. Slurry Walls shall extend below underside of Invert Slab as follows:
 - a) If rock is within depth of excavation - 2'-6" below underside of Invert Slab.
 - b) If rock is from 1'-6" to 9'-6" below underside of Invert Slab - 1'-0" into rock.
 - c) In earth - 9'-6" below underside of Invert Slab.
 - d) Slurry Walls shall be level for each panel.
 4. All concrete in Safety Walk and Center Wall Bench shall be 3000 psi strength concrete.
 5. All concrete in Mud Slab and Waterproofing Protection shall be 2500 psi strength concrete. No reinforcing steel shall be placed in the Mud Slab or Waterproofing Protection.
 6. Pay Limits of Earth Excavation shall be within Slurry Walls and/or Steel Sheeting from Existing Grade to bottom of gravel as noted on Section A-A on Sheet 56 and as noted on Construction Staging on Sheet 51B.
 7. The Slurry Wall above the Top Slab shall be supported by means of temporary bracing during construction. These struts shall remain in place until backfill is within two feet of the E of each strut to be removed.
 8. All invert slab and Top Slab construction joints shall be radial to the E of outboard track.
 9. Panel joints in slurry walls and construction joints in slabs shall be avoided at the same location in tunnel.
 10. Slab reinforcing steel shall be placed perpendicular to slurry walls.
 11. Laps excepted bars shown with 0" dimension are to be alternated.
 12. Notes on Section A-A on Sheet 56 apply also to Sections B-B through K-K.
 13. Dewatering shall continue until backfilling is completed over Sections AA, BB, CC, FF, GG, HH, JJ, KK.
 14. For dimensions not shown or noted on Sections see Sheets 52 through 55.
 15. For Waterproofing Details see Sheet 516.
 16. For Cathodic Protection Details see Sheet 516.
 17. For Detail at Change of Slab Thickness see Sheet 515.
 18. For Limits of Work see Sheet RW-1.
 19. For location of outboard and inbound tracks see Sheets P-1 and P-2.



SECTION E-E (S3,S5)
Scale: 4"=1'-0"



SECTION D-D (S2,S3,S4,S5)
Scale: 4"=1'-0"



ISSUE DATE	DESCRIPTION	BY	CHECKED

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NW DAVIS TO ALEWIFE
 CONTRACT NO. 091-509 PART A
TUNNEL-DAVIS SQ. STA. TO CAMPBELL PAR
 SECTIONS C-C, D-D & E-E

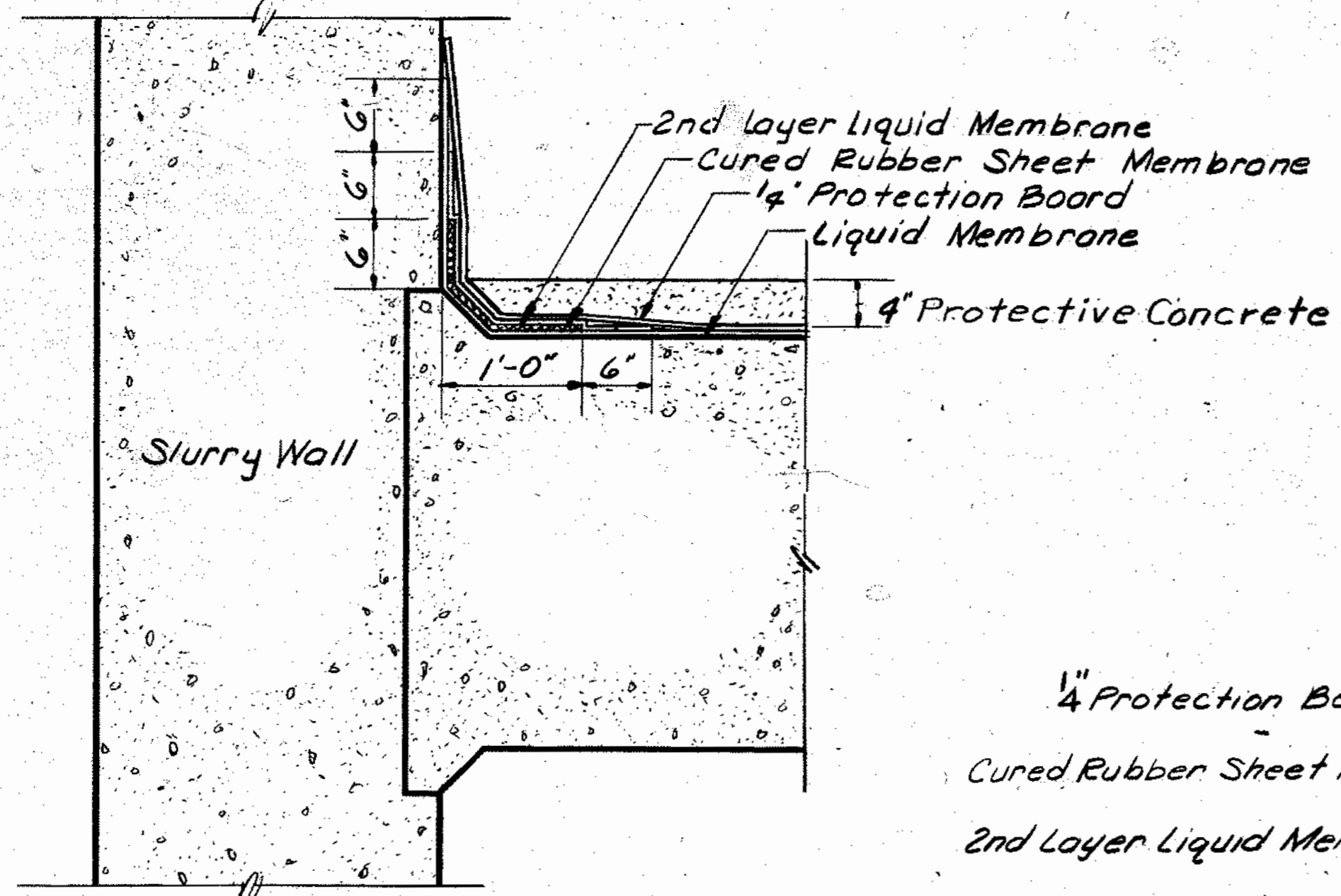
SVENDRUP & PARCEL AND ASSOCIATES, INC.
 ENGINEERS-ARCHITECTS-PLANNERS
 BOSTON, MASSACHUSETTS

MASS. BAY TRANSPORTATION AUTHORITY
 APPROVED BY
 PROJECT MANAGER

DATE 2/7/80 REC. ARM/NJB

SCALE 4"=1'-0" DRAWN BY DESIGN BY CHECK BY PLAN NO. 54622 SHEET S7 OF 18

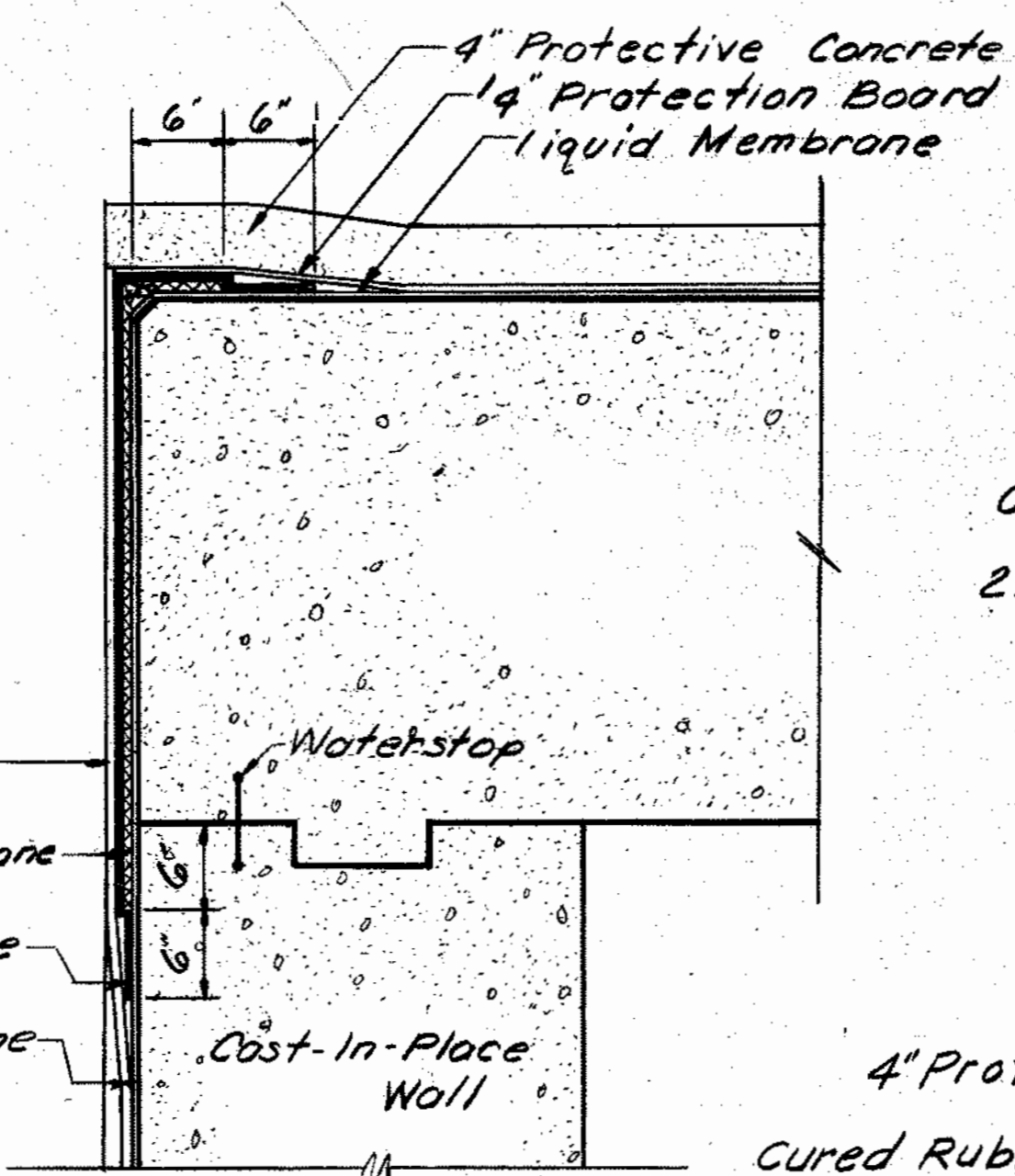
5162
79599



2nd Layer Liquid Membrane
Cured Rubber Sheet Membrane
1/4\"/>

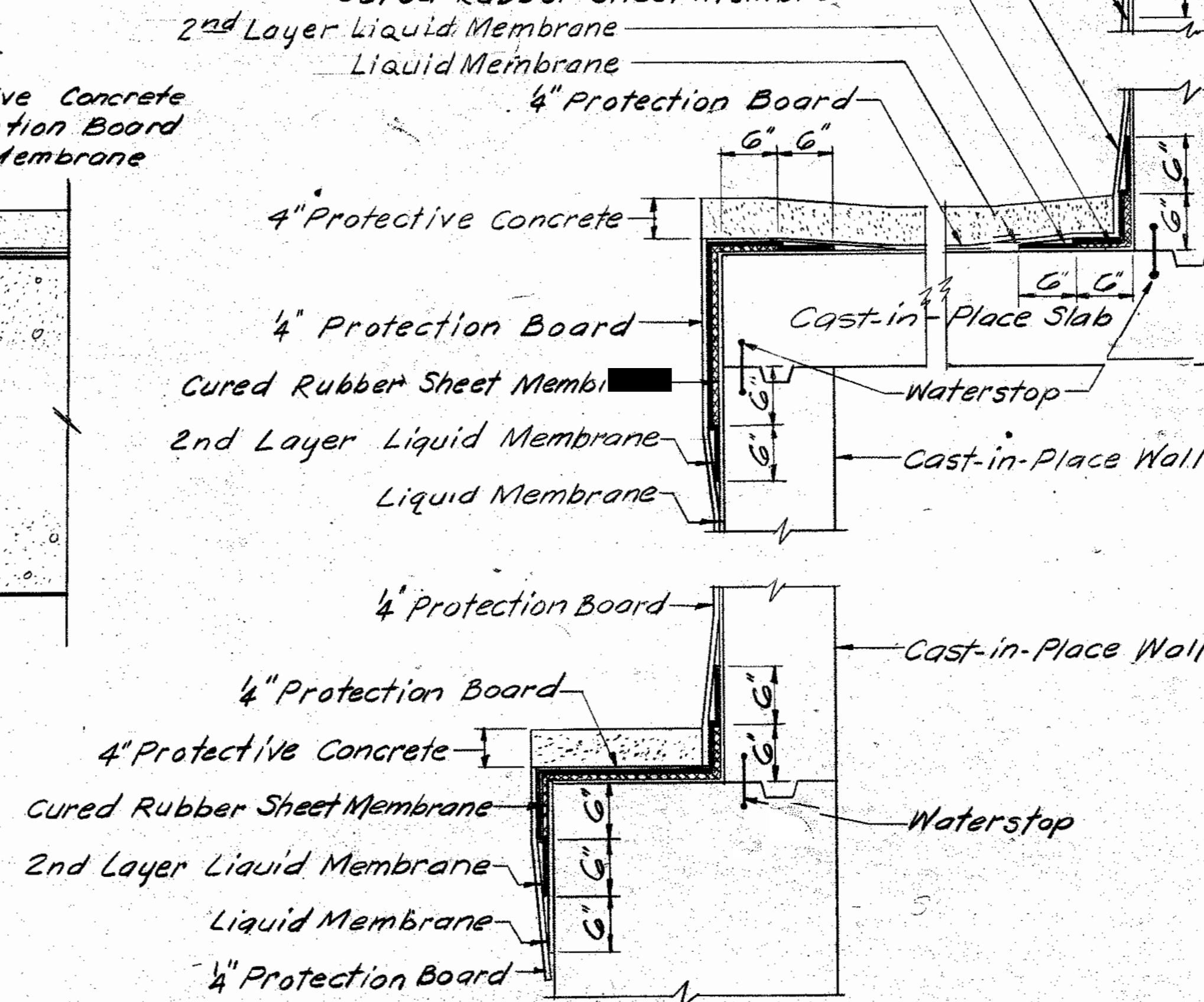
Slurry Wall

1/4\"/>



4\"/>

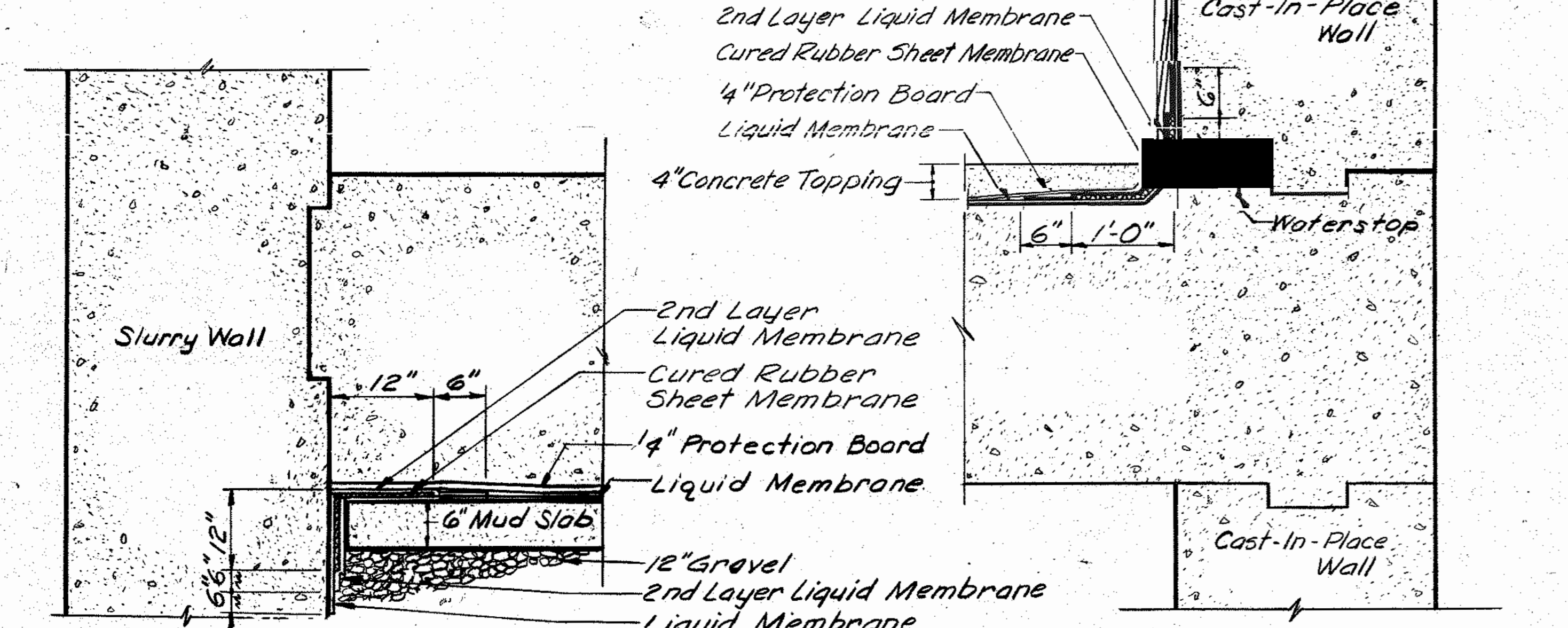
1/4\"/>



4\"/>

1/4\"/>

AT VENTILATION STRUCTURES



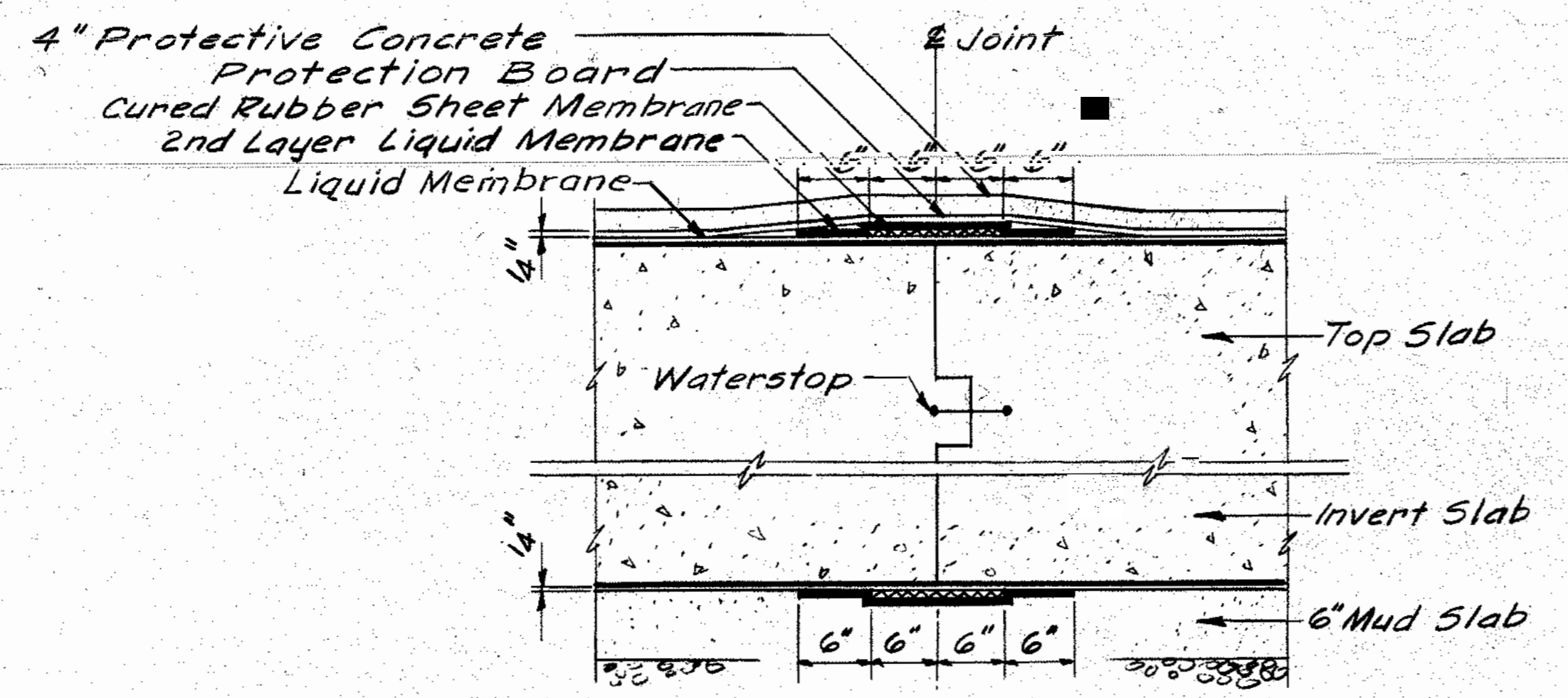
Slurry Wall

2nd Layer Liquid Membrane
Cured Rubber Sheet Membrane
1/4\"/>

1/4\"/>

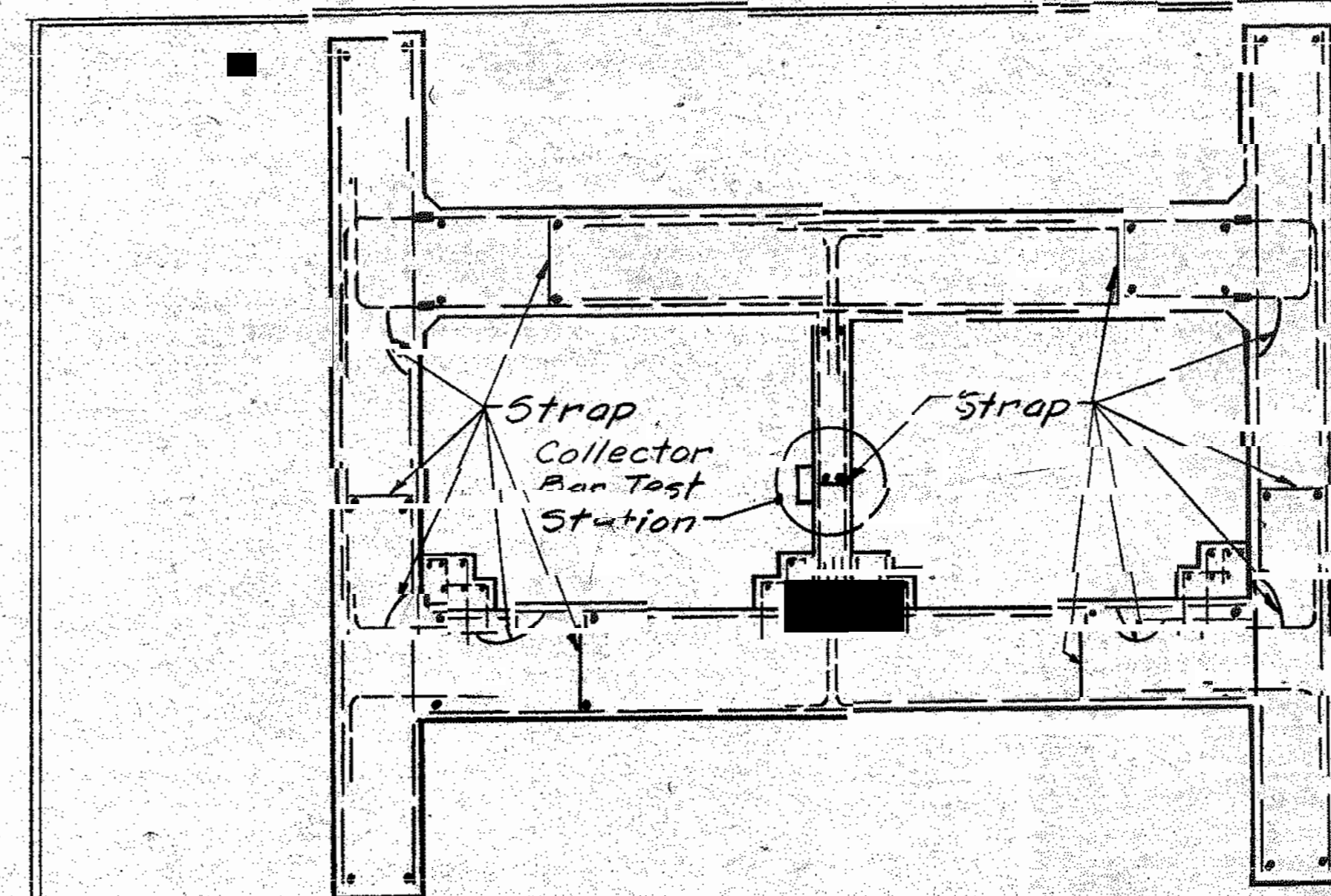
AT SLURRY WALL

AT CAST-IN-PLACE SECTION

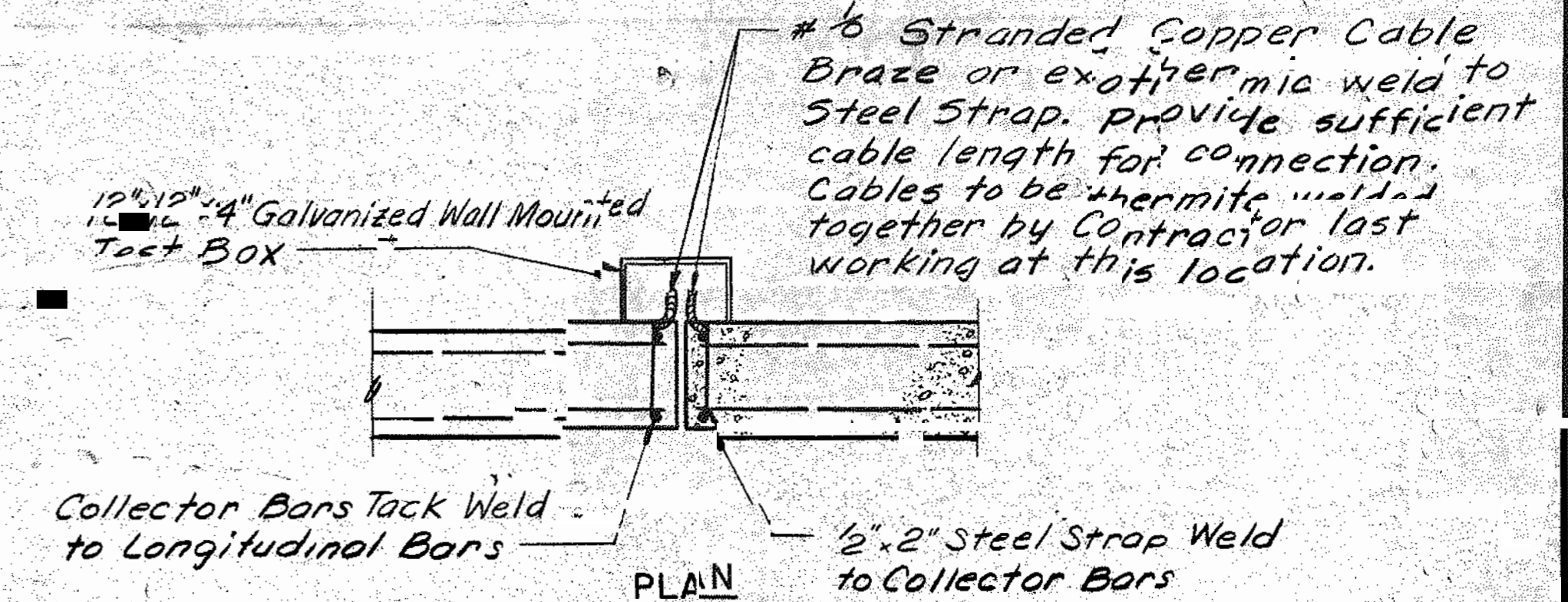


TYPICAL DETAIL AT ALL JOINTS IN SLABS

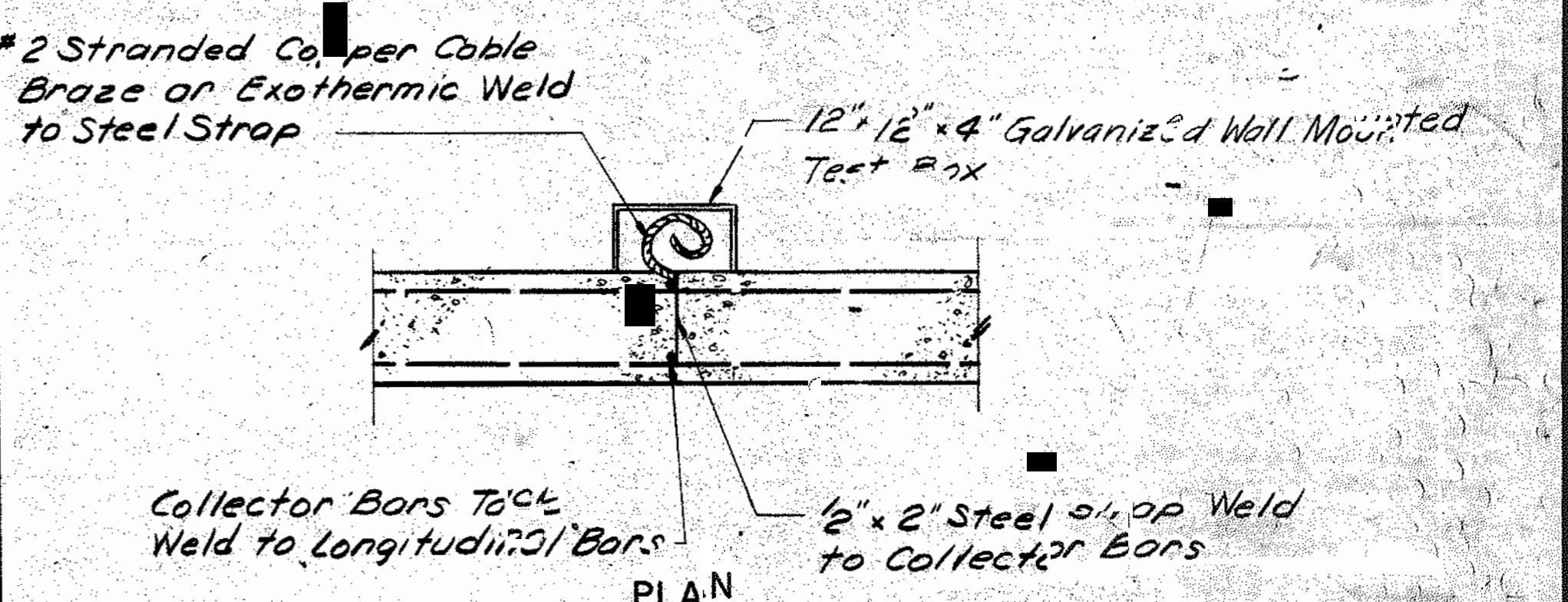
WATERPROOFING DETAILS



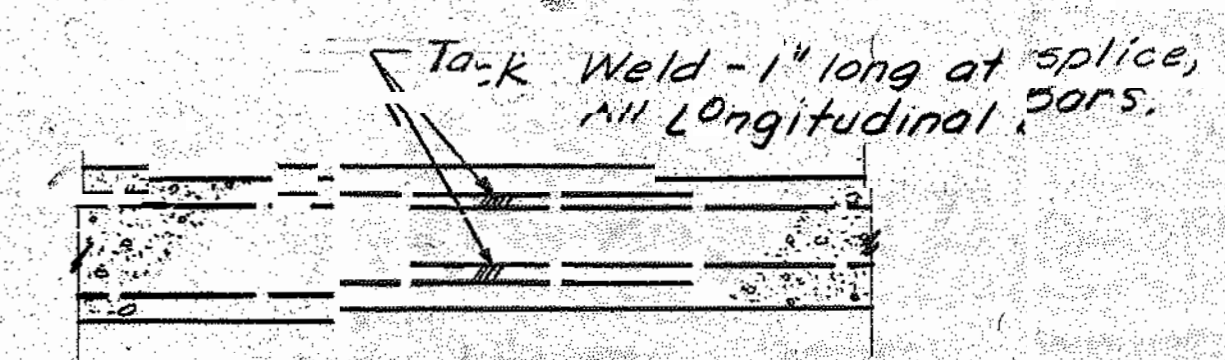
COLLECTOR BAR SECTION



COLLECTOR BAR TEST STATION
AT END OF STRUCTURE AND/OR AT END OF CONTRACT



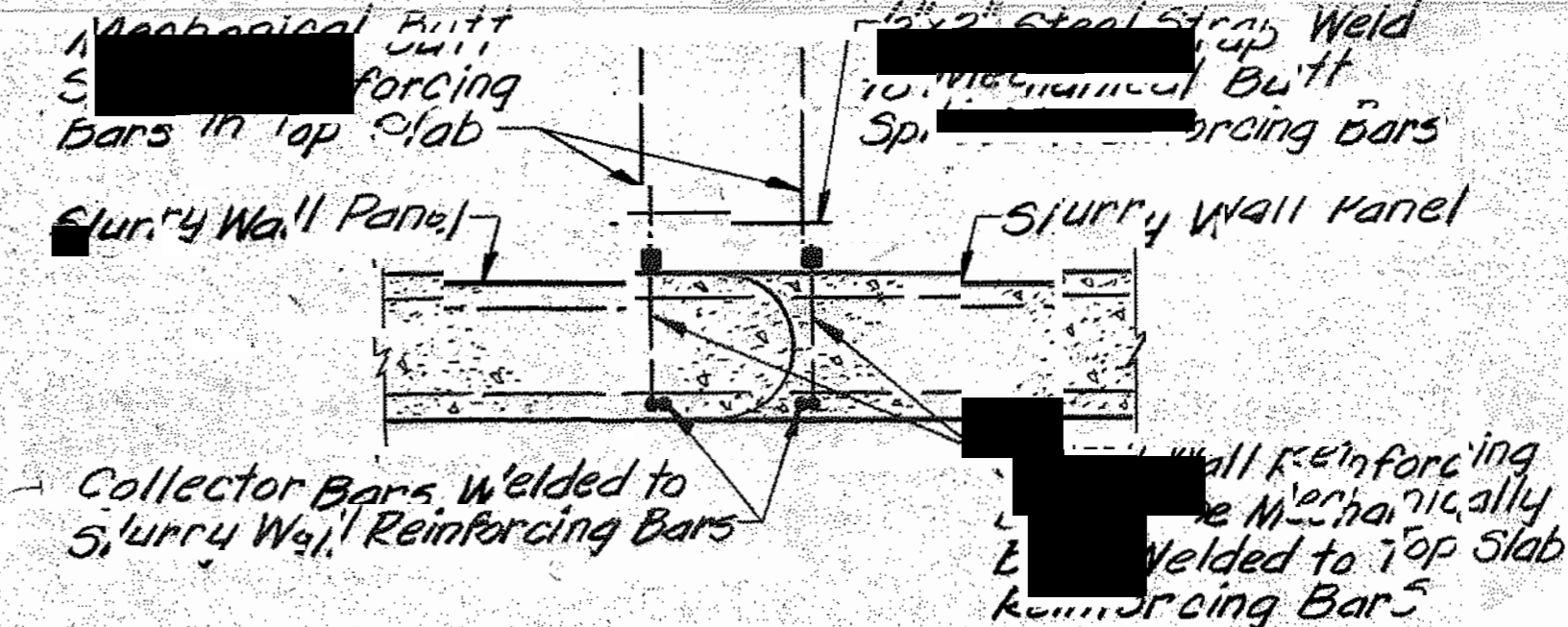
STANDARD COLLECTOR BAR TEST STATION



TACK WELD DETAIL

- NOTES:
- Waterstops are required in all joints for Top Slab and Invert Slab.
 - Waterstops will be 6\"/>

- Collector bars shall be installed at End-of-Structures, End-of-Contract and Construction Joints. Steel straps shall provide electrical continuity between inner and outer layers of reinforcement.
- The Test Stations shall be located on the center wall of the Tunnel Structures as per Sheet E1 and be positioned to allow access without use of a ladder or other equipment. (Test Stations shall be provided for all collector bar installations.)



TYPICAL JOINT BETWEEN SLURRY WALL PANELS

CATHODIC PROTECTION DETAILS



MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NW DAVIS TO ALEWIFE
CONTRACT NO. 091 - 509 PART A
TUNNEL DAVIS SQ STA TO CAMPBELL PARK PL
MISCELLANEOUS DETAILS - I

SVENDRUP & PARCEL AND ASSOCIATES, INC. MASS. BAY TRANSPORTATION AUTHORITY
ENGINEERS-ARCHITECTS-PLANNERS APPROVED BY
BOSTON, MASSACHUSETTS
Eugene Pels PROJECT MANAGER

SCALE: N.T.S. DRAWN BY: DESIGN BY: CHECK BY: PLAN NO. 54631
DATE: 2/7/80 1/1 ARM/NJB SHEET 516 OF 18

5/52
7/27/06

APPENDIX D

MBTA EXPIRED LICENSE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
LICENSE MBTA-13514
TRANSIT PROPERTIES
SOMERVILLE, MASSACHUSETTS
CITY OF SOMERVILLE

1. **The License**

The Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts, established and existing pursuant to Chapter 161A of the Massachusetts General Laws, with a usual place of business at 10 Park Plaza, Boston, Massachusetts (hereinafter referred to as "MBTA"), hereby grants The City of Somerville, 1 Franey Road, Somerville, Massachusetts 02143, employees, consultants and contractors (hereinafter referred to as "LICENSEE"), the right and privilege to work over the Red Line Tunnels within the Somerville Bike Path, Somerville, Massachusetts, as shown on Exhibit A, attached hereto and incorporated herein, (hereinafter referred to as the "Premises") for the purposes described in the Scope of Activity below. Such activity may be conducted only during the Term.

2. **General Conditions**

Among the terms and conditions of this License are included the following General Conditions:

- 2.1 **Date:** February 27, 2014
- 2.2 **Licensee:** City of Somerville
- 2.3 **Term:** From March 3, 2014 to March 2, 2015; except the MBTA may terminate this agreement with thirty (30) days written notice.
- 2.4 **Administrative Fee:** \$ 1,000.00 WAIVED
Design and Construction Review Fee: \$1,000.00 WAIVED
Design and Construction Structural Review Fee: \$1,000.00 WAIVED
License Fee: \$ 1,000.00 WAIVED
- 2.5 **Premises:** The area located within the Somerville Bike path over the Red Line tunnel between Elmwood Street and Thorndike Street, Somerville, Massachusetts, as more fully shown in Exhibit A attached hereto.
- 2.6 **Scope of License:** LICENSEE shall conduct repairs to an existing retaining wall and install a new drainage system on the Premises. No other investigations of any kind may be performed on MBTA owned land. LICENSEE shall have the right to permit its employees, contractors and agents to use the Premises as permitted

hereunder and acting by and through the LICENSEE, subject to all of the terms and conditions of this License.

LICENSEE understands and agrees to the following conditions:

1. LICENSEE shall adhere to the requirements in the (i) MBTA Design and Construction letter, dated February 3, 2014, attached hereto as Exhibit C; (ii) MBTA Track letter dated December 23, 2013, attached hereto as Exhibit D.
2. LICENSEE must submit to the MBTA an analysis of expected loads imposed on the Red Line Tunnel by the construction equipment (i.e., excavators, trucks). The Design and Construction Department must review and approve this documentation.
3. All work shall be coordinated with Red Line Operations, Engineering and Maintenance, Design and Construction and Safety so that oversight of the project can be performed to ensure the Red Line Tunnel structure is not compromised.
4. If cranes will be used, MBTA Safety shall receive all information as outlined in the May 6, 2011 Crane Requirements memorandum, as shown on www.transitrealty.com/License section. In addition, MBTA Safety shall be contacted at least 48 hours prior to the placement of the mobile crane to make arrangements to inspect and verify the operator's license and crane certifications.
5. The terms and conditions outlined in the MBTA Special Instructions, April 2003 and in the Right of Way Manual must be strictly adhered to.
6. LICENSEE shall not perform any excavating or drilling in the vicinity of the Red Line Tunnel unless an MBTA Structural Engineer, Track Engineer or representative from MBTA Engineering and Maintenance is present and approves the excavating.
7. A force account must be established to support MBTA departments through the completion of the project. LICENSEE and the MBTA shall share the cost of the work included under this Scope of License on a 50%-50% basis.
8. Licensee shall contact Tom Crowley, Red Line Construction Supervisor at 617-721-1197 to coordinate scope of work.

2.7 Notices:

MBTA:

Real Estate Department
Massachusetts Bay Transportation Authority
10 Park Plaza, Room 5750
Boston, Massachusetts 02116
Attn: Assistant General Manager
Real Estate and Asset Development

and

DESIGNATED REPRESENTATIVE:
Transit Realty Associates, LLC
77 Franklin Street, 9th floor
Boston, Massachusetts 02110
Attn: Chief Operating Officer

and

LICENSEE:
City of Somerville
Department of Public Works-Engineering Department
1 Franey Road
Somerville, Massachusetts 02143
Attn: Joseph A. Curatone, Mayor

3. **Consideration**

The rights contained in this License are granted for good and valuable consideration, the sufficiency of which is hereby acknowledged.

4. **Terms and Conditions of License**

This License is subject to the following terms and conditions:

4.1 **Scope of Activity**

(a) **Scope of Activity**

The Scope of Activity is the Scope of License (Section 2.6) as modified by the terms of this License and Exhibit B attached hereto and incorporated herein. The LICENSEE shall minimize the disruption to and alteration of the Premises and, as soon as possible after each entry onto the Premises, shall return the Premises to the condition existing immediately prior to the initiation of the Scope of Activity and entry hereunder.

Except in case of emergency, LICENSEE shall provide at least (5) days' prior written notice of its desire to enter the Premises to the MBTA's departments according to Section 2.6 for access. The MBTA may have an observer present at all times when LICENSEE is present on the Premises. See Exhibit B for required notice from LICENSEE when LICENSEE needs access because of an emergency. LICENSEE shall do all work in accordance with the Plan described in Exhibit B.

(b) **Utilities**

LICENSEE acknowledges that there may be surface and subsurface utilities on and adjacent to the Premises and agrees to exercise extreme caution in performance of the Scope of Activity. LICENSEE shall comply with Massachusetts General Laws, Chapter 82, Section 40 (said statute also known as the "Dig Safe" law) and the regulations promulgated pursuant thereto including but not limited to the Code of Massachusetts Regulations, more particularly, 220 CMR 99.00 et seq. LICENSEE is required to give prior written notification of any planned installation of the herein permitted utility to all pre-existing utility licensees of the MBTA if said planned installation will involve digging to within a three foot cylindrical area surrounding the center line of the existing utility conduit. To the extent the MBTA, or parties

acting on behalf of the MBTA, locate and mark utilities in the rights of way and appurtenant thereto, LICENSEE shall be responsible for payment to such parties for such services which may include, but not be limited to, locating and marking utilities, facilities and appurtenances thereto serving the line(s) or used in connection with services or operations of the MBTA. Any damage to any utilities on or near the Premises caused by LICENSEE shall be the sole responsibility of LICENSEE. If LICENSEE does not immediately repair any utilities it has damaged, the MBTA, without being under any obligation to do so and without waiving the LICENSEE's obligation hereunder, may repair any utilities damaged by the LICENSEE immediately and without notice in case of emergency. In the event the MBTA exercises such right, the LICENSEE shall pay to the MBTA immediately upon demand all of the MBTA's cost of performing such repairs plus a fee equal to twenty-five percent of the MBTA's cost of performing such repairs to reimburse the MBTA for its administrative costs.

(c) Subordination to MBTA's Operating Requirements

The work permitted hereby shall be subordinate to the requirements of the MBTA in maintaining and operating a transportation system and may be stopped or delayed, at any time, in response to each requirement. MBTA shall not be responsible for any damages incurred by LICENSEE as a result of any such work stoppage, delay or required relocation.

(d) Environmental Cooperation

If for any reason LICENSEE is not responsible for Hazardous Materials, defined below, on the Premises then LICENSEE agrees to cooperate with the MBTA in the determination of the party liable for the remediation of the Premises under applicable Federal and/or state law. Such cooperation may include the temporary adjustment of the rights granted to LICENSEE hereunder. The MBTA shall not be responsible for any damages incurred by the LICENSEE as a result of such temporary adjustment. "Hazardous Materials" shall mean "oil" or "hazardous materials", as those terms are defined in Massachusetts General Laws Chapter 21E ("Chapter 21E") and the regulations promulgated pursuant thereto, the Massachusetts Contingency Plan, 310 CMR 40.0000 et seq. (the "MCP").

(e) Remediation Obligation of the LICENSEE

Whenever by law or the terms of this License, LICENSEE is responsible for remediation of Hazardous Materials on MBTA property, LICENSEE, upon written demand of the MBTA, shall conduct, at LICENSEE's sole cost and expense (or, at the MBTA's election, reimburse the MBTA for the cost and expense incurred by the MBTA in connection with the MBTA's conduct of), all response actions required by Chapter 21E and the MCP with respect to the Hazardous Materials (including the hiring of a Licensed Site Professional). Any such response action, if performed by LICENSEE, shall be performed in accordance with Chapter 21E, the MCP, any other applicable statutes and regulations, and in accordance with plans and specifications approved by the MBTA, shall be completed in a timely manner to the reasonable satisfaction of the MBTA, and shall allow the MBTA to use the Premises, and/or MBTA owned adjacent or contiguous property, for its present use and for any future transportation use. LICENSEE shall also be responsible for the reasonable costs incurred by the MBTA in hiring consultants (including a

Licensed Site Professional) to review, supervise and inspect any plans, specifications, proposed method of work, installation, operation and results.

- (f) Notice of Project Completion and Record Drawings
Upon completion of its work, LICENSEE shall provide written notice ("Notice of Project Completion") to the MBTA Department of the date of project completion. The Notice of Project Completion shall be delivered to:

MBTA Design and Construction
100 Summer Street
Boston, Massachusetts 02110
Attn: Assistant General Manager

- (g) Evidence of Financial Responsibility
Prior to commencement of LICENSEE'S activities hereunder, LICENSEE shall provide evidence to the MBTA'S reasonable satisfaction that LICENSEE has sufficient financial resources available to discharge any anticipated obligations hereunder. Such resources may be in the form of LICENSEE'S net worth, insurance coverage, a bond or such other financial security as may be acceptable to the MBTA in form and amount.

- (h) Plan Review Costs – INTENTIONALLY OMITTED

4.2 Indemnification and Release of MBTA

- (a) LICENSEE shall indemnify, defend (at the option of the MBTA) and save the MBTA harmless from and against any and all liabilities, losses, damages, costs, expenses (including reasonable attorneys' expenses and fees), causes of action, suits, claims, demands or judgments of any nature whatsoever including, without limitation, those related to Hazardous Materials that may be imposed upon, incurred by, or asserted against the MBTA by reason of any of the following occurrences:
- (1) the activities of the LICENSEE hereunder or the exercise by the LICENSEE of any rights or privileges hereby granted; or
 - (2) the presence, discovery or revealing of any pre-existing Hazardous Materials on the Premises (or other property of the MBTA adjacent to the Premises) (i) which discovery is a result of the LICENSEE'S activities hereunder; (ii) where said Hazardous Materials are present because of LICENSEE'S previous occupancies of the Premises, whether those occupancies were unauthorized or permitted pursuant to prior agreements between the parties; or (iii) where those pre-existing Hazardous Materials migrated from land now or previously owned, leased, occupied or operated by the LICENSEE or for which the LICENSEE is a potentially responsible party as defined under Chapter 21E; or
 - (3) the placement or accidental release of any Hazardous Materials onto the Premises (or other property of the MBTA adjacent to the Premises) by

LICENSEE or its employees, agents, contractors or consultants or by the employees, agents, or consultants of LICENSEE's contractors or subcontractors; or

- (4) any use, condition or occupation of the Premises or any part thereof by LICENSEE; or
- (5) any failure of LICENSEE to perform or comply with any of the terms hereof, or of any contracts, agreements or restrictions, statutes, laws, ordinances or regulations affecting the activities or any part thereof.

In subsection (2) above, LICENSEE'S previous occupancies of the Premises includes occupancies by the predecessors in interest of LICENSEE.

- (b) LICENSEE has inspected the Premises and decided that the Premises are suitable for the uses LICENSEE contemplates. LICENSEE assumes all the risk of entry on to the Premises.
- (c) LICENSEE hereby releases the MBTA from any responsibility for LICENSEE's losses or damages related to the condition of the Premises, and LICENSEE covenants and agrees that it will not assert or bring, nor cause any third-party to assert or bring, any claim, demand, lawsuit or cause of action (whether by way of original claim, cross claim, counterclaim, contribution claim, indemnification claim, third-party claim or any other claim) (hereinafter "Claims") against the MBTA, including, without limitation, claims for response actions, response costs, assessments, containment, removal and remedial costs, governmental oversight charges, including any overhead or response action costs incurred or assessed by DEP, fines or penalties, permit and annual compliance fees, reasonable attorney and expert fees, natural resource damages, property damages, including diminution in property value claims, and personal injury damages and damages related to a person's death relating to, or arising from, the condition of the Premises.

LICENSEE shall obtain a written release of liability similar to the one in this Section 4.2(c) in favor of the MBTA from each of LICENSEE'S consultants and contractors before they enter onto the Premises.

- (d) In clarification of the above release and covenants of defense and indemnification, and not in limitation of them, LICENSEE shall indemnify, defend (at the option of the MBTA) and save the MBTA harmless from and against any and all liabilities, losses, damages, costs, expenses (including reasonable attorneys' expenses and fees), causes of action, suits, claims, demands or judgments related to the injury, illness or death of any employee of LICENSEE or of an employee of LICENSEE'S contractors or consultants; except if the "Claim" arose because of the MBTA's grossly negligent or willful misconduct. It shall not be grossly negligent to allow access to the Premises that are in substantially the condition they were in when LICENSEE inspected the Premises before accepting this License.

- (e) LICENSEE shall be notified, in writing, by the MBTA of the assertion of any claim against it that LICENSEE has agreed to indemnify above (the "Indemnified Claim").
- (1) If the MBTA decides to itself conduct the defense of an Indemnified Claim against it or to conduct any other response itself, LICENSEE shall reimburse the MBTA for all costs and expenses (including, without limitation, reasonable attorneys' fees and expenses) incurred by the MBTA in connection with the MBTA's defense of the Indemnified Claim against it and/or the conduct of all response actions, including, without limitation, those required by Chapter 21E and the MCP. The settlement or compromise of any Indemnified Claim shall not include the admission of guilt (or comparable plea), wrongdoing or negligence or the permitting or imposition of civil or criminal penalties or indictments, or the entering of consent decrees or orders of any kind by the MBTA on behalf of the LICENSEE or any other action that would materially prejudice the rights of the LICENSEE without the LICENSEE'S express written approval. The LICENSEE shall cooperate with the MBTA fully and promptly in the defense of any Indemnified Claim.
 - (2) If the MBTA decides to have LICENSEE defend the Indemnified Claim or handle the response action, the MBTA shall notify LICENSEE of that decision in writing and the LICENSEE shall bear the entire cost thereof and shall have sole control of the defense of any Indemnified Claim and all negotiations for its settlement or compromise provided that the MBTA is fully indemnified by the LICENSEE and provided further that the settlement or compromise shall not include the admission of guilt (or comparable plea), wrongdoing or negligence or the permitting or imposition of civil or criminal penalties or indictments, or the entering of consent decrees or orders of any kind by the LICENSEE on behalf of the MBTA or any other action that would materially prejudice the rights of the MBTA without the MBTA's express written approval. The MBTA shall cooperate with the LICENSEE in the defense of any Indemnified Claim.
- (f) If any response action due to the presence of Hazardous Material or the threat of release of Hazardous Waste onto the Premises (or other property of the MBTA which abuts the Premises), is performed by LICENSEE, the response action shall be performed in accordance Section 4.1 (e).

For purposes of this Section 4, the MBTA shall include the MBTA and its directors, officers, employees, agents, successors and assigns.

The provisions of Sections 4.1 and 4.2 shall survive the termination or expiration of this License.

4.3 Insurance

Prior to entry hereunder, LICENSEE and its consultants and contractors shall provide the MBTA with a certificate or certificates of insurance and shall, during the term hereof,

renew and replace any expired certificate, evidencing the insurance of the activities permitted hereunder, and LICENSOR's covenant of indemnification hereinabove, with companies that are reasonably acceptable to the MBTA, as stated below, in which LICENSOR and others hereinafter specified are either additional insureds as their interests may appear or named insureds and which provide minimum liability coverage as follows:

- (a) Commercial General Liability Insurance
Insuring the LICENSEE, the MBTA, the Premises and all activities allowed hereunder as well as LICENSEE's indemnification obligations contained in Section 4 with minimum liability coverage for personal injury, bodily injury and property damage with limits not less than One Million Dollars (\$1,000,000.00) per occurrence and Three Million Dollars (\$3,000,000.00) in aggregate. Umbrella liability coverage with limits of not less than Five Million Dollars (\$5,000,000.00) covering all work performed must also be provided. Such insurance shall be written on an occurrence basis (as opposed to a claims made basis). These policies shall name the MBTA as an additional insured.
- (b) Worker's Compensation Insurance
Insuring all persons employed by LICENSEE in connection with any work done on or about the Premises with respect to which claims for death or bodily injury could be asserted against the MBTA or the Premises with limits of liability of not less than those required by Massachusetts General Laws, Chapter 152, as amended. The policy shall contain a clause waiving the right of subrogation in favor of the MBTA. Each of LICENSEE's subcontractors and consultants shall have similar policies covering their employees.
- (c) Automobile Liability Insurance
Automobile liability insurance with limits of not less than One Million Dollars (\$1,000,000.00) covering all owned, non-owned, hired, rented or leased vehicles of LICENSEE and its consultants and contractors that are used in the activities permitted hereunder.
- (d) Railroad Protective Liability Insurance – Intentionally Omitted

The required insurance coverages hereinbefore specified shall be placed with insurance companies currently licensed by the Massachusetts Division of Insurance to do business in the Commonwealth of Massachusetts (which licensure shall remain in effect during the entire Term of this License) and having a Best's rating of B+ or better, shall be taken out before the License is commenced and be kept in full force and effect throughout the term of this License, shall be primary to and non-contributory to any insurance or self-insurance maintained by the MBTA, and shall require that the MBTA be given at least 30 days advance written notice in the event of any cancellation or materially adverse change in coverage. All such required insurance shall be written on an occurrence basis form, as opposed to a claim made basis form. The MBTA shall be named as an additional insured under the Commercial General Liability, Automobile Liability, Umbrella Insurance Policies. The Workers' Compensation and Employers' Liability Insurance Policies shall include a waiver of subrogation in favor of the MBTA which clause precludes these insurers from being able to make any subrogation claims against the MBTA. All such insurance as is required of the LICENSEE shall be provided by

or on behalf of all subcontractors to cover their operations performed. The LICENSEE shall be held responsible for any modifications, deviations or omissions in the compliance with these requirements by its subcontractors. At the inception date of the License and throughout the term of the License, the MBTA shall be provided with certificates of insurance evidencing that such insurance policies are in place and provide coverage as required.

ALL CERTIFICATES OF INSURANCE PERTAINING TO THIS REQUEST (AS WELL AS RENEWAL CERTIFICATES) SHOULD DESCRIBE THE SITE THAT IS COVERED.

4.4 Compliance with Laws

LICENSEE shall comply with, and shall cause all work performed to comply with all Federal, state, county, municipal and other governmental statutes, laws, rules, orders, regulations and ordinances.

LICENSEE shall also be responsible for obtaining any and all Federal, state, and/or local permits and/or approvals necessary to carry out the activities permitted hereunder.

4.5 Non-Exclusive Use

The MBTA makes no representations or warranty, express or implied, that the LICENSEE shall have sole or exclusive use of the Premises under this License. In the event other agreements, licenses or easements have been or are granted, the LICENSEE shall be responsible for coordinating its work and activities with that of other licensees and parties in interest. The MBTA shall not be liable for delays, obstructions, or like occurrences affecting the LICENSEE, arising out of the work of the MBTA or other licensees or parties in interest.

LICENSEE'S rights herein are granted subject to easements and rights of record and existing leases and licenses.

4.6 No Warranty

LICENSEE accepts the Premises "As Is" and the MBTA makes no warranty, express or implied, as to the condition of the Premises.

4.7 Termination

At the termination of this License for Entry, LICENSEE agrees to restore promptly the Premises to the condition it was in at the commencement of the term hereof (except for any installation explicitly permitted to remain herein), and to remove all of LICENSEE'S personal property and debris from the Premises. Should LICENSEE not perform such restoration at the end of the Term, the MBTA may perform any and all necessary restoration at the sole expense of the LICENSEE. Any personal property not so removed shall, at the option of the MBTA, either become the property of the MBTA or be removed by the MBTA and disposed of without any liability in the MBTA for such removal and disposition, all at the sole expense of LICENSEE.

4.8 Assignment

LICENSEE shall not, without the prior written consent of the MBTA, transfer or assign this License or any part hereof. Such consent may be withheld in the sole discretion of the

MBTA. Any assignment made by LICENSEE without the prior written consent of the MBTA shall render this License null, void and of no further force or effect.

5. Notices

All notices, demands, requests, consents, approvals and other instruments required or permitted to be given pursuant to the terms hereof (hereinafter "Notice"), shall be in writing and shall be deemed to have been properly given when delivered by a nationally recognized overnight mail service to the correct addressee described in Section 2.8., or when delivered by Facsimile Machine (FAX). Notice shall be deemed received when actually received or when the proffered Notice has been refused by the Addressee, or, when delivered by FAX, when the sender has received a "Successful Transmission" Notice. The signature of an employee, servant or agent of the Addressee shall be determinative on the issue of actual receipt.

LICENSEE and the MBTA shall, at any time and from time to time, have the right to specify as their proper addresses for purposes of this License any other address or addresses giving fifteen (15) days' written notice thereof to the other party.

6. Results

If this License explicitly allows LICENSEE to conduct certain investigations on MBTA owned land, then if asked to do so by the MBTA in writing, the LICENSEE agrees to provide to the MBTA, at no cost, a copy of the results of such investigations (including data and analysis) and all other work conducted under this License in both hard copy form and in a digital format specified by the MBTA regardless of whether the report was prepared by LICENSEE, its agent, consultant or contractor, or prepared on behalf of the LICENSEE. All results and reports shall be provided to the MBTA within ten (10) days of receipt by LICENSEE of such written request. LICENSEE agrees to consult with the MBTA prior to contacting any governmental entity, regarding any information, results of analysis or reports regarding the Premises. LICENSEE shall give the MBTA a copy of any reports or notifications, including but not limited to release notifications, prior to submitting the same to any governmental entity.

7. Default and Termination

(a) Termination for Non-Payment

In the event that LICENSEE shall neglect or fail to pay the License Fee, Administrative Fee or any other sum herein specified to be paid upon the due date hereunder, LICENSEE shall be in default and the MBTA shall have the right at any time thereafter to terminate this License by giving LICENSEE two (2) weeks written notice of the MBTA's decision to terminate for non-payment ("Termination Notice"). LICENSEE shall not be entitled to cure any such default by tendering payment after the expiration of the two (2) week grace period which starts upon LICENSEE's, or LICENSEE's servants, agents or employee's, receipt of (or refusal to accept) the MBTA's Termination Notice. Any amount due hereunder that is not paid when due shall be charged to 1.5% per month and 8% per annum.

(b) Default of Terms and Conditions

LICENSEE shall also be in default if LICENSEE:

- (1) fails to perform or observe any of the other covenants or agreements contained in this instrument and on its part to be performed or observed, or

- (2) makes any assignment for the benefit of creditors or files petition for relief under bankruptcy law, or
- (3) has a bankruptcy petition filed against it that is not dismissed within sixty (60) days, or
- (4) has its estate taken by process of law, proceeding in bankruptcy or insolvency or otherwise,

and if such defaults continue after two (2) weeks' written notice given by the MBTA to LICENSEE to cure, the MBTA may terminate this License by written notice to LICENSEE and/or deny access to the Premises and expel LICENSEE and those claiming through or under LICENSEE and remove LICENSEE'S effects from the Premises without prejudice to any remedies which might otherwise be available for such breach of covenant, and, upon entry as aforesaid, the rights of LICENSEE created by this License shall terminate. Notwithstanding the preceding, if LICENSEE begins to cure a default as soon as possible within said two week period and thereafter continues to pursue a cure with all due diligence, then the MBTA shall not terminate this License until and unless LICENSEE ceases to pursue a cure with all due diligence and has not in fact cured said default. LICENSEE agrees to pay any expense including reasonable attorneys' fees incurred by the MBTA in enforcing any of LICENSEE'S obligations hereunder.

Notwithstanding the preceding, if the default is one that threatens the safety of the public or the ability of the MBTA to operate its transit system, then it shall be considered an Emergency Default and if LICENSEE does not effect an immediate cure, the MBTA may terminate the License upon reasonable notice and use self help at the expense of LICENSEE and LICENSEE shall be responsible for such expenses as well as for a twenty five percent (25%) administrative fee above the expenses.

In the event this License is terminated pursuant to this Paragraph 7, the MBTA shall retain the License Fee as partial damages, without prejudice to its right to claim additional damages as a result of the breach.

8. Holding Over

- A. If LICENSEE desires to continue the work defined in the Scope of Activity after the termination of this License, the resulting license shall be on a month-to-month basis and may be terminated by either party at any time by providing the other party with thirty (30) days prior written notice of termination. During such extended term, LICENSEE shall be bound by all applicable provisions of this License.

9. Work in Harmony

LICENSEE agrees that in any work performed in or about the Premises, it will employ only labor which can work in harmony with all elements of labor being employed by the MBTA.

10. Promotional Material

LICENSEE shall not, without the prior written approval of the MBTA, refer to the MBTA in any promotional matter or material, including, but not limited to advertising, letterheads, bills, invoices and brochures.

11. Nondiscrimination

With respect to its exercise of all rights and privileges herein granted, LICENSEE shall undertake affirmative action as required by Federal and state laws, rules and regulations pertinent to Civil Rights and Equal Opportunity unless otherwise exempted therefrom. LICENSEE agrees that it shall comply with any and all required affirmative action plans submitted pursuant to the directives of any Federal agency and in accordance with applicable Federal Law and applicable state laws, rules and regulations.

LICENSEE shall not discriminate against any person, employee or applicant for employment because of race, color, creed, national origin, age, sex, sexual orientation, disability or Vietnam era veteran status in its activities at the Premises, including without limitation, the hiring and discharging of employees, the provision or use of services and the selection of suppliers, contractors, or subcontractors.

Consistent with the law, LICENSEE shall use reasonable efforts to contact, encourage and utilize minority and female business enterprises in the procurement of materials and service under this License.

12. Taxes

LICENSEE shall be solely responsible for the payment of any taxes, levies, betterments or assessments, fees or charges, whether in existence on the date hereof or becoming applicable during the Term, which may be assessed against LICENSEE or the MBTA which are directly attributable to LICENSEE'S installations in, or use of, the Premises, or any personal property or fixtures of LICENSEE located thereon (collectively referred to as "Taxes"). LICENSEE shall pay all Taxes directly to the taxing authority before delinquency and before any fine, interest, or penalty shall become due or be imposed by operation of law for their nonpayment. Such payments shall constitute an additional License Fee hereunder.

LICENSEE may contest, in good faith for its own account and at its own expense, the validity or amount of any Taxes, provided LICENSEE shall indemnify the MBTA against any resulting loss, cost and expense. LICENSEE shall not permit a lien or encumbrance on the Premises by reason of failure to pay any Taxes.

13. No Third Party Beneficiaries

This License shall not be construed to create any third party beneficiary rights in favor of any other parties or any right or privilege for the benefit of any other parties.

14. Entire Agreement

This License contains the entire agreement of the parties hereto with respect to the subject matter hereof, and no representations, inducements, promises, or agreements, oral or otherwise, between the parties hereto with respect to the subject matter hereof not embodied herein shall be of any force or effect.

15. Governing Law

This License shall be construed and interpreted under and pursuant to the laws of the Commonwealth of Massachusetts, and the Massachusetts and Federal conflict of laws provisions shall not be applied if the result is that other than Massachusetts law shall govern.

16. Successors and Assigns

The provisions of this License shall be binding on and inure to the benefit of the parties hereto and their respective successors and assigns.

17. Limitation On Damages

The MBTA shall not be liable to LICENSEE for any loss of business or any indirect, incidental, special, consequential or exemplary damages or lost profits unless specified herein.

- 18. No Waiver** No failure by Licensor to insist upon strict performance of any term, covenant or condition hereof, or to exercise any right or remedy consequent upon a breach thereof shall constitute a waiver of any such breach or of any such term, covenant or condition. The acceptance by Licensor of any amount less than the full amount due to Licensor hereunder shall not be deemed a waiver by Licensor of its right to collect the full amount due. Licensor may deposit checks or drafts that state "final payment", "payment in full" or the like without being deemed to have waived its right to receive all amounts due hereunder. Any waiver by Licensor of any term, covenant or condition hereof shall not be effective unless such waiver is in writing.

IN WITNESS WHEREOF, the parties hereto have caused this License to be executed this _____ day of _____ 2014 .

**MASSACHUSETTS BAY TRANSPORTATION
AUTHORITY**

CITY OF SOMERVILLE

By: _____

By: _____

Mark E. Boyle

Printed Name: _____

Assistant General Manager
Real Estate and Asset Development

Title: _____

EXHIBIT A
PLAN OF PROPERTY

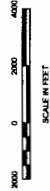
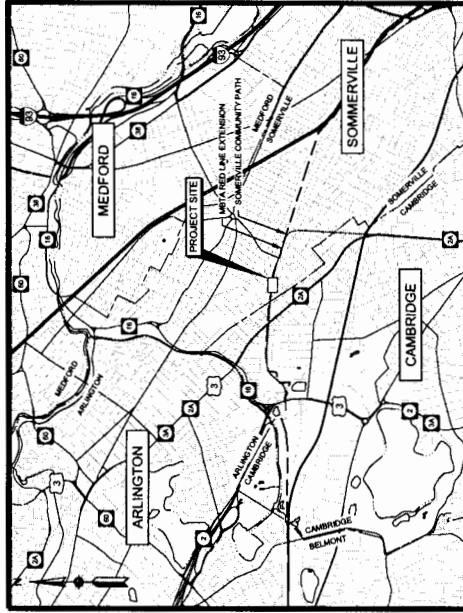
CITY OF SOMERVILLE



PLAN OF SOMERVILLE COMMUNITY PATH ENHANCEMENTS

LIST OF DRAWINGS

DRAWING	SHEET NO.	DESCRIPTION
000	1	TITLE SHEET & INDEX
001	2	LEGEND & ABBREVIATIONS
001-002	3-4	EXISTING CONDITIONS PLAN
C11-013	5-6	SITE AND TRAIL PROFILE PLANS
C21-021	7-8	SWIMS AND DRAINAGE PLANS
003	9	CONSTRUCTION DETAILS
001-004	10-13	META REDLINE EXTENSION RECORD DRAWINGS



LENGTH OF PROJECT = 900.00 FEET = 0.170 MILES



Maguire Group Inc.
211 Congress Street, 11th Floor
Boston, Massachusetts 02110
617-778-1440
www.cdmmaguire.com

REVISIONS	Number	Description	Date

**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

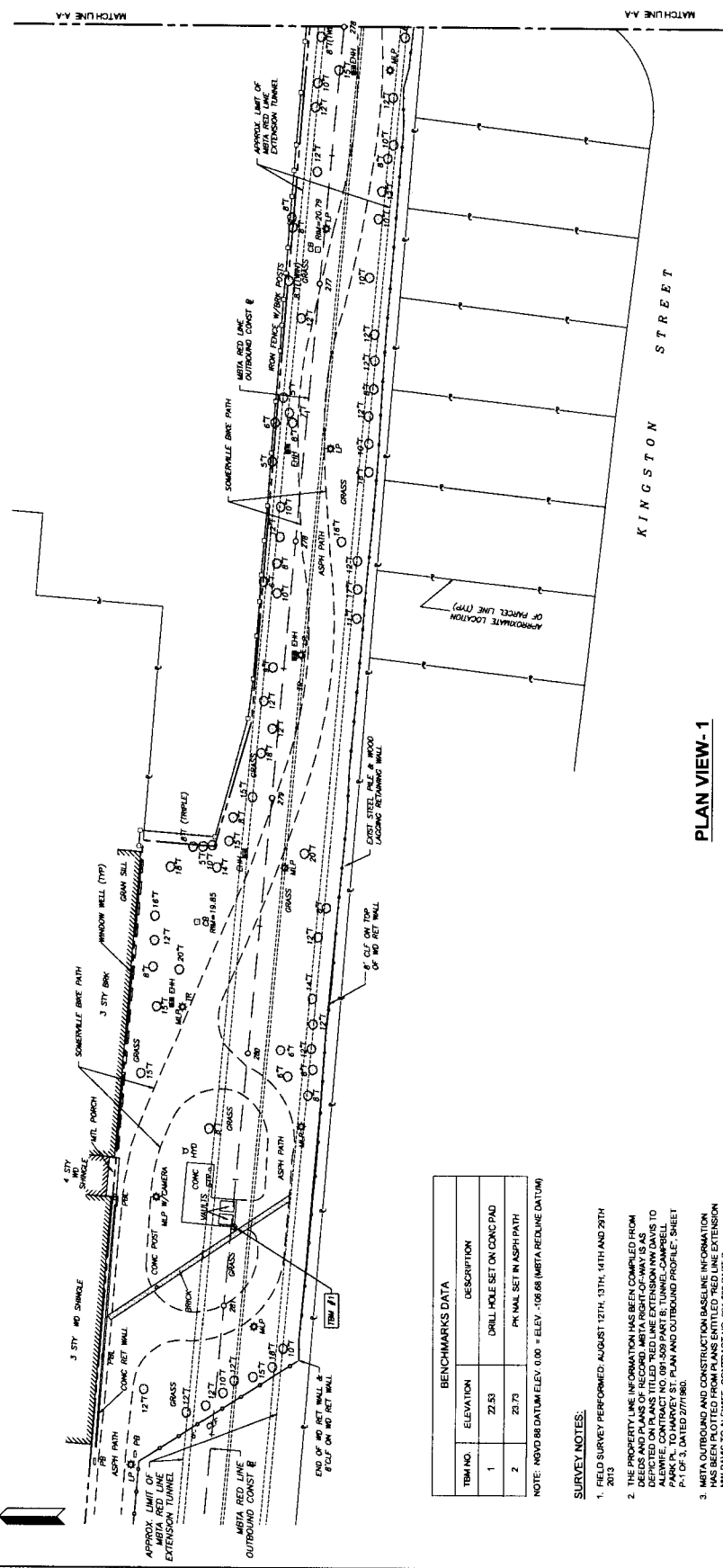
**CITY OF SOMERVILLE
 COMMUNITY PATH
 ENHANCEMENTS**

**EXISTING
 CONDITIONS
 PLAN - 1**

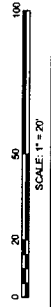
PROJECT NO.: 160602
 DESIGNED BY: JTS
 DRAWN BY: JTS
 CHECKED BY:
 DATE: NOVEMBER 6, 2013
 SCALE: AS SHOWN
 DRAWING

C01

SHEET 3 OF 13



PLAN VIEW - 1



BENCHMARKS DATA	
TBM NO.	DESCRIPTION
1	DRILL HOLE SET ON CONC PAD
2	PK NAIL SET IN ASPH PATH

NOTE: NGVD 88 DATUM ELEV. 0.00 = ELEV. -106.88 (META REDLINE DATUM)

SURVEY NOTES:

1. FIELD SURVEY PERFORMED AUGUST 12TH, 13TH, 14TH AND 20TH 2013.
2. THE PROPERTY LINE INFORMATION HAS BEEN COMPILED FROM DEEDS AND PLANS OF RECORD. META RIGHT-OF-WAY IS AS DEPICTED ON PLANS TITLED "RED LINE EXTENSION NW DAVIS TO ALENWEE, CONTRACT NO. 091-509 PART B; TUNNEL-CAMPBELL PARK PL. PLAN AND OUTBOUND PROFILE", SHEET P-1 OF 3, DATED 2/7/10.
3. META OUTBOUNDS AND CONSTRUCTION BASELINE INFORMATION HAS BEEN PLOTTED FROM PLANS ENTITLED "RED LINE EXTENSION NW DAVIS TO ALENWEE, CONTRACT NO. 091-509 PART B; TUNNEL-CAMPBELL PARK PL. TO HARVEY ST. RIGHT-OF-WAY PLAN", PLAN NOS. 0460 AND 0461, DATED 2/7/10.
4. ELEVATIONS REFER TO NGVD88 AS DETERMINED BY GPS OBSERVATIONS.



Maguire Group Inc.
 115 Park
 115 Park
 115 Park
 115 Park

REVISIONS	Number	Description	Date

PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION

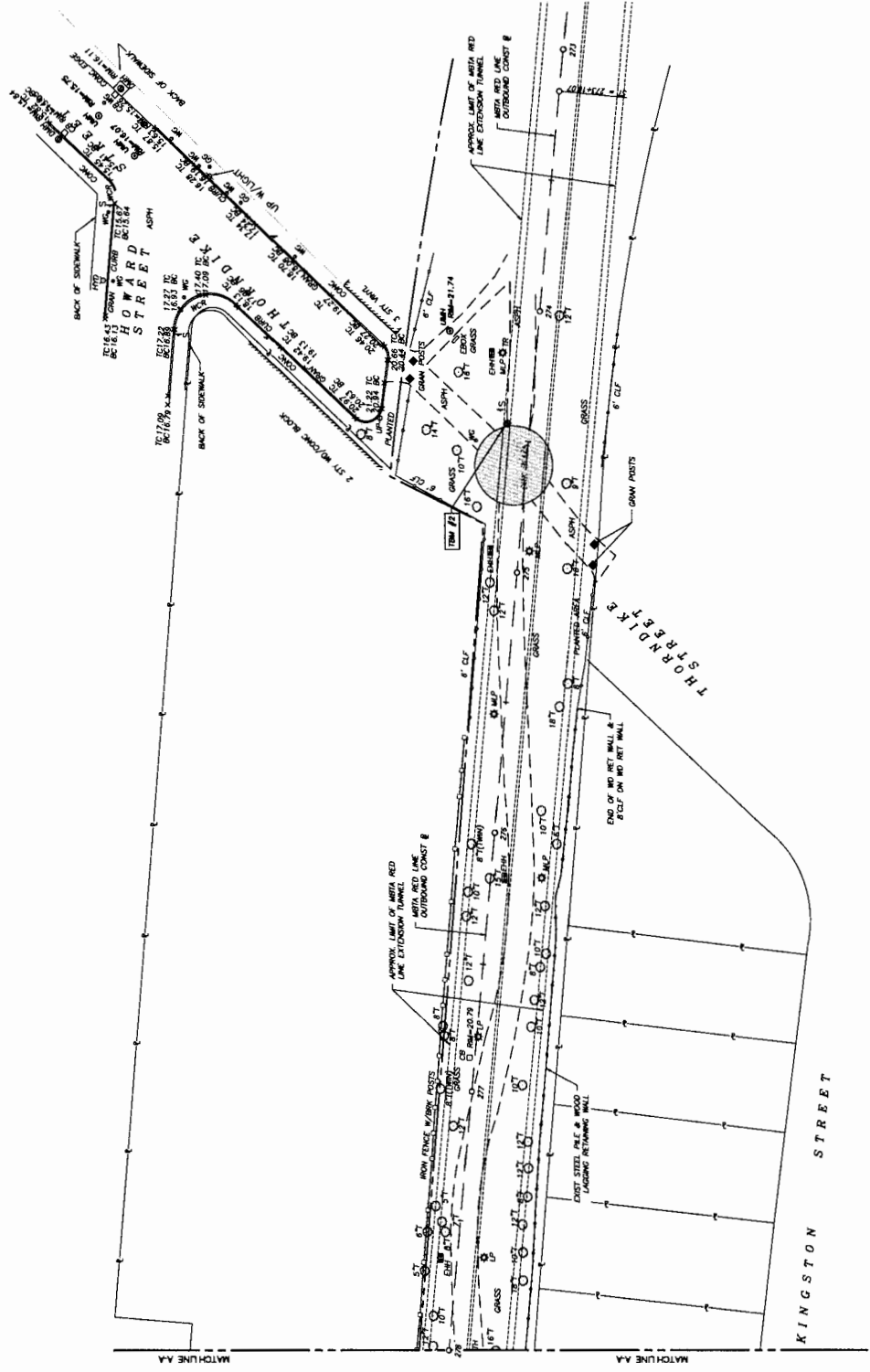
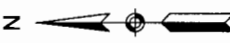
CITY OF SOMERVILLE
 COMMUNITY PATH
 ENHANCEMENTS

EXISTING
 CONDITIONS
 PLAN - 2

PROJECT NO.: 1808.02
 DESIGNED BY: JTS
 DRAWN BY: JTS
 CHECK BY:
 DATE: NOVEMBER 8, 2013
 SCALE: AS NOTED
 DRAWING

C02

SHEET 4 OF 13



PLAN VIEW-2



REVISIONS	Description	Date

**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

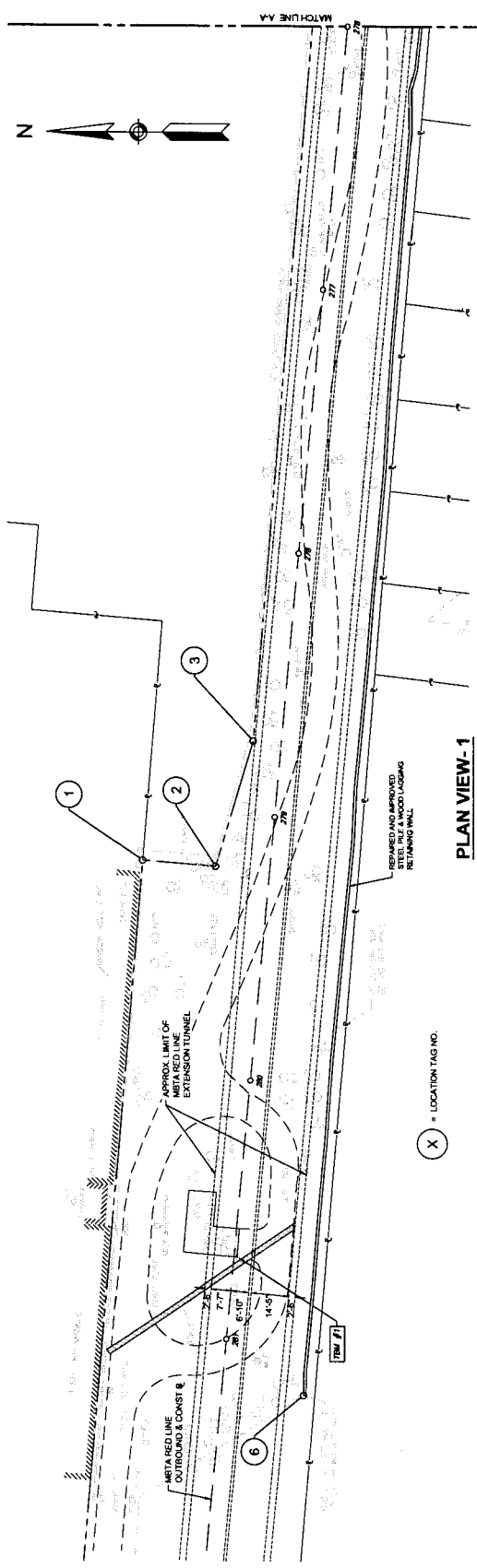
**CITY OF SOMERVILLE
 COMMUNITY PATH
 ENHANCEMENTS**

**SITE PLAN
 &
 PROFILE - 1**

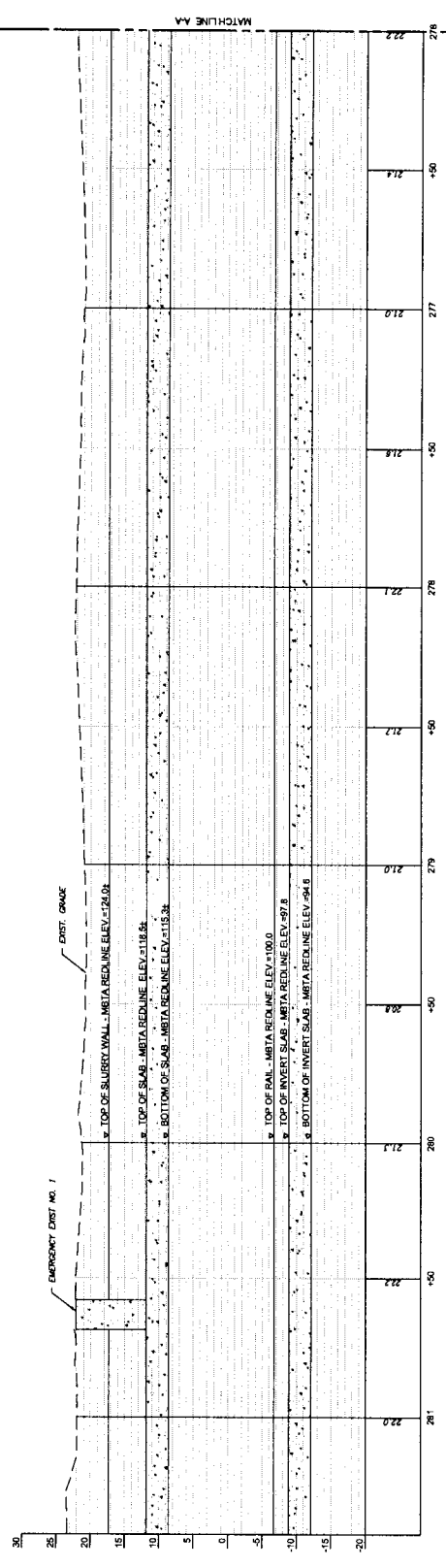
PROJECT NO.: 1006102
 DESIGNED BY: JTS
 DRAWN BY: JTS
 CHECKED BY: JTS
 DATE: NOVEMBER 8, 2013
 SCALE: AS NOTED
 DRAWING

C12

SHEET 5 OF 13



PLAN VIEW - 1



TUNNEL PROFILE - 1

LEGEND

- PROPOSED HOT MIX ASPHALT
- PROPOSED CONCRETE
- PROPOSED LOAM AND SEED

NOTES:

1. EXISTING MBTA TUNNEL WIDTH HAS BEEN PLOTTED FROM THE DIMENSIONS OF CONTRACT NO. 091-559 PART B: TUNNEL-CAMPBELL PARK PL. TO HARVEY ST. SECTIONS AA & B-B', PL. AN NO. 54712, DATED 2/7/1980.
2. EXISTING MBTA TUNNEL ELEVATIONS HAVE BEEN PLOTTED FROM THE INFORMATION SHOWN ON A PLAN ENTITLED "RED LINE EXTENSION NW DAVIS TO ALENHURST CONTRACT NO. 091-559 PART B: TUNNEL-CAMPBELL PARK PL. TO ALENHURST" PROFILE STA. 276+00 TO STA. 286+10', PL. AN NO. 54701, DATED 2/7/1980.
3. SEE PLAN SHEET C13 FROM LAYOUT DATA.



REVISIONS	Number	Description	Date

**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

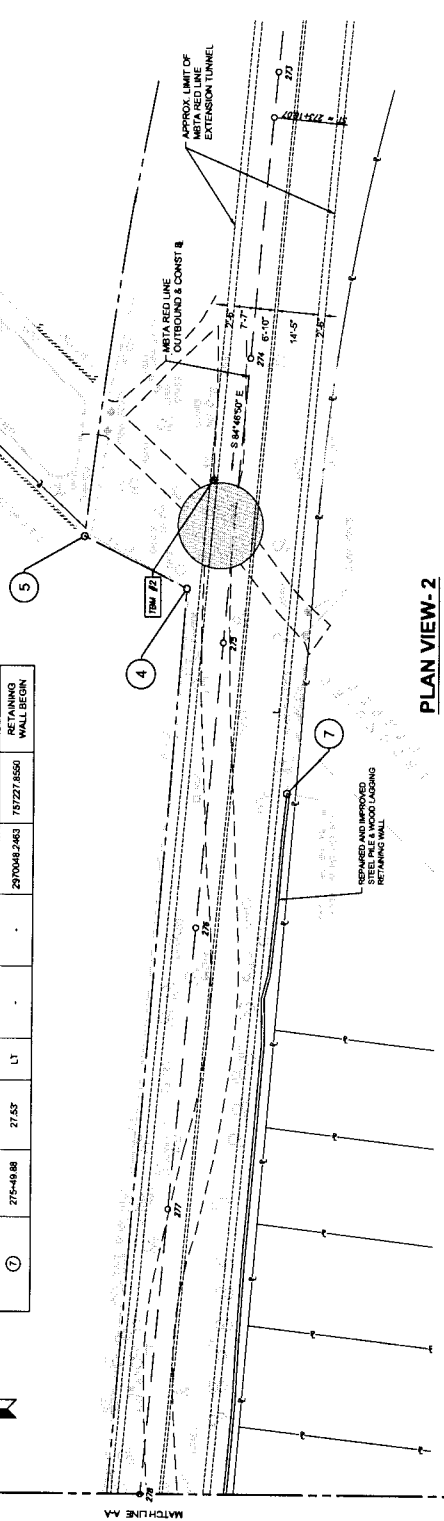
**CITY OF SOMERVILLE
 COMMUNITY PATH
 ENHANCEMENTS**

**SITE PLAN
 &
 PROFILE - 2**

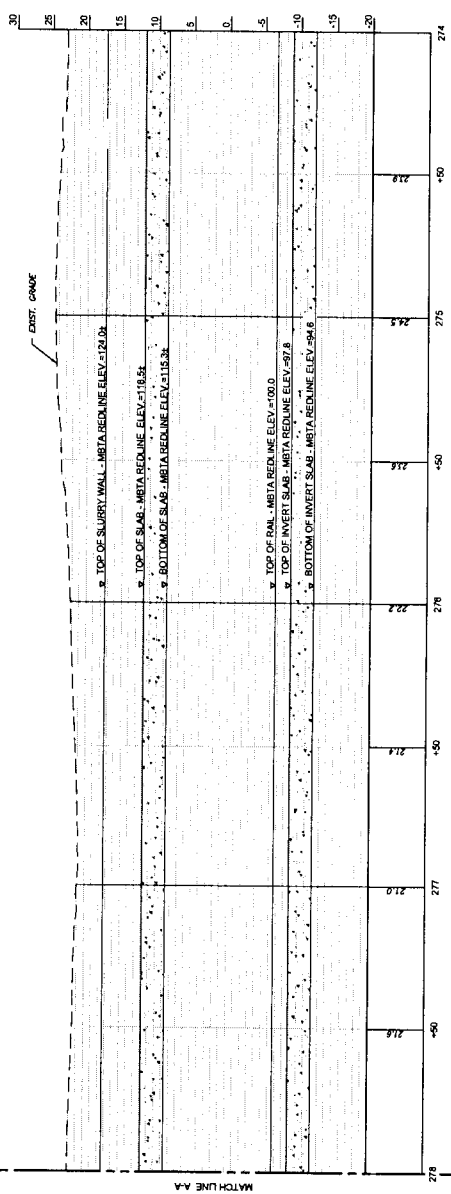
PROJECT NO.: 1006102
 DESIGNED BY: JTS
 DRAWN BY: JTS
 CHECKED BY: JTS
 DATE: NOVEMBER, 2013
 SCALE: AS NOTED
 DRAWING

C13
 SHEET 6 OF 13

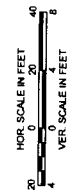
TAG NO.	MBTA REDLINE EXTENSION OUTBOUND & CONSTRUCTION BASELINE		LOCATION DATA		STATE PLANE COORDINATES		COMMENTS	
	STATION	OFFSET	SIDE	MBTA REDLINE EXTENSION COORDINATES	NORTHING	EASTING		
1	279+21.03	48.75	LT	50488.903	70665.750	2970157.9890	756985.1600	RIGHT-OF-WAY CORNER
2	279+20.76	20.75	RT			2970130.0820	756982.9040	RIGHT-OF-WAY CORNER
3	278+71.77	10.78	RT	50447.553	700611.351	2970115.6790	756910.7840	RIGHT-OF-WAY CORNER
4	274+82.86	14.63	RT			2970284.1190	757298.6310	RIGHT-OF-WAY CORNER
5	274+68.10	57.26	RT	50452.155	701017.127	2970120.2860	757316.5580	RIGHT-OF-WAY CORNER
6	261+18.89	31.48	LT			2970296.0521	756861.3358	RETAINING WALL END
7	275+48.88	27.55	LT			2970048.2463	757227.8550	RETAINING WALL BEGIN



PLAN VIEW - 2



TUNNEL PROFILE - 2



REVISIONS	Number	Description	Date

PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION

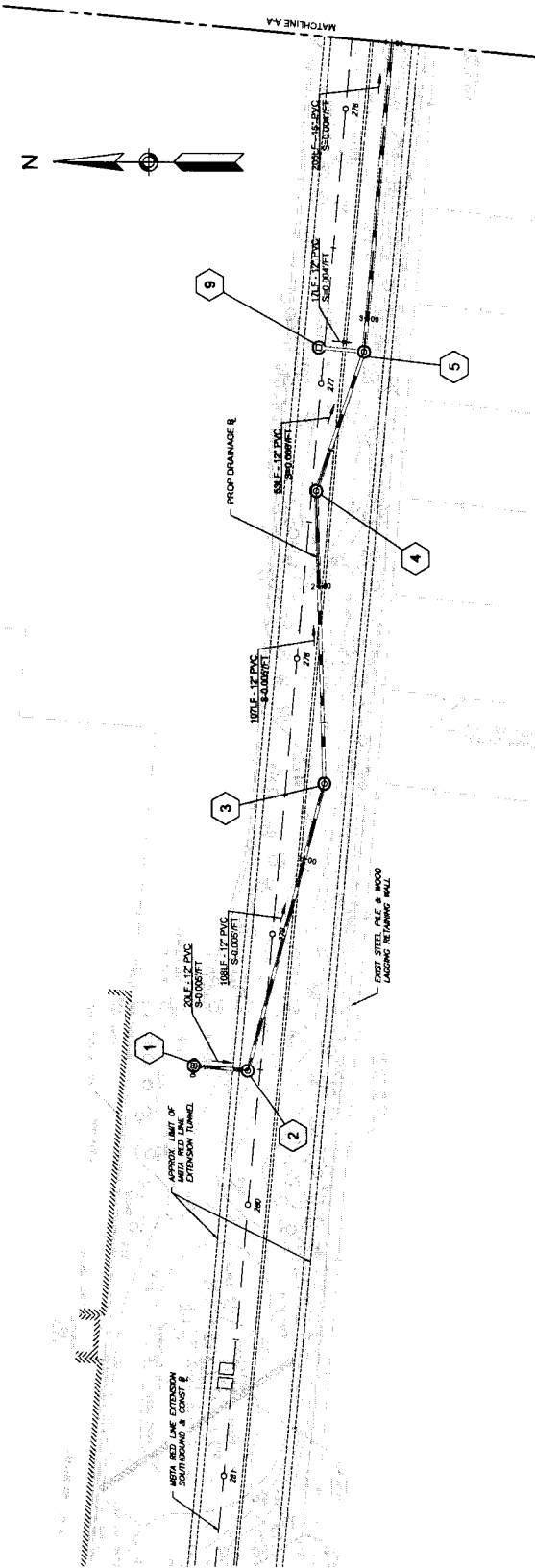
CITY OF SOMERVILLE
 COMMUNITY PATH
 ENHANCEMENTS

GRADING & DRAINAGE
 IMPROVEMENTS
 PLAN & PROFILE - 1

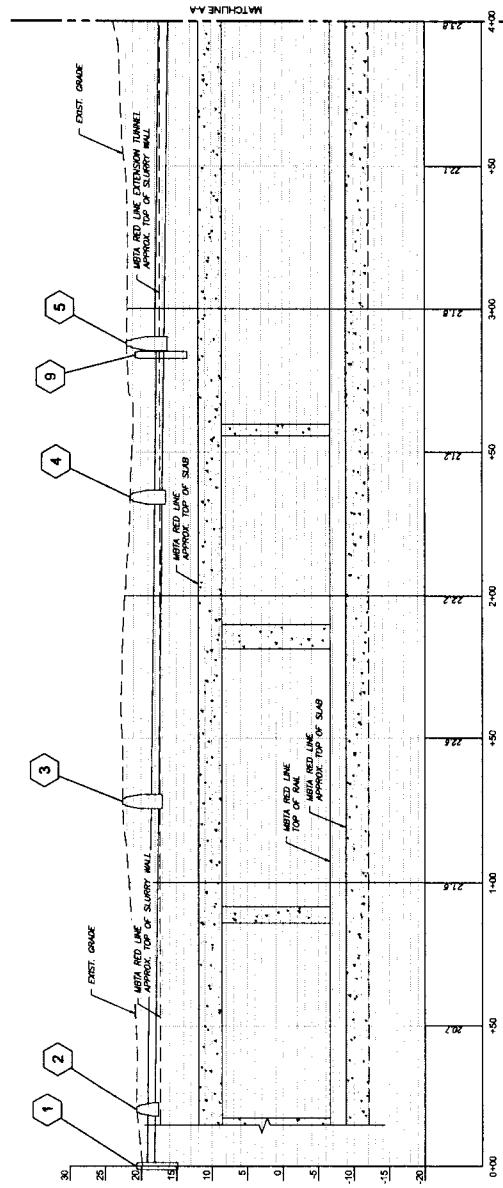
PROJECT NO.: 1606102
 DESIGNED BY: KOK
 DRAWN BY: DK
 CHECK BY:
 DATE: NOVEMBER 8, 2013
 SCALE: AS NOTED
 DRAWING

C20

SHEET 4 OF 13



PLAN VIEW - 1



DRAINAGE PROFILE - 1



NO.	TYPE	STATION	OFFSET	IN/WELEV	IN/IN	IN/OUT	REMARKS
1	48" DIA PRE-CAST CONCRETE W/ FAC	1+10.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
2	48" DIA PRE-CAST CONCRETE W/ FAC	2+00.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
3	48" DIA PRE-CAST CONCRETE W/ FAC	3+00.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
4	48" DIA PRE-CAST CONCRETE W/ FAC	3+50.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
5	48" DIA PRE-CAST CONCRETE W/ FAC	4+00.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
6	EXIST OR						EXIST OR
7	48" DIA PRE-CAST CONCRETE W/ FAC	1+10.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
8	48" DIA PRE-CAST CONCRETE W/ FAC	2+00.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC
9	48" DIA PRE-CAST CONCRETE W/ FAC	3+00.00	11.00	11.00	11.00	11.00	48" DIA PRE-CAST CONCRETE W/ FAC

- DRAINAGE NOTES**
- META RED LINE EXTENSION TUNNEL PROFILE HAS BEEN PLOTTED FROM AN AS EXISTING 'RED LINE EXTENSION' TUNNEL CAMPBELL PARK PL. TO HARVEY ST. PLAN AND PROFILE ARE SHOWN ON SHEET STA. 286+70.7 PLAN NO. 84701. SHEET SQUARED 277/800.
 - ALL DRAINAGE PIPE SHALL BE SINKS PVC PIPE UNLESS OTHERWISE NOTED.
 - NEOPRENE COUPLERS WITH STAINLESS STEEL BANDS AND GASKETS SHALL BE REQUIRED FOR JOINING DISSIMILAR TYPES OF PIPES.
 - ALL EXISTING DRAIN OR SEWER STRUCTURES SHALL BE CORED PRIOR TO INSTALLING NEW PIPES.

REVISIONS	Number	Description	Date

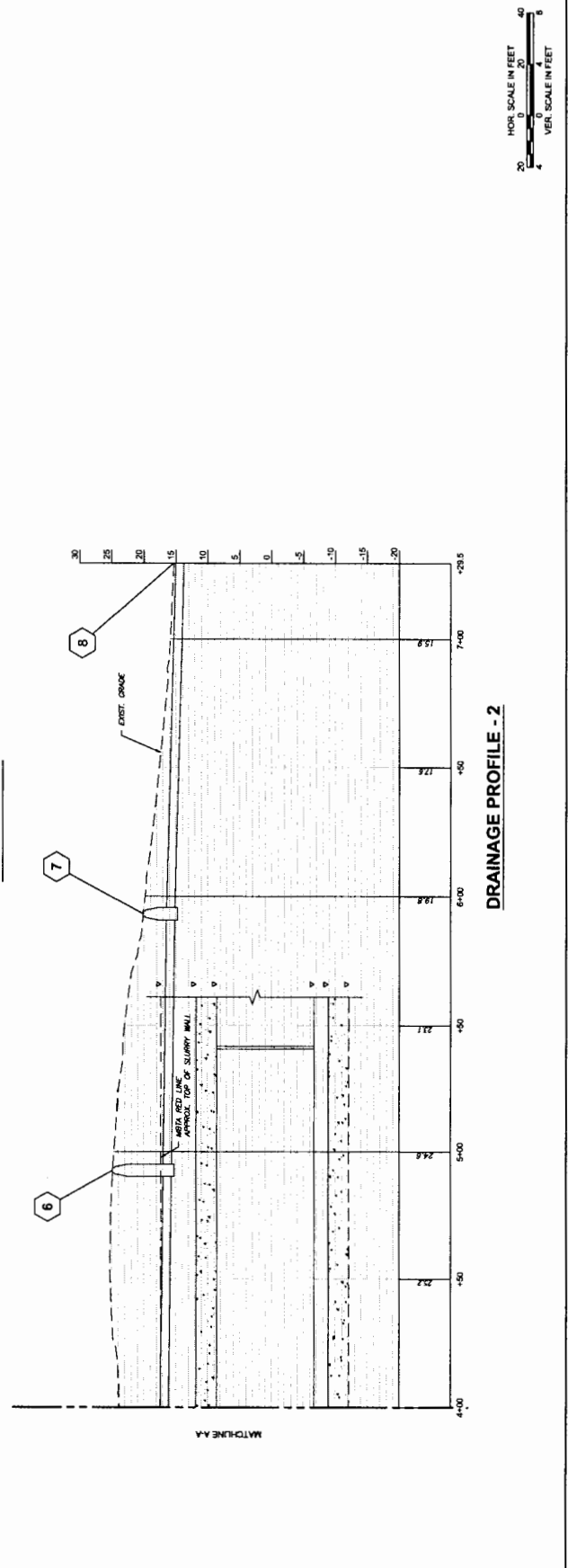
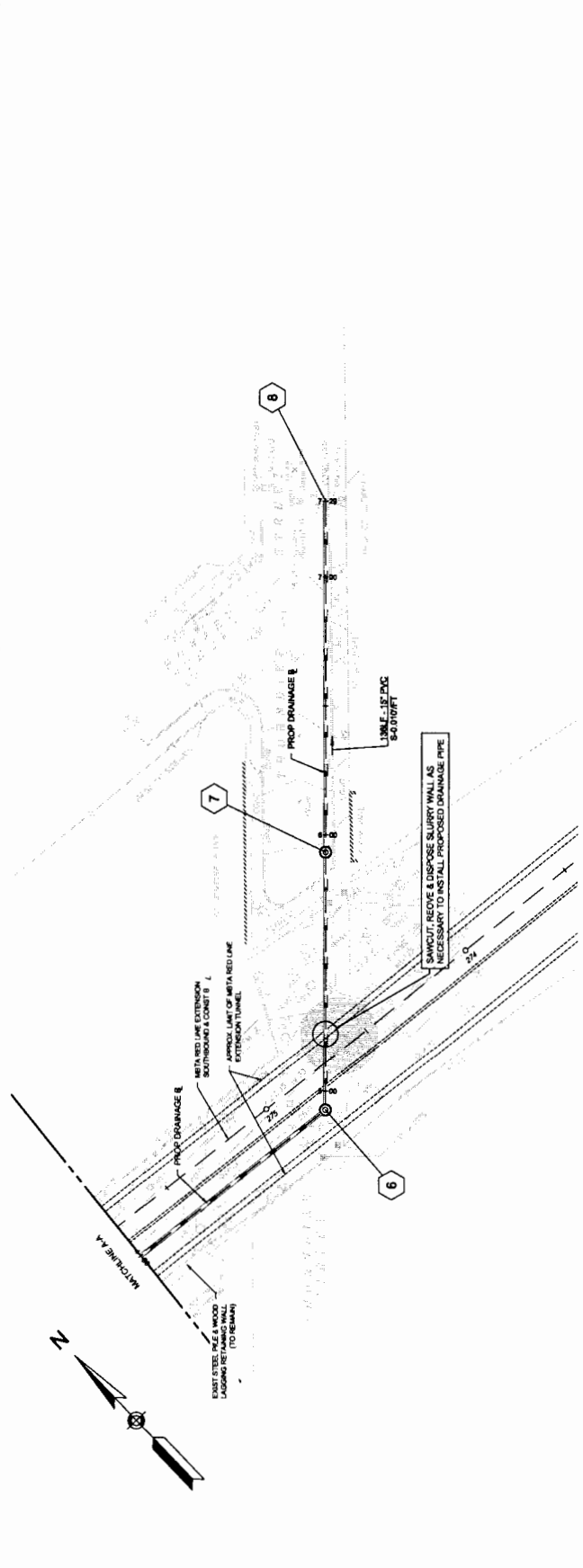
PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION

CITY OF SOMERVILLE
 COMMUNITY PATH
 ENHANCEMENTS

GRADING & DRAINAGE
 IMPROVEMENTS
 PLAN & PROFILE - 2

PROJECT NO.: 1000102
 DESIGNED BY: XJK
 DRAWN BY: XX
 CHECKED BY:
 DATE: NOVEMBER 6, 2013
 SCALE: AS NOTED
 DRAWING

C21



REVISIONS	Number	Description	Date

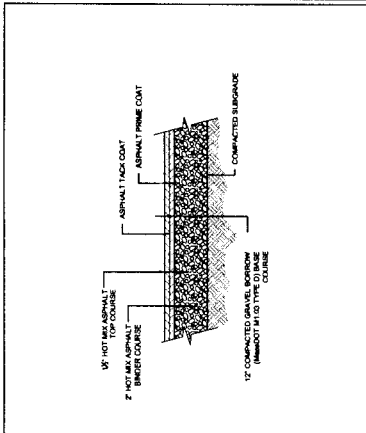
**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

**CITY OF SOMERVILLE
 COMMUNITY PARK
 ENHANCEMENTS**

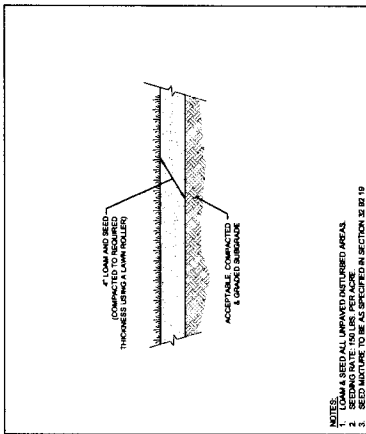
**CONSTRUCTION
 DETAILS**

PROJECT NO.: 1608-02
 DESIGNED BY:
 DRAWN BY:
 CHECKED BY:
 DATE: NOVEMBER 8, 2013
 SCALE: NOT TO SCALE
 DRAWING

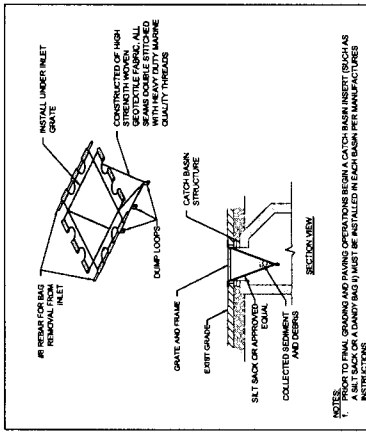
C30



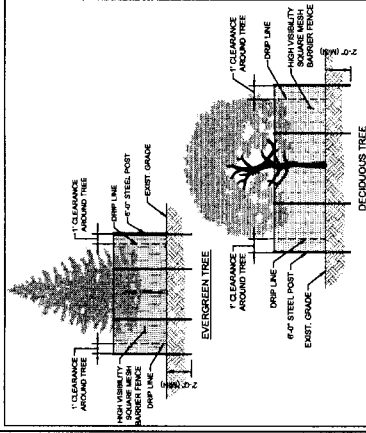
4 HOT MIX ASPHALT PAVEMENT
 N.T.S.



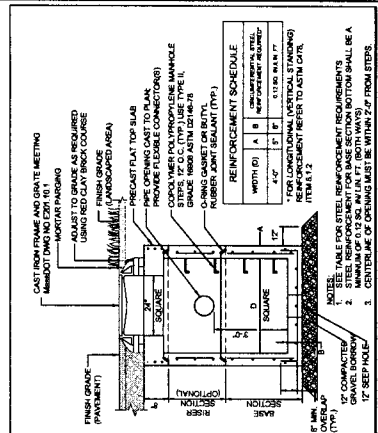
3 LOAM & SEED DETAIL
 N.T.S.



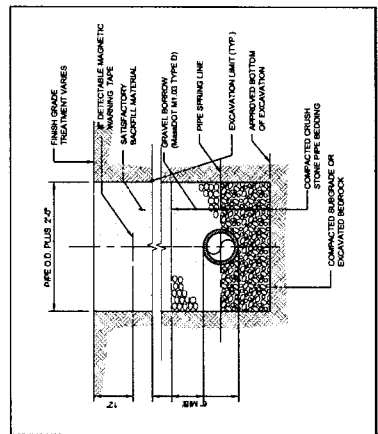
2 INLET PROTECTION DETAIL
 NOT TO SCALE



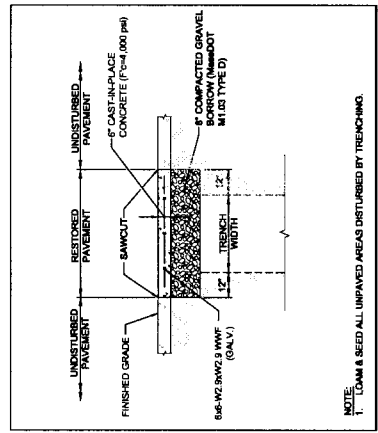
1 TEMPORARY TREE PROTECTION
 N.T.S.



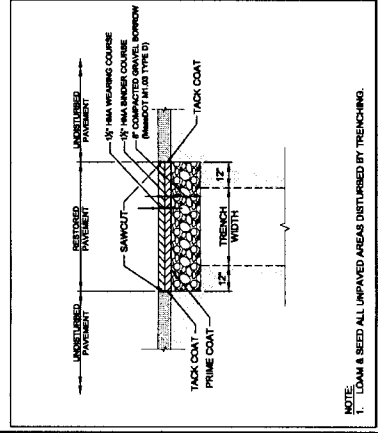
8 PRECAST CATCH BASIN DETAIL
 N.T.S.



7 DRAINAGE PIPE TRENCH DETAIL
 N.T.S.



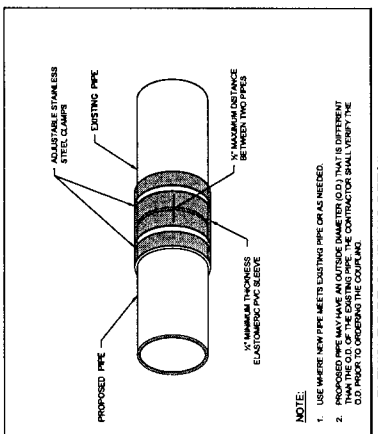
6 CONCRETE PAVEMENT RESTORATION DETAIL
 N.T.S.



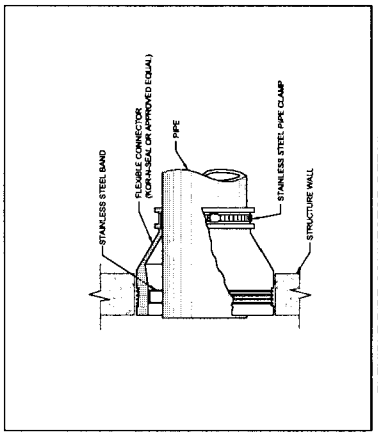
5 HOT MIX ASPHALT PAVEMENT RESTORATION DETAIL
 N.T.S.



11 FLEXIBLE PIPE COUPLING DETAIL
 N.T.S.



10 FLEXIBLE PIPE CONNECTOR DETAIL
 N.T.S.



9 PRECAST DRAIN MANHOLE
 N.T.S.

REVISIONS	Number	Description	Date

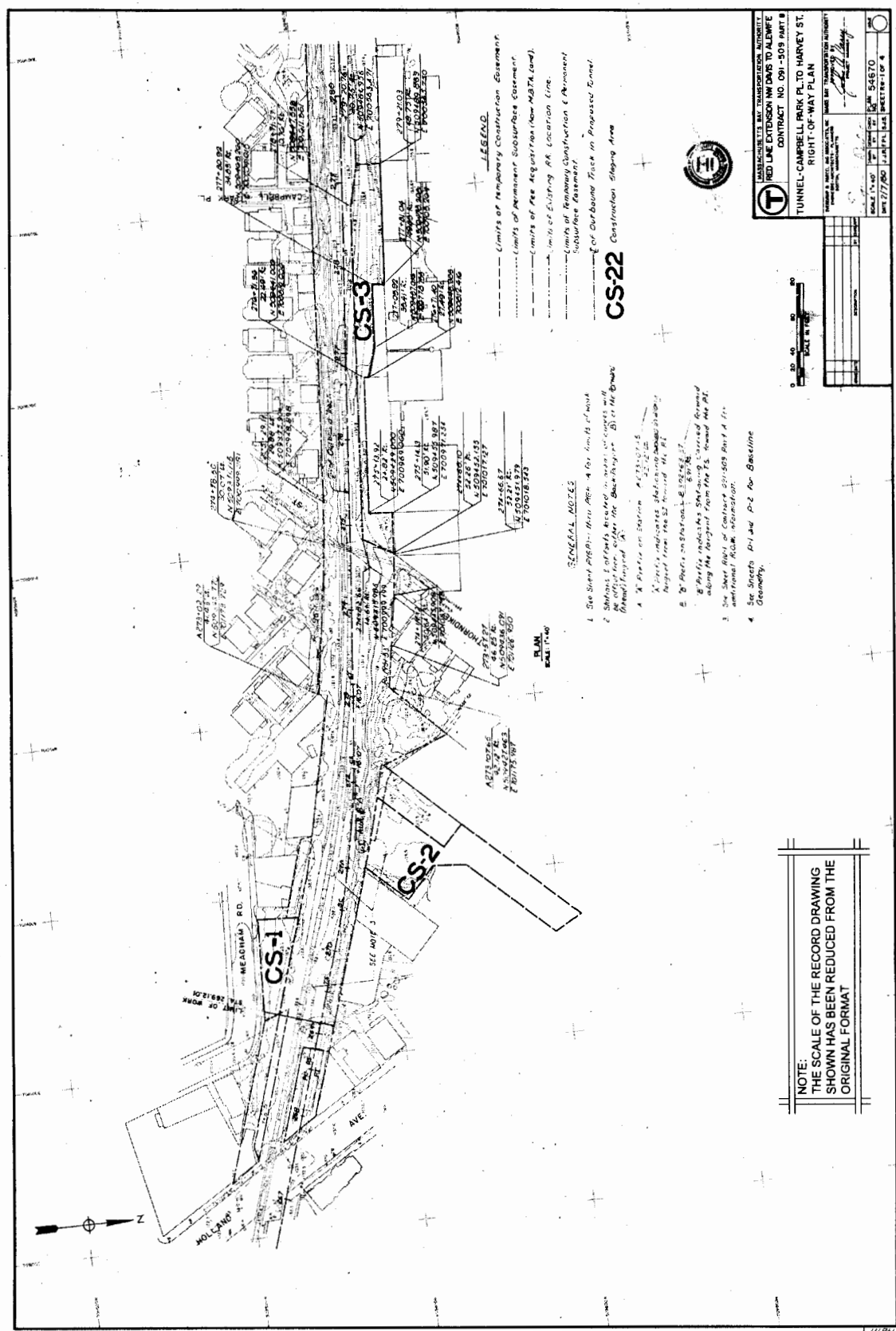
**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

**CITY OF SOMERVILLE
 COMMUNITY PARK
 ENHANCEMENTS**

**REDLINE
 EXTENSION NW
 DAVIS TO ALEWIFE
 RECORD PLANS**

PROJECT NO.: 1800182
 DRAWN BY:
 CHECKED BY:
 DATE: NOVEMBER 4, 2013
 SCALE: NOT TO SCALE
 DRAWING

R01



**TUNNEL CAMPBELL PARK PL. TO HARVEY ST.
 RIGHT-OF-WAY PLAN**

CONTRACT NO. 091-509 PART B

DATE: NOVEMBER 4, 2013
 SCALE: NOT TO SCALE

PROJECT NO.: 1800182

DATE: NOVEMBER 4, 2013

SCALE: NOT TO SCALE

DRAWING

NOTE:
 THE SCALE OF THE RECORD DRAWING
 SHOWN HAS BEEN REDUCED FROM THE
 ORIGINAL FORMAT



Maguire Group Inc.
 711 Congress Street
 Boston, Massachusetts 02110
 www.cdrmaguire.com

REVISIONS	Date

**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

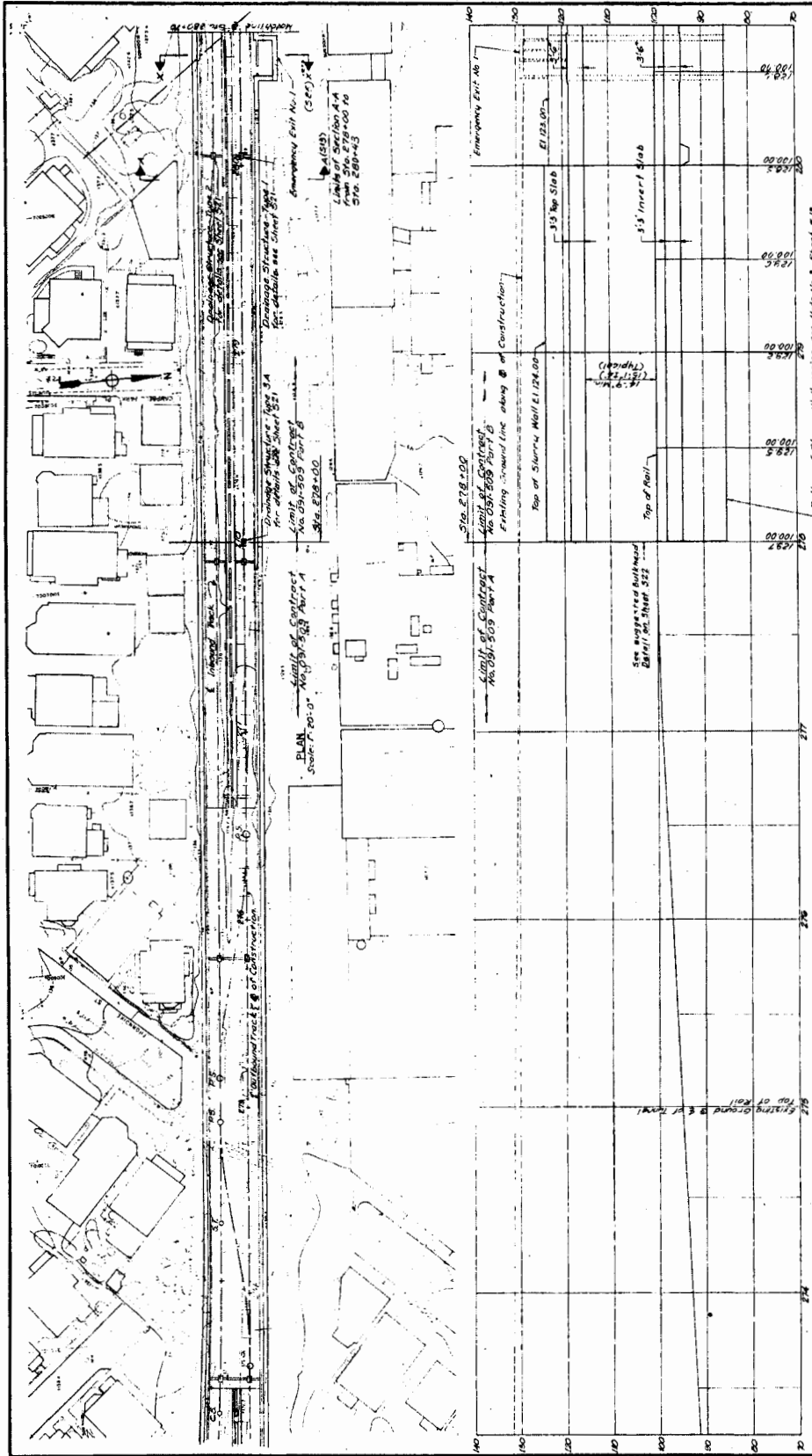
**CITY OF SOMERVILLE
 COMMUNITY PARK
 ENHANCEMENTS**

**REDLINE
 EXTENSION AND
 DAVIS TO ALEWIFE
 RECORD PLANS**

PROJECT NO.: 10042
 DESIGNED BY:
 DRAWN BY:
 CHECKED BY:
 DATE: NOVEMBER 1, 2013
 SCALE: NOT TO SCALE
 DRAWING

R03

SHEET 12 OF 13



T RED LINE EXTENSION AND DAVIS TO ALEWIFE TUNNEL, CAMBRIDGE PARK TO HANCOCK ST. CONTRACT NO. 081-505 PART B STA. 278+00 TO STA. 280+70

DATE: NOVEMBER 1, 2013
 SCALE: NOT TO SCALE
 DRAWING

10

Scale: Horizontal 1" = 20', Vertical 1" = 8'

1" = 20'
 1" = 8'

NOTE:
 THE SCALE OF THE RECORD DRAWING SHOWN HAS BEEN REDUCED FROM THE ORIGINAL FORMAT

5/15/09

REVISIONS	DESCRIPTION	DATE

**PRELIMINARY DESIGN
 NOT FOR
 CONSTRUCTION**

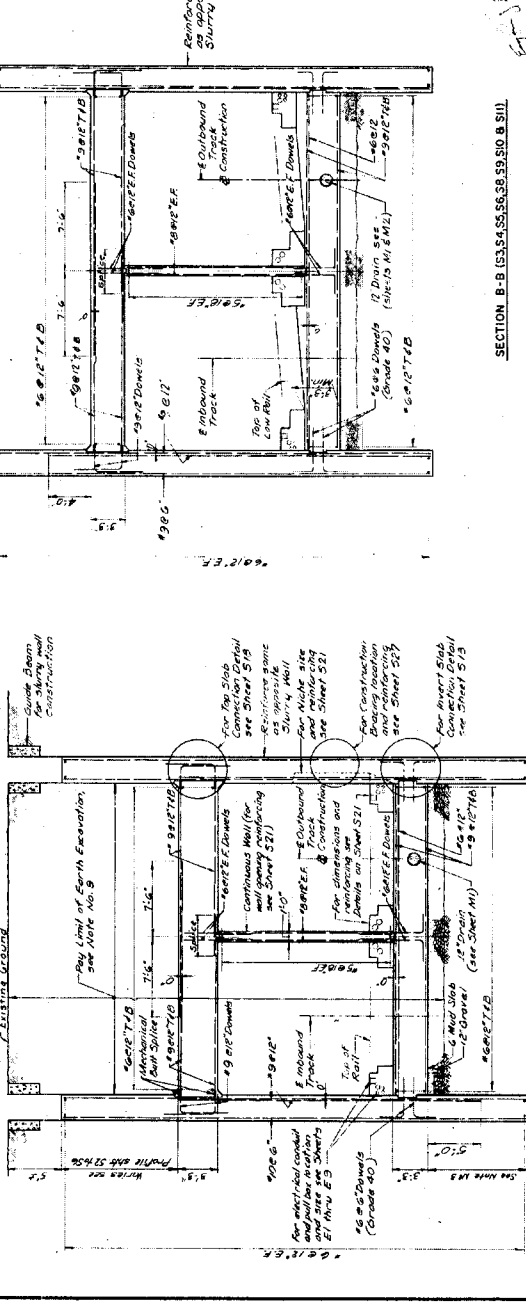
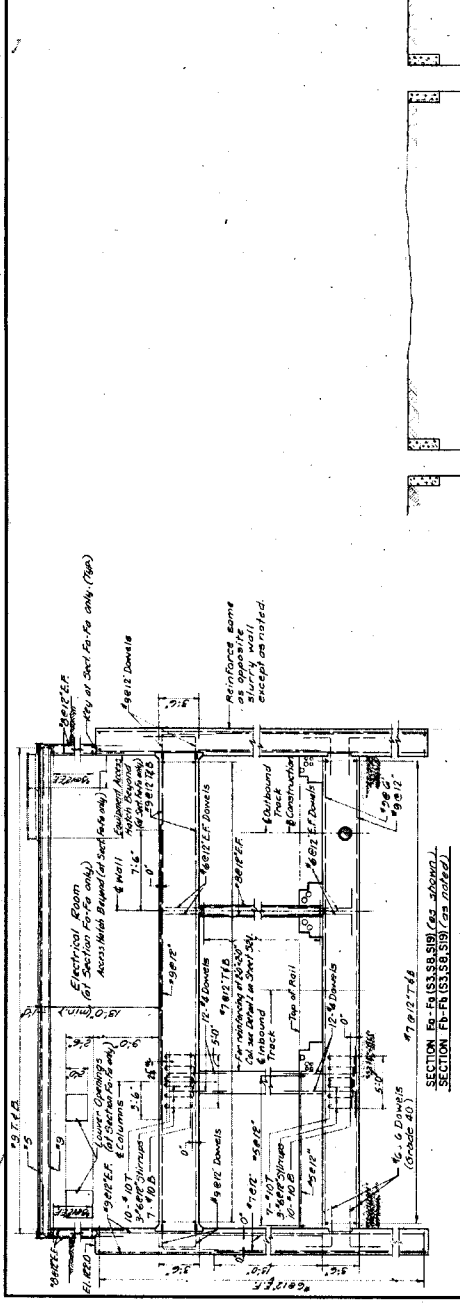
**CITY OF SOMERVILLE
 COMMUNITY PARK
 ENHANCEMENTS**

**REDLINE
 EXTENSION NW
 DAVIS TO ALEWIFE
 RECORD PLANS**

PROJECT NO.: 1008102
 DRAWN BY:
 CHECK BY:
 DATE: NOVEMBER 4, 2013
 SCALE: NOT TO SCALE
 DRAWING

R04

- NOTES:**
1. For General Notes see Sheet S1.
 2. All exterior walls are 8" thick slurry walls unless otherwise noted.
 3. All interior walls are 8" thick unless otherwise noted.
 4. All exterior walls shall be placed on a minimum 4" thick concrete slab.
 5. For Massing Details see Sheet S.3.
 6. For Detail at Change of Slab Thickness see Sheet S.2.
 7. Slab shall be 3000 psi strength concrete.
 8. All concrete in Slab and Waterproofing shall be placed on a minimum 4" thick concrete slab.
 9. No reinforcing steel shall be placed in the Slab on Waterproofing Protection.
 10. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 11. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 12. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 13. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 14. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 15. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 16. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.
 17. Slab on Waterproofing Protection shall be placed on a minimum 4" thick concrete slab.



T MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
 RED LINE EXTENSION NW DAVIS TO ALEWIFE
 CONTRACT NO. DN - 509 MIT 8
 TUNNEL-CAMPBELL PARK PL. TO HARVEY ST.
 SECTIONS A-A & B-B
 SCALE: 1/4" = 1'-0"
 DATE: NOV 4, 2013
 SHEET 10 OF 13

NOTE:
 THE SCALE OF THE RECORD DRAWING
 SHOWN HAS BEEN REDUCED FROM THE
 ORIGINAL FORMAT

EXHIBIT B

SCOPE OF ACTIVITY

Subject to the terms and conditions in this License, the LICENSEE, its agents, employees, contractors, subcontractors, and/or representatives are hereby granted a license to enter upon the Premises for the sole purpose of conducting the Scope of License according to Section 2.6.

LICENSEE shall conduct the scope of work in a safe manner and immediately notify the MBTA if any problem occurs which may result in a safety hazard. If any unsafe situation should occur, LICENSEE will correct the situation by eliminating any safety hazard immediately or, if the situation cannot be reasonably cured immediately, then in such longer time as is reasonably required, and in all such unsafe situations, MBTA Operations Safety Procedures shall be followed.

LICENSEE shall submit a plan and detailed specifications (including the materials to be used and the proposed methods of performing the work), or any part thereof (the "Plan") to the MBTA. LICENSEE shall not enter the Premises until the Plan has been approved by the MBTA. Such approval may be withheld in the MBTA's sole discretion. The Scope of Activity for said construction, installation, maintenance, operation and/or replacement will be more fully defined in the approved Plan, which approved Plan will automatically be incorporated herein by reference and made part of this License. The LICENSEE shall also provide the MBTA with a detailed schedule of times when LICENSEE, its employees, contractors, subcontractors, or agents would like to be on the Premises to undertake the Scope of Activity (the "Access Plan"). The MBTA shall have full power to make a final determination of when LICENSEE may be on the Premises as it is necessary to coordinate the work of all those desiring or having the right to access the Premises.

Unless entry is made pursuant to an Access Plan approved by the MBTA, LICENSEE agrees to give, each time it desires entry, at least 5 days' prior written notification to the MBTA (except in cases of emergency when notice shall be given to the MBTA as quickly as possible) of its need to access the Premises for all work to be performed under this License by contacting the operating departments according to Section 2.6. LICENSEE understands that the more notice given to the MBTA the more likely it will be that LICENSEE can gain access at the times requested. **LICENSEE shall present evidence of the required insurance coverage before each entry. In the case of an emergency, LICENSEE shall as soon as possible contact the MBTA Control Center at 617-222-5278.**

No activities permitted herein may be performed by LICENSEE except as approved in writing by the MBTA; and no method of testing, installation or construction shall be used by LICENSEE except with prior written approvals or written approvals received in the field from the MBTA's representatives at the time the work is performed.

If at any time during the work of installation or connection, the MBTA should, in its sole and absolute discretion, deem, inspectors assigned to construction crews, and/or other measures, including but not limited to train re-routing, desirable or necessary to protect its operations, its property or its employees or other persons on or near the Premises, the MBTA shall upon notice to LICENSEE (where such notice is feasible) have the right to place such personnel, including personnel of the MBTA's agents or to take such measures, at the sole cost and expense of LICENSEE. Such cost and expense shall include the current wages and fringe benefits due and owing to such personnel in and for the performance of such measures. LICENSEE hereby covenants and agrees to bear the full cost and expense thereof and to reimburse the MBTA within thirty (30) days of receiving an itemized, written invoice for such

reimbursement. The MBTA's failure to furnish such personnel or take such measures shall not relieve LICENSEE of any obligation or liability it might otherwise have assumed, and shall not give rise to any liability to LICENSEE on the part of the MBTA. Upon being notified that the personnel or measures referred to in the first sentence of this Paragraph have been deemed desirable or necessary by the MBTA, LICENSEE shall not commence or continue construction or repair measures, as the case may be, unless and until such personnel or measures are in place.

If LICENSEE shall deem any requirement for flagging or the like by the MBTA or one of their agents for supervision of the activity hereunder as unreasonable, LICENSEE shall nevertheless pay for such flagging and the like, but may take exception in writing thereto as an unreasonable requirement in each instance. The parties agree to review such exceptions at the times of billings for such services and attempt to adjust them as the MBTA may deem appropriate. This reimbursement is in addition to the License Fee and Administrative Fee required hereunder.

LICENSEE shall comply with applicable "MBTA Special Instructions" dated April 2003. To the extent that there is an irreconcilable conflict between the aforementioned requirements and this License, the terms and conditions contained in the "MBTA Special Instructions" shall control unless the requirements in this License are stricter.

EXHIBIT C

EXHIBIT D

1.4 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01600 – PRODUCTS, MATERIALS AND EQUIPMENT.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has thoroughly cured.
- C. Allow a minimum of 48 hours for drying before backfilling, unless a greater drying period is recommended by manufacturer.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cold-Applied, Cut-Back (Solvent-Based) Bituminous Dampproofing shall be:
 - a. Karnak 83 AF by Karnak Corporation,
 - b. Sealmastic by Meadows, W. R., Inc.,
 - c. Waterban 50 by Lambert Corporation,
 - d. or equal.

2.2 BITUMINOUS DAMPPROOFING (ASBESTOS-FREE)

- A. Cold-Applied, Cut-Back (Solvent-Based) Bituminous Dampproofing:
 - 1. Brush and Spray Coats: ASTM D 4479, Type I.
 - 2. Trowel Coats: ASTM D 4586, Type I.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
 - 1. Begin dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

3.3 APPLICATION, GENERAL

- A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
 - 1. Apply additional coats if recommended by manufacturer or required to achieve coverages indicated and shall be applied to subsequent coat(s).
 - 2. Allow each coat of dampproofing to cure 24 hours before applying subsequent coat(s).
- B. Apply dampproofing to all exterior below grade concrete surfaces.
 - 1. For application on structures extending above grade, apply from finished-grade line down.

3.4 COLD-APPLIED, CUT-BACK ASPHALT DAMPPROOFING

- A. On all dampproofing applications: Apply two brush or spray coats at not less than 1.25 gallons/100 feet². for first coat and 1 gallons/100 feet². for second coat, or one trowel coat at not less than 4 gallons/100 feet².

3.5 CLEANING

- A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

PART 4 – COMPENSATION (Not Used)

-END OF SECTION 07160-

APPENDIX E

(PENDING APPROVED MBTA LICENSE)

APPENDIX F

CITY OF CAMBRIDGE PERMITTING DOCUMENTS


How to Register to use the City of Cambridge’s Citizens Access Portal

To begin, visit the Cambridge Citizen’s Access Portal at:

<http://permits.cambridgema.gov/CAPSite/Public/Main>

Step 1: Register to become a CAP user



Before you can apply for permits, you must be a registered user. Click on  in the upper right corner of the webpage to begin this process. (If you are already registered, skip to Step 2).



Links

- ▶ Building
- ▶ Electric
- ▶ Housing
- ▶ Plumbing
- ▶ Public Works
- ▶ Sanitary
- ▶ Zoning

Welcome to the City of Cambridge On-Line Permit Program

The City of Cambridge's goal is to make the permit process convenient for the applicant and reduce the amount of leg work currently required for some permits. *Inspectional Services Department* permits are available. *Excavation, Sidewalk Obstruction and Crane, Boom & Pump Truck Permits offered by the Public Works Department* are also available. Links to other Public Works permits can be found [here](#). Additional permits will be available in the future through this site.

To begin using the *On-Line Permit Program*, you will be required to register. Click on *"Register"* located on the right side of the grey bar above. After filling in the required information which will include your email address and a password, click submit. The City Departments will review for approval. Upon approval you will receive a notification. Following notification and using your email address and password to login, you may begin the permitting process.

Click on the *"Permitting"* link on the toolbar above. Click *"Begin Process"*. A list of permits available on-line will appear. Click on the permit type you would like to obtain.

You are now ready to begin.

**The City of Cambridge recommends Internet Explorer 9 or later when using this application.
For OS X users, the City of Cambridge recommends Safari when using this application.**

©2015 Tyler Technologies. All Rights Reserved.

Next, you will be taken to the registration screen. Fill in all of the required information. Notice the red asterisks – these are required fields.

New User Registration

The form is divided into two sections: "User Details" and "Address Fields".

User Details:

- First Name (required)
- Middle Name
- Last Name (required)
- Company
- Phone (required)
- Email (required)
- Confirm Email (required)
- Password (required)
- Confirm Password (required)
- Contact Preference (required)

Address Fields:

- Street Number (required)
- Street Name (required)
- Suite/Unit
- Street Type (required)
- Address Type (required)
- City (required)
- State (required)
- Zip Code
- County

After entering all of your information, click the submit button. You will receive an email once your registration is approved and your account has been activated. You can now apply for permits. Your user name is your email address.

New User Registration

The form is filled with sample data:

User Details:

- First Name: Tamara
- Middle Name: (empty)
- Last Name: Tatarinov
- Company: (empty)
- Phone: 617-349-4143
- Email: tamara.tatarinov@gmail.com
- Confirm Email: tamara.tatarinov@gmail.com
- Password: (masked with dots)
- Confirm Password: (masked with dots)
- Contact Preference: Email

Address Fields:

- Street Number: 17
- Street Name: Simpson Dr
- Suite/Unit: (empty)
- Street Type: -Street Type-
- Address Type: Location
- City: Framingham
- State: -State-
- Zip Code: (empty)
- County: (empty)

A blue "Submit" button is located at the bottom right of the form, with a yellow arrow pointing to it.

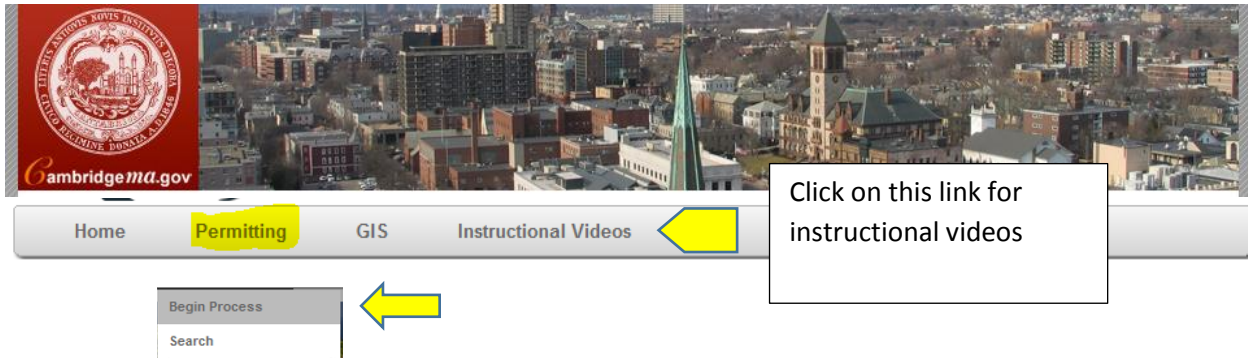
Questions? Call the DPW permit desk at (617) 349-4833

Applying for an Excavation or Trench Permit

1. Registered users can apply for permits using the City of Cambridge Citizens Access Portal:

<http://permits.cambridgema.gov/CAPSite/Public/Main>

2. To begin, either log on or click on the Permitting > Begin Process button.



Links

- ▶ Building
- ▶ Electric
- ▶ Housing
- ▶ Plumbing
- ▶ Public Works
- ▶ Sanitary
- ▶ Zoning

Welcome to the City of Cambridge On-Line Permit Program

The City of Cambridge's goal is to make the permit process convenient for the applicant and reduce the amount of leg work currently required for some permits. *Inspectional Services Department* permits are available. *Excavation, Sidewalk Obstruction and Crane, Boom & Pump Truck Permits offered by the Public Works Department* are also available. Links to other Public Works permits can be found [here](#). Additional permits will be available in the future through this site.

To begin using the *On-Line Permit Program*, you will be required to register. Click on "*Register*" located on the right side of the grey bar above. After filling in the required information which will include your email address and a password, click submit. The City Departments will review for approval. Upon approval you will receive a notification. Following notification and using your email address and password to login, you may begin the permitting process.

Click on the "*Permitting*" link on the toolbar above. Click "*Begin Process*". A list of permits available on-line will appear. Click on the permit type you would like to obtain.

You are now ready to begin.

The City of Cambridge recommends Internet Explorer 9 or later when using this application. For OS X users, the City of Cambridge recommends Safari when using this application.

3. Next, you will be prompted to enter your user name and password. Your user name is the email address that you registered with. If you cannot remember your password, ask to resend it.

Log On

User Login

Email address

Password

Remember me?

[Forgot Password](#)



Note

Your username will be the email address you registered with!

4. The first page that will open up is the list of permits that you can apply for. Click on "Excavation".

Curb Cut
Demolition (Entire Removal of Building)
Dumpster
Electrical
Excavation
Food (Mobile Food Truck)
Food Establishment
Gas
Mechanical

5. Review the application instructions and then click,



Welcome to the On-Line Excavation Permit Application.

The applicant will be required to supply all requested information. Please read each item below:

- Search address - This is the location where the work will be done. The address that you enter must be a validate address in the City of Cambridge Assessor's Database. If you are working on a larger area, like an intersection o an entire street, please use the nearest address and state the limits of your work location in the "Other Location Description" field on the main permit page.
- Once you select an address, click next on parcel number screen.
- Select the appropriate type of excavation permit - "No Trench" is for work where excavating will be done, but the work is not considered to be a trench under the State of Massachusetts Trench Laws and Regulations, ie: sidewalk replacement.
- All fields with an ! are required fields. You will not be able to submit a permit when a required field is left blank.
- Make sure you select an infrastructure type in the "Work Detail" field on the main permit page as this will trigger the fee.
- Under the Street Cuts and Sidewalk Cuts sections, only fill in the size of the area that will need to be restored.
- Required attachments (Please note that a permit will not be reviewed until we have received these documents):
 - For work in the public way:
 - a) Utility plans.
 - b) Traffic/pedestrian management plan.

Cancel




- Click on the "Search Address" button on the lower left.

Addresses

To search for an address, please click on "Search Address" below, then provide the street number and street name ONLY before clicking "Search". After the search results are displayed, please click on the folder next to the address that you wish to add.

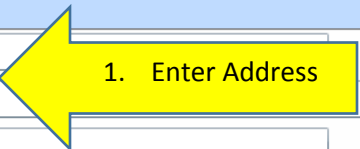
 Search Addresses

 Cancel  Previous 

You will be prompted to enter a street number and street name of the location that you will be working. You must select a valid address that exists in the City of Cambridge Assessors Database. If working in an intersection or an entire street enter the closest address. You can enter in additional location information on the main permit information page.

- Enter in the street number and the first 3 or 4 letters of the street name only. Click search, and the search results should appear below the address section. Click on the little file folder to select the right address.

Address Search



Street Number 



Street Name

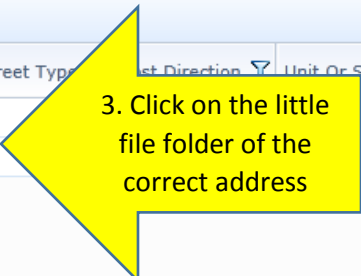
Unit Or Suite

City State

Postal Code

Street Number	Pre Direction	Street Name	Street Type	Post Direction	Unit Or Suite	Address Line 3
 147		Hampshire St				
 147		Hampshire St				

  Search




8. Confirm that the address you selected is correct and click "Next".

The screenshot shows a web form titled "Addresses" with a scrollable area. On the left, a list box contains one entry: "147 Hampshire ... Location (Main)" with a "Remove" link. To the right of the list are several input fields: "Address Type" (Location), "Country Type" (US), "Street Number" (147), "Street Name" (Hampshire St), "Unit Or Suite" (empty), "City" (Cambridge), "State" (MA), "Postal Code" (02139), and "Parcel Number" (empty). A "Search Addresses" button is at the bottom left of the scrollable area. Below the scrollable area, there are three buttons: "Cancel", "Previous", and a green "NEXT" button.


9. Click "Next" on the search parcel screen.



The screenshot shows a search interface. At the top left is a magnifying glass icon and a blue "Search" button. Below this is a horizontal bar with a search filter icon and the text "Parcel Number" and "Main". A yellow horizontal line is positioned below the search bar. At the bottom of the screen, there are three buttons: "Cancel", "Previous", and a green "NEXT" button.

10. Once you have entered in the permit address information, select the appropriate permit class from the dropdown. “No Trench” is for work where excavating will be done, but the work is not considered to be a trench under the State of Massachusetts Trench Laws and Regulations. Click  .


What Type of Permit?

- Trench
- No Trench
- City Contract - Trench
- City Contract - No Trench



11. In this section please provide us with as much information as possible. All fields with an  are required fields. You will not be able to submit a permit when a required field is left blank. If you are working in an intersection or on an entire street you can enter this information in the Other Location Description Field and select a cross street.



Emergency Contact  Emergency Phone 

Cross Street Utilities



Other Location Description 

Permit Dates


Proposed Start Date  

Proposed End Date  

Weekday Work Hours 7 A.M. - 4 P.M.

Purpose  

Related Permits


Dig Safe Control Number 


Conduit Permit #

Water Permit #


Work Detail


<input type="checkbox"/> Public Roadway	<input type="checkbox"/> Private Roadway
<input type="checkbox"/> Public Sidewalk	<input type="checkbox"/> Private Sidewalk
<input type="checkbox"/> Public Sewer	<input type="checkbox"/> Private Sewer
<input type="checkbox"/> Public Stormwater	<input type="checkbox"/> Private Stormwater
<input type="checkbox"/> Public Utility/Comm.	<input type="checkbox"/> Private Utility/Comm.
<input type="checkbox"/> Public Water	<input type="checkbox"/> Private Water
<input type="checkbox"/> Public Site Work	<input type="checkbox"/> Private Site Work


Make sure you select an infrastructure type in the “Work Detail” field on the main permit page as this will trigger the permit fee. Click  when done.



12. Enter in the name of the competent person and his or her hosting license information (this screen only comes up for trench work). Be sure to click on the box that indicates you understand and agree to comply with the State of Massachusetts trench laws. Click  .

Trench License

Name of Competent Person 

Massachusetts Hoisting License # 

License Grade 

Hoisting License Expiration Date  

Applicant understands and agrees to comply

13. Under the Street Cuts and Sidewalk Cuts sections, only fill in the size of the area that will need to be restored – For instance if you are cutting a 5'x4' section of asphalt and need to take out one sidewalk panel to do your trench work, these are the dimensions that you enter in the next two sections.

Enter the size of all street cuts:

Street Cut #	Length	Width	Depth
1	<input type="text"/>	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>	<input type="text"/>
6	<input type="text"/>	<input type="text"/>	<input type="text"/>
7	<input type="text"/>	<input type="text"/>	<input type="text"/>
8	<input type="text"/>	<input type="text"/>	<input type="text"/>
9	<input type="text"/>	<input type="text"/>	<input type="text"/>
10	<input type="text"/>	<input type="text"/>	<input type="text"/>

[Cancel](#) [Previous](#)

NEXT

Enter the size of all sidewalk cuts:

Sidewalk Cut #	Length	Width	Material
1	<input type="text"/>	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>	<input type="text"/>

[Cancel](#) [Previous](#)

NEXT

14. On the Required Attachments page attach utility plans, traffic/pedestrian management plans, bond information and a copy of your company's certificate of insurance that lists the City of Cambridge as an additional insured and the certificate holder on your policy. Also submit and any Water Department or utility (conduit) permits.

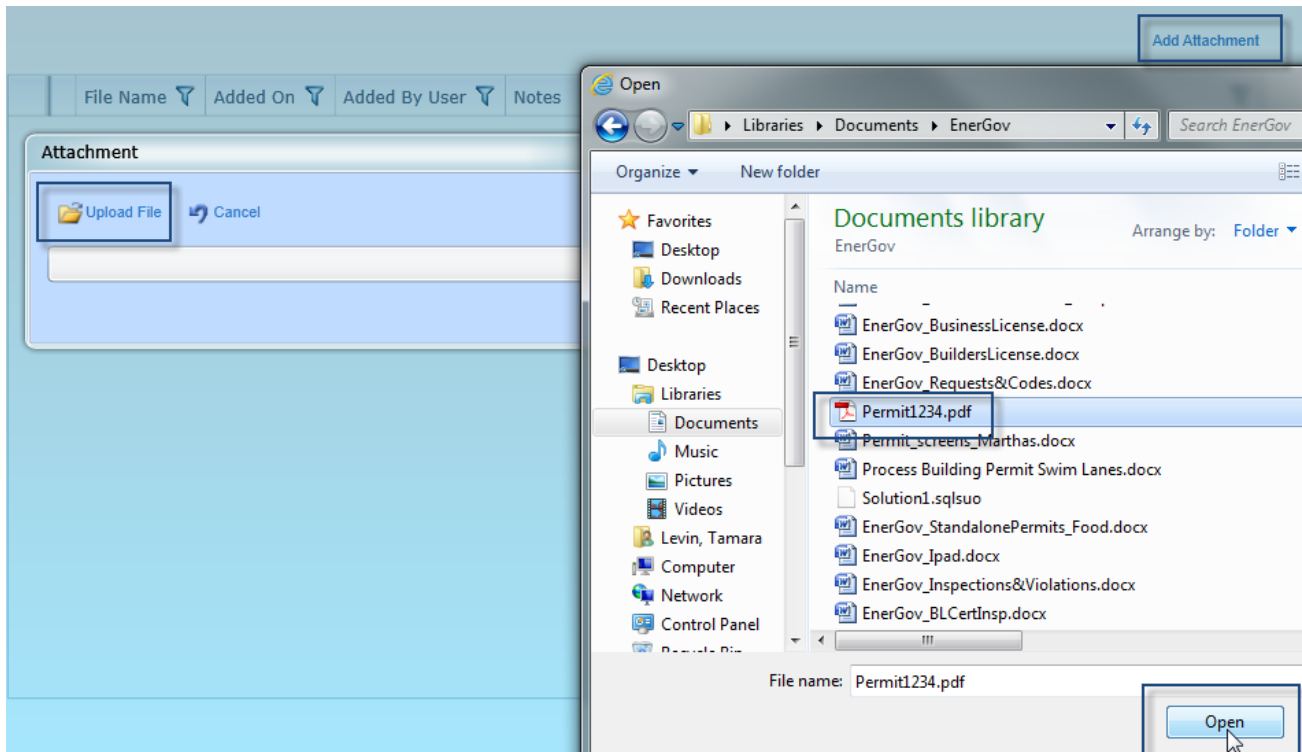
Required attachments:

- 1) A certificate of insurance that demonstrates your company has at least \$1,000,000.00 in general liability coverage and \$2,000,000.00 aggregate for personal injury or property damage. The City of Cambridge must be listed as an additional insured and the certificate holder on your policy.
- 2) At site plan that indicates the dimensions of the obstruction, distances from trees and other obstructions and the amount of room that will be open on the sidewalk for pedestrians to pass.
- 3) If alcohol related a stamped engineer drawing must be attached

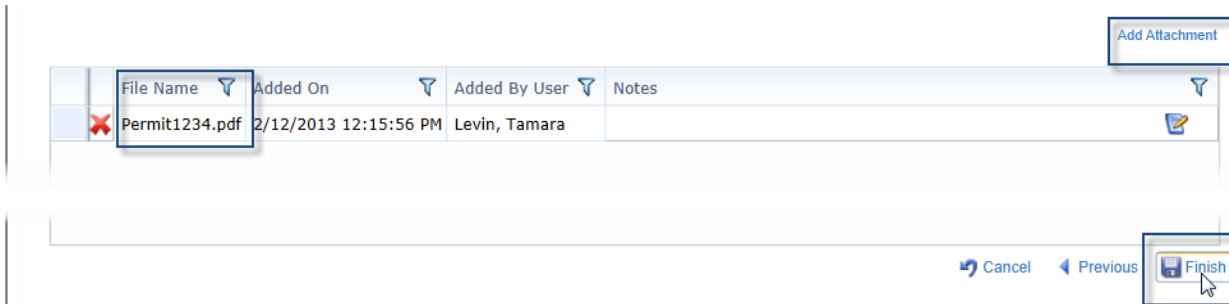
Add Attachment

File Name	Added On	Added By User	Notes
-----------	----------	---------------	-------

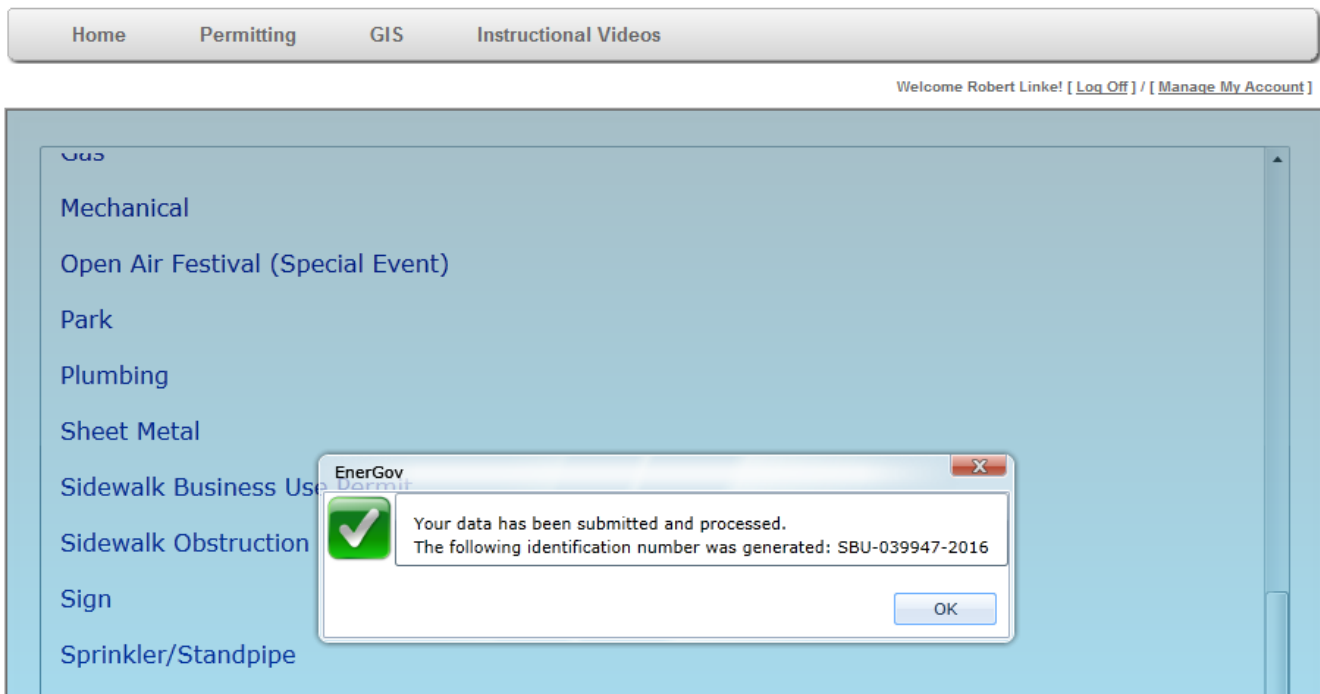
Cancel **Previous** **Finish**



15. Click "Finish" once all attachments have been uploaded.



16. A window will open up that informs you that your permit has been submitted. Click "okay". Click on "Home" to view permits you have applied for and pay for the permit.



17. On the home screen, to pay for a permit, click on the invoice number in the Invoices Section.

The screenshot shows the Cambridge MA Citizen Access Portal. At the top, there is a navigation bar with links for Home, Permitting, GIS, and Instructional Videos. A welcome message for Robert Linke is displayed. On the left, a 'Links' menu lists various categories like Building, Electric, Housing, Plumbing, Public Works, Sanitary, and Zoning. The main content area is titled 'Citizen Access Portal' and is divided into two sections: 'Robert Linke Businesses' and 'Robert Linke Permits'. Both sections include a 'Change Filter' button and a table of data. The 'Businesses' table has columns for Company Name, DBA, Company Type, Status, District, and Business Type. The 'Permits' table has columns for Permit Number, Type, Work Class, Status, ApplyDate, and Issued.

Company Name	DBA	Company Type	Status	District	Business Type
Cambridge DPW		Company	Active	City	

Permit Number	Type	Work Class	Status	ApplyDate	Issued
SBU-039947-2016	Sidewalk Business Use	Sidewalk Business Use	Received - CAP	04/06/2016	
PRK-039945-2016	Park	N/A	Received - CAP	04/06/2016	

The screenshot shows the 'Robert Linke Invoices' section. It features a 'Change Filter' button and a table with columns for Invoice Number, Status, Invoice Total, Invoice Date, and Due Date. Two invoices are listed. The second invoice, with number 00054099, is highlighted in yellow and has a yellow arrow pointing to it from the left. The bottom of the section includes a pagination bar showing 'Displaying items 1 - 2 of 2'.

Invoice Number	Status	Invoice Total	Invoice Date	Due Date
00054097	Due	\$25.00	4/6/2016	4/6/2016
00054099	Due	\$75.00	4/6/2016	4/6/2016

18. Click on the “Make Payment” button in the upper right corner and you will be taken to the Govolution payment screen.

Cambridge MA.gov

Home Permitting GIS Instructional Videos

Welcome Robert Linke! [Log Off] / [Manage My Account]

Invoice Number: 00054099

Make Payment

Invoice Details

Billing Contact: Cambridge DPW (Linke, Robert) **Invoice Status:** Due
Invoice Date: 4/6/2016 **Invoice Number:** 00054099
Invoice Due Date: 4/6/2016 **Invoice Description:**
Invoice Total: \$75.00

Primary Fees

Fee Name	Fee Total	Amount Due	Reference Entity #	Entity	Notes
DPW - Sidewalk Business Use	\$75.00	\$75.00	SBU-039947-2016	Permit	

19. You can pay with a credit or a debit card or by e-check. A recipt will be email directly to you once the transaction has been completed.

Select Payment Method

Please choose the method of payment.

- Pay by Credit or Debit Card
- Pay by Personal Check
- Pay by Corporate Check

Pay Now

Required fields are highlighted with an asterisk.

Payment information:

Amount:* \$75.00
Invoice Number:* 00054099
Case Number:* 00054099

Please enter the following information about your payment method:

Cardholder's Name:*

Cards Accepted:

Card Number:*

Expiration Date:* MM / YY

Billing information:

Address Line 1:*

Address Line 2:

Country:* United States

ZIP Code:*

City:

State: --Select One--

Receipt information:

Email Address:

Continue

Change Payment Method

PART 4: CONSTRUCTION DRAWINGS LIST

(SEE SEPARATE DOCUMENTS AT

www.somervillema.gov/bidpostings - “Drawings – IFB 17-73 Bike Path Retaining Wall and Drainage”)