Addendum No. 4 to IFB 17-73

CITY OF SOMERVILLE, MASSACHUSETTS
Department of Purchasing
JOSEPH A. CURTATONE
MAYOR

To: All Parties on Record with the City of Somerville as Holding IFB 17-73, **Bike Path Retaining Wall and Drainage Upgrades**

From: Michael Richards, Assistant Purchasing Director

Date: August 18th, 2017

Re: Revise Specifications and Project Timeline, Append MBTA License for Entry, Append Bid Holder List as of 8/18/2017

Addendum No. 4 to IFB 17-73

Please acknowledge receipt of this Addendum by signing below and including this form in your proposal package. Failure to do so may subject the proposer to disqualification.

This addendum appends and addresses the revised license requirements and updates the contract times to reflect the extended bid period.

The submission deadline remains unchanged - sealed bids are to be delivered to the Purchasing Department at the address below by **11:00am Thursday, August 31st, 2017.**

NAME OF COMPANY / INDIVIDUAL: _____

ADDRESS:_____

CITY/STATE/ZIP:_____

TELEPHONE/FAX/EMAIL:_____

SIGNATURE OF AUTHORIZED INDIVIDUAL:_____

ACKNOWLEDGEMENT OF ADDENDA:

Addendum #1 _____ **#2** _____ **#3**_____ **#4** _____

ADDENDUM NO. 4

CITY OF SOMERVILLE
BIKE PATH DRAINAGE AND RETAINING WALL UPGRADES

AUGUST 18, 2017

The attention of bidders submitting proposals for the above-referenced project is called to the following Addendum to the Contract Documents. The items set forth herein, whether of omission, addition, substitution or other change, are all to be included in and form a part of the proposed Contract Documents for the work.

The date and time of the bid opening has not changed, and will be held Thursday, August 31, 2017 at 11:00 a.m.

Inclusion of this Addendum must be acknowledged by signing the City of Somerville addendum 4 and including this form in your proposal package. Failure to acknowledge any and all addenda in the above specified bid forms may be cause for rejection of a bid by the Owner on the grounds that it is not responsive.

This Addendum consists of one hundred ninety-two (192) pages including attachments.

SPECIFICATIONS

1. IFB #17-73, In the Key Project Information table **DELETE** date of substantial completion, date of final completion, and estimated contract commencement date, and estimated contract completion date and **REPLACE** in its entirety with the following:

Anticipated Contract Award	09/14/2017
Date of Substantial Completion	01/18/2018
Date of Final Completion	05/18/2018
Est. Contract Commencement Date	10/19/2017

2. **DELETE** Paragraph 1.1.B.1 from Specification 02015 and **REPLACE** in its entirety with the following:

   "*One seismograph shall monitor vibrations adjacent to the nearest private property 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. Additionally, a minimum of one seismograph shall monitor vibrations at a location to be determined by the Owner within the MBTA right-of-way for the duration of the project. Vibration levels shall not exceed the criteria indicated herein."*

3. Revise Specifications T.O.C., **INSERT**, "Section 01390 Pre-construction & Post-construction Surveys".

4. **INSERT** Attachment 6, Section 01390 - Pre-Construction and Post-Construction Surveys, to the contract specifications.

5. Section 01200, General Requirements for Utility Work, **DELETE** Section 1.5.A.3 in its entirety and **REPLACE** in its entirety the following,

"Prior to start of construction, submit to the Engineer and the MBTA for review and approval a detailed excavation procedure/construction management plan 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, including possible removal of Contractor personnel from the site."

6. Section 01200, General Requirements for Utility Work, **INSERT** Section 1.9 Railroad Coordination detailed below.

"1.9 Railroad Coordination

A. SUMMARY

1. This section includes coordination with the railroad companies and related entities including the Massachusetts Bay Transportation Authority (MBTA), including meetings; flagmen and engineering coordination; coordination of access to tunnels and stations; construction support; and compliance with regulations and schedules.

B. LIMITATIONS AND REQUIREMENTS

1. The Contractor shall review the MBTA Railroad Operations Directorate (May 1994) appended. The MBTA Directorate specification requirements shall govern all construction within MBTA zones of influence.

2. The Contractor shall be required to schedule all work affecting the MBTA or its property with the MBTA authorities and shall be subject to MBTA approval of the construction schedule.

3. The surveyor who will be conducting the pre-construction and post-construction surveys must be MBTA right of way trained to enter the tunnel and the surveys must be conducted during MBTA non-revenue hours.

4. The Contractor shall be responsible for restoring all MBTA property and structures to their preapproved condition by the MBTA and approved by the MBTA inspector.

C. GENERAL

1. Any damage to the tunnel caused by the Contractor shall be repaired to existing or better condition at no additional cost to the Owner and as accepted by the MBTA.

2. The Contractor shall perform a pre-construction and post-construction MBTA tunnel survey in accordance with Section 01390 – Pre-Construction and Post-Construction Surveys."

7. APPENDIX E: **DELETE** Appendix E, and **REPLACE** in its entirety with Attachment 1, Draft MBTA License 15797.

a) The attached draft MBTA license is a part of the contract and its conditions and provisions shall apply to the contract. It currently lists the licensee as the City of Somerville. The licensee **will be revised and updated to the contractor** once the project is awarded. The MBTA license will be fully executed by the Contractor after the award of the contract.

b) The contractor shall be aware of the Indemnification and Release of MBTA requirements of the license, including providing a written release of liability to the MBTA by the Contractor and all Subcontractors. Section 4.3.a states,

"Licensee shall indemnify, defend (at the option of the MBTA) and save the MBTA and any other company operating on the rights of way within or adjacent to the Premises (collectively, except for the MBTA, the "Railroad Companies") 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 or the Railroad Companies by reason of any of the following occurrences …"

Contractor shall refer to section 4.2 for all indemnification and Release of MBTA requirements.

c) The contractor shall note the insurance requirements, Section 4.3. Policies shall name the MBTA and the Railroad companies in addition to The City of Somerville and Kleinfelder as additionally insured.

d) Contractor shall note per the draft MBTA License Attachment, Exhibit C, Item 3, the contractor shall submit a construction management plan indicating sequence of construction, locations of construction equipment and material storage, and documentation showing that no piece of equipment, or combination of equipment, exceeds the **MBTA tunnel roof capacity of 400lbs/ft^2 surface loading or HS 20-44** at vehicular intersections, prior to deploying the equipment on the portion of the path located above the tunnel roof. This plan must be submitted to the Engineer and the MBTA Capital Delivery department for review and approval prior to construction.

e) MBTA Notification requirements to note include the following:

<u>Per Section 4.1.a of the draft MBTA License,</u>

"Licensee shall provide at least five (5) days' prior written notice of its desire to enter the Premises to the MBTA departments (in accordance with Section 2.7) for access."

<u>Per Section 4.1.f, Notice of Project Commencement and Completion,</u>

"Notice of Project Commencement and Completion"
Upon commencement and completion of its work, Licensee shall provide written notice of the project commencement ("Notice of Project Commencement") or notice of the project completion ("Notice of Project Completion"), as applicable, to:

Real Estate Department
Massachusetts Bay Transportation Authority
10 Park Plaza, Room 5720
Boston, Massachusetts 02116
Attn: Chief of MBTA Real Estate

and

MBTA Red Line Operations Department
Rail & Transit Division
45 High Street
Boston, Massachusetts 02110
Attn: Chris Shea, Division Chief Light-Rail Operations

and

MBTA Design and Construction Department
100 Sumer Street- 12th floor
Boston, Massachusetts 02143
Attn: Assistant General Manager

and

Massachusetts Realty Group
20 Park Plaza, Suite 1120
Boston, Massachusetts 02116
Attn: MBTA License Management"

Contractor shall refer to Section 4.3 and Section 5 of the draft MBTA license for additional notification requirements.

f) The contractor shall complete a pre-construction survey and post-construction survey of the existing MBTA red line tunnel in accordance with section 01200 and section 01390. This surveyor must be MBTA right of way trained to enter the tunnel and the surveys must be conducted during MBTA non-revenue hours.

g) Per the License, Exhibit D, the contractor shall be responsible for establishing a MBTA force account for costs incurred by the MBTA as needed, such as flagmen.

h) The Contractor shall pay for flagmen when deemed necessary by the MBTA either by paying invoices sent to the Contractor by the MBTA or through the Contractor's force account. The Owner will fully reimburse the Contractor for flagmen costs incurred, except for flagmen that are scheduled, but not used due to the Contractor's cancellation of work crews and failure to notify the flagmen of such cancellation. The Contractor shall submit receipts to the Owner for reimbursement.

i) The Contractor shall maintain as-built drawings during construction and provide to the Engineer upon completion of work for Engineer to use in preparing the record drawings required by the MBTA in the license.

j) Regarding the remediation obligations contained in the draft MBTA license, Chapter 21E provides liability release to municipalities, including their agents, doing work on railroad properties. The Contractor is required to manage soil and hazardous materials in accordance with Specification Sections 02080 and 02095 and in accordance with the Contract Drawings.

DRAWINGS

1. **SHEET CG-1– Details I**

   DELETE Sheet CG-1 and **REPLACE** in its entirety Attachment 2, Sheet CG-1, MBTA License Revision.

2. **SHEET C-2 – SITE PLAN AND PROFILE STA. 4+00 TO STA. 7+44**

   DELETE Sheet C-2 and **REPLACE** in its entirety Attachment 3, Sheet C-2, MBTA License Revision.

3. **SHEET CG-2– Details II**

   INSERT Figure 1 Emergency MBTA Waterproofing Repair Detail, Attachment 4, as detail on Sheet CG-2.

4. APPENDIX C – RECORD DRAWINGS

Attach Sheet S-23, Miscellaneous Details – 1, MBTA Red Line Record Drawing, Attachment 5 to Appendix C.

ATTACHMENT NO. 1:

MBTA License 15797 (37 pages)

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

LICENSE FOR ENTRY MBTA 15797

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 ("MBTA"), hereby grants to City of Somerville, with a usual place of business at 93 Highland Avenue, Somerville Massachusetts 02143("Licensee"), the right to replace two failing infiltrating catch basins in the Community Path, with two new standard catch basins and provide a drainage connection to the city existing storm drainage system at Thorndike Street, by installing new 12" diameter storm drain pipe over the MBTA Red Line tunnel in Somerville, Massachusetts more particularly described in Section 2.5 below, subject to the terms and conditions set forth in this License for Entry.

2. **General Conditions**

Among the terms and conditions of this License for Entry are included the following General Conditions:

2.1 Date: July 7, 2017

2.2 Licensee: City of Somerville

2.3 Term: From July 7, 2017 to July 6, 2018, except the MBTA may terminate this License for Entry with thirty (30) days written notice to Licensee

2.4 **Fees:**

Administrative Fee: $ 1,000.00 paid with application.

Annual License Fee: $ 1,000.00 to be paid with License execution.

Design and Construction Review Fee: In accordance with Section 4.1 (h) herein.

2.5 Premises: Over The MBTA Red Line tunnel, adjacent to the Community Path near the Thorndike Street right of way in, Somerville Massachusetts, as more fully shown in Exhibit A attached hereto.

2.6 Scope of License: Licensee may replace two failing infiltrating catch basins in the Community Path with two new standard catch basins and provide a drainage connection to the city existing storm drainage system at the Premises, in accordance with the Licensee's application and plans submitted to the MBTA. No other investigations of any kind may be performed on MBTA property. 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 for Entry.

Licensee understands and agrees to the following conditions:

1. Licensee shall adhere to the terms and conditions of the MBTA Capital Delivery Department's letter dated June 14, 2017, attached hereto and incorporated herein as Exhibit C, unless otherwise agreed by the MBTA Design and Construction Department.
2. Licensee shall adhere to the terms and conditions of the MBTA Power Department's letter dated June 5, 2017, attached hereto and incorporated herein as Exhibit D.
3. Licensee shall adhere to the terms and conditions of the MBTA Safety Department's memorandum dated June 13, 2017, attached hereto and incorporated herein as Exhibit E.
4. Licensee shall adhere to the terms and conditions of the MBTA Red Line Department's memorandum dated May 31, 2017, attached hereto and incorporated herein as Exhibit F.

In the event of a conflict between the conditions stated in this Section 2.6 and other provisions of this License for Entry, whichever provisions are more restrictive of Licensee or impose a higher standard on Licensee shall control.

2.7 Notices: **MBTA:**

Real Estate Department
Massachusetts Bay Transportation Authority
10 Park Plaza, Room 5720
Boston, Massachusetts 02116
Attn: Chief of Real Estate

and

MBTA Red Line Operations Department
Rail & Transit Division
45 High Street
Boston, Massachusetts 02110
Attn: Chris Shea, Division Chief Light-Rail Operations

and

MBTA Capital Delivery Department
100 Sumer Street- 12th floor
Boston, Massachusetts 02143
Attn: Assistant General Manager

and

Massachusetts Realty Group
20 Park Plaza, Suite 1120
Boston, Massachusetts 02116
Attn: MBTA License Management

LICENSEE:

City of Somerville
93 Highland Avenue
Somerville, Massachusetts 02143
Attn: Rich Raiche, Director of Engineering

3. Consideration

The rights contained in this License for Entry are granted for good and valuable consideration, the sufficiency of which is hereby acknowledged.

4. Terms and Conditions of License for Entry

This License for Entry 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 for Entry 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 as specifically authorized under the Scope of License.

Except pursuant to an approved Access Plan, defined in Exhibit B, attached hereto and incorporated herein, or in case of emergency, Licensee shall provide at least five (5) days' prior written notice of its desire to enter the Premises to the MBTA departments (in accordance with Section 2.7) 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. To the extent the MBTA or parties acting on behalf of either the MBTA, locate and mark railroad utilities in the railroad rights of way and appurtenant thereto, Licensee shall be responsible for payment to such parties for the actual costs incurred in providing such services which may include, but not be limited to, locating and

marking utilities, facilities and appurtenances thereto serving the railroad and transit line(s) or used in connection with services or operations of the MBTA and/or the Railroad Companies (as defined below). 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 actual costs incurred by the MBTA in 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 for Entry, 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 actual 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 actual and reasonable costs incurred by the MBTA in hiring consultants (including a Licensed Site Professional) to review, supervise and inspect any associated plans, specifications, proposed method of work, installation, operation and results.

(f) Notice of Project Commencement and Completion

Upon commencement and completion of its work, Licensee shall provide written notice of the project commencement ("Notice of Project Commencement") or notice of the project completion ("Notice of Project Completion"), as applicable, to:

Real Estate Department
Massachusetts Bay Transportation Authority
10 Park Plaza, Room 5720
Boston, Massachusetts 02116
Attn: Chief of MBTA Real Estate

and

MBTA Red Line Operations Department
Rail & Transit Division
45 High Street
Boston, Massachusetts 02110
Attn: Chris Shea, Division Chief Light-Rail Operations

and

MBTA Design and Construction Department
100 Sumer Street- 12th floor
Boston, Massachusetts 02143
Attn: Assistant General Manager

and

Massachusetts Realty Group
20 Park Plaza, Suite 1120
Boston, Massachusetts 02116
Attn: MBTA License Management

Upon completion of its work, Licensee shall also provide the MBTA Design & Construction Department (and such other MBTA departments as the MBTA may request) with an "as built" copy of each approved construction drawing, in a digital and a reproducible format, marked to indicate all changes and deviations from the approved plans and recording the final conditions of the Premises (collectively, "Record Drawings"). All Record Drawings shall be received and accepted by the MBTA prior to final inspection.

(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

Licensee shall be responsible for and pay all costs that may be incurred by the MBTA for Design and Construction Plan Review and Design and Construction Structural Review that are in excess of the Fees allocated to those reviews in Section 2.4 above within 30 days of being invoiced for same. Such costs and Fees are in addition to the Administrative Fee and the License Fee, and are included within the Licensee's indemnity obligations in Section 4.2(a) below.

4.2 **Indemnification and Release of MBTA**

(a) Licensee shall indemnify, defend (at the option of the MBTA) and save the MBTA and any other company operating on the rights of way within or adjacent to the Premises (collectively, except for the MBTA, the "Railroad Companies") 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 or the Railroad Companies 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

(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 include occupancies by the predecessors in interest of Licensee. The foregoing indemnification is limited to the extent of the gross negligence or willful

misconduct of the MBTA or the Railroad Companies or their respective agents and employees.

(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 and the Railroad Companies 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 or the Railroad Companies, 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, provided that the foregoing shall not in any way release the MBTA or the Railroad Companies from any liability for their respective gross negligence or willful misconduct.

Licensee shall obtain a written release of liability similar to the one in this Section 4.2(c) and including the language of Section 4.2(d) in favor of the MBTA and the Railroad Companies 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 or the Railroad Companies' 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 for Entry.

(e) Licensee shall be notified, in writing, by the MBTA and each of the affected Railroad Companies 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 reasonably incurred 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 fully and promptly with the MBTA in the defense of any Indemnified Claim. This same right of self-defense and the right to Licensee reimbursement shall apply to each of the Railroad Companies that has an Indemnified Claim against it.

(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 indemnified by the Licensee in accordance with the terms hereof 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. If any of the Railroad Companies wants the Licensee to defend it against an Indemnified Claim, then they must agree to this paragraph 4.2 (e)(2).

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 with Section 4.1 (e).

For purposes of this Section 4, Licensee shall include Licensee and its directors, officers, employees, agents, successors and assigns and the MBTA shall include the MBTA and its directors, officers, employees, agents, successors and assigns, provided that none of the MBTA's nor Licensee's directors, officers, employees or agents shall ever have any personal liability hereunder, including but not limited to any of the indemnity obligations set forth in this License for Entry.

The provisions of Sections 4.1 and 4.2 shall survive the termination or expiration of this License for Entry.

4.3 **Insurance**

Prior to entry hereunder, Licensee shall provide (or cause its consultants and contractors to provide) the MBTA and any other Railroad Company with a certificate or certificates of insurance and shall, during the term hereof, renew and replace (or cause its consultants and contractors to renew and replace) any expired certificate, evidencing the insurance of the activities permitted hereunder, and Licensee's covenant of indemnification hereinabove (to the extent covered by the insurance required to be carried by Licensee hereunder), with companies that are reasonably acceptable to the MBTA, as stated below, in which Licensee and others hereinafter specified are either additional insureds as their interests may appear or named insureds and which provide minimum liability coverage carried by Licensee or its consultants and contractors as listed below in this Section 4.3. The parties acknowledge that the terms "Railroad Company" and "Railroad Companies" as referenced in this Section 4.3 shall be limited to those Railroad Companies which the MBTA has identified to Licensee upon thirty (30) days' prior notice. By way of example, any Railroad Companies to be listed as an additional insured pursuant to this Section 4.3 shall be limited to those Railroad Companies of which the Licensee has been notified by thirty (30) days' prior notice from the MBTA.

(a) Commercial General Liability Insurance

Insuring the Licensee (or its applicable consultants and contractors), the MBTA, the Railroad Companies, the Premises and all activities allowed hereunder as well as Licensee's indemnification obligations contained in Section 4.2 (to the extent they are insurable) 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 Five Million Dollars ($5,000,000.00) 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 and the Railroad Companies as additional insureds.

(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, the Railroad Companies 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 and the Railroad Companies. Each of Licensee's subcontractors and consultants shall have similar policies covering their employees.

(c) Railroad Protective Liability Insurance

While working within fifty (50) feet of the tracks on the right of way, insuring the MBTA and the Railroad Companies as named insureds with limits of not less than Two Million Dollars ($2,000,000.00) per occurrence and Six Million Dollars ($6,000,000.00) in aggregate combined bodily injury property damage. The MBTA shall be provided with an original policy of Railroad Protective Liability Insurance and the remaining Railroad Companies shall be provided with certificates of insurance.

(d) 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.

The required insurance coverages hereinbefore specified shall be placed with insurance companies licensed by the Massachusetts Division of Insurance to do business in the Commonwealth of Massachusetts and having a Best's rating of B+ or better, shall be taken out before the use and occupancy 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 thirty (30) days advance written notice in the event of any cancellation or materially adverse change in coverage. All such required insurance, with the possible exception of Pollution Liability Insurance, if required, 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 precludes these insurers from being able to make any subrogation claims against the MBTA. All such required insurance shall not contain any exclusions for acts of terrorism, and shall fully cover any acts of terrorism, irrespective of whether such acts of terrorism are caused by domestic or foreign terrorists, and irrespective of whether such acts of terrorism are certified or non-certified by the Secretary of the Treasury, in concurrence with the Secretary of State and the Attorney General of the United States, to be an act of terrorism pursuant to the federal Terrorism Risk Insurance Act of 2002. All such insurance as is required of the Licensee shall be provided by or on behalf of all contractors and 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 the contractors and subcontractors. At the inception date of this License and throughout the term of this 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 for Entry. 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 the Premises promptly to the condition it was in at the commencement of the term hereof, and to remove all of Licensee's personal property and debris from the Premises; except improvements constructed in accordance with plans approved by the MBTA. 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 for Entry 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 for Entry 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 deposited in registered or certified United States mail, postage prepaid, return receipt requested, addressed, as described in Section 2.7 or when delivered by messenger or overnight mail service to the correct addressee. Notice shall be deemed received when actually received or when the proffered Notice has been refused by the Addressee. 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 for Entry any other address or addresses giving fifteen (15) days' written notice thereof to the other party.

6. Results

If this License for Entry explicitly allows Licensee to conduct certain investigations on MBTA owned land, then 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 for Entry 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 written request by the MBTA. 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, Design and Construction Plan Review 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 for Entry 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 18% 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 For Entry 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 for Entry 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 for Entry 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 or a Railroad Company to operate its transportation system, then it shall be considered an Emergency Default and if Licensee does not affect 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 for Entry 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

If Licensee desires to continue the work defined in the Scope of Activity after the termination of this License for Entry, 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 the Extended Term, the Annual License Fee shall escalate each License Year on the anniversary of the License Fee Commencement Date by a three percent (3%) increase per year. 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 or the Railroad Companies.

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 military 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 for Entry.

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. Without limiting the foregoing, the parties acknowledge that the scope of this License does not include any proposed installations of any personal property or fixtures of Licensee in or on the Premises or any use of the Premises beyond the term of this License.

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 for Entry shall not be construed to create any third party beneficiary rights in favor of any other parties (except the explicit rights granted to the Railroad Companies) or any right or privilege for the benefit of any other parties.

14. Entire Agreement

This License for Entry 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. Licensee shall not be liable to the MBTA or any of the Railroad Companies 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 the MBTA 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 the MBTA of any amount less than the full amount due to the MBTA hereunder shall not be deemed a waiver by the MBTA of its right to collect the full amount due. The MBTA 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 the MBTA 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 July, 2017

MBTA:

MASSACHUSETTS BAY
TRANSPORTATION AUTHORITY

By:_____
Name: Janelle Chan
Title: Chief of Real Estate

LICENSEE:

CITY OF SOMERVILLE

By: _____
Name: _____
Title: _____

EXHIBIT A

PLAN OF PREMISES

EXCERPTS FROM THE CONTRACT DRAWINGS

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAINAGE DESIGN

MARCH 2017

DIRECTOR OF ENGINEERING

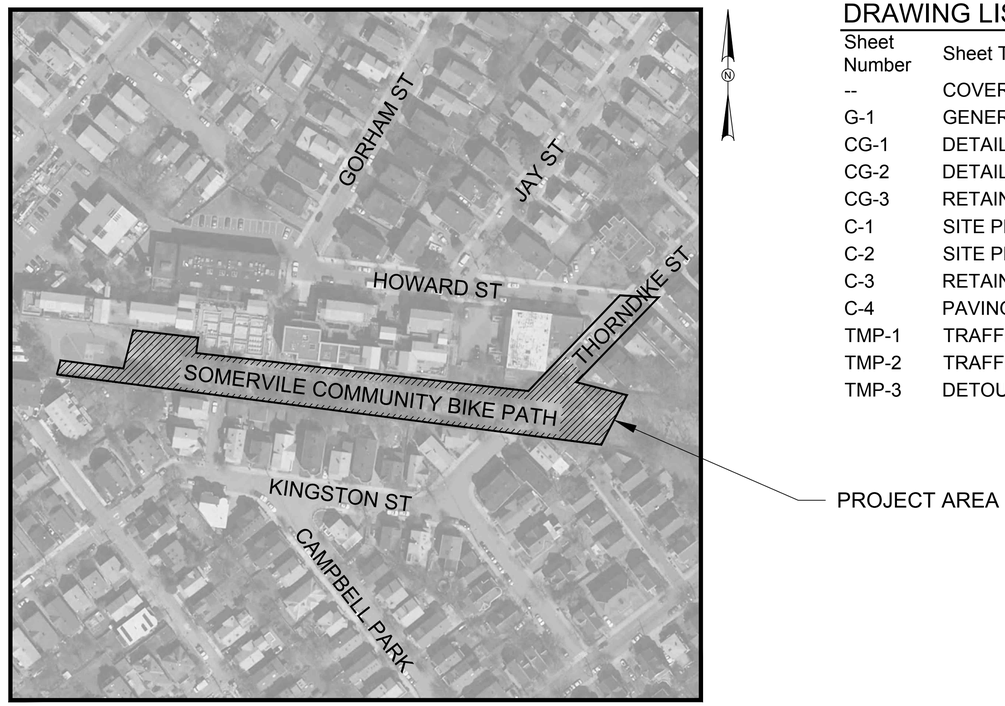
RICHARD RAICHE, P.E.

DEPARTMENT OF PUBLIC WORKS COMMISSIONER

STANLEY KOTY

MAYOR

JOSEPH A. CURTATONE



LOCUS PLAN
(N.T.S.)

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+40
C-3	RETAINING WALL SITE PLAN STA 100+00 TO STA 105+69
C-4	PAVING SITE PLAN
TMP-1	TRAFFIC MANAGEMENT DETAILS I
TMP-2	TRAFFIC MANAGEMENT PLAN I
TMP-3	DETOUR PLAN

KLEINFELDER
Bright People. Right Solutions.

PLOTTED: 3/29/2017 2:02 PM BY: alex silveri
CAD FILE: G:_clients\somerville Ma\20171752.002a - Bike Path Retaining Wall And Drainage Design\Drawings\G-Cover And Notes.dwg LAYOUT: COVER

GENERAL NOTES

1. INFORMATION AS SHOWN ON THE DRAWINGS RELATING TO MATERIALS, CONDITIONS AND/OR LOCATIONS OF EXISTING PIPES, CABLES, CONDUITS, AND STRUCTURES EXPECTED. OVER/UNDER CROSSING INFORMATION HAS BEEN COMPILED FROM THE BEST AVAILABLE INFORMATION INCLUDING FIELD SURVEY, RECORD MAPS AND DRAWINGS, AND UTILITY RECORD DRAWINGS. THE OWNER TOGETHER WITH ITS AGENTS DOES NOT IMPLY OR GUARANTEE THE DATA AND INFORMATION IN CONNECTION WITH THE UNDERGROUND PIPES, CABLES, CONDUITS, STRUCTURES AND SUCH OTHER PARTS AS TO THEIR COMPLETENESS NOR THEIR LOCATIONS AS INDICATED. THE CONTRACTOR SHALL CONTACT UTILITY OWNERS AND REQUEST MARKING LOCATION OF ALL THEIR LINES IN THE WORK AREAS. PRIOR TO EXCAVATION THE CONTRACTOR SHALL ASSUME THAT THERE ARE EXISTING WATER, GAS AND OTHER UTILITY CONNECTIONS TO EACH AND EVERY BUILDING EN ROUTE WHETHER THEY APPEAR ON THE PLANS OR NOT. ANY EXPENSE AND/OR DELAY OCCASIONED BY THESE UTILITIES AND STRUCTURES OR DAMAGE THERETO, INCLUDING THOSE NOT SHOWN, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND AT NO ADDITIONAL EXPENSE TO THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION.

2. BASE MAP INFORMATION WAS PREPARED BY DGT SURVEY GROUP, BOSTON, MA BASED ON A COMPOSITE OF FIELD EVIDENCE AND AVAILABLE RECORD INFORMATION AND THEIR LOCATIONS ARE ONLY APPROXIMATE. COORDINATES, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, (2011), EPOCH 2010.00, BASED ON THE KEYNET GPS VIRTUAL REFERENCE SYSTEM (VRS). ELEVATIONS, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) BASED ON THE KEYNET GPS VIRTUAL REFERENCE SYSTEM (VRS) NETWORK.

3. THE MBTA RED LINE TUNNEL AND SLURRY WALL EXTENTS SHOWN IN PLAN AND PROFILE WERE DRAWN FROM THE MBTA RED LINE EXTENSION DESIGN DRAWING DATED 02/07/1980 BY SVERDRUP AND PARCEL AND ASSOCIATES INC, TITLED "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." THIS DRAWING IS ATTACHED AS AN APPENDICES TO THE CONTRACT SPECIFICATIONS.

   3.1. THE MBTA RED LINE EXTENSION NW DAVIS TO ALEWIFE DRAWINGS ARE IN THE VERTICAL DATUM MBTA REDLINE (BOSTON). THE MBTA RED LINE TUNNEL AND SLURRY WALL ELEVATIONS WERE CONVERTED TO NAVD 88 USING THE CONVERSION 0.00 EL NAVD 88 = -106.677 EL MBTA RED LINE AS NOTED IN THE MASS HIGHWAY SURVEY MANUAL RELATION OF DATUM PLANES DATED SEPTEMBER 1996.

4. THE LOCATION OF ALL SUBSURFACE STRUCTURES AND UTILITIES SHALL BE VERIFIED THROUGH THE APPROPRIATE AGENCY, AND THE DIG-SAFE CALL CENTER AT 1-800-DIGSAFE (1-888-344-7233) SHALL BE CONTACTED AT LEAST 72 HOURS BEFORE ANY EXCAVATION.

5. UNLESS OTHERWISE INDICATED, PROPERTY LINES AND LAYOUT LINES SHOWN WERE TAKEN FROM CITY ASSESSOR MAPS AND GIS AND ARE APPROXIMATE.

6. PRIOR TO BEGINNING WORK THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS INFORMATION AND REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND THE ACTUAL CONDITIONS TO THE ENGINEER.

7. ALL STATIONING IS TO CENTER OF STRUCTURE. DISTANCES OF "LEFT" (L) "RIGHT" (R) ON THE PLAN REFER TO THE ORIENTATION RELATIVE TO THE STATION LINE WHEN FACING THE POSITIVE DIRECTION. THE STATIONS AS SHOWN FOR SEWERS AND DRAINS ARE APPROXIMATE. THE EXACT STATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND RECORDED ON THE RECORD DRAWINGS.

8. THE CONTRACTOR SHALL TEMPORARILY MATCH EXISTING GRADES AND CONDITIONS WITH THE CONSTRUCTION AREA UNTIL FINAL RESTORATION IS COMPLETE.

9. ALL MATERIAL THICKNESSES NOTED ON THE DRAWING REFER TO DEPTH AFTER COMPACTION, UNLESS OTHERWISE NOTED. CONTRACTOR TO REUSE EXISTING EXCAVATED MATERIAL AS BACKFILL TO THE MAXIMUM EXTENT FEASIBLE IN ACCORDANCE WITH SECTION 02210 OF THE SPECIFICATIONS.

10. EACH LAYER OF MATERIAL USED FOR BACKFILL, EMBANKMENT, ROADBED OR FOUNDATIONS FOR STRUCTURES SHALL BE COMPACTED UNTIL THE DRY DENSITY OF EACH LAYER IS AT LEAST THE DRY DENSITY ACHIEVED BY THE ASTM D 1557 TEST FOR THAT SOIL REQUIRED BY SPECIFICATION SECTION 02210 - EARTH EXCAVATION, BACKFILL, FILL AND GRADING. REFER TO UTILITY TRENCH DETAIL ON SHEET CG-1 FOR ADDITIONAL REQUIREMENTS.

11. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL DEMOLISHED MATERIALS, RUBBISH, EXCAVATED MATERIAL AND DEBRIS, UNLESS OTHERWISE NOTED, AND IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL DISPOSAL PERMITS AT NO ADDITIONAL COST TO THE OWNER.

12. CONSTRUCTION TRAILER(S), STOCKPILING LOCATIONS, AND EQUIPMENT STORAGE AREAS ARE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE COORDINATED WITH THE OWNER.

13. THE CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENT CONTROL DEVICES AND SHALL NOT COMMENCE CONSTRUCTION UNTIL THESE MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER.

14. THE CONTRACTOR SHALL PROTECT ALL TRAVELED WAYS FROM DUST AND CONSTRUCTION DEBRIS AT ALL TIMES.

15. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ANY SEWER, WATER OR DRAIN PIPING, OR STRUCTURE HE OR SHE DAMAGES. ALL COSTS OF REPLACEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. INTERMEDIATE COUPLINGS SHALL BE ALLOWED ON A TEMPORARY BASIS ONLY.

16. CONTROLLED DENSITY FILL (CDF) SHALL BE REQUIRED FOR ALL UTILITY CROSSINGS WITH CLEARANCE LESS THAN 12 INCHES.

17. WHERE EXISTING GAS, ELECTRIC AND TELECOM UTILITIES CROSS THE PROPOSED TRENCH LIMITS, CONTRACTOR SHALL COORDINATE WITH THE UTILITY OWNER TO SUPPORT AND BE RESPONSIBLE FOR COSTS AND FEES. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE WORK IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS.

18. EXISTING UTILITY POLES THAT FALL WITHIN 5 FEET OF THE PROPOSED EDGE OF TRENCH SHALL BE SUPPORTED BY THE UTILITY OWNER DURING EXCAVATION OF THE TRENCH. CONTRACTOR SHALL COORDINATE WITH THE UTILITY OWNER TO SUPPORT AND BE RESPONSIBLE FOR COSTS AND FEES. CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPORTING THE EXISTING UTILITY IN ACCORDANCE WITH THE OWNER'S REQUIREMENTS.

19. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN PUBLIC OR PRIVATE POTABLE WATER SUPPLY SYSTEM AND A SEWER, OR APPURTENANCE THERETO WHICH WOULD PERMIT THE PASSAGE OF ANY WASTEWATER OR POLLUTED WATER SUPPLY.

20. ALL EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING AND TEMPORARY PAVING OR BY COVERING WITH STEEL PLATES WHEN APPROVED BY THE OWNER. REFER TO PAVING DETAIL ON SHEET CG-1 FOR PAVING REQUIREMENTS.

21. ALL DISTURBED TRAFFIC MARKINGS ARE TO BE REPLACED BY THE CONTRACTOR AND SHALL MATCH EXISTING.

22. REFER TO SECTION 01040 FOR COMMUNITY NOTIFICATION AND COORDINATION REQUIREMENTS.

23. THE CONTRACTOR SHALL PROVIDE FOR THE SAFE AND ORDERLY PASSAGE OF PEDESTRIANS AND EMERGENCY VEHICLES AT ALL TIMES IN AREAS UNDER CONSTRUCTION.

24. CONTRACTOR IS REQUIRED TO COORDINATE WITH THE POLICE AND FIRE DEPARTMENTS IN ORDER TO MAINTAIN EMERGENCY VEHICLE ACCESS THROUGHOUT PROJECT DURATION.

25. THE CONTRACTOR SHALL NOT BLOCK ACCESS TO THE COMMUNITY BIKE PATH, THE STREET AND PRIVATE PARKING IN THE VICINITY OF THE LIMITS OF CONSTRUCTION AFTER WORK HOURS AND ON WEEKENDS.

26. THE CONTRACTOR SHALL NOT BE PERMITTED TO STARTUP OR OPERATE EQUIPMENT BEFORE OR AFTER ESTABLISHED WORKING HOURS OF 7:00 AM TO 4:00 PM, MONDAY THROUGH FRIDAY WITHOUT WRITTEN APPROVAL OF THE OWNER, UNLESS NOTED OTHERWISE.

27. UPON COMPLETION OF THE WORK, ALL DISTURBED AREAS SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION. TRENCH RESTORATION IN SOMERVILLE SHALL MEET THE REQUIREMENTS OF THE SOMERVILLE DEPARTMENT OF PUBLIC WORKS.

28. THE OWNER RESERVES THE RIGHT TO ELIMINATE ANY PORTION OF THE CONTRACT AT ANY TIME. FINAL PAYMENT WILL BE MADE BASED UPON ACTUAL QUANTITIES AT THE BID UNIT PRICE. NO CLAIM WILL BE ALLOWED FOR ADDITIONAL COMPENSATION OR ANTICIPATED PROFIT ON ITEMS THAT HAVE BEEN DECREASED OR ELIMINATED.

29. REFER TO SHEET TMP-1 FOR TRAFFIC MANAGEMENT NOTES AND REQUIREMENTS.

EXISTING LEGEND

ASPH	ASPHALT
BC	BOTTOM OF CURB
BRK	BRICK
BW	BOTTOM OF WALL
CBN	CATCH BASIN
CBNCI	CATCH BASIN CURB INLET
CLF	CHAIN LINK FENCE
CONC	CONCRETE
DMH	DRAIN MANHOLE
EBOX	ELECTRICAL BOX
EHH	ELECTRIC HANDHOLE
GG	GAS GATE
GRAN	GRANITE
HCR	HANDICAPPED RAMP
HYD	HYDRANT
I	INVERT
MBTA	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
MLP	METAL LIGHT POLE
MTL	METAL
PBL	PULLBOX LIGHT
R=	RIM
RET	RETAINGING WALL
S	SIGN
SMH	SEWER MANHOLE
STP	STANDPIPE
STY	STORY
T	TREE (X" DIAMETER)
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TR	TRASH CAN
TW	TOP OF WALL
TYP	TYPICAL
UMH	UNKNOWN MANHOLE
UP	UTILITY POLE
WD	WOOD
WG	WATER GATE
WMH	WATER MANHOLE
20	CONTOUR (1-FT INTERVAL)

PROPOSED LEGEND

	MANHOLE
	PIPE
	COUPLING OR SOLID SLEEVE
	CAP OR BULKHEAD
	CATCH BASIN

GEOTECHNICAL NOTES

1. BORING B-1 WAS ADVANCED AND COMPLETED AS AN OBSERVATION WELL BY NEW ENGLAND BORING CONTRACTORS ON 2/2/17. A COPY OF THE BORING LOG IS PROVIDED AS AN APPENDIX TO THE SPECIFICATIONS FOR INFORMATIONAL PURPOSES ONLY.

2. BORINGS WERE PERFORMED FOR THE PURPOSE OF DESIGN AND INDICATE CONDITIONS AT THEIR LOCATION ONLY. SUBSURFACE CONDITIONS ENCOUNTERED DURING CONSTRUCTION MAY VARY FROM THOSE SHOWN IN THE LOGS.

3. GROUNDWATER LEVELS INDICATED ON THE LOGS WERE OBSERVED AT THE TIMES INDICATED. GROUNDWATER LEVELS ARE KNOWN TO FLUCTUATE DUE TO LOCAL AND REGIONAL FACTORS INCLUDING, BUT NOT LIMITED TO, PRECIPITATION EVENTS, SITE TOPOGRAPHY, SEASONAL CHANGES, WELL PUMPING AND PERIODS OF WET OR DRY WEATHER.

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. STOCKPILED MATERIALS SHALL BE LOCATED AND MAINTAINED SO AS TO MINIMIZE THE POTENTIAL FOR EROSION.

2. SILT SACKS SHALL BE FURNISHED, INSTALLED AND MAINTAINED AT ALL CATCH BASINS WITHIN THE PROJECT AREA AND ALONG THE LIMIT OF EXCAVATION. THROUGHOUT PROJECT DURATION, DEBRIS COLLECTED IN SILT SACKS SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF-SITE ON A WEEKLY BASIS OR MORE FREQUENTLY IF NECESSARY TO MAINTAIN FLOW THROUGH THE SILK SACKS. UPON COMPLETION OF THE PROJECT AND AS DIRECTED BY THE ENGINEER, THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND LEGALLY DISPOSING OF THE SILT SACKS AND DEBRIS OFF-SITE.

3. THE CONTRACTOR SHALL INSTALL SOIL EROSION/SEDIMENT CONTROL WITHIN THE PROJECT AREA AND ALONG THE LIMIT OF EXCAVATION. THROUGHOUT THE PROJECT THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SOIL EROSION/SEDIMENT CONTROL MATERIALS PER SECTION 01568 OR AS DIRECTED BY THE ENGINEER.

4. CONTRACTOR SHALL STOCKPILE SUFFICIENT SOIL EROSION AND SEDIMENT CONTROL MATERIALS ON SITE TO REPAIR ANY AND ALL DAMAGE TO SOIL EROSION AND SEDIMENT CONTROL MEASURES.

STORM DRAIN INSTALLATION NOTES

1. DEWATERING MAY BE REQUIRED DURING CONSTRUCTION. THE CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS OF SPECIFICATION SECTION 02210, SECTION 01500, SECTION 02140 AND ALL DEWATERING PERMITS. THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE ENGINEER FOR APPROVAL AS SPECIFIED. DISCHARGE TO CITY DRAIN AND SEWER SYSTEMS SHALL REQUIRE AN MWRA CONSTRUCTION DEWATERING PERMIT. REFER TO SECTION 01060 OF SPECIFICATIONS.

2. DIVERSION, BYPASS, AND CONTROL OF SANITARY SEWER, STORM DRAIN AND DEWATERING FLOWS ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR'S INTENDED DIVERSION, BYPASS, AND CONTROL AND DEWATERING PLANS SHALL BE SUBMITTED TO THE OWNER AND ENGINEER FOR REVIEW AT LEAST 7 DAYS PRIOR TO ANY EXCAVATION. WHEN PERFORMING DEWATERING, THE CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS OF SECTION 02210, SECTION 01500, SECTION 02140, AND ALL DEWATERING PERMITS.

3. WHERE THE STORM DRAIN MUST CROSS BELOW THE EXISTING EVERSOURCE TRANSMISSION MAIN AND SPARE, THE CONTRACTOR SHALL BACKFILL WITH CONTROL DENSITY FILL (CDF) PER THE TYPICAL UTILITY CROSSING DETAIL ON SHEET CG-2.
   3.1. THE CONTRACTOR SHALL HAVE AN EVERSOURCE CONDUIT INSPECTOR ON SITE FOR THE TRANSMISSION MAIN CROSSING AND HAVE APPROVAL FROM THE CONDUIT INSPECTOR TO COMPLETE THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EVERSOURCE COORDINATION AND SHALL PROVIDE 3 DAYS MINIMUM NOTICE TO THE EVERSOURCE CONDUIT INSPECTOR, MATT VIENS, WHO CAN BE REACHED DIRECTLY VIA TELEPHONE, 401-473-1508. IF MATT VIENS IS UNAVAILABLE, CONTACT THE CONDUIT INSPECTION LINE AT 617-541-7071 AND LEAVE A VOICEMAIL.

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REVISIONS

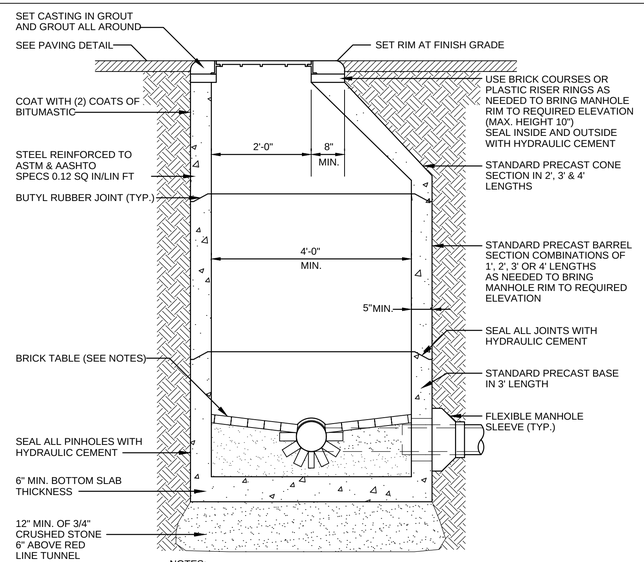
DATE	MARCH 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	G-Cover and Notes

GENERAL NOTES

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

SHEET
G-1

PLOTTED: 3/29/2017 2:02 PM, BY: alex silver
CAD FILE: G:_clients\somerville Mat\20171752.002a - Bike Path Retaining Wall And Drainage Design\Drawings\G-Cover And Notes.dwg LAYOUT: GENERAL NOTES



NOTES:

1. INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP OF PIPE. TABLE TO SLOPE AT 1" PER 1' TO INSIDE OF MANHOLE BASE.
2. TYPICAL SANITARY MANHOLE TO BE 4 FOOT DIAMETER.

TYPICAL MANHOLE (ELEVATION)

SCALE: N.T.S.

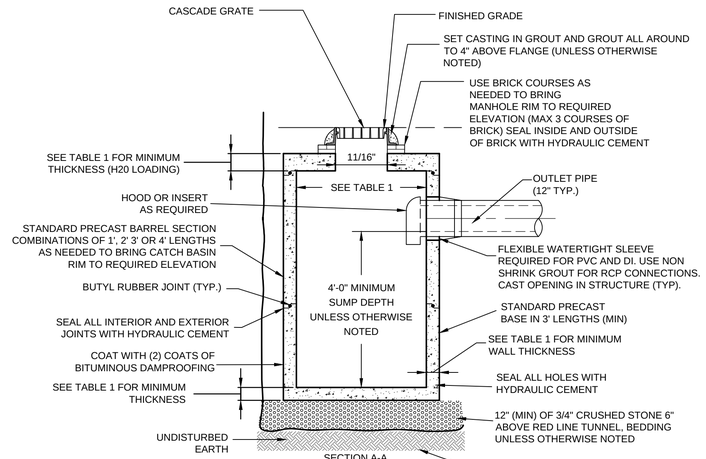
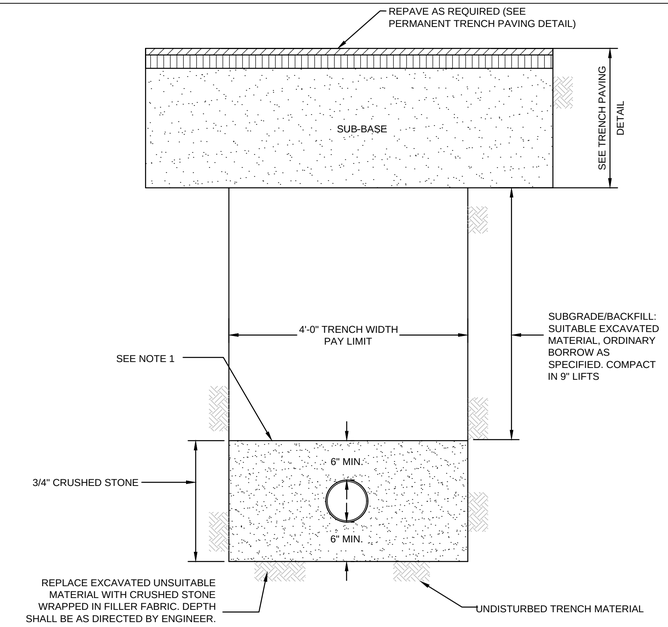


	TABLE 1: PRECAST SIZE TABLE			
	MANHOLE WIDTH	MINIMUM WALL THICKNESS		
	Ø (I.D.)	TOP	BOTTOM	SIDE
TYPE 1	4'-0"	8"	6"	5"

I.D. = INSIDE DIMENSION

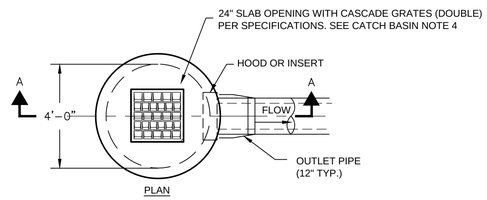


NOTES:

1. BEDDING SHALL BE WRAPPED WITH FILTER FABRIC IN LOCATIONS WHERE EXISTING SOIL IS CONSIDERED UNSUITABLE BY THE ENGINEER.

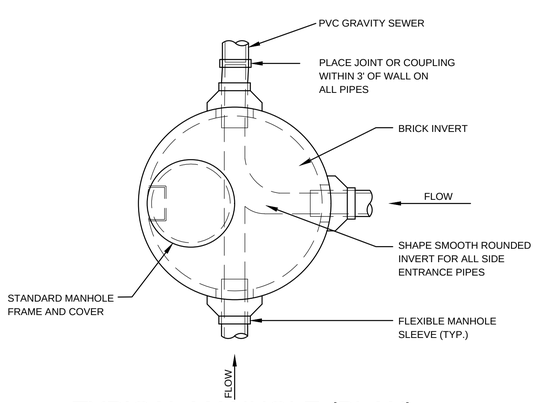
UTILITY TRENCH DETAIL

SCALE: N.T.S.



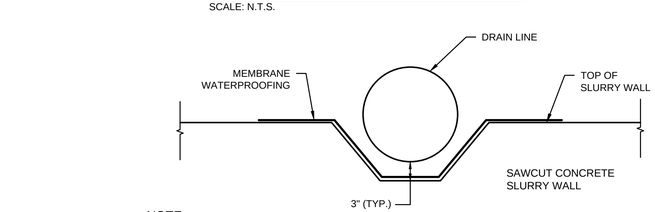
SINGLE GRATE CATCH BASIN

SCALE: N.T.S.



TYPICAL MANHOLE (PLAN)

SCALE: N.T.S.

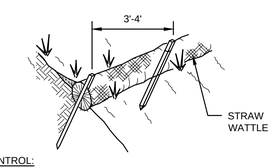


NOTE:

1. WHERE THE PROPOSED DRAINAGE LINE IMPACTS THE EXISTING CONCRETE SLURRY WALL THE SLURRY WALL SHALL BE NOTCHED AS NECESSARY TO INSTALL THE DRAINAGE.
2. SAWCUT CONCRETE SLURRY WALL AND REMOVE TO PROVIDE 3 INCH CLEARANCE BETWEEN THE PIPE AND THE SLURRY WALL.
3. INSTALL MEMBRANE WATERPROOFING ON ALL EXPOSED SURFACES OF THE CONCRETE SLURRY WALL. THE MEMBRANE WATERPROOFING SHALL EXTEND A MINIMUM OF 12 INCHES BEYOND THE EXISTING UNDISTURBED WATERPROOFING.
4. INSTALL THE DRAINAGE PIPE WITH SAND BORROW BETWEEN THE PIPE AND SLURRY WALL.
5. ANY WORK THAT IMPACTS OR EXPOSES THE MBTA TUNNEL OR SLURRY WALLS SHALL BE PERFORMED IN THE PRESENCE OF MBTA ENGINEERS. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THIS DETAIL AND AS DIRECTED BY THE MBTA.

SLURRY WALL AND DRAIN CROSSING DETAIL

SCALE: N.T.S.

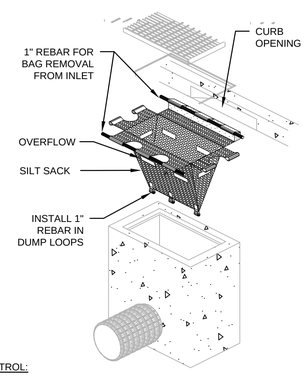


NOTES FOR EROSION CONTROL:

1. STRAW WATTLE INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF SHALL NOT BE ALLOWED TO RUN UNDER OR AROUND WATTLE.
2. STRAW WATTLES SHALL BE PLACED ALONG SLOPE CONTOURS.
3. ADJACENT WATTLES SHALL TIGHTLY ABUT.

TYPICAL STRAW WATTLE DETAIL

SCALE: N.T.S.



NOTES FOR EROSION CONTROL:

1. CONTRACTOR SHALL REMOVE SEDIMENT AS NECESSARY TO MAINTAIN LEVEL BELOW OVERFLOW HOLES IN SILT SACK.
2. SILT SACK SHALL BE USED ON ALL EXISTING CATCH BASINS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SEDIMENTATION BARRIERS THROUGHOUT THE DURATION OF THE PROJECT.
4. CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE OF SEDIMENT AS REQUIRED.
5. CONTRACTOR SHALL REMOVE SILT SACKS AND STRAW WATTLES AND LEGALLY DISPOSE OF THEM OFF-SITE, UPON COMPLETION OF THE PROJECT AND AS REQUIRED.

TYPICAL SILT SACK DETAIL

SCALE: N.T.S.

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REVISIONS

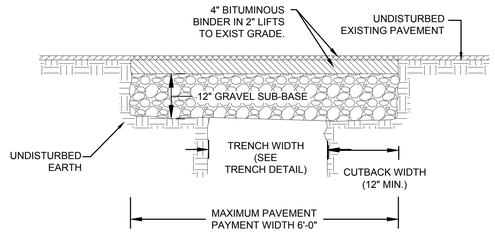
DATE	MARCH 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	C-Details

DETAILS I

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

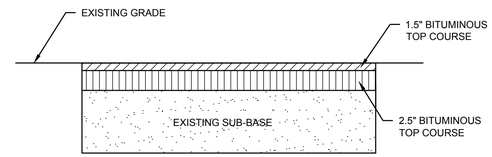
SHEET
CG-1

PLOTTED: 3/30/2017 12:01 PM BY: judy.leigh.arndot
CAD FILE: G:_clients\Somerville MA\20171752.002A - Bike Path Retaining Wall And Drainage Design\Drawings\IC-Details.dwg LAYOUT: DETAILS I



PERMANENT TRENCH PAVING DETAIL

SCALE: N.T.S.

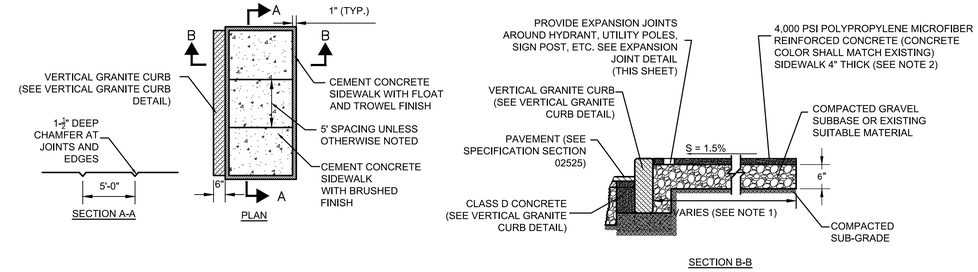


NOTES:

1. COMMUNITY PATH PAVING DETAIL FOR EXTENTS OF THE ASPHALT PATH THAT DOES NOT FALL WITHIN THE TRENCH AND CUTBACK WIDTH LIMITS.
2. CONTRACTOR SHALL MILL EXISTING PAVEMENT AND OVERLAY WITH BITUMINOUS CONCRETE AS SHOWN IN THIS DETAIL.
3. CONTRACTOR SHALL MATCH EXISTING GRADE.

COMMUNITY PATH PAVING DETAIL

SCALE: N.T.S.

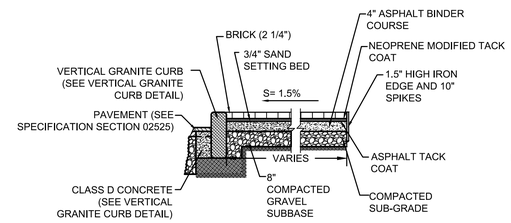


NOTES:

1. NEW SIDEWALK SHALL MATCH WIDTH OF EXISTING SIDEWALK UNLESS OTHERWISE NOTED.
2. SIDEWALK MATERIAL TO MATCH EXISTING SIDEWALK. FOR EXISTING ASPHALT SIDEWALK, SUBSTITUTE 4" CONCRETE.
3. AROUND HYDRANTS, UTILITY POLES SIGN POSTS ETC., SEE EXPANSION JOINT DETAIL (THIS SHEET).
4. SIDEWALKS TO BE BUILT ACCORDING TO ADA AND MA AAB REGULATIONS, 2.0% MAX (0% TOLERANCE) CROSS SLOPE.

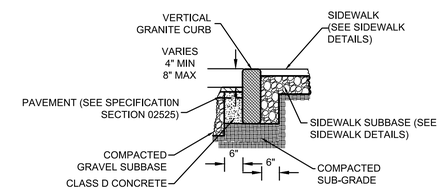
CONCRETE SIDEWALK RESTORATION DETAIL

SCALE: N.T.S.



BRICK SIDEWALK RESTORATION DETAIL

SCALE: N.T.S.

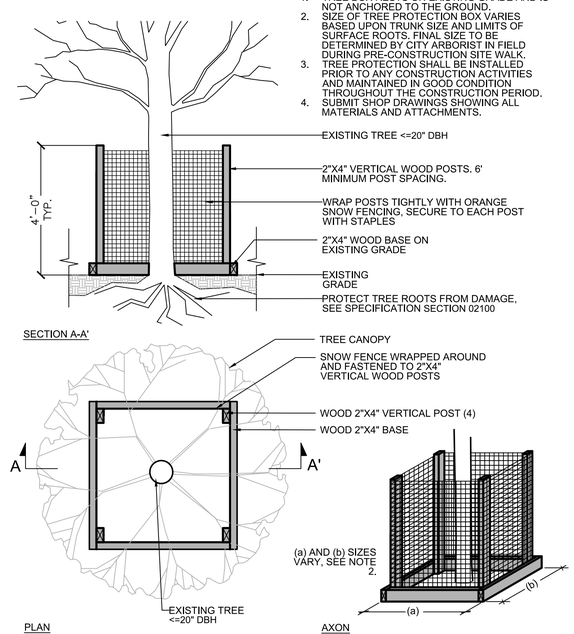


VERTICAL GRANITE CURB RESETTING DETAIL

SCALE: N.T.S.

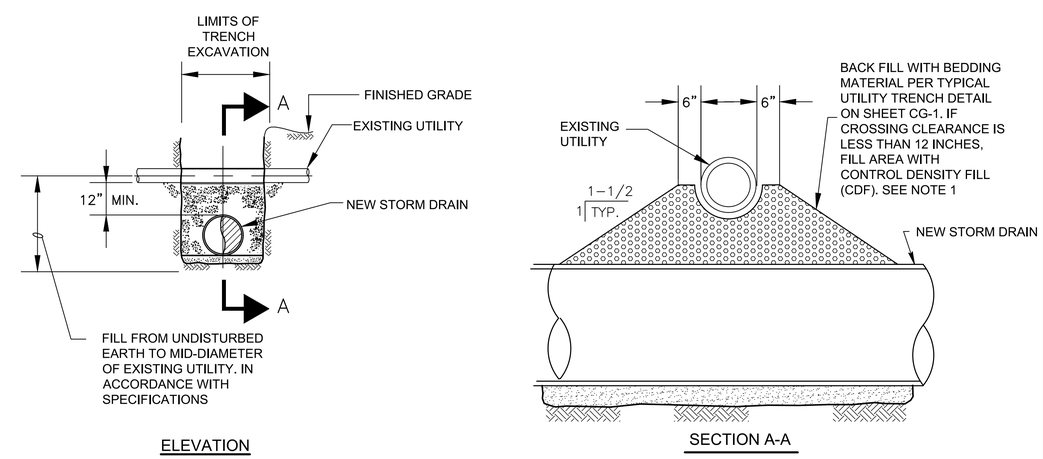
NOTES:

1. TREE BOX RESTS ON EXISTING GRADE AND IS NOT ANCHORED TO THE GROUND.
2. SIZE OF TREE PROTECTION BOX VARIES BASED UPON TRUNK SIZE AND LIMITS OF SURFACE ROOTS. FINAL SIZE TO BE DETERMINED BY CITY ARBORIST IN FIELD DURING PRE-CONSTRUCTION SITE WALK.
3. TREE PROTECTION SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES AND MAINTAINED IN GOOD CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.
4. SUBMIT SHOP DRAWINGS SHOWING ALL MATERIALS AND ATTACHMENTS.



TREE PROTECTION

SCALE: N.T.S.



NOTES:

1. CONTRACTOR SHALL ENCASE STORM DRAIN FOR UTILITY CROSSINGS WHERE MINIMUM CROSSING CLEARANCE IS LESS THAN 12-INCHES AND WHERE INDICATED ON THE DRAWINGS.

TYPICAL UTILITY CROSSING DETAIL

SCALE: N.T.S.

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REVISIONS

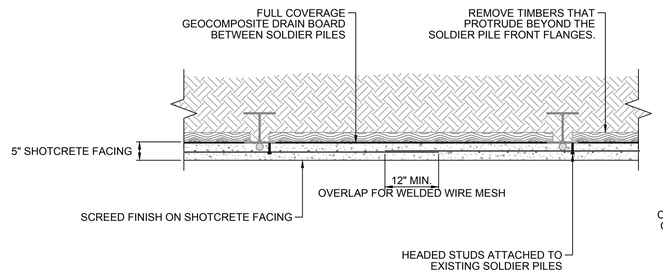
DATE	MARCH 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	C-Details

DETAILS II

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

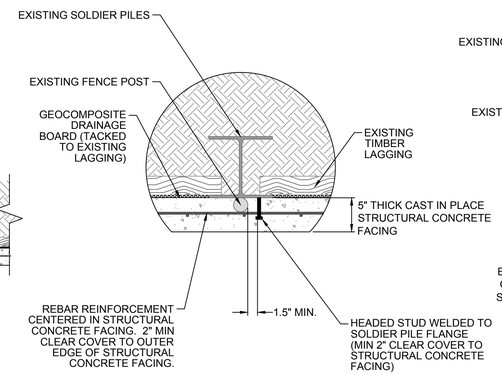
SHEET
CG-2

PLOTTED: 3/29/2017 2:03 PM, BY: alex silver
CAD FILE: G:_clients\somerville Ma\20171752.002a - Bike Path Retaining Wall And Drainage Design\Drawings\C-Details.dwg LAYOUT: DETAILS II



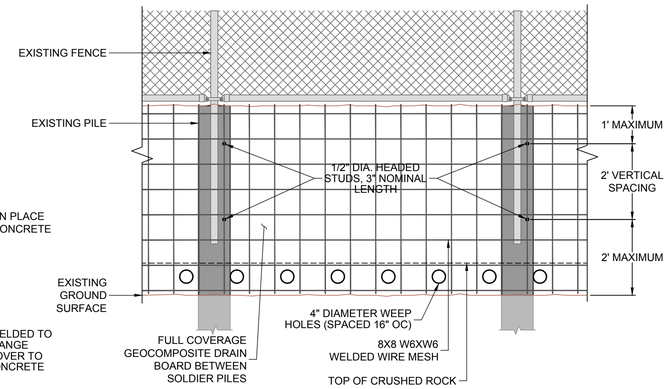
TYPICAL WALL FACING DETAIL (PLAN VIEW)

NOT TO SCALE



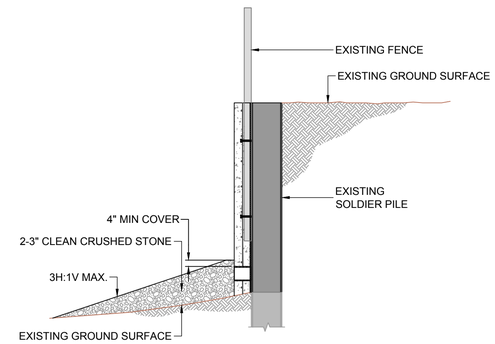
CONNECTION DETAILS (PLAN VIEW)

NOT TO SCALE



TYPICAL WALL FACING REINFORCEMENT AND DRAINAGE DETAIL (ELEVATION VIEW)

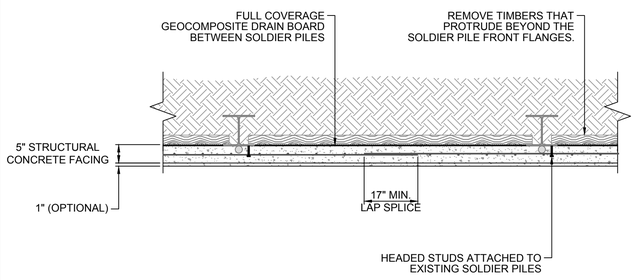
NOT TO SCALE



TYPICAL WALL FACING AND DRAINAGE DETAIL (SECTION VIEW)

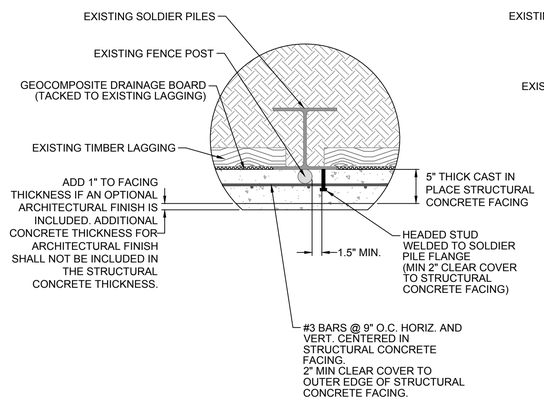
NOT TO SCALE

SHOTCRETE OPTION



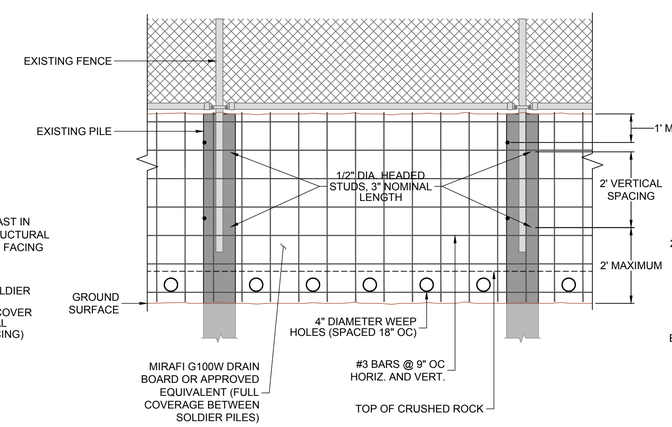
TYPICAL WALL FACING DETAIL (PLAN VIEW)

NOT TO SCALE



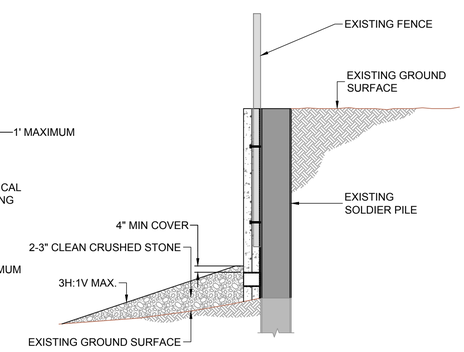
CONNECTION DETAILS (PLAN VIEW)

NOT TO SCALE



TYPICAL WALL FACING REINFORCEMENT AND DRAINAGE DETAIL (ELEVATION VIEW)

NOT TO SCALE



TYPICAL WALL FACING AND DRAINAGE DETAIL (SECTION VIEW)

NOT TO SCALE

CAST IN PLACE OPTION

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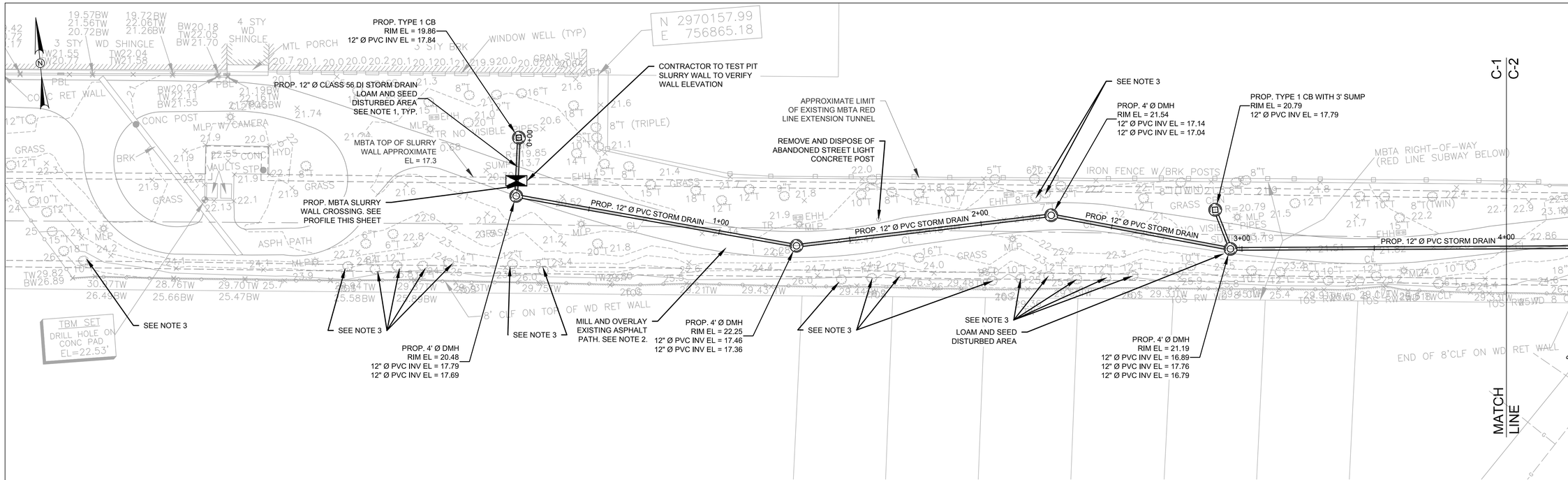
REVISIONS

DATE MARCH 2017
PROJECT NO. 20171752.0024
DRAWN BY AS
CHECKED BY JA
FILE NAME C:\Wall Design Details

RETAINING WALL DETAILS

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

SHEET
CG-3



PLAN

SCALE: 1"=20'

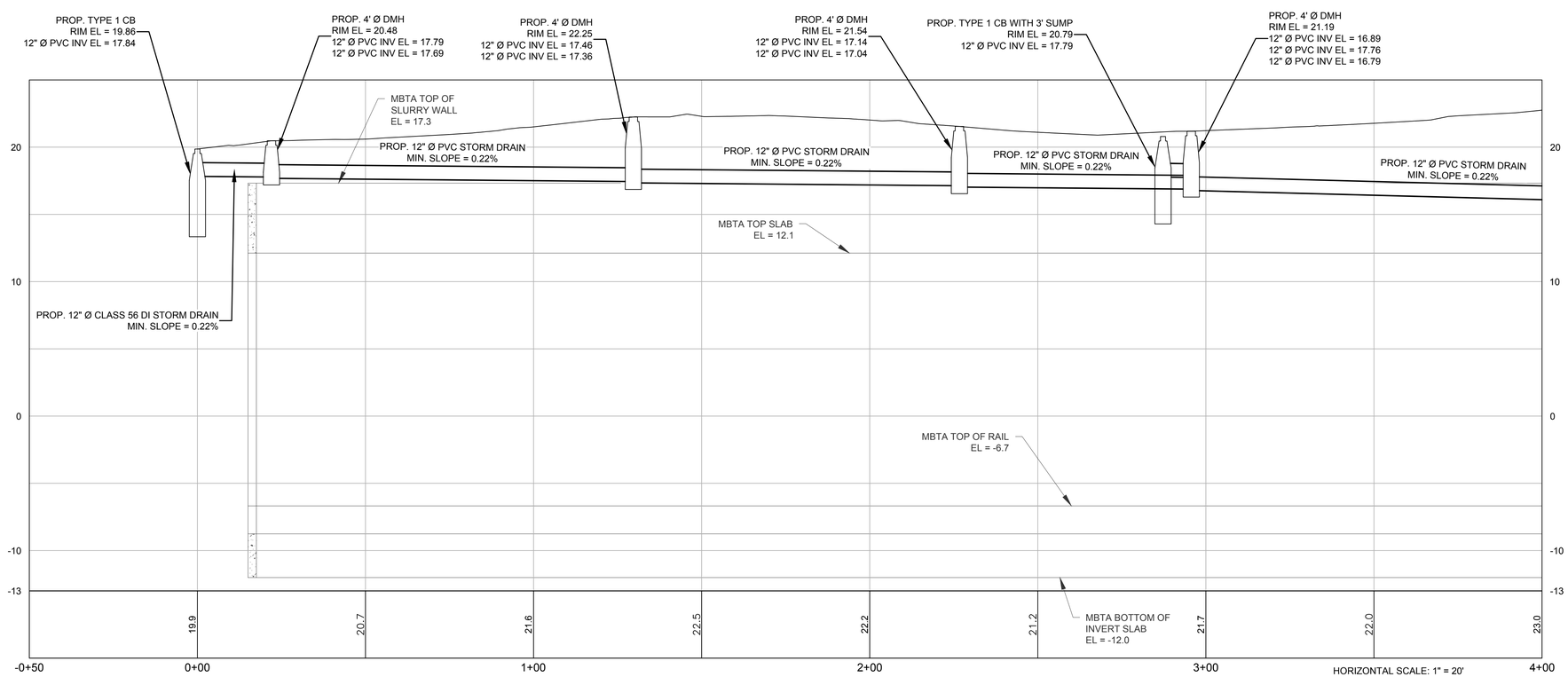
0 20 40 60
SCALE: 1" = 20' SCALE IN FEET

NOTES:

1. CONTRACTOR SHALL RESTORE AREA TO MATCH EXISTING CONDITIONS. WHERE INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER, CONTRACTOR SHALL LOAM AND SEED DISTURBED AREAS, SEE SECTION 02900. WHERE THE EXCAVATION FALLS INTO THE PAVED SOMERVILLE COMMUNITY PATH AND THORNDIKE STREET, THE CONTRACTOR SHALL RESTORE PAVEMENT AS SHOWN ON THE TYPICAL TRENCH RESTORATION DETAIL ON SHEET CG-2.

2. FROM STA 0+20 TO STA 4+00 CONTRACTOR SHALL MILL AND OVERLAY EXISTING PAVEMENT PER THE COMMUNITY PATH PAVING DETAIL ON SHEET CG-2.

3. CONTRACTOR SHALL PROTECT TREES PER THE TREE PROTECTION DETAIL ON SHEET CG-2.



PROFILE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

HORIZONTAL SCALE: 1" = 20'

20 10 0 20 40
5 0 5 10
VERTICAL SCALE: 1"=5'

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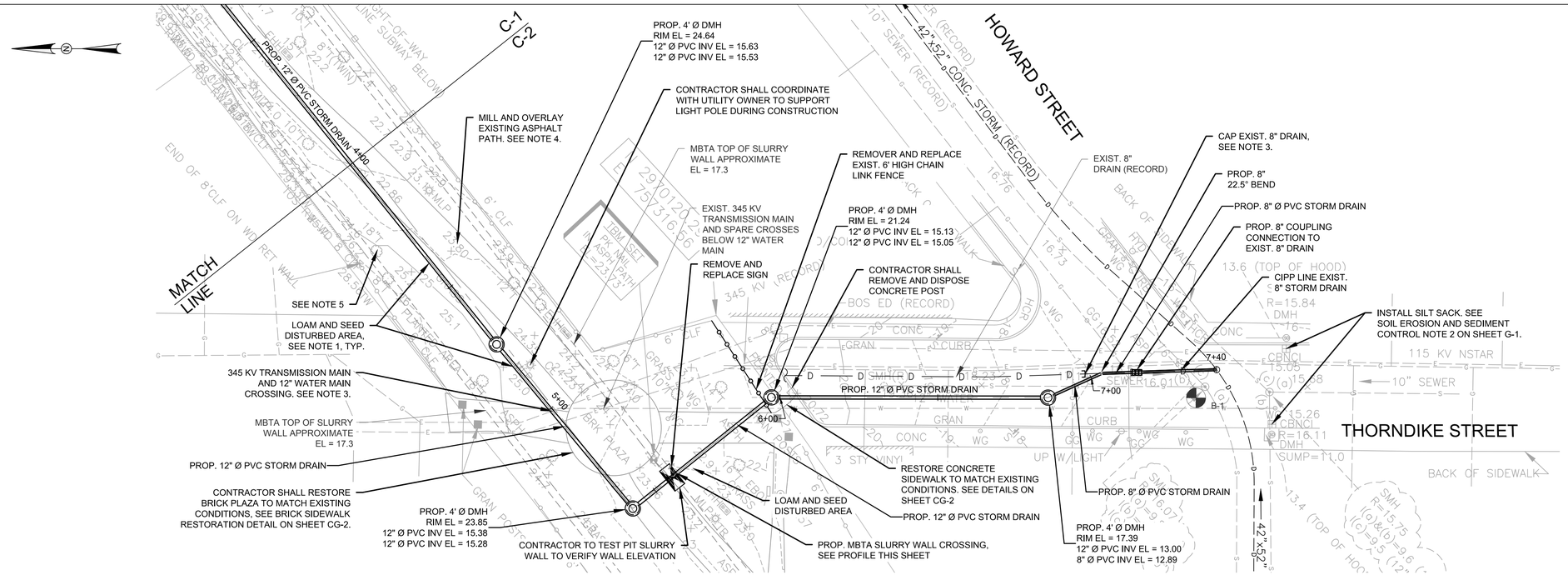
REVISIONS

DATE	MARCH 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	

SITE PLAN AND PROFILE STA 0+00 TO STA 4+00

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

SHEET
C-1

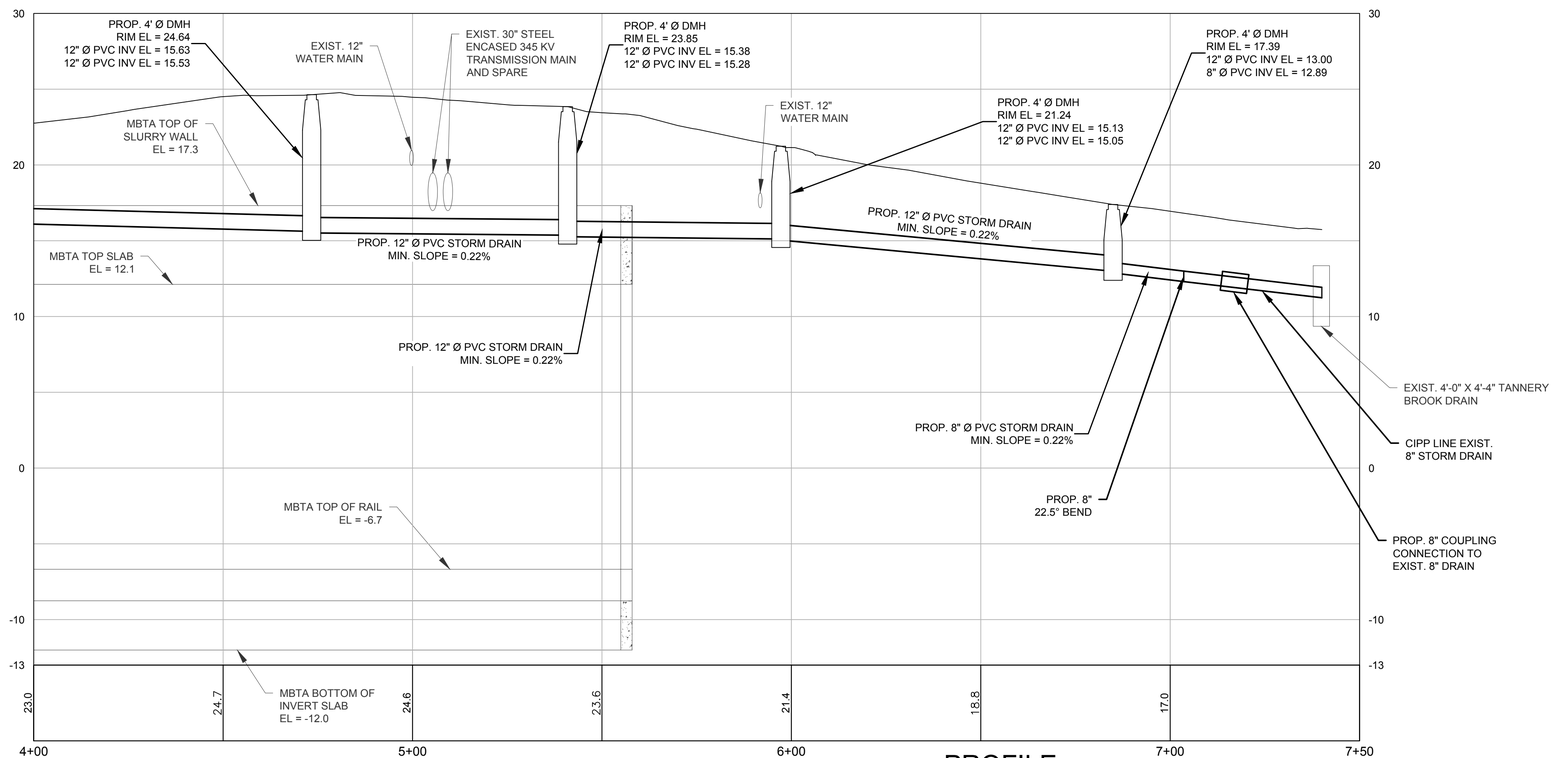


PLAN

SCALE: 1"=20'

0 20 40 60

SCALE: 1" = 20' SCALE IN FEET



PROFILE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

HORIZONTAL SCALE: 1" = 20'

20 10 0 20 40

5 0 5 10

VERTICAL SCALE: 1"=5'

NOTES:

1. CONTRACTOR SHALL RESTORE AREA TO MATCH EXISTING CONDITIONS. WHERE INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER, CONTRACTOR SHALL LOAM AND SEED DISTURBED AREAS, SEE SECTION 02900. CONTRACTOR SHALL RESTORE BRICK PLAZA, SEE SECTION 02525 FOR BRICK WALKWAY REQUIREMENTS AND DETAIL ON SHEET CG-2. WHERE THE EXCAVATION FALLS INTO THE PAVED SOMERVILLE COMMUNITY PATH AND THORNDIKE STREET, THE CONTRACTOR SHALL RESTORE PAVEMENT AS SHOWN ON THE TYPICAL TRENCH RESTORATION DETAIL ON SHEET CG-2.
2. REMOVE AND DISPOSE OF EXISTING 8" DRAIN AS NECESSARY TO INSTALL THE 12" 22.5 DEGREE DI BEND AND PROPOSED STORM DRAIN PIPING.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM 12" CROSSING CLEARANCE FOR EXISTING UTILITY CROSSINGS. WHERE THE CROSSING CLEARANCE IS LESS THAN 12 INCHES, THE CONTRACTOR SHALL BACKFILL THE TRENCH WITH CONTROL DENSITY FILL (CDF) PER THE TYPICAL UTILITY CROSSING DETAIL ON SHEET CG-2.
   - 3.1. FOR ALL TRANSMISSION MAIN CROSSINGS, THE CONTRACTOR SHALL HAVE AN EVERSOURCE CONDUIT INSPECTOR ON SITE, AND SHALL BE RESPONSIBLE FOR PROVIDING 3 DAYS MINIMUM NOTICE TO EVERSOURCE TO COORDINATE AN EVERSOURCE CONDUIT INSPECTOR TO BE ON SITE. SEE STORM DRAIN INSTALLATION NOTE 3 ON SHEET G-1.
4. FROM STA 4+00 TO STA 5+60 CONTRACTOR SHALL MILL AND OVERLAY EXISTING PAVEMENT PER THE COMMUNITY PATH PAVING DETAIL ON SHEET CG-2.
5. CONTRACTOR SHALL PROTECT TREES PER THE TREE PROTECTION DETAIL ON SHEET CG-2.

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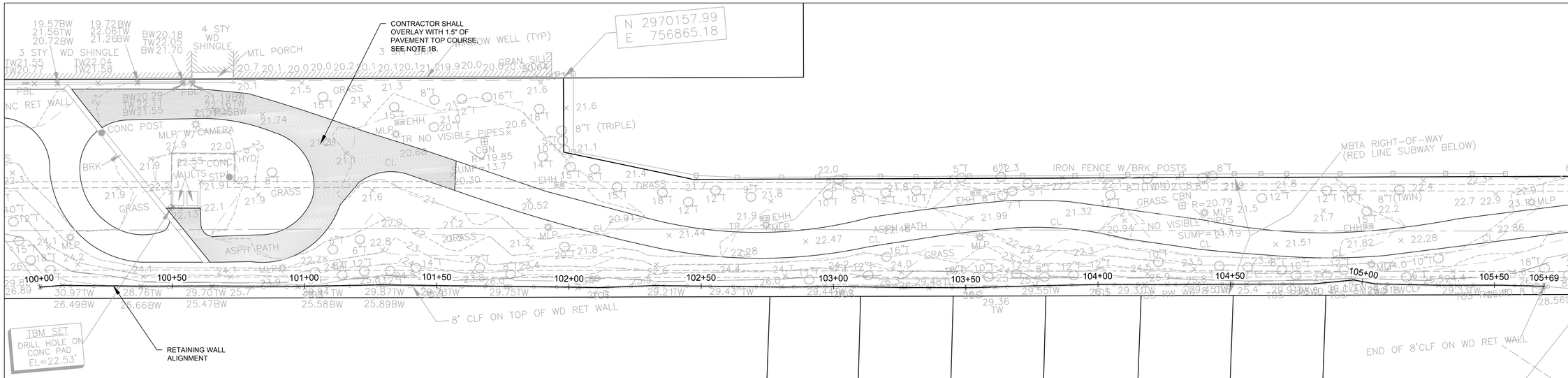
REVISIONS

DATE	MARCH 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	

SITE PLAN AND PROFILE STA 4+00 TO STA 7+40

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

SHEET
C-2



PAVING LEGEND

OVERLAY ONLY

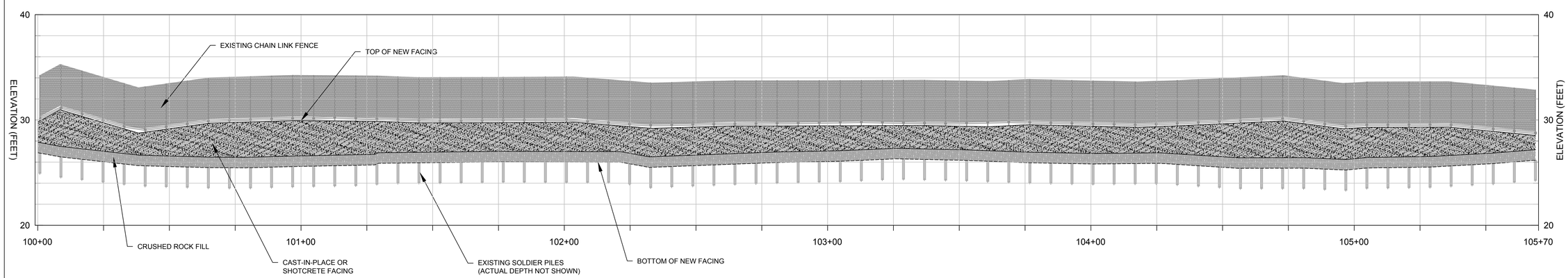
NOTE:
1. SOLDIER PILE QUANTITIES AND LOCATIONS SHOWN IN THESE PLANS ARE APPROXIMATE. EXISTING WALL IS CONSTRUCTED OF A TOTAL OF 72 SOLDIER PILES.

PLAN

SCALE: 1"=20'

PAVING NOTES:
1. CONTRACTOR SHALL RESTORE COMMUNITY PATH FROM CITY OF SOMERVILLE CITY LINE TO BUENA VISTA ROAD.
   - 1A. TRENCH PAVEMENT RESTORATION SHALL CONFORM TO THE PERMANENT TRENCH PAVING DETAIL ON SHEET CG-2.
   - 1B. WHERE SHOWN CONTRACTOR SHALL OVERLAY 1.5" TOP COURSE ON TOP OF EXISTING PAVEMENT TO MATCH EXISTING SLOPE.

0 20 40 60
SCALE: 1" = 20' SCALE IN FEET



PROFILE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

HORIZONTAL SCALE: 1" = 20'
20 10 0 20 40
5 0 5 10
VERTICAL SCALE: 1"=5'

KLEINFELDER
Bright People. Right Solutions.

REVISIONS

DATE	MARCH 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME C:\Vail Design	

RETAINING WALL SITE PLAN STA 100+00 TO STA 105+69

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAIN DESIGN

SHEET
C-3

EXHIBIT B

SCOPE OF ACTIVITY

Subject to the terms and conditions in this License for Entry Agreement, the Licensee, its agents, employees, contractors, subcontractors, and/or representatives are hereby granted a license to enter upon the Premises for the sole purpose as described in section 2.6.

Licensee shall conduct all activities within the Premises 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 Railroad 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 for Entry. 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 ten (10) days' prior written notification to (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 For Entry by contacting the MBTA departments in accordance to Section 2.6 for access. 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 MBTA Control Center 617-222-5298.**

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 or an affected Railroad Company should, in its sole and absolute discretion, deem flagmen, watchmen, communications/signaling personnel, electric traction personnel, 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 and/or a Railroad Company shall upon notice to Licensee (where such notice is feasible) have the right to place such personnel, including personnel of the MBTA's or the Railroad Company'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 and/or the Railroad Company, as applicable, within thirty (30) days of receiving an itemized, written invoice for such reimbursement. The MBTA's or a Railroad Company'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 or the Railroad Company. 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 and/or a Railroad Company, 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 a Railroad Company 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 all applicable requirements of the MBTA Railroad Operations Directorate (including, but not limited to, those entitled: "I - Guidelines and Procedures for Construction on MBTA Railroad and Transit Properties" dated August 2014, "II - Maintenance and Protection of Railroad Traffic" dated August 2014, "III - Insurance Specifications" dated August 2014) and the MBTA Special Instructions dated April, 2003. To the extent that there is an irreconcilable conflict between the aforementioned requirements and this License for Entry, the terms and conditions contained in the MBTA Railroad Operations Directorate Procedures and/or MBTA Special Instructions shall control unless the requirements in this License for Entry are stricter.

EXHIBIT C

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO
Brian Shortsleeve, Chief Administrator and Acting General Manager

massDOT
Massachusetts Department of Transportation

June 14, 2017

Ms. Krista LoCurto
Lease Manager
Massachusetts Realty Group
20 Park Plaza, 11th Floor, Suite 1115A
Boston, MA 02116

Re: **MRG Request No. 15797**
Somerville Community Path, Somerville, MA

Dear Ms. LoCurto,

The MBTA Capital Delivery Department has reviewed your May 3, 2017 request from the City of Somerville to replace two failing infiltrating catch basins in the Community Path near the Thorndike Street right-of-way adjacent to the MBTA Red Line tunnel with new catch basins and to provide a drainage connection to the City's existing storm drain system.

The MBTA Capital Delivery Department has reviewed the request and requires the following conditions be met prior to construction:

1. All work and access times are to be coordinated with MBTA Red Line Operations.

2. RWP training for Surveyors, flagging and power support is required.

3. A construction management plan indicating sequence of construction, locations of construction equipment and material storage, and documentation showing that no piece of equipment, or combination of equipment, exceeds the MBTA tunnel roof capacity of 400 lbs./ft^2 surface loading or HS 20-44 at vehicular intersections, prior to deploying the equipment on the portion of the path located above the tunnel roof must be submitted

4. Revise and resubmit sheet C-1 of the submitted contract plans to include details of the proposed 12" diameter storm drain crossing above the MBTA slurry wall on sheet CG-1 of that plan set.

5. Develop typical details of dewatering and repair to the MBTA tunnel waterproofing details as necessary in the event of damage caused by inadvertent contact/damage with the tunnel elements, and submit for review.

In addition:

6. Prior to and following construction, the Applicant shall perform an interior condition survey of the MBTA tunnel along surface work limits, in addition to 100 feet beyond the limits of work in each direction within the tunnel. The condition survey shall clearly show the relationship of the work to the location of the tunnel

7. An MBTA Capital Delivery Inspector shall be present during work in close proximity to the tunnel.

8. The Applicant shall establish an MBTA force account to cover the costs associated with the tunnel survey, plan review, and construction oversight.

This Department has no objection to the request subject to adherence to the conditions stated above. Any conditions that other MBTA Departments may have shall be incorporated with those stated above.

Please contact Peter Paravalos, Director of Transit-Oriented Development, at pparavalos@mbta.com or at 617-222-5678 with any questions you may have.

Sincerely,

Beth J. Larkin, P.E.
Assistant General Manager for Capital Delivery

cc: C. Shea, P. Paravalos, Jack Martin, J. McNall, R. Martin, J. Chan, L. Brelsford

EXHIBIT D

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO
Brian Shortsleeve, Chief Administrator and Acting General Manager

massDOT
Massachusetts Department of Transportation

June 5, 2017

Mr. Brian Clarizia
Director of Licensing
Greystone Management Solutions
20 Park Plaza, Suite 1120
Boston, MA 02116

Subject: MRG File #15797- City of Somerville
Request to Replace Two (2) Infiltrating Catch Basins
Thorndike Street, Somerville MA
MBTA E&M Systems Department Review Comments

Dear Mr. Clarizia,

Per your request, the MBTA E&M Systems Department has reviewed File #15797, dated 5/3/17, relative to the request from the City of Somerville to replace two failing infiltrating catch basins in the Community Path with two new standard catch basins and provide a drainage connection to the city existing storm drainage system, near Thorndike Street Right of Way, in Somerville, MA. As a result of our review, we would like to provide the following comments.

1. There is no objection to the scope and work involved, but a force account will be established for any portions of work that may affect the MBTA E&M Systems Department.
2. Please see the attached MBTA Signals Department comments, dated 5/24/17, provided by Ted Smedberg- Supervisor of Signal Engineering, MBTA Signals and Communications.
3. Please see the attached MBTA MOW Department comments, dated 5/23/17, provided by Ray Martin- Track Engineer, MBTA Maintenance of Way Department.

If you have any questions regarding this response, please feel free to contact my office at (617) 222-5434.

Sincerely,

John M. Martin

for John A. Martin
Senior Director of E&M Systems

JMM/jmm
(MRG#17-68)

Cc: W. Charrette
E. Baird
A. Abdulakhatov
File

O:\POWER DEPARTMENT ENGINEERING\MRG (Greystone)\2017 MRG\MRG #15797 City of Somerville\MRG #17-68 #15797 Somerville MBTA E&M response 060517.docX

EXHIBIT E

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO
Brian Shortsleeve, Chief Administrator and Acting General Manager

massDOT
Massachusetts Department of Transportation

MEMORANDUM

To: Steven V. Culp
Director of Safety Engineering

From: Jeffrey Young SVC for
System Safety Analyst

Date: June 13, 2017

Subject: Drainage Utility Installation
City of Somerville
MRG Project #MDOT-15797

MBTA Safety has received and reviewed the proposal from the City of Somerville to replace failing infiltrating catch basins in the Community Path with two new standard catch basins and provide a 12 inch diameter pipe drainage connection to the city's existing storm drainage system at Thorndike Street and Howard Street. The proposed work interacts directly with the Red Line tunnel for approximately 543 feet and the contractor will excavate approximately 4 feet wide and will be modifying a total of 8 manholes. The work will also require crossing over the Red Line tunnel slurry wall above the tunnels top slab at two locations.

Based on this information submitted, MBTA Safety should deem the request to be "Approved with Conditions". In addition to any or all conditions set forth by Red Line Operations, Transit Oriented Development, and Engineering & Maintenance (Signal, Track, and Power), the following conditions shall be met:

1. Red Line Operations and Engineering & Maintenance shall be notified and coordinated with to ensure proper scheduling, if necessary. Based on requirements, work may be deemed necessary for non-revenue hours.
2. All existing MBTA utilities must be identified and protected prior to the start of work.
3. All equipment utilized (i.e. vehicles, etc.) during the construction shall be easily moved to ensure worker safety and to avoid interference with operations.
4. If at any time the work is deemed as a hazard to MBTA employees/customers/passengers or impedes operations, MBTA has the right to cease all work until the conditions are corrected.

If you have any questions or concerns, please feel free to contact me.

EXHIBIT F

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO
Brian Shortsleeve, Chief Administrator and Acting General Manager

massDOT
Massachusetts Department of Transportation

MEMORANDUM

To: Patty Schuster
Greystone Management Solutions

From: Christopher Shea
Division Chief, Red Line Operations

Date: Wednesday– May 31, 2017

Subject: MBTA #15797- City of Somerville

With regards to the request made by the City of Somerville to replace two failing infiltrating catch basins in the community path with two new standard catch basins and provide drainage connection to the city's existing drainage system, near Thorndike St Right of Way, by the MBTA Red Line tunnel in Somerville, Ma. Red Line Operations approves the request to perform the activity with following conditions:

- City of Somerville and its sub contractors must coordinate a field visit with the Red Line Construction Supervisor and Director of Construction Logistics, to outline the exact scope of work to take place.
- All work must be approved by the Director of Construction Logistics and the Red Line Construction Supervisor.
- When the project takes place, the terms and conditions outlined in the Authority's Special Conditions for Subway Operations as well as those set forth in the Right of Way Manual must be adhered to (if applicable).
- All work will be under the supervision Red Line Construction Supervisor or his designee.
- City of Somerville and its sub contractors understand that the MBTA can suspend all work at any time and limit the hours and/or timeframe(s) that work will be allowed to take place including the possibility of limiting hours to "non-revenue hours" or diversions.
- All diversions must be carefully coordinated with the MBTA Director of Construction Logistics.
- If it is determined that MBTA flagging support or a diversion of normal train service is required a force account must be established through the completion of the project.

- Train service will not be obstructed during revenue service unless it is an approved diversion.

- City of Somerville and its sub contractors understand care must be taken as to not damage MBTA property or infrastructure.

- All MBTA infrastructure and property must be in the same condition as it was prior to work taking place. Any damage to MBTA property/infrastructure will be the financial responsibility of City of Somerville and their sub contractors.

- City of Somerville and its sub contractors will provide their contact information for their designated liaison to Red Line Operations, who will be available throughout the course of the work.

- City of Somerville personnel understand that the MBTA can suspend all work at any time and limit the hours and/or timeframe(s) that work will be allowed to take place.

- The exact scope of the work and all equipment used must be approved by the Red Line Construction Supervisor and will proceed under the direction of the Red Line Construction Supervisor and the Director of Construction Logistics.

- Care must be taken to ensure MBTA customers are not in harm's way as a result of this project.

- I also recommend that you seek concurrence of Beth Larkin, Assistant General Manager of Capital Delivery, John Martin, Director of Power Systems Maintenance, Steven Culp, Director of Safety and Engineering Systems, Joseph McNall, Director of Signals and Communications, Raymond Martin, Engineer of Systemwide Maintenance and Improvements, Any and all conditions outlined by the aforementioned divisions must be strictly adhered to.

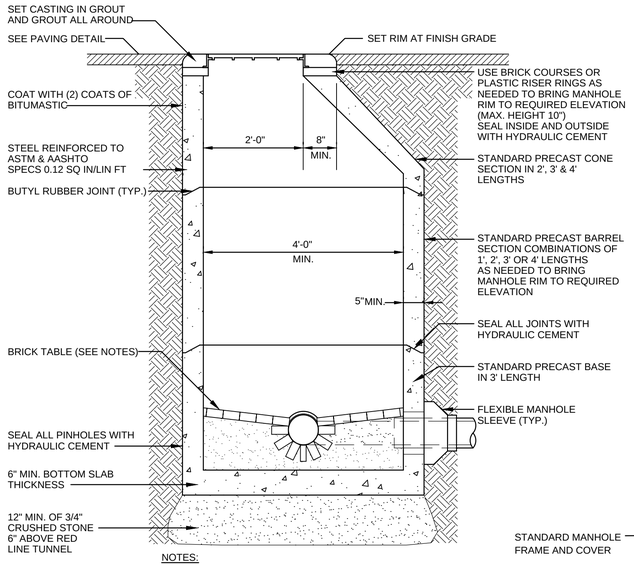
Once the above conditions are met, work can proceed under the direction of the Red Line Construction Supervisor Tom Crowley. Mr. Crowley can be reached at 617-721-1197. If I can be of further assistance please contact me at x5844.

cc:	J. Martin	J. McNall	R. Martin	B. Larkin
	W. McClellan	S. Culp	N. Ortiz	
	E. Stoothoff	N. Michaud	T. Crowley	

ATTACHMENT NO. 2:

Sheet CG-1 - Details I (1 sheet)

MBTA License Revision

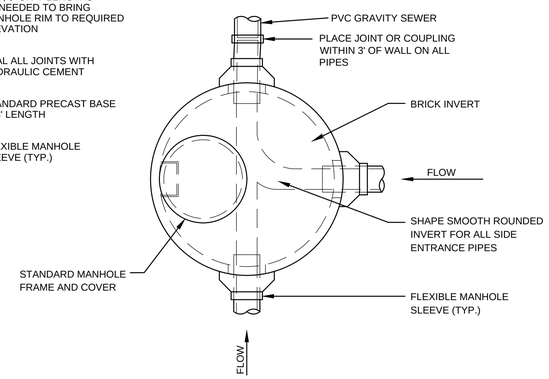


NOTES:

1. INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP OF PIPE. TABLE TO SLOPE AT 1" PER 1' TO INSIDE OF MANHOLE BASE.
2. TYPICAL SANITARY MANHOLE TO BE 4 FOOT DIAMETER.

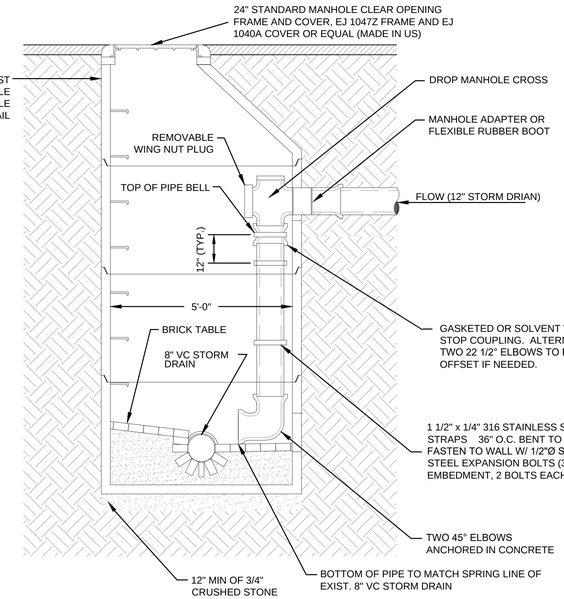
TYPICAL MANHOLE (ELEVATION)

SCALE: N.T.S.



TYPICAL MANHOLE (PLAN)

SCALE: N.T.S.



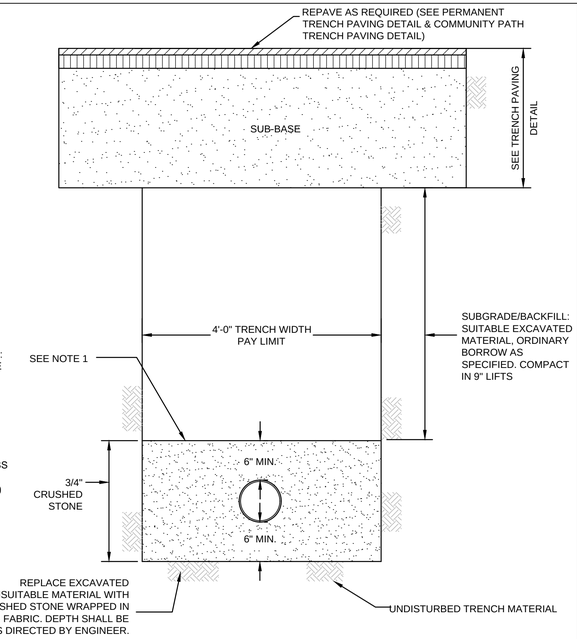
ELEVATION

NOTES:

1. DROP MANHOLES SHALL BE USED WHEN ENTRANCE PIPE INVERTS ARE 1'-6" OR GREATER THAN MANHOLE INVERT.

5'Ø DROP MANHOLE (INTERNAL)

SCALE: N.T.S.

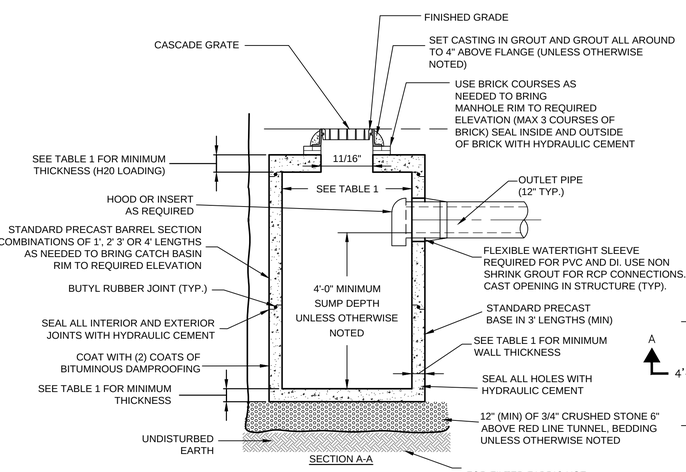


NOTES:

1. BEDDING SHALL BE WRAPPED WITH FILTER FABRIC IN LOCATIONS WHERE EXISTING SOIL IS CONSIDERED UNSUITABLE BY THE ENGINEER.

UTILITY TRENCH DETAIL

SCALE: N.T.S.



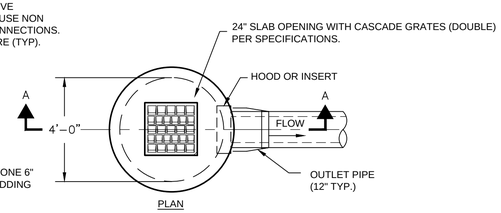
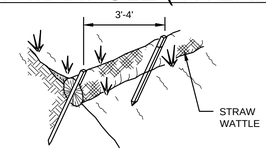


	TABLE 1: PRECAST SIZE TABLE			
	MANHOLE WIDTH	MINIMUM WALL THICKNESS		
	Ø (I.D.)	TOP	BOTTOM	SIDE
TYPE 1	4'-0"	8"	6"	5"

I.D. = INSIDE DIMENSION

SINGLE GRATE CATCH BASIN

SCALE: N.T.S.

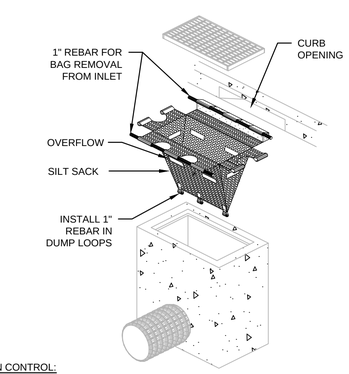


NOTES FOR EROSION CONTROL:

1. STRAW WATTLE INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF SHALL NOT BE ALLOWED TO RUN UNDER OR AROUND WATTLE.
2. STRAW WATTLES SHALL BE PLACED ALONG SLOPE CONTOURS.
3. ADJACENT WATTLES SHALL TIGHTLY ABUT.

TYPICAL STRAW WATTLE DETAIL

SCALE: N.T.S.



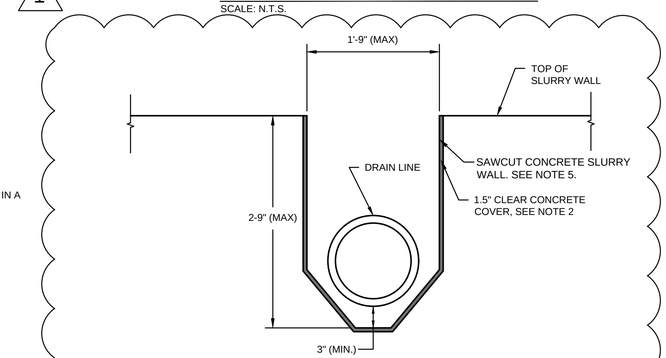
NOTES FOR EROSION CONTROL:

1. CONTRACTOR SHALL REMOVE SEDIMENT AS NECESSARY TO MAINTAIN LEVEL BELOW OVERFLOW HOLES IN SILT SACK.
2. SILT SACK SHALL BE USED ON ALL EXISTING CATCH BASINS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SEDIMENTATION BARRIERS THROUGHOUT THE DURATION OF THE PROJECT.
4. CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE OF SEDIMENT AS REQUIRED.
5. CONTRACTOR SHALL REMOVE SILT SACKS AND STRAW WATTLES AND LEGALLY DISPOSE OF THEM OFF-SITE, UPON COMPLETION OF THE PROJECT AND AS REQUIRED.

TYPICAL SILT SACK DETAIL

SCALE: N.T.S.

1



NOTE:

1. WHERE THE PROPOSED DRAINAGE LINE IMPACTS THE EXISTING CONCRETE SLURRY WALL THE SLURRY WALL SHALL BE NOTCHED AS NECESSARY TO INSTALL THE DRAINAGE.
2. CONTRACTOR SHALL SAW CUT EXISTING SLURRY WALL AS SHOWN AND ROUGHEN RESULTING CONCRETE SURFACE TO A MINIMUM 0.25" AMPLITUDE BEFORE APPLYING A 1.5" THICK HIGH EARLY STRENGTH REPAIR MORTAR AND BONDING AGENT IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
3. INSTALL THE DRAINAGE PIPE WITH SAND BORROW BETWEEN THE PIPE AND SLURRY WALL.
4. ANY WORK THAT IMPACTS OR EXPOSES THE MBTA TUNNEL OR SLURRY WALLS SHALL BE PERFORMED IN THE PRESENCE OF MBTA ENGINEERS. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THIS DETAIL, CONDITIONS OF THE LICENSE AGREEMENT, ATTACHED AS AN APPENDIX TO THE SPECIFICATIONS, AND AS DIRECTED BY THE MBTA. REFER TO STORM DRAIN INSTALLATION NOTE 4 ON SHEET G-1.
5. CONTRACTOR SHALL TEST PIT AND CHIP EXISTING SLURRY WALL TO LOCATE REBAR INTERFERING WITH PROPOSED DRAIN CROSSING. AT A MAXIMUM, CONTRACTOR SHALL CUT (2) HORIZONTAL BARS AND (2) VERTICAL BARS TO INSTALL DRAIN. IF ADDITIONAL REINFORCING INTERFERES WITH DRAIN CROSSING INSTALLATION, CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO CUTTING REINFORCING. CONTRACTOR SHALL NOT MODIFY REINFORCING HOOKED FROM TOP SLAB OF TUNNEL INTO SLURRY WALL.

SLURRY WALL AND DRAIN CROSSING DETAIL

SCALE: N.T.S.

KLEINFELDER
Bright People. Right Solutions.

REVISIONS	
1	MBTA LICENSE REVISION

AUGUST 1, 2017

DATE	JUNE 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	C-Details

DETAILS I

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAINAGE UPGRADES

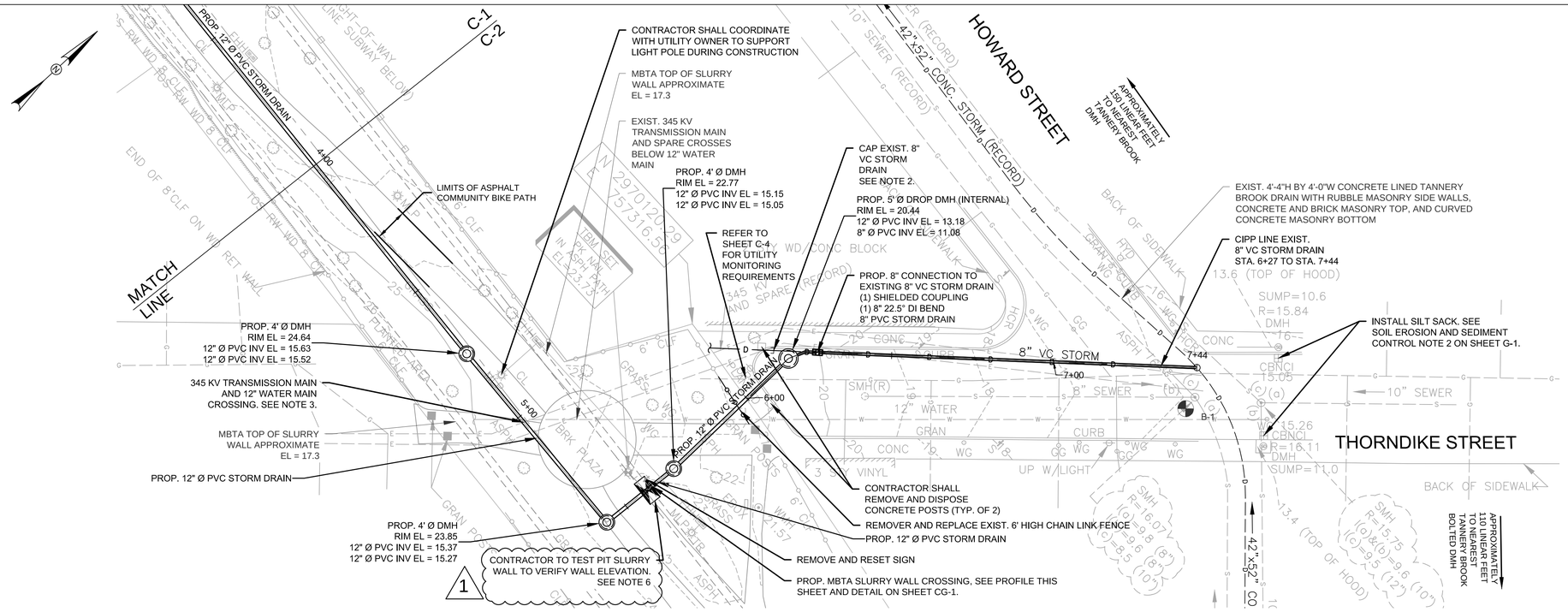
SHEET
CG-1

PLOTTED: 8/1/2017 10:20 AM BY: judy.leigh.arnobit
CAD FILE: G:_clients\Somerville MA\20171752.002A - Bike Path Retaining Wall And Drainage Design\Drawings\C-Details.dwg LAYOUT: DETAILS I

ATTACHMENT NO. 3:

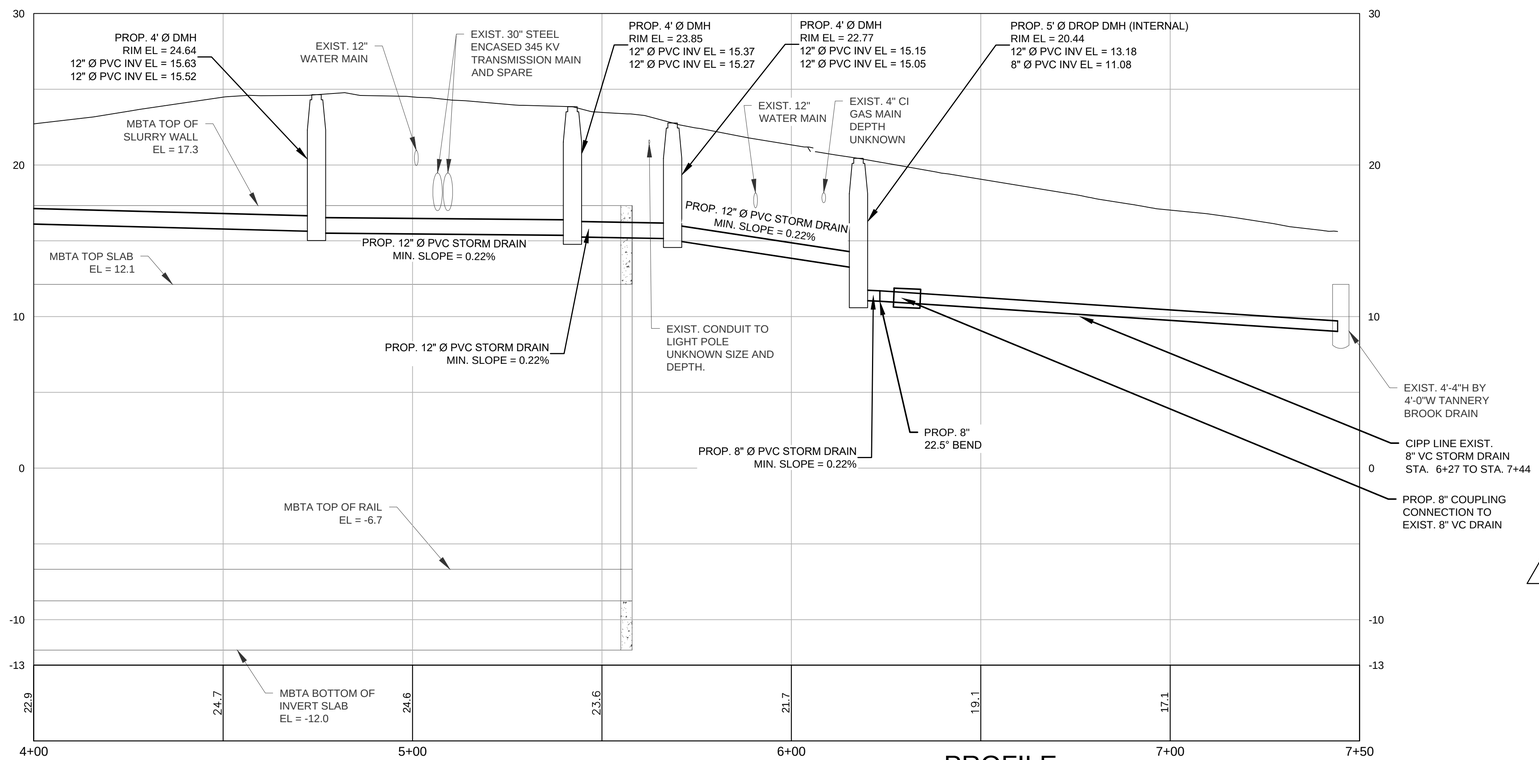
Sheet C-2 - Site Plan and Profile Sta. 4+00 to Sta. 7+44 (1 sheet)

MBTA License Revision



PLAN

SCALE: 1"=20'



PROFILE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

NOTES:

1. CONTRACTOR SHALL RESTORE AREA TO MATCH EXISTING CONDITIONS. WHERE INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER, CONTRACTOR SHALL LOAM AND SEED DISTURBED AREAS, SEE SECTION 02900. CONTRACTOR SHALL RESTORE BRICK PLAZA, SEE SECTION 02525 FOR BRICK WALKWAY REQUIREMENTS AND DETAIL ON SHEET CG-2. WHERE THE EXCAVATION FALLS INTO THE PAVED SOMERVILLE COMMUNITY PATH AND THORNDIKE STREET, THE CONTRACTOR SHALL RESTORE PAVEMENT AS SHOWN ON THE TYPICAL TRENCH RESTORATION DETAIL ON SHEET CG-2. REFER ALSO TO SHEETS C-3 & C-4 FOR SURFACE RESTORATION LIMITS.

2. REMOVE AND DISPOSE OF EXISTING 8" VC STORM DRAIN AS NECESSARY TO INSTALL THE 5'Ø DROP DMH, PROVIDE ACCESS FOR CIPP LINING AND INSTALL THE CONNECTION TO THE EXISTING 8" VC STORM DRAIN.

3. CONTRACTOR SHALL MAINTAIN A MINIMUM 6" CROSSING CLEARANCE FOR EXISTING UTILITY CROSSINGS AND SHALL BACKFILL THE TRENCH WITH CONTROL DENSITY FILL (CDF) TO THE SPRING LINE OF THE 345 KV TRANSMISSION MAIN AND SPARE. REFER TO THE TYPICAL UTILITY CROSSING DETAIL ON SHEET CG-2.

   3.1. FOR ALL TRANSMISSION MAIN CROSSINGS, THE CONTRACTOR SHALL HAVE AN EVERSOURCE CONDUIT INSPECTOR ON SITE, AND SHALL BE RESPONSIBLE FOR PROVIDING 3 DAYS MINIMUM NOTICE TO EVERSOURCE TO COORDINATE AN EVERSOURCE CONDUIT INSPECTOR TO BE ON SITE. SEE STORM DRAIN INSTALLATION NOTE 3 ON SHEET G-1.

4. FROM STA 4+00 TO STA 5+60 CONTRACTOR SHALL MILL AND OVERLAY EXISTING PAVEMENT PER THE COMMUNITY PATH PAVING DETAIL ON SHEET CG-2.

5. CONTRACTOR SHALL PROTECT TREES PER THE TREE PROTECTION DETAIL ON SHEET CG-2.

1

6. CONTRACTOR SHALL TEST PIT AND CHIP EXISTING SLURRY WALL TO LOCATE REBAR INTERFERING WITH PROPOSED DRAIN CROSSING. CONTRACTOR SHALL PERFORM SLURRY WALL TEST PIT ACTIVITIES IN THE PRESENCE OF MBTA ENGINEERS.

KLEINFELDER
Bright People. Right Solutions.

REVISIONS	
1	MBTA LICENSE REVISION
	AUGUST 1, 2017

DATE	JUNE 2017
PROJECT NO.	20171752.002A
DRAWN BY	AS
CHECKED BY	JA
FILE NAME	

SITE PLAN AND PROFILE STA 4+00 TO STA 7+44

CITY OF SOMERVILLE, MASSACHUSETTS
BIKE PATH RETAINING WALL AND DRAINAGE UPGRADES

SHEET
C-2

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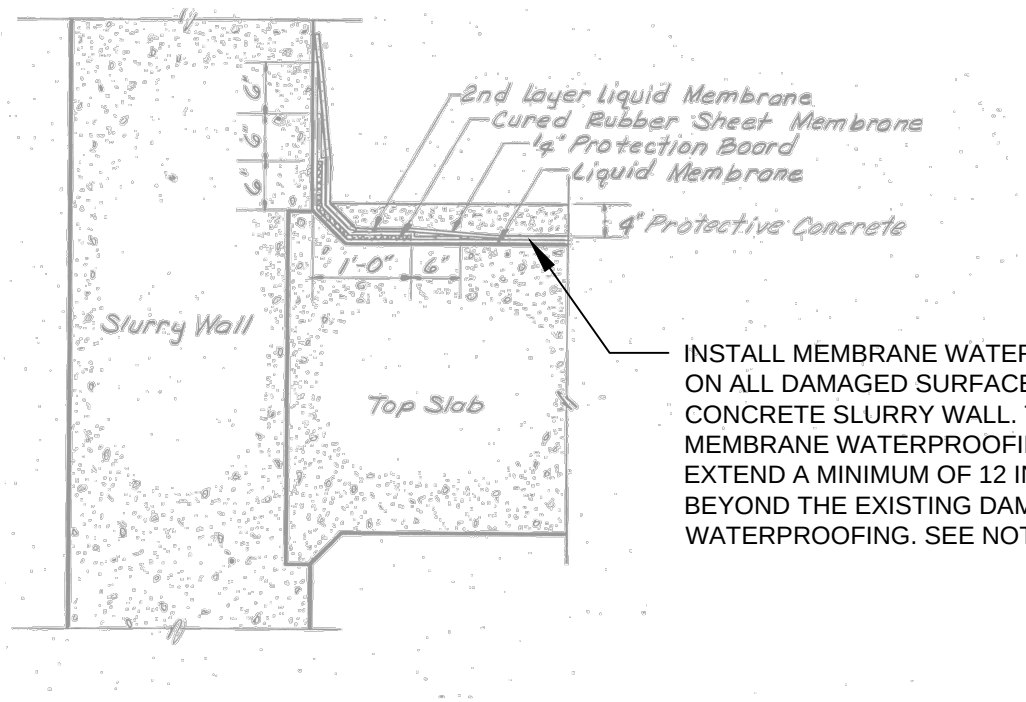
PLOTTED: 8/1/2017 10:21 AM BY: judy.leigh.arndot
CAD FILE: G:_clients\Somerville MA\20171752.002A - Bike Path Retaining Wall And Drainage Design\Drawings\C-Drain Drawing_Final\V2.dwg LAYOUT: SITE PLAN AND PROFILE STA 4+00 TO STA 7+44

ATTACHMENT NO. 4:

Figure 1 - Emergency MBTA Waterproofing Repair Detail (1 sheet)



INSTALL MEMBRANE WATERPROOFING ON ALL DAMAGED SURFACES OF THE CONCRETE SLURRY WALL. THE MEMBRANE WATERPROOFING SHALL EXTEND A MINIMUM OF 12 INCHES BEYOND THE EXISTING DAMAGED WATERPROOFING. SEE NOTE 1.

NOTE:
1. DAMAGE TO THE EXISTING MBTA RED LINE TUNNEL WATERPROOFING IS NOT ANTICIPATED AS PART OF THE WORK. IN THE EVENT OF INADVERTENT DAMAGE TO THE EXISTING MBTA RED LINE TUNNEL WATERPROOFING, CONTRACTOR SHALL REPAIR THE EXISTING WATERPROOFING WITH THE SHEET MEMBRANE WATERPROOFING SYSTEM SPECIFIED IN SPECIFICATION SECTION 02051, REPLACE THE DAMAGED 1/4" PROTECTION BOARD, AND PARGE OR OTHERWISE REPAIR THE EXISTING 4" PROTECTIVE CONCRETE COVER.

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KLEINFELDER
Bright People. Right Solutions.

PROJECT NO. 20171752.002A
DRAWN BY: JA
CHECKED BY: GO
DATE: AUGUST 2017
REVISED:

EMERGENCY MBTA WATERPROOFING REPAIR DETAIL

BIKE PATH RETAINING WALL AND DRAINAGE UPGRADES
SOMERVILLE, MA

FIGURE
1

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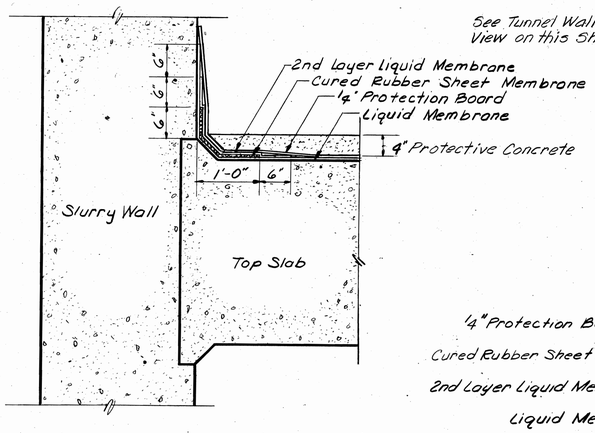
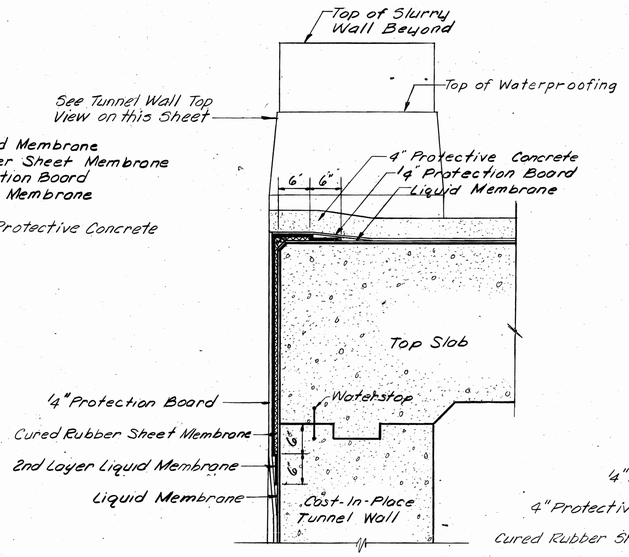
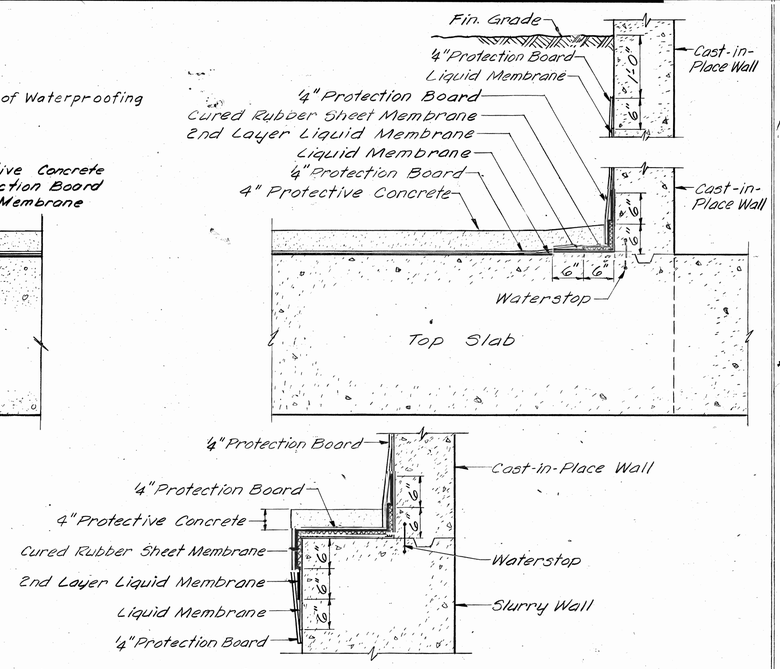
ATTACHMENT NO. 5:

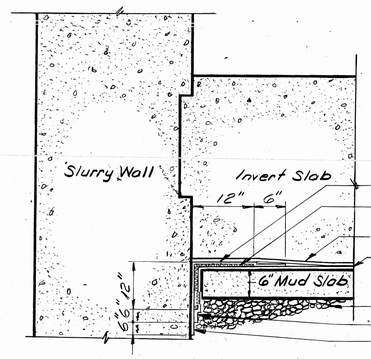
Sheet S-23, Miscellaneous Details – 1, MBTA Red Line Record Drawing (1 sheet)



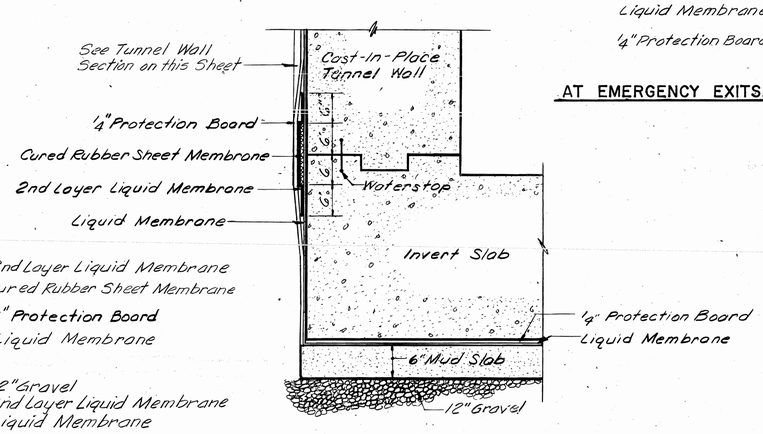




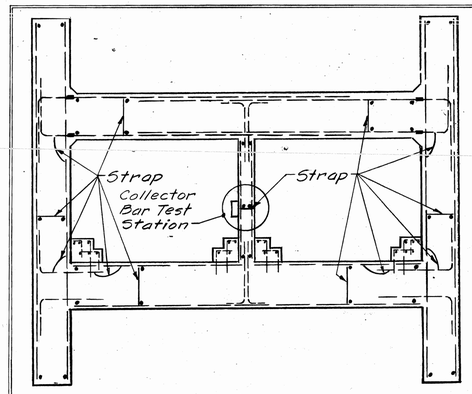
AT EMERGENCY EXITS, ELECTRIC ROOMS AND VENTILATION STRUCTURES



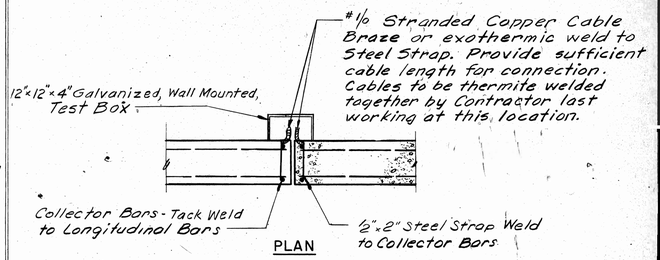
AT SLURRY WALL



AT CAST-IN-PLACE SECTION

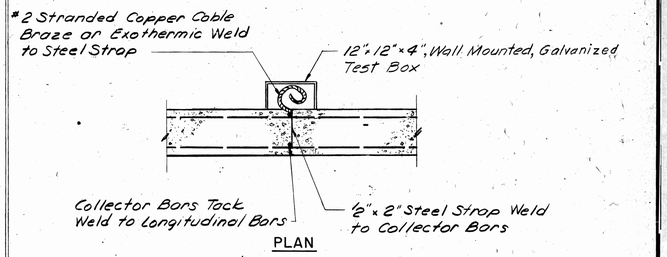


COLLECTOR BAR SECTION



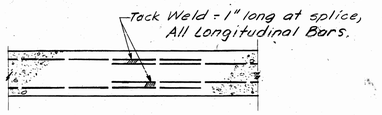
PLAN

COLLECTOR BAR TEST STATION
AT END OF STRUCTURE AND/OR AT END OF CONTRACT



PLAN

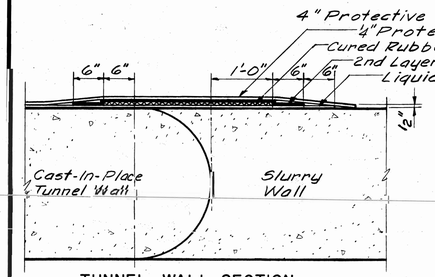
STANDARD COLLECTOR BAR TEST STATION



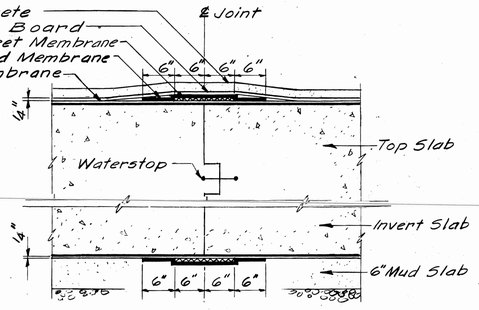
TACK WELD DETAIL

NOTES:

1. Waterstops are required in all joints for Top Slab and Invert Slab.
2. Waterstops will be 6" wide with 3/8" minimum web thickness and 5/8" minimum bulb.
3. 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.
4. 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.)

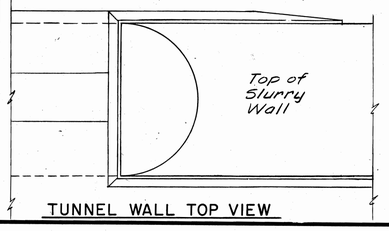


TUNNEL WALL SECTION

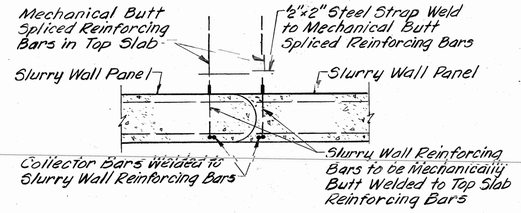


TYPICAL DETAIL AT ALL JOINTS IN SLABS

WATERPROOFING DETAILS
N.T.S.



TUNNEL WALL TOP VIEW



TYPICAL JOINT BETWEEN SLURRY WALL PANELS

CATHODIC PROTECTION DETAILS
N.T.S.

ISSUE	DATE	DESCRIPTION	BY	CHKD	APP

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
RED LINE EXTENSION NW DAVIS TO ALEWIFE
CONTRACT NO. 091 - 509 PART B
TUNNEL CAMPBELL PARK PL. TO HARVEY ST.
MISCELLANEOUS DETAILS-I

SVERDRUP & PARCEL AND ASSOCIATES, INC.
ENGINEERS - ARCHITECTS - PLANNERS
BOSTON, MASSACHUSETTS

MASS. BAY TRANSPORTATION AUTHORITY
APPROVED BY
PROJECT MANAGER

SCALE AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. 54722	ISSUE
DATE 2/7/80	R.E.C.	A.R.M.	N.J.B.	SHEET S23 OF 29	

51 52
78 8340

ATTACHMENT NO. 6:

Section 01390 – Pre Construction and Post Construction Surveys (5 pages)

SECTION 01390

PRE-CONSTRUCTION AND POST-CONSTRUCTION SURVEYS

1390.1 PRE-CONSTRUCTION AND POST-CONSTRUCTION SURVEYS LUMP SUM

PART 1 - GENERAL

1.1 SUMMARY:

A. Work under this section includes photography and video recording of surface conditions of two areas:

1. Perform internal preconstruction and post-construction surveys of the MBTA Red Line tunnel along surface work limits, in addition to 100-ft beyond the limits of the drainage work in each direction within the tunnel. Pre-construction and post-construction surveys shall be completed during the MBTA's non-revenue hours.

1.2 QUALITY ASSURANCE

A. Qualifications

1. The company engaged to perform the pre-construction and post-construction surveys shall, during the past 5 years, have successfully completed photographing and video recording three construction projects of similar scope and dollar value as the construction project which is the subject of this Contract.

2. Qualifications of the firm performing the pre- and post-construction surveys of MBTA Red Line tunnel:

   a. The individual performing the inspection shall have at least 3 years' experience in the inspection or design of similar infrastructure. The individual shall meet requirements of MBTA License.

1.3 SUBMITTALS:

A. Submit in accordance with Section 01300 Submittals.

B. Submit prior to performing any photography and video work, the qualification of the firm performing the photography and video recording work. Include a list of projects to demonstrate compliance with paragraph 1.2.A.1 of this section. For each project, include project name, location, owner, year(s), name of general contractor, and current address and phone number of the owner or owner's representative.

C. Submit copies of all videos as follows:

1. Four (4) copies of the pre-construction video to the ENGINEER within 30 days after Notice to Proceed.

2. Format shall be DVD.

D. Submit copies of photographs as follows:

1. Photographic compact discs (photo CDs). Submit three photo CDs.

E. Submit written release(s) from the photographer and photographic studio covering all videos and photo CDs of images taken as specified. Submit each release at the time of development of the subject video and/or photograph.

F. Within 30 days of Notice to Proceed, submit the qualifications of Inspector that will perform the "before and after" condition survey of the MBTA Red Line Tunnel as specified in paragraph 3.1 of this section.

G. Within 14 days of inspection of MBTA Red Line Tunnel, submit four (4) copies of pre-construction ("before") "MBTA Red Line Tunnel Condition Survey" reports and videos (on DVD) of the tunnel as indicated in paragraph 3.1 to ENGINEER and (2) copies to MBTA.

H. Within 14 days of inspection of MBTA Red Line Tunnel, submit four (4) copies of post-construction ("after") "MBTA Red Line Tunnel Condition Survey" reports and videos (on DVD) of the tunnel as indicated in paragraph 3.1 to ENGINEER and (2) copies to MBTA.

1.4 SEQUENCING AND SCHEDULING:

A. MBTA Red Line Tunnel Surveys:

1. Pre-construction tunnel survey shall be prioritized upon Notice to Proceed and completed prior to beginning of construction.

2. Post-construction tunnel condition survey shall be completed within 5 days of completion of the drainage installation.

B. Dates for other photography and video recording at the site shall be coordinated with the ENGINEER.

1.5 WORKSITE CONDITIONS

A. Contractor shall coordinate with MBTA as specified in Section 01200 General Requirements for Utility Work for access to the MBTA Red Line for survey of the tunnel.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Video:

1. Format: Digital recorded and submitted on DVD.

2. Video Identification:
   a. Video Number: ####-yyy

   Where: ### = Contract Number
   yyy = video number, sequentially numbered 001

   b. Clearly identify and indicate:

      i. Project name and Contract No.

      ii. General description of the subject(s) of the video.

      iii. Date (s)

3. Log of Videos: Provide a binder with the log of all videos taken for this Contract. Format of the log shall be tabular and shall include a description of each video that includes all the information specified in paragraph 2.1.A.2 of this section.

B. Photographs:

1. Format: photographic compact disc (photo CD).

2. Identification:

   a. Photograph number: ####-yyy+yy-zz

      Where: #### - Contract Number

      yyy+yy – Retaining Wall Stationing starting from 101+00

      zz – Photograph number, sequentially numbered from 01 for each photo

   b. Clearly identify and indicate:

      i. Project name and Contract No.
      ii. The location (e.g., station number) where the photograph was taken.
      iii. The view/orientation of the photograph (compass direction and vertical declination of view (e.g., horizontal, looking up, looking down, etc.)

iv. Identification of main features in view.
v. Any other data and information pertinent to the purpose and identification of the exposure.
vi. Date and time.
vii. Weather conditions (for exterior shots).

PART 3 - EXECUTION

3.1 GENERAL PHOTOGRAPH AND VIDEO RECORDING:

A. General:

1. All views shall contain a relative dimension reference that is easily recognizable. In views where dimensions are critical use a recognizable measuring device such as folding ruler or measuring tape in a manner that the markings are clean and sharp in the photograph and the device located in close relationship to the subject of the photograph.

B. Detailed examination of the MBTA Red Line tunnel shall include documentation of interior visual survey of the tunnel; detailed video inspections of the interiors of the tunnel; color photographs of the interior of the tunnel showing visually evident structural faults, including but not limited to:

1. Damaged interior surface coatings;
2. Location and size of cracks in interior walls, especially instances of cracked or missing coatings;
3. Damaged rails, supports and other metal appurtenances;
4. Damaged mechanical and electrical equipment, wiring and other appurtenances;
5. Voids, holes, or other non-uniformity in gravel rail base;
6. Walls which are not vertical
7. Damaged concrete walls, floors, and ceilings, including exposed steel rebar or steel beams.
8. Additional requirements as required by Section 01200 General Requirements for Utility Coordination and the MBTA License.

PART 4 – COMPENSATION

<u>Item 01390.1 - Pre construction and Post construction surveys</u>

METHOD OF MEASUREMENT:

Measurement for payment for Pre Construction and Post Construction Surveys 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 Pre construction and post construction surveys 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 complete the pre-construction and post-construction surveys for the MBTA Red line tunnel. Payment under this item includes, but is not limited to, MBTA coordination, meeting MBTA license requirements for the pre-construction and post-construction surveys, Roadway Worker Protection (RWP) training for personnel conducting the pre-construction and post-construction surveys, conducting the pre-construction and post-construction survey as specified, furnishing copies of inspection reports and CDs and DVDs to the Engineer and MBTA.

END OF SECTION 01390

ATTACHMENT NO. 7:

MBTA RAILROAD OPERATION DIRECTORATE (133 Pages)

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORATE

The attached Specifications are required for any construction and/or related activities on, over, under, within or adjacent to railroad property owned or controlled by the Massachusetts Bay Transportation Authority. They are intended to provide general guidelines and safeguards. Attachmen A" of Construction Guidelines and Procedures contains a summary of MBTA Railroad Operations Specifications which may be required. It is the responsibility of the Contractor to obtain all the necessary specifications for each project.

MAY 1994

I. GUIDELINES AND PROCEDURES FOR CONSTRUCTION ON MBTA RAILROAD PROPERTY

This general specification outlines the immediate design requirements and methodology for progressing construction activities on MBTA Railroad Property.

II. MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC

This specification will be included in ALL work requirements on MBTA Railroad Property, and covers rules, requirements, and protective services for any construction-related activity on MBTA Railroad Property. Supplemental specifications are listed below:

III. INSURANCE SPECIFICATIONS

This specification details required insurance coverages and limits of the MBTA and Railroad Company(s).

IV. PIPELINE OCCUPANCY SPECIFICATIONS

This specification details requirements for all pipeline borings/jackings and open cuts on or adjacent to MBTA Railroad Property, as well as requirements for plan submittals.

V. SPECIFICATIONS FOR WIRE, CONDUIT AND CABLE OCCUPATIONS

This specification details requirements for clearances and installations of parallel and overhead crossings on MBTA Railroad Property, as well as requirements for plan submittals.

VI. BRIDGE ERECTION, DEMOLITION AND HOISTING OPERATIONS

This specification details plan preparation for demolition and/or hoisting and erection of structures on and over MBTA Railroad Property.

VII. TEMPORARY SHEETING AND SHORING

This specification details requirements for plan preparation and calculations necessary for sheeting and shoring for construction on or adjacent to MBTA Railroad Property.

VIII. BLASTING SPECIFICATIONS

This specification outlines submittals, details and requirements for blasting on or adjacent to MBTA Railroad Property.

IX. TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION

This specification outlines criteria for plan preparation related to protection of MBTA Railroad Property when work takes place on overhead structures.

X. INDUSTRIAL SIDE TRACK SPECIFICATIONS

This specification outlines minimal requirements for materials and installation submission for private railroad side tracks up to MBTA property line and/or clearance point. Other provisions, site-specific, may be required, including signal protection maintenance and protection of railroad traffic.

XI. RIGHT OF WAY FENCING SPECIFICATIONS

This specification details the requirements for the materials, construction and installation of standard right of way fence.

XII. TEST BORING SPECIFICATIONS

This specification outlines procedures and requirements for the performance of test borings on MBTA Railroad Property.

XIII. FIBER OPTIC CABLE SPECIFICATIONS

This specification details requirements for design and installation of fiber optic cables on MBTA Railroad Property; and is modified by site-specific requirements, including the construction methodology, location and type of fiber optic cables and protection conduits.

XIV. RAILROAD OPERATIONS BOOK OF STANDARD PLANS, TRACK AND ROADWAY, MW-1 SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF TRACK

Certain construction activities may require obtaining this comprehensive package if rail construction details and requirements are related to the track operation.

XV. COMMUTER RAIL DESIGN STANDARDS

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORATE

I

GUIDELINES AND PROCEDURES FOR CONSTRUCTION ON MBTA RAILROAD PROPERTY

MAY 1994

SECTION 1. SCOPE

1.01 These specifications provide general safeguards to railroad property owned or controlled by the Massachusetts Bay Transportation Authority and to railroad operations upon that property during the performance of construction and/or related activities on, over, under, within or adjacent to the railroad property. They are intended as guidelines and do not represent all legal requirements which are or may be associated with construction and/or related activities. The MBTA reserves the right to require additional information and clarification and to make unilateral changes to these specifications at any time, at its sole discretion.

SECTION 2. DEFINITIONS

MBTA	Massachusetts Bay Transportation Authority
RAILROAD COMPANY	The particular reference for the purpose of these specifications is the railroad company which maintains and/or operates or has trackage rights on the subject MBTA Railroad Property, including, but not limited to: -Massachusetts Bay Transportation Authority ("MBTA") -Providence and Worcester Railroad ("P&W") -National Railroad Passenger Corporation ("Amtrak") -Consolidated Rail Corporation ("Conrail") -The Boston and Maine Corporation, The Springfield Terminal Railway Company, its affiliates, successors and assigns ("B&M") -Bay Colony Railroad Corporation ("Bay Colony")
MBTA RAILROAD PROPERTY	All railroad rights of way and adjacent lands owned and/or controlled by the MBTA.
OWNER	The individual, utility, government, or corporation having title to the structure to be constructed upon, over or adjacent to railroad property owned or controlled by the MBTA.
UTILITY	Public or private communication, water, sewer, electric, gas and petroleum companies or other entity governed by the Massachusetts Department of Public Utilities.
GOVERNMENT	Federal, State, Town, City, County and other forms of government.

CORPORATION	Any firm duly incorporated under laws of a state government.
INDIVIDUAL	Any party not defined by "Owner, Utility, Government or Corporation".
CONTRACTOR	The individual, partnership, firm, corporation or any combination thereof, or joint venture, contracting with a Utility, Government, Firm, Company, Corporation or Individual for work to be done on, over, under, within or adjacent to MBTA Railroad Property.
OWNER OR ITS CONTRACTOR	As used in these specifications, does not affect the responsibilities of either party for work conducted on, over, under, within or adjacent to MBTA Railroad Property.

SECTION 3. SUBMITTALS

3.01 INITIAL CONTACT

A. The MBTA owns the majority of the railroad lines in eastern Massachusetts. Many of these railroad lines are operated for passenger service, using a Railroad Company as an operating and maintaining contractor. Some of the railroad lines are used for freight-only service, operated and maintained by other Railroad Company(s). In most instances, both passenger and freight service are operated over the same railroad lines.

B. All of the MBTA railroad lines are maintained by a designated Railroad Company(s), excepting rapid transit and light rail lines. The maintaining Railroad Company(s) has rights and responsibilities, in addition to the MBTA's property owner's rights.

C. To obtain further information concerning License Agreements, Easements, Licenses for Entry, and performance of construction-related activities which affect MBTA Railroad Property, a written request must be forwarded to:

Director of Real Estate
Ten Park Plaza
Boston, MA 02116

The Director of Real Estate is also the contact person for information concerning rapid transit and light rail lines. However, no part of these instructions or specifications are applicable to rapid transit or light rail lines.

SECTION 4. PLANS AND SPECIFICATIONS

4.01 SCOPE: It is the intent of the MBTA to eliminate or minimize any risk involved with construction or related activities on, over, under, within or adjacent to MBTA Railroad Property. Therefore, MBTA approval and frequently one or more Railroad Company(s) approval of construction plans and specifications for all phases of a proposed project affecting MBTA Railroad Property is required.

4.02 GENERAL: The applicant must provide six (6) sets of plans and specifications to the Director of Real Estate. These plans and specifications must meet the approval of the Railroad Company(s) and the MBTA prior to the start of construction. These plans are to be prepared in sizes as small as possible and are to be folded to an 8-1/2 inch by 11 inch size (folded dimensions) with a 1-1/2 inch margin on the left side and a 1 inch margin on the top.

A. After folding, the title block and other identification of the plans shall be visible at the lower right corner, without the necessity of unfolding. Each plan shall bear an individually identifying number and an original date, together with subsequent revision dates, clearly identified on the plan.

B. All plans are to be individually folded or rolled and where more than one plan is involved, they shall be assembled into complete sets before submission to the MBTA.

4.03 PLANS: The plans are to show all the work which may affect MBTA Railroad Property, and contain a location map and plan view of the project, with appropriate cross sections and sufficient details. The proposed construction or related activities must be located with respect to top of rail (vertical) and center line of track (horizontal). The plan must also include railroad stationing, property lines and subsurface soil conditions. The subsurface information is to be in the form of boring logs with the borings located on the plan view. (The purchase of railroad valuation plans may be arranged by contacting MBTA Engineering offices at 722-3448).

4.04 SPECIFICATIONS: The specifications summarized on Attachment "A" attached hereto are the Standard Specifications of the MBTA Railroad Operations Department and apply to all types of construction work affecting MBTA Railroad Property.

A. In addition to "Maintenance and Protection of Railroad Traffic" and "Insurance Specifications" which are required for all work on, over,

under, within or adjacent to MBTA Railroad Property, certain other Specifications contained in Attachment "A" shall be incorporated into construction/engineering submittals when deemed necessary by the MBTA and/or Railroad Company(s). (The purchase of additional specifications may be arranged by contacting MBTA offices at 722-3448).

SECTION 5. SUBMISSION/REVIEW

5.01 An initial submission of six (6) sets of plans and specifications for MBTA review must be forwarded to the Director of Real Estate, along with a completed MBTA Application for Entry (Attachment "B"). The submission will be circulated for review and comment to MBTA departments which may be impacted by the proposed project. If approved by the MBTA, an additional submission for the Railroad Company(s) review may be requested by the Director of Real Estate or his designee.

5.02 The applicant is advised that the MBTA's initial review process requires a minimum forty-five (45) day period, prior to the Railroad Company(s) involvement, and additional processing time may be required for specific documents (See Section 9).

SECTION 6. INSPECTIONS/PAYMENTS

6.01 The MBTA may inspect all projects affecting MBTA Railroad Property at least twice, at the applicant's sole expense. The actual number of MBTA inspections will depend on the size and complexity of the project.

6.02 The MBTA may utilize Railroad Company inspectors and flagmen for daily inspection and protection of rail traffic during the term of the construction period or related activities. The Owner or Contractor will be responsible for advance payment of all associated fees.

6.03 Advance payments to the MBTA for construction/engineering review of plans and specifications by MBTA staff must be submitted when initial contact is made with the Director of Real Estate. Payments shall be in the form of check or money order, made payable to the Massachusetts Bay Transportation Authority.

6.04 Advance payments covering the services for Railroad Company(s) construction/engineering review of plans and specifications, or services of an inspector or flagman, will be paid directly to the Railroad Company(s). The MBTA will advise when such services are required, and the Railroad Company(s) will advise of the amount of the required advance payment.

SECTION 7. EXAMINATION OF PLANS OR PROPERTY

7.01 The Contractor/Applicant shall have no claim for any differences between MBTA valuation plans and the actual conditions encountered in the field.

SECTION 8. INSURANCE AND INDEMNIFICATION

8.01 Prior to entry upon MBTA Railroad Property, insurance will be provided to and approved by the MBTA and affected Railroad Company(s), as outlined in "Insurance Specifications."

8.02 Additionally, all MBTA Licenses and Letters of Authorization contain a clause for indemnifying MBTA and the Railroad Company(s) from and against any and all liabilities, losses, damages, costs, expenses, causes of action, suits, claims, demands and/or judgments of any nature whatsoever that may be imposed upon or incurred by or asserted against the MBTA or the Railroad Company(s).

SECTION 9. LEGAL DOCUMENTS FOR TEMPORARY AND PERMANENT INSTALLATIONS

9.01 The nature of entry upon or installation within MBTA Railroad Property will determine the authorizing document to be issued. Listed below are brief descriptions of MBTA documents:

A. **License for Entry**: Authorizes short-term entry for purposes of survey, inspection, test borings, access, etc. One-time administrative/engineering/legal review fee.

B. **License Agreement**: Authorizes installations, subject to termination clause, if Applicant chooses not to pursue an Easement. One-time administrative/engineering/legal review fee as well as annual rental fee.

C. **Easement**: Authorizes permanent installations in form suitable for recording at Registry Deeds. All easements are non-exclusive and subject to relocation at the Owner's expense, for mass transportation purposes.

1. Easements must receive MBTA Board of Directors approval, which involves considerable time. Once approved by the Board of Directors and upon payment in full to the MBTA, a License for Construction is issued. Upon final inspection and acceptance of the installation by the MBTA the Easement document is issued.

2. Permanent Subsurface Easement widths are limited to a maximum three-foot distance on either side of the occupation.

3. a) A one-time administrative/engineering/legal review fee, in addition to value of easement, as established by independent appraisal conducted at the Applicant's expense.

   b) If easement size is minimal, as determined by the MBTA, a fixed fee, encompassing administrative/engineering/legal review fees and value of easement shall be assessed.

D. **Letter of Authorization**: Authorizes installations and construction activities within the confines of a public way over or under which MBTA railroad tracks cross. One-time administrative/engineering/legal review fee.

ATTACHMENT "A"

SUMMARY OF MBTA RAILROAD OPERATIONS SPECIFICATIONS

I. GUIDELINES AND PROCEDURES FOR CONSTRUCTION ON MBTA RAILROAD PROPERTY

This general specification outlines the immediate design requirements and methodology for progressing construction activities on MBTA Railroad Property.

II. MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC

This specification will be included in ALL work requirements on MBTA Railroad Property, and covers rules, requirements, and protective services for any construction-related activity on MBTA Railroad Property. Supplemental specifications are listed below.

III. INSURANCE SPECIFICATIONS

This specification details required insurance coverages and limits of the MBTA and Railroad Company(s).

IV. PIPELINE OCCUPANCY SPECIFICATIONS

This specification details requirements for all pipeline borings/jackings and open cuts on or adjacent to MBTA Railroad Property, as well as requirements for plan submittals.

V. SPECIFICATIONS FOR WIRE, CONDUIT AND CABLE OCCUPATIONS

This specification details requirements for clearances and installations of parallel and overhead crossings on MBTA Railroad Property, as well as requirements for plan submittals.

VI. BRIDGE ERECTION, DEMOLITION AND HOISTING OPERATIONS

This specification details plan preparation for demolition and/or hoisting and erection of structures on and over MBTA Railroad Property.

VII. TEMPORARY SHEETING AND SHORING

This specification details requirements for plan preparation and calculations necessary for sheeting and shoring for construction on or adjacent to MBTA Railroad Property.

VIII. BLASTING SPECIFICATIONS

This specification outlines submittals, details and requirements for blasting on or adjacent to MBTA Railroad Property.

IX. TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION

This specification outlines criteria for plan preparation related to protection of MBTA Railroad Property when work takes place on overhead structures.

X. INDUSTRIAL SIDE TRACK SPECIFICATIONS

This specification outlines minimal requirements for materials and installation submission for private railroad side tracks up to MBTA property line and/or clearance point. Other provisions, site-specific, may be required, including signal protection maintenance and protection of railroad traffic.

XI. RIGHT OF WAY FENCING SPECIFICATIONS

This specification details the requirements for the materials, construction and installation of standard right of way fence.

XII. TEST BORING SPECIFICATIONS

This specification outlines procedures and requirements for the performance of test borings on MBTA Railroad Property.

XIII. FIBER OPTIC CABLE SPECIFICATIONS

This specification details requirements for design and installation of fiber optic cables on MBTA Railroad Property; and is modified by site-specific requirements, including the construction methodology, location and type of fiber optic cables and protection conduits.

XIV. RAILROAD OPERATIONS BOOK OF STANDARD PLANS, TRACK AND ROADWAY, MW-1 SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF TRACK

Certain construction activities may require obtaining this comprehensive package if rail construction details and requirements are related to the track operation.

XV. COMMUTER RAIL DESIGN STANDARDS

ATTACHMENT "B"

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
APPLICATION FOR ENTRY UPON MBTA RAILROAD PROPERTY

1. Name of Applicant: _____

2. Type of Entity (Partnership, Corporation, Proprietorship, Public Authority, etc.): _____

3. Mailing Address: _____

4. If incorporated, state of incorporation: _____

5. Proposed license term commencement date: _____

6. Proposed license term: _____

7. Brief description of construction (Including types of pipes and other attachments or ancillary facilities to be installed on MBTA Railroad Property): _____

_____

_____

_____

_____

8. Brief description of purpose of entry and/or installation: _____

_____

_____

_____

_____

9. Nearest MBTA station: _____

10. County: _____

11. State: _____

12. Agents for licensee (applicant) for service of notice or process: _____

_____

_____

13. If applicant is self-insured, please provide limits of self-insurance and attach copies of authorizing legislation or certification thereof: _____

_____

14. If applicant is authorized by public authority to enter into such license

agreement, please provide:

Motion, Resolution, or Ordinance No.: _____

Date of Adoption: _____

Adopted by: _____

15. Name and title of Licensee's officer authorized to sign agreement: _____

_____

_____

16. Is this occupancy within limits of public road? _____
Attach copies of applicant's franchise to occupy such space.

17. If occupancy is under, over, through or attached to undergrade or overhead bridge, who owns such bridge? _____

_____

18. Type of occupancy (facility):

a) Exact length of MBTA Railroad Property to be burdened by occupancy:

_____

b) Width of excavation facility on MBTA Railroad Property:

_____

c) Number of manholes: _____

A. **Aerial or underground wire and cable:**

(1) Telephone and other communication cables:

Number of cables: _____

Number of pairs/cable: _____

Are these composite coaxial cables? _____

(2) Power cables:

Number of cables/size: _____

Number of volts per conductor: _____

Are these pipe-type cables consisting of 1 or more high voltage cables encased in steel pipe under inert oil pressure?

(3) Fiber optic cables:

Number of cables: _____

Number of distribution cables: _____

Number of transmission cables: _____

Number of strands in each cable: _____

Number of repeater stations on MBTA Railroad Property:

_____

Systems (Check one)

Transmission
Distribution
Sensor

(4) Number of spare or unoccupied ducts to be installed:

_____

B. **Pipes and Sewers**

(1) Circular line carrying no pressure:

Number of pipes: _____

Number of inches of inside nominal diameter per pipe:

_____

(2) Circular lines under pressure and carrying non-flammable, non-explosive, or non-combustible supporting materials, except coal and slurry:

Number of pipes: _____

Number of inches of inside nominal diameter per pipe:

_____

(3) Circular lines under pressure and carrying flammable, explosive or combustible supporting material:

Number of pipes: _____

Number of inches of inside nominal diameter per pipe:

_____

(4) Non-circular pipe: _____

(5) Will a pipe tunnel be constructed: _____

(6) Will pipe be supported by MBTA structures, bridges etc.?

_____

Explain: _____

(7) Will pipe be attached to MBTA structures, bridges?

_____

Explain: _____

C. **Ancillary Facilities**

Number of wooden poles to be installed on MBTA Railroad Property: _____

Other wooden supporting structures: _____

_____

Steel supporting structures: _____

Explain: _____

Number of braces, stub poles: _____

Number of guy wires anchored on MBTA Railroad Property:

_____

Number of span guy wires crossing MBTA Railroad Property:

_____

D. **Attachments**

(1) Attachment of aerial wires and cables to poles or other structures of MBTA used in wire line construction or support:

Number of wires attached to MBTA cross-arm: _____

Voltage of wire: _____

Number of wires attached to Licensee's cross-arm or bracket: _____

Voltage of wire: _____

Number of cross-arms or brackets attached to MBTA poles:

_____

(2) Attachment of aerial wires and cables to buildings or structures other than those used in wire line construction or support.

Number of wires or cables attached to MBTA's building or structures: _____

(3) Attachment of cable terminals to poles, buildings, or structures including highway bridges railroad bridges over highways or other bridges of MBTA.

Number of cable terminals, loading coils, transformers or like devices attached: _____

Explain: _____

E. **Guy wire crossings and overhanging cross-arms and power wires of pole lines outside MBTA right-of-way.**

Number of guy wires crossing MBTA Railroad Property but not anchored thereon: _____

Number of cross-arms overhanging MBTA Railroad Property from poles located outside thereof: _____

Number of cross-arms on any pole: _____

It is hereby understood and agreed that the undersigned applicant will bear any and all costs associated with MBTA's preliminary and final engineering review in connection with this application. Any charges in excess of the initial advance payment will be billed directly to the address indicated in item #3.

Agent: _____

For: _____
Name of Applicant

BY: _____

_____
(Title)

_____
(Date)

ATTACHMENT "C"

REFERENCED STANDARDS AND SPECIFICATIONS

A. Wherever standards or specifications issued by a recognized industry association or regulatory body are referenced in these Specifications, the reference shall be interpreted as incorporating the referenced standard or specification in total into these Specifications as applicable. In the event of a difference between referenced standard or specifications and these Specifications, the latter shall govern.

B. Technical Reference Abbreviations - References are made to recognized standards by use of the acronyms listed below. Addresses are included for convenience, and the accuracy of the addresses is not warranted:

AA	The Aluminum Association 900 19th Street NW Washington, DC 20006
AAR	The Association of American Railroads American Railroads Building 50 F Street NW Washington, DC 20001
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street NW Suite 249 Washington, DC 20001
ACGIH	American Conference of Governmental Industrial Hygienists 1330 Kemper Meadow Drive Cincinnati, OH 45240
ACI	American Concrete Institute P.O. Box 19150 Detroit, MI 48219

AFPA	American Forest and Paper Association 1111 19th Street, NW Suite 700 Washington, DC 20036
AIA	American Insurance Association 1130 Connecticut Avenue NW Washington, DC 20036
AISC	American Institute of Steel Construction Inc. 1 East Wacker Drive Suite 1300 Chicago, IL 60601
AISI	American Iron and Steel Institute 1101 17th Street NW Suite 1300 Washington, DC 20036-4700
AITC	American Institute of Timber Construction 7012 South Revere Parkway Suite 140 Englewood, CO 80112
ANSI	American National Standards Institute 11 West 42nd Street New York, NY 10036
APA	American Plywood Association P.O. Box 11700 Tacoma, WA 98411
APHA	American Public Health Association 1015 15th Street NW Washington, DC 20005
AREA	American Railway Engineering Association 50 F Street N.W. Washington, D.C. 20001
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers' Association P.O. Box 286 Woodstock, MD 21163-0286
AWS	American Welding Society 550 NW 42nd Avenue Miami, FL 33126
AWWA	American Water Works Association, Inc. 6666 W. Quincy Avenue Denver, CO 80235
CSI	Construction Specifications Institute 601 Madison Avenue Alexandria, VA 22314-1791
FHA	Federal Highway Administration 400 7th Street SW Washington, DC 20590
FRA	Federal Railroad Administration 400 7th Street SW Washington, DC 20590
ICBO	International Conference of Building Officials 5360 Workman Mill Road Whittier, CA 90601
IIA	Incinerator Institute of America 60 East 42nd Street New York, NY 10017

Mass-DEP	Massachusetts Department of Environmental Protection 1 Winter Street Boston, MA 02018
Mass-DPS	Massachusetts Department of Public Safety 1 Ashburton Place Boston, MA 02108
Mass-DPU	Massachusetts Department of Public Utilities 100 Cambridge Street Boston, MA 02202
Mass-FPR	Massachusetts Fire Prevention Regulation 1010 Commonwealth Avenue Boston, MA 02215
MHD	Massachusetts Highway Department 10 Park Plaza Boston, MA 02116
NACE	The National Association of Corrosion Engineers P.O. Box 218340 Houston, TX 77218-8340
NCMA	National Concrete Masonry Association 2302 Horse Pen Road Herndon, VA 22071
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02269
NSWMA	National Solid Wastes Management Association 4301 Connecticut Avenue NW Suite 300 Washington, DC 20008
SJI	Steel Joist Institute 1205 48th Ave. North Suite A Myrtle Beach, S.C. 29577

UL	Underwriter's Laboratories, Inc. 207 East Ohio Street Chicago, IL 60611
USCG	United States Coast Guard 2100 Second Street SW Washington, DC 20593-0001

When reference is made to the specifications or standards of any of the above organizations, federal agencies, trade associations, or others, it is made to the edition current as of the date of approval of application.

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORATE

II

MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC

MAY 1994

A00898 - 201

SECTION 1. GENERAL

1.01 The contractor should note that these specifications govern proposed work that involves construction on, over, under, within or adjacent to MBTA Railroad Property. Requirements must be strictly observed whenever the tracks, structures, or properties of the MBTA are involved or affected.

1.02 If the tracks or other facilities of the MBTA are endangered, the Contractor shall immediately perform such work as directed by the Railroad Company(s), and upon failure of the Contractor to carry out such orders immediately, the Railroad Company(s) may take whatever steps are necessary to restore safe conditions. The cost and expense to the Railroad Company(s) and/or MBTA of restoring safe conditions or of any damage to the MBTA's trains, tracks, or other facilities caused by the Contractors' or subcontractors' operations, shall be at the sole expense of the Contractor and will be collected as appropriate. This cost shall be paid for by the Contractor and may be deducted from any monies due and that may become due to the Contractor.

1.03 Before entering upon MBTA Railroad Property:

A. The Owner or its Contractor shall be fully informed of all requirements of the MBTA pertaining to the specific project and shall conduct all his work accordingly. Any questions relating to the requirements of the MBTA should be directed to the Chief Engineering Officer of the MBTA or his authorized representative.

B. The Owner or its Contractor shall execute an MBTA License for Entry, and shall provide the MBTA and Railroad Company(s) with the information required in the "Insurance Specifications".

C. The Owner or its Contractor shall take note that if an excavation is to be made within a 2 to 1 slope line commencing 5.5 feet from the centerline of track, he shall submit the proposed method of soil stabilization for approval by the Chief Engineering Officer of the MBTA.

D. The Owner or its Contractor shall furnish detailed plans, for falsework, bracing, sheeting, or other supports adjacent to the tracks for approval by the Chief Engineering Officer of the MBTA and the Railroad Company(s), and the work shall be performed in accordance with "Temporary Sheeting and Shoring". All plans and calculations shall be stamped by a Registered Professional Engineer.

E. The Owner or its Contractor shall give written notice to the Chief Engineering Officer of the MBTA and the applicable Railroad Company(s)

at least 21 days in advance of starting work or locating equipment at the site.

F. The Owner or its Contractor shall make all necessary arrangements with the MBTA before entering upon MBTA Railroad Property.

1.04 After entering upon MBTA Railroad Property:

A. The Owner or its Contractor shall have in his possession on the job site the contract plans and specifications which bear the stamp of approval of the MBTA Chief Engineering Officer or Railroad Company(s). The Owner or its Contractor shall conduct all his work according to these plans and specifications.

B. All work shall be performed and completed in a manner fully satisfactory to the MBTA Chief Engineering Officer or authorized representative(s). Railroad Company(s) inspection of the work shall be conducted at any time and the Owner or its Contractor shall cooperate fully with the MBTA and Railroad Company(s) representatives.

C. All equipment used by the Owner or its Contractor on MBTA Railroad Property may be inspected by the Railroad Company(s) and shall not be used if considered unsatisfactory by the Railroad Company(s) representative. Equipment of the Owner or its Contractor to be used adjacent to tracks shall be in first class condition so as to positively prevent any failure that would cause delay in the operation of trains or damage to MBTA or railroad facilities. Equipment shall not be placed or put into operation adjacent to a track without first obtaining the permission of the Railroad Company(s).

D. Operators of such equipment must be properly licensed and may be examined by the Railroad Company(s) representative to determine their fitness. If it is determined that they are unfit to work, then the Owner or its Contractor shall remove them from MBTA Railroad Property.

E. If the Chief Engineering Officer of the MBTA deems it necessary, the Owner or its Contractor shall furnish and erect in close proximity to the site of the work a suitable, furnished shelter with lights, heat, telephone, etc., for use by Railroad Company(s) personnel providing services to the Owner's or Contractor's work.

F. The Owner or its Contractor's work shall be performed in such manner that the tracks, train operations and appurtenances of the MBTA and the Railroad Company(s) will be safeguarded.

G. Open excavations shall be suitably planked and safeguarded when construction operations are not in progress.

H. Blasting will be permitted under or adjacent to tracks only after proof that blasting is required and all methods have been approved by the MBTA's Chief Engineering Officer and the Railroad Company(s). All blasting operations must comply with the MBTA's "Blasting Specifications".

I. The Owner or its Contractor shall be fully responsible for all damages arising from their failure to comply with the requirements of these specifications. Failure to comply may result in their removal from MBTA Railroad Property, at the MBTA's sole discretion.

SECTION 2. RULES, REGULATIONS, ETC.

2.01 Railroad traffic shall be maintained at all times with safety and continuity, and the Contractor shall conduct all operations on, over, under, within or adjacent to MBTA Railroad Property within the rules, regulations, and requirements of the Railroad Company(s) and/or MBTA. The Contractor shall be responsible for acquainting himself with such requirements as the Railroad Company(s) and/or MBTA may demand.

2.02 The Contractor shall obtain verification of the time and schedule of track occupancy from the Railroad Company(s) before proceeding with any construction or demolition work on, over, under, within or adjacent to MBTA Railroad Property. The work shall not proceed until the plans and method of procedure have been approved by the Chief Engineering Officer of the MBTA or his authorized representative.

2.03 All work to be done on, over, under, within or adjacent to MBTA Railroad Property shall be performed by the Contractor in a manner satisfactory to the MBTA and the Railroad Company(s), and shall be performed at such times and in such manner, as to not interfere with the movement of trains or operations upon the tracks of the MBTA. The Contractor shall use all necessary care and precaution in order to avoid accidents, delay or interference with the MBTA's trains or other property.

2.04 The Contractor shall give written notice to the Railroad Company(s) at least twenty-one (21) days prior to the commencement of any work, or any portion of the work, by the Contractor or his subcontractors on, over, under, within or adjacent to MBTA

Railroad Property, in order that necessary arrangements may be made by the Railroad Company(s) to protect railroad operations.

2.05 If deemed necessary by the Railroad Company(s), it may assign an inspector and/or engineer who will be placed on the work site during the time the Contractor or any subcontractor is performing work on, over, under, within or adjacent to MBTA Railroad Property. The cost and expense will be paid directly by the contracting party with an advance deposit to the Railroad Company(s), unless otherwise approved.

2.06 Before proceeding with any construction or demolition work, on, over, under, within or adjacent to the MBTA's Railroad Property, a preconstruction meeting shall be held at which time the Contractor shall submit for approval of the MBTA and Railroad Company(s), plans, computations, and a detailed description of the method for accomplishing the construction work, including methods of protecting railroad operations. Such approval shall not serve in any way to relieve the Contractor of complete responsibility for the adequacy and safety of the referenced methods.

2.07 During any demolition procedure, the Contractor must provide an approved shield to prohibit all debris from falling onto MBTA Railroad Property. A protective fence must be erected at both ends of the project to prohibit trespassers from entering MBTA Railroad Property.

2.08 Cranes, shovels, or any other equipment shall be considered to be fouling the track when located in such position that failure of same with or without load, brings the equipment within the fouling limit. The Contractor's employees and equipment will not be permitted to work near overhead wires or apparatus.

2.09 The Contractor shall conduct his work and handle his equipment and materials so that no part of any equipment should foul an operated track or wire line without the written permission of the Railroad Company(s). When it becomes necessary for the Contractor to foul any track, he must give the Railroad Company(s) written notice of his intentions twenty-one (21) days in advance, so that if approved, arrangements may be made for proper protection of the Railroad Company(s).

2.10 The Contractor's equipment shall not be placed or put into operation adjacent to tracks without first obtaining permission from the Railroad Company(s). Under no circumstances shall any equipment or materials be placed or stored within fifteen

(15) feet from the centerline of the closest track.

2.11 Materials and equipment belonging to the Contractor shall not be stored on MBTA Railroad Property without first having obtained permission from the Railroad Company(s), and such permission will be on the condition that the MBTA and/or Railroad Company(s) will not be liable for damage to such materials and equipment from any cause. The Contractor shall keep the tracks adjacent to the site clear of all refuse and debris that may accumulate from construction operations, and shall leave the MBTA Railroad Property in the condition existing before construction commencement. Equipment repair, refueling or extended storage is prohibited on MBTA Railroad Property.

2.12 The Contractor shall consult the Railroad Company(s) in order to determine the type of protection required to insure safety and continuity of railroad operations. The railroad field engineer may assign track foremen, flagmen, signalmen or other employees deemed necessary for protective services by the Railroad Company(s), to insure the safety of trains and MBTA Railroad Property. The cost of same shall be paid directly by the contracting party with an advance deposit to the Railroad Company(s), unless otherwise approved.

2.13 The provision of such protective services, and other precautionary measures, shall not relieve the Contractor from liability for the cost of any and all damages caused by his operations.

2.14 The Railroad Company(s) will require protection during all periods when the Contractor is working on, over, under, within or adjacent to MBTA Railroad Property or as may be deemed necessary. When protection is required, the Contractor shall make the request in writing to the Railroad Company(s) at least twenty-one (21) days before such protection is required.

2.15 The Contractor shall not bill the Railroad Company(s) or MBTA for any work which he may perform, unless the Railroad Company(s) or MBTA authorizes the said work in writing. This work must be to the benefit of the MBTA or Railroad Company(s).

2.16 The Contractor, subcontractor and respective employees who will come within the limits of the MBTA Railroad Property, must first attend the Railroad Company(s) Safety Orientation Class. They are required to comply with the Railroad Company(s) Safety Requirements throughout the entire construction period. All costs associated

with compliance of the Railroad Company(s) Safety Requirements will be at the sole expense of the Contractor and subcontractors.

A. The Contractor for the project must appoint a qualified person who will be designated as a Safety Representative. He must be approved by the Railroad Company(s) Safety Representative. The Contractor's designee will be responsible to give Safety Orientation to the Contractor's/subcontractor's employees who will come onto the MBTA's Railroad Property for short periods of time after the initial Safety Orientation Class has been given by the Railroad Company(s). The Contractor's designee will keep the Railroad Company(s) Safety Representative informed of the temporary employees who received Safety Orientation. The Railroad Company(s) Safety Orientation Class will be repeated when employee turnover or groups of Contractor's and subcontractor's employees are such that another Railroad Company(s) Safety Orientation Class is justified.

B. Contractors will follow established safety procedures and remain 15 feet or more from the centerline of the closest track. When it becomes necessary for Contractors to encroach on this 15 foot limitation, the proper fouling procedures will be arranged with the Railroad Company(s).

C. Contractors will establish the 15 foot foul line by installing stakes and taping off the area prior to beginning work.

2.17 Upon completion of the work, the Contractor shall remove from the MBTA Railroad Property, all machinery, equipment, surplus materials, falsework, rubbish, temporary buildings and other property of the Contractor, or any subcontractor, and shall leave MBTA Railroad Property in a condition satisfactory to the MBTA and Railroad Company(s). Failure to comply will result in Railroad Company(s) forces restoring MBTA Railroad Property at the Contractor's expense.

2.18 The Contractor will pay the Railroad Company(s) directly, for all protective services unless otherwise approved. The services are performed to insure safe operation of trains when construction work would, in the Railroad Company(s) opinion, be a hazard.

SECTION 3. DEFINITION OF HAZARD

3.01 Protection Services will be required whenever the Contractor is performing work on, over, under, within or adjacent to MBTA Railroad Property. This will include

excavating, sheeting, shoring, erection, removal of forms, handling material, using equipment which by swinging or by failure could foul the track, and when any other type of work being performed, in the opinion of the Railroad Company(s), requires such service.

3.02 Railroad operations will be considered subject to hazard when explosives are used in the vicinity of MBTA Railroad Property during the driving or pulling of sheeting for footings adjacent to a track, when erecting structural steel across or adjacent to a track, when operations involve swinging booms or chutes that could in any way come closer than 15 feet to the center line of a track or wire line. None of these or similar operations, shall be carried on without Railroad Company(s) protective services personnel on site.

3.03 A signal line or communication line shall be considered fouled and subject to hazard when any object is brought closer than ten (10) feet to any wire or cable. An electrical supply line shall be considered fouled and subject to hazard when any object is brought closer than ten (10) feet to any wire of the line.

3.04 As excavation approaches pipes, conduits, or other underground structures on or adjacent to MBTA Railroad Property, digging by machinery shall be discontinued and the excavation shall continue by means of hand tools. All existing pipes, poles, wires, fences, property line markers, and other structures, which the MBTA and/or Railroad Company(s) decides must be preserved in place, shall be carefully protected from damage by the Contractor or its Owner. Should such items be damaged, they shall be restored by the Railroad Company(s), at the Owner's or Contractor's sole expense to the original condition prior to construction commencement. If any excavation is taken beyond the work limit indicated on the approved plans or prescribed herein, the Owner or its Contractor shall backfill and compact to the satisfaction of the Railroad Company(s) at his own expense.

SECTION 4. BACKFILL

4.01 Backfilling

A. All backfill material adjacent to any Railroad Company(s) facility shall be approved by the Railroad Company(s). Backfill material shall be free from hard lumps and clods larger than 3 inches in diameter, and free from large rocks or stumps. Uniformly fine material shall be placed next to any pipe liable to dent or break.

B. All backfill material shall be compacted at near optimum moisture content, in layers not exceeding 6 inches in compacted thickness by pneumatic tampers, vibrator compactors, or other approved means to the base of the railroad subgrade. Material shall be compacted to not less than 95 percent of AASHTO T 99, Method C. The Contractor will be required to supply to the job site, ballast stone (AREA #4) to be installed by the Railroad Company(s).

4.02 Certification

The Owner or its Contractor shall provide testing, through the use of a testing lab or Professional Engineer, to insure that the inplace density of the backfill meets or exceeds the requirements of Section 4.01(B). Written certification of the tests shall be given to the Railroad Company(s) immediately upon completion of the test.

4.03 Alternate

In the case of an open cut crossing of the MBTA Railroad Property, the Owner or its Contractor may backfill with concrete having a three-day compressive strength of 1000 psi to the base of the track subgrade. This may be used in lieu of providing the certification of proper compaction when using gravel backfill. The Owner or its Contractor will be required to supply to the job site, ballast stone (AREA #4) to be installed by the Railroad Company(s).

SECTION 5. CLEARANCES

5.01 Staging, falsework, or forms shall at all times be maintained with a minimum vertical clearance of 22'6" above top of the high rail and a minimum horizontal clearance of 15' from the center line of track.

SECTION 6. PROTECTION SERVICES

6.01 The MBTA shall require railroad inspection and may require railroad flagging. Prior to start of any work on MBTA Railroad Property, the Owner or its Contractor shall submit a deposit in the amount required by the Railroad Company(s). If Railroad Company(s) expenses are greater than the amount of deposit, the Owner or its Contractor shall reimburse the Railroad Company(s) for the balance when billed, and, if the Railroad Company(s) expenses are less than the amount of deposit, the

Railroad Company(s) will refund the balance to the Owner or its Contractor. The Railroad Company(s) reserves the right to request additional deposits as project work progresses.

6.02 If the MBTA or Railroad Company(s) determines that flagmen are necessary, the number required shall be on duty at the site during the hours of hazard described under Section 3. No work shall be performed if flagmen are required but are not on duty.

6.03 It shall be the responsibility of the Owner or its Contractor to keep the MBTA and Railroad Company(s) informed at all times when the Owner or its Contractor shall be working on, over, under, within or adjacent to MBTA Railroad Property and creating the hazards described under Section 3. Failure of the Owner or its Contractor to give the MBTA and Railroad Company(s) suitable advance notice of hazardous operation shall result in the shut down of the work by the Railroad Company(s), until such time as sufficient number of flagmen are on duty at the site. If this becomes a repeat occurrence, the Contractor will be removed from the project.

6.04 The Railroad Company(s) will make its best effort to provide protective services personnel. Should the situation arise where such personnel are not available, Contractor operations must cease. The Railroad Company(s) is not liable for any monetary claims incurred during the absence of protective services personnel.

SECTION 7. INSPECTION

7.01 If deemed necessary by the Chief Engineering Officer of the MBTA, the MBTA will furnish and assign an engineer(s) for inspection and the Railroad Company(s) will furnish an appropriate inspector for general inspection purposes or for general protection of MBTA Railroad Property and operations during construction. All protection services will be at the expense of the Owner or its Contractor.

SECTION 8. EXTRA-CONTRACT SERVICES

8.01 Temporary and permanent changes of tracks and all railroad utilities made necessary by the work of the Contractor, will be made by the MBTA or Railroad Company(s)

at the expense of the Owner or its Contractor.

8.02 All other changes made or services furnished by the Railroad Company(s), at the request of the Owner or its Contractor will be at the Owner's or its Contractor's expense.

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORATE

III

INSURANCE SPECIFICATIONS

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The insurance outlined in these Specifications is required of the Owner or Contractor, and shall be provided by or in behalf of all subcontractors performing any portion of the work. The Owner or Contractor shall be responsible for any modifications, deviations or omissions of the required insurance as it applies to subcontractors.

All insurance policies, unless otherwise specified under Railroad Protective Liability Insurance, are to be written either on an occurrence basis or, if a claims-made form, applicable renewals must have a date retroactive to the construction start date and shall be maintained in force for one year following the acceptance of the work by the MBTA or its duly authorized representative.

With the exception of Railroad Protective Liability Insurance, all insurance policies must name the MBTA as an additional insured as its interest appears and waive any rights of subrogation against the MBTA.

Certificates of Insurance evidencing (1) either the claims-made or occurrence form coverage, (2) work description/location, (3) Owner or Contractor's corporate name, and (4) individual, company, government agency or municipality for which the work is being performed, are to be furnished to the MBTA prior to work commencement, and within fifteen (15) days of expiration of the insurance coverage, when applicable.

All policies must contain a minimum thirty (30) day written notice of cancellation clause, and provide that the Insurance Company shall notify the Owner, Contractor, MBTA and Railroad Company(s), via registered mail, of any cancellation, change or expiration of the policy.

Original Insurance Certificate(s) shall be received and approved by the MBTA before the Owner or Contractor will be allowed entry upon MBTA Railroad Property. Certificates, including any required endorsements, shall be furnished to the MBTA, c/o Risk Manager, Office of the Treasurer-Controller, Ten Park Plaza, Room 8450, Boston, MA 02116, and shall provide stated coverage and a provision that Notice of Accident (occurrence) and Notice of Claim shall be given to the Insurance Company as soon as practicable after notice to the insured(s).

Original Insurance Binders reflecting Railroad Protective Insurance shall be received and approved by the MBTA and the appropriate Railroad Company(s) prior to entry upon MBTA Railroad Property. Mailing addresses for transmittal of original Insurance Binders to the named insured Railroad Company(s) are contained on Page Four of these Specifications.

The Owner or Contractor shall indemnify, defend and save harmless the MBTA and the appropriate Railroad Company(s) from and against any and all liabilities, losses (including losses of revenue), claims, costs, damages and expenses (including reasonable attorney's fees and expenses) that may be asserted against or incurred by the MBTA and the Railroad Company(s) arising from or as a result of the Owner or Contractor's work, or its use of adjacent land. Said indemnification shall include claims, whether covered by

insurance or not, including, but not limited to Worker's Compensation and similar insurance.

The Owner or Contractor shall maintain, during the life of the contract, from company(s) authorized to do business in the Commonwealth of Massachusetts and satisfactory to the MBTA:

A. COMMERCIAL GENERAL LIABILITY INSURANCE for personal injury, bodily injury and property damage in an amount not less than $1,000,000 per occurrence and $3,000,000 in the aggregate covering all work performed on over or adjacent to MBTA Railroad Property (the "work"), including:

1. All operations;

2. Contractual liability;

3. Coverage for the so-called "X, C, U" hazards, i.e., collapse of building, blasting, and damage to underground property;

4. Asbestos abatement, when applicable.

B. AUTOMOBILE LIABILITY INSURANCE, including the use of all vehicles owned, non-owned, leased and hired, in an amount not less than $2,000,000 combined single limit covering all the work.

C. WORKER'S COMPENSATION INSURANCE including Employees Liability Insurance, as provided by Massachusetts General Laws, Chapter 152, as amended, covering all the work.

D. UMBRELLA LIABILITY COVERAGE, in an amount not less than $5,000,000 per occurrence covering all the work.

E. HAZARDOUS MATERIALS INSURANCE if the work involves hazardous materials, the following coverage is required:

1. **Pollution Liability Insurance** for sudden and gradual occurrences in an amount not less than $1,000,000 per occurrence and $5,000,000 in the aggregate arising out of the work, including but not limited to all hazardous materials identified in the contract.

2. When applicable, the Owner or Contractor shall designate the disposal site and furnish a Certificate of Insurance from the Disposal Facility for Environmental Impairment Liability Insurance for (a) sudden and accidental occurrences in an amount not less than $3,000,000 per occurrence and $6,000,000 in the aggregate and (b) non-sudden occurrences in an amount not less than $5,000,000 per occurrence and $10,000,000 in the aggregate.

4. Certificates of Insurance shall clearly state the hazardous materials exposure work being performed.

F. **RAILROAD PROTECTIVE LIABILITY INSURANCE** is specifically designed for insuring Railroads, and is purchased by the Owner or Contractor in the name of the MBTA and the Railroad Company(s). **The Railroad Company(s) is the named insured on the policy**. Railroad Protective Liability Insurance is required for any work performed within fifty (50) feet from center line of the nearest railroad track; it is not a substitute for any types of insurance outlined in these Specifications. Required limits are:

Bodily Injury: not less than $2,000,000 for all damages arising out of bodily injuries to or death of one person, and subject to that limit for each person, a total limit of $6,000,000 for all damages arising out of bodily injury to or death of two or more persons in any one accident;

Property Damage: not less than $2,000,000 for all damages arising out of injury to or destruction of MBTA property in any one accident, and subject to that limit per accident, a total of $6,000,000 in the aggregate for all damages arising out of injury to or destruction of MBTA property.

Questions regarding insurance should be directed to MBTA's Risk Manager at (617) 722-4447.

Questions regarding train counts and train speeds should be directed to the appropriate Railroad Company(s) listed on Page Four.

PROOF OF INSURANCE
MAILING ADDRESSES :

MBTA	Risk Manager c/o Treasurer-Controller 10 Park Plaza Boston, MA 02116 cc: MBTA Real Estate Management
National Railroad Passenger Corporation (Amtrak)	Boston Division Office c/o Division Engineer 32 Cobblehill Road Somerville, MA 02143
Consolidated Rail Corporation	Chief Engineer Design and Construction 2201 Market Street - 11C P.O. Box 41411 Philadelphia, PA 19101
Bay Colony Railroad Corporation	General Manager 4 Freight House Road East Wareham, MA 02571
Boston and Maine Corporation and Springfield Terminal Railway Co.	Chief Engineer 402 Amherst Street Suite 300 Nashua, NH 03063-1287
Providence and Worcester Railroad Company	P.O. Box 1188 Worcester, MA 01601

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORATE

IV

PIPELINE OCCUPANCY SPECIFICATIONS

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SECTION 1. GENERAL REQUIREMENTS

1.01 DESCRIPTION OF WORK AND LOCATION

These specifications apply to the design and construction of pipelines carrying flammable and non-flammable substances and to casings over 4-inches in diameter containing wires and cables, under, across or along MBTA Railroad Property, facilities and tracks.

1.02 LICENSE TO ENTER RAILROAD PROPERTY

A. Entry upon MBTA Railroad Property for the purpose of conducting surveys, field inspections, obtaining soil information, or any other purpose associated with the design and engineering of the proposed occupancy, will be authorized by an MBTA License for Entry (See "Guidelines and Procedures for Construction on MBTA Railroad Property").

B. Issuance of the License does not constitute authority to proceed with the actual construction.

1.03 WORK ON RAILROAD PROPERTY

A. The safety and continuity of train operations shall be the first priority. The Applicant shall arrange the work so that the trains will be protected and safeguarded at all times. Whenever the work may affect the safety and movement of trains, the method, sequence and time schedule of performing such work shall be submitted to the MBTA's Chief Engineering Officer or his authorized representative for approval.

B. The Applicant waives all claims against the Railroad Company(s) and/or the MBTA for delays or any interference occasioned by railroad traffic or railroad maintenance.

C. All Applicant-designed temporary construction on MBTA Railroad Property, shall be designed in accordance with the appropriate railroad criteria and all construction performed on, over, under, within or adjacent to MBTA Railroad Property will be subject to the inspection and approval of the Railroad Company(s) and/or MBTA.

D. A minimum of fourteen (14) days advance written notice shall be given to the

Railroad Company(s) prior to construction related activities.

E. The Railroad Company(s) will furnish such qualified flagmen, signalmen or protection men as may be required to insure complete protection of train operations and railroad facilities. The need for this type of service will be determined by the Railroad Company(s) on the basis of railroad regulations and the Applicant's approved construction schedule. No work shall proceed without proper protection on the site.

F. All expenses incurred in connection with protection of railroad facilities by Railroad Company(s) employees will be borne by the Applicant. Billings for such service or expense, including labor, materials and equipment will be made directly to the Applicant for payment.

G. During construction, railroad traffic shall be maintained at all times without interruption, except when approved in advance, in writing, by the Chief Engineering Officer or his authorized representative.

H. All construction operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains, nor damage, destroy, or endanger the integrity of railroad facilities. All work on or near MBTA Railroad Property shall be conducted in accordance with the Railroad safety rules and regulations. The Applicant shall secure and comply with the Railroad safety rules and shall give written acknowledgement to the Railroad Company(s) that they have been received, read, and understood by the Applicant and his employees. Construction operations will be subject to Railroad Company(s) inspection at any and all times.

I. All cranes, lifts, or other equipment that will be operated in the vicinity of the MBTA's electrification and power transmission facilities shall be electrically grounded as directed by the Railroad Company(s).

J. At all times when the work is progressing, a field supervisor for the work with no less than twelve (12) months experience in the operation of the equipment being used shall be present. Certification of the above must be submitted to the Railroad Company(s).

K. Whenever equipment or personnel are working closer than fifteen (15) feet to the centerline of an adjacent track, that track shall be considered as being obstructed. Insofar as possible, all construction operations shall be conducted no less than this distance. Construction operations closer than fifteen (15) feet to the centerline of a track shall be conducted only with the permission of, and as directed by, a qualified Railroad Company(s) employee present at the work site.

L. Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangement with, and as directed by, the Chief Engineering Officer or his authorized representative.

M. All tunneling, jacking and boring operations within railroad influence lines will be done on a 24-hour per day basis to minimize Railroad exposure to construction hazards.

1.04 COORDINATION

The Applicant shall coordinate his work with his contractors, subcontractors, utility companies, governmental units, and any affected Railroad Company(s) with regard to site access, establishment and use of temporary facilities, work schedules, and other elements of the specified work which require interfacing with others.

1.05 LAYOUT OF WORK

The Applicant shall lay out his work true to lines and grades indicated on the drawings and shall be responsible for all measurements in connection therewith. The Applicant will be held responsible for the execution of the work to such lines and grades indicated on the approved construction drawings or such other lines and grades as may be directed or established by the Chief Engineering Officer or his authorized representative.

1.06 INDEMNIFICATION AND INSURANCE

See requirements in "Guidelines and Procedures for Construction on MBTA Railroad Property" and "Insurance Specifications."

1.07 SCIENTIFIC OR HISTORIC ARTIFACTS

The Applicant shall immediately notify the Chief Engineering Officer of the discovery of scientific or historical artifacts and shall protect same until identified and removed by the appropriate Authorities exercising jurisdiction.

1.08 RECORD DOCUMENTS

A. The Applicant shall furnish the Railroad Company(s) and the MBTA with one

reproducible "As Built" copy of each approved Construction Drawing, marked to indicate all changes and deviations from same.

B. All project record documents shall be received and accepted by the MBTA and the Railroad Company(s) prior to final inspection.

SECTION 2. SUBMITTALS

2.01 APPLICATION FOR OCCUPANCY

The Applicant must agree, upon approval of the construction details by the Chief Engineering Officer, to execute the MBTA Pipeline Occupancy Agreement and pay any required fees and/or rentals outlined therein. Refer to "Guidelines and Procedures for Construction on MBTA Railroad Property" for application policy.

2.02 SUBMISSION OF CONSTRUCTION PLANS AND SPECIFICATIONS

A. Six (6) sets of plans and specifications for proposed pipeline occupations shall be submitted to the Director of Real Estate and meet the approval of the Railroad Company(s) and the MBTA prior to the start of construction. These plans are to be prepared in sizes as small as possible and are to be folded to an 8-1/2 inch by 11-inch size (folded dimensions) with a 1-1/2 inch margin on the left side and a 1-inch margin on the top.

1. After folding, the title block and other identification of the plans shall be visible at the lower right corner, without the necessity of unfolding. Each plan shall bear an individually identifying number and an original date, together with subsequent revision dates, clearly identified on the plan.

2. All plans are to be individually folded or rolled and where more than one plan is involved, they shall be assembled into complete sets before submission to the MBTA.

B. Draw plans to scale and show the following (see attached Plates).

1. Plan view of proposed pipeline in relation to all railroad facilities.

2. Location of pipe (in feet) from nearest railroad milepost, centerline of a railroad bridge (giving bridge number), or centerline of an existing or former passenger station, or other fixed point. In all cases, the name of the City or Town and County in which the proposed facilities are located must be shown.

3. Profile of ground on centerline of pipe from field survey showing relationship of pipe and casing to ground level, tracks and other facilities. For longitudinal occupations, the profile of adjacent track(s)

must be shown.

4. All MBTA property lines. If pipeline is in a public highway, the limits of the right-of-way for the highway shall be clearly indicated with dimensions from centerline.

5. The angle of crossings in relation to centerline of tracks.

6. Location of valves or control stations of the pipeline.

7. "Pipe Crossing Data Sheet" completed and put on plan.

C. The plan must be specific (both on MBTA Railroad Property and under tracks that are not on MBTA Railroad Property) as to:

1. Method of installations.
2. Size and material of casing pipe.
3. Size and material of carrier pipe.

These items shall not have an alternative.

D. Once an application is approved by the Chief Engineering Officer or his authorized representative, proposed variances from the approved plans, specifications, method of construction, etc., will be resubmitted for approval.

E. Location and dimensions of jacking, boring, or tunneling pits shall be shown with details of their sheeting and shoring. If the bottom of the pit excavation nearest the adjacent track intersects a line from a point 5.5 feet horizontally from center line of adjacent track at the plane of the base of rail drawn on a slope of 2 horizontal to 1 vertical, submit design and details of the pit construction to the MBTA for approval, complete with computations prepared by a Registered Professional Engineer. In any event, the face of the pit shall be no less than 25 feet from adjacent track, unless otherwise approved by the Chief Engineering Officer or his authorized representative. Pits shall be fenced, lighted, and otherwise protected as directed by the Railroad Company(s).

F. All plans and computations, including those submitted by contractors, must bear the seal of a Registered Professional Engineer.

G. Computations for all structures involving the support or protection of railroad track, embankment and facilities must be prepared by and bear the seal of a Registered Professional Engineer and shall be submitted within the construction plans.

H. When computer calculations are included with design calculations, the following documentation shall be furnished:

1. A synopsis of the computer program(s) stating briefly required input, method of solution, approximations used, second order analysis incorporated, specifications or codes used, cases considered, output generated, extent of previous usage of certification of program(s) and program(s) author.

2. Identification by number, indexing and cross-referencing of all calculation sheets, including supplemental "long-hand" calculation sheets.

3. Fully identified, dimensioned, and annotated diagram of each member or structure being considered.

4. Clear identification and printing of all input and output values, including intermediate values if such values are necessary for orderly review.

5. Identification of the processing unit, input/output devices, storage requirements, etc., if such supplemental information is significant and necessary for evaluation of the submittal.

I. Specifications shall conform to Construction Specifications Institute (CSI) 16 Division, 3-part Section Format.

J. If other than American Railway Engineering Association (AREA), American Society for Testing and Materials (ASTM), or American National Standards Institute (ANSI) specifications are referred to for design, materials or workmanship on the construction plans and specifications for the work, then copies of the applicable sections of such other specifications referred to shall accompany the construction plans and specifications for the work.

SECTION 3. TEMPORARY FACILITIES AND CONTROLS

3.01 REQUIREMENTS OF REGULATORY AGENCIES

Applicant shall:

A. Obtain and pay all costs for required permits for installation and maintenance of temporary facilities and controls.

B. Comply with all applicable Federal, State and local codes, regulations and ordinances.

C. Comply with regulations and requirements of all utility or service companies from which temporary utilities or services are obtained, and pay all costs incurred therewith.

3.02 INSTALLATION AND COORDINATION - GENERAL

Applicant shall:

A. Install all temporary facilities and controls in a neat and orderly manner.

B. Make all temporary facilities structurally and functionally sound throughout.

C. Construct temporary facilities and controls to give continuous service and to provide safe working conditions.

1. Enforce conformance with applicable standards
2. Enforce safe practices.

D. Modify, extend or relocate temporary facilities and controls as work progress requires.

E. Locate temporary facilities and controls to avoid interference with, or hazards to:

1. Work or movement of railroad personnel or traffic.
2. Vehicular traffic.
3. General Public.
4. Work of other contracts.
5. Railroad Passengers

F. Obtain easements as may be required across non-MBTA Railroad Property.

G. Provide materials for temporary facilities and controls for the purpose intended and shall not violate requirements of applicable codes and shall not create unsafe conditions.

3.03 SANITARY FACILITIES

Prior to the start of work, the Applicant shall furnish necessary toilet conveniences, secluded from public observation. They shall be kept in a clean and sanitary condition and comply with the requirements and regulations of the area in which the work is performed.

3.04 LIGHT AND POWER

Applicant shall make his own arrangements for obtaining temporary light and power as required for the work, and shall maintain such temporary facilities in a proper and safe condition, including compliance with applicable codes.

3.05 TEMPORARY WATER

Applicant shall make his own arrangements for obtaining all temporary water service as required for the work.

3.06 TEMPORARY TRAFFIC CONTROLS

Applicant shall cooperate with the directives of the MBTA and/or Railroad Company(s) regarding vehicular traffic control and provide any temporary controls or devices required to eliminate or minimize congestion or obstruction of vehicular traffic caused by the work, including use of designated routes of ingress and egress from the work area.

3.07 TEMPORARY WORK AND STORAGE AREAS

A. The areas designated by the MBTA as the temporary parking, work and storage area(s) will be provided to the Applicant in accordance with the terms of the MBTA License Agreement.

B. All designated temporary parking, work and storage areas used by the

Applicant shall be restored to their original condition prior to completion of the work, subject to inspection and approval of the MBTA and the Railroad Company(s).

3.08 POLLUTION ABATEMENT CONTROLS

Applicant shall:

A. Conduct operations in a manner to minimize pollution of the environment surrounding the area of work by every means possible. Specific controls shall be provided as follows:

1. Vehicles: All vehicles and material transport trucks leaving the site and entering paved public streets shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle. Trucks arriving at or leaving the site with materials shall be loaded in a manner which will prevent dropping of materials or debris on the streets. Spills of materials in public areas shall be removed immediately at no cost to the MBTA or Railroad Company(s).

2. Waste Materials: No waste or erosion materials shall be allowed to enter natural or man-made water or sewage removal systems. Erosion materials from excavations, borrow areas or stockpiled fill shall be contained within the work area. The Applicant shall develop methods for control of waste and erosion which shall include such means as filtration, settlement and manual removal to satisfy the above requirements. Do not dispose of machinery lubricants, fuels, coolants and solvents on the site. If hazardous waste is encountered, the Applicant shall dispose of it in accordance with all federal, state and local codes. Verification of proper disposal must be provided, in writing, to the MBTA and the Railroad Company(s).

3. Burning: No burning of waste shall be allowed without prior written permission. In cases where permission is granted, burning shall be conducted in accordance with the regulations of the appropriate jurisdictional agency.

4. Dust Control: The Applicant shall at all times control the generation of dust by his operations. Control of dust is mandatory and shall be accomplished by water sprinkling or by other methods approved by the MBTA or Railroad Company(s).

5. Noise Control: The Applicant shall take every action possible to

minimize the noise caused by his operation. When required by agencies having jurisdiction, noise producing work shall be performed during less sensitive hours of the day or week as directed by the MBTA or Railroad Company(s) or as required by local ordinance.

6. Environmental: All local and state environmental laws will be strictly adhered to. All applications, permits, licenses, approvals, etc., will be the sole responsibility of the applicant.

B. Submit a program for pollution control with applicable licenses and permits for all piping carrying non-potable liquids, gases or other pollutants.

3.09 PROTECTION OF PERSONS AND PROPERTY

A. Safety Requirements

1. The Applicant must adhere to the most stringent provisions of the applicable statutes and regulations of the political subdivision in which the work is being performed. The Applicant must also observe the Department of Labor-Occupational Safety, Health Administration provision, pertaining to the safe performance of the work, and further, the methods of performing the work must not involve undue danger to the personnel employed thereon, Railroad Company(s) employees, the public, or to public and private property. Should charges of violation of any of the above be issued to the Applicant in the course of the work, a copy of each charge shall immediately be forwarded to the Railroad Company(s). The Applicant shall pay all fines and penalties levied against him.

2. The Applicant shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection. This includes posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

B. Safety of Persons and Property - The Applicant shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the work site and all other persons who may be affected.

2. All materials and equipment, whether in storage on or off the site,

under the care, custody or control of the Contractor or any of his subcontractors.

3. Other property at the site or adjacent thereto, including walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction. Any damage to such items shall be restored to original condition by the Applicant at no cost to the MBTA or Railroad Company(s).

C. First Aid

The Applicant shall maintain adequate first aid supplies at the site as prescribed by Federal, State or Local codes and regulations.

D. Use of Explosives

Non blasting methods are preferred. See "Blasting Specifications".

E. Site Security

The Applicant shall:

1. Maintain a secure work site protecting the MBTA and the Railroad Company(s) interests and property from claims arising from trespass, theft and vandalism.

2. Permit access to the work site only to employees, contractors and those persons having business related to the work.

3. Provide security measures as required to protect his or his subcontractor's tools, equipment and property from damage, theft or vandalism.

4. Assume all costs for any MBTA and/or local police details required by the work.

3.10 VERMIN CONTROL

A. Do not permit food scraps, lunch bags, food wrappers or other items which would attract rats or other vermin to be left lying around the site. Deposit such items in closed, rat-proof metal containers for disposal on a regular basis.

B. The Applicant must provide vermin control as required by the MBTA or Railroad Company(s).

3.11 RUBBISH AND DEBRIS REMOVAL

A. Rubbish and debris resulting from the work must be neatly piled in a single location and legally disposed of at least once a week. If rubbish or debris interferes with railroad activities, or creates a fire or safety hazard, it must be removed on a more frequent basis.

B. Volatile waste such as mineral spirits, oil, or paint thinner shall not be disposed of in storm or sanitary drains, streams or waterways or any location upon the site.

SECTION 4. PIPELINE OCCUPANCY GENERAL CRITERIA

GENERAL:

4.01 METHOD OF INSTALLATION:

A. In a public way:

1. No work shall be done without a Railroad Company(s) Inspector present.

2. Open cuts will not be allowed in or immediately adjacent to an at grade crossing. Sleeves will be installed by the jacking method, unless otherwise approved by the Chief Engineering Officer.

3. Jacking is the preferred method of installation in or immediately adjacent to an at grade crossing. The sleeve may be installed by the open cut method with the Applicant paying for the complete rebuilding of the crossing, pending approval of MBTA's Chief Engineering Officer. Approval will be given only under very unusual circumstances.

4. Jacking is the preferred method of installation in or immediately adjacent to an at grade crossing scheduled for rebuilding. The sleeve may be installed by the open cut method within seven (7) calendar days of the scheduled date of the crossing reconstruction. In the case of any open cut, strict adherence shall be made to the backfill specifications which provide the MBTA with written certification from a testing lab or Professional Engineer, that the backfill density requirements of the MBTA specifications have been met or exceeded.

B. Not within a Public Way:

The preferred method of crossing the railroad is by jacking of a pipe sleeve under the railroad. Only upon written request, will an alternate of open cut be given consideration. The engineering decision shall be based upon, but not limited to, the following: (1) track usage, (2) depth of cut, (3) soil conditions, (4) physical restraints. In the event an open cut is allowed, the following items shall be adhered to: and (5) any other circumstances which may necessitate an open cut.

1. The installation is to be a continuous operation and performed according to an MBTA approved schedule.

2. No work shall be done without a Railroad Company(s) Inspector present.

3. MBTA backfill specifications by the Owner or its Contractor.

4. The Owner or its Contractor may be required to provide a non-refundable lump sum payment for "after the fact maintenance." The determination of this amount is based on the individual situation. No work will be allowed until this payment is received. This payment is not to be confused with payments for plans and specification review, flagging, inspection, etc. (also required from the Owner or its Contractor before he enters upon MBTA property.)

4.02 GENERAL REQUIREMENTS

A. Pipelines under or across MBTA tracks on rights-of-way shall be encased in a larger pipe or conduit called the casing pipe as indicated in Plate II.

B. Casing pipe will be required for all pipelines carrying oil, gas, petroleum products, or other flammable, highly volatile substances which, from their nature or pressure, might cause damage if escaping on or near MBTA Railroad Property.

C. For non-pressure sewer or drainage crossings where the installation can be made without interference to railroad operations, the casing pipe may be omitted when the pipe strength is capable of withstanding railroad loading. This type of installation must be approved by the MBTA's Chief Engineering Officer.

D. The casing pipe shall be laid across the entire width of the right-of-way. Casing pipe shall extend beyond the right-of-way when the right-of-way line on either side of the tracks is less than the minimum length of casing specified in Section 6, Para. 6.01(E).

E. Pipelines laid longitudinally on railroad right-of-way shall be located in accordance with Plate III. If located within 25 feet of the centerline of any track or closer than 45 feet to nearest point of any bridge, building or other structure, the carrier pipe shall be encased.

F. Where practicable, pipelines shall be located to cross the tracks at approximate right angles, but preferably at not less than 45 degrees.

G. Pipelines shall not be placed within a culvert, under railroad bridges, or closer

than 45 feet to any portion of a railroad bridge, building, or other structure, except in special cases, and then by special design, as approved by the Chief Engineering Officer.

H. Pipelines carrying liquified petroleum gas shall, where practicable, cross the railroad where tracks are carried on embankment.

I. Any replacement or modification of an existing carrier pipe and/or casing shall be considered a new installation, subject to the requirements of these Specifications.

J. Where laws or orders of public authority prescribe a higher degree of protection than specified herein, the higher degree so prescribed shall be deemed a part of these Specifications.

K. Pipelines and casings shall be suitably insulated from underground conduits carrying electric wires on MBTA Railroad Property.

4.03 INSPECTION AND TESTING

For pipelines carrying flammable or hazardous materials, ANSI Codes B 31.8 and B 31.4, current at time of constructing the pipeline, shall govern the inspection and testing of the facility on MBTA Railroad Property, except that proof-testing of strength of carrier pipe shall be in accordance with the requirements of ANSI Code B 31.4, as applicable, for all pipelines carrying all, liquified petroleum gas, natural or manufactured gas, and other flammable substances.

4.04 CATHODIC PROTECTION

A. Cathodic protection shall be applied to all pipelines and casings carrying flammable substances.

B. Where casing and/or carrier pipe is cathodically protected by other than anodes, the Chief Engineering Officer shall be notified and suitable testing shall be made. This testing shall be witnessed by the Railroad Company(s) to insure that other railroad structures and facilities are adequately protected from the cathodic current in accordance with the recommendations of Reports of Correlating Committee on Cathodic Protection, current issue by the National Association of Corrosion Engineers.

4.05 SOIL INVESTIGATIONS

A. Soil borings (or other soil investigations approved by the Railroad Company(s) will be performed to determine the nature of the underlying material for all pipe crossings under tracks. See "Test Boring Specifications".

B. Borings shall be made on each side of the tracks, on the centerline of the pipe crossing, and as close to the tracks as practicable.

C. Soil borings shall be in accordance with the current issue of the American Railway Engineering Association Specifications, Chapter 1, Part 1, "Specifications for Test Borings". Soils shall be investigated by the split-spoon and/or thin-walled tube method and rock shall be investigated by the Coring method specified therein.

D. Soil boring logs shall clearly indicate <u>all</u> of the following:

1. Boring number as shown on boring location plan.
2. Elevation of ground at boring, using same datum as the pipeline construction plans.
3. Description or soil classification of soils and rock encountered.
4. Elevations or depth from surface for each change in strata.
5. Identification of where samples were taken and percentage of recovery.
6. Location of ground water at time of sampling and, if available, subsequent readings.
7. Natural dry density in lbs./sq. ft. for all strata.
8. Unconfined compressive strength in tons/sq. ft. for all strata.
9. Water content (percent). Liquid limit (percent) and plastic limit (percent).
10. Standard penetration in blows/ft.

E. The location of the carrier pipe and casing shall be superimposed on the boring logs before submission to the Chief Engineering Officer.

F. Soil investigation by auger, wash, or rotary drilling methods are not acceptable.

G. Soil boring logs shall be accompanied by a plan drawn to scale showing location of borings in relation to the tracks and the proposed pipe location, <u>the elevation of ground surface at each boring</u>, and the elevation of the base of rail of the tracks.

4.06 GROUND STABILIZATION

Soil stabilization shall take place prior to the start of jacking. Stabilization shall be achieved by dewatering, grouting or a combination of both to maintain the stability of the face of the heading.

A. The Owner or its Contractor shall lower and maintain the ground water level a minimum of two (2) feet below the invert at all times during construction by well points, vacuum well points, or deep wells to prevent inflow of water and/or soil into the heading. Ground water observation wells shall be installed in the area to be dewatered to demonstrate that the dewatering requirements are being complied with.

B. The grouting contractor shall be a specialist in the field with a minimum of five (5) continuous years of successfully grouting soils. All granular soils (silty sands, sand or sand and gravel) shall be stabilized by injection of a cement or chemical grout from the ground surface or from the pipe heading. The stabilization shall extend as far as necessary outside the periphery of the casing pipe in order to maintain a stable face at the heading.

C. Railroad Company(s) forces will survey the crossing prior to, during and after construction. If it is necessary to align or surface the tracks as a result of construction, the Railroad Company(s) will perform the work at the expense of the Owner or the Owner's Contractor.

4.07 SUPPORT OF TRACKS

A. When jacking, boring, or tunneling, temporary track support structures will be installed. The track support structures will be provided by the Applicant and installed by the Railroad Company(s) at the Applicant's expense. The type of temporary track support structures shall be approved by the Railroad Company(s).

B. All work involving rail, signals, ties and other track material will be performed by the Railroad Company(s) at the Applicant's expense.

C. The Applicant shall deliver the track support structures to a site approved by the Railroad Company(s). Provisions for unloading will be provided by the Applicant at no expense to the Railroad Company(s) and the Applicant will provide the necessary labor to handle the material for pre-installation inventory.

4.08 GEOTECH MONITORING

THE FOLLOWING SPECIFICATIONS ARE REQUIRED FOR ALL PIPE JACKING OPERATIONS.

A. Jacking will be on a continuous basis, 24 hours per day, 7 days per week.

B. The monitoring points will be set up one week before the jacking operation begins. The MBTA and Railroad Company(s) shall be notified. Elevation readings shall begin two days prior to the start of jacking and continue for a minimum of two weeks after the completion of the jacking operation. Initial readings immediately after any surfacing operations shall serve as new baseline figures. All future elevation readings shall be compared to the adjusted baseline. If the track deviates to a condition not acceptable to the MBTA or Railroad Company(s), corrections will be made at the proponent's expense.

C. Elevation readings will be taken from the top rail of each track.

D. Elevation readings will be taken every four hours or two times per shift, i.e.: six times per day. The readings will be faxed to the MBTA and Railroad Company(s) on a daily basis and all information is to be presented in legible print. Additional readings may be required by the MBTA or Railroad Company(s).

E. Stations will be spaced at 15-1/2 foot intervals. The number of stations required will be determined by the depth of the pipe. There will be a minimum of two stations on either side of the centerline jacking. Additional stations may be required by the MBTA or Railroad Company(s).

F. Elevation readings must show the date, time, weather conditions and temperature. Each reading must also provide the following information: track number, compass direction, station number, base elevation (with date), static elevation, change in elevation (recorded in hundredths and in inches), dynamic reading and total deflection in inches. See sample sheet attached.

G. Station "0" will be located at the centerline of the pipe jacking with Stations 1 and being to the right and Stations -1 and -2 being to the left when standing in the gauge of the near track and looking at the receiving pit. In multiple track areas the stations as determined herein are to be carried across each track perpendicular to the near track.

H. At each monitoring station a dynamic load measurement will also be taken. The dynamic load measurement device will consist of a wooden stake placed

loaded measurement is the resultant gap between the bottom of the rail and the top of the stake caused by the deflection of the rail under the load of a passing train.

I. Elevation readings taken from the top of the rail for static measurement and the dynamic readings shall be combined and the sum compared to the adjusted baseline. This reading will demonstrate the difference in elevation caused by the jacking operation.

J. The MBTA requires that the track be maintained at all times within established criteria for the specific track classification. At the completion of the project the requirement for tamping and realigning the tracks, caused by the settlement from the construction activity, remains with the proponent for the duration as specified by the MBTA in their initial review of the work plans. This tamping and track realignment will be performed by the MBTA or Railroad Company(s) at the sole expense of the proponent.

GEOTECH MONITORING – SAMPLE SHEET

DATE: 1/13/94

WEATHER: CLOUDY

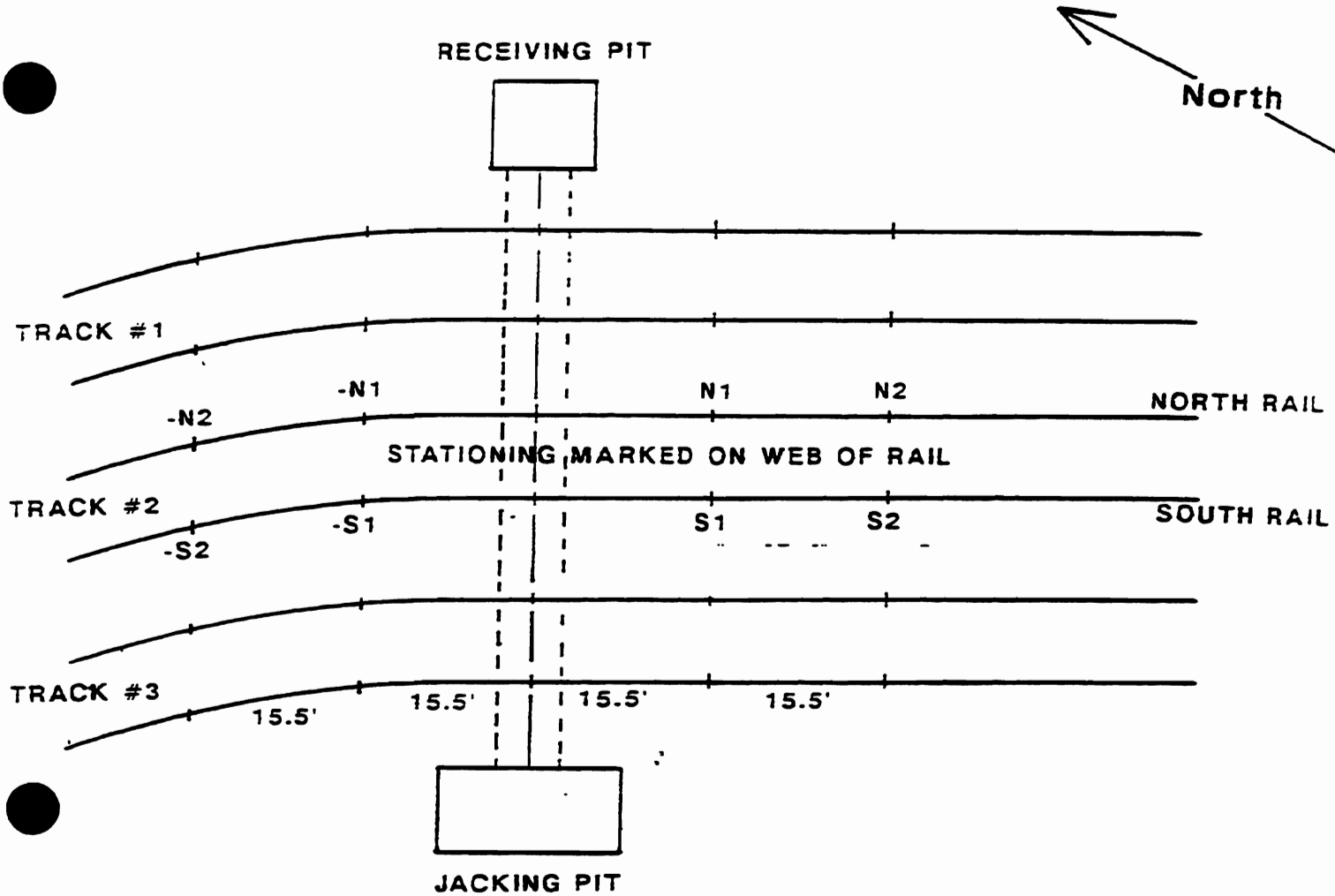
TIME: 8:30 AM

TEMPERATURE: 27°

Track #	Station #	Base Elev. 1/12/94 (A)		Static Elevation (B)		Change in Elevation (C)				Dynamic Reading (D)		Total Deflection (E)	
		N RAIL	S RAIL	N RAIL	S RAIL	N RAIL		S RAIL		N RAIL	S RAIL	N RAIL	S RAIL
1	−2	107.891	107.890	107.891	107.890	0.000	0	0.000	0	0	0	0	0
1	−1	107.862	107.865	107.841	107.844	0.021	−1/4"	−0.021	1/4"	−1/8	−1/8"	−3/8	−3/8"
1	0	107.834	107.835	107.792	107.793	0.042	−1/2"	−0.042	1/2"	−1/2	−1/4"	−1	−3/4"
1	1	107.800	107.802	107.779	107.781	0.021	−1/4"	−0.021	1/4"	−1/4	−1/8"	−1/2	−3/8"
1	2	107.775	107.780	107.775	107.780	0.000	0	0.000	0	0	0	0	0

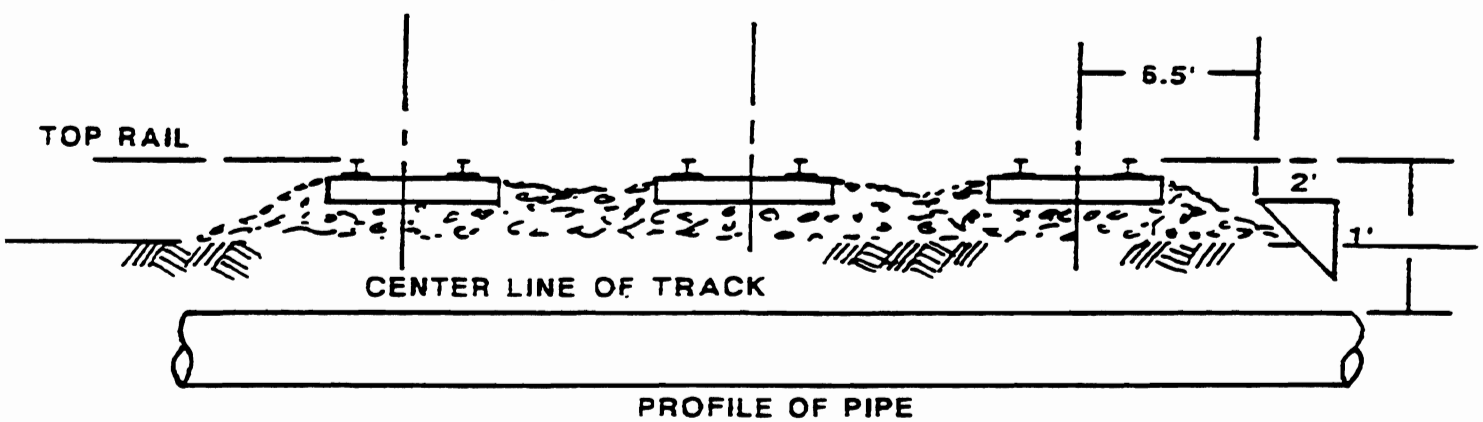
$$E = (B+C)-A$$

THE OPERATION OF THE TRACKS IN THIS EXAMPLE IS EAST TO WEST



← Left Right →

Looking in Direction of Pipe Jacking
(From Jacking Pit to Receiving Pit)



* This monitoring method will be used for driving piles within 15' of center line of track.

Revised: 3-18-94

4.09 PIPELINES ON BRIDGES

A. Pipelines carrying flammable or non-flammable substances which by their nature might cause damage if escaping on or near railroad facilities or personnel, shall not be installed on bridges over railroad tracks or bridges carrying railroad tracks.

B. The Chief Engineering Officer may approve such an installation when it is demonstrated that no practicable alternative is available.

C. When allowed by the Chief Engineering Officer, pipelines on bridges shall be located as to minimize the possibility of damage from vehicles, railroad equipment, vandalism and other external causes. Pipelines on bridges may be installed in a utility bay that is constructed between the girders of the bridge. The utility bay will be protected from the environment by a removable shield bolted to the girders. This will allow utility companies to comply with the Code of Federal Regulations for Periodic Inspection.

D. In the event of pipe relocation due to the reconstruction of a bridge, the installation of the new pipe must comply with the requirements in these Specifications.

4.10 BONDING AND GROUNDING OF PIPELINES IN ELECTRIFIED TERRITORY

A. Carrier pipe shall be enclosed in a metal casing that is isolated from carrier pipe by approved insulators having a dielectric value of not less than 25 k.v. that provide an air gap between carrier pipe and casing of not less than 2 inches.

B. Carrier pipe supporting hangers, mountings or cradles shall provide an insulation value of not less than 25 k.v. and an air gap of not less than 2 inches between casing and any portion of mounting assembly.

C. Any grounding or isolation methods used must have a minimum dielectric of 25,000 volts.

4.11 ABANDONED PIPELINES OR FACILITIES

A. For all pipeline occupations on the railroad right-of-way, the owner of the pipeline shall notify the MBTA, in writing, of the intention to abandon the pipeline. Upon abandonment, the carrier pipe shall be removed and the

casing shall be filled with cement grout, compacted sand or other material approved by the Chief Engineering Officer. If it is impractical to remove the carrier pipe, then the carrier must be filled along with the annular space between the casing and carrier.

B. Facilities other than pipelines will be removed or altered at abandonment to the satisfaction of the Chief Engineering Officer.

4.12 DRAINAGE

A. Occupancies shall be designed, and constructed, so that adequate and uninterrupted drainage of railroad right-of-way is maintained. If it becomes necessary to block a ditch, pipe or other drainage facility, the applicant shall install temporary pipes, ditches or other drainage facilities as required to maintain adequate drainage, as approved by the MBTA or Railroad Company(s). Upon completion of the work, the temporary drainage facilities shall be removed and the permanent facilities restored.

B. Water may not be pumped or disposed of onto railroad rights-of-way unless discharged into an existing drainage facility, providing discharge does not cause erosion or leave sediment.

C. When water runoff is disposed of onto MBTA Railroad Property, it must be demonstrated to the Railroad Company(s) that the existing drainage facility can accommodate the increased runoff. Drainage calculations stamped by a Registered Professional Engineer must accompany all requests to use railroad culverts or drainage ditches.

D. If, in the estimation of the Chief Engineering Officer or his authorized representative, the railroad culvert or drainage ditch has to be cleaned in order to allow the increased flow to safely pass through the culvert, it must be cleaned at the expense of the applicant.

SECTION 5. CARRIER PIPE

GENERAL:

5.01 DESIGN CRITERIA

A. If the maximum allowable stress in the carrier pipe on either side of the occupancy of MBTA Railroad Property is less than specified herein, the carrier pipe on MBTA Railroad Property shall be designed at the same stress as the adjacent carrier pipe.

B. Requirements for carrier pipe under railroad tracks shall apply for a minimum distance equal to that of the casing pipe.

C. Carrier pipes within a casing shall be designed for railroad live loads as if they were not encased.

D. All pipes, ditches and other structures carrying surface drainage on MBTA Railroad Property and/or crossing under railroad tracks shall be designed to carry the run-off from a one hundred (100) year storm. Computations indicating this design and suitable topographic plans, prepared by a Registered Professional Engineer, shall be submitted to the Chief Engineering Officer, or his authorized representative, for approval. If the drainage is to discharge into an existing drainage channel on railroad right-of-way and/or under railroad tracks, the computations should include the hydraulic analysis of any existing structures. Submitted with the computations should be formal approval of the proposed design by the appropriate governmental agency.

PRODUCTS:

5.02 GENERAL

A. All pipes shall be designed for the external and internal loads to which they will be subjected. The dead load of earth shall be considered 120 pounds per cubic foot. Railroad live loading shall be Cooper's E-80 with 50% added for impact. On railroad right-of-way or where railroad loading will be experienced, the following shall be the minimum requirements for carrier pipes:

1. Reinforced concrete pipe - ASTM Spec. C-76, Class V, Wall C.

2. Ductile Iron Pipe - For Culverts and Gravity Sewers - ASTM Spec. A-142 Extra Heavy.

5.03 OIL AND GAS PIPES

A. Pipelines carrying oil, liquified petroleum gas, natural or manufactured gas and other flammable products shall conform to the requirements of the current ANSI B 31.4, with Addenda, "Liquified Petroleum Transportation Piping Systems," ANSI B 31.8, "Gas Transmission and Distribution Piping Systems," and other applicable ANSI codes, except that the maximum allowable stresses for the design of steel pipe shall not exceed the following percentages of the specified minimum yield strength (multiplied by the longitudinal joint factor) of the pipe as defined in the ANSI Codes:

1. Steel pipe within a casing, under, across and longitudinally on MBTA Railroad Property. (The following percentages apply to hoop stress):

   a. Seventy-two percent for installation on oil pipelines.
   b. Fifty percent for pipelines carrying liquified petroleum gas and other flammable liquids with low flash point.
   c. Sixty percent for installations on gas pipelines.

2. Steel pipe without a casing laid longitudinally on MBTA Railroad Property. (The following percentages apply to hoop stress):

   a. Sixty percent for installations on oil pipelines.
   b. Forty percent for pipelines carrying liquified petroleum gas and other flammable liquids with low flash point.
   c. Forty percent for installations on gas pipelines.

B. Design computations showing compliance with the requirements of Paragraph 5.03(A) above, and prepared by a Registered Professional Engineer, shall accompany the application for occupancy.

5.04 CAST IRON PIPE: for water and other materials under pressure, shall conform to the current ANSI specifications A-21 Series 21/45 Iron strength with plain end, compression type or mechanical joints. The strength to sustain external railroad and other loadings shall be computed in accordance with the current ANSI A-21.1 "Thickness Design of Cast Iron Pipe."

5.05 VITRIFIED CLAY PIPE: ASTM Spec. C-700, Extra Strength.

5.06 CORRUGATED METAL PIPE: AREA Spec. Chapter 1, Part 4.

5.07 ASBESTOS CEMENT PIPE (Non-pressure): ASTM Spec. C-428, Cl. 5000 Min. Pressure: AWWA Spec. C-400, Cl. 150 Min.

5.08 OTHER: Other miscellaneous piping not specified above shall be submitted for approval by the Chief Engineering Officer.

5.09 SHUT-OFF VALVE

A. Provide accessible emergency shut-off valves at each side of the railroad within distances and at locations as directed by the Chief Engineering Officer.

B. Where pipelines are provided with automatic control stations and within distances approved by the Chief Engineering Officer, no additional valves will be required.

5.10 SIGNS

A. Prominently identify all pipelines at rights-of-way by durable, weatherproof signs located over the centerline of the pipe. Mark pipelines at under-crossings on both sides of track. Signs shall display the following:

1. Name and address of pipeline Owner.
2. Contents of Pipe.
3. Pressure in Pipe.
4. Depth below grade at point of sign.
5. Emergency telephone in event of pipe rupture.
6. Railroad File Number.

B. For pipelines running longitudinally on MBTA Railroad Property, place signs over the pipe (or offset and appropriately mark) at all changes in direction of the pipeline. Locate signs so that when standing at one sign, the next adjacent marker in either direction is visible. In no event shall pipeline identification signs be placed more than 500 feet apart, unless otherwise directed by the Chief Engineering Officer.

C. Submit details of signs (materials, size, methods of support, etc.) to the Chief Engineering Officer for approval.

EXECUTION:

5.11 INSTALLATION:

A. Install carrier pipes in accordance with approved Construction Drawings, requirements of this specification, and all applicable codes and ordinances.

B. Install carrier pipes with sufficient slack so they are not in tension.

SECTION 6. CASING PIPE

GENERAL:

6.01 DESIGN CRITERIA

A. Casing pipe and joints shall be of metal and of leakproof construction.

B. Casing pipe shall be designed for the earth and/or other pressures present, and for railroad live load. The dead load of earth shall be considered 120 pounds per cubic foot. Railroad live load shall be Cooper E-80 with 50% added for impact.

C. The inside diameter of the casing pipe shall be such as to allow the carrier pipe to be removed subsequently without disturbing the casing or the roadbed. For carrier pipe less than six (6) inches in diameter, the inside diameter of the casing pipe shall be at least two (2) inches greater than the largest outside diameter of the carrier pipe joints or couplings. For carrier pipe six (6) inches and over in diameter, the inside diameter of the carrier pipe shall be at least four (4) inches greater than the largest outside diameter of the carrier pipe joints or couplings.

D. For flexible casing pipe, a minimum vertical deflection of 3 percent of its diameter, plus 1/2 inch, shall be provided so that no loads from the roadbed, track, traffic or casing pipe itself are transmitted to the carrier pipe. When insulators are used on the carrier pipe, the inside diameter of the flexible casing pipe shall be at least two (2) inches greater than the outside diameter of the carrier pipe for pipe less than eight (8) inches in diameter; at least 3-1/4 inches greater for pipe 8 to 16 inches in diameter; and at least 4-1/2 inches greater for pipe 18 inches and over in diameter. In no event shall the casing pipe diameter be greater than is necessary to permit the insertion of the carrier pipe.

E. Casing pipe under railroad tracks and across MBTA Railroad Property shall extend the Greater of the following distances, measured at right angles to centerline of track:

1. Across the entire width of MBTA Railroad Property.
2. Two (2) feet beyond ditch line.
3. Three (3) feet beyond toe of slope.
4. A minimum distance of 25 feet each side from centerline of outside track when casing is sealed at both ends.
5. A minimum distance of 45 feet from centerline of outside track when casing is open at both ends.

F. If additional tracks are constructed in the future, the casing shall be extended at the expense of the Applicant.

G. Table of Live Loads

LIVE LOADS, INCLUDING IMPACT, FOR VARIOUS HEIGHTS OF COVER FOR COOPER E- 80

COVER(FT)	LOAD(PSF)	COVER(FT)	LOAD(PSF)	COVER(FT)	LOAD(PSF)
2	3800	10	1100	20	300
5	2400	12	800	30	100
8	1600	15	600		

6.02 PROTECTION AT ENDS OF CASING

A. Casings for carriers of flammable substances shall be sealed to the outside of the carrier pipe. Details of seals shall be shown on the plans.

B. Casings for carriers of non-flammable substances shall have both ends of the casing blocked in such a way as to prevent the entrance of foreign material, but allowing leakage to pass in the event of a carrier break.

C. Where ends of casing are at or above ground surface and above high water level, they may be left open, provided drainage is afforded in such a manner that leakage will be conducted away from railroad tracks and structures.

6.03 VENTS

A. Sealed casings for flammable substances shall be properly vented. Vent pipes shall be of sufficient diameter, but in no case less than two (2) inches in diameter, and shall be attached near each end of the casing and project through the ground surface at right-of-way lines or not less than 45 feet (measured at right angles from centerline of nearest track).

B. Vent pipes shall extend at least four (4) feet above the ground surface. Top of vent pipe shall have a down-turned elbow, properly screened, or a relief valve. Vents in locations subject to high water shall be extended above the maximum elevation of high water and shall be supported and protected in a manner approved by the Chief Engineering Officer.

C. Vent pipes shall be at least four (4) feet from the closest aerial electric wires.

D. When the pipeline is in a public highway, street-type vents shall be installed.

PRODUCTS:

6.04 STEEL PIPE

The minimum yield strength for steel pipe will be 35,000psi. Smooth wall pipes with a nominal diameter greater than 70 inches require special approval by the Chief Engineering Officer. See Plate V, "Table of Minimal Wall Thickness for Steel Casing Pipe."

6.05 CAST IRON PIPE

May be used for a casing, provided the method of installation is by open trench. Cast iron pipe shall conform to ASTM Specification A-142, Extra Heavy. The pipe shall be of the mechanical joint type or plain end type with compression type couplings.

6.06 CORRUGATED METAL PIPE AND CORRUGATED STRUCTURAL PLATE PIPE

May be used for casing only when emplaced by the open-cut method. Jacking or boring through railroad embankment is not permitted. Pipe shall be bituminous coated and shall conform to AREA Specifications Chapter 1, Part 4.

6.07 REINFORCED CONCRETE PIPE

Shall conform to ASTM Specification C-76, Class V, Wall C. It shall be used only in the open cut and jacking methods of installation. If concrete pipe is to be jacked into place, grout holes tapped for at least 1-1/2 inch pipe spaced at approximately 3 feet around the circumference and approximately 4 feet longitudinally shall be cast into the pipe at manufacture. Immediately upon completion of jacking operations, the installation shall be pressure grouted.

6.08 TUNNEL LINER PLATES

6.08 TUNNEL LINER PLATES

Shall be four flange and otherwise conform to American Railway Engineering Association Specifications Chapter 1, Part 4. In no event shall the liner plate thickness be less than 0.1046 inches. Tunnel liner plates are to be used only to maintain a tunneled opening until the carrier pipe is installed. After installation the annular space between the carrier and liner must be filled with 1:6 cement grout or lined with 6 inches of concrete, reinforced with 6x6-6/6 wire mesh for tunnels up to 108 inches in diameter. Required thickness of lining for larger tunnels will be determined by span and structural analysis. Manufacturer's Shop Detail plans and manufacturer's computations showing the ability of the tunnel liner plates to resist the jacking stresses shall be submitted to the Chief Engineering Officer for approval.

EXECUTION:

6.09 DEPTH OF INSTALLATION:

A. Casing pipe under railroad tracks and across MBTA Railroad Property shall be at least 6-1/2 feet from top of rail to top of casing at its closest point. Under secondary or industrial tracks this distance will be at least 5-1/2 feet. On other portions of MBTA Railroad Property where casing is not directly beneath any track, the depth from ground surface or from bottom of ditches to top of casing shall be at least four (4) feet, unless otherwise specified herein.

B. Pipelines laid longitudinally on MBTA Railroad Property 50 feet or less from centerline of track, shall be buried not less than five (5) feet from ground surface to top of pipe. This applies to all pipelines carrying oil, gas, petroleum products, or other flammable or highly volatile substances under pressure, and all non-flammable substances which by their nature or presence in the judgement of the Chief Engineering Officer may be hazardous to life or property. For pipelines carrying water, sewage and non-flammable substances, the distance from surface of ground to top of pipe shall not be less than four (4) feet.

C. Pipelines located within the line of track live load influence (as shown on Plates II and III) are subject to railroad loading and require a casing or are to be of special design approved by the Chief Engineering Officer. All longitudinal occupation locations must be approved by the Chief Engineering Officer.

D. The minimum cover shall be at least three (3) feet when pipeline is laid more

than 50 feet from center line of track.

E. Pipelines installed under or adjacent to any overhead structure must be a minimum of 29 feet from the bottom of the structure to the top of the casing. Such installations must comply with the above requirements.

6.10 METHOD OF INSTALLATION

A. The Owner or its Contractor shall submit to the Chief Engineering Officer, data and information demonstrating that he or his subcontractor has had successful previous experience in jacking, or using the proposed method of installation, in similar situations.

B. Before any work is begun within the limits of jacking, the Owner or its Contractor shall have assembled all tools, materials, and equipment which will be required. When the Owner or its Contractor has started the jacking operation, he will proceed in a continuous operation without stopping. This will minimize the tendency of the material to freeze around the pipe.

C. A jacking shield shall be used and jacked ahead of the casing pipe. The excavation within the jacking pipe should not advance beyond the head of the pipe shield. If the stability at the face needs to be maintained from raveling or running soil, suitable temporary bulkheads, struts, and bracing shall be required. After completion of the sleeve installation the annular space around it shall be completely grouted with cement grout under pressure.

D. Casing pipe ends shall be beveled with a single V-groove for field welding. Pipe joints shall be butt welded and shall be a full penetration on the outside circumference of the pipe. The single V-groove butt weld shall conform to the latest A.W.S. Welding Code. All joints of the casing pipe shall be butt welded, by a certified welder, prior to being subject to the jacking operation.

Alternate method: The casing pipe may be jacked without being butt welded through the use of a continuous 1/2"x12" interior collar plate. The collar plate shall be welded completely upon completion of the jacking operation. All welding shall conform to the latest A.W.S. Welding Code, and shall be performed by a certified welder.

6.11 CONSTRUCTION:

A. The casing pipe shall be constructed so as to prevent leakage of any substance from the casing throughout its length, except where the ends are left open, or

through vent pipes when the ends are sealed. The casing shall be installed so as to prevent the formation of a waterway under the railroad, shall have an even bearing throughout its length, and shall slope to one end (except for longitudinal occupancy).

B. Casing pipes shall be installed by the following methods:

1. Jacking

a. This method shall be in accordance with the most current edition of the American Railway Engineering Association Specifications, "Jacking Culvert Pipe Through Fills." This operation shall be conducted without handmining ahead of the pipe and without the use of any type of boring, auguring, or drilling equipment.

b. Bracing and backstops shall be designed and jacks of sufficient rating used so that the jacking will be continuous.

2. Drilling

This method employs the use of an oil field type rock roller bit or a plate bit made up of individual roller cutter units which is welded to the pipe casing being installed and which is turned as it is advanced. The pipe is turned for its entire length from the drilling machine to the ground being drilled. A high density slurry is injected through a small supply line to the head which acts as a cutter lubricant. This slurry is injected at the rear of the cutter units to prevent any jetting action ahead of the pipe. The drilling machine runs on a set of steel rails and is advanced (thus advancing the pipe) by a set of hydraulic jacks. The method is the same whether earth or rock is being drilled. Any other drilling methods shall be submitted to the Chief Engineering Officer for approval.

3. Tunneling

a. Tunneling operations shall be conducted as approved by the Railroad Company(s). Care shall be exercised in trimming the surface of the excavated section in order that the steel liner plates fit snugly against the undisturbed material. Excavation shall not be advanced ahead of the previously installed liner plates any more than is necessary for the installation of the succeeding liner plate. The vertical face of the excavation shall

be supported as necessary to prevent sloughing. At any interruption of the tunneling operation, the heading shall be completely bulkheaded. Tunneling shall be conducted continuously, on a 24-hour basis until the tunnel liners extend at least one foot beyond the railroad line of influence.

b. When tunneling, tight breasting must be maintained around the entire face. On any shutdowns (under or beyond railroad influence line, see Plate II), the entire face will be fully breasted and packed with hay.

c. The tail void shall be filled with pea stone (or other approved material) simultaneously with each advancement of the shield.

d. An ample supply of hay and/or sandbags must be kept at the site to fill any voids caused by the removal of large stones or other obstructions extending outside the shield.

e. A uniform mixture of 1:6 cement grout shall be placed under pressure behind the liner plates, in addition to the previously placed pea stone. Grout holes, tapped for at least 1-1/2 inch pipe and spaced 3 feet $\pm$ around the tunnel liner, shall be placed in every other ring. Grouting shall start at the lowest hole and proceed upwards. A threaded plug shall be installed in each grout hole as the grouting is completed at that hole.

f. Grouting shall be kept as close to the heading as possible, using grout stops behind the liner plates, if necessary. Grouting shall proceed as directed by the Railroad Company(s), but in no event shall more than six lineal feet of tunnel be progressed beyond the grouting.

4. Tunneling Shields

a. All pipes 70 inches and larger in diameter shall be emplaced with the use of a tunneling shield, unless otherwise approved by the Chief Engineering Officer. Pipes of smaller diameter may also require a shield when, at the sole discretion of the Chief Engineering Officer, soil, or other conditions indicate its need.

b. The shield shall be of steel construction, designed to support railroad track loading as specified in Paragraph 6.01 B herein, in addition to other loadings it must sustain. The advancing face shall be provided with a hood, extending no less than 20

inches beyond the face and extending around no less than the upper 240 degrees of the total circumference. Installations made with linear plates shall be provided with a full 360 degree shield. It shall be of sufficient length to permit the installation of at least one complete ring of liner plates within the shield before it is advanced for the installation of the next ring of liner plates. It shall conform to and not exceed the outside dimensions of the pipe being emplaced by more than one inch at any point in the periphery.

c. The shield must be adequately braced and provided with necessary appurtenances for completely bulkheading the face with horizontal breastboards, and arrange so that the excavation can be benched as may be necessary. Excavation shall not be advanced beyond the edge of the hood, unless otherwise approved by the Railroad Company(s).

d. Manufacturer's Shop Detail plans and computations showing the ability of the tunnel liner plates to resist the jacking stresses shall be submitted to the Chief Engineering Officer for approval.

e. For jacking reinforced concrete pipe, the shield shall be fabricated as a special section of reinforced concrete pipe with the steel cutting edge, hood, breasting attachments, etc., cast into the pipe. The wall thickness and reinforcing shall be designed for the jacking stresses.

f. Grout holes tapped for no less than 1-1/2 inch pipe, spaced at approximately 3 foot centers around the circumference of the shield (or the aforementioned special reinforced concrete section) and no more than 4 foot centers longitudinally shall be provided.

g. Detail plans sufficient to determine the adequacy of the shield, accompanied with design calculations prepared by a Registered Professional Engineer, shall be submitted to the Chief Engineering Officer for approval and no work shall proceed until such approval is obtained.

5. Boring

a. This method consists of pushing the pipe into the fill with a boring auger rotating within the pipe to remove the spoil. When augers, or similar devices, are used for pipe emplacement, the front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger and cutting head from leading the pipe so that there will be no unsupported excavation ahead of the pipe. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than one-half inch. The face of the cutting head shall be arranged to provide reasonable obstruction to the free flow of soft or poor material.

b. Plans and descriptions of the auger stop arrangement to be used shall be submitted to the Chief Engineering Officer for approval, and no work shall proceed until such approval is obtained and the arrangement is inspected in the field by the Railroad Company(s).

c. The use of water or other liquids to facilitate casing emplacement and/or spoil removal is prohibited.

d. Any method which employs simultaneous boring and jacking or drilling and jacking for pipes over 8 inches in diameter which does not have the above approved arrangement WILL NOT BE PERMITTED. For pipes 8 inches and less in diameter, auguring or boring without this arrangement may be considered for use only as approved by the Chief Engineering Officer.

C. If an obstruction is encountered during the installation which stops the forward action of the pipe, and it becomes evident that it is impossible to advance the pipe, operations will cease and the pipe shall be abandoned in place and filled completely with grout, in accordance with Section 4, Paragraph 4.10.

D. Bored or jacked installations shall have a bored hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe (plus coating) by more than 1 inch, grouting or other methods approved by the Railroad Company(s) shall be employed to fill such voids.

E. Pressure grouting or freezing of the soils before or during jacking, boring, or tunneling may be required at the direction of the Railroad Company(s) to stabilize the soils, control water, prevent loss of material and prevent settlement or displacement of the embankment and/or tracks. Grout shall be cement, chemical or other special injection material selected to accomplish the necessary stabilization.

F. The materials to be used and the method of injection shall be prepared by a Registered Professional Engineer (Geotechnical), or by an experienced and qualified company specializing in this work and submitted for approval to the Railroad Company(s) before the start of work. Proof of experience and competency shall accompany the submission.

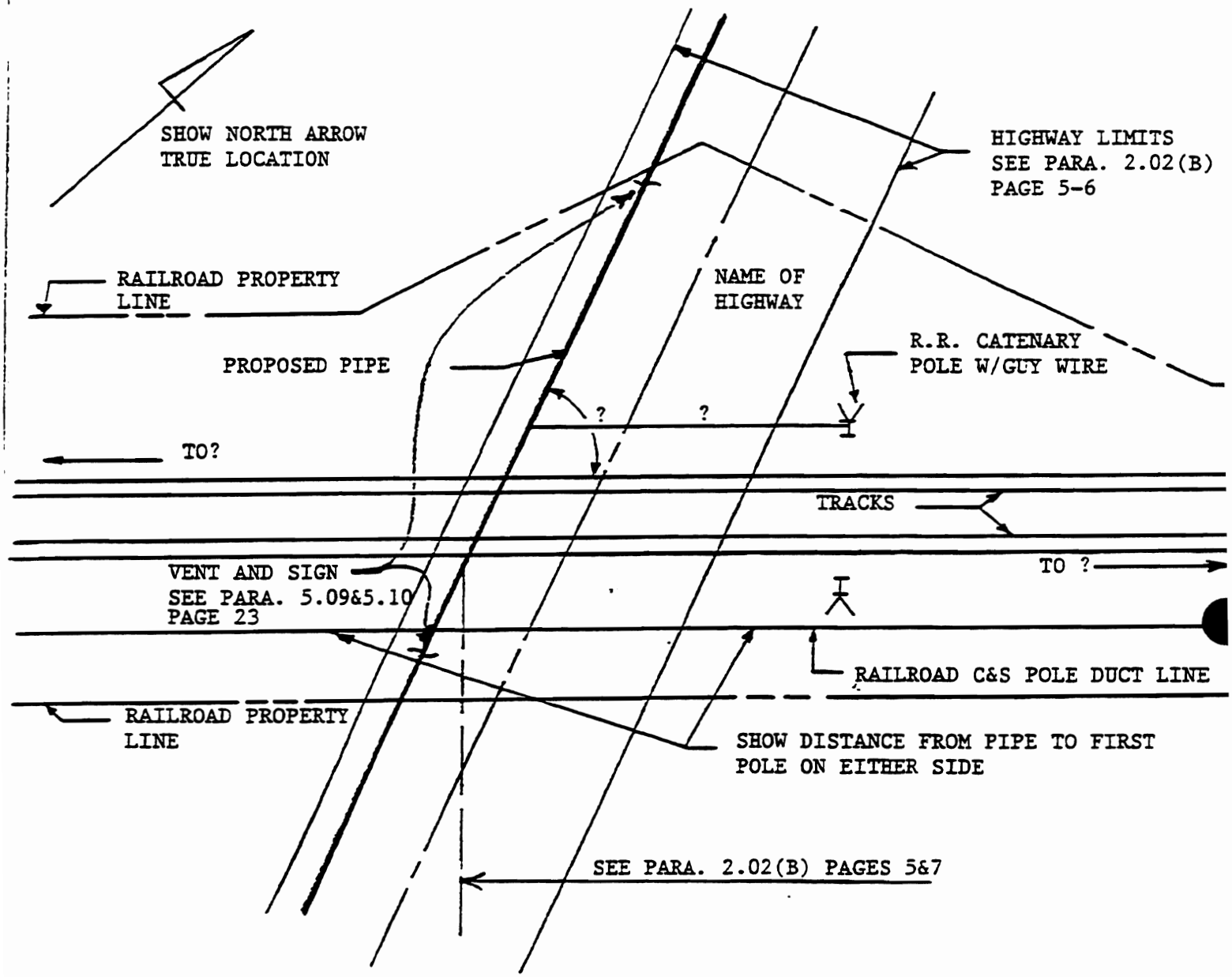
G. When water is expected to be encountered, pumps of sufficient capacity shall be provided and maintained at the site, and continually attended on a 24-hour basis, until in the sole judgement of the Railroad Company(s), their operation can be safely halted. When dewatering, close observation shall be maintained to detect any settlement or displacement of railroad embankment, tracks, and facilities.

H. Proposed methods of dewatering must be submitted to the Railroad Company(s) for approval prior to implementation. The discharge from the dewatering operations in the vicinity of the railroad shall be carefully monitored. If in the opinion of the Railroad Company(s), there is an excessive loss of fine soil particles at any time during the dewatering process, the dewatering will be halted immediately. The dewatering operation cannot resume until the unsatisfactory condition is remedied to the satisfaction of the Railroad Company(s).

PLATE I

PIPE CROSSING

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWING



(SCALE OF DRAWING TO BE SHOWN)

NOTE:

IF MANHOLES ARE PLACED ON MBTA RAILROAD PROPERTY, DETAILS OF SAME, WITH CLEARANCES TO THE CENTERLINE OF THE NEAREST TRACK ARE TO BE SHOWN ON THE DRAWINGS.

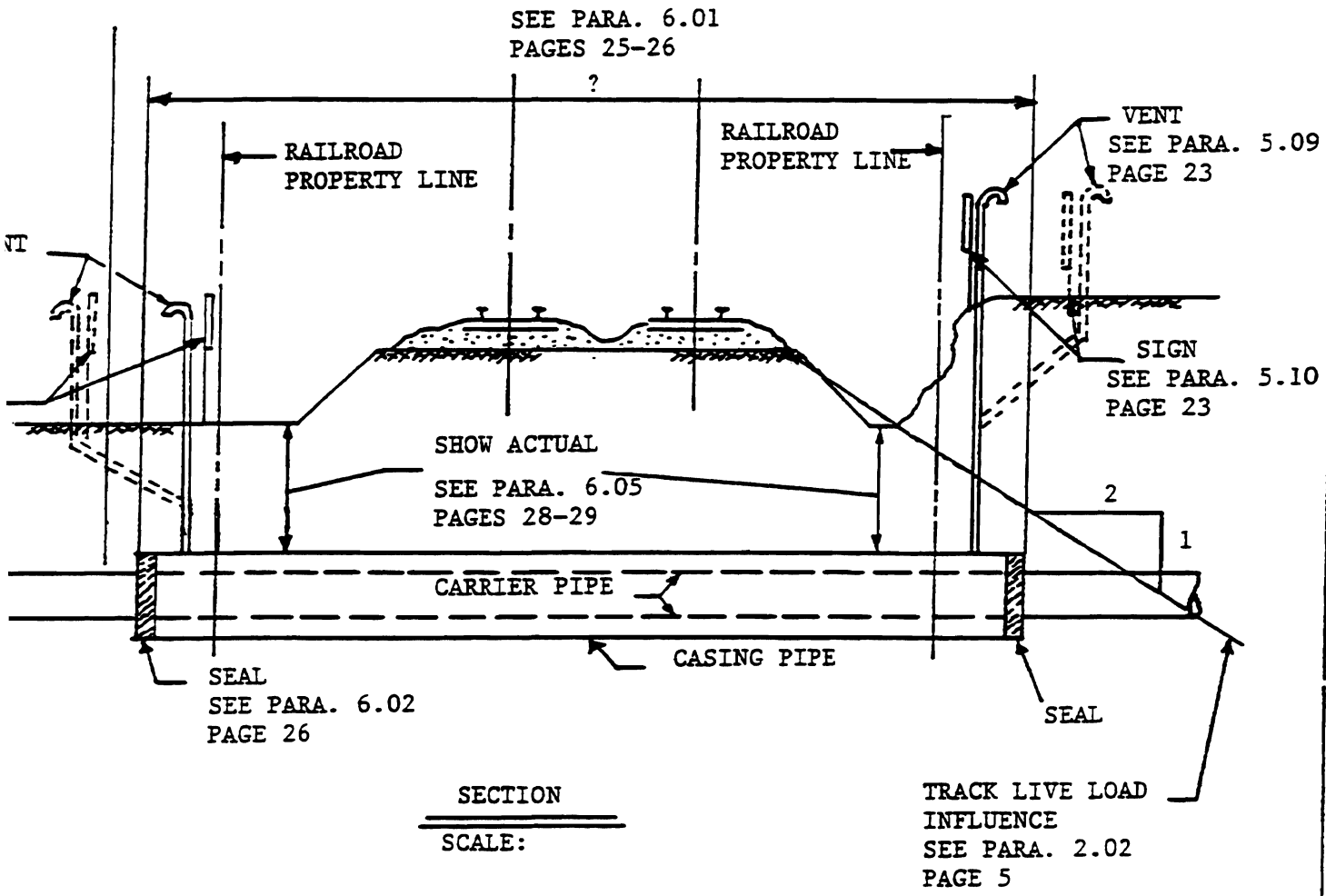
IF THE PROPOSED PIPE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SENT WITH THE REQUEST.

IF THE PROPOSED PIPE IS NOT WHOLLY WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.

PLATE II

PIPE CROSSING

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWING

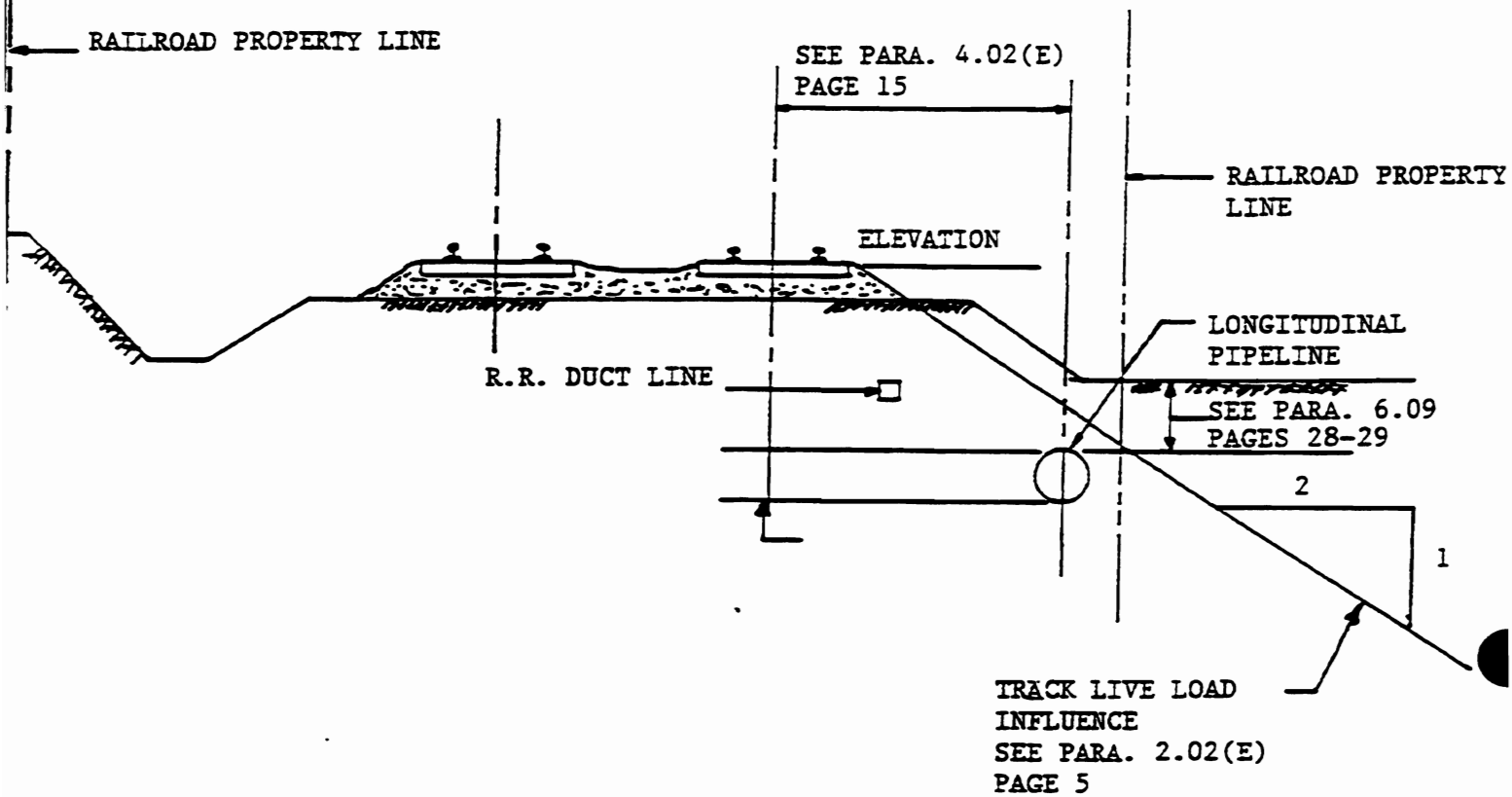


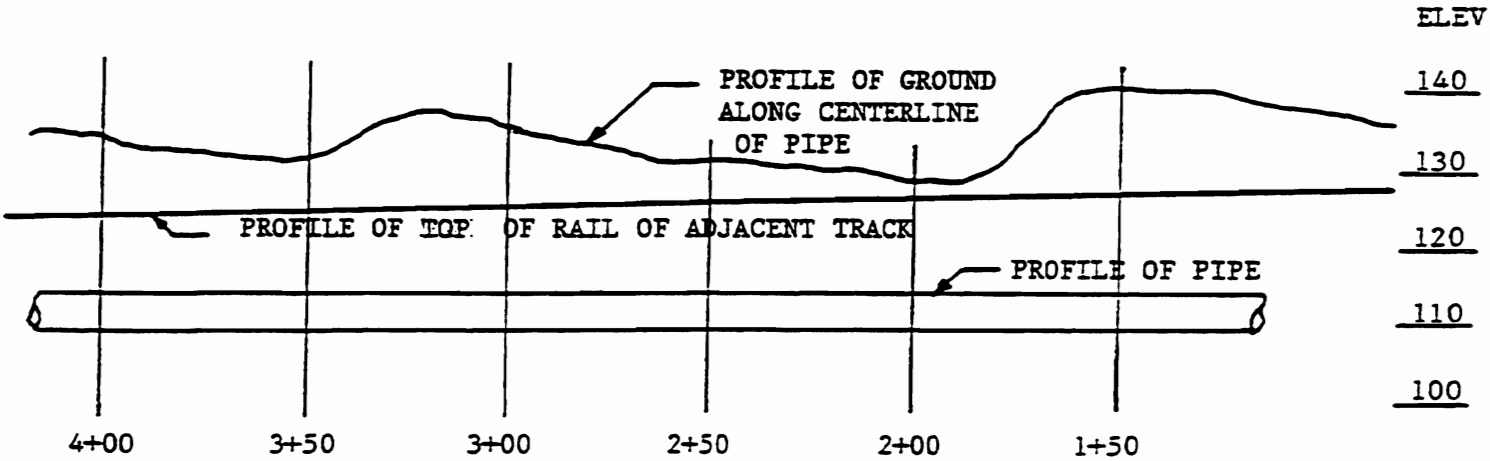
SECTION

SCALE:

PLATE III

LONGITUDINAL OCCUPANCY





STATIONING

PROFILE - SEE PARA. 2.02
PAGES 5-7

SCALE - HOR:
VER:

PLATE IV

PIPE CROSSING DATA SHEET

In addition to plan and profile of crossing, drawings submitted for the Railroad Company(s) approval shall contain the following information:

	Pipe Date	
	Carrier Pipe	Casing Pipe
Contents To Be Handled	_____	_____
Normal Operating Pressure	_____	_____
Normal Size of Pipe	_____	_____
O.S. Diameter	_____	_____
I.S. Diameter	_____	_____
Wall Thickness	_____	_____
Weight Per Foot	_____	_____
Material	_____	_____
Process of Manufacture	_____	_____
Specification	_____	_____
Grade or Class	_____	_____
Test Pressure	_____	_____
Type of Joint	_____	_____
Type of Coating	_____	_____
Details of Cathodic Protection	_____	_____
Details of Seal or Protection at Ends of Casing	_____	_____
Method of Installation	_____	_____
Character of Subsurface Material At the Crossing Location	_____	_____
Approximate Ground Water Level	_____	_____
Source of Information on Sub-surface conditions (Test Pits, Borings or Other)	_____	_____

NOTE: Any soil investigation made on MBTA Railroad Property or adjacent to tracks shall be carried on under the supervision of the Railroad Company(s).

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE
(FOR INFORMATION ONLY)

PROTECTED WALL THICKNESS

PIPE SIZE (INCHES)	WALL THICKNESS (PROTECTED)
10	0.375
12	0.375
14	0.375
16	0.375
18	0.375
20	0.375
22	0.375
24	0.375
26	0.375
28	0.406
30	0.469
32	0.501
34	0.532
36	0.532
38	0.569
40	0.569
42	0.569
44	0.594
46	0.688
48	0.688
50	0.688
52	0.813
54	0.813
56	0.876
58	0.876
60	0.876
62	0.876
64	0.876
66	0.876
68	0.876
70	0.906

NOTE: FOR UNPROTECTED PIPE 26" AND UNDER ADD 0.032" TO PROTECTED WALL THICKNESS. FOR UNPROTECTED PIPE 28" AND OVER ADD 0.063" TO PROTECTED WALL THICKNESS.

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V

SPECIFICATIONS FOR WIRE, CONDUIT AND CABLE OCCUPATIONS

MAY 1994

SECTION 1. SCOPE

1.01 These specifications apply to the design of electric transmission wires and cables (power and communication) which are to be located over, under, across or upon property, facilities, and tracks owned by the MBTA.

SECTION 2. LICENSE TO ENTER MBTA RAILROAD PROPERTY

2.01 Individuals, corporations, or municipalities desiring wire or cable occupations must agree, upon approval of the construction details by the Chief Engineering Officer, to execute an appropriate occupational agreement and pay any required fees and/or rentals outlined therein.

2.02 Application for an occupancy shall be submitted in writing to:

Director of Real Estate
MBTA, 10 Park Plaza
Boston, Massachusetts 02116

See "Guidelines and Procedures for Construction on MBTA Railroad Property."

2.03 All applications shall be accompanied with six (6) copies of all construction plans, specifications and computations concerning the proposed occupancy.

SECTION 3. APPROVAL OF PLANS

3.01 Entry upon MBTA Railroad Property for the purpose of conducting surveys, field inspections, obtaining soil information, or any other purpose associated with the design and engineering of the proposed occupancy, will be permitted only with a proper entry permit prepared by the MBTA Real Estate Department. The issuance of such a permit does not constitute authority to proceed with the actual construction. Construction cannot begin until the proper insurance certificate is received and a formal agreement is executed by the MBTA and permission is received by the Railroad Company(s).

3.02 Plans shall be drawn to scale and show the following: (See attached plates I - VI).

A. Plan view of crossing or occupation in relation to all Railroad Company(s) facilities. (See Plate I)

B. Location of wire or cable (in feet) from nearest railroad mile post,

center line of a railroad bridge (giving bridge number), or center line of a passenger station. In all cases, the name of the County and City or Town in which the proposed facilities are located must be shown.

C. Profile of ground on center line of pole or tower line, showing clearances between top of rail and bottom of sag, as well as clearances from bottom wire or cable to top wire or cable of the MBTA's transmission, signal and communication lines and catenary. If none of these facilities are in existence at the point of crossing, the plan should so indicate. Actual under-clearances are to be shown. (See Plate V for the required clearances).

D. Show all known property lines. If wires, cables or conduits are within public highway limits, such limits should be clearly indicated with dimensions from center line.

E. The plan must be specific as to:

1. Base diameter, height, class and bury of poles. Poles shall be set no closer than 13'6" from face of pole to center line of nearest track. When necessary, however, each location will be analyzed to consider speed, traffic, access, etc.

2. Number, size and material of power wires, as well as number of pairs in communication cables.

3. Nominal voltage of line, type of current and frequency.

4. Number, location, size and material of anchors and all guying for poles and arms.

NOTE: Double cross-arms are required on poles adjacent to track. Any tower designs must be accompanied by engineering computations and data.

SECTION 4. CONSTRUCTION REQUIREMENTS

4.01 Power and communication lines shall be constructed in accordance with "Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines, National Electrical Safety Code Handbook, Part 2" (current issue), with the following exceptions:

A. Item 3 (c), page 2.

B. Casing pipes to contain power or communication wires or cables having an outside diameter of over four (4) inches shall be constructed in accordance with the current issue of MBTA Railroad Operations "Pipeline Occupancy Specifications".

SECTION 5. LONGITUDINAL OCCUPATIONS

5.01 Wires and cables running longitudinally along railroad right-of-way shall be constructed as close to MBTA property lines as possible in accordance with Plate III. For electrical power lines and cables with voltages of 34,500 or over and communication cables containing over 180 pairs, the following information must be submitted in addition to the detail of the pole top configuration as called for on Plate IV of these specifications:

A. Voltage of circuit(s) or number of pairs.
B. Phase of electrical circuit(s).
C. Number of electrical circuits.
D. Size (AWG or CM) and material of wires and cables.

5.02 Any facilities overhanging MBTA Railroad Property must have approval of the MBTA and appropriate rental charges will be applied.

SECTION 6. INDUCTIVE INTERFERENCE

6.01 On agreements covering longitudinal occupations, provisions will be included that the applicant will provide appropriate remedies, at his own expense, to correct any inductive interference with MBTA facilities.

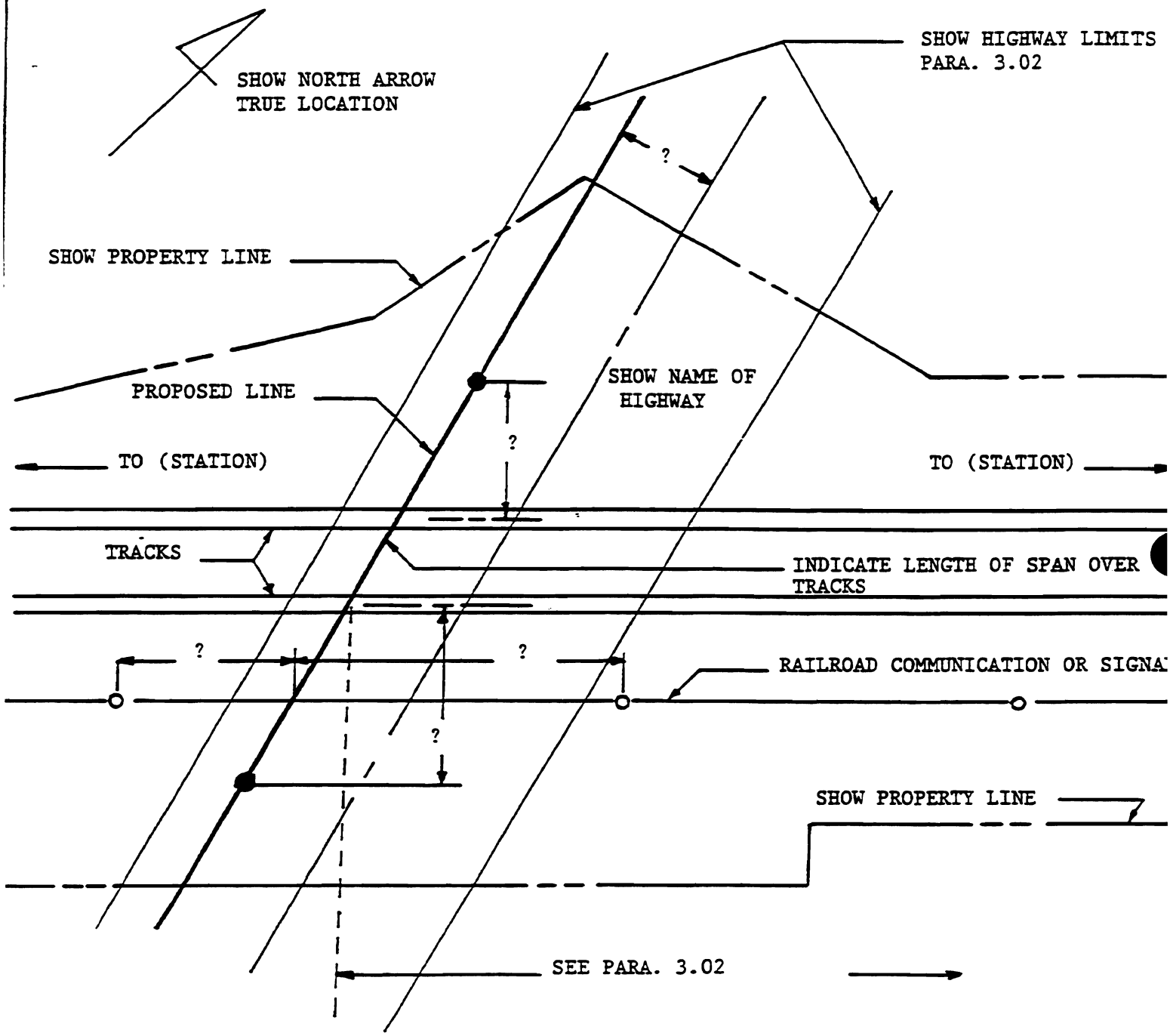
VOLTAGE	OVERHEAD CLEARANCE (Top of Rail to Bottom of Sag)	
0 - 750	27'0"	
750 - 15,000	28'0"	
15,000 - 50,000	30'0"	
69,000	30'8"	At 120°
115,000	32'2"	Ambient
138,000	33'0"	Temperature
345,000	39'10"	
500,000	45'0"	
745,000	53'2"	
765,000	53'10"	
Other than power lines	27'0"	

(Calculation is 30'0" + 0.4" per 1,000 volts over 50,000 volts)

PLATE I

PLAN VIEW

INFORMATION TO BE SHOWN ON PLAN SECTION OF DRAWINGS
WHEN FACILITY IS A CROSSING



SCALE OF DRAWING TO BE SHOWN

NOTE:

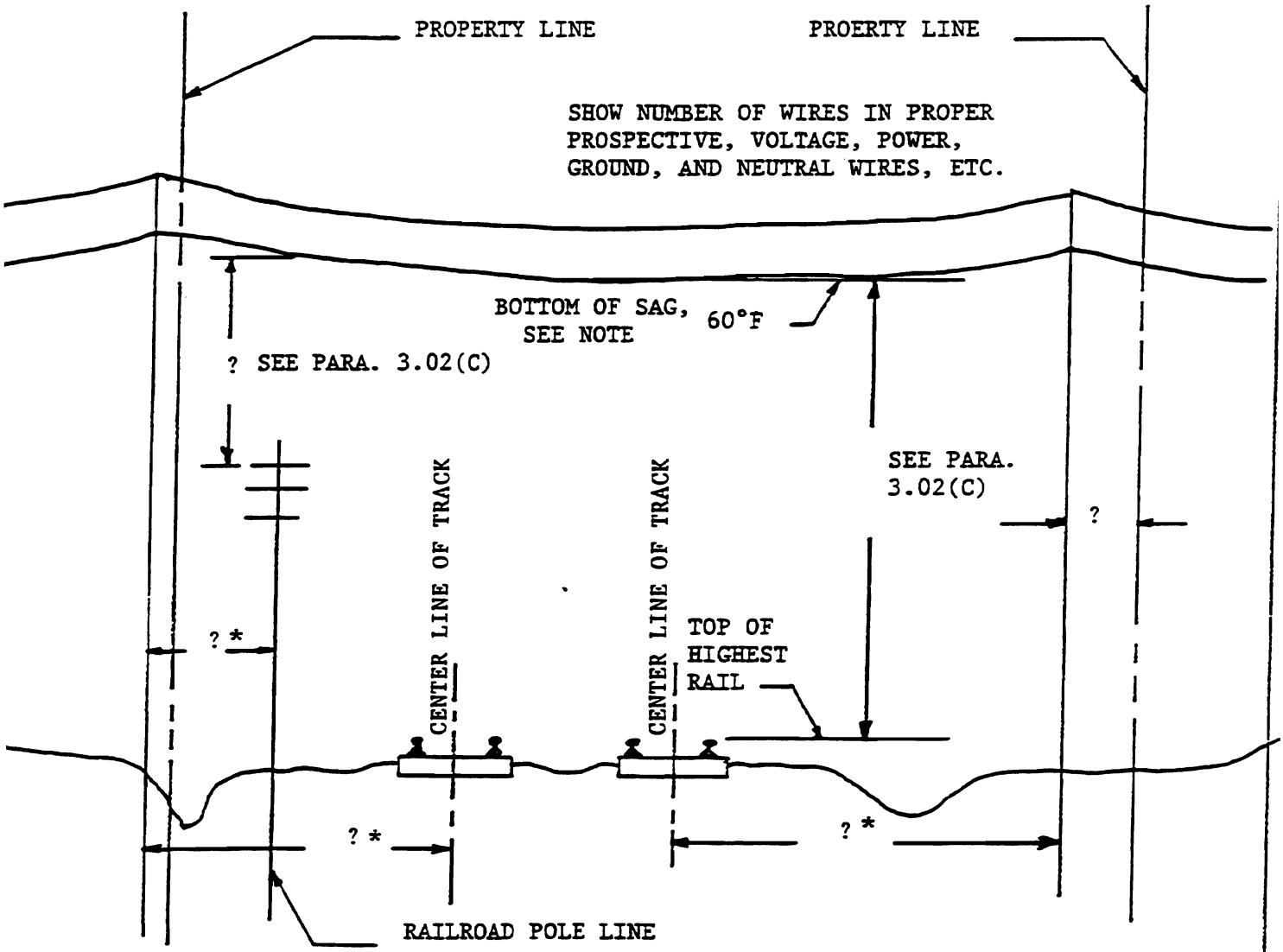
IF THE PROPOSED LINE IS TO SERVE A NEW DEVELOPMENT, A MAP SHOWING THE AREA IN RELATION TO ESTABLISHED AREAS AND ROADS IS TO BE SENT WITH THE REQUEST.

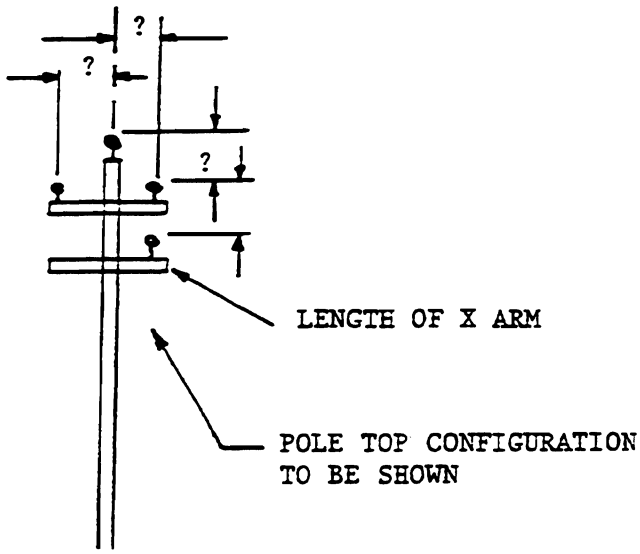
IF THE PROPOSED LINE IS NOT WHOLLY (OR PARTIALLY) WITHIN HIGHWAY LIMITS, THE SAME INFORMATION IS REQUIRED AS SHOWN ON THIS PLATE.

PLATE II

PROFILE VIEW

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS - IN CASES OF CROSSINGS





*AS MEASURED AT RIGHT ANGLES TO TRACK

SECTION LOOKING _____ (DIRECTION)

SCALE: H _____

V _____

NOTE:

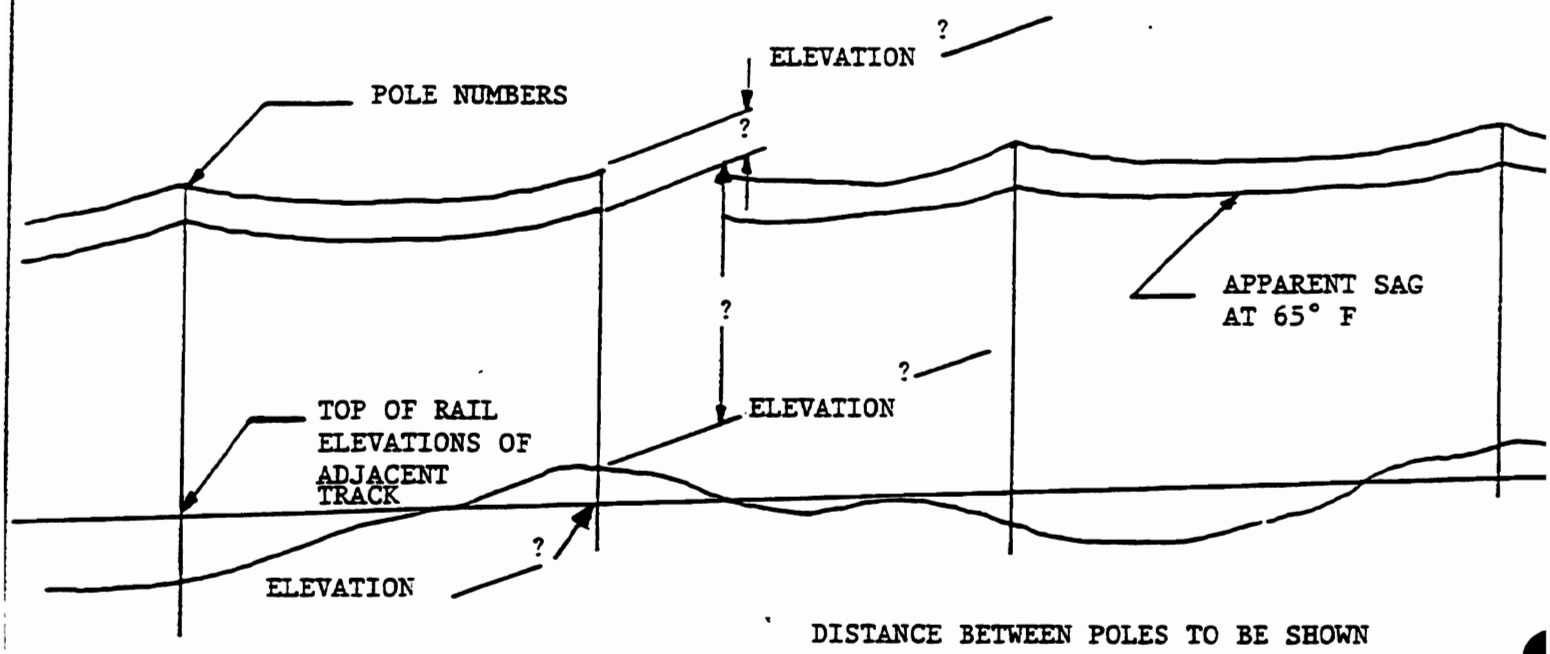
ALL TRANSMISSION, SIGNAL, COMMUNICATION LINES, AND THIRD RAIL SHOULD BE INDICATED AND PROPER CLEARANCES SHOWN.

SHOW MAXIMUM SAG INCREASE OF POWER WIRES OVER TRACKS IF SPAN EXCEEDS 175 FEET IN LENGTH.

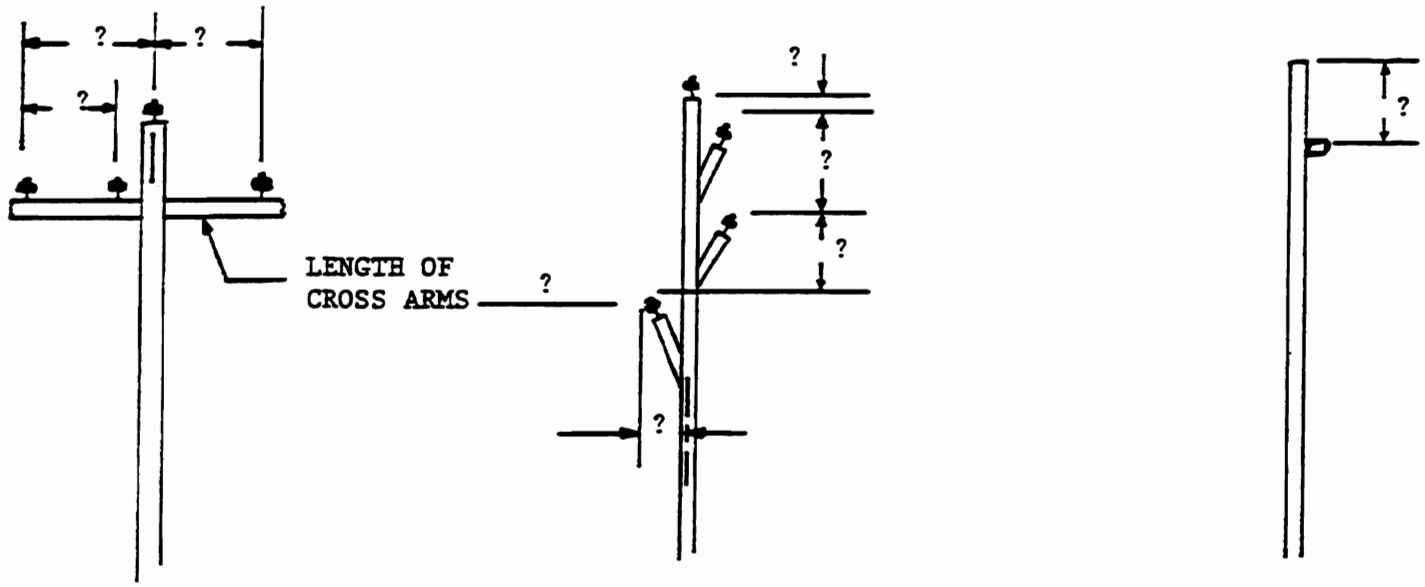
PLATE III

PROFILE VIEW

INFORMATION TO BE SHOWN ON PROFILE SECTION OF DRAWINGS
IN CASES OF LONGITUDINAL OCCUPATIONS



DISTANCE BETWEEN POLES TO BE SHOWN



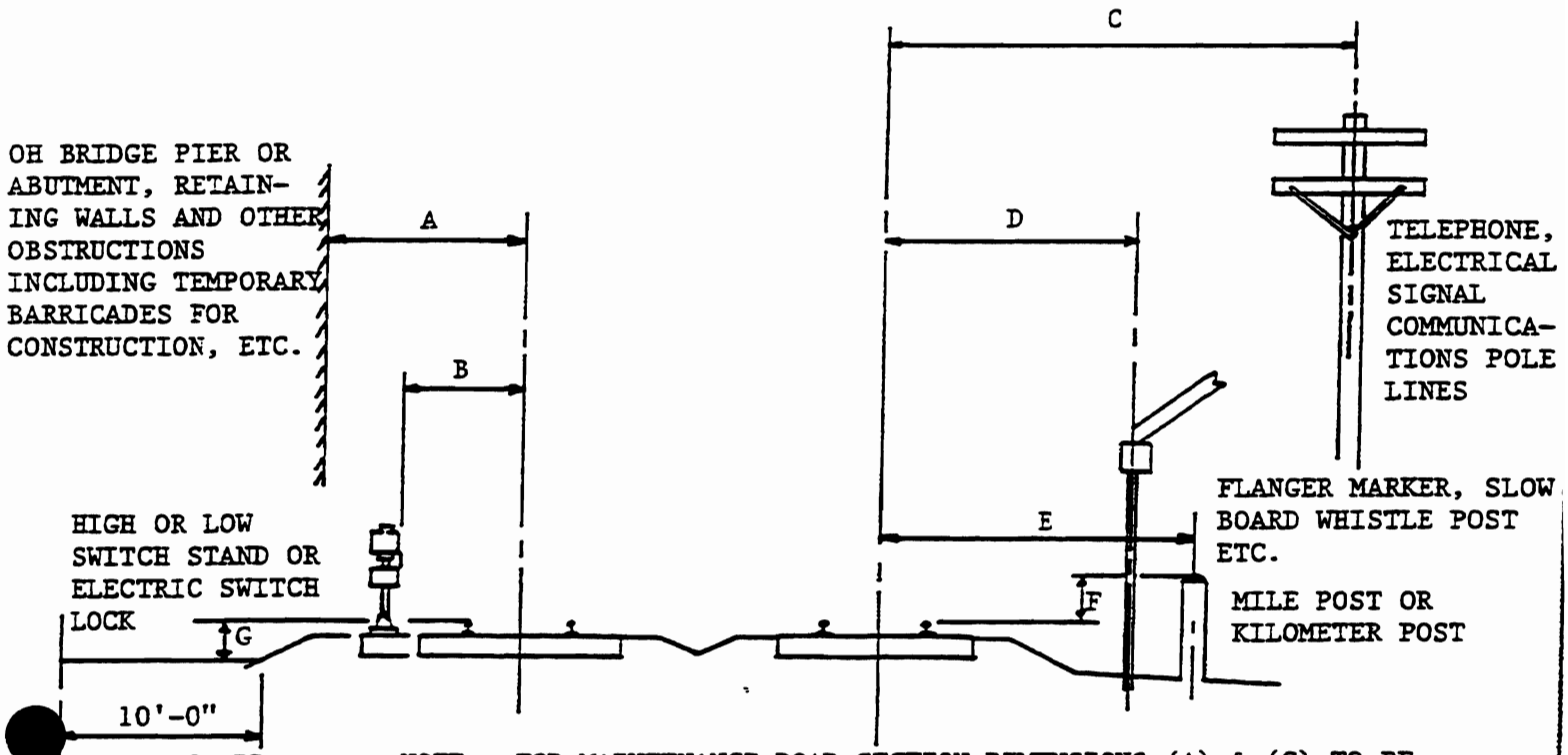
POLE TOP CONFIGURATION TO BE SHOWN SIMILAR TO SAMPLES ABOVE

NOTE: IF POWER LINE CROSSES ANY TRACK, THEN INFORMATION SHOWN ON PLATE II IS ALSO REQUIRED.

PLATE IV

STANDARD SIDE CLEARANCES - TANGENT TRACK

(FOR OBSTRUCTIONS OTHER THAN PASSENGER STATIONS)



NOTE: FOR MAINTENANCE ROAD SECTION DIMENSIONS (A) & (C) TO BE INCREASED ACCORDINGLY - DIMENSIONS (D) & (E) MAY BE REDUCED TO 8'-6" CLEARANCE.

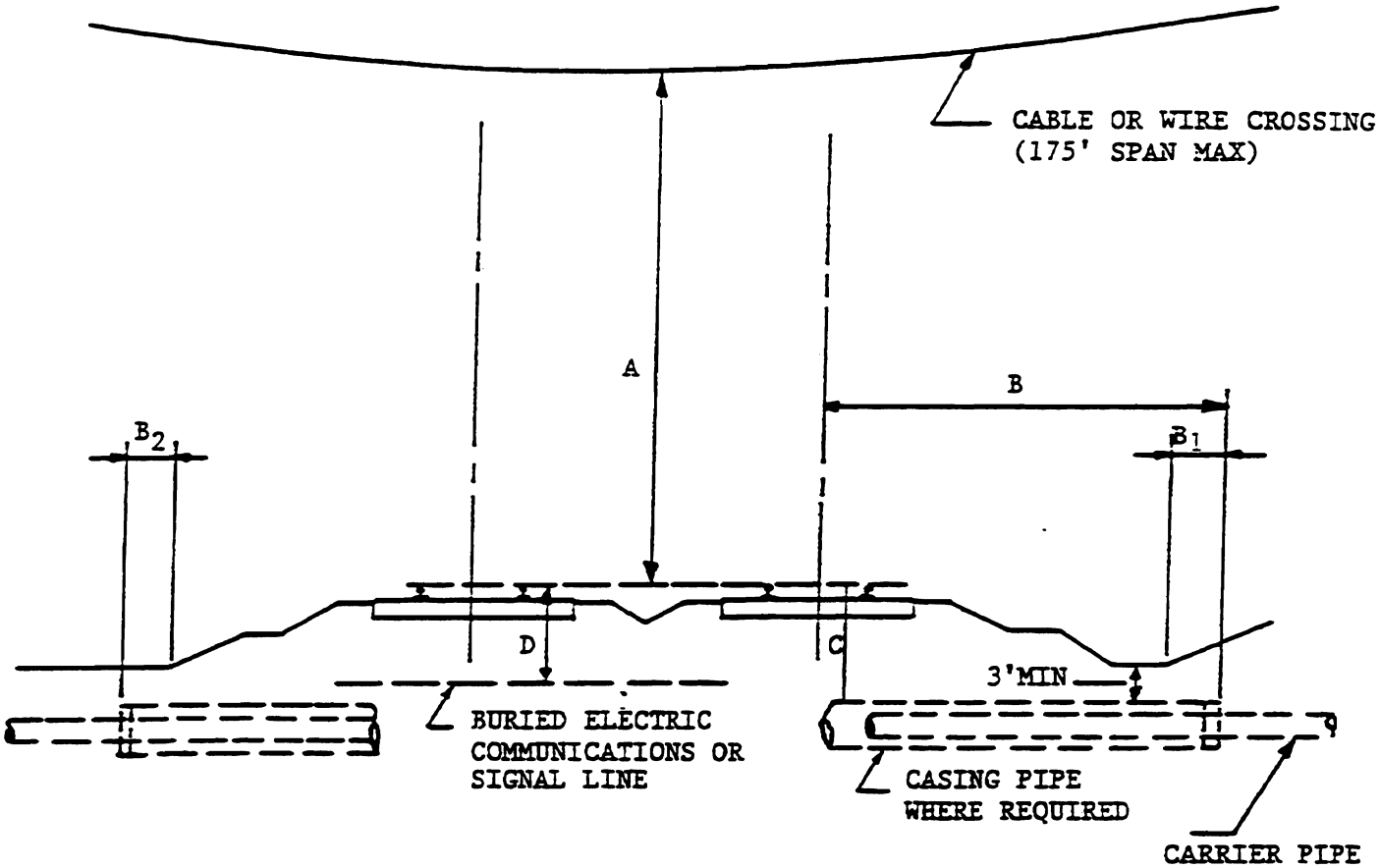
DIMENSION	DESCRIPTION	
A	GENERAL MINIMUM SIDE CLEARANCE	8'-6"
	OVERHEAD BRIDGE PIERS & ABUTMENT, RETAINING WALLS & OTHER EXISTING STRUCTURES	8'-6"
B	LOW SWITCH STANDS (3'-0" MAX HEIGHT)	6'-6"
	HIGH SWITCH STANDS (OVER 3'-0" HEIGHT)	9'-0"
	ELECTRIC SWITCH LOCKS	6'-6"
C	POLE LINES - TELEPHONE, ELECTRIC, SIGNAL COMMUNICATIONS (MIN)	13'-6"
D	CENTERLINE WHISTLE POSTS, FLANGER MARKERS, SLOW OR SPEED BOARDS AND OTHRE WAYSIDE SIGNS	12'-0"
	AUTOMATIC HIGHWAY CROSSING PROTECTION (MIN)	8'-6"
	AUTOMATIC HIGHWAY CROSSING PROTECTION (DESIRED)	15'-0"
E	MILE POSTS - HORIZONTAL	13'-6"
F	MILE POSTS - VERTICAL	7'-0"
G	DEPRESSION OF MAINTENANCE ROAD	

VOLTAGE	OVERHEAD CLEARANCE (Top of Rail to Bottom of Sag)	
0 - 750	27'0"	At 120°F Ambient Temperature
750 - 15,000	28'0"	
15,000 - 50,000	30'0"	
69,000	30'8"	
115,000	32'2"	
138,000	33'0"	
345,000	39'10"	
500,000	45'0"	
745,000	53'2"	
765,000	53'10"	
Other than power lines	27'0"	

(Calculation is 30'0" + 0.4" per 1,000 volts over 50,000 volts)

CLEARANCES FOR OVERHEAD AND BURIED UTILITY CROSSINGS

PLATE VI



DIMENSION	DESCRIPTION		
A	POWER LINES 0 TO 750V	27'-0"	At 120°F Ambient Temperature
	POWER LINES 750V to 15,000V	28'-0"	
	POWER LINES 15 to 50KV	30'-0"	
	OTHER THAN POWER LINES	27'-0"	
B	SEALED ENDED CASINGS	25'-0"	
	OPEN ENDED CASINGS	45'-0"	
B_1	END CASING DEYOND DITCH	2'-0"	
B_2	END CASING BEYOND SLOPE	3'-0"	
C	CASING PIPE	4'-6"	
	CARRIER PIPE WITHOUT CASING	6'-6"	
D	BURIED ELECTRIC LINES	6'-6"	
	RAILROAD SIGNAL LINES (220V)	2'-6"	
	COMMUNICATIONS LINES	3'-6"	

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VI

BRIDGE ERECTION, DEMOLITION AND HOISTING OPERATIONS

MAY 1994

A00898 - 276

Submittals for bridge erection, demolition, or other hoisting operations shall be prepared and stamped by a Registered Professional Engineer and must include the following:

1. Plan view showing locations of crane or cranes, operating radii, with delivery or disposal locations shown.

2. Crane rating sheets showing cranes to be adequate for 150% of the lift. Crane and boom nomenclature is to be indicated.

3. Plans and computations showing weight of picks.

4. Location plan showing obstructions, indicating that the proposed swing is possible.

5. Data sheet listing type and size of slings or other connecting equipment. Include copies of catalog cuts or information sheets of specialized equipment. The method of attachment must be detailed on the erection plan. All lifting components must be adequate for 150% of the lift.

6. A complete procedure indicating the order of lifts and any repositioning or rehitching of the crane or cranes.

7. Plans detailing temporary support of any components or intermediate stages.

8. A time schedule (by hour and day) of the various stages, as well as a schedule for the entire lifting procedure.

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VII

TEMPORARY SHEETING AND SHORING

MAY 199

A00898 - 278

The following items are to be included in the design and construction procedures for all permanent and temporary facilities on, over, under, within or adjacent to MBTA Railroad Property:

1. Footings for all piers, columns, walls or other facilities shall be located and designed so that any temporary sheeting and shoring for support of adjacent track or tracks during construction will not be closer than toe of ballast slope. (See dimensions in the MBTA's Book of Standard Plans, #1000 and #1002 for tangent and curved track). Sheeting will be required when excavation is inside of a line which extends horizontally from 5.5 feet off center line of adjacent track, then on a 2 (horizontal) to 1 (vertical) slope. This is known as the zone of influence.

2. Where physical condition of design impose insurmountable restrictions requiring the placing of sheeting closer than specified above, the matter must be submitted to the Chief Engineering Officer for approval of any modifications.

3. When support of track or tracks is necessary during construction of above mentioned facilities, interlocking steel sheeting adequately braced and designed to carry E-80 live load plus 50% impact is required. Soldier piles and lagging will be permitted for supporting adjacent track or tracks <u>only</u> when required penetration of steel sheet piling cannot be obtained or when in the opinion of the Chief Engineering Officer, or his authorized representative, steel sheet piling would be impracticable to place.

4. Exploratory trenches, three (3) feet deep and fifteen (15) inches wide in the form of an "H" with outside dimensions matching the outside of sheeting dimensions are to be hand dug, prior to placing and driving steel sheeting, in areas where railroad underground installations are known to exist. These trenches are for exploratory purposes only and are to be backfilled and compacted immediately. This work must be done in the presence of a railroad inspector.

5. Absolute use of track is required while driving sheeting adjacent to any track. Procedure for arranging the use of track shall be through the Railroad Company(s) representative on the project.

6. Cavities adjacent to sheet piling, created by driving of sheet piling, shall be filled with sand and any disturbed ballast must be restored and tamped immediately as required by the Railroad Company(s).

7. Sheet piling shall be cut off at top of tie during construction. After construction and backfilling has been completed, the piling within twelve (12) feet from centerline of track will be cut off 24" below bottom of tie or 24" below finished grade, whichever is greater. Sheeting, used as a form on a permanent structure, will be cut as directed by the Railroad Company(s).

8. The excavation adjacent to the track shall be covered and protected by handrails and barricades, warning lights shall be provided by the Contractor as directed by the Railroad Company(s).

9. Graded backfill material shall be compacted at near optimum moisture content, in layers not exceeding 6 inches in compacted thickness, by pneumatic tampers, vibrator compactors, or other approved means to the base of the railroad subgrade. Material in the vicinity of sheet pile shall be compacted to not less than 95 percent of AASHTO T 99, Method C. The Contractor will be required to supply, to the job site, ballast stone as prescribed herein to be installed by the Railroad Company(s).

10. The Contractor is to advise the Railroad Company(s) of the time schedule of each operation and obtain approval of the Railroad Company(s) for all work to be performed adjacent to MBTA tracks so that it may be properly supervised by railroad personnel.

11. All drawings for temporary sheeting and shoring shall be prepared and stamped by a Registered Professional Engineer and shall be accompanied by complete design computations when submitted for approval.

12. Particular care shall be taken to avoid erosion or filling of the Railroad Company(s) drainage facilities. Erosion and sediment control in the vicinity of the railroad shall be as approved by the Chief Engineering Officer. Correction of disrupted Railroad Company(s) drainage facilities shall be at the Contractor's sole expense.

MBTA REQUIREMENTS FOR GEOTECH MONITORING

THE FOLLOWING SPECIFICATIONS ARE REQUIRED FOR ALL PILE DRIVING/EXCAVATING OPERATIONS:

1. Pile driving will be on a continuous basis for each pile driven. Once a pile is started it will be driven to or cut off at an elevation not to exceed the plane across the top of the rails of any track within 8'-6" plus 2" for each degree of curvature from centerline of track to the closest edge of the pile or excavation.

2. The monitoring points will be set up one week before the pile driving or excavation operations begin. The MBTA and the Railroad Company(s) shall be notified. Elevation readings to establish the initial baseline reading shall begin two days prior to the start of driving. Readings shall be for a minimum of two weeks after the completion of the driving or backfilling of the excavation, whichever is longer. Initial readings immediately after any surfacing operations shall serve as new baseline figures. All future elevation readings shall be compared to the adjusted baseline. If the track deviates to a condition not acceptable to the MBTA or Railroad Company(s), corrections will be made at the proponent's expense.

3. Elevation readings will be taken from the top of each rail of each track within the "zone of influence" of the excavation. See Section 1, Page 1 of this specification.

4. Elevation readings will be taken once per eight hour shift. The readings will be faxed to the MBTA and Railroad Company(s) on a daily basis and all information is to be presented in legible print. During excavation within the sheet pile protected area, the top of rail elevations shall be checked every four hours. Additional readings may be required by the MBTA or Railroad Company(s)

Stations shall be spaced at 15-1/2 foot intervals. The number of stations required will be determined by the length of the excavation parallel to the tracks. There will be four additional stations on each end of the pile driving/excavation operation along the track. Extra stations may be required by the MBTA or Railroad Company(s).

Elevation readings must show the date, time, weather conditions and temperature. Each reading must also provide the following information: track number, compass direction, station number, base elevation (with date), static elevation, change in elevation (recorded in hundredths and in inches), dynamic reading and total deflection in inches. See sample sheet attached.

Station "0" will be located at the centerline of the project with Stations 1, 2, 3, etc., being to the right and Stations -1, -2, -3, etc., being to the left when standing on the near track and looking at the work. In multiple track areas the stations as determined herein are to be carried across each track located within any part of the zone of influence. See Plate I.

At each monitoring station a dynamic load measurement will also be taken. The dynamic load measurement device will consist of a wooden stake placed firmly in the ballast and initially in contact with the bottom of rail. The loaded measurement is the resultant gap between the bottom of the rail and the

top of the stake caused by the deflection of the rail under the load of a passing train. Based on fi observations of the excavation, and at the option of the MBTA or railroad company(s), this requirem may be reduced.

9. Elevation readings taken from the top of rail for static measurement and the dynamic reading shall b combined and the sum compared to the adjusted baseline. This reading will demonstrate the differen in elevation caused by the excavation.

10. The MBTA requires that the track be maintained at all times within established criteria for the speci track classification. At the completion of the project the requirement for tamping and realigning t tracks, caused by the settlement from the construction activity, remains with the proponent for t duration as specified by the MBTA in their initial review of the work plans. This tamping and tra realignment
will be performed by the MBTA or railroad company(s) at the sole expense of the proponent.

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VIII

BLASTING SPECIFICATIONS

MAY 1994

A00898 - 283

Blasting on, over, under, within or adjacent to MBTA Railroad Property will be permitted only in special cases where it is demonstrated to the MBTA's Chief Engineering Officer that there is no practicable alternative to perform the work.

In such cases when blasting is permitted, the Contractor must submit a detailed blasting program to the MBTA and Railroad Company(s) for approval prior to the commencement of any work. The blasting program must contain the following information:

a. Site plan with location of nearest MBTA structure.
b. Plan of each blast showing hole spacing and delay pattern.
c. Diameter and depth of each hole.
d. Amount of explosives per hole.
e. Total pounds of explosives per day.
f. Total amount of explosives per blast.
g. Type of non-electric delays to be used.
h. Amount of stemming in each hole.
i. Type of explosive to be used.
j. Soil and rock profile in blast zone.
k. Scaled distance to the nearest MBTA facility.
l. Type and location of seismograph to be used.
m. Size of blasting mats to be used.
n. Safety precautions to be followed.

The following general requirements are to be adhered to:

a. Obtain the services of a qualified vibration and blasting consultant to monitor the blasting.
b. Use a non-electric detonation system whenever possible. If electric caps are used, a check must be made for stray currents, induced current and radio frequency energy to insure that this hazardous extraneous electricity is at an acceptable safe level.
c. Provide an open face for maximum relief of burden.
d. Limit the maximum peak particle velocity to 1 inch per second. Depending on existing conditions, this may be modified to 2 inches per second.
e. Maintain an initial scale distance of 60 ft. per 1-1/2 lbs. After initial blasting, scale distance may be modified to a minimum of 50 ft. per 1-1/2 lbs. if conditions permit.

$$\text{Scale distance} = \frac{\text{Distance from blast to structure (in feet)}}{\sqrt{\text{Weight of explosives per delay (in pounds)}}}$$

The contractor shall provide for a pre-blast and post-blast survey, including photographs. An inspection of all nearby MBTA facilities shall be made to determine any changes that may occur due to blasting operations.

The contractor shall coordinate all blasting with the MBTA and Railroad Company(s) in advance to determine when the charges may be set. The contractor is advised that the MBTA and Railroad Company(s) use two-way radios for train control. The radios operate in the 160 Mhz area. These radios cannot be turned off at any time.

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IX

TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION

MAY 199

A00898 - 286

The Railroad Company(s) will determine when and where protection shields are required. The design and construction of temporary protection shields must adhere to the following specifications:

1. The construction of temporary protection shields will be designed to prevent any dust, debris, concrete, formwork, paint, or tools from falling on MBTA Railroad Property below.

2. The temporary protection shields shall be erected prior to the start of work. The Railroad Company(s) will determine whether or not sufficient protection has been provided to perform the work over any particular area.

3. The temporary protection shields shall remain in place until all work over the railroad has been completed and shall be removed only when ordered by the Railroad Company(s).

4. To minimize the inconvenience to the users of any properties below and adjacent to the project, the Contractor will be required to complete the actual erection and removal of the temporary shields within time limits acceptable to the Railroad Company(s).

5. The erected temporary protection shields shall not infringe on any existing minimum vertical clearance.

6. The Contractor will be required to obtain the approval of the Railroad Company(s) before commencing any work beneath the shield. In certain areas, depending on the nature of the work, the Railroad Company(s) may require a specific method of protection.

7. The horizontal shield shall be designed to carry a live load of 100 pounds per square foot and a single concentrated load of 2,000 pounds located to produce maximum stress. The vertical shield shall be designed to carry a wind load of 30 pounds per square foot.

8. Prior to the start of construction, the Contractor will be required to submit the details of the temporary protection shield to the Railroad Company(s), who will review and approve the details only as to the methods of erection and as to whether or not the proposed installation will provide the level of protection required at the various locations. It is the Contractor's responsibility to design these protections so that they are in conformance with all existing laws, regulations and specifications that govern this type of work. Shield plans must include a material list and shall be designed by a Registered Professional Engineer. The drawings and calculations must bear his seal when they are submitted to the Railroad Company(s).

9. If during the actual construction, the Railroad Company(s) deems that the

shield is not providing the desired level of protection or that the Contractor has failed to properly maintain the shield, all work at the affected location shall cease until corrective measures acceptable to the Railroad Company(s) are instituted.

10. All temporary shields will be constructed using new material.

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X

INDUSTRIAL SIDE TRACK SPECIFICATIONS

MAY 1994

A00898 - 289

SECTION 1. GENERAL

1.01 All railroad track construction shall be performed under competent supervision of personnel experienced in railroad construction and shall conform to the standards of the MBTA. The MBTA and Railroad Company(s) will inspect and approve all side tracks prior to being put in service. This specification will be used for side tracks directly on or within 15 feet of the MBTA property line. Any construction outside of the MBTA property line will be in compliance with the standards of the serving freight railroad.

SECTION 2. MATERIALS

2.01 MATERIAL

Rails, ties, switches, frogs, etc. will conform with the standards of the MBTA for various types of turnouts and track installations thereby insuring replacement availability.

2.02 RAIL

The rails shall be 100# ASCE Section or of a heavier rail section in common use, new or relay. Relay rails shall not have more than 1/4" top wear measured vertically along center line of rail, and not more than 3/8" side wear measured horizontally 3/4" below the normal top of rail. Rails shall be free from kinks, excessive rust and excessive head flow. Rails having line or surface bends that cannot be spiked will be rejected. Rail shall be free of internal defects. Rail used on the limits of MBTA Railroad Property shall be equal in weight and in section to the attached main line.

2.03 CROSS TIES

Cross ties shall conform to MBTA specifications, minimum size will be 7" x 8" x 8'6" and shall be treated with creosote in accordance with MBTA specifications. Relay ties may be approved after inspection by the MBTA and Railroad Company(s) prior to installation.

2.04 SWITCH TIMBER

Switch timber shall be new hardwood and conform to MBTA specifications 7" x 9" and of lengths required by MBTA standard turnout bill of materials. All timber shall be creosote treated as specified for cross ties. Relay timber

as above.

2.05 TIE PLATES

Tie plates shall be new or relay at least 7-1/2" x 10-3/4", 1/2" thick, double shoulder and should be canted. Tie plates must conform to MBTA specifications. Damaged plates or plates showing more than 25% reduction in section due to corrosion or wear will be rejected.

2.06 JOINT BARS

Joint bars shall be new or relay, 100% toeless, 24" long or equal and conform to MBTA specifications. Relay bars must be free from appreciable wear. Joint bars shall have a minimum of four holes and the holes are to fit the punchings of the rail. Holes to have a clearance of 1/16". Joint bars that cannot be drawn up to give a tight fit will be rejected. No fewer than 4 bolts per joint will be allowed.

2.07 BOLTS, NUTS AND WASHERS

Bolts and nuts shall be new and of a size to fit the rail punchings. They shall conform to AREA specifications for low carbon steel track bolts and nuts. Washers shall be new spring type of appropriate size and shall conform to MBTA specifications.

2.08 TRACK SPIKES

Track spikes shall be 6" long, 5/8" square with an oval head and conform to MBTA specifications for soft steel track spikes. Tangent track will have at least 2 rail holding spikes per tie plate and all curves over 3° will have 3 spikes per tie plate.

2.09 BALLAST

Ballast shall conform to MBTA Material Specification 9248.

2.10 BUMPING POSTS

Bumping posts will be Hayes type, Durable "D" or equal, unless otherwise specified, and will conform to MBTA Material Specification 9206.

2.11 DERAIL

Type and quality of derail will be specified for each individual side track requirement. Derail will be connected into the railroad signal system. This will be performed by the Railroad Company(s) at the Owner's expense. Two pairs of insulated joints will be installed at a location to be determined by the MBTA. Side tracks with a descending grade toward the main track will require a split switch type derail.

SECTION 3. INSTALLATION

3.01 The track will be properly installed with a standard gauge of 4'8-1/2" except on sharp curves. In cases of sharp curves, gauge will be specified by the MBTA or the Railroad Company(s).

3.02 Ballast will be installed on top of subgrade for a depth of at least 6" below the bottom of tie and brought up to the top of the tie at the center and slope off to 1" below top of tie at the ends. It will then extend 1' beyond the end of the tie at that height, at which point it will slope off at a rate of 2:1 to the sub-ballast.

3.03 Cross ties will be placed not more than 24" on center on tangent track and $19^1/_2$" on center on curved track. When relay rails are used the unworn side will be placed on the gauge side. Tie plates will be installed on each cross tie. The center of the joint should be installed so as to be suspended by two ties.

3.04 It will be the responsibility of the builder of that portion of track designated as "property line to end" to connect to that portion of track designated as "clearance to property line" and provide the necessary joints or compromise joints with bolts as the weights of rail would dictate.

SECTION 4. BONDING

4.01 Where track bonding is necessary, it will be performed by the Railroad Company(s) in accordance with MBTA standards.

SECTION 5. APPROVAL

5.01 Plans for track installation must be approved by the MBTA and Railroad Company(s) before the design of the facility to receive rail service is finalized.

SECTION 6. CURVATURE OF TRACK

6.01 The recommended curvature shall be exceed 8° or less. The maximum allowable degree of curve is not to exceed 12° 30', unless approved by the Chief Engineering Officer.

SECTION 7. GRADE OF TRACK

7.01 The maximum allowable grade for all tracks shall not exceed 1.5% descending towards mainline or 3% descending from mainline using 100 foot vertical curves.

SECTION 8. ELEVATION

8.01 Super elevation shall not exceed 1 inch.

SECTION 9. SUBGRADE

9.01 Subgrade will be prepared to a grade 18" - 20" below the proposed top of rail and shall be of a material that is compacted to 95% and provides for adequate drainage.

SECTION 10. ACCEPTANCE

10.01 Before track is placed into service to receive cars, it will be inspected and approved by a qualified track inspector from the MBTA, the Railroad Company, and the freight carrier.

10.02 No exceptions to these specifications are authorized without the written approval of the Chief Engineering Officer.

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XI

RIGHT OF WAY FENCING SPECIFICATIONS

MAY 1994

A00898 - 295

SECTION 1. GENERAL

1.01 DESCRIPTION

This section specifies the furnishing and installing of new Type I galvanized steel or Type II aluminum coated steel chain link fence. Right of way fence will be 6', 8' or 10' as required by site specific conditions.

1.02 SUBMITTALS

Shop Drawings

1. Include cross sectional dimensions of posts, braces, rails, fittings, accessories and gate frames, design of gates, and details of gate hardware.

2. Include a layout drawing showing the spacing of posts and location of all gates, abrupt changes in grade, and all corner, gate, anchor, end and pull posts.

SECTION 2. PRODUCTS

2.01 MATERIALS

A. General

1. Steel pipe dimensions and weights: ASTM A-53, Schedule 40 (except the hydrostatic testing requirement is waived). Dimensions specified are outside diameter (O.D.).

2. Provide post with accepted semi-steel or pressed steel tops, so designed as to fit securely over post and carry top rail or spring tension wire; the base of post top fitting shall fit over the outside of post and shall exclude moisture from post. All fittings and accessories shall be hot dipped galvanized in accordance with ASTM A-53.

B. Line Post: For all post heights, unless otherwise noted, Schedule 40, 2.375" O.D. pipe weighing 3.65 lbs/ft ASTM A-53 with a 2 oz. hot dipped galvanized coating shall be used.

C. Gate post: Furnish post to support single gate leaf, or one leaf of a double gate installation, for the following gate widths:

Leaf Width	Gate Post	Sch. 40
up to 6'	2.875" O.D.	5.79 lb/ft
6' to 12'	4.000" O.D.	9.11 lb/ft
12' to 18'	6.625" O.D.	18.97 lb/ft
18' to 32'	8.625" O.D.	28.55 lb/ft

D. End, Corner and Intermediate Posts

For all post heights, unless otherwise noted, Schedule 40, 2.875" O.D. pipe weighing 5.79 lbs/.ft. ASTM A-53 with a 2 oz. hot dipped galvanized coating shall be used.

E. Top rail and Spring Tension Wire

1. Top Rail

a. Schedule 40, 1.66" O.D. pipe weighing 2.27 lbs/ft. ASTM A-53 with a 2 oz. hot dipped galvanized coating.

b. Couplings and expansion sleeves: Outside sleeve type, minimum six inches long.

2. Spring tension wire: shall be marcelled (spiralled or crimped) #7 gauge (.177 inches) plus or minus 0.005 inches in diameter. ASTM A-824. 1.2 oz zinc per sq. ft.

F. Braces and Tension Rods

1. Compression braces: Same type and size as top rail.

2. Tension rods: 3/8" round rods with drop forged turnbuckles or other approved type of adjustment.

G. Fence Fabric

1. Type I galvanized steel ASTM A-392 Class 2 coating 2 oz.

a. Typical-2" diamond mesh 6 gauge (.192") 2 oz.

b. Hot dipped galvanizing after weaving.

2. Type II aluminum coated steel ASTM A-491 size 2, 3/8" mesh.

3. Selvages: All types

   a. Fabric shall be knuckled at both selvages.

   b. Fabric over 60 inches high: knuckled at one selvage and twisted and barbed at the other.

H. Fabric Bands, Brace Bands and Stretcher Bars

1. Fabric Bands: 12 gauge pressed steel 7/8 inch wide.

2. Brace Bands: 11 gauge pressed steel 1 inch wide.

3. Stretcher Bars: 3/16" x 3/4" galvanized steel.

I. Tie wire and miscellaneous Items

1. Tie Wire: Galvanized steel 6 gauge (.192") for post and rails.

2. Hog rings: Galvanized steel 6 gauge (.192") for spring tension wire.

3. Rail and Truss Cups: Galvanized semisteel or pressed steel.

J. Barbed Wire and Extension Arms

1. Barbed Wire: ASTM A121, 12-1/2 gauge, 4-point round barbs, Class 3 coating.

2. Extension Arms: Projecting at an angle of approximately 45 degrees, fitted with clips or other means of attaching three strands of barbed wire, the top outside wire approximately 12 inches from the fence line and the other wires spaced uniformly between the top outside wire and the fence fabric.

K. Gates

1. General: Furnish gates complete with necessary hinges, latches, and drop bar locking devices; corners shall be welded or fastened and reinforced with suitable fittings.

2. All gates fabricated from 1.90" O.D. Schedule 40 pipe weighing 2.72 lbs/ft with a 2 oz hot dipped galvanized coating.

L. Concrete: Class 2500 psi concrete consisting of aggregate passing the No. 8 sieve.

SECTION 3. EXECUTION

3.01 INSTALLATION

A. Place terminal post at each end, corner, gate post, pull post (maximum 500'), or any change in grade or direction greater than 30 degrees.

B. Line posts shall be spaced on a maximum of 10 foot centers. In determining the post spacing, measure parallel to slope of finished grade. All posts to be set plumb and in line. Post spacing on radius as follows:

200' - 500' radius 8' O.C.
100' - 200' radius 6' O.C.
less than 100' radius 5' O.C.

C. When fencing is installed on the top of concrete structures, use galvanized sleeve and grout posts or install with suitable galvanized flange casing and galvanized anchor bolts. Set all other posts permanently in concrete.

D. Excavate post hole footings at least 12" in diameter for line post and 16" for terminal and gate posts up to 4" O.D. Larger gate posts require 18" diameter footings. All footings excavated to a depth of 42" with a minimum post embedment of 36". Crown top of concrete to shed water and allow to cure not less than 72 hours before proceeding with further work on the post.

E. Brace end, corner pull, and gate posts to the nearest line post, with diagonal or horizontal brace rails used as compression chambers, and with truss rods with turnbuckles used as tension members. Brace line posts horizontally and truss in both directions as required, at approved intervals.

F. Install fabric on post side which best secures MBTA's Railroad Property. Pull fabric taut and tie to all line posts, rails, braces and spring tension wire spacing all ties at 12" intervals. Use hook shaped steel ties confined to the diameter of the pipe to which it is attached, clasping pipe and fabric firmly with both ends twisted at least 2 turns.

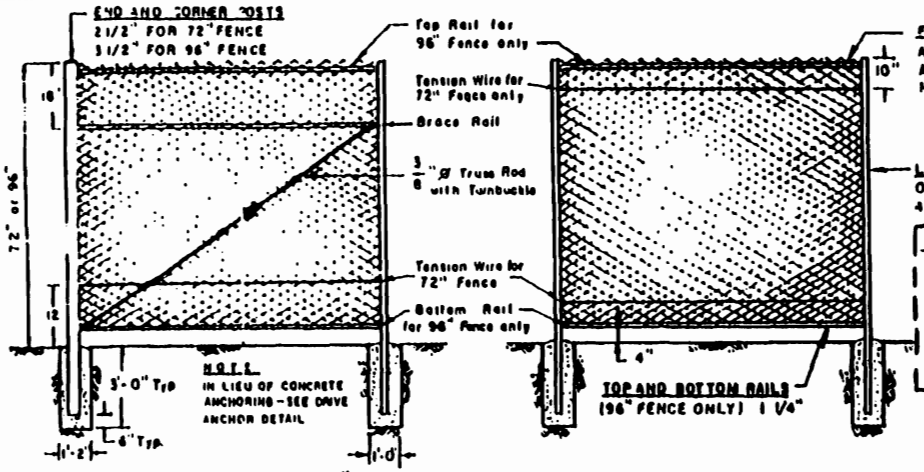
G. Barbed wire and tension wire must be taut and properly secured with brace bands at each terminal and gate post.

H. Electric Ground: Where a power line carrying more than 600 volts passes

over fence, install ground rod at the nearest point directly below each point of crossing. Ground all substation fences and gates and perform other electrical grounding as indicated.

3.02 TOUCH-UP AND REPAIR WORK

Remove and replace fencing which is improperly located or is not true to line, grade and plumb within tolerances as indicated.



END OR CORNER PANEL*

* BRACE PANEL TO INCLUDE AN ADDITIONAL PANEL BRACED AS SHOWN EXCEPT TRUSS ROD IN OPPOSITE DIRECTION

LINE PANEL

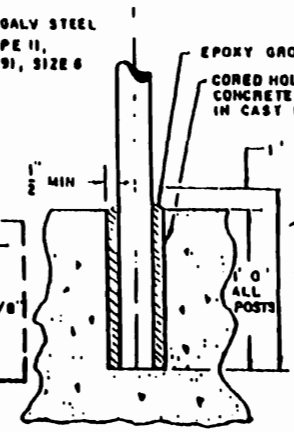
FENCE FABRIC - SHALL BE TYPE I, GALV STEEL ASTM A392, SIZE 6, COATING 2 OR TYPE II, ALUMINUM COATED STEEL, ASTM A491, SIZE 6 MESH, 2' MAX

LINE POSTS - SHALL BE 2" DIA PIPE OR 199 x 2.25 inch 'H' COLUMN WEIGHING 4.10 LBS PER FOOT

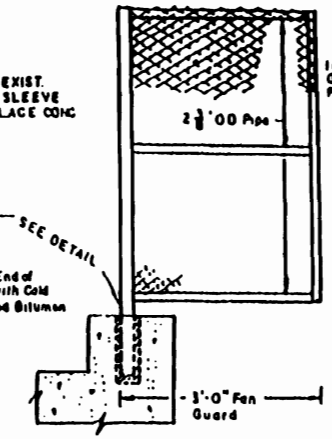
HIGH SECURITY FENCE ONLY

WHEN HIGH SECURITY FENCE IS INDICATED, MODIFY ITEMS SHOWN ON THIS SHEET AS FOLLOWS:

- FABRIC - ASTM A491, Size II, Mesh 3/8"
- LINE POSTS - 2 1/2" for 72", 3" for 96"
- END POSTS - 3 1/2" for 72", 4" for 96"
- USE TOP & BOTTOM RAILS FOR BOTH 96" & 72" FENCE



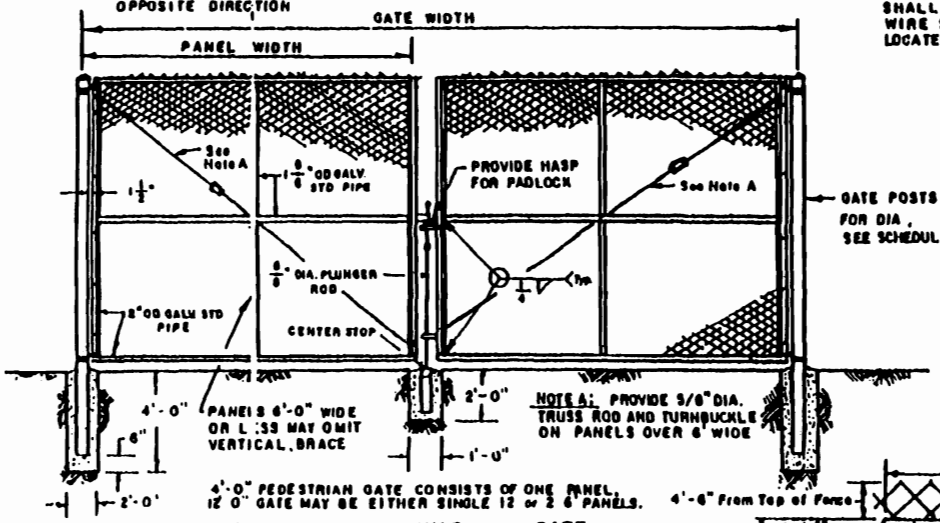
POST ANCHORED INTO CONCRETE



CANTILEVER FENCE DETAIL

BARBED WIRE TOP

USE ON FENCE AND GATES WHEN INDICATED. SHALL BE THREE STRANDS OF BARBED WIRE SUPPORTED ON EXTENSION ARMS LOCATED ON ALL POSTS



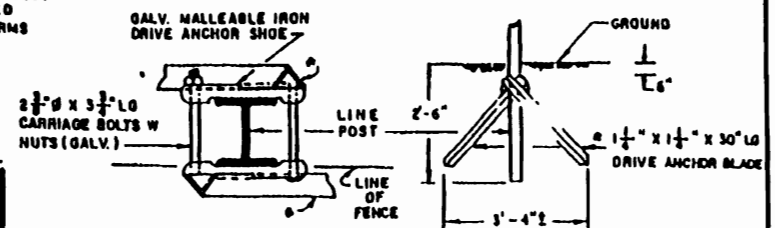
NOTE A: PROVIDE 5/8" DIA. TRUSS ROD AND TURNBUCKLE ON PANELS OVER 6' WIDE

4'-0" PEDESTRIAN GATE CONSISTS OF ONE PANEL, 12'-0" GATE MAY BE EITHER SINGLE 12' or 2 6' PANELS.

VEHICULAR SWING GATE

GATE POST SCHEDULE

HEIGHT OF FENCE	GATE WIDTH	GATE POSTS
96"	4'-0"	4"
	12'-0"	6 5/8"
	20'-0"	6 5/8"
	24'-0"	6 5/8"
	30'-0"	8 5/8"
72"	4'-0"	3 1/2"
	12'-0"	4"
	20'-0"	6 5/8"
	24'-0"	6 5/8"
	30'-0"	6 5/8"



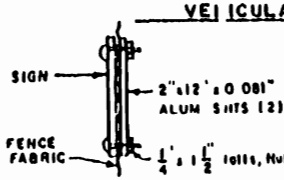
NOTE: Use Drive Anchors instead of Concrete only with authorization of Chief Engineering Officer

DRIVE ANCHOR DETAIL

(FOR USE WITH 72" FENCE - LINE POSTS ONLY)

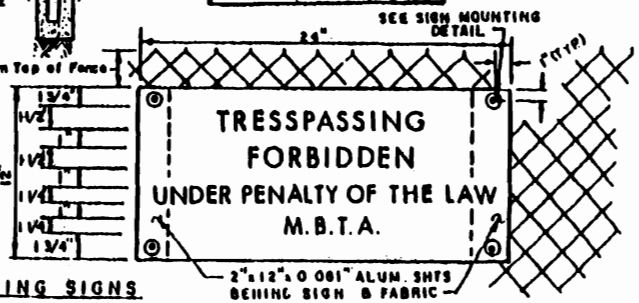
NOTES:

1. MAXIMUM SPACING BETWEEN LINE POSTS (℄ TO ℄) TO BE 10'-0"
2. FOR INTERMEDIATE BRACING PANEL SEE END OR CORNER PANEL
3. ALL PIPE DIMENSIONS TO BE CONSIDERED NOMINAL
4. FOR HIGH SECURITY FENCE, SEE DASHED BOX, TOP CENTER OF PLAN



SIGN MOUNTING DETAIL

SIGNS TO BE 0.081" THICK ALUMINUM ALLOY SHEET - ASTM B209. BACKGROUND - YELLOW REFLECTIVE SHEETING, FS L-S-300 A TYPE, CLASS 1 or 2, REFLECTIVITY I. LEGEND - BLACK GLOSS SILK SCREEN, MDPW MATERIALS SPEC. M7.04.12. PLACE SIGNS ON ALL GATES, EVERY 500' MAX ON LINE FENCE, AT ALL BREAKS OR ABRUPT CHANGES IN GRADE AND CHANGES IN DIRECTION OVER 30°.



WARNING SIGNS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

RAILROAD OPERATIONS

DWG NO 3206

Nov. 17, 1986 — ISSUE DATE — 1 ISSUE NO

CHAIN LINK FENCING

72", 96" and "HIGH SECURITY" TYPE

ENGINEERING OFFICER — CHIEF ENGINEERING OFFICER

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORAT

XII

TEST BORING SPECIFICATIONS

MAY

A00898 - 302

SECTION 1. GENERAL

All borings on MBTA Railroad Property are to be performed according to the following requirements:

1.01 Work on MBTA Railroad Property must be performed with a Railroad Company(s) inspector and/or flagman present.

1.02 Where access can only be gained by crossing the tracks, a temporary crossing must be used. This crossing shall adhere to the following:

A. The location and material must be approved in advance by the Chief Engineering Officer or Railroad Company(s).

B. The crossing will be constructed by Railroad Company(s) forces at the Contractor's expense.

C. The crossing must be protected at all times when not in use. Access will be prohibited through the use of right-of-way gates which will be constructed by Railroad Company(s) forces at the contractor's expense.

D. No crossing of the track shall be made without a railroad flagman and/or inspector present.

E. The crossing of tracks shall be kept to a minimum.

1.03 Boring locations, including positioning of the boring rig, shall be kept at least 8'6" from the center line of track.

1.04 All borings must be cased to insure adequate return (of mud and water) and to avoid undermining of the track.

1.05 All holes shall be backfilled with cement grout to fill the voids and protect against an artesian condition.

1.06 The location of all utilities owned or private, shall be located and suitably marked by the Railroad Company(s) and/or the private owner at the Contractor's expense to avoid damage to the utility and/or track structure.

1.07 Prior to entry upon the MBTA Railroad Property, all necessary contracts, insurance

policies and financial obligations shall be provided in a form acceptable to the Railroad Company(s).

1.08 Work within the operating right-of-way that has potential to foul the tracks, shall be restricted to periods of non-peak passenger operations.

1.09 While performing the work, full cooperation with the inspector and flagman is essential. The work will be terminated immediately if the safety of rail traffic and personnel is jeopardized in any way.

SECTION 2. TESTING

2.01 Soil borings shall be in accordance with the current issue of the American Railway Engineering Association Specifications, Chapter 1, Part 1, "Specifications for Test Borings". Soils shall be investigated by the split-spoon and/or thin-walled tube method and rock shall be investigated by the Coring method specified therein.

2.02 Soil boring logs shall clearly indicate all of the following:

1. Boring number as shown on boring location plan.
2. Elevation of ground at boring.
3. Description or soil classification of soils and rock encountered.
4. Elevations or depth from surface for each change in strata.
5. Identification of where samples were taken and percentage of recovery.
6. Location of ground water at time of sampling and, if available, subsequent readings.
7. Natural dry density in lbs./sq. ft. for all strata.
8. Unconfined compressive strength in tons/sq. ft. for all strata.
9. Water content (percent). Liquid limit (percent) and plastic limit (percent).
10. Standard penetration in blows/ft.

2.03 Soil boring logs shall be accompanied by a plan drawn to scale showing location of borings in relation to the tracks, the elevation of ground surface at each boring, and the elevation of the top of rail of the tracks.

2.04 Soil investigation by auger, wash, or rotary drilling methods are not acceptable.

2.05 Borings shall be taken no more than two (2) feet from the field stake which marks

the boring location. The stake should not be disturbed during boring operations. Lost stakes shall be reinstalled.

2.06 Unless a boring hole is actively being worked, it shall be securely covered or otherwise protected until permanently filled. When work at each boring hole is completed, the hole shall be properly filled.

2.07 Access to the boring locations must be approved by the Railroad Company(s). When possible, access shall be from public roads. Licenses for Entry, Insurance and Flag Protection must be obtained by the Contractor in accordance with all applicable MBTA Specifications.

2.08 Boring operations shall be confined to each boring location to the extent possible. The contractor shall take necessary precautions to prevent damage to structures and facilities. The site shall be restored to a condition satisfactory to the Railroad Company(s).

MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY

RAILROAD OPERATIONS DIRECTORATE

XIII

FIBER OPTIC CABLE SPECIFICATIONS

MAY 1

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SECTION 1. GENERAL

1.01 The purpose of the following standards is to provide basic information about the MBTA's requirements with respect to the design and construction of fiber optic cables on MBTA Railroad Property to fiber optic cable companies and their contractors.

1.02 All work performed on or affecting MBTA Railroad Property must be designed and constructed in accordance with the Commuter Rail Design Standards (Vol. I and II), MBTA Book of Standards, Railroad Operations Specifications and the following standards. Additional job specific requirements will be contained in the MBTA's Fiber Optic License Agreement and can be obtained by contacting:

Director of Real Estate
Ten Park Plaza
Boston, MA 02116

The Chief Engineering Officer or his designated representative will be responsible for the approval of all work. No modifications, changes or deletions will be made without his approval.

SECTION 2. PROJECT REVIEW AND COORDINATION

2.01 All plans and specifications shall be reviewed and approved by the MBTA and Railroad Company(s) prior to construction. The MBTA must approve the construction schedule and sufficient Railroad Company(s) personnel must be available before work begins.

2.02 If another fiber optic cable company has previous or exclusive rights along the proposed route, the alignment and cable location must be approved in accordance with existing agreements.

2.03 The fiber optic cable companies must coordinate the construction with others to minimize the disruptions to the MBTA railroad operations.

SECTION 3. CONDUCT OF WORK

3.01 In order to minimize the manpower requirements of the Railroad Company(s)

and afford better control, supervision, and protection, the contractor will conduct his work sequentially and minimize the number of crews and their proximity. Crews should be confined geographically to an area that can be covered easily by a minimum number of Railroad Company(s) personnel. This can be accomplished by a block method of construction. A construction block will be used and is a 1-4 mile segment of right of way in which up to 3 fiber optic cable installation crews can work. The crews can work within the construction block, but cannot work outside of it. The construction block must move as a unit along the right of way. The crews cannot work two blocks concurrently.

SECTION 4. CONSTRUCTION SCHEDULE

4.01 The fiber optic company or its contractor will submit a schedule of work to the MBTA for approval. The schedule will be based on methods of construction acceptable to the MBTA and Railroad Company(s). No work shall begin prior to approval by the MBTA.

4.02 Any changes or modifications to the schedule proposed by the fiber optic company or its contractor must be submitted to and approved by the MBTA prior to implementation. The MBTA, however, may be required to change or modify the construction schedule on account of its operations, maintenance requirements, or manpower shortages. In this event, the MBTA will give the fiber optic cable company as much advance notice as possible.

4.03 Construction schedules will be reviewed and updated every two (2) weeks or as required.

SECTION 5. ESTIMATE OF EXPENSES

5.01 An estimate of anticipated expenses will be provided based on durations provided by the fiber optic cable company or his contractor and construction schedules approved by the Railroad Company(s). Any changes in the schedule will cause the estimate to be revised. The fiber optic cable company or his contractor will be responsible for all of the costs incurred by the MBTA and Railroad Company(s) in support of the construction activities. This includes design review, engineering support, administration and supervision.

SECTION 6. BILLING

6.01 The fiber optic cable company or its contractor will be required to pay for railroad protective services in advance of costs incurred.

IFB #17-73 Bike Path Retaining Wall and Drainage Upgrades
Register of Prospective Bidders / IFB Holders

Name	Vendor Name	Address	Phone	Fax	E-mail Address	Sent IFB	Addenda
Ryan Dewey	Dewcon, Inc.	Basking Ridge, NJ	908-832-5710	**908-832-0784**	rdewey@dewconinc.com	6/15/2017	
Christopher Walsh	W. Walsh Company	Attleboro, MA	508-226-4300	**508-226-8449**	chriswalsh@wwalsh.com	6/15/2017	
John Diamond	Biszko Corp		508-679-0518	**508-679-9144**	jdiamond@biszkocorp.com	6/15/2017	
Sharon Karns	Dodge Reports		513-666-3355	**800-768-5594**	Sharon.Karns@construction.com	6/15/2017	
Jeff Houser	McWane Ductile	Phillipsburg, NJ	518-275-1780		jeff.houser@mcwaneductile.com	6/15/2017	
Lynne Murphy	Hi-Way Safety System	Rockland, MA	781-982-9229	**781-982-9226**	lmurphy@hiwayss.com	6/15/2017	
Ounica Moore	Construction Journal		772-781-2144		O.Moore@constructionjournal.com	6/15/2017	
Karen Fitzgerald	Projectdog	Newburyport, MA			addenda@projectdog.com	6/15/2017	
Bob Savage	DeFelice Corporation	Dracut, MA	978-452-6967		engineering@defelicecorp.com	6/15/2017	
Kevin Marston	Everett J. Prescott, Inc.	162 N. Main St., Middleton, MA	800-444-7738		Kevin.Marston@ejprescott.com	6/15/2017	
Jennifer Allen	Newport Construction Corp	145 Temple St., Nashua, NH	603-882-1700		j.allen@newportconstruct.com	6/15/2017	
Justin Felisco	Construction Connect	Norcross, GA			Justin.Felisco@ConstructConnect.com	6/15/2017	
Paula Paolini	ADPaolini LLC	50 Smith Ave., Newton, MA	617-454-4277		paula@adpaolini.com	6/15/2017	
Shania Angus	Construction.com		347-620-7930		Shania.Angus@construction.com	6/15/2017	
Paul Umbro	Umbro & Sons Construction Corp				paul@umbroconstruction.com; steve@umbroconstruction.com	6/15/2017	
Christina Donahue	FW Webb	Malden, MA			christina.donahue@fwwebb.com	6/15/2017	
Lisa French Kelley	WL French Excavating Corporation	North Billerica, MA	978-663-2623		lkelley@wlfrench.com	6/15/2017	
Wally Shield	HD Supply Waterworks				shieldsfive@comcast.net	6/15/2017	
Shelley M. O'Rourke	MAS Building & Bridge, Inc.	Norfolk, MA	508-520-2277		sorourke@masbuildingandbridge.com	6/15/2017	
Sean Evers	ATL Construction				sean@atlconstruction.us	6/15/2017	
	P. Gioioso & Sons	**50 Sprague Street, Hyde Park, MA 02136**	**617-364-5800**	**617-364-9462**	info@pgioioso.com	6/15/2017	
	D'Allesandro Corp	**41 Ledin Drive, PO Box 245, Avon, MA 02322**	**508-559-6400**	**508-559-6432**	jbd@dallessandro.com; ppiantedosi@dallessandro.com	6/15/2017	
	Blue Diamond Equipment	**73 E. Belcher Rd, Foxboro, MA 02035**	**508-543-3711**	**508-543-3755**	bluediamondcc@comcast.net	6/15/2017	
Mark Santora	**Juniors LLC**	**123 Old Westboro Road, N Grafton, MA 01536**	**508-839-0170**		mspeinc@aol.com	6/15/2017	
Ducilinh Hoang	**Pacella Enterprises**				dhoang@pacellaenterprises.net	6/15/2017	
Paul Clancy	**P. Clancy & Sons**	**126 Willard Street, Quincy, MA 02169**	**617-464-1305**		clancy12040@yahoo.com	6/15/2017	
Anne Mohrmann	**Sonco Worldwide**	**450 Pavilion Avenue, Warwick, RI**	**401-406-3762**		amohrmann@sonco.com	6/15/2017	
Marc Ciampa	**P. Caliacco Corp**	**1373 Washington Street, Weymouth, MA 02189**	**781-340-0400**		mciampa@caliacco.com	6/15/2017	
Marc Scopelleti	Baker Corp	Oxford, MA	508-987-0034		mscopelleti@bakercorp.com	6/15/2017	
Gabriel Padilla	Aqua Line Utility Incorporated	210 Winter Street, Suite 306, Weymouth, MA 02188	508-690-2009	508-456-1305	Gabriel@aqualineutility.com	6/15/2017	
Zachary Gordon	InSite Contracting, Inc.	162 Cross St., Winchester, MA 01890	781-721-1275	781-721-1232	estimator@insitecontracting.com	6/15/2017	
Jill Cunningham	Revoli Construction Co., Inc.	90 Earls Way, Franklin, MA 02038	508-520-2350	508-520-2355	jillc@revoliconst.com	6/15/2017	
Amanda Wiley	Baker Corp	102 Old Worcester Road, Oxford, MA 01540	508-987-0034 x7519		awiley@bakercorp.com	6/15/2017	
Jennifer Allen	Newport Construction Corp	145 Temple Street, Nashua, NH 03060	603-882-1700	603-882-2784	j.allen@newportconstruct.com	6/15/2017	
Colleen Haynes	Kennedy/Jenks Consultants	1 Highwood Drive, Ste 301, Tewksbury, MA 01876	978-770-2031		colleenhaynes@kennedyjenks.com	6/15/2017	
Bruce Maxwell	HD Supply	11 Esquire Rd., Billerica, MA 01862	978-901-6044		bruce.maxwell@hdsupply.com; keith.holmes@hdsupply.com	6/15/2017	
Christina Donahue	FW Webb Company	869 Eastern Avenue, Malden, MA 02148	781-922-1238		christina.donahue@fwwebb.com	6/15/2017	
Justin Miller	Dodge Data & Analytics	7265 Kenwood Rd., Ste 200, Cincinnati, OH 45236	513-666-800-3347	800-768-5594	justin.miller@construction.com	6/15/2017	

IFB #17-73 Bike Path Retaining Wall and Drainage Upgrades
Register of Prospective Bidders / IFB Holders

John Tate	National Water Main Cleaning Co	25 Marshall Street, Canton, MA 02021	800-422-0815	781-828-2473	jtate@nwmcc-bos.com	6/15/2017
Carl Daly	Metro Equipment Corp	Braintree, MA	508-975-3024		Cdaly@metroequipmentcorp.com	6/15/2017
Ian Jardin	D'Allesandro Corp				ijardin@dallessandro.com	6/17/2017
Nancy Munyon	J. D'Amico Inc	Randolph, MA	781-961-3700	781-986-4667	nancy@jdamico.com	6/19/2017
Randi DeLoreto	Tim Zanelli Excavating	North Reading, MA	978-207-1233	978-207-1649	rdeloreto@gmail.com	6/19/2017
Gina Marie DiCenso	GVW, Inc.	East Boston, MA	617-567-6000 x301	617-567-3344	gdicenso@gvwinc.com	6/19/2017
Joan Allen	Aegion	Charlton, MA	508-248-7640	508-523-4821	jallen@aegion.com	6/19/2017
Tina Seymour	AJ Virgilio Construction	Westfield, MA	413-562-6600	413-562-8366	tina@ajvirgilio.com	6/20/2017
Pam Dobeck	UEL Contractors	Clinton, MA	978-345-2740	978-348-2282	pam.dobeck@uelcontractors.com	6/20/2017
Michael Ruggiero	CRL, Inc.		781-391-3800	781-391-3801	estimating@crlinc.co	6/20/2017
Donna McFadden	MDR Construction Inc	Tewksbury, MA	978-851-1000	978-851-0999	dmcfadden@mdrconstruction.com	6/22/2017
Joe Solimini	Solimini Excavation and Utilities		781-844-4541		soliminiexcavation@gmail.com	6/30/2017
Esteban Montoya	MacKay Construction Services		617-314-6213	617-314-7831	emontoya@mackaycompanies.com	7/5/2017
Donna Famulari	The Blue Book		800-431-2584 x3623		dfamulari@mail.thebluebook.com	
Ryan Elliott	JJ Phelan & Son Co., Inc	Tewksbury, MA	978-851-5850 x202	978-851-4980	RElliott@jjphelan.com	7/12/2017
Denise DiMento	Kodiak Corporation	Lawrence, MA	978-685-07777		ddimento@kodiakcorporation.com	8/7/2017